Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

Job #47388.11

August 25, 2021

Dexter Legg, Chair
Portsmouth Planning Board
1 Junkins Avenue, 3rd Floor
Portsmouth, NH 03801

Re: Open Space Planned Unit Development, 83 Peverly Hill Road

Dear Chairman Legg & Members of the Planning Board,

On behalf of the Applicant, Green & Company, TF Moran, Inc. (TFM) respectfully submits the following revised plans and supporting documents for review at the September 16 Planning Board meeting:

- Site Development Plans, Parson Woods Condominium, 83 Peverly Hill Road, Portsmouth, New Hampshire Dated April 19, 2021, Last Revised August 25, 2021 (1-Full Sized Plan Set / 1-11x17 Plan set)
- Letter of Authorization
- Abutters List
- Site Plan Checklist, Updated August 25, 2021
- Subdivision Checklist, Updated August 25, 2021
- Waiver Requests, Dated June 23, 2021
- A copy of a letter to Michael Green from GDS Associates, Inc. Engineers & Consultants
- Planned Unit Development Versus Conventional Subdivision Memorandum, Dated August 6, 2021
- Declaration and Bylaws draft#1
- Traffic Memorandum by Stephen Pernaw, Date October 6, 2020
- Traffic Calming by Stephen Pernaw, Date June 17, 2021
- Transportation Peer Review by TEC, Dated June 22, 2021
- Traffic Memo – Response to TEC's Comments, Dated July 3, 2021
- Transportation Peer Review #2 by TEC, Dated July 20, 2021
- Will serve letter from Unitil, Dated June 14, 2021
- Will serve letter from Eversource, Dated June 18, 2021
- Water Distribution Analysis from Weston and Sampson, Dated May 21, 2021
- Drainage Report dated April 19, 2021, Last Revised August 25, 2021
- Drainage Letter Conforming to Article 7 of the Site Plan Review Regulations, Dated August 25, 2021

- Draft of the NHDES Sewer Submittal Dated April 19, 2021, Last Revised August 11, 2021
- Architectural Plans
- Overall Site Layout Color Plan – Dated May 4, 2021, Last Revised July 20, 2021
- Overall Proposed Developed and Remaining Land – Dated June 21, 2021
- Concept – Conventional Subdivision Plan – Dated July 19, 2021

This proposal is for an Open Space Planned Unit Development containing 56 single-family condominium dwelling units with 2,950 linear feet of public roadway. Associated improvements include underground utility installation, 2 recreational pocket parks, a public bike/pedestrian path to an existing rail trail, a multi-use path to Middle Road, landscaping, and open space.

The property contains 105 acres and is bounded by Peverly Hill Road on the East, the New Hope Baptist Church, conservation land, the Swift Water Girl Scout Council, and several smaller properties on the South, the Boston and Main Railroad on the West, and the Calvary Cemetery on the North.

The project proposes to put 71 acres, in the form of a conservation easement, to the city. These 71 acres will abut Map 255 Lot 5, a property already in conservation which abuts the recently required 27.5 acre conservation easement on Map 256 Lot 2.

This project has had several reviews and/or meetings with City Staff, TAC and the Planning Board. A summary of our meetings to date, in order is listed below.

- August 20, 2020 - Preliminary meeting with the Planning Board
- September 3, 2020 - Meeting with Mark Newport of Portsmouth Police Department
- September 4, 2020 - Meeting with Patrick Howe of Portsmouth Fire Department
- September 17, 2020 - Preliminary Conceptual Consultation with Planning Board
- October 13, 2020 – Technical Advisory Committee (TAC) Work Session
- October 30, 2020 - Meeting with Planning Department Staff
- December 11, 2020 - Michael Cuomo review of Wetland Delineation
- December 21, 2020 - Meeting with Planning Department Staff
- February 9, 2021 - TAC Work Session
- May 4, 2021 - TAC Meeting
- May 12, 2021 - Meeting with Planning Department Staff
- July 6, 2021 – TAC Meeting
- August 3, 2021 – TAC Meeting & Conditional Approval

Based on comments received from the TAC and Planning staff during those meetings, we have revised the plans as follows:

- We removed the hammer head drive and limited the development to the smaller area abutting Peverly Drive.
- Reduced paved width of loop road from 26' to 22.'
- Created an offset intersection at the loop road to prevent a long straight thru roadway.

- Changed 5' wide asphalt sidewalk to 5 1/2' wide concrete.
- Increased the 2' wide grass strip between roadway and sidewalk to 4 ½'.
- Added horizontal curves to the loop road to prevent long straight sections.
- Added a raised crosswalk at the bike path entrance.
- Provided a 10' wide equipment access (15' wide easement) to drainage BMP's.
- Added pavement markings to delineate bike route to bike path.
- Revised street lighting to comply with City preferences.
- Added all utilities to roadway profiles.
- Added underdrain at bottom of slope adjacent to cemetery.
- Added a 5' sidewalk from the development to Middle Street and a pedestrian crossing across Peverly Hill Road and the Middle Street Intersection.

The project received Conditional Approval from the Technical Advisory Committee on August 3, 2021.

We look forward to reviewing this project with you at the September 16, 2021 Planning Board hearing.

Cordially,
TFMoran, Inc.

Jack McTigue, PE
Project Manager

JJM/jcc

cc: Green & Company
Greg Mikolaities
John Kuzinevich, Esq.

TFM Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

Abutters List

Green & Company
83 Peverly Hill Rd, Portsmouth, NH
April 19, 2021
47388-11

	Assessors Map		Abutter Name	Mailing Address
	Map	Lot		
1	LOCUS 242	4	S B & N A STOKEL TRUST & PHILIP J. STOKEL	83 PEVERLY HILL ROAD PORTSMOUTH, NH 03801
2	165	14	BOSTON & MAINE CORPORATION	IRON HORSE PARK HIGH STREET NORTH BILLERICA, MA 01862
3	232	87	SUSAN L. DIXON	68 WIBIRD STREET PORTSMOUTH, NH 03801
4	232	88	NATHAN M. & SHERRI M. TARLETON	74 LEAVITT AVENUE PORTSMOUTH, NH 03801
5	232	92	DYANNA L. INNES	78 PEVERLY HILL ROAD PORTSMOUTH, NH 03801
6	232	93	KENNETH T. BLACK	82 PEVERLY HILL ROAD PORTSMOUTH, NH 03801
7	232	95	CITY OF PORTSMOUTH DPW	PO BOX 628 PORTSMOUTH, NH 03802
8	242	1	STATE OF NEW HAMPSHIRE FISH & GAME DEPT	11 HAZEN DRIVE CONCORD, NH 03301
9	242	3	NEW HOPE BAPTIST CHURCH	PO BOX 1473 PORTSMOUTH, NH 03802
10	242	5	ROMAN CATHOLIC BISHOP OF MANCHESTER CHURCH OF IMMAC	153 ASH STREET MANCHESTER, NH 03104
11	243	50	ASRT, LLC	266 MIDDLE STREET PORTSMOUTH, NH 03801
12	243	51	AJEI REAL ESTATE LLC	163 SPINNEY ROAD PORTSMOUTH, NH 03801
13	243	52	CITY OF PORTSMOUTH DPW	PO BOX 628 PORTSMOUTH, NH 03802
14	255	5	THOMAS E. & MARYBETH B. REIS AND JAMES B. & MEEGAN C. REIS	305 PEVERLY HILL ROAD PORTSMOUTH, NH 03801
15	255	8	MERRIMAC VALLEY HOMES, INC.	1794 BRIDGE STREET, UNIT 6 DRACUT, MA 01826
16	256	1	SWIFT WATER GIRL SCOUT COUNCIL	ONE COMMERCE DRIVE BEDFORD, NH 03110
17	265	2	MARK H. ODIORNE	520 BANFIELD ROAD PORTSMOUTH, NH 03801
18	265	2A	DAVID W. ECKER	875 BANFIELD ROAD PORTSMOUTH, NH 03801
19	265	2B	LEE ANN & RICHARD M. RILEY	470 BANFIELD ROAD PORTSMOUTH, NH 03801
20	265	2C	APOSTOLIC CHURCH OF J CHRIST	500 BANFIELD ROAD PORTSMOUTH, NH 03801
21	265	2D	CITY OF PORTSMOUTH DPW	PO BOX 628 PORTSMOUTH, NH 03802
22	265	2E	CITY OF PORTSMOUTH	1 JUNKINS AVENUE PORTSMOUTH, NH 03801

Civil Engineers / Surveyor	TFMoran, Inc.	170 Commerce Way - Suite 102 Portsmouth, NH 03801
Environmental / Wetlands Scientist	Gove Environmental Services, Inc.	8 Continental Drive, Unit H Exeter, NH 03833

June 23, 2021

Mr. Dexter Legg, Chair
Portsmouth Planning Board
1 Junkins Avenue
Portsmouth, NH 03801

RE: Waiver Requests for Condominium Development, Parson Woods Condominium LLC, Tax Map 242, Lot 4

Dear Chairman Legg:

On behalf of our client, Green and Company, we respectfully request the following waivers as part of our submittal of the Parsons Woods Condominium Open Space Planned Unit Development:

Waiver Request: for Subdivision Rules and Regulations, Residential Street Minimum Standards (page 36), requiring 32' of pavement width.

Explanation: The pavement width of 26' at the entrance of the subdivision and 22' within the inner loop, is provided pursuant to City Staff recommendations. This recommendation is based on "City of Portsmouth Complete Street Design Guidelines," dated June 2017. Page 8 of this document suggests a pavement width of 20' for a neighborhood slow street, which best describes the street for this Planned Unit Development. A width of 26' is provided to meet fire code standards for roads over 750' long. Two (2) access points are provided for the looped section of road, where the width is reduced to 22'.

Waiver Request: For Subdivision Rules and Regulations Section VI(3)(b), "The minimum right-of-way for main thoroughfares shall be as shown on the City's Master Plan or Official Map and shall, when not indicated on such Master Plan or Official Map, be not less than sixty (60) feet; for residential streets, fifty (50) feet."

Explanation: The ROW width of 40' was provided pursuant to City Staff recommendations. This recommendation is based on the narrower road width and by the applicant's desire to avoid impacting the remainder of the property. This is in alignment with a Planned Unit Development.

Waiver Request: For Site Plan Review Regulations Section 2.5.4.3(c), "Use current AASHTO truck turning templates descriptions with the minimum vehicle allowed being a WB-50, unless otherwise approved by the TAC."

Explanation: The proposed development is residential, and the largest vehicle anticipated to travel the roadway is a Portsmouth Fire Truck (H3635). This vehicle template was applied in the truck turning analysis, and can maneuver throughout this planned unit development.

We look forward to your review of these waiver requests at the next Planning Board hearing.

Respectfully,
TFMoran, Inc.

Jack McTigue, PE, CPESC
Project Manager

GDS Associates, Inc.
ENGINEERS & CONSULTANTS

Bruce A. Bennett, Principal
Manager Building Energy Services
bruce.bennett@gdsassociates.com
direct 603-391-.0052
cell 603-860-0968

Green & Co
Attn: Michael Green
11 Lafayette Road, P.O. Box 1297
North Hampton, NH 03862

RE: 83 Peverly Hill Rd, Portsmouth, New Hampshire

Hello Michael:
Thank you for your continued commitment to NH Saves. We look forward to working with you on the energy ratings for the home being constructed at 83 Peverly Hill Rd. Our team here at GDS is happy to be working with Green and Company on another NH Saves project.

For the benefit of others not familiar with the NH Saves and the Home Energy Rating System index (HERS index) and what it means for homes receiving the label, these units are modeled and analyzed to estimate annual energy consumption but are more than just energy efficient. The program also includes an element of building durability and healthy building environments. The process includes energy modeling and performance-based testing as well as on-site inspections to confirm the modeling inputs, to identify opportunities to improve insulation and air-sealing prior to drywall, duct leakage testing, and blower door testing.

These homes are by design at least 30% more efficient than code built home (IECC 2015) and include high efficient HVAC and water heating equipment, insulation installed to attain an installation grading of grade, excellent window efficiencies (u-value ≤ 0.30) and high efficacy lighting and ENERGY STAR appliances.

Because NH Saves encourages tight, well insulated buildings, the program does not want to create any issues with indoor air quality. Therefore, the program requires some means of whole-house ventilation (compliant with ASHRAE Standard 62.2) and includes a moisture management checklist. All of this adds a non-energy benefit to constructing a home that is energy efficiency, healthy and durable.

Our plan is to utilize the NHSaves program (sponsored by Eversource, Unitil, Liberty and NHEC) to provide support for modeling and inspections.

Once we receive a set of plans we can begin the take-off and energy modeling. In the meantime, as always, please contact me with any questions or design changes that may impact the HERS index.

Thank you,

Bruce Bennett, Principal

(This Page Is Intentionally Blank)

August 6, 2021

Dexter Legg, Chair
Portsmouth Planning Board
1 Junkins Avenue, 3rd Floor
Portsmouth, NH 03801

Re: Parson Woods Condominium, Proposed Open Space PUD
Article 7, Section 10.727.30 of Portsmouth Zoning Ordinance
Planning Board Findings Relative to a Planned Unit Development
TFMoran Project: 47388.11

Dear Chairman Legg & Members of the Planning Board,

In accordance with the above referenced section, prior to granting conditional use permit for a Planned Unit Development (PUD), the planning board shall make the following findings:

(10.727.311) The site is appropriate for an OS-PUD or RDI-PUD, as applicable.
(10.727.312) The anticipated impacts of the proposed PUD on traffic, market values, stormwater runoff or environmental factors will not be more detrimental to the surrounding area than the impacts of conventional residential development of the site

10.727.311 – The site is appropriate for an OS-PUD. This site is 105.70 acres with 665'of frontage on Peverly Hill Road. The site is almost entirely vegetated, with one existing single-family home located at 83 Peverly Hill Road. The majority of the property is surrounded by undeveloped conservation land and residential properties, as well the Calvary Cemetery to the north, the Boston-Maine Railroad property to the west, and religious properties, Girl Scout Camp, and city-owned property to the southern and eastern side. There are approximately 60 acres of upland and 45 acres of wetland on the subject parcel.

The proposed OS-PUD allows us to cluster the units, with no impact to wetlands or wetland buffers, significantly reduce impervious surface, reduce tree clearing, preserve natural features of the property, provide public amenities, and create open space land which will be protected by a conservation easement. For these reasons, the site is well suited and appropriate for an OS-PUD.

10.727.312 – These anticipated impacts of the proposed OS-PUD are less than the impacts of a conventional subdivision on stormwater runoff, traffic, market values, and environmental factors, further described below:

Stormwater Runoff

A conventional subdivision on this property would generate considerably more stormwater runoff than an OS-PUD. The paved roadway for a conventional subdivision would be 32’ wide and 7,332’ long with individual driveways for each home. Clustering of the homes in the OS-PUD layout allows us to reduce the road length to 2,945’, which is 4,387’ less roadway than a conventional layout. With a conventional layout, individual lots are a minimum of 15,000 s.f. to 1 acre in size and owned in fee by individual homeowners with one driveway to each lot. This layout pushes homes further back from the main roadway and thus creating longer driveways to each home than the proposed OS-PUD layout where homes are closer to the road and driveways are shorter. The reduction in road length and driveway length in the OS-PUD significantly reduces impervious surface area of the site, which reduces stormwater runoff when compared to a conventional layout. The conventional layout impacts all of the upland of the subject property. In comparison, the OS-PUD impacts approximately 30% of the property. The increase in road length, driveway length, and area to be cleared for a conventional subdivision generates significantly more stormwater runoff than the OS-PUD proposed on this property.

Traffic

A traffic memorandum has been prepared by Stephen G Pernaw, P.E. A condominium unit, which are proposed within this PUD, have 15%-43% fewer vehicle trips than a single-family home, depending upon the day of the week and hour of the day. According to the Institute of Transportation Engineers, “Single family detached units had the highest trip generation rate per dwelling units of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than any other residential land uses.” Condominium units tend to generate fewer trips than conventional single-family homes as these are typically smaller in gross floor area and family size. In similar developments completed by the applicants, these condominium units typically attract the empty nester market due to the low-maintenance amenities and lifestyle the condominiums units offer, and often have 1-2 residents per unit where a conventional single family home averages 3.5 residents per unit. For these reasons, a conventional subdivision would generate more traffic than an OS-PUD.

Market Value

The property containing the proposed OS-PUD is located in the Single Residence A and Single Residence B zoning districts. The development of the property is concentrated in a small portion of the property in the northeast part of the parcel, and the remaining majority of the property will be protected by a conservation easement. The new proposed homes will be of equal or greater value than surrounding single family homes and condominium properties and will not diminish their market value. Furthermore, the public park and rail trail connection proposed in the OS-PUD layout is a benefit to the community that could increase property value of surrounding homes. The surrounding properties that abut the portion of the property that will be protected by a conservation easement will not be affected or diminished in value by the proposed OS-PUD. The abutting properties of the proposed developed portion of the parcel (cemetery, religious property, and undeveloped land) will not be impacted by the OS-PUD, but will also be protected by a landscaping buffer surrounding the OS-PUD. The anticipated difference in market value for the condominium units within this OS-PUD versus the market values of a conventional subdivision development are negligible.

Environmental Factors

When comparing the proposed OS-PUD and the conventional subdivision plan for this property, it is clear that the OS-PUD will be far less detrimental to the environment. By clustering the homes, we are able to reduce the road length by less than half the length of that of a conventional layout. There is a significant reduction in impervious surface by the reduction in road length and driveway lengths. The OS-PUD allows us to impact a much smaller portion of the site and significantly reduce tree clearing, thus preserving more of the natural environment. The reduction in tree clearing and impervious surface reduces stormwater runoff. The conventional layout has two wetland crossings and wetland buffer impacts, while the OS-PUD layout has no impacts to wetlands or wetland buffers. The OS-PUD allow us to preserve 71 of the 105.70 acres of land in the form of a conservation easement, where a conventional subdivision allows for zero acres of conservation land. With a conventional subdivision, these wetlands and adjacent buffers would be owned by many different owners. The OS-PUD allows the condominium form of ownership. Therefore, wetlands and adjacent buffers would be owned by the Condominium Association, and one owner of all undeveloped land allows us to preserve it in the form of a conservation easement which is a benefit for the environment and the public.

In summary, for the reasons stated above, it is our professional opinion that the anticipated impacts of this proposed PUD on traffic, market values, stormwater runoff, and environmental factors will be far less detrimental to the surrounding area than the impacts of a conventional residential development.

Respectfully Submitted,

Sincerely,
TFMoran, Inc.

J. Corey Colwell

Corey Colwell
Division Manager/Principal

Project Manager/Typist
cc:

DECLARATION OF CONDOMINIUM
OF
PARSON WOODS CONDOMINIUM, PORTSMOUTH, NEW HAMPSHIRE

___________________________, a duly organized New Hampshire limited liability company with an address of 11 Lafayette Road, North Hampton, New Hampshire 03862, and its successors or assigns, ("Declarant"). The covenants and restrictions provided for herein may also be enforced by Green & Co. Building & Development Corp., a Massachusetts corporation with a place of business at 11 Lafayette Road, North Hampton, New Hampshire 03862 ("Green & Company"), who is the builder of the Development.

ARTICLE 1
SUBMISSION OF PROPERTY

The Declarant hereby submits land located in the City of Portsmouth, Rockingham County, New Hampshire, consisting of approximately 107 acres, more or less, situated on Peverly Hill Road, Portsmouth, New Hampshire, and more particularly described in **Exhibit A** hereto ("Land"), together with the buildings and other improvements heretofore or hereafter constructed thereon, and all easements, rights and appurtenances thereto described in said **Exhibit A**, or as shown on plans of said land, all of which are owned by the Declarant, to the provisions of the Condominium Act, in order to create a plan of condominium ownership in such property containing up to fifty six (56) units, as shown on the following plan; See plan of land entitled, "Condominium Site Plan," project for "Peverly Hill Road, Portsmouth, NH 03801" prepared by **TFM Engineering, Inc., dated _______ with revision # _____ dated and recorded in the Rockingham County Registry of Deeds as Plan #D-______.**

ARTICLE 2
DEFINITIONS

As provided in Section 12, I of the Condominium Act capitalized terms not otherwise defined in this Declaration or in the Bylaws attached hereto as Exhibit B, as amended from time to time, shall have the meanings specified in Section 3 of the Condominium Act. The following terms are expressly defined herein:

(a) "Building" means any building constructed on a Unit or on the Limited Common Area assigned to a Unit as permitted herein, which Buildings shall be owned by the Unit Owner of the Unit.

(b) "Bylaws" mean the Bylaws provided for the self-government of the Condominium attached hereto, as amended from time to time.

(c) "Common Area" means all parts of the Property other than the Units, as more fully set forth in Article 5 of this Declaration and in the Site Plans, and includes the Limited Common Area.

(d) "Condominium" means "Parson Woods Condominium", the condominium established by this Declaration.

(e) "Condominium Act" means Chapter 356-B of the New Hampshire Revised Statutes Annotated, as amended.

(f) "Condominium Plan" or "Plans" or "Plat" means the plan entitled Condominium Site Plan," project for, "Peverly Woods, Portsmouth, NH 03811," prepared by **TFM Engineering, Inc., dated _______ with revision # _____ dated and recorded in the Rockingham County Registry of Deeds as Plan #D-______,** and any revisions thereof, recorded in the Registry simultaneously herewith or recorded subsequently pursuant to the Condominium Act, and any updated or amended site or floor plans.

(g) "Limited Common Area" means all those certain portions of the Common Area which are assigned to each Unit, 15 feet on either side of each unit, 30 feet behind each unit and 20 feet in front of each unit, or to the edge of pavement, whichever is less. Such Limited Common Area shall be restricted for use by the owner(s) of each such Unit, as more fully set forth in this Declaration and in the Plans, and additional limited common area as Declarant may determine in the future.

(h) "Majority of the Owners" means the Owners of the Units to which more than fifty one percent (51%) of the votes in the Unit Owners' Association appertain. Any specified percentage of the Owners means the Owners of Units to which the specified percentage of the votes in the Unit Owners' Association appertain.

(i) "Owner" or "Unit Owner" means any Person or Persons who holds or hold fee simple title to a Unit. No mortgagee shall be deemed to be an Owner until such mortgagee has acquired such title pursuant to foreclosure or any procedure in lieu of foreclosure.

(j) "Percentage Interest" or "Undivided Percentage Interest" means the interest of each Unit in the Common Area as set forth in **Exhibit E** of this Declaration and as may be amended hereafter, which may be expressed as a fraction.

(k) “Registry” means the Rockingham County Registry of Deeds, or any then applicable real property recording office.

(l) “Property” means the Land and the buildings and all other improvements heretofore and hereafter constructed thereon, and all easements, rights and appurtenances thereto, and all articles of personal property intended for common use in connection therewith which are submitted to the Condominium by this Declaration, as amended from time to time.

(m) “Rules” means those rules and regulations adopted from time to time by the Association relative to the use of the Condominium, provided they are not in conflict with the condominium Act, the Declaration or the Bylaws, the City of Portsmouth Zoning Ordinance and the conditions on the plat approved by the Planning Board.

(n) "Site Plan" means the plat of the land submitted to the Condominium Act by this Declaration, which plat is being recorded in the Registry simultaneously herewith. Such term shall include, as appropriate, any such plat recorded in the Registry: (i) subsequently pursuant to RSA 356-B: 20, III, and 356-B:21 or any other provisions of the Condominium Act, or (ii) subsequently for the purpose of amending any previously recorded plat, as the case may be.

(o) "Unit" means a unit as defined by the Condominium Act, which is bounded and described (i) as shown on the Condominium Site Plan; (ii) Floor Plan; and (iii) as provided in Article 4, below.

(p) “Unit Owners’ Association” or “Association” means all of the Owners acting as a group in accordance with this Declaration and Bylaws.

ARTICLE 3
STATUTORY REQUIREMENTS

The following information is provided pursuant to the provisions of the Condominium Act:

(a) Name: The name of the Condominium is “Parson Woods Condominium.”

(b) Location: The Condominium is located on Peverly Hill Road, City of Portsmouth, Rockingham County, New Hampshire.

ARTICLE 4
DIVISION OF PROPERTY

The property, together with all buildings and improvements thereon, is hereby divided into fifty sixty (56) separate freehold condominium units, hereinafter referred to as Units #1, #2, #3, #4, #5, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, #16, #17, #18, #19, #20, #21, #22, #23, #24, #25, #26, #27, #28, #29, #30, #31, #32, #33, #34, #35, #36, #37, #38, #39, #40, #41, #42, #43, #44, #45, #46, #47, #48, #49, #50, #51, #52, #53, #54, #55, and #56. The layout, numerical designation, dimensions and area of each Unit are shown on the Condominium Site Plan.

A. The boundaries of the Units are defined as follows:

The Units shall be Land Units, the vertical boundaries being coextensive with the area identified as such Unit on the Site Plan and the horizontal boundaries being from the center of the earth to the upper edge of the atmosphere and includes the entirety of any building or addition to buildings or improvements to be constructed on the land and includes all rights above the land and any existing building and improvements or any building or improvements constructed within the Land Unit. For the purposes of RSA 356-B, the Condominium Plan shall serve as the Floor Plan for each Land Unit declared herein. In the event a building is constructed within the Land Unit, upon completion of the foundation, a Floor Plan, certified as required by RSA 356-B:20 shall also be recorded, provided the boundary of the Land Unit shall remain the unit boundary.

ARTICLE 5
DESCRIPTION OF COMMON AREAS

Common Areas are set forth on the Condominium Plan Common Areas include, but are not limited to, the following:

SECTION A. All open space, common utilities, walkways, and paths.

SECTION B. All roadways servicing the Condominium and shown on the Plat shall be public and shall be maintained by the City of Portsmouth.

ARTICLE 6
DESCRIPTION OF LIMITED COMMON AREA

Limited Common Area (herein "LCA") is defined as a portion of the Common Area which has been reserved for the exclusive use of the specific Unit or Units to which the Limited Common Area is assigned.

Limited Common Area shall be assigned as set forth in these Condominium Instruments. The "Condominium Instruments" is a term collectively referring to the Declaration, the By-Laws, and the Condominium Site Plan, and the building envelopes depicted on the Condominium Site Plan and recorded pursuant to the provisions of the Condominium Act. To the extent there is a conflict within the Condominium Instruments regarding the assignment of the Limited Common Area to a specific Unit, the assignment of Limited Common Area as set forth on the Condominium Plan shall control.

Reassignment of the LCA is expressly permitted if the reassignment complies with the Condominium Instruments and RSA 356-B, as amended. However, LCA may not be reassigned without the express written permission of the Unit Owner(s) who possesses the exclusive use of the LCA. Any reassignment of the LCA must be recorded in the Rockingham Registry of Deeds to be effective.

It is the intention of the Declarant that the following portions of the Common Area shall be exclusively assigned as LCA:

1. The land shown on the Condominium Plan and which includes the septic system serving the appurtenant units and the appurtenant driveways.

2. All piping, wiring, cable, facilities, improvements, utilities, propane tanks, septic tank or other portions of the Common Area contained within any Limited Common Area shall be exclusively assigned to such appurtenant Units, except the piping, duct work or other improvements which serve the condominium as a whole.

SECTION A. Subject to the restrictions, easements, covenants, conditions, and terms set forth in these Condominium Instruments, the Condominium Act, the ordinance of the City of Portsmouth, and any documents of record, the Owner of the Unit which possesses the assignment and exclusive use of Limited Common Area shall be permitted to encroach upon, use and possess the Limited Common Area. The Declarant shall provide for lawn mowing and landscape maintenance, operation and maintenance of the septic systems, driveway plowing, and walkway snow shoveling within the Limited Common Areas and Unit (collectively referred to as "Maintenance"). The Board of Directors shall be responsible for the Maintenance when its takes control of the Association.

The exterior of Units shall be kept in good repair by the Unit Owner and maintained to the aesthetic and repair standards set forth in this Declaration and By-Laws. Failure of a Unit owner to maintain its Unit to such standards shall give cause to the Association to enter the Limited Common Area to effectuate such repairs or maintenance and to invoice the Unit Owner for the expense thereof.

SECTION B. The LCA, including any improvements or developments, shall run with and be appurtenant to the Unit to which it is assigned and shall automatically pass with the title to the Unit whether or not the LCA is expressly conveyed.

ARTICLE 7
ALLOCATION OF UNDIVIDED INTERESTS ("COMMON INTERESTS")

There is hereby allocated to each Unit an undivided interest in the Common Areas as set forth on **Exhibit E** attached hereto and made a part hereof, under the column "Common Interest". Said undivided interest appurtenant to each Unit is herein called the "common interest". The interest appurtenant to each Unit are shown on **Exhibit E**. The common interest appurtenant to each Unit will have a permanent character and shall not be altered without the consent of the owner of each Unit affected thereby. The common interest appurtenant to each Unit will not be separated from said Unit even though not expressly mentioned or described in the conveyance or other instrument. The Common Areas will remain equal and undivided and no right shall exist to partition or divide any part thereof except as may be provided in the New Hampshire Condominium Law.

ARTICLE 8
PARKING

Subject to regulation by the Association of Unit Owners (as set forth in the Condominium By-Laws to be recorded with this Declaration as well as Rules and Regulations to be adopted) the Unit owners shall have the exclusive right to park vehicles in the portion of the Limited Common Area associated with his/her Unit as shown on the Plan.

ARTICLE 9
EASEMENTS

SECTION A. Each Unit shall have appurtenant thereto non-exclusive easements in the Common Areas designed for such purposes for ingress to, egress from, and utility services for such Unit, and in the other Common Areas for their use according to their respective purposes, subject always to the exclusive or limited use of the Limited Common Areas as herein provided. These non-exclusive easement rights include, but are not limited to, the right to for the purposes of maintenance or repair of same and any Common Area. If any Unit or Common Area encroaches on any other Unit or Common Area, a valid easement for such encroachment and the maintenance and use thereof so long as it continues shall exist;

SECTION B. To the extent permitted by New Hampshire Revised Statutes Annotated Section 356-B:42 II, as amended from time to time or any successor statute, the Association of Unit Owners shall have the irrevocable power as attorney in fact on behalf of all of the Unit Owners and their successors in title to grant easements through the Common Areas and accept easements benefiting the condominium or any portion thereof;

SECTION C. Declarant hereby expressly reserves the right to grant easements to the owners of abutting property, as well as to the City of Portsmouth, private utilities, electric utilities or gas line utilities, telephone utilities or cable utilities, and any other utilities over, under and through the common and Limited Common Areas of the Condominium for whatever use may be made thereof.

ARTICLE 10

STATEMENT OF PURPOSES, USE, AND RESTRICTIONS.

The Units, Common Areas, and Limited Common Areas shall be occupied subject to the following rules and restrictions:

SECTION A. The Developer shall have the right to transact any business on the Condominium property necessary to consummate sales of Condominium units; including, but not limited to the right to maintain models, having signs identifying units, maintaining employees in the offices, use of the Common Areas and facilities on the Condominium property, and to show units for sale. All furniture and furnishings and equipment in the model units, signs, and all items pertaining to sales shall not be considered Common Areas and facilities and shall remain the property of the Developer. In the event there are unsold Condominium units, Developer's right as the owner of said unsold units shall be the same as all other unit owners in the Condominium; and the Developer, as the owner of the Condominium units, shall contribute the common expenses in the same manner as other Condominium unit owners once an Occupancy Permit has been issued and the Developer, as the owner of the Condominium units, shall have a vote in the Association for each unsold Condominium unit.

SECTION B. None of the fifty-six (56) residential units shall be used for any purpose except residential purposes.

SECTION C. Nothing shall be done or kept in any unit or in the Common Areas or Limited Common Areas, which will increase the rate of insurance in those areas without the prior written consent of the Owners' Association. No owner shall permit anything to be done or kept in his Unit or in the Common Areas or Limited Common Areas which will result in the cancellation of insurance of any unit or any part of the Common Areas or Limited Common Areas, which would be in violation of any law. No waste will be permitted in the Common Areas or the Limited Common Areas.

SECTION D. Units shall be used solely for residential purposes and for uses accessory thereto as may be permitted from time to time by the zoning ordinances of the City of Portsmouth. Notwithstanding the restrictions of this paragraph, the Declarant and its successors in interest may, until all of the residential Units shall have been sold by the Declarant or such successor(s), use unsold Units as models for purposes of promoting the sale or leasing of Units.

SECTION E. DESIGN AND PLAN APPROVAL.

(1) All buildings and structures shall be architecturally designed in keeping with traditional styles as determined by the Declarant. The Declarant, at Declarant's sole discretion, subject to federal, state, and/or municipal approvals, if applicable, reserves the right to approve the plans and specifications of all residences and other structures for as long as the Declarant is the owner of any Unit in the condominium. At such time as the Declarant relinquishes its control to the Association, the responsibility and/or authority for any architectural approvals in accordance with the Declaration and By-Laws shall become the responsibility of the Board of Directors of the Association or any subcommittee of the Association appointed to perform that task. The Declarant reserves the right to turn over responsibility for architectural approvals to the Association at any time prior to its conveyance of the last Unit it owns.

(2) No construction of any kind shall be commenced on any Unit nor shall any exterior addition or change or alteration be made to any structure nor shall utility lines be erected or installed until plans for the foregoing have been approved in writing by the Declarant at

Declarant's sole discretion, subject to federal, state, and/or municipal approvals, if applicable. A copy of such plans shall be provided to the Association for its records.

(3) The architectural integrity of the buildings and the Units shall be preserved, and to that end, no awnings, antennas, and no exterior change, addition, structure, projection, decoration or other feature which is visible from the exterior of a Unit, shall be erected or placed upon or attached to the buildings or any Unit, or any part of either, unless previously approved by the Declarant, at Declarant's sole discretion, subject to federal, state, and/or municipal approvals, if applicable,. This subparagraph, however, shall not restrict the right of the Owner(s) of each Unit to decorate the interiors of the Unit as said Owner(s) may desire;

SECTION F. ARCHITECTURAL FEATURES

(1) Renovations of the Units must be in keeping with the architectural character of the condominium.

(2) Without limiting the generality of the foregoing, all renovations, including the painting, repairing and replacing of exterior doors, door frames, windows, window frames, roofs, siding, porches, decks, entries and other exterior features of the buildings shall be subject to the review and approval of the Board of Directors or its subcommittee established for this purpose prior to commencement of the work.

SECTION G. No animals, livestock, or poultry of any kind shall be raised, bred, or kept in any unit or in any of the Common Areas or Limited Common Areas without the express written permission of the Board of Directors. Pets shall be allowed only with the written permission of the Board of Directors and such permission may be withdrawn should the pets become a nuisance to other unit owners. Owners shall strictly comply with all rules and regulations concerning pets as may be adopted by the Association. No exotic pets are allowed. Pets shall be kept under control of their owners at all times and shall not be allowed to run loose except in the presence and under the control of their owner. The board of directors may make further provisions in the Rules for the control and regulation of household pets on the property. The owner of a unit where a pet is kept or maintained shall be responsible for the maintenance of said pet, and any costs incurred by the association in enforcing the rules prescribed or to be prescribed by the Board of Directors for the control and regulation of pets and each such owner, by electing to keep a pet, shall be deemed to indemnify and hold the Board harmless against such loss or liability resulting from said pet. Owner shall comply with all town ordinances related to pets and pet laws.

SECTION H. The Declarant has adopted and the Association Board may amend from time to time detailed rules and regulations for the use and enjoyment of the Common Areas, for avoiding noxious or offensive activity which may disturb the occupants of any Unit, and for the occupants of any Unit, and for the general governing of the Condominium, consistent with, and not in conflict with, this Declaration and the Bylaws. All Owners and their tenants, guests and licensees will strictly comply with said rules and regulations.

SECTION I. Units may be rented. All rental agreements shall be documented by a written lease for a term of not less than six (6) months. The lease shall be subject to the Declaration, Bylaws and Rules and Regulations of the Condominium.

SECTION J. The Declarant shall be responsible for arranging for snow removal and lawn mowing within the Common Areas and Limited Common Areas as a Common Expense, together with the maintenance of all drainage improvements. This includes arranging for the maintenance of the road and gate and snow removal for the emergency access road for the purpose of keeping it accessible for the Fire Department.

SECTION K. Declarant reserves the right to make use of unsold Units as may facilitate the completion, construction or sale of the Condominium, including the right to enter all Units, and Limited Common Areas, upon reasonable notice to the Owner thereof, or Common Areas for construction purposes. Declarant reserves the right to store materials, to maintain a sales office or a rental office in any unsold Units, to show such Units for sale or lease, and to display appropriate signs, at Declarant's sole discretion, in conjunction therewith, on unsold buildings or building envelopes, and has the right to implement any other marketing signage anywhere in the entire development.

SECTION L. SIGNS. No sign of any kind, towels, blankets or laundry of any kind, shall be displayed to the public view on or from any unit without the prior written consent of the Board of Directors. No commercial or advertising signs of any kind shall be erected, placed, permitted or maintained on any common area or limited common area or improvement except such signs as may be approved by the Association for the operation of the condominium or for the sale of Units within the condominium. Declarant shall be permitted, at Declarant's sole discretion, to place signs advertising the sale or lease of units, along with development signage, entrance way signage, directional and temporary signage. Display of the United States Flag shall be regulated by RSA 356-B:47-a and rules and regulations adopted thereunder by the Owners' Association and any applicable Zoning and Planning Regulations of the City of Portsmouth.

SECTION M. MOBILE HOMES AND TEMPORARY STRUCTURES. Mobile homes or structures of any kind or character, whether temporary or otherwise, shall not be permitted on any common area or limited common area. However, Declarant, at Declarant's sole discretion, may maintain a trailer for development purposes.

SECTION N. NO VEHICLE STORAGE. No commercial vehicles, pleasure or commercial boats or vessels of any kind, motor homes, campers, trailers, school buses, all-terrain vehicles, off road vehicles or snow mobiles shall be used in the condominium nor shall they be stored within the common area or limited common area, including, but not limited to parking areas and trails. Golf carts may be allowed on the premises subject to the approval of the Declarant, at Declarant's sole discretion, and subject to the approval of the Association after the Declarant relinquishes control. None of the above referenced vehicles may be kept on the premises except out of sight of the roadway, behind the structure or properly screened from the roadway and abutters or if the same be kept stored in a garage or outbuilding conforming to these covenants. Unregistered or uninspected automobiles or automobiles being repaired, refinished, restored or otherwise brought onto the premises for a period of more than seven (7) days shall be stored in a garage or other enclosed structure.

SECTION O. TREE REMOVAL. Only the Declarant shall be permitted to cut trees on the property. No unit owner shall be permitted to cut any tree(s) without the express written permission of the Declarant. All clearing shall comply with the City of Portsmouth's land use regulations and ordinances.

SECTION P. No noxious or offensive activities shall be carried on in any unit or in the Common Areas or Limited Common Areas, nor shall anything be done therein which may become an annoyance or nuisance to the other unit owners.

SECTION Q. There shall be no violation of the rules of the use of the units, Common Area, or Limited Common Area as adopted by the Owners' Association and furnished in writing to the owners. The Declarant, until such time as the Owners' Association is formed, and thereafter the Owners' Association are authorized to adopt such rules.

SECTION R. Insofar as may be necessary, the Developer and persons that they may select shall have the right of ingress and egress over, upon, and across the Common Area and Limited Common Area and the right to store materials thereon and to make such other use thereof as may be reasonable, necessary, and incidental to construction and complete development and sale of the project, but the Declarant and the persons to whom he has granted this permission shall not unduly interfere with the unit owners or persons living in the units and their rights to use the Common Area and Limited Common Area and facilities.

SECTION S. No unit owner shall paint or otherwise decorate or change the appearance or the type of exterior siding of any portion of the exterior of his/her unit.

SECTION T. No unit owner shall make any alterations to his/her unit; provided, however, any unit owner shall have the right to make interior decorating improvements or any interior changes which do not affect any facilities, which are shared with the other units.

SECTION U. ADDITIONAL PROVISIONS.

The following are prohibited:

(1) Clotheslines;

(2) Above ground swimming pools;

(3) Antennas or satellite dishes with diameters larger than 24 inches;

(4) Additions or outbuildings or appurtenances unless prior approval has been obtained;

(5) Any basketball hoops, soccer nets or other personal property in the right-of-way;

SECTION V. OPEN SPACE USE LIMITATIONS. The Declarant on behalf of itself and its successors in interest covenants that "Open Space" as depicted on the Condominium Site Plan, is and shall forever be and remain subject to the following restrictions, which covenants and restrictions shall bind the Declarant, its successors in interest, and the Owner of each Unit:

(a) The purpose of the Open Space after completion of the proposed improvements depicted on the Condominium Site Plan is to retain the area forever in its scenic and open space condition and to prevent any use of the Open Space that will significantly impair, or interfere with, its conservation value. Notwithstanding the foregoing, green energy uses shall be permitted within the Open Space;

(b) To protect and conserve the natural biological diversity of the region including, Blanding's and spotted turtle, and other rare plants and animals, exemplary natural communities, wetlands and other significant wildlife habitats on the Restricted Property;

(c) It shall be maintained in perpetuity as open space.

(d) There shall be no motorized vehicles permitted upon the Open Space with the exception of temporary intrusions associated with the implantation or ongoing maintenance of any green energy uses.

(e) No structure of any kind, size or shape shall be constructed, on the Open Space, except for structures or equipment associated with a green energy use such as solar panels, windfarms, etc.

(f) Upon completion of the proposed improvements, no filling or excavation of soil or other alteration of topography or cutting or removal of standing trees shall be allowed, except those that present an imminent threat to person or property. In addition, trees may be removed in accordance with accepted silvacultural forest practices as outlined in the publication entitled <u>Good Forestry Practices in the Granite State</u> by the Society for the Protection of NH Forests. No disturbance of other natural features shall be allowed unless such activities are commonly necessary to maintain the existing natural environment of the open space.

(g) There shall be no dumping or depositing of trash, debris, stumps, yard waste, hazardous fluid or materials, vehicle bodies or parts within the Open Space.

(h) No discharge of firearms or shooting with a bow and arrow or trapping of animals shall be permitted upon the Open Space in violation of RSA 207:3-a, as amended.

(i) The "Open Space" comprises a portion of the Common Area of the Condominium. As such, maintenance, if any, in the Open Space will be performed pursuant to the other provisions of this Declaration and the Bylaws. Costs for the maintenance, monitoring and annual reporting of the Open Space will be treated as a Common Expense and paid by the Unit Owners in accordance with the provisions of this Declaration. The term maintenance shall include monitoring and reporting of the conditions of the open space requirements by the Association or by the City of Portsmouth. The Association will be responsible for annually monitoring the Open Space and reporting any violations to the City of Portsmouth.

(j) Such reasonable rules and regulations as may from time to time be promulgated by the Condominium Association for "open space recreational uses."

(k) Access to the Open Space shall be as depicted on the Plan.

(l) Acceptance of any deed for any Unit within the condominium constitutes acknowledgment by the purchaser of the existence of these restrictions and agreement to be bound by it and that said purchaser will not take any action which might violate any provision hereof.

SECTION W. PERMITTED USES OF OPEN SPACE

(a) The Declarant, its successors or assigns, reserve the right to perform cutting, grading, planting and seeding on the common area or limited common area for construction and to install and maintain drainage structures as needed in the development of the condominium.

(b) The Declarant, its successors or assigns, reserve the right to grant utility easements on the common area or limited common area to install and maintain utilities as needed in the development of the condominium.

(c) Dead, diseased, unsafe or fallen trees, saplings, shrubs and ground cover may be removed by the Declarant, its successors or assigns.

ARTICLE 11
ENFORCEMENT OF RESTRICTIONS

If any person or entity shall violate or attempt to violate any of the rules or restrictions set forth in this Declaration, in the By-Laws or in any rules or regulations adopted by the Association of Unit Owners, the Association may commence legal action against said person or entity or against the owner(s) of any Units within which such violation are occurring, either to prevent or abate such violation, or to recover damages caused by such violation or both. In the event of a successful prosecution, the Association of Unit Owners will be entitled to receive its costs, including reasonable attorney's fees, as part of its judgment against the defendant.

If the Association of Unit Owners shall fail to enforce this or any one or more of the covenants set forth in this Declaration or any rule contained in the By-Laws or any rules of the Association of Unit Owners after receiving written request to do so from any Unit Owner within the condominium, then any such Unit Owner may attempt to enforce said requirements by giving ten (10) days' prior written notice to the person violating them, followed by legal proceedings either to enjoin the violation or to recover damages or other compensation, including reasonable collection costs and attorney's fees if the court deems it appropriate under the circumstances.

Notwithstanding anything in this Declaration or in the By-Laws to the contrary, no Unit Owner shall be liable for any violations except such as occur during his or her Unit ownership.

ARTICLE 12
INSURANCE

1. Insurance Required. Pursuant to Section 43 of the Condominium Act, the Board of Directors shall obtain (i) a master casualty policy affording fire and extended coverage in an amount equal to the full replacement value of the common structures within the Condominium; (ii) a master liability policy covering the Association, the Board, the Manager and agents or employees of the foregoing with respect to the Condominium, and all Owners and other persons entitled to occupy any portion of the Condominium; and (iii) such other policies as specified hereinbelow; which insurance shall be governed by the following provisions to the extent obtainable or possible:

(a) Fire insurance with standard extended coverage endorsement, vandalism and malicious mischief endorsements insuring all the common buildings in the Condominium including without limitation all portions of the interior of such buildings are for insurance purposes normally deemed to constitute part of the building and customarily covered by such insurance, such as heating and air conditioning and other service machinery, interior walls, all finished wall surfaces, ceiling and floor surfaces including any wall to wall floor coverings, bathroom and kitchen cabinets and heating and lighting fixtures, except for improvements which exceed a total value of One Thousand Dollars ($1,000.00) and are not reported to the insurer, such insurance to be in an amount at least equal to the replacement value of the buildings and to be payable to the board as trustee for the Owners and their mortgagees as their respective interests may appear.

(b) Public liability insurance in such amounts as the Board may from time to time determine, but in no event shall the limits of liability be less than One Million Dollars ($1,000,000.00) for bodily injury and property damage per occurrence, insuring the Association and all individuals referred to in Section I (ii) above, against any liability to anyone, and with cross liability coverage with respect to liability claims of anyone insured thereunder against any other insured thereunder. The insurance, however, shall not insure against individual liability for negligence occurring within a Unit or within the Limited Common Area to which a Unit has exclusive use.

c) Workmen's compensation insurance as required by law.

d) Such other insurance as the Board may determine.

2. General Insurance Provisions.

(a) The Board shall deal with the insurer or insurance agent in connection with the adjusting of all claims under insurance policies provided for under Paragraph 1 above and shall review with the insurer or insurance agent, at least annually, the coverage under said policies, said review to include an appraisal of improvements within the Condominium, and shall make any necessary changes in the policy provided for under Paragraph 1 (a) above (prior to the expiration date set forth in any agreed amount endorsement contained in said policy) in order to meet the coverage requirements of such Paragraph.

(b) The Board shall be required to make every effort to see that all policies of physical damage insurance provide for under Paragraph 1 above : (i) shall contain waivers of subrogation by the insurer as to claims against the Association, its employees and agents, members of the Board, the Manager, Owners and members of the family of any Owner who reside with said Owner, except in cases of arson and fraud; (ii) shall contain a waiver of defense of invalidity or prejudice on account of the conduct of any of the Owners over which the Association has "no control"; (iii) shall contain a waiver of defense of invalidity or prejudice by failure of the insured, or Owners collectively, to comply with any warranty or condition with regard to any portion of the Condominium over which the insured, or Owners collectively, have no control; (iv) shall provide that such policies may not be canceled or substantially modified without at least thirty (30) days written notice to all of the insureds thereunder and all mortgagees of Units in the Condominium; (v) shall provide that in no event shall the insurance under said policies be brought into contribution with insurance purchased individually by Owners or their mortgagees; (vi) shall exclude policies obtained by individual Owners for consideration under any "no other insurance" clause; and (vii) shall provide that until the expiration of thirty (30) days after the insurer gives notice in writing to the mortgagee of any Unit, the mortgagee's insurance coverage will not be affected or jeopardized by any act or conduct of the Owner of such Unit, the other Owners, the Board of Directors, or any of their agents, employees or household members, nor canceled for non-payment of premiums.

3. Individual Policies. All Owners shall obtain, at his own expense, insurance insuring his own unit and all buildings thereon and insurance against loss or damage to personal property used or incidental to the occupancy of the Unit, additional living expense, vandalism or malicious mischief, theft, personal liability and the like.

(a) Each Owner shall obtain additional insurance for his own benefit and at his own expense. No such policy shall be written so as to decrease the coverage under any of the policies obtained by the Board pursuant to paragraph 1(a) above, and each Owner hereby assigns to the Board the proceeds to be applied pursuant to the terms hereof as if produced by such coverage. Copies of all such policies (except policies covering only personal property, owned or supplied by individual Owners) shall be filed with the Association.

(b) Each Owner shall obtain insurance for his own benefit and at his own expense insuring all personal property presently or hereafter located in his Unit or Limited Common Area, any floor coverings, appliances and other personal property not covered in the master policy, and any insurance deductible that the unit may be assessed and all improvements.

(c) Each Owner, prior to commencement of construction of such improvements, shall notify the Board of all improvements to his Unit (except personal property other than fixtures) which exceed a total value of One Thousand Dollars ($1,000.00).

(d) Each Owner shall obtain liability insurance with respect to his ownership and/or use of his Unit.

4. Notice to Unit Owners. When any policy of insurance has been obtained on behalf of the Association, written notice of the obtainment thereof and of any subsequent changes therein or termination thereof shall be promptly furnished to each Unit Owner by the Secretary of the Association. Such notice shall be sent by U.S. Mail, return receipt requested, to all Unit Owners of record at the address of their respective Units and to such other addresses as any of them may have designated to the Secretary; or such notice may be hand delivered by the Secretary or Manager obtains a receipt of acceptance of such notice from the Unit Owner.

ARTICLE 13
CONDEMNATION

If part of the project shall be taken or condemned by any authority having the power of eminent domain such that no Unit or any part thereof is taken, then all compensation and damages for on account of the taking or the common elements, exclusive of compensation for consequential damages to certain affected Units, shall be payable to the President of the Association as Trustee for all Unit Owners and Mortgagees according to the loss or damage to their respective interests in such common elements. The Association shall have the right to act on behalf of the Unit Owners with respect to all issues related to the taking and compensation affecting the common elements. Such proceeds shall, subject to the prior rights of such mortgagees, become a part of the reserve funds of the Association.

If any Unit or a part thereof is taken, the Unit Owners directly affected by such taking and their respective mortgagees shall represent and negotiate for themselves with respect to the damages affecting their respective Units. The awards so made shall, subject to the prior rights of mortgagees, be used and distributed by the Trustee first to restore the Units on the remaining land of the project in the same manner as provided for restoration under Section 13 hereof to the extent possible, attempting to rebuild the building, containing new units of the same number, size and basic plan as the units taken, with any excess award distributed in accordance with the provisions of this section.

ARTICLE 14
REVIEW OF INSURANCE

The Association will review not less frequently than annually the adequacy of its insurance program and will, if requested by Unit Owners report to each Unit Owner in writing the Association's conclusions and actions taken, from time to time. Such review shall include an appraisal of all improvements to the project by a representative of the insurance carrier writing the Master Policy. Also, the Association shall provide each Unit Owner with notices describing each new policy of insurance and all amendments and terminations thereof, as and when occurring, in the same manner as it provides notices of Association meetings as set forth in the By-Laws, all as required by New Hampshire Revised Statutes Annotated, Section 356-B:43 II, or any successor statute.

ARTICLE 15
AMENDMENTS TO THE CONDOMINIUM AND TERMINATION

This Declaration, the By-Laws, the Floor Plan, the Condominium Plan or any other condominium instruments (as defined by New Hampshire Revised Statutes Annotated Chapter 356-B) may be amended from time to time, or this condominium may be terminated, only in strict compliance with New Hampshire Revised Statutes Annotated Section 356-B:34, as amended from time to time, or any successor statute. In no event shall such amendments be made without the consent of at least 2/3 of the Unit Owners.

ARTICLE 16
DEFINITIONS

All terms and expressions used in this Declaration which are defined in New Hampshire Revised Statutes Annotated Chapter 356-B shall have the same meanings here unless the context otherwise requires.

ARTICLE 17
PARTIAL INVALIDITY

The invalidity of any provision of this Declaration shall not impair or affect the validity of the remainder of this Declaration and all valid provisions shall remain enforceable and in effect notwithstanding such invalidity.

ARTICLE 18
MORTGAGES

1. Notice to Board. An Owner who mortgages his Condominium Unit shall notify the Board of the name and address of his mortgagee, and shall file a conformed copy of the mortgage with the Board. The Board shall maintain suitable records pertaining to such mortgages.

2. Notice of Action. Upon written request to the Unit Owners' Association, identifying the name and address of the holder, insurer or guarantor and the Unit number or address, any such Eligible Mortgage Holder or Eligible Insurer or Guarantor will be entitled to timely written notice of:

(a) Any condemnation loss or any casualty loss which affects a material portion of the Condominium or any Unit on which there is a first mortgage held, insured, or guaranteed by such Eligible Mortgage holder or Eligible Insurer or Guarantor, as applicable;

(b) Any delinquency in the payment of assessments or charges owed by an Owner of a Unit subject to a first mortgage held, insured or guaranteed by such Eligible Mortgage Holder or Eligible Insurer or Guarantor, which remains uncured for a period of 60 days.

(c) Any lapse, cancellation or material modification of any insurance policy or fidelity bond maintained by the Owners' Association;

(d) Any proposed action which the Declaration, these Bylaws or the Condominium Act, requires the consent of a specified percentage of mortgage holders.

3. Notice of Default. The Board shall give written notice to an owner of any default by the Owner in the performance of any obligations under the Act, Declaration or Bylaws and, if such default is not cured within thirty (30) days, shall send a copy of such notice to each holder of a mortgage covering such Unit whose name and address has theretofore been furnished to the Board. No suit or other proceeding may be brought to foreclose the lien for any assessment levied pursuant to the Declaration or these Bylaws except after ten (10) days written notice to the holder of the first mortgage on the Unit which is the subject matter of such suit or proceeding.

4. Notice of Damage. The Board of Directors shall notify (i) the mortgagee of a Unit whenever damage to the Unit covered by the mortgage exceeds One Thousand Dollars ($1,000.00) and the Board is made aware of such damage; and (ii) all the mortgagees whenever damage to the Common Area exceeds Ten Thousand Dollars ($10,000.00).

5. Examination of Books. Each Owner and each mortgagee shall be permitted to examine the books on account of the Condominium at reasonable times, on business days, but, with respect to Owners, not more often than once a month.

DECLARATION OF THE PARSON WOODS CONDOMINIUM EXECUTED as of the day and year first above written.

_____________________ LLC

_________________________ By: ________________________________

Witness Richard W. Green, Manager
Duly Authorized

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM, ss.

This instrument was acknowledged before me on _____________________, 2021, by Richard W. Green, Manager of _____________LLC, a New Hampshire limited liability company.

____
Notary Public
Printed Name: ______________________
My Commission Expires: _____________

EXHIBIT A

LEGAL DESCRIPTION

EXHIBIT B

EXHIBIT C

EXHIBIT D

EXHIBIT E

COMMON INTEREST

Unit No.	Common Interest
1	1/56
2	1/56
3	1/56
4	1/56
5	1/56
6	1/56
7	1/56
8	1/56
9	1/56
10	1/56
11	1/56
12	1/56
13	1/56
14	1/56
15	1/56
16	1/56
17	1/56
18	1/56
19	1/56
20	1/56
21	1/56
22	1/56
23	1/56
24	1/56
25	1/56
26	1/56
27	1/56
28	1/56
29	1/56
30	1/56
31	1/56
32	1/56
33	1/56
34	1/56
35	1/56
36	1/56
37	1/56

38	1/56
39	1/56
40	1/56
41	1/56
42	1/56
43	1/56
44	1/56
45	1/56
46	1/56
47	1/56
48	1/56
49	1/56
50	1/56
51	1/56
52	1/56
53	1/56
54	1/56
55	1/56
56	1/56

BYLAWS
OF
PARSON WOODS CONDOMINIUM OWNERS ASSOCIATION

1. PURPOSE AND DEFINITIONS

Purpose. The administration of Parson Woods Condominium (the "Condominium") shall be governed by these By-Laws which are annexed to the Declaration of Parson Woods Condominium (the "Declaration") and are made a part thereof.

Definitions. Certain of the terms used in these By-Laws have been defined in the Declaration and, when used herein, shall have the same meaning as set forth in the Declaration, unless the context clearly indicates a different meaning therefor.

Applicability of By-Laws. The provisions of these By-Laws are applicable to all of the property which now constitutes or hereafter may be added to the Condominium, and to the use and occupancy thereof.

2. MEMBERS AND MEETINGS

A. Members and Voting Rights. Each unit owner and the Declarant, until such time as all of the Declarant's development rights have expired or been terminated (each an "Owner" and collectively the "Owners") shall be a member of Parson Woods Condominium Owner's Association. The membership of the Association shall consist of all of the Owners. The Owner of each Unit shall be entitled to one (1) vote.

B. Transfer of Membership. Membership in the Association may be transferred only as an incident to the transfer of title to a Unit and shall become effective upon recordation of a deed of conveyance to the said Unit.

C. Annual Meeting. The annual meeting of the members shall be held on the second Monday of March, for the purpose of electing officers and for the transaction of such other business as may come before the meeting.

D. Regular Meetings. Regular meetings of the Board of Directors shall be held in accordance with the provisions of RSA 356-B: 37-c at such time and place as shall be determined, from time to time, by a majority of the directors, but at least quarterly meetings shall be held during each twelve-month period after the annual meeting of the Unit Owners' Association. Notice of regular meetings of the Board of Directors shall be posted to the community and given to each director, personally or by mail, e-mail, telephone or telegraph, at least five (5) business days prior to the day named for such meeting, except that no notice shall be required for a regular meeting held immediately after, and at the same place as the annual meeting of the Association. Directors may attend vote and participate at meetings by telephone or E-Mail pursuant to RSA 356-B:37-b.

Pursuant to RSA 356-B:37-c (II) at least once per quarter the Board shall hold open regular meeting to afford owners an opportunity to common on any matter affecting the Association. Notice of the meeting and any materials distributed to the Board shall be available to the owner pursuant to RSA 356-B:37 (c) (III) and (IV).

E. Special Meetings. Special meetings of the Owners may be called at any time for the purpose of considering matters which, by the terms of the Declaration, these By-Laws, or the Condominium Act, (the "Act"), require the approval of the Owners, or for any other reasonable purposes. Special meetings shall be called by the President upon at least three (3) days written notice prior to the date of the meeting.

F. Contents of Notice. Pursuant to RSA 356-B:37 (I) and 356-B:37-a, it shall be the duty of the clerk or secretary, to send to all owners of record, at least twenty-one (21) days in advance of any meeting notice of any meeting. Said Notice shall state the time, place and purpose of the meeting and shall be sent to the unit owners at the addresses on file with the Association. The clerk or secretary shall attest that the notice was sent to the list of owners attached to the affidavit at the addresses on file with the association in the manner conforming with RSA 356-B: 37-a.Any such notice shall be deemed waived by any Owner who expressly waives the same in writing or who is present in person or by proxy at any such meeting.

G. Quorum. The presence in person or by proxy at the commencement of any meeting of the Association of Unit Owners of two thirds of the Unit Owners shall constitute a quorum at all meetings of the Unit Owners. In determining a quorum, the term "all Unit Owners" in this paragraph will not include Units the title of which is held by the Association. Pursuant to RSA 356-B: 38 (III) if a quorum is not met for an annual meeting, the board shall reschedule the meeting within sixty days and provide proper notice and proxies.

H. (1). Number of Directors and Initial Selection of Board. The Board of Directors shall be composed of three (3) persons. Until the election of the Board of Directors takes place at the first annual meeting of the Unit Owners' Association, the Board of Directors shall consist of such persons as shall have been designated by the Declarant. Thereafter, anything in these Bylaws to the contrary notwithstanding, until seven (7) years after the date of recordation of this Declaration, or until ninety percent (90%) of the Units have been conveyed by the Declarant, whichever occurs later, the members of the Board of Directors shall be selected and designated by the Declarant. The Declarant shall have the right in its sole discretion to replace such Directors as may be so selected and designated by it, and to select and designated their successors. The Declarant may relinquish its rights hereunder at any prior time. Directors shall consist only of Owners or spouses of Owners, or, where a Person which is an Owner is not a natural person, any natural person having authority to execute deeds in behalf of such person.

(2). Election and Term of Office. The initial Board of Directors shall be elected to staggered terms of one, two and three years. Thereafter, each Director shall serve a three (3) year term and one Director shall be elected at every annual meeting. At the expiration of the initial term of office of each director, his successor shall serve a term of three (3) years and each director shall hold office until his successor has been appointed or elected as appropriate.

I. Voting and Minutes. At any meeting of the Association, the Owners shall be entitled to cast their votes for each condominium unit owned as provided in the Declaration. The majority vote of all Unit Owners shall be required to adopt decisions at any meeting of the Association. Any Owner may attend and vote at such meeting in person or by proxy. The provisions of the Condominium Act shall govern all votes (including proxy votes and the votes of units owned by more than one person) at meetings of the Association. Pursuant to RSA 356-B: 37 (VI) the Board of Directors shall make copies of the minutes of all meetings available to the unit owners within 60 days of the date of the meeting or 15 days of the date the minutes are approved by the Board whichever occurs first. The association may opt to provide the minutes electronically or post them on the association website in which case the owners shall be informed of the web address.

J. Budget Ratification. Pursuant to RSA 356-B:40-c (I) the board of directors shall annually adopt a budget for the unit owners' association for consideration by the unit owners at a meeting. The board of directors shall, within 30 days of adoption of the proposed budget, provide the owners a summary of the budget, including any reserves and a statement of the basis on which any reserves are calculated and funded. The board of directors shall set a date not less than 10 days or more than 60 days after providing the budget summary to consider the ratification of the budget. Unless at that meeting, 2/3 of all unit owners reject the budget the budget is ratified whether or not a quorum is present. If no budget is proposed or the proposed budget is rejected, the last budget ratified by the owners shall be in effect until a new budget is ratified by the owners. Pursuant to RSA 356-B:40-c (II) the board of directors at any time may propose a special assessment which shall be ratified by the owners. The assessment shall be in accordance with the provisions of RSA 356-B:40-c (III).

3. POWERS

Powers and Duties. The Association shall have all of the powers and responsibilities assigned by the New Hampshire Condominium Act, RSA 356-B, as amended from time to time or any successor statute. Without limiting the generality of the preceding sentence, the Association will have all of the powers and duties necessary for the administration of the affairs of the condominium. Said powers and duties shall include, but not be limited to, the following:

A. Operation, care, upkeep and maintenance of the common areas;

B. The employment, dismissal and replacement of agents and employees to facilitate the operation, care, upkeep and maintenance of the common areas;

C. To make or cause to be made additional improvements on and as part of the common areas (subject to Article VII, Section 2 below);

D. To acquire, hold, manage, convey and encumber title to real property (including but not limited to condominium Units conveyed to or acquired by the Association) in the name of and on behalf of the Association;

E. To grant easements through the common areas and to accept easements benefitting the condominium or any portion thereof;

F. The assessment and collection of the common expenses from the Unit Owners, and the enforcement of liens to secure unpaid assessments, pursuant to RSA Section 356-B:46, as amended from time to time, or any successor statute;

G. The adoption and amendment of rules and regulations covering the details of the operation and use of the condominium, the common areas or any portion thereof;

H. Opening of bank accounts on behalf of the Association and designating the signatories required for such accounts;

I. Obtaining and administering insurance for the condominium as set forth in the Declaration;

J. Repairing, restoring or replacing common areas after damage or destruction, or as a result of eminent domain proceedings, as provided in the By-Laws;

K. Procuring legal and accounting services necessary or proper in the operation of the condominium or the enforcement of these By-Laws;

L. The assessment of costs or damages against any Unit Owner whose actions have proximately caused damages to the common areas;

M. Payment of any amount necessary to discharge any lien or encumbrance levied against the entire condominium or any part thereof which may in the opinion of the Association constitute a lien against the condominium or against the common areas, rather than merely against the interests of particular Unit Owners (where one or more Owners are responsible for the existence of such lien, they shall be jointly and severally liable for the cost of discharging it and the costs incurred by the Association by reason of said lien or liens);

N. All other powers granted by the Declaration or these By-Laws, permitted by law or enjoyed by associations of this kind.

4. OFFICERS

A. Officers. The officers of the Association shall be a president, a treasurer and a secretary, all of whom shall be appointed by the Unit Owners. Such other officers and assistant officers as may be deemed necessary may be appointed by the Association. Any two or more offices may be held by the same person. Pursuant to RSA 356-B:35 (II), the board of directors/officers shall have a fiduciary relationship to members of the unit owners' association.

B. Appointment and Term of Office. The officers of the Association shall be appointed at the annual meeting. If the appointment of officers shall not be made at such meeting, such appointment shall be made as soon thereafter as conveniently may be. Each officer shall hold office until his successor shall have been duly appointed and shall have qualified or until his death or until he shall resign or shall have been removed in the manner hereinafter provided.

C. Removal. Any officer or agent may be removed by the Association whenever, in its judgment, the best interests of the Association will be served thereby, but such removal shall be without prejudice to the contract rights, if any, of the person so removed. Appointment of an officer or agent shall not in and of itself create contract rights. Removal of officers or directors shall be by a vote held in accordance with RSA 356-B: 40-b.

D. Vacancies. A vacancy in any office because of death, resignation, removal, disqualification, or otherwise may be filled by the Association for the unexpired portion of the term.

E. President. The president shall be the principal executive officer of the Association and shall in general supervise and control all of the business and affairs of the corporation. He shall, when present, preside at all meetings of the unit owners at meetings of the Association. He may sign with the secretary or with any other proper officer of the Association, deeds, mortgages, bonds, contracts, or other instruments which the Association has authorized to be executed, except in cases where the signing and execution thereof shall be expressly delegated by the Association or by these bylaws to some other officer or agent of the Association, or which is required by law to be otherwise signed or executed; and in general shall perform all duties incident to the office of president and such other duties as may be prescribed by the Association from time to time.

F. The Secretary. The secretary shall: (a) keep the minutes of the proceedings of the annual meeting in one or more books provided for that purpose; (b) see that all notices are duly given in accordance with the provisions of these bylaws or as required by law; (c) be custodian of the Unit Owner records of the Association; (d) keep a register of the post office address of each Unit Owner which shall be furnished to the secretary by such Unit Owner; (e) have general charge of the books of the Association; and (f) in general perform all duties incident to the office of secretary and such other duties as from time to time may be assigned to him by the president or by the Association.

G. The Treasurer. The treasurer if any is appointed and, if none, then the president shall: (a) have charge and custody of and be responsible for all funds and securities of the Association; (b) receive and give receipts for monies due and payable to the Association from any source whatsoever and deposit all such monies in the name of the Association in such banks, trust companies, or other depositories as may be authorized by the Association; (c) in general perform all of the duties incident to the office of treasurer and such other duties as from time to time may be assigned to him by the president or by the Association.

H. Execution of Instruments. All checks, drafts, notes, deeds, acceptances, conveyances, contracts or other instruments shall be signed on behalf of the Association by such person or persons as shall be provided authority by general or special resolution of the Association or, in the absence of any such resolution applicable to such instrument, by the President and by the Treasurer.

5. INTERIM MANAGEMENT BY DECLARANT

From and after the date of the recording of these By-Laws, the Declarant shall exercise all powers and responsibilities assigned by these By-Laws, the Declaration and by the New Hampshire Condominium Act to the Association of Unit Owners, and the Officers until such time as it turns over said powers and responsibilities to the Unit Owners. Said transfer of said powers and responsibilities shall in no event occur later than the first to occur of (1) the time at which the Declarants have completed the passing of title to third party purchasers of Units to which are assigned a total of 90% of the undivided interest in the common areas, or (2) the expiration of seven (7) years from the date of the incorporation of the Association. No contract binding the Association of Unit Owners, or the Unit Owners as a group, which shall have been entered into during the period of Declarant's control as described in this Article shall be binding after the termination of the Declarant's control unless ratified or renewed with the consent or affirmative vote of Unit Owners of a majority of the Units in the Association of Unit Owners.

6. COMMON EXPENSES

A. Common Expenses. The Owner of each Unit shall be equally liable for and shall pay as and when assessed a share of common expenses. Common expenses will include all charges, costs and expenses of every kind incurred by or on behalf of the Association for and in connection with the administration of the condominium, including without limitation all charges for taxes (except real property taxes or other such taxes which are or may hereafter be assessed separately on each Unit and the common interest appurtenant thereto or the personal property or any other interest of a Unit Owner) assessments, insurance, liability for loss or damage arising out of or in connection with the common areas or any fire, accident or nuisance thereon, the cost of repair, reinstatement, rebuilding and replacement of facilities in the common areas, wages, accounting and legal fees, management fees and all other necessary expenses of upkeep, maintenance, management and operation incurred on or for the common areas. The common expenses may also include such amount as the Association may deem proper to make up any deficit in the reserve. Common expenses will also include all common expense assessments against all Units, title to which is held by the Association.

B. Capital Improvements. Whenever in the judgment of the Association the common areas should be improved by new construction, any such new or replacement construction may be made by the Association only after obtaining approval of all Units. If such approval is so obtained, the cost thereof shall constitute a part of the common expenses.

C. Reserves. The Association shall assess as a common expense an amount or amounts on a monthly basis for the purpose of establishing and maintaining a general operating reserve and general replacement reserve, against anticipated future outlays for operations or for maintenance or replacement of facilities within the common areas or equipment or other property held by the Association in connection with the condominium. The size of any such reserve shall be reviewed at each annual meeting of the Association. The funds will be deposited in a responsible bank and may be intermingled with the Association's general operating account, or segregated in a separate account, in the Association's discretion.

Any such reserve may be used at the discretion of the Association to meet any deficiencies in operating funds from time to time resulting from higher than expected operating expenses and maintenance costs, or any delinquency by any Unit Owner or Owners in the payment of assessment for common expenses. Said reserve shall not operate to exempt any Owner from liability to contribute his or her proportionate share of such expenses or to pay any such assessments thereof and any funds withdrawn from said reserve for the purpose of making up any delinquency shall be reimbursed upon the payment of such delinquent assessments. The proportionate interest of each Owner in said reserve shall not be withdrawn or assigned separately but shall be deemed to be transferred with each Unit even though not mentioned or described expressly in the instrument of transfer.

D. <u>Expenses for Limited Common Areas</u>. Common expenses relating to the limited common areas shall be charged in accordance with Article 6, Section A of the Declaration.

> i. <u>Maintenance and Repair</u>. The Board of Directors shall be responsible for the maintenance, repair and replacement (unless necessitated by the negligence, misuse or neglect of an Owner, or of a person gaining access with said Owner's actual or implied consent, in which case such expenses shall be charged to such Owner) of all Limited Common Area, whether located inside or outside of the Units, the costs of which shall be charged to all Owners as a Common Expense except the cost of repairing and replacing Limited Common Area shall be assessed to the units assigned such Limited Common Area.

E. <u>Books</u>. The Association will maintain books of account for common expenses for the common areas, general operating reserves and replacement reserves, in accordance with generally recognized accounting practices, and will have such books of account available for inspection by each Owner or his authorized representative at reasonable business hours. The Association will not less frequently than annually render or cause to be rendered a statement to each Owner of all receipts and disbursements during the preceding year and the balances of the various accounts.

F. <u>Enforcement</u>. The Association of Unit Owners shall have a lien on every Unit for unpaid assessments of common expenses levied against the Unit, which may be applicable to said Unit, in accordance with the provisions of the New Hampshire Condominium Act. Reference is made to RSA Section 356-B:46, as amended from time to time, and any successor statute, describing the enforcement of the Association's lien rights.

G. <u>Delinquent Assessments</u>. In the event an assessment is not paid within thirty (30) days of the date it is due and payable, the Association, through its Board of Directors, may proceed to enforce and collect the said assessment, with interest at the maximum lawful rate of eighteen percent (18%) per annum, whichever is greater, against the unit Owner owing the same in the manner set forth in RSA 356-B:46. Each delinquent unit Owner shall be responsible for attorney's fees, interest and costs incurred by the Association incident to the collection of such delinquent assessments or enforcement of any lien held by the Association for unpaid assessments.

H. Assessments. The Association shall determine the amounts and frequency of assessments for common expenses. In determining the amount, the Association shall in its discretion set a figure for a reasonable prospective period (up to one year) sufficient to accumulate and pay when due the anticipated common expenses for that period. In determining the frequency of the payments, the Association has full discretion to levy the assessments on a quarterly basis or as otherwise determined by the Association. If at the end of any assessment period it is determined that the assessments were estimated too low, the deficiency may be forthwith assessed by the Association and paid by the Unit Owners as a special assessment or assessments.

I. Expense to Unit Owner. No one shall obstruct, commit any waste in or otherwise cause any damage beyond reasonable wear and tear to the Common Area and any one causing such damage shall pay the expense incurred by the Association in repairing same.

8. GENERAL PROVISIONS

A. Violations. In the event of a violation other than non-payment violation of the Declaration, these By-Laws, or the applicable portions of the Act, the Association, by direction of its Board of Directors, may notify the unit owner by written notice of such breach, and if such violation shall continue for a period of thirty (30) days from the date of this notice, the Association, through its Board of Directors, shall have the right to treat such violation as an intentional and inexcusable and material breach of the Declaration, the By-Laws, or the pertinent provisions of the Condominium Act, and the Association may then, at its option, have the following election: (a) an action at law to recover for its damage on behalf of the Association or on behalf of the other unit owners; (b) an action in equity to enforce performance on the part of the unit owner; or (c) an action in equity for such equitable relief as may be necessary under the circumstances, including injunctive relief. Failure on the part of the Association to maintain such an action at law or in equity within ninety (90) days from date of a written request, signed by a unit owner, sent to the Board of Directors, shall authorize any unit Owner to bring an action in equity or suit at law on account of the violation. Any violations which are deemed by the Board of Directors to be a hazard to public health may be corrected immediately as an emergency matter. The Association shall be entitled to collect all legal fees incurred as a result of any such action or any action instituted for collection of any unpaid assessments.

B. Waiver. The failure of the Association of Unit Owners to insist in any one or more instances upon strict performance of or compliance with any of the covenants of the Owner hereunder, or to exercise any right or option herein contained or to serve any notice, or to institute any action or summary proceeding, shall not be construed as a waiver or a relinquishment for the future, of such covenant or option or right, but such covenant or option or right shall continue and remain in full force and effect.

C. Notices. All notices to Unit Owners shall be deemed given if hand delivered or sent by Registered or Certified Mail, Return Receipt Requested, to the Owner, addressed to the Owner's address appearing on the records of the Association. Any notice given or mailed to one co-Owner shall be presumed to have been properly given to any other co-Owner, regardless of whether a separate notice was given or sent to said other co-Owner. When any policy of insurance has been obtained on behalf of the Association, written notice of the obtainment thereof and of any subsequent changes therein or termination thereof shall be promptly furnished to each Unit Owner by the Secretary of the Association. Pursuant to the provisions of RSA 356-B:43 (II) all notices shall be sent in accordance with the provisions of the last sentence of RSA 356-B:37-a.

D. Amendment. Except as otherwise provided in the Condominium Act and this Declaration and Bylaws, this Declaration and Bylaws may only be amended by agreement of at least two thirds (2/3) of the Owners, provided, however, that (i) any such amendment shall be executed by such two thirds (2/3) of the Owners or by the President and Treasurer of the Association accompanied by a certification of vote of the Secretary; (ii) evidence of such amendment shall be duly recorded at the Registry pursuant to Section 34 IV, of the Condominium Act; (iii) no amendment to the Declaration shall be adopted that could interfere with the construction, sale, lease or other disposition or use of such Units; (iv) no such amendment shall be contrary to the provisions of the Condominium Act. Any approval of amendments by Mortgagees shall be subject to the provisions of and limitations of RSA 356-B.

E. Resale by Purchaser. In the event of any resale of a unit or any interest therein by any person (other than the Declarant or its successors in interest) the prospective Unit Owner shall have the right to obtain from the Association, prior to the contract date of the disposition, the following:

i. A statement of any capital expenditures and major maintenance expenditures anticipated by the Association within the current or succeeding two fiscal years;

ii. A statement of the status and amount of any reserve for the major maintenance or replacement fund, and any portion of such fund earmarked for any specified project by the Association;

iii. A copy of the income statement and balance sheet of the Association for the last fiscal year for which such statement is available;

iv. A statement of the status of any pending suits or judgments in which the Association is a defendant;

v. A statement setting forth what insurance coverage is provided for all Unit Owners by the Association and what additional insurance coverage would normally be secured by each individual Unit Owner;

vi. A statement that any improvements or alterations made to the Unit or the limited common area assigned thereto by the prior Unit Owner are not known to be in violation of the Declaration.

The President of the Association or any other Officer of the Association shall furnish such statements upon written request of any prospective Unit Owner within ten (10) days of the receipt of such request.

Said statement once issued shall be binding upon the Association, and every other Unit Owner. The Association may establish a fee to be charged to the Unit Owner in consideration of issuing said statement, which fee shall not exceed $10.00 for each request, unless a higher amount is permitted by law.

F. Notices to or from Mortgagees

i. Notice to Board. A Unit Owner who mortgages his condominium unit shall notify the Board of the name and address of his mortgagee and the principal amount of such mortgage. The Board shall maintain suitable records pertaining to such mortgages.

ii. Reporting. The Board, whenever so requested in writing by a mortgagee of a condominium unit, shall promptly report any then unpaid assessments for common expenses due from, or any other default by, the Owner of the mortgaged condominium unit. The Board shall be entitled to require a fee of Ten Dollars ($10.00) for each report provided a mortgagee.

iii. Default. The Board shall give written notice to an Owner of any default by the Owner in the performance of any obligations under the Condominium Instruments and, if such default is not cured within thirty (30) days, shall send a copy of such notice to each holder of a mortgage covering such unit whose name and address has theretofore been furnished to the Board. No suit or other proceeding may be brought to foreclose the lien for any assessment levied pursuant to the Declaration or these By-Laws except after ten (10) days written notice to the holder of the first mortgage on the unit which is the subject matter of such suit or proceeding.

Dated this ____ day of _____________, 2021.

__________________, LLC

____________________________ By: ____________________________________

Witness Richard W. Green, Manager

Duly Authorized

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM, ss.

This instrument was acknowledged before me on _____________________, 2018, by Richard W. Green, Manager of ___________________, LLC, a New Hampshire limited liability company.

____
Notary Public
Printed Name: _______________________
My Commission Expires: ______________

Stephen G. Pernaw
& Company, Inc.

P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com

Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 2047A

To: Michael Green
Green & Company

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Development – Traffic Evaluation
Portsmouth, New Hampshire

Date: October 6, 2020

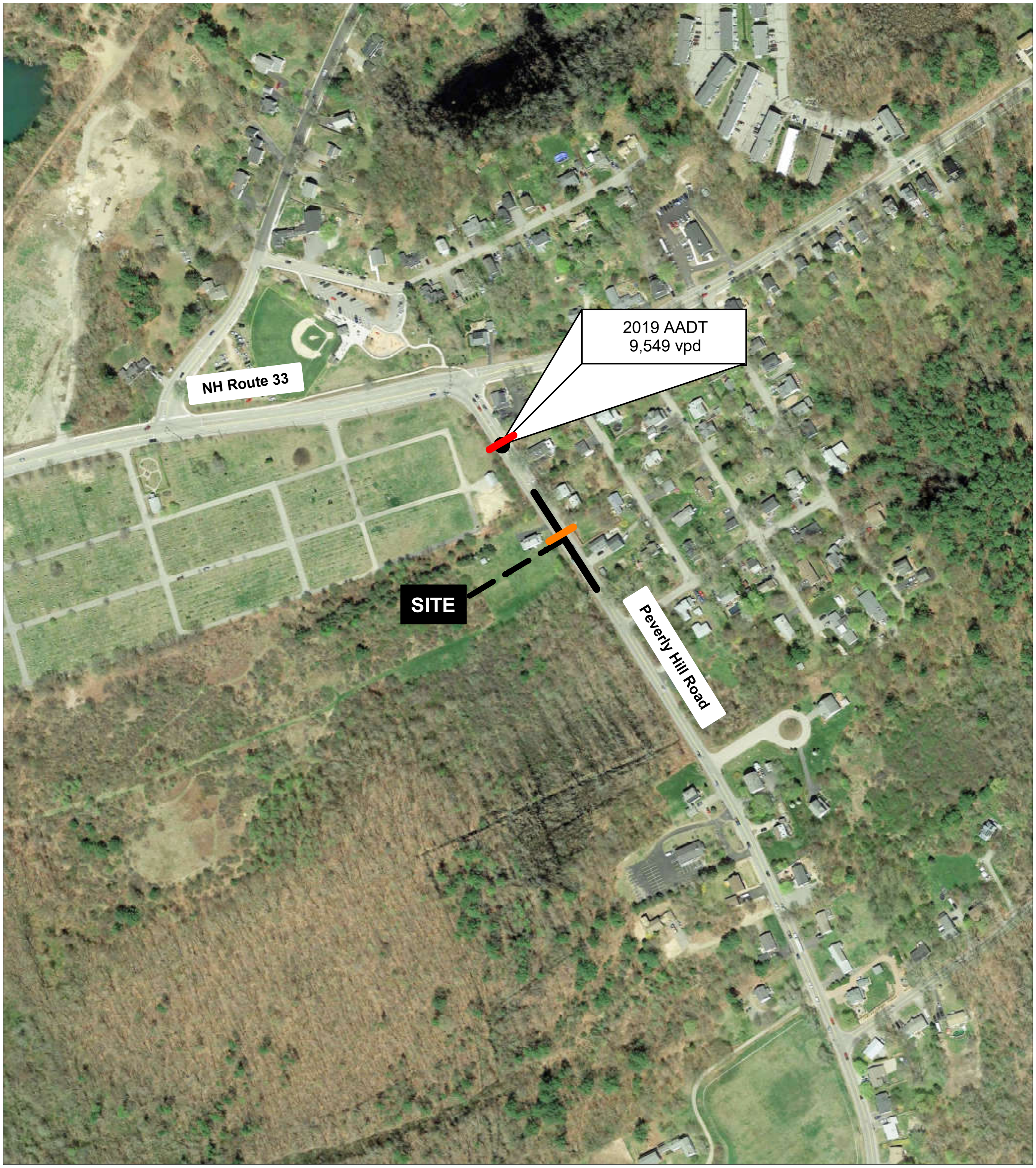
As requested, Pernaw & Company, Inc. has conducted this *"Traffic Evaluation"* regarding your proposed residential development project located on the west side of Peverly Hill Road in Portsmouth, New Hampshire. This study evaluates the Peverly Hill Road / Private Road A intersection and in terms of traffic operations, capacity, and safety based on 2032 Build traffic volumes. The purpose of this memorandum is to summarize our research of available traffic count data, our recent traffic counts at the subject site, the trip generation analysis for the proposed development, the post-development traffic projections, and the results of the various technical analyses. This study has determined that this proposed intersection will function safely and adequately as a conventional three-leg T-intersection with one shared general-purpose travel lane on each approach. To summarize:

<u>Proposed Development</u> – The conceptual design plan entitled *"Concept A-PUD Plan,"* prepared by TFM, Inc., Sheet A-02, dated July 28, 2020 shows that the proposed development will create 60 single-family detached residential units along a private roadway system (see Attachment 1). Private Road A is proposed to intersect the west side of Peverly Hill Road approximately 450-feet south of NH33 (Middle Road). The location of the automatic traffic recorders and the subject site with respect to the area roadway system is shown on Figure 1.

<u>Existing Conditions</u> – Peverly Hill Road extends in a general north-south direction along the site frontage and provides access between NH33 and US1. This road provides one travel lane in each direction in the vicinity of the subject site. The pavement width is delineated with a four-inch double yellow centerline and four-inch single white edge lines. Paved, grass and gravel shoulders of variable width are present along both sides of the roadway. The speed limit is posted at 25 mph in each direction in this area.

<u>Existing Traffic Volumes</u> – According to a short-term NHDOT traffic count conducted on Peverly Hill Road (south of NH33) in June 2019, this roadway section carried an estimated Annual Average Daily Traffic (AADT) volume of approximately 9,549 vehicles per day in 2019. The hourly data indicates that weekday volumes typically reached peak levels from 8:00 to 9:00 AM and from 4:00 to 5:00 PM. The diagrams on Page 3 summarize the daily and hourly variations in traffic demand at this location (see Attachments 2 & 3). This information was supplemented by a 24-hour Automatic Traffic Recorder count conducted by our office in September 2020.

Pernaw & Company, Inc.



= AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)

= AUTOMATIC TRAFFIC RECORDER LOCATION (PERNAW & CO., INC.)

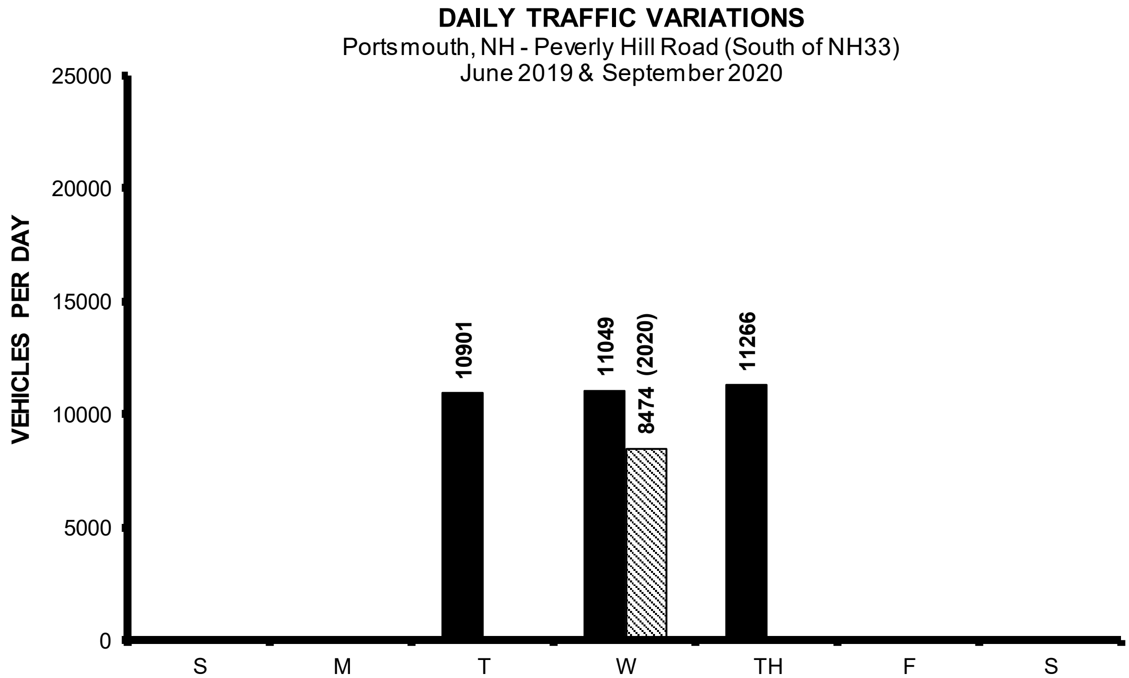
NORTH

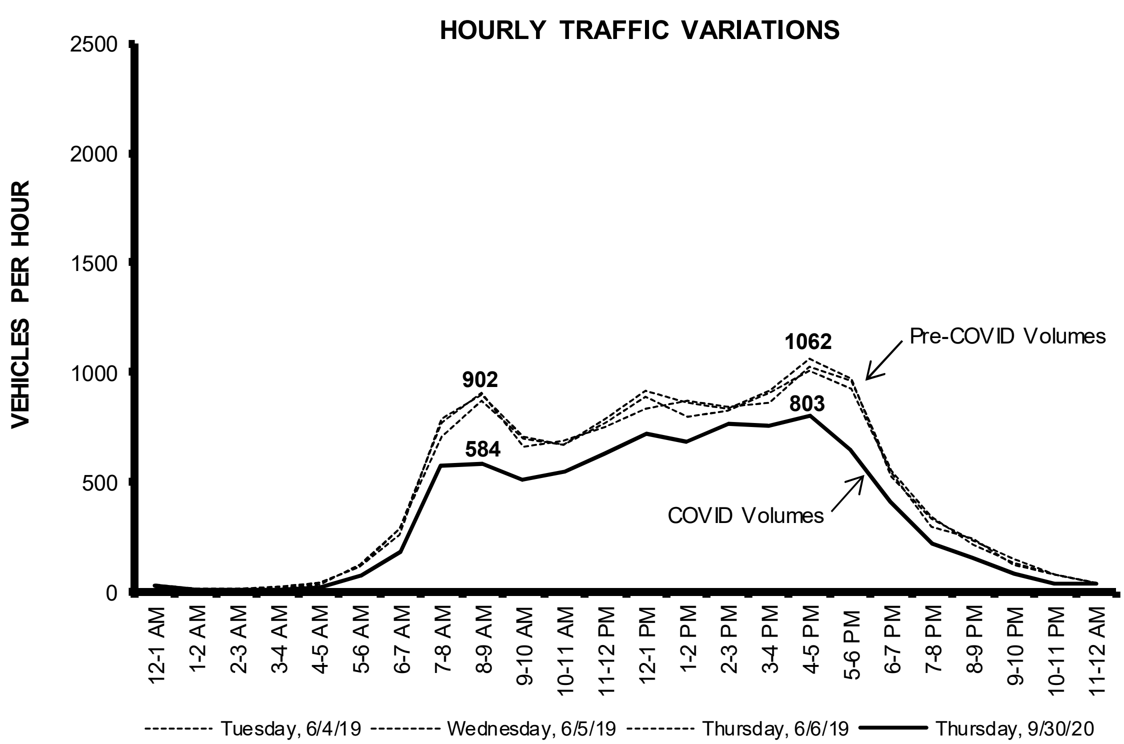
2047A

Figure 1

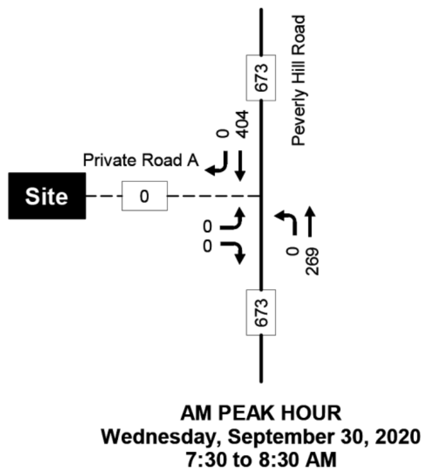
Site Location

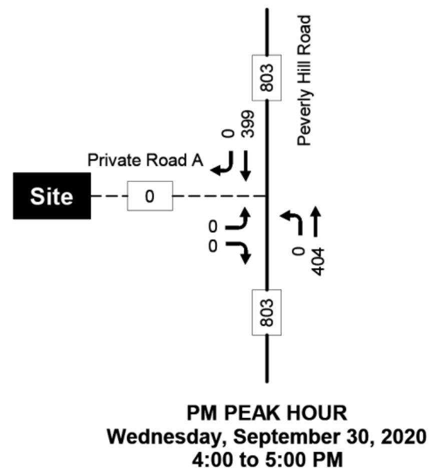
Traffic Evaluation, Proposed Residential Development, Portsmouth, New Hampshire


DAILY TRAFFIC VARIATIONS
Portsmouth, NH - Peverly Hill Road (South of NH33)
June 2019 & September 2020
VEHICLES PER DAY
25000
20000
15000
10000
5000
0
10901
11049
8474 (2020)
11266
S
M
T
W
TH
F
S


HOURLY TRAFFIC VARIATIONS
VEHICLES PER HOUR
2500
2000
1500
1000
500
0
902
584
1062
803
Pre-COVID Volumes
COVID Volumes
12-1 AM
1-2 AM
2-3 AM
3-4 AM
4-5 AM
5-6 AM
6-7 AM
7-8 AM
8-9 AM
9-10 AM
10-11 AM
11-12 PM
12-1 PM
1-2 PM
2-3 PM
3-4 PM
4-5 PM
5-6 PM
6-7 PM
7-8 PM
8-9 PM
9-10 PM
10-11 PM
11-12 AM
Tuesday, 6/4/19
Wednesday, 6/5/19
Thursday, 6/6/19
Thursday, 9/30/20

The raw 2020 directional traffic volume data on Peverly Hill Road are summarized in the diagrams below. This data shows that travel in the southbound direction is predominant during the morning peak hour, and this reverses to northbound during the evening peak hour. This pattern is indicative of the employment opportunities in the city, and the proximity of Interstate Route 95.





When compared with the 2019 NHDOT count data, it is obvious that the current traffic levels on Peverly Hill Road have been affected by the COVID-19 pandemic. For this reason, the subsequent post-development traffic volumes contained herein reflect the use of a separate COVID adjustment factor. The raw traffic count data is attached (see Attachment 4).

Trip Generation - To estimate the quantity of vehicle-trips that will be produced by the proposed residential development, the standard trip generation rates and equations published by the Institute of Transportation Engineers[1] (ITE) were considered. Both Land Use Code 210 and 220 are somewhat applicable, for different reasons. LUC 210 applies to single-family detached dwellings; however, the proposed units are condominiums and are much smaller in size than is found in a conventional residential subdivision. LUC 220 applies to condominiums, apartments, and townhouses; however, with multiple units in the same building. Consequently, the trip rates per person for LUC 210 and the trip rates per dwelling unit for LUC 220 were considered; and the higher of the two results were utilized for traffic projection and analysis purposes. According to Green & Company's experience with similar development projects, there are approximately two persons per unit in this type of housing.

[1] Institute of Transportation Engineers, *Trip Generation*, 10th Edition (Washington, D.C., 2017)

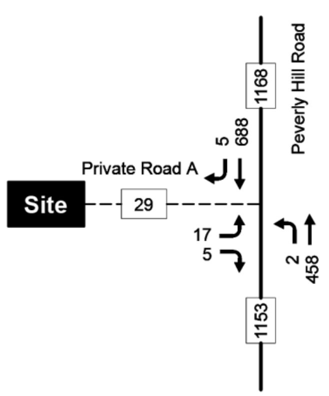
Table 1		Trip Generation Summary	
		Estimate A LUC 210 120 Residents [1]	**Estimate B** LUC 220 60 Units [2]
Weekday AM Peak Hour			
	Entering	8 veh	**7 veh**
	Exiting	17 veh	**22 veh**
	Total	25 trips	**29 trips**
Weekday PM Peak Hour			
	Entering	**28 veh**	23 veh
	Exiting	**14 veh**	14 veh
	Total	**42 trips**	37 trips
Weekday Total (24-hours)			
	Entering	198 veh	207 veh
	Exiting	198 veh	207 veh
	Total	396 trips	414 trips

[1] ITE Land Use Code 210 - Single-Family Detached Housing (Use 2 persons per unit, Trip Equation Method)

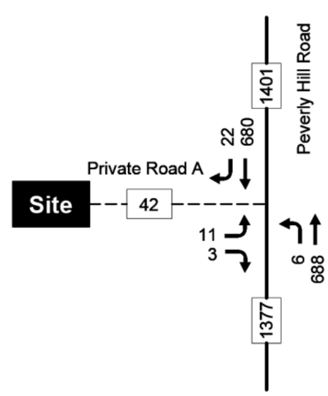
[2] ITE Land Use Code 220 - Multifamily Housing - Low-Rise (60 Dwelling Units, Trip Equation Method)

Based upon ITE Land Use Code 210 (Single-Family Detached Housing) and ITE Land Use Code 220 (Multifamily Housing – Low Rise), the overall development is expected to generate approximately 29 vehicle-trips (7 arrivals, 22 departures) during the AM peak hour, and 42 vehicle-trips (28 arrivals, 14 departures) during the PM peak hour, on an average weekday basis (see Attachment 5).

Future Build Traffic Projections – The diagrams below summarize the Build traffic projections for the 2032 horizon year. These projections are based on the September 2020 traffic count data, a peak-month seasonal adjustment factor of 1.05 (see Attachment 6), a 2.0% background traffic growth rate, compounded annually (see Attachment 7), and a COVID-19 adjustment factor of 1.28 (see Attachment 8). The trip distribution analysis (see Attachment 9) indicates that the majority of site traffic (78%) will travel to/from points north on Peverly Hill Road.



2032 AM Build



2032 PM Build

Intersection Capacity and Level of Service - The long-range (2032) traffic projections form the basis for assessing traffic operations at the Peverly Hill Road / Private Road A intersection from a capacity and delay standpoint. This intersection was analyzed according to the methodologies of the *Highway Capacity Manual 2010*[2] as replicated by the latest edition of the *Synchro Signal Timing Software (Version 10),* which is capable of analyzing unsignalized intersections as well.

Capacity and Level of Service (LOS) calculations pertaining to unsignalized intersections address the quality of service for those vehicles turning into and out of the intersecting side street or driveway. The availability of adequate gaps in the traffic stream on the major street actually controls the potential capacity for vehicle movements to and from the minor approaches, in terms of vehicles per hour.

The results of the analysis for the subject intersection show that all applicable turning movements will operate well below capacity through 2032 with the proposed development fully occupied. Nevertheless, departures from the Private Road A approach to Peverly Hill Road can be expected to encounter moderate delays during the peak hour periods in 2032: Level of Service E during the morning peak hour; Level of Service D during the evening peak hour (see Attachments 10 & 11).

Auxiliary Turn Lane Warrants Analysis

Left-Turn Treatment - The type of treatment needed to accommodate left-turning vehicles from any street or highway to an intersecting side street (or driveway) can range from no treatment, where turning volumes are low; to the provision of a bypass lane for through traffic to travel around left-turning vehicles; to the addition of a formal center turn lane used exclusively by left-turning vehicles for deceleration and storage while waiting to complete their maneuvers.

Analysis of the 2032 traffic volumes using NCHRP 457 guidelines confirmed that no special treatment is needed for left-turn arrivals from Peverly Hill Road. The results of the analysis are summarized on Table 2. This finding means that the northbound through lane on Peverly Hill Road will function safely and adequately as a shared through-left lane (see Attachments 12 & 13).

Right-Turn Treatment - The type of treatment needed to accommodate right-turning vehicles from any street or highway to any intersecting side street (or driveway) can range from a radius only, where turning volumes are low; to the provision of a short 10:1 right-turn taper; to the addition of an exclusive right-turn lane, where turning volumes and through traffic volumes are significant.

Analysis of the 2032 traffic volumes contained herein using NCHRP 457 guidelines confirmed that right-turn treatment is not warranted at the subject intersection. The results of these analyses are summarized on Table 2 and the computations are attached (Attachments 14 & 15).

Minor Road Approach Treatment - The type of treatment needed to accommodate exiting vehicles from the minor-road approach at a stop-controlled intersection can range from a single lane (shared left-right lane) in low-volume conditions, to two exit lanes (exclusive left-turn lane and exclusive right-turn lane) where turning volumes and through traffic volumes are significant,

[2] Transportation Research Board, *Highway Capacity Manual* (Washington, D.C., 2010).

to multiple exit lanes in extreme cases. The analysis is summarized on Table 2 and shows that a single departure lane on the Private Road A approach to Peverly Hill Road is sufficient (see Attachments 16 & 17).

Table 2 — **Auxiliary Turn Lane Warrants Analysis**
Peverly Hill Road / Private Road A

	2032 AM Build Volumes	2032 PM Build Volumes
I. LEFT-TURN LANE WARRANTS ANALYSIS		
Peak Hour Inputs:		
Left-Turn Volume (NB)	2	6
Advancing Volume (NB)	460	694
Opposing Volume (SB)	693	702
Percent Lefts	0.4%	0.9%
Speed (mph)	25	25
Limiting Advancing Volume (veh/h)	>1000	>1000
Left-Turn Treatment Warranted?	**NO**	**NO**
II. RIGHT-TURN LANE WARRANTS ANALYSIS		
Peak Hour Inputs:		
Right-Turn Volume (SB)	5	22
Approach Volume (SB)	693	702
Speed (mph)	25	25
Limiting Right-Turn Volume (veh/h)	225	208
Add Right-Turn Bay?	**NO**	**NO**
III. MINOR-ROAD APPROACH GEOMETRY ANALYSIS		
Peak Hour Inputs:		
Major-Road Volume (NB-SB)	1153	1396
% Right-Turns on Minor (EB)	23	21
Minor-Road Approach Volume	22	14
Limiting Minor-Road Volume (veh/h)	132	95
Consider TWO Approach Lanes?	**NO**	**NO**

Findings & Conclusions

1. The September 2020 traffic count conducted on Peverly Hill Road at the subject site revealed that this section of roadway carried approximately 8,500 vehicles on a typical weekday, with 673 vehicles observed passing the site during the AM peak hour (7:30 to 8:30 AM) and 803 vehicles observed during the PM peak hour (4:00 to 5:00 PM). The predominant travel direction was southbound during the AM, and northbound during the PM.

2. The proposed residential development is expected to generate approximately 29 (AM) and 42 (PM) vehicle-trips during the peak hour periods. The majority (78%) are expected to travel to/from points north on Peverly Hill Road (via NH33).

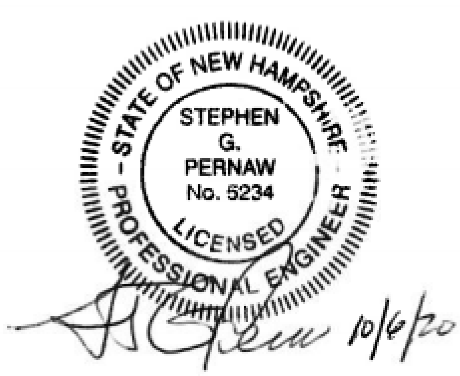
3. Site traffic is expected to increase the two-way traffic volume on Peverly Hill Road by +2% north of the site, and +1% south of the site by 2032.

4. The intersection capacity and Level of Service analysis indicates that all applicable traffic movements at this intersection will operate well below capacity through 2032 with the development fully occupied. By 2032, departures from the site are expected to operate at Level of Service E during the morning peak hour, and at Level of Service D during the PM peak hour. Left-turn arrivals (from Peverly Hill Road northbound) will operate at Level of Service B, or higher, during all hours of the day through 2032. Vehicle queuing on the Private Road A approach to Peverly Hill Road is expected to be minimal.

5. The 2032 Build traffic volumes do <u>not</u> satisfy the NCHRP guidelines for left-turn treatment or right-turn treatment at the Private Road A intersection on Peverly Hill Road. The subject intersection will function safely and efficiently with one shared travel lane on each approach to the subject intersection.

From a traffic operations and safety standpoint, providing ample sight distances looking left and right from the Proposed Road A approach to Peverly Hill Road is an important safety consideration. This new access road should operate under stop sign control, and be delineated with a 18-inch white stop line and a short section of 4-inch double-yellow centerline to separate inbound and outbound vehicles.

Attachments



A T T A C H M E N T S

Attachment 1

PUD SITE DATA

DIMENSIONAL REQUIREMENTS (PROPOSED PUD USE)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
MINIMUM LOT SIZE	10 AC	100± AC
FRONTAGE	100 FT OR (2) @ 50'	665± FT
BASE RESIDENTIAL DENSITY:	74 RESIDENCES	60 RESIDENCES
MINIMUM INTERNAL SETBACKS:		
FRONT	20 FT	20 FT
SIDE	25 FT	TBD
REAR	25 FT	25 FT
BETWEEN BUILDINGS	30 FT	30 FT
MINIMUM OPEN SPACE	25%	TBD
MINIMUM PERIMETER BUFFER:		
FRONT	100 FT	>100 FT
SIDE	50 FT	>50 FT
REAR	50 FT	>50 FT

BASE RESIDENTIAL DENSITY CALCULATIONS

REQUIRED BASE RESIDENTIAL DENSITY:

SRA:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 3,938,561 SF – 1,684,960 SF – 156,927 SF
= 2,096,674 SF

MINIMUM LOT AREA PER DWELLING = 1 AC = 43,560 SF

SRB:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 665,948 SF – 286,452 SF – 1,217 SF

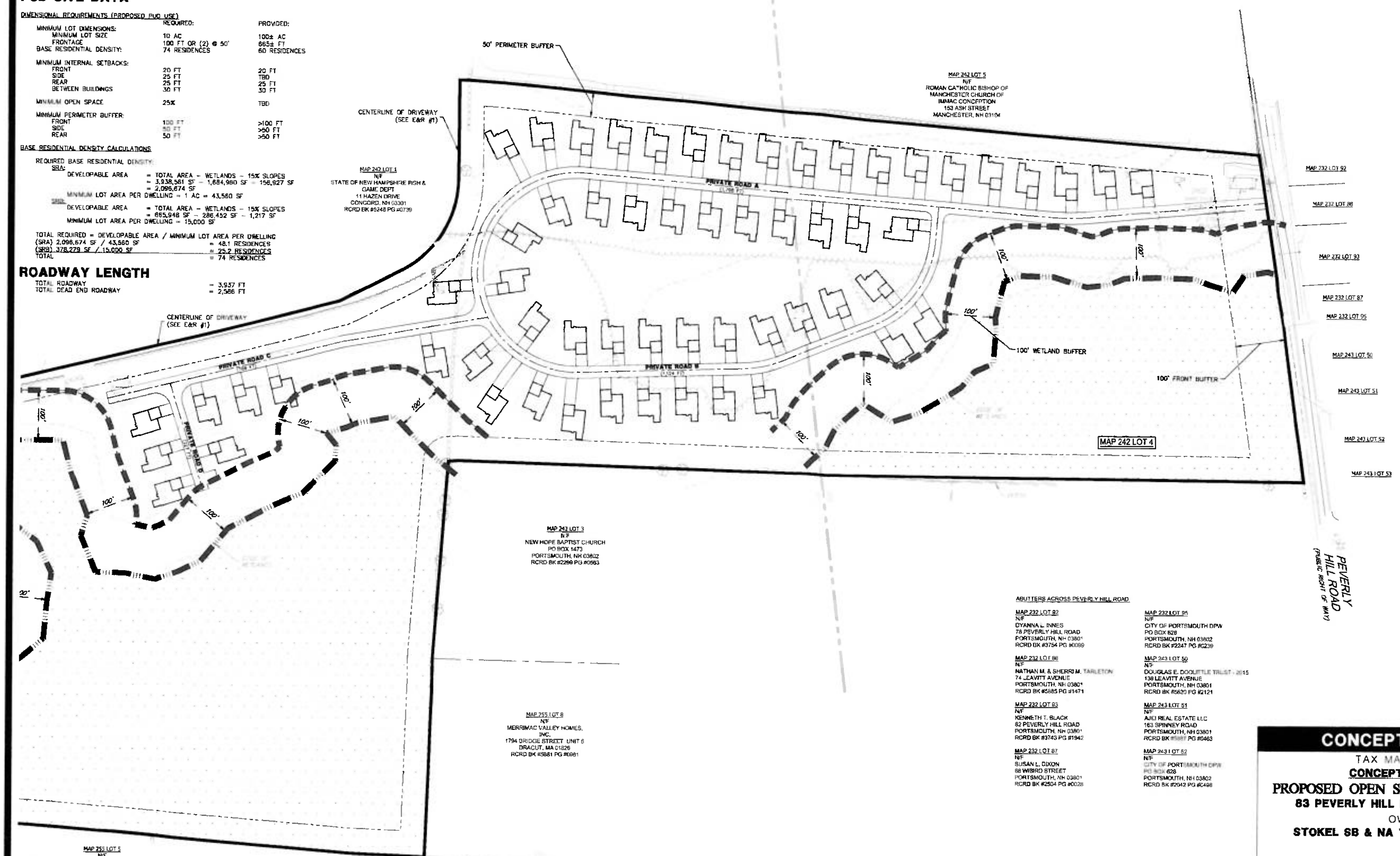
MINIMUM LOT AREA PER DWELLING = 15,000 SF

TOTAL REQUIRED = DEVELOPABLE AREA / MINIMUM LOT AREA PER DWELLING

(SRA) 2,096,674 SF / 43,560 SF	= 48.1 RESIDENCES
(SRB) 378,279 SF / 15,000 SF	= 25.2 RESIDENCES
TOTAL	= 74 RESIDENCES

ROADWAY LENGTH

TOTAL ROADWAY	= 3,937 FT
TOTAL DEAD END ROADWAY	= 2,586 FT



ABUTTERS ACROSS PEVERLY HILL ROAD

MAP 232 LOT 92
N/F
DYANNA L. INNES
78 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
RCRD BK #3754 PG #0099

MAP 232 LOT 86
N/F
NATHAN M. & SHERRI M. TARLETON
74 LEAVITT AVENUE
PORTSMOUTH, NH 03801
RCRD BK #5885 PG #1471

MAP 232 LOT 93
N/F
KENNETH T. BLACK
82 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
RCRD BK #3743 PG #1942

MAP 232 LOT 87
N/F
SUSAN L. DIXON
68 WIBIRD STREET
PORTSMOUTH, NH 03801
RCRD BK #2504 PG #0028

MAP 232 LOT 95
N/F
CITY OF PORTSMOUTH DPW
PO BOX 628
PORTSMOUTH, NH 03802
RCRD BK #2247 PG #0239

MAP 243 LOT 50
N/F
DOUGLAS E. DOOLITTLE TRUST - 2015
138 LEAVITT AVENUE
PORTSMOUTH, NH 03801
RCRD BK #5620 PG #2121

MAP 243 LOT 51
N/F
AJEI REAL ESTATE LLC
163 SPINNEY ROAD
PORTSMOUTH, NH 03801
RCRD BK #5887 PG #0463

MAP 243 LOT 52
N/F
CITY OF PORTSMOUTH DPW
PO BOX 628
PORTSMOUTH, NH 03802
RCRD BK #2042 PG #0498

THIS PLAN IS A PRELIMINARY CONCEPTUAL DESIGN FOR SITE LOCATION FEASIBILITY AND DISCUSSION PURPOSES ONLY. ADDITIONAL PERMITS, WAIVERS, AND VARIANCE MAY BE REQUIRED UPON FURTHER DESIGN, REVIEW, AND COORDINATION WITH THE TOWN.

HORIZONTAL SCALE 1"=100'
100 50 0 100

CONCEPTUAL DESIGN

TAX MAP 242 LOT 4

CONCEPT A - PUD PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TURST, PHILIP J 25% INT

1"=200' (11X17")
SCALE: 1"=100' (22"X34")

JULY 28, 2020

REV.	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	HEG	FB	-	
47388.11	CK	HEG	CADFILE	47388-10 CONCEPT A	A-02

New Hampshire DOT Department of Transportation

MS2

Transportation Data Management System

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379124	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	Yes
LRS ID	L3790080__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Major Collector	Milepost	
Located On	Peverly Hill Rd		
Loc On Alias	PEVERLY HILL RD SOUTH OF NH 33		

More Detail

STATION DATA

Directions: 2-WAY

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2019	9,549	1,062	11		8,748 (92%)	801 (8%)	
2018	10,823[3]		11		9,978 (92%)	845 (8%)	Grown from 2017
2017	10,611[3]		11		9,847 (93%)	764 (7%)	Grown from 2016
2016	10,403	1,150	11		9,487 (91%)	916 (9%)	
2015	10,527[3]						Grown from 2014

> >>| 1-5 of 20

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 6/6/2019	60	11,266
	Wed 6/5/2019	60	11,049
	Tue 6/4/2019	60	10,901
	Tue 7/19/2016	60	12,808
	Mon 7/18/2016	60	12,033
	Sun 7/17/2016	60	6,806
	Fri 9/13/2013	60	11,838
	Thu 9/12/2013	60	11,713
	Wed 9/11/2013	60	11,902
	Tue 9/10/2013	60	11,404

VOLUME TREND

Year	Annual Growth
2019	-12%
2018	2%
2017	2%
2016	-1%
2015	3%
2014	2%
2013	4%
2010	-7%
2007	-10%

New Hampshire DOT Department of Transportation

MS2

Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82379124	Type:	SPOT
Located On:	Peverly Hill Rd	:	
Direction:	2-WAY		
Community:	PORTSMOUTH	Period:	Mon 6/3/2019 - Sun 6/9/2019
AADT:	9549		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		14	28	24				22	0.2%
1:00 AM		11	18	12				14	0.1%
2:00 AM		16	13	13				14	0.1%
3:00 AM		13	17	20				17	0.2%
4:00 AM		35	39	40				38	0.3%
5:00 AM		125	113	115				118	1.1%
6:00 AM		286	290	263				280	2.5%
7:00 AM		710	771	786				756	6.8%
8:00 AM		867	906	902				892	8.1%
9:00 AM		700	664	707				690	6.2%
10:00 AM		666	688	674				676	6.1%
11:00 AM		773	751	792				772	7.0%
12:00 PM		893	835	916				881	8.0%
1:00 PM		802	872	858				844	7.6%
2:00 PM		828	840	830				833	7.5%
3:00 PM		904	861	916				894	8.1%
4:00 PM		1004	1025	1062				1,030	9.3%
5:00 PM		926	963	973				954	8.6%
6:00 PM		543	548	524				538	4.9%
7:00 PM		299	340	336				325	2.9%
8:00 PM		246	216	237				233	2.1%
9:00 PM		124	133	148				135	1.2%
10:00 PM		74	78	79				77	0.7%
11:00 PM		42	40	39				40	0.4%
Total	**0**	**10,901**	**11,049**	**11,266**	**0**	**0**	**0**		
24hr Total		10901	11049	11266				11,072	
AM Pk Hr		8:00	8:00	8:00					
AM Peak		867	906	902				892	
PM Pk Hr		4:00	4:00	4:00					
PM Peak		1004	1025	1062				1,030	
% Pk Hr		9.21%	9.28%	9.43%				9.31%	

Attachment 4

Stephen G. Pernaw & Company, Inc.

Automatic Traffic Recorder Count - Peverly Hill Road, Portsmouth, NH (South of NH Route 33)

Wednesday, September 30, 2020

Period Beginning	CARS SB	CARS NB	TRUCKS SB	TRUCKS NB	TOTAL SB	TOTAL NB	TOT		Period Beginning	CARS SB	CARS NB	TRUCKS SB	TRUCKS NB	TOTAL SB	TOTAL NB	TOT	
12:00 AM	6	3	0	0	6	3	9		12:00 PM	98	80	10	10	108	90	198	683
12:15 AM	5	2	0	0	5	2	7		12:15 PM	88	86	3	2	91	88	179	714
12:30 AM	4	1	0	0	4	1	5		12:30 PM	92	81	8	2	100	83	183	740
12:45 AM	2	2	0	0	2	2	4	25	12:45 PM	88	66	2	3	90	69	159	719
1:00 AM	0	1	0	0	0	1	1	17	1:00 PM	75	81	4	2	79	83	162	683
1:15 AM	2	0	0	0	2	0	2	12	1:15 PM	79	74	4	3	83	77	160	664
1:30 AM	1	1	0	0	1	1	2	9	1:30 PM	79	76	8	6	87	82	169	650
1:45 AM	1	1	0	1	1	2	3	8	1:45 PM	100	80	3	8	103	88	191	682
2:00 AM	1	0	1	0	2	0	2	9	2:00 PM	94	68	8	6	102	74	176	696
2:15 AM	1	1	0	0	1	1	2	9	2:15 PM	92	79	6	6	98	85	183	719
2:30 AM	1	0	0	0	1	0	1	8	2:30 PM	107	68	5	5	112	73	185	735
2:45 AM	1	1	0	0	1	1	2	7	2:45 PM	110	102	3	7	113	109	222	766
3:00 AM	1	2	0	1	1	3	4	9	3:00 PM	113	90	7	2	120	92	212	802
3:15 AM	0	0	0	0	0	0	0	7	3:15 PM	89	81	3	5	92	86	178	797
3:30 AM	0	0	0	1	0	1	1	7	3:30 PM	91	91	8	6	99	97	196	808
3:45 AM	3	0	0	0	3	0	3	8	3:45 PM	94	68	3	2	97	70	167	753
4:00 AM	1	1	0	0	1	1	2	6	4:00 PM	93	110	0	3	93	113	206	747
4:15 AM	1	2	0	0	1	2	3	9	4:15 PM	99	111	2	1	101	112	213	782
4:30 AM	1	0	0	0	1	0	1	9	4:30 PM	86	92	5	0	91	92	183	769
4:45 AM	4	4	1	0	5	4	9	15	4:45 PM	110	82	4	5	114	87	201	803
5:00 AM	6	2	1	0	7	2	9	22	5:00 PM	89	100	2	0	91	100	191	788
5:15 AM	17	4	0	0	17	4	21	40	5:15 PM	100	71	2	0	102	71	173	748
5:30 AM	9	10	1	0	10	10	20	59	5:30 PM	79	76	1	1	80	77	157	722
5:45 AM	20	3	1	1	21	4	25	75	5:45 PM	76	48	0	0	76	48	124	645
6:00 AM	13	13	3	1	16	14	30	96	6:00 PM	72	55	0	0	72	55	127	581
6:15 AM	17	7	0	0	17	7	24	99	6:15 PM	60	40	0	0	60	40	100	508
6:30 AM	26	11	3	2	29	13	42	121	6:30 PM	49	40	0	1	49	41	90	441
6:45 AM	63	22	4	1	67	23	90	186	6:45 PM	58	32	0	0	58	32	90	407
7:00 AM	50	27	5	0	55	27	82	238	7:00 PM	31	43	0	0	31	43	74	354
7:15 AM	76	33	4	3	80	36	116	330	7:15 PM	33	25	0	0	33	25	58	312
7:30 AM	91	41	2	7	93	48	141	429	7:30 PM	29	21	0	0	29	21	50	272
7:45 AM	150	73	8	6	158	79	237	576	7:45 PM	20	19	0	1	20	20	40	222
8:00 AM	76	72	4	6	80	78	158	652	8:00 PM	21	23	0	0	21	23	44	192
8:15 AM	69	61	4	3	73	64	137	673	8:15 PM	16	19	0	0	16	19	35	169
8:30 AM	71	36	2	7	73	43	116	648	8:30 PM	17	23	0	0	17	23	40	159
8:45 AM	91	72	3	7	94	79	173	584	8:45 PM	20	13	0	0	20	13	33	152
9:00 AM	71	54	1	2	72	56	128	554	9:00 PM	15	9	1	0	16	9	25	133
9:15 AM	68	43	7	2	75	45	120	537	9:15 PM	11	6	0	0	11	6	17	115
9:30 AM	65	50	4	7	69	57	126	547	9:30 PM	6	9	0	0	6	9	15	90
9:45 AM	86	45	1	2	87	47	134	508	9:45 PM	12	11	2	0	14	11	25	82
10:00 AM	80	44	7	0	87	44	131	511	10:00 PM	3	11	0	0	3	11	14	71
10:15 AM	79	60	8	6	87	66	153	544	10:15 PM	5	7	0	0	5	7	12	66
10:30 AM	64	51	2	1	66	52	118	536	10:30 PM	1	1	0	0	1	1	2	53
10:45 AM	85	53	7	3	92	56	148	550	10:45 PM	2	7	0	0	2	7	9	37
11:00 AM	79	51	7	3	86	54	140	559	11:00 PM	5	5	0	0	5	5	10	33
11:15 AM	77	60	7	4	84	64	148	554	11:15 PM	2	5	0	0	2	5	7	28
11:30 AM	81	61	6	9	87	70	157	593	11:30 PM	9	4	0	0	9	4	13	39
11:45 AM	93	71	7	9	100	80	180	625	11:45 PM	2	7	0	0	2	7	9	39
					1920	1247	3167							2824	2483	5307	
7:30 - 8:30 AM Peak Hour					404	269	673		4:00 - 5:00 PM Peak Hour					399	404	803	

DAILY TRAFFIC VOLUME = 8,474 vehicles per day

2047A

Trip Generation Summary

Alternative: Alternative 1
Phase:
Project: 2047A Gen

Open Date: 10/5/2020
Analysis Date: 10/5/2020

ITE	Land Use	Weekday Average Daily Trips *			Weekday AM Peak Hour of Adjacent Street Traffic *			Weekday PM Peak Hour of Adjacent Street Traffic *		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
210	SFHOUSE 1	198	198	396	8	17	25	28	14	42
	120 Residents									
220	LOW-RISE 1	207	206	413	7	22	29	23	14	37
	60 Dwelling Units									
Unadjusted Volume		405	404	809	15	39	54	51	28	79
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		405	404	809	15	39	54	51	28	79

Total Weekday Average Daily Trips Internal Capture = 0 Percent

Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition

TRIP GENERATION 10, TRAFFICWARE, LLC

Seasonal Adjustment Factors
NHDOT Group 4 (Urban Highways)

Stephen G. Pernaw & Company, Inc.

Year 2019 Monthly Data - Urban

Month	ADT	Adjustment to Average	Adjustment to Peak
Jan	11,431	1.12	1.23
Feb	11,848	1.08	1.18
Mar	12,141	1.06	1.15
Apr	12,860	1.00	1.09
May	13,551	0.95	1.03
Jun	13,785	0.93	1.02
Jul	13,942	0.92	1.01
Aug	14,016	0.92	1.00
Sep	13,379	0.96	1.05
Oct	13,339	0.96	1.05
Nov	12,265	1.05	1.14
Dec	11,496	1.12	1.22

Year 2018 Monthly Data - Urban

Month	ADT	Adjustment to Average	Adjustment to Peak
Jan	11,282	1.13	1.24
Feb	11,848	1.08	1.18
Mar	11,828	1.08	1.18
Apr	12,491	1.02	1.12
May	13,587	0.94	1.03
Jun	13,911	0.92	1.00
Jul	13,765	0.93	1.01
Aug	13,945	0.92	1.00
Sep	13,168	0.97	1.06
Oct	13,367	0.96	1.04
Nov	12,215	1.05	1.14
Dec	11,963	1.07	1.17

Year 2017 Monthly Data - Urban

Month	ADT	Adjustment to Average	Adjustment to Peak
Jan	12254	1.21	1.33
Feb	13494	1.10	1.21
Mar	14335	1.03	1.14
Apr	15004	0.99	1.09
May	15547	0.95	1.05
Jun	16310	0.91	1.00
Jul	15523	0.95	1.05
Aug	15974	0.93	1.02
Sep	15546	0.95	1.05
Oct	15104	0.98	1.08
Nov	14544	1.02	1.12
Dec	14151	1.05	1.15

September to Peak-Month Factor = 1.05

Stephen G. Pernaw & Company, Inc.

STEPHEN G. PERNAW & COMPANY, INC.
PROJECT: Proposed Residential Development, Portsmouth New Hampshire
NUMBER: 2047A
COUNT STATION: 82379124

HISTORICAL GROWTH CALCULATIONS

LOCATION : Peverly Hill Road (S. of NH33)
CASE : AADT

ARITHMETIC PROJECTIONS

YEAR	AADT
2015	10527
2016	10403
2017	10611
2018	10823

Regression Output:

Constant	-210417.4
Std Err of Y Est	129.62099
R Squared	0.6412368
No. of Observations	4
Degrees of Freedom	2
X Coefficient	109.6
Std Err of Coef.	57.968267

PROJECTIONS

2020	10975
2021	11084
2022	11194
2023	11303
2024	11413
2025	11523
2026	11632
2027	11742
2028	11851
2029	11961
2030	12071

RATE = 110 VPD/YEAR

GEOMETRIC PROJECTIONS

YEAR	AADT	Ln AADT
2015	10527	9.26170
2016	10403	9.24985
2017	10611	9.26965
2018	10823	9.28943

Regression Output:

Constant	-11.49974
Std Err of Y Est	0.0122527
R Squared	0.6384951
No. of Observations	4
Degrees of Freedom	2
X Coefficient	0.0102987
Std Err of Coef.	0.0054796

PROJECTIONS

2020	10979
2021	11092
2022	11207
2023	11323
2024	11440
2025	11559
2026	11678
2027	11799
2028	11921
2029	12045
2030	12170

RATE = 1.0 % / YEAR

Use 2.0%

CALCULATION SHEET

Attachment 8

Stephen G. Pernaw & Company, Inc.

Project:	Portsmouth - Res.	Job Number:	2047A
Calculated By:	SGP	Date:	10/5/2020
Checked By:	CA	Date:	10/5/2020
Sheet No:	1	Of:	1
Subject:	COVID-19 Adjustment Factor		

I. Given:

1. NHDOT traffic count on Peverly Hill Road (south of NH33) in June 2019 (Pre-covid conditions)
   - Average AM peak hour = 892 veh.
   - Average PM peak hour = 1,030 veh.
   - Average weekday = 11,072 veh.
2. SGP ATR count on Wednesday, September 30, 2020
   - AM peak hour = 673 veh.
   - PM peak hour = 803 veh.
   - Weekday = 8,474 veh.
3. NHDOT Group 4 (Urban Highways) seasonal adjustment factors
   - September to peak month = 1.05 (average of 2017, 2018 & 2019)
   - June to peak month = 1.01 (average of 2017, 2018 & 2019)
4. Background growth rate = 1.0/year; use 2.0% to account for other unknown development projects

II. Calculate 2020 peak month volumes using NHDOT June 2019 data (pre-covid conditions)

1. AM = 892 x 1.02 x 1.01 = 919 veh
2. PM = 1,030 X 1.02 x 1.01 = 1,061 veh
3. Weekday = 11,072 x 1.02 x 1.01 = 11,406 veh

III. Calculate 2020 peak month volumes using SGP September 2020 data (during covid)

1. AM = 673 x 1.05 = 707 veh
2. PM = 803 X 1.05 = 843 veh
3. Weekday = 8,474 x 1.05 = 8,898 veh

IV. Calculate individual COVID-19 factors

1. AM = 919 / 707 = 1.30
2. PM = 1,061 / 843 = 1.26
3. Weekday = 11,406 / 8,898 = 1.28

V. Calculate average COVID-19 factor

Average covid factor = (1.30 + 1.26 + 1.28) / 3 = 1.28

Stephen G. Pernaw & Company, Inc.

Location: Portsmouth, New Hampshire
Job Number: 2047A

TRIP DISTRIBUTION ANALYSIS

Work Destination Report - Where Workers are Employed Who Live in the Selection Area - by County Subdivisions

Total All Jobs

Jobs Counts by County Subdivisions Where Workers are Employed - All Jobs	Count	Gateway % A	Gateway % B	Gateway % C		Gateway Allocation A	Gateway Allocation B	Gateway Allocation C	
Portsmouth city (Rockingham, NH)	4,355	0.40	0.40	0.20	1.00	1742	1742	871	4355
Dover city (Strafford, NH)	604	0.50		0.50	1.00	302	0	302	604
Exeter town (Rockingham, NH)	423	1.00			1.00	423	0	0	423
Manchester city (Hillsborough, NH)	399	1.00			1.00	399	0	0	399
Boston city (Suffolk, MA)	371	1.00			1.00	371	0	0	371
Newington town (Rockingham, NH)	343	0.50		0.50	1.00	172	0	172	344
Hampton town (Rockingham, NH)	266	0.70		0.30	1.00	186	0	80	266
Durham town (Strafford, NH)	266	0.30		0.70	1.00	80	0	186	266
Nashua city (Hillsborough, NH)	249	1.00			1.00	249	0	0	249
Salem town (Rockingham, NH)	193	1.00			1.00	193	0	0	193
	7469					4117	1742	1611	7470
						55.1%	23.3%	21.6%	100%
					USE	55	23	22	100

KEY
A=To/From Points West via NH Route 33
B=To/From Points East via NH Route 33
C=To/From Points South via Peverly Hill Road

HCM 2010 TWSC
3: Peverly Hill Road & Proposed Site Driveway

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
Traffic Vol, veh/h	17	5	2	458	688	5
Future Vol, veh/h	17	5	2	458	688	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	85	85	64	64
Heavy Vehicles, %	0	0	0	8	5	0
Mvmt Flow	19	6	2	539	1075	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1622	1079	1083	0	-	0
Stage 1	1079	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	114	268	652	-	-	-
Stage 1	329	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	114	268	652	-	-	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	328	-	-	-	-	-
Stage 2	586	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	38.7	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	652	-	131	-	-
HCM Lane V/C Ratio	0.004	-	0.187	-	-
HCM Control Delay (s)	10.5	0	38.7	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

HCM 2010 TWSC
3: Peverly Hill Road & Proposed Site Driveway

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	3	6	688	680	22
Future Vol, veh/h	11	3	6	688	680	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	89	89	88	88
Heavy Vehicles, %	0	0	0	2	3	0
Mvmt Flow	12	3	7	773	773	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1573	786	798	0	-	0
Stage 1	786	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	123	395	833	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	121	395	833	-	-	-
Mov Cap-2 Maneuver	121	-	-	-	-	-
Stage 1	446	-	-	-	-	-
Stage 2	452	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.4	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	833	-	142	-	-
HCM Lane V/C Ratio	0.008	-	0.11	-	-
HCM Control Delay (s)	9.4	0	33.4	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

2032 AM Build
Peverly Hill Road - Proposed Site Driveway

Stephen G. Pernaw & Company, Inc.

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

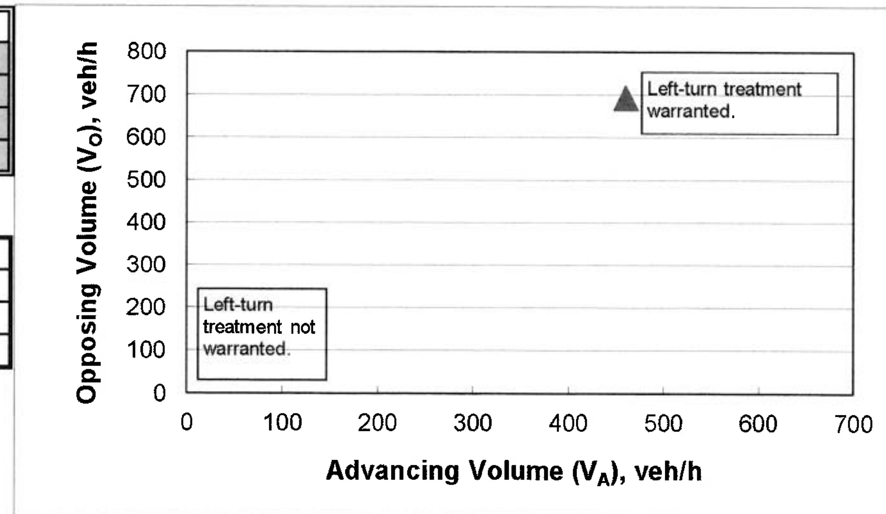
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	460
Opposing volume (V_O), veh/h:	693

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1456
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

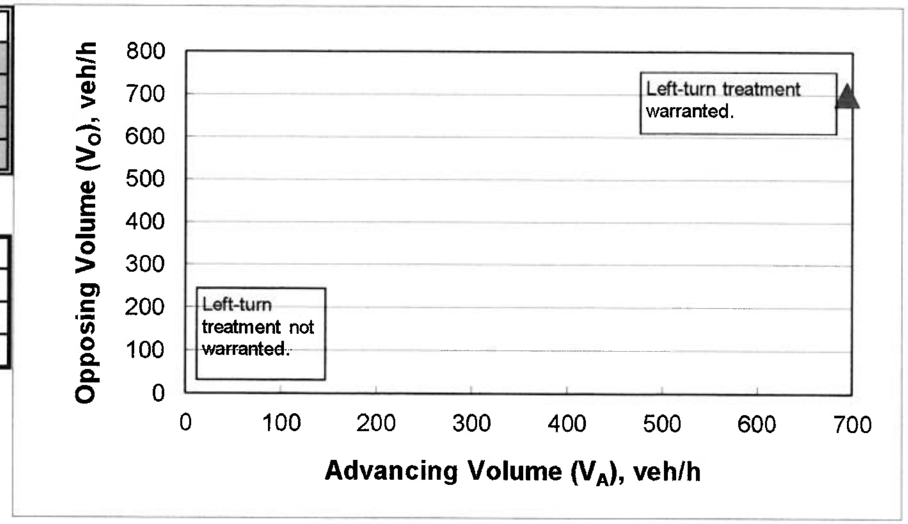
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	694
Opposing volume (V_O), veh/h:	702

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1023
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

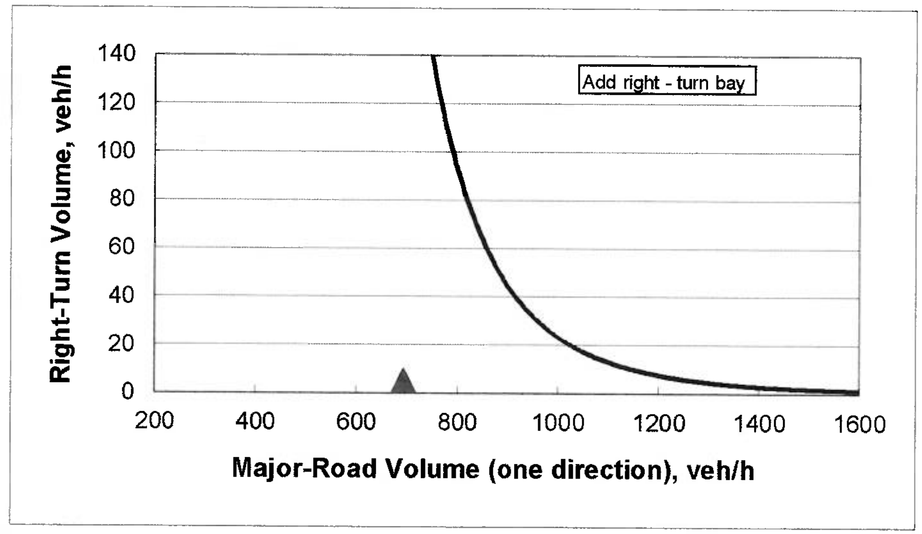
INPUT

2-lane roadway

Variable	Value
Major-road speed, mph:	25
Major-road volume (one direction), veh/h:	693
Right-turn volume, veh/h:	5

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	225
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



2032 PM Build
Peverly Hill Road / Proposed Site Driveway

Stephen G. Pernaw & Company, Inc.

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

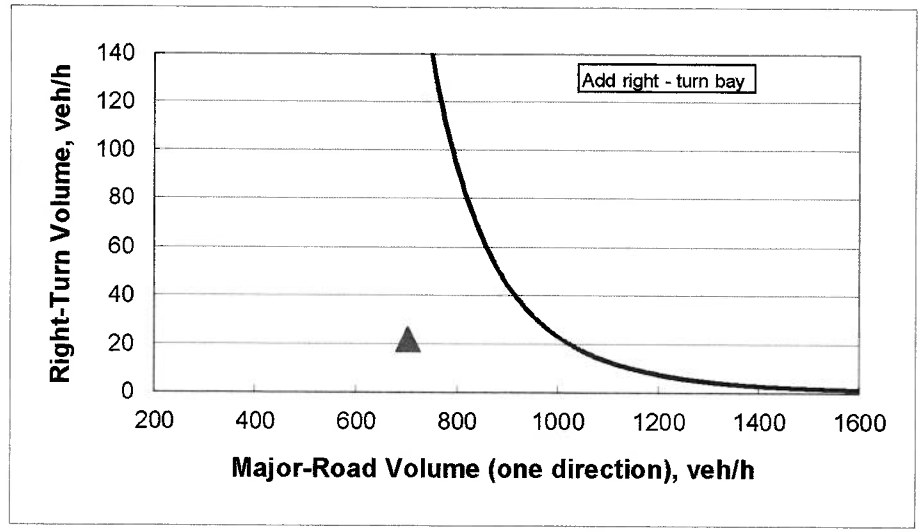
INPUT

2-lane roadway

Variable	Value
Major-road speed, mph:	25
Major-road volume (one direction), veh/h:	702
Right-turn volume, veh/h:	22

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	208
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Stephen G. Pernaw & Company, Inc.

Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1153
Percentage of right-turns on minor road, %:	23%
Minor-road volume (one direction), veh/h:	22

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	132
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

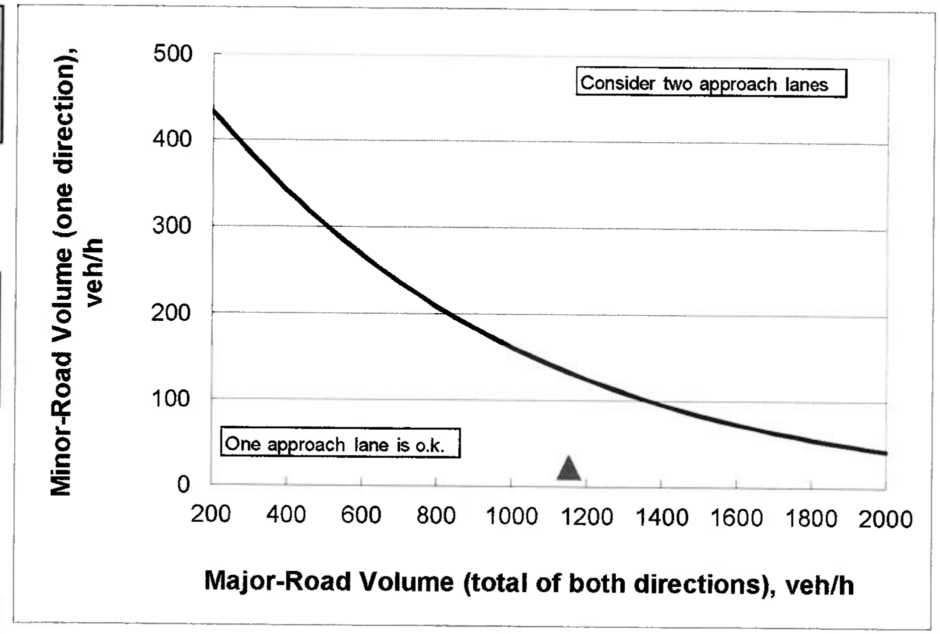


Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1396
Percentage of right-turns on minor road, %:	21%
Minor-road volume (one direction), veh/h:	14

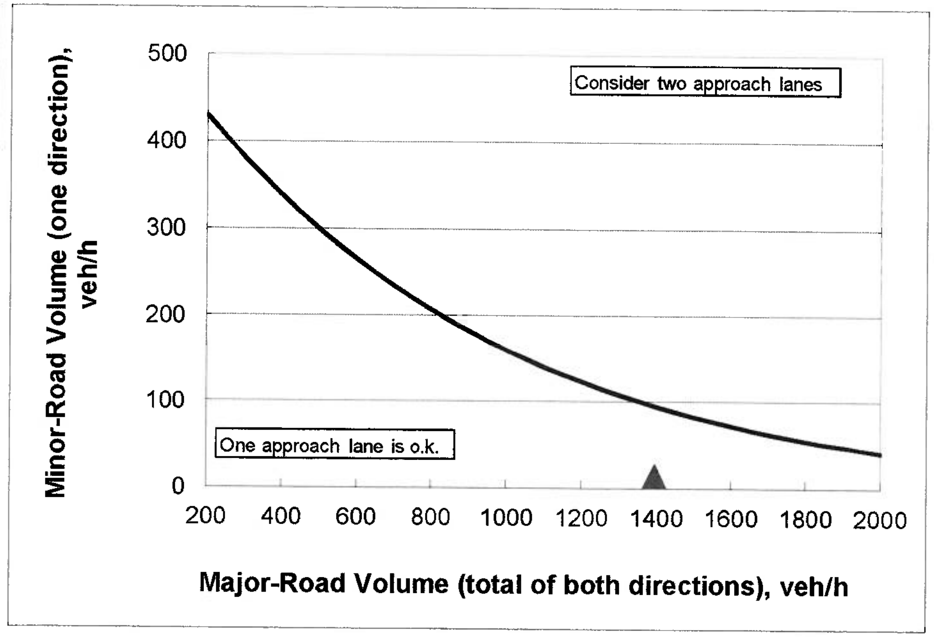
OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	95
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM



Stephen G. Pernaw
& Company, Inc.
P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com
Transportation: Engineering • Planning • Design

MEMORANDUM

Ref: 2047A

To: Jack McTigue, P.E., CPESC
TFMoran - Seacoast Division

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Development – 83 Peverly Hill Road
Portsmouth, New Hampshire

Date: June 17, 2021

As requested, our office has reviewed the plan entitled: *"Overall Site Layout Plan – Peverly Hill Road Condominiums"* dated April 19, 2021 (no revisions, see Attachment 1) and the "Site Layout Plans" (Sheets C-04 through C-12) and offer the following comments:

1. The proposed development has been reduced in size since the publication of our *"Traffic Evaluation"* memorandum dated 10/6/20 from 60 dwelling units to 56 units. This change translates into a slight reduction of -2 (AM) and -3 (PM) fewer vehicle-trips during the peak hour periods than was previously analyzed.
2. The roadway system employs a 26-foot pavement width on the section that extends from Peverly Hill Road to the first and only internal T-intersection. From there, the loop road will be constructed with a 22-foot pavement width. The proposed pavement widths are acceptable from a traffic engineering standpoint given the traffic volumes and travel speeds involved.
3. The various "Site Layout Plans" include several horizontal curves and reverse curves and specifies the installation of vertical granite curb on both sides of the roadway. The elimination of the previously proposed straight tangent sections will reduce travel speeds in the neighborhood. The "side friction" associated with vertical curbing will also serve to reduce travel speeds.
4. The raised crosswalk located between units #44 and #45 will require slower speeds and the advanced warning signs (W17-1) are appropriate. These should be supplemented with an Advisory Speed Plaque (W13-1P).

We find that the current layout of the proposed roadway system is superior to the initial conceptual layout in terms of travel speeds and overall livability. The proposed roadway layout reasonably mitigates the previous concerns with travel speeds within the development.

Attachment

cc: Michael Green, Jenna Green – Green and Company

169 Ocean Boulevard/PO Box 249
Hampton, NH 03842
603.601.8154
TheEngineeringCorp.com
Create | Design | Innovate

Juliet T.H. Walker, AICP
Planning Director
City of Portsmouth Planning Department
City Hall, 3rd Floor
1 Junkins Avenue
Portsmouth, NH 03801

June 22, 2021

Ref. T1118

Re: Peverly Hill Road Residential Development
Transportation Peer Review

Dear Ms. Walker:

On behalf of the City of Portsmouth, TEC, Inc. (TEC) has reviewed documents as part of the transportation engineering peer review of a proposed mixed used development located at 83 Peverly Hill Road in Portsmouth. The project consists of constructing 56 dwelling units. Access is provided by one site roadway intersection onto Peverly Hill Road. It is proposed that the site roadway be accepted as a public road by the City.

The following documents were received as part of our review:

- *Traffic Evaluation – Proposed Residential Development*, prepared by Stephen G. Pernaw & Company, Inc. – October 6, 2020
- *Proposed Residential Development Traffic Calming Memorandum,* prepared by Stephen G. Pernaw & Company, Inc. – April 5, 2021
- *Peverly Hill Road Condominiums Site Development Plans,* prepared by TFM – April 19, 2021
- *Peverly Hill Road Condominiums Conceptual plan,* prepared by TFM, May 10, 2021

TEC completed a review of these documents for the City of Portsmouth, and the following provides a summary of the comments that were compiled during our review:

1. In order to be consistent with the Traffic Evaluation, Peverly Hill Road is designated as a north/south roadway within this letter.
2. The Traffic Evaluation presents a study area including one intersection of the site roadway with Peverly Hill Road. TEC concurs with the scope of the study area and does not find that additional intersections are warranted based upon the documented trip generation levels.
3. Traffic counts utilized within the Traffic Evaluation were conducted along Peverly Hill Road in September 2020, when vehicular traffic volumes were impacted by the Covid-19

pandemic. The 2020 volumes were compared with June 2019 traffic volumes recorded by NHDOT in the same location. In order to project future traffic volumes along Peverly Hill Road for the design year of 2032, the September 2020 volumes were increased by a seasonal adjustment factor, a background growth rate, and a Covid-19 adjustment factor. TEC concurs with this methodology and the use of a 2032 horizon year.

The weekday morning and evening peak commuter hours were studied to determine the project's overall effect on the adjacent roadway system. TEC concurs that these time periods are generally appropriate to study the impact for a residential development.

4. The Traffic Evaluation uses data published in the industry standard Institute of Transportation Engineers (ITE) publication, *Trip Generation, 10th Edition* to estimate the traffic generated by the proposed development. The Traffic Evaluation uses a combination of data found under Land Use Code (LUC) 221 – Multi-Family Housing (Mid-Rise) and LUC 210 – Single Family Detached Housing to project future traffic volumes associated with the proposed residential units. The information provided in the TAC Submission, dated April 19, 2021, illustrates the units as three-bedroom detached dwellings averaging 2,400 square feet of living space. No age restriction is proposed for the development. The units appear to be intended to be sold as condominium units, however, the traffic generation characteristics may more closely resemble single family dwellings due to the size, separation, and number of bedrooms in each unit.

   The Traffic Evaluation projects 29 vehicle trips during the weekday morning peak hour and 42 vehicle trips during the weekday evening peak hour using the combined methodology. TEC recommends the use of only LUC 210 - Single Family Detached Housing to reflect the trip generation characteristics of the proposed residential units more accurately. For the 56 proposed units as shown on the Site Plan, LUC 210 projects 41 vehicle trips during the weekday morning peak hour and 55 vehicle trips during the weekday evening peak hour. TEC understands that the increase likely will not change the impact of the site on the adjacent roadway system. However, the Applicant should discuss whether these additional trips can be accommodated safely and efficiently at the site roadway intersection onto Peverly Hill Road.

5. The vehicular traffic generated by the proposed project was distributed onto the adjacent roadway system based upon available Journey-to-Work data published by the US Census Bureau for persons residing in the City of Portsmouth. TEC notes that there are significant employment opportunities within the City of Portsmouth along the Route 1 corridor to the south of the site, which can be accessed directly via Peverly Hill Road. The Applicant should discuss if these employment opportunities were considered when preparing the vehicular traffic distribution, as only 22% of the site generated traffic is projected to travel to/from this direction. The Applicant should review the site distributions and revise the analyses at the intersection of the site roadway with Peverly Hill Road, as necessary.

6. TEC generally concurs with the use of the Highway Capacity Manual 2010 methodology as used within the Synchro version 10 software.

7. The Traffic Evaluation indicates that the site traffic is expected to increase the two-way traffic volume along Peverly Hill Road by 2% north of the site and 1% south of the site in the 2032 future conditions, which is unlikely to be noticeable. The intersection of the site

roadway with Peverly Hill Road is projected to operate with available capacity, minimal queues, and typical delays for intersecting side streets under stop control. No off-site mitigation is proposed to be implemented.

8. The comments as noted above may result in modifications to the results of the capacity and queue analysis and therefore TEC reserves the right to provide additional comments and improvement recommendations upon completion of the peer review comment responses.
9. The site roadway approach to its intersection with Peverly Hill Road is shown with one exiting lane to accommodate left turning and right turning vehicles. Provision of two lanes on this approach may not significantly improve the operation of this approach and maintaining a minimum crossing distance for pedestrians is preferred.
10. Peverly Hill Road provides one travel lane in each direction along most of its length. The northbound approach of Peverly Hill Road widens at its intersection with Middle Road, just to the north of the site, to provide an exclusive left turn lane and a shared left/right turn lane. The taper area for this widening occurs along the site frontage. No dedicated left turn lane is required or provided for northbound left turns into the site roadway. The Applicant should discuss whether any conflicts are anticipated between northbound left turns accessing the site roadway and northbound vehicles wishing to enter the exclusive left turn lane at Middle Road.
11. Provision of a multi-use path along the west side of Peverly Hill Road, extending between Middle Road and West Road is under design by the City of Portsmouth to increase safety for pedestrians and bicyclists and provide infrastructure to accommodate alternative modes of transportation between residential areas and commercial areas along Route 1. The multi-use path will directly benefit the residents of the proposed development by providing the opportunity for multi-modal travel along Peverly Hill Road as well as safe and uninterrupted access to the Portsmouth Plains Playground and recreational area at the intersection of Peverly Hill Road with Middle Road. The Applicant should provide any necessary easements identified by the City in order to facilitate the construction of this path. The site roadway approach at its intersection with Peverly Hill Road should be designed and constructed in anticipation of the multi-use path by including a crosswalk with ADA-compliant curb ramps across the site roadway approach. The City should consider requiring the Applicant to construct the multi-use path along the site frontage and extending north 500 feet toward Middle Road in accordance with the City's design plans to provide a direct connect between the residential development and the recreation area and pedestrian facilities along Middle Road.
12. Sidewalk is provided along one side of the site roadway throughout the site, creating a pedestrian network. Further, connection to the planned Seacoast Greenway Rail Trail is proposed, along with a pocket park and four parking spaces for visitor access. The Applicant should discuss the volume of vehicular traffic that may access the site daily and the anticipated volume of pedestrian and bicycle traffic that are anticipated to use the site roadway between the Rail Trail and the proposed multi-use path along Peverly Hill Road.
13. The site roadway has been designed in accordance with the City of Portsmouth Complete Streets Design Guidelines for a Neighborhood Slow Street. The roadway is 26 feet wide,

which allows for parking along one side of the roadway and two 9-foot travel lanes. Sidewalk along one side of the roadway creates a pedestrian network facility. Bicycles will be accommodated within the roadway. However, in order to experience the benefit of a Complete Streets design along the site roadway, residents should be encouraged to park along at least one side of the roadway.

Should residents not park on-street, the traffic calming nature of the roadway will be reduced, as the entire 26-foot width would be useable by vehicle traffic. While the circular curvature of the roadway will aid in reducing vehicle speeds, alternative forms of traffic calming, such as raising the proposed crosswalks or the addition of speed humps, can be considered along the straight portion of the roadway to keep both resident and visitor vehicular speeds low.

14. The Pernaw memorandum discussing traffic calming opportunities, dated April 5, 2021, recommends additional signage around the proposed crosswalk located at the internal T-intersection to alert vehicles to potential crossing pedestrians. TEC concurs with these recommendations. Similar additional signage is recommended for the proposed crosswalk across the site roadway at the pocket park/Rail Trail connection.

Please do not hesitate to contact me directly if you have any questions concerning this peer review at 978-794-1792.Thank you for your consideration.

Sincerely,
TEC, Inc.
"The Engineering Corporation"

Elizabeth Oltman

Elizabeth Oltman, PE
Director of Transportation Planning

Stephen G. Pernaw
& Company, Inc.
P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com
Transportation: Engineering • Planning • Design

MEMORANDUM

Ref: 2047A

To: Michael Green
Green & Company

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Development – Response to Comments
Portsmouth, New Hampshire

Date: July 3, 2021

On October 6, 2020 and April 5, 2021 our office published traffic memoranda relative to the proposed residential development located at 83 Peverly Hill Road in Portsmouth, New Hampshire. We are now in receipt of the TEC peer review letter dated June 22, 2021, and offer the following responses:

TEC Comment 1: *"In order to be consistent with the Traffic Evaluation, Peverly Hill Road is designated as a north/south roadway within this letter."*

SGP Response: Comment acknowledged.

TEC Comment 2: *"The Traffic Evaluation presents a study area including one intersection of the site roadway with Peverly Hill Road. TEC concurs with the scope of the study area and does not find that additional intersections are warranted based upon the documented trip generation levels."*

SGP Response: Comment acknowledged.

TEC Comment 3: *"Traffic counts utilized within the Traffic Evaluation were conducted along Peverly Hill Road in September 2020, when vehicular traffic volumes were impacted by the Covid-19 pandemic. The 2020 volumes were compared with June 2019 traffic volumes recorded by NHDOT in the same location. In order to project future traffic volumes along Peverly Hill Road for the design year of 2032, the September 2020 volumes were increased by a seasonal adjustment factor, a background growth rate, and a Covid-19 adjustment factor. TEC concurs with this methodology and the use of a 2032 horizon year.*

The weekday morning and evening peak commuter hours were studied to determine the project's overall effect on the adjacent roadway system. TEC concurs that these time periods are generally appropriate to study the impact for a residential development.

SGP Response: Comment acknowledged.

TEC Comment 4: *"The Traffic Evaluation uses data published in the industry standard Institute of Transportation Engineers (ITE) publication, Trip Generation, 10th Edition to estimate the traffic generated by the proposed development. The Traffic Evaluation uses a combination of data found under Land Use Code (LUC) 221 - Multi-Family Housing (Mid-Rise) and LUC 210 - Single Family Detached*

Housing to project future traffic volumes associated with the proposed residential units. The information provided in the TAC Submission, dated April 19, 2021, illustrates the units as three-bedroom detached dwellings averaging 2,400 square feet of living space. No age restriction is proposed for the development. The units appear to be intended to be sold as condominium units, however, the traffic generation characteristics may more closely resemble single family dwellings due to the size, separation, and number of bedrooms in each unit.

The Traffic Evaluation projects 29 vehicle trips during the weekday morning peak hour and 42 vehicle trips during the weekday evening peak hour using the combined methodology. TEC recommends the use of only LUC 210 - Single Family Detached Housing to reflect the trip generation characteristics of the proposed residential units more accurately. For the 56 proposed units as shown on the Site Plan, LUC 210 projects 41vehicle trips during the weekday morning peak hour and 55 vehicle trips during the weekday evening peak hour. TEC understands that the increase likely will not change the impact of the site on the adjacent roadway system. However, the Applicant should discuss whether these additional trips can be accommodated safely and efficiently at the site roadway intersection onto Peverly Hill Road."

SGP Response: The trip generation estimates contained in the traffic evaluation are intended to reflect the type of housing that is proposed, and the fact that Green & Company's experience with similar development projects is that these types of units are occupied by approximately two persons per unit. We believe that using LUC 210 only, as recommended by TEC, would not accurately reflect the fact that these are condominium units with approximately two persons per unit. It should be noted that the ITE LUC 210 trip rates reflect approximately 3.5 persons per unit, well above the 2.0 persons per unit that Green & Company anticipates.

Nevertheless, supplemental traffic projections utilizing LUC 210, as recommended by TEC, show that during the worst-case weekday PM peak hour the projected number of southbound right turn arrivals would increase from 22 to 29 vehicle over the course of the one-hour period. This particular traffic movement is not capacity-constrained as it is a Rank 1 Movement that does not encounter a conflicting traffic stream, nor does it have a Level of Service associated with it. The remaining traffic movements at this intersection would increase by 1-3 vehicles during the PM peak hour using LUC 210, which is an inconsequential amount in terms of traffic operations, capacity, and safety.

<u>TEC Comment 5</u>: *"The vehicular traffic generated by the proposed project was distributed onto the adjacent roadway system based upon available Journey-to-Work data published by the US Census Bureau for persons residing in the City of Portsmouth. TEC notes that there are significant employment opportunities within the City of Portsmouth along the Route 1 corridor to the south of the site, which can be accessed directly via Peverly Hill Road. The Applicant should discuss if these employment opportunities were considered when preparing the vehicular traffic distribution, as only 22% of the site generated traffic is projected to travel to/from this direction. The Applicant should review the site distributions and revise the analyses at the intersection of the site roadway with Peverly Hill Road, as necessary."*

SGP Response: While it was recognized that there are significant employment opportunities along US1 south of the site, it important to recognize that there are even more employment opportunities at Pease International Tradeport and in downtown Portsmouth. As a sensitivity analysis, doubling of the site traffic to/from the south would add only +6 left-turn arrivals and +3 right-turn departures to the subject intersection during the worst-case weekday PM peak hour period. Again, dealing with changes of this order of magnitude will not significantly alter the prevailing traffic operations and safety aspects at the subject intersection.

TEC Comment 6: *"TEC generally concurs with the use of the Highway Capacity Manual 2010 methodology as used within the Synchro version 10 software."*

SGP Response: Comment acknowledged.

TEC Comment 7: *"The Traffic Evaluation indicates that the site traffic is expected to increase the two-way traffic volume along Peverly Hill Road by 2% north of the site and 1% south of the site in the 2032 future conditions, which is unlikely to be noticeable. The intersection of the site roadway with Peverly Hill Road is projected to operate with available capacity, minimal queues, and typical delays for intersecting side streets under stop control. No off-site mitigation is proposed to be implemented."*

SGP Response: We concur; a standard three-leg T-intersection with one general-purpose travel lane on each approach is appropriate for the size and type of development that is proposed at this location.

TEC Comment 8: *"The comments as noted above may result in modifications to the results of the capacity and queue analysis and therefore TEC reserves the right to provide additional comments and improvement recommendations upon completion of the peer review comment responses.*

SGP Response: Our responses to Comments 4 & 5 noted above do not warrant re-analysis given the magnitudes involved.

TEC Comment 9: *"The site roadway approach to its intersection with Peverly Hill Road is shown with one exiting lane to accommodate left turning and right turning vehicles. Provision of two lanes on this approach may not significantly improve the operation of this approach and maintaining a minimum crossing distance for pedestrians is preferred."*

SGP Response: We concur.

TEC Comment 10: *"Peverly Hill Road provides one travel lane in each direction along most of its length. The northbound approach of Peverly Hill Road widens at its intersection with Middle Road, just to the north of the site, to provide an exclusive left turn lane and a shared left/right turn lane. The taper area for this widening occurs along the site frontage. No dedicated left turn lane is required or provided for northbound left turns into the site roadway. The Applicant should discuss whether any conflicts are anticipated between northbound left turns accessing the site roadway and northbound vehicles wishing to enter the exclusive left turn lane at Middle Road."*

SGP Response: As is the case when approaching any intersection while traveling along a major street, there is always the potential need to temporarily slow or brake for another vehicle that is decelerating with its turn signal flashing. In this particular case, only six vehicles are expected to turn left into the site during the weekday PM peak hour (one vehicle every 10-minutes, on average), thus the potential conflict exists, but is totally manageable. Decelerating northbound vehicles on this section of Peverly Hill Road is a frequent occurrence given the proximity of the nearby traffic signal at NH33.

TEC Comment 11: *"Provision of a multi-use path along the west side of Peverly Hill Road, extending between Middle Road and West Road is under design by the City of Portsmouth to increase safety for pedestrians and bicyclists and provide infrastructure to accommodate alternative modes of transportation between residential areas and commercial areas along Route 1. The multi-use path will directly benefit the residents of the proposed development by providing the opportunity for multi-modal travel along Peverly Hill Road as well as safe and uninterrupted access to the Portsmouth Plains Playground and recreational area at the intersection of Peverly Hill Road with Middle Road. The Applicant should provide any necessary easements identified by the City in order to facilitate the construction of this path. The site roadway approach at its intersection with Peverly Hill Road should be designed and constructed in anticipation of the multi-use path by including a crosswalk with ADA-compliant curb ramps across the site roadway approach. The City should consider requiring the Applicant to construct the multi-use path* *along the site frontage and extending north 500 feet toward Middle Road in accordance with the City's design plans to provide a direct connect between the residential development and the recreation area and pedestrian facilities along Middle Road.*

SGP Response: This comment is best addressed by Green & Company and TFM, Inc.

TEC Comment 12: *"Sidewalk is provided along one side of the site roadway throughout the site, creating a pedestrian network. Further, connection to the planned Seacoast Greenway Rail Trail is proposed, along with a pocket park and four parking spaces for visitor access. The Applicant should discuss the volume of vehicular traffic that may access the site daily and the anticipated volume of pedestrian and bicycle traffic that are anticipated to use the site roadway between the Rail Trail and the proposed multi-use path along Peverly Hill Road."*

SGP Response: We are not familiar the details of the Rail Trail or proposed multi-use path, and will defer to others.

TEC Comment 13: *"The site roadway has been designed in accordance with the City of Portsmouth Complete Streets Design Guidelines for a Neighborhood Slow Street. The roadway is 26 feet wide, which allows for parking along one side of the roadway and two 9-foot travel lanes. Sidewalk along one side of the roadway creates a pedestrian network facility. Bicycles will be accommodated within the roadway. However, in order to experience the benefit of a Complete Streets design along the site roadway, residents should be encouraged to park along at least one side of the roadway.*

Should residents not park on-street, the traffic calming nature of the roadway will be reduced, as the entire 26-foot width would be useable by vehicle traffic. While the circular curvature of the roadway will aid in reducing vehicle speeds, alternative forms of traffic calming, such as raising the proposed crosswalks or the addition of speed humps, can be considered along the straight portion of the roadway to keep both resident and visitor vehicular speeds low."

SGP Response: This comment has been previously addressed by utilizing a combination of 22-foot and 26-foot pavement widths within the development, along with a curvilinear roadway alignment that includes several horizontal curves and reverse curves.

TEC Comment 14: *"The Pernaw memorandum discussing traffic calming opportunities, dated April 5, 2021, recommends additional signage around the proposed crosswalk located at the internal T-intersection to alert vehicles to potential crossing pedestrians. TEC concurs with these recommendations. Similar additional signage is recommended for the proposed crosswalk across the site roadway at the pocket park/Rail Trail connection."*

SGP Response: Comment acknowledged; this comment is best addressed by TFM. Inc.

169 Ocean Boulevard/PO Box 249
Hampton, NH 03842
603.601.8154
TheEngineeringCorp.com
Create | Design | Innovate

Juliet T.H. Walker, AICP
Planning Director
City of Portsmouth Planning Department
City Hall, 3rd Floor
1 Junkins Avenue
Portsmouth, NH 03801

July 20, 2021

Ref. T1118

Re: Peverly Hill Road Residential Development
Transportation Peer Review #2
Response to Comments Review

Dear Ms. Walker:

On behalf of the City of Portsmouth, TEC, Inc. (TEC) has reviewed additional documents as part of the transportation engineering peer review of a proposed residential development located at 83 Peverly Hill Road in Portsmouth, NH.

The following additional documents were received as part of our review:

- *Response to Comments Memorandum*, prepared by Stephen G. Pernaw & Co., Inc, dated July 3, 2021
- *Parson Woods Condominium Site Development Plans,* prepared by TFM, revision dated June 23, 2021

Comments 1 thru 14 have been retained from the most recent TEC review letter dated June 22, 2021, originally issued as part of the project review. The Applicant's response to comments is shown as **bold**; TEC responses are shown as *italic*:

TEC completed a review of these documents for the City of Portsmouth, and the following provides a summary of the comments that were compiled during our review:

1. In order to be consistent with the Traffic Evaluation, Peverly Hill Road is designated as a north/south roadway within this letter.

   SGP Response: Comment acknowledged.

   TEC: No response required.

2. The Traffic Evaluation presents a study area including one intersection of the site roadway with Peverly Hill Road. TEC concurs with the scope of the study area and does not find that additional intersections are warranted based upon the documented trip generation levels.

   SGP Response: Comment acknowledged.

   TEC: No response required.

3. Traffic counts utilized within the Traffic Evaluation were conducted along Peverly Hill Road in September 2020, when vehicular traffic volumes were impacted by the Covid-19 pandemic. The 2020 volumes were compared with June 2019 traffic volumes recorded by NHDOT in the same location. In order to project future traffic volumes along Peverly Hill Road for the design year of 2032, the September 2020 volumes were increased by a seasonal adjustment factor, a background growth rate, and a Covid-19 adjustment factor. TEC concurs with this methodology and the use of a 2032 horizon year.

   The weekday morning and evening peak commuter hours were studied to determine the project's overall effect on the adjacent roadway system. TEC concurs that these time periods are generally appropriate to study the impact for a residential development.

   SGP Response: Comment acknowledged.

   TEC: No response required.

4. The Traffic Evaluation uses data published in the industry standard Institute of Transportation Engineers (ITE) publication, *Trip Generation, 10th Edition* to estimate the traffic generated by the proposed development. The Traffic Evaluation uses a combination of data found under Land Use Code (LUC) 221 – Multi-Family Housing (Mid-Rise) and LUC 210 – Single Family Detached Housing to project future traffic volumes associated with the proposed residential units. The information provided in the TAC Submission, dated April 19, 2021, illustrates the units as three-bedroom detached dwellings averaging 2,400 square feet of living space. No age restriction is proposed for the development. The units appear to be intended to be sold as condominium units, however, the traffic generation characteristics may more closely resemble single family dwellings due to the size, separation, and number of bedrooms in each unit.

   The Traffic Evaluation projects 29 vehicle trips during the weekday morning peak hour and 42 vehicle trips during the weekday evening peak hour using the combined methodology. TEC recommends the use of only LUC 210 - Single Family Detached Housing to reflect the trip generation characteristics of the proposed residential units more accurately. For the 56 proposed units as shown on the Site Plan, LUC 210 projects 41 vehicle trips during the weekday morning peak hour and 55 vehicle trips during the weekday evening peak hour. TEC understands that the increase likely will not change the impact of the site on the adjacent roadway system. However, the Applicant should discuss whether these additional trips can be accommodated safely and efficiently at the site roadway intersection onto Peverly Hill Road.

   SGP Response: The trip generation estimates contained in the traffic evaluation are intended to reflect the type of housing that is proposed, and the fact that Green & Company's experience with similar development projects is

that these types of units are occupied by approximately two persons per unit. We believe that using LUC 210 only, as recommended by TEC, would not accurately reflect the fact that these are condominium units with approximately two persons per unit. It should be noted that the ITE LUC 210 trip rates reflect approximately 3.5 persons per unit, well above the 2.0 persons per unit that Green & Company anticipates. Nevertheless, supplemental traffic projections utilizing LUC 210, as recommended by TEC, show that during the worst-case weekday PM peak hour the projected number of southbound right turn arrivals would increase from 22 to 29 vehicle over the course of the one-hour period. This particular traffic movement is not capacity-constrained as it is a Rank 1 Movement that does not encounter a conflicting traffic stream, nor does it have a Level of Service associated with it. The remaining traffic movements at this intersection would increase by 1-3 vehicles during the PM peak hour using LUC 210, which is an inconsequential amount in terms of traffic operations, capacity, and safety.

TEC: TEC concurs with this clarification. No further response necessary.

5. The vehicular traffic generated by the proposed project was distributed onto the adjacent roadway system based upon available Journey-to-Work data published by the US Census Bureau for persons residing in the City of Portsmouth. TEC notes that there are significant employment opportunities within the City of Portsmouth along the Route 1 corridor to the south of the site, which can be accessed directly via Peverly Hill Road. The Applicant should discuss if these employment opportunities were considered when preparing the vehicular traffic distribution, as only 22% of the site generated traffic is projected to travel to/from this direction. The Applicant should review the site distributions and revise the analyses at the intersection of the site roadway with Peverly Hill Road, as necessary.

   SGP Response: While it was recognized that there are significant employment opportunities along US1 south of the site, it important to recognize that there are even more employment opportunities at Pease International Tradeport and in downtown Portsmouth. As a sensitivity analysis, doubling of the site traffic to/from the south would add only +6 left-turn arrivals and +3 right-turn departures to the subject intersection during the worst-case weekday PM peak hour period. Again, dealing with changes of this order of magnitude will not significantly alter the prevailing traffic operations and safety aspects at the subject intersection.

   TEC: TEC concurs with the assessment of the site generated traffic distribution. No further response necessary.

6. TEC generally concurs with the use of the Highway Capacity Manual 2010 methodology as used within the Synchro version 10 software.

   SGP Response: Comment acknowledged.

   TEC: No response required.

7. The Traffic Evaluation indicates that the site traffic is expected to increase the two-way traffic volume along Peverly Hill Road by 2% north of the site and 1% south of the site in the 2032 future conditions, which is unlikely to be noticeable. The intersection of the site roadway with Peverly Hill Road is projected to operate with available capacity, minimal queues, and typical delays for intersecting side streets under stop control. No off-site mitigation is proposed to be implemented.

   SGP Response: We concur; a standard three-leg T-intersection with one general-purpose travel lane on each approach is appropriate for the size and type of development that is proposed at this location.

   TEC: No response required.

8. The comments as noted above may result in modifications to the results of the capacity and queue analysis and therefore TEC reserves the right to provide additional comments and improvement recommendations upon completion of the peer review comment responses.

   SGP Response: Our responses to Comments 4 & 5 noted above do not warrant re-analysis given the magnitudes involved.

   TEC: TEC concurs. No response required.

9. The site roadway approach to its intersection with Peverly Hill Road is shown with one exiting lane to accommodate left turning and right turning vehicles. Provision of two lanes on this approach may not significantly improve the operation of this approach and maintaining a minimum crossing distance for pedestrians is preferred.

   SGP Response: We concur.

   TEC: No response required.

10. Peverly Hill Road provides one travel lane in each direction along most of its length. The northbound approach of Peverly Hill Road widens at its intersection with Middle Road, just to the north of the site, to provide an exclusive left turn lane and a shared left/right turn lane. The taper area for this widening occurs along the site frontage. No dedicated left turn lane is required or provided for northbound left turns into the site roadway. The Applicant should discuss whether any conflicts are anticipated between northbound left turns accessing the site roadway and northbound vehicles wishing to enter the exclusive left turn lane at Middle Road.

    SGP Response: As is the case when approaching any intersection while traveling along a major street, there is always the potential need to temporarily slow or brake for another vehicle that is decelerating with its turn signal flashing. In this particular case, only six vehicles are expected to turn left into the site during the weekday PM peak hour (one vehicle every 10-minutes, on average), thus the potential conflict exists, but is totally manageable.

Decelerating northbound vehicles on this section of Peverly Hill Road is a frequent occurrence given the proximity of the nearby traffic signal at NH33.

TEC: TEC concurs with this clarification. No further response necessary.

11. Provision of a multi-use path along the west side of Peverly Hill Road, extending between Middle Road and West Road is under design by the City of Portsmouth to increase safety for pedestrians and bicyclists and provide infrastructure to accommodate alternative modes of transportation between residential areas and commercial areas along Route 1. The multi-use path will directly benefit the residents of the proposed development by providing the opportunity for multi-modal travel along Peverly Hill Road as well as safe and uninterrupted access to the Portsmouth Plains Playground and recreational area at the intersection of Peverly Hill Road with Middle Road. The Applicant should provide any necessary easements identified by the City in order to facilitate the construction of this path. The site roadway approach at its intersection with Peverly Hill Road should be designed and constructed in anticipation of the multi-use path by including a crosswalk with ADA-compliant curb ramps across the site roadway approach. The City should consider requiring the Applicant to construct the multi-use path along the site frontage and extending north 500 feet toward Middle Road in accordance with the City's design plans to provide a direct connect between the residential development and the recreation area and pedestrian facilities along Middle Road.

    SGP Response: This comment is best addressed by Green & Company and TFM, Inc.

    TEC: Further discussion between the City and the Applicant on this recommendation is recommended.

12. Sidewalk is provided along one side of the site roadway throughout the site, creating a pedestrian network. Further, connection to the planned Seacoast Greenway Rail Trail is proposed, along with a pocket park and four parking spaces for visitor access. The Applicant should discuss the volume of vehicular traffic that may access the site daily and the anticipated volume of pedestrian and bicycle traffic that are anticipated to use the site roadway between the Rail Trail and the proposed multi-use path along Peverly Hill Road.

    SGP Response: We are not familiar the details of the Rail Trail or proposed multi-use path, and will defer to others.

    TEC: The proposed multi-use path has been provided between Peverly Hill Road and the Seacoast Greenway Rail Trail access within the site. The proposed crossings of Public Road A as shown in the June 23, 2021 Site Plan have been designed to be safely navigated by pedestrians and bicyclists. No further response required.

13. The site roadway has been designed in accordance with the City of Portsmouth Complete Streets Design Guidelines for a Neighborhood Slow Street. The roadway is 26 feet wide, which allows for parking along one side of the roadway and two 9-foot travel lanes. Sidewalk along one side of the roadway creates a pedestrian network facility. Bicycles will be accommodated within the roadway. However, in order to experience the benefit of

a Complete Streets design along the site roadway, residents should be encouraged to park along at least one side of the roadway.

Should residents not park on-street, the traffic calming nature of the roadway will be reduced, as the entire 26-foot width would be useable by vehicle traffic. While the circular curvature of the roadway will aid in reducing vehicle speeds, alternative forms of traffic calming, such as raising the proposed crosswalks or the addition of speed humps, can be considered along the straight portion of the roadway to keep both resident and visitor vehicular speeds low.

SGP Response: This comment has been previously addressed by utilizing a combination of 22-foot and 26-foot pavement widths within the development, along with a curvilinear roadway alignment that includes several horizontal curves and reverse curves.

TEC: The June 23, 2021 Site Plan shows reduced roadway widths of 22 feet and additional curvature within the roadway alignment, which will aid in maintaining low vehicle speeds within the development. A raised crosswalk is proposed at the multi-use path crossing to the Seacoast Greenway Rail Trail and pocket park for the safety of residents and visitors. Comment addressed. No further response required.

14. The Pernaw memorandum discussing traffic calming opportunities, dated April 5, 2021, recommends additional signage around the proposed crosswalk located at the internal T-intersection to alert vehicles to potential crossing pedestrians. TEC concurs with these recommendations. Similar additional signage is recommended for the proposed crosswalk across the site roadway at the pocket park/Rail Trail connection.

    SGP Response: Comment acknowledged; this comment is best addressed by TFM. Inc.

    TEC: Additional signage has been added at the raised crosswalk for the multi-use path crossing to the Seacoast Greenway Rail Trail and pocket park. The eastern crosswalk for the multi-use path has been relocated to the internal T-intersection of Public Road A, which is a more visible and appropriate location for pedestrians to cross. Comment addressed. No further response required.

Please do not hesitate to contact me directly if you have any questions concerning this peer review at 978-794-1792.Thank you for your consideration.

Sincerely,
TEC, Inc.
"The Engineering Corporation"

Elizabeth Oltman

Elizabeth Oltman, PE
Director of Transportation Planning

Unitil

June 14, 2021

Michael Green
Green & Company
11 Lafayette Rd
North Hampton NH 03862

RE: Natural Gas Availability to 83 Peverly Hill Rd Portsmouth NH

Dear Michael,

Unitil's natural gas division has reviewed the requested site for natural gas service.

Unitil hereby confirms natural gas service will be available to the 83 Peverly Hill Rd Project in Portsmouth to serve 57 single family homes.

Installation is pending an authorized installation agreement with Green & Company and street opening approval from the City of Portsmouth DPW.

Let me know if you have any questions. You can email me at oliver@unitil.com. My phone number is 603-294-5174.

Sincerely,

Janet Oliver
Senior Business Development Representative

EVERSOURCE ENERGY

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

June 18, 2021

Jack McTigue
TFMoran, Inc. Seacoast Division
170 Commerce Way-Suite 102
Portsmouth, NH 03801

Dear Jack McTigue:

I am responding to your request to confirm the availability of electric service for the proposed Peverly Hill Road Condominiums (83 Peverly Hill Road, Portsmouth, NH – Tax Map 242, Lot 4) project being constructed for Green and Company Real Estate.

The proposed project consists of 2-story buildings with 56 residential units, each unit with approximately 2,600 s/f of residential space at the ground level parking. The proposed development will be constructed along Peverly Hill Road.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the proposed 56 residential units. Eversource will use the attached drawing titled "Peverly Hill Road Condominiums", dated April 19, 2021 (Utility Plans C-27 through C-35) to layout all required padmounted transformers and underground infrastructure. The proposed development will be fed from the relocated Utility Pole PSNH145/4 NETT4 on Peverly Hill Road as depicted on Utility Plans C-18. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed overhead and underground facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

Eversource will be responsible for the final design of all primary electrical equipment and secondary handholes to ensure locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements for Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Portsmouth Office, 603-436-7708 Ext. 555-5678

Respectfully.

Michael J Busby

Michael J. Busby, PE
NH Eastern Regional Engineering and Design Manager, Eversource

cc: (via e-mail)
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource

5 Centennial Drive, Peabody, MA 01960 (HQ)
Tel: 978.532.1900

May 21, 2021

Raymond C. Pezzullo, P.E.
Assistant City Engineer
Portsmouth Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

Corey Colwell, LLS
Division Manager / Principal
TFMoran Seacoast Division
170 Commerce Way, Suite 102
Portsmouth, NH 03801

Re: Portsmouth Water Distribution System Model
Peverly Hill Road Developer Review

Dear Mr. Pezzullo and Mr. Colwell:

As requested, Weston & Sampson has completed the water system evaluation of the proposed residential development located on Peverly Hill Road in Portsmouth, NH. The proposed development includes 56 new single family condominiums on a cul-de-sac. The progress print, dated 03/09/2021, of the "Site Development Plans: Proposed Open Space Residential PUD," prepared by TFMoran Seacoast Division, was used for this review. The plan set shows the development connecting to the existing 6-inch water main in Peverly Hill Road and does not specify a size for the proposed water main in the development. The plans also note that each unit is to have a sprinkler system. Demands were estimated to be about 68,320 gpd by TFMoran Seacoast Division, dated 05/18/2021.

Two hydrant flow tests were performed by Weston & Sampson and City staff, the results of which were used to calibrate the City's hydraulic model in the area of the proposed development. The results of the flow test indicated an available fire flow of 1,326 gpm at 20 psi near the location of the proposed connection to the 8-inch water main on Peverly Hill Road. The hydrants on Peverly Hill Road are connected to the existing 6-inch water main. The hydraulic model was calibrated using the flow test data, carried over into the existing 8-inch water main running parallel to the existing 6-inch water main in Peverly Hill Road. When compared to the hydraulic model, the simulated fire flows were similar to the field observations. Based on these results the model was determined to be adequately calibrated.

The purpose of this evaluation was to determine if the proposed development will receive adequate water pressure and fire flows from the existing Portsmouth water system, and if the development may have an adverse impact on the Portsmouth water system.

REGULATIONS AND EVALUATION CRITERIA

The New Hampshire Code of Administrative Rules and the Insurance Services Office's (ISO) requirements for available fire flow were used as the basis for our determination. The New Hampshire Code of Administrative Rules PUC 600.02 states that: "Each utility shall maintain normal operating pressures of not less than 20 [psi]." Env-Dw 405.32, which applies to community water systems that serve between 25 and 1000 people and so is relevant but not directly applicable in this case, provides additional detail: "The water distribution piping system shall be capable of passing peak flow without excessive frictional loss. At peak flow, pressure at the sill elevation of each lot or unit shall be at least 20 psi." In addition to the regulatory requirement to maintain pressure greater than 20 psi during all conditions, Weston & Sampson recommends that the City maintain a minimum of 35 psi pressure to all residences in the system during all "typical" demand conditions, which would include peak hour and summertime irrigation demands but exclude fire flows.

The Insurance Services Office (ISO) is an independent organization that provides ratings for town insurance pricing on systems providing fire protection. ISO estimates needed fire flow requirements at representative locations throughout communities and publishes their methodology and guidance for calculating needed fire flow for individual buildings in their "Guide for Determination of Needed Fire Flow." In our experience, the necessary available fire flow for a development like the one proposed here at 83 Peverly Hill Road would be approximately 1,250 gpm at 20 psi.

MODELING RESULTS

The model was run to evaluate the development if connected to the existing 8-inch water main in Peverly Hill Road. The connection to the existing parallel 6-inch water main was evaluated and identified to be less than 1,000 gpm at 20 psi. It is recommended that the new development connect to the existing 8-inch water main and not to the existing parallel 6-inch water main.

The model was evaluated under peak hour demand (PHD) conditions to determine the potential impact on typical system pressure and under maximum day demand (MDD) conditions to determine if the development will receive adequate fire flows. The extended period simulation diurnal curve in the hydraulic model, previously developed for the City of Portsmouth, scaled the MDD by a factor of 2.33 for PHD. The estimated demands provided by the developer denoted that conditions for June/July, which would be a period of MDD conditions. Table 1 below shows how demands were scaled for PHD conditions.

Table 1: Estimated Demands

	Developer Estimated MDD (gpm)	PHD (gpm)
Demand (gpm)	47.4	110.5

EVALUATION

The hydraulic model indicates that the pressures in the development at PHD would be greater than 35 psi, as shown in Table 2 below.

Table 2: Hydraulic Model Results

Pressure (psi) at PHD	Available Fire Flow (gpm) at 20 psi
45.2	1352

The plans indicate that the proposed condominiums will have sprinklers for fire protection. However, it is still recommended that the system be able to provide adequate fire flows to the fire hydrants in the development to handle a fire event outside the limits of the sprinkler systems. Fires on the exterior of the buildings, roofs, a car, or a dumpster would require fire flows from nearby hydrants. It is anticipated that a fire flow of approximately 1,250 gpm for 2 hours at a pressure of 20 psi would be appropriate for this development. The hydraulic model indicates that the available fire flow from the existing 8-inch water main on Peverly Hill Road is in excess of 1,250 gpm, as indicated in Table 2 above.

RECOMMENDATIONS

The hydraulic model indicates that Peverly Hill Road can support peak domestic demands with subsequent pressure greater than the recommended pressure for this type of residential development. The model indicated that the available flow through the existing 8-inch water main in Peverly Hill Road would be in excess of 1,250 gpm. It is recommended that the proposed water main for the development connect to the existing 8-inch water main in Peverly Hill Road and not to the existing parallel 6-inch water main.

We appreciate the opportunity to assist the City of Portsmouth and TF Moran in this matter. Please contact me at 978-532-1900 should you have any questions or require further support.

Sincerely,

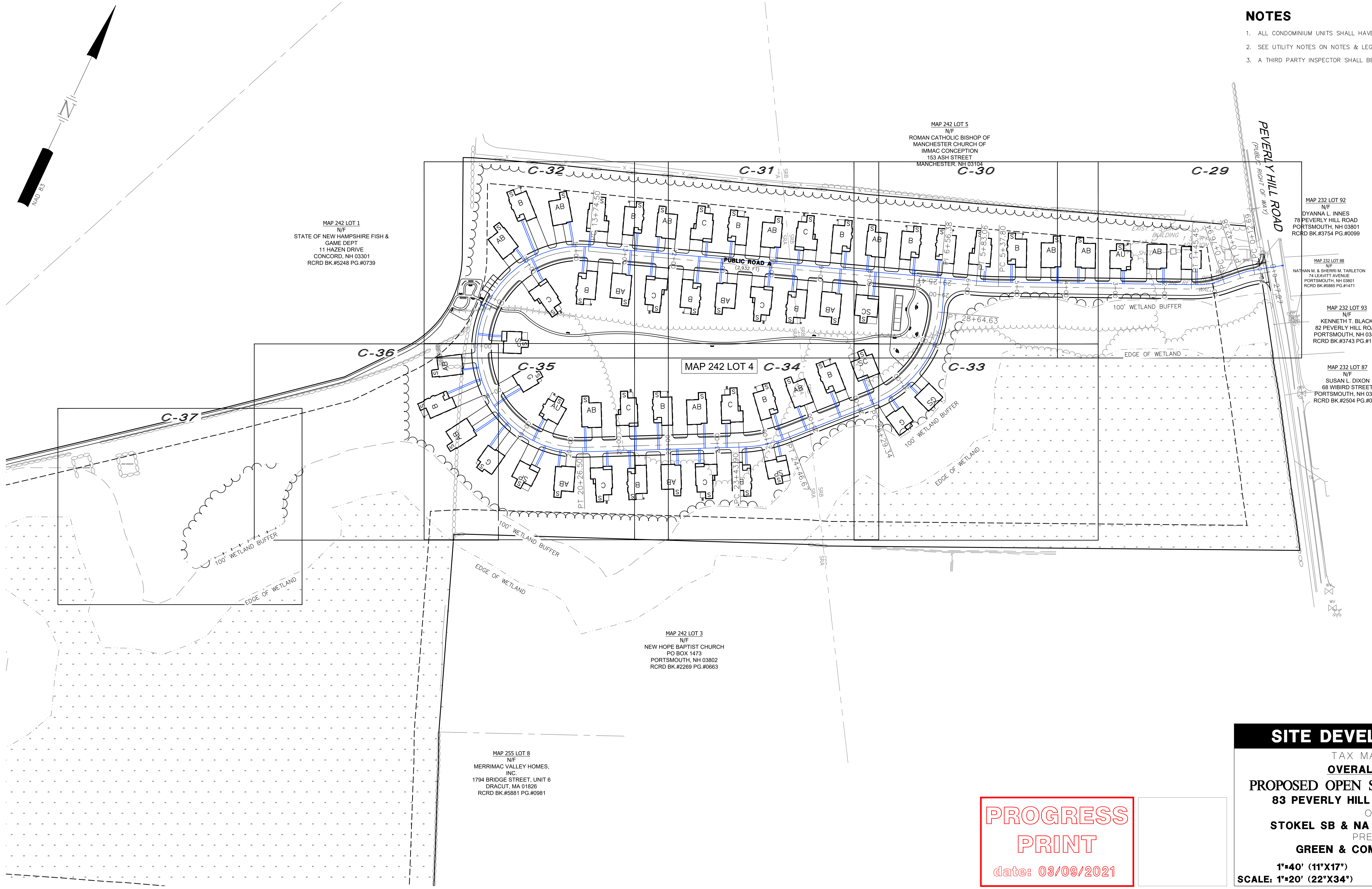
WESTON & SAMPSON ENGINEERS, INC.

Leah Stanton

Leah Stanton, PE
Vice President

Attachments:
Peverly Hill Water Utilities (plan set)
Peverly Hill Water Flows (estimate demands)

\\wse03.local\WSE\Projects\NH\Portsmouth, NH\Modeling On-Call\Peverly Hill Rd\Peverly HIll Rd Developer Review Memo_Draft.docx



NOTES

1. ALL CONDOMINIUM UNITS SHALL HAVE FIRE SUPPRESSION SPRINKLERS SYSTEMS INSTALLED.
2. SEE UTILITY NOTES ON NOTES & LEGEND SHEET (C-01).
3. A THIRD PARTY INSPECTOR SHALL BE ON SITETO INSPECT THE INSTALLATION OF THE UTILITIES.

UTILITY COLOR LEGEND
WATER

HORIZONTAL SCALE 1"=100'
100 50 0 100

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

OVERALL UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

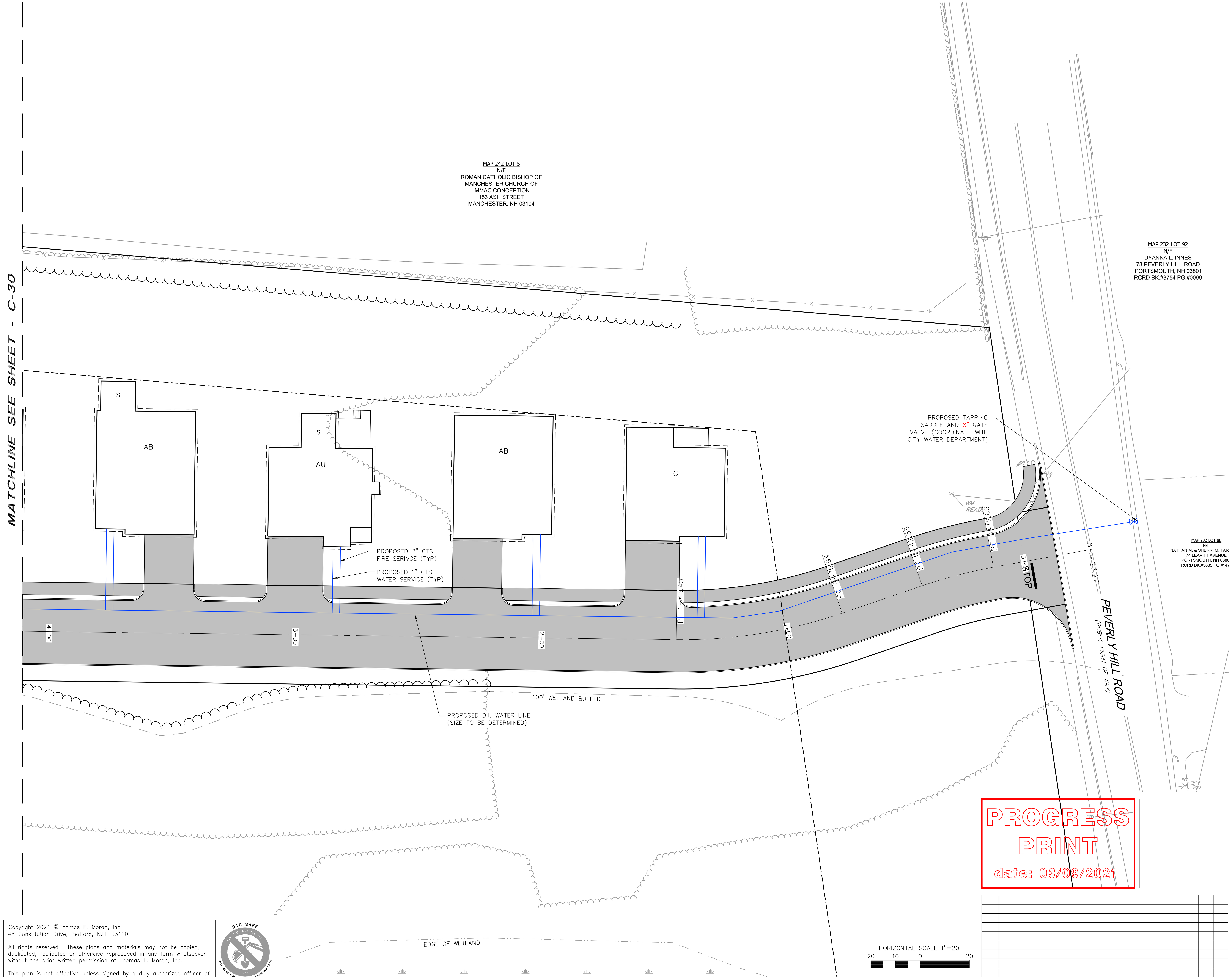
Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-28
		CK	JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg



NOTES

1.

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

PROGRESS PRINT

date: 03/09/2021

Seacoast Division

TFM®

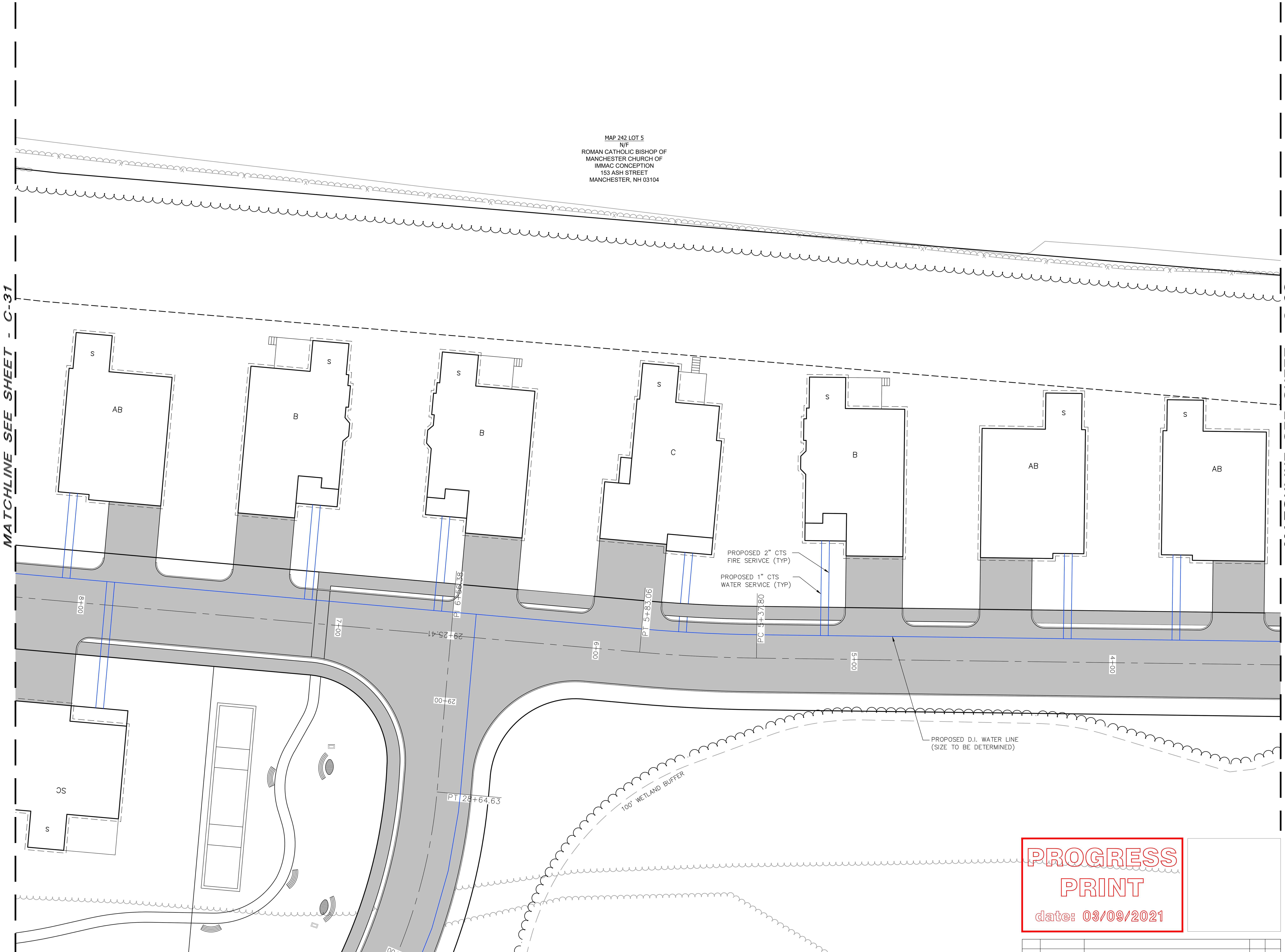
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

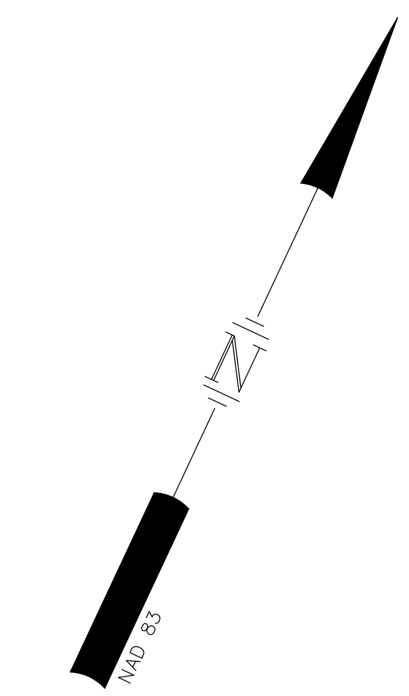
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-29
		CK	JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
MA ME NH RI VT
811
UTILITIES UNDER GROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg





NOTES

1.

PROGRESS PRINT
date: 03/09/2021

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

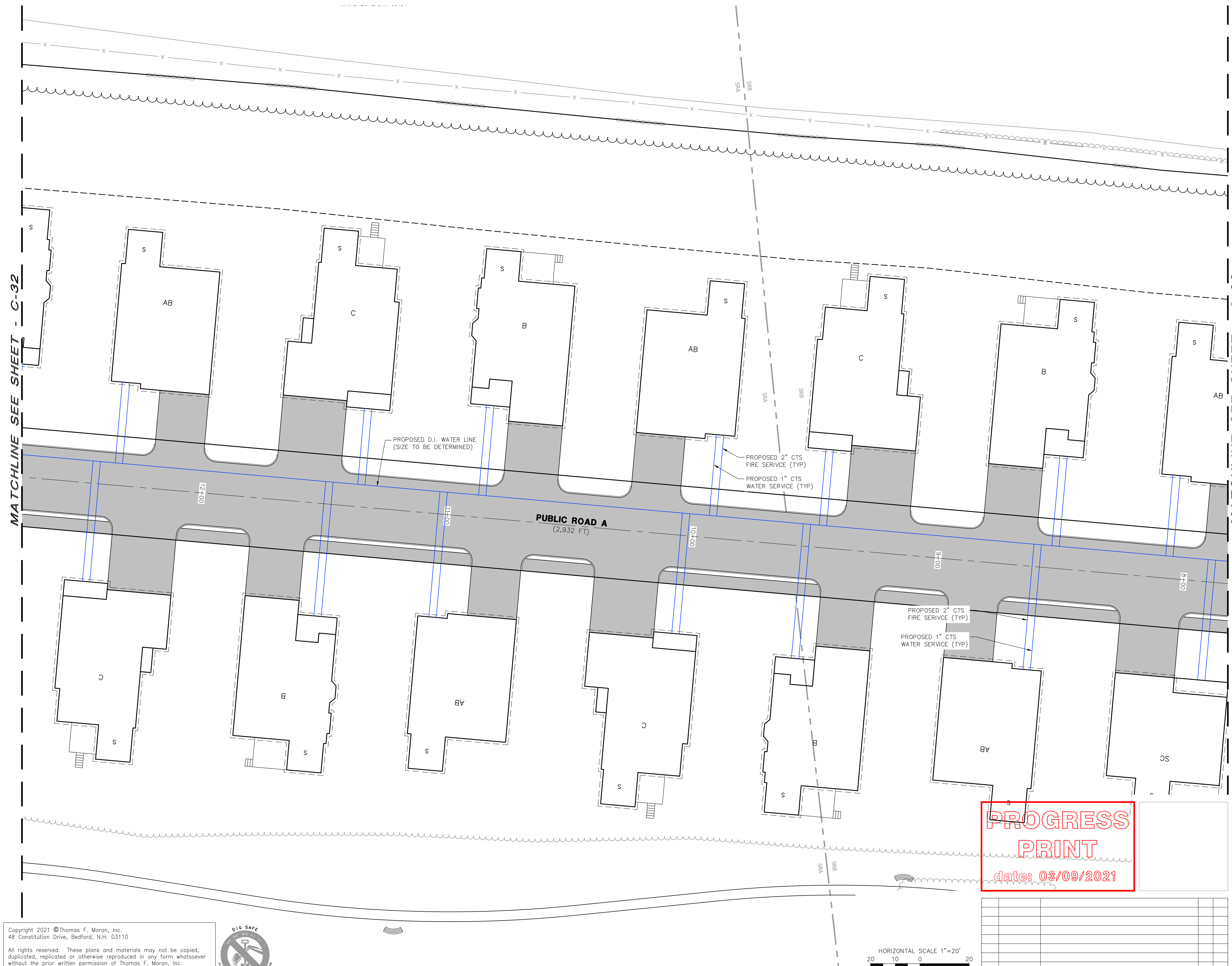
REV.	DATE	DESCRIPTION	DR	CK

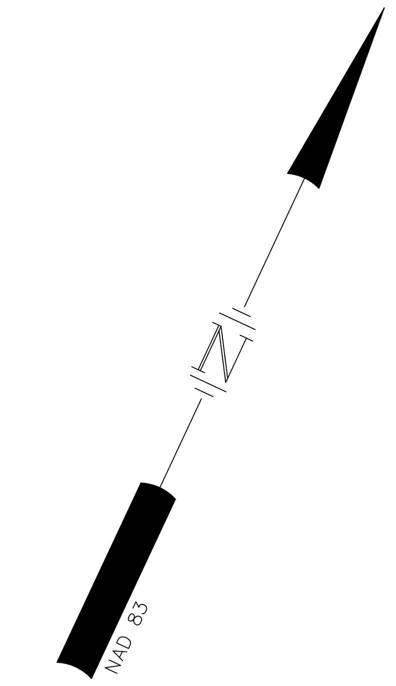
Seacoast Division
TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-30
		CK	JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg





NOTES

1.

PROGRESS PRINT
date: 03/09/2021

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

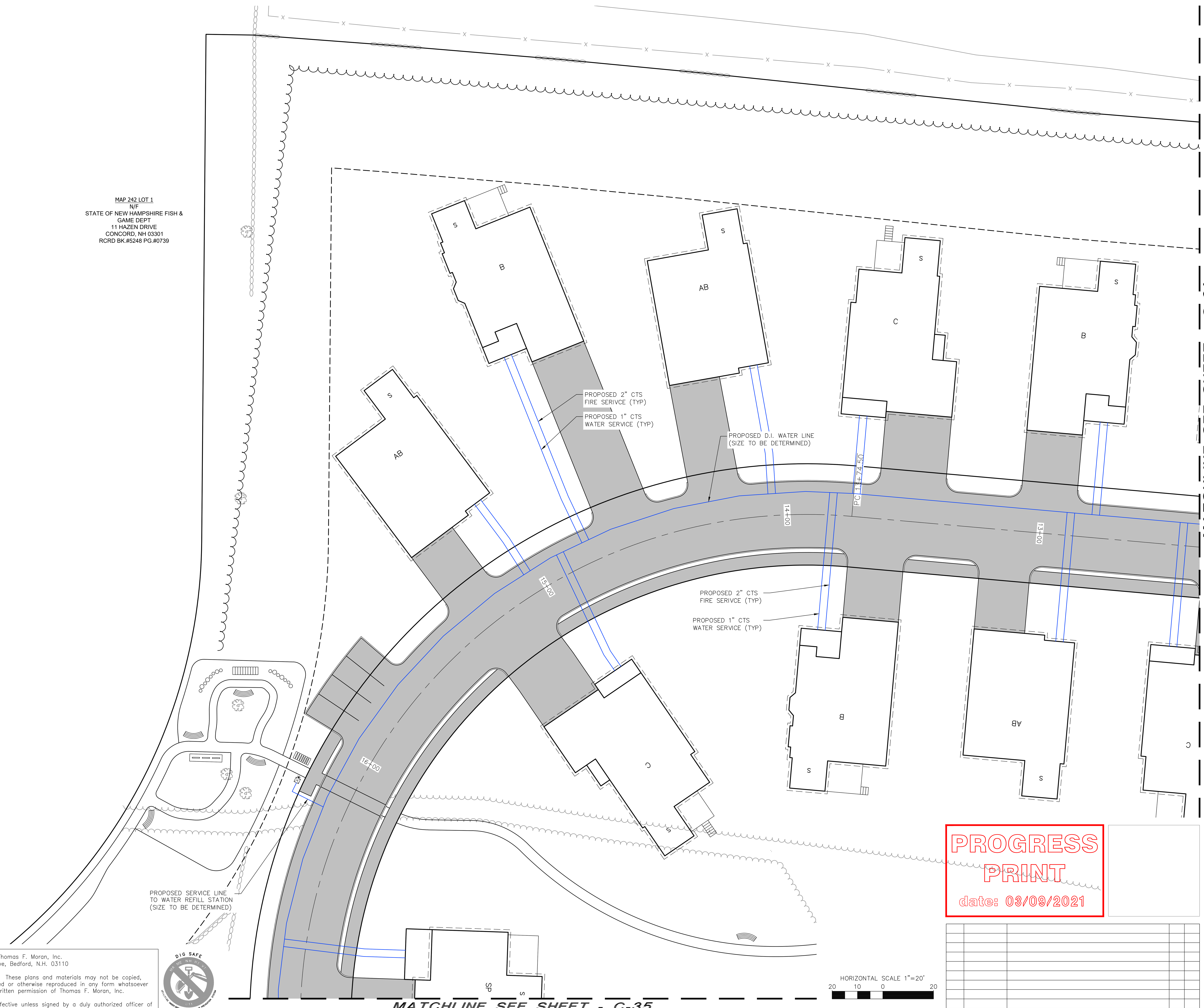
GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

Seacoast Division
TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	-	C-31
		CK	JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION



NOTES

1.

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

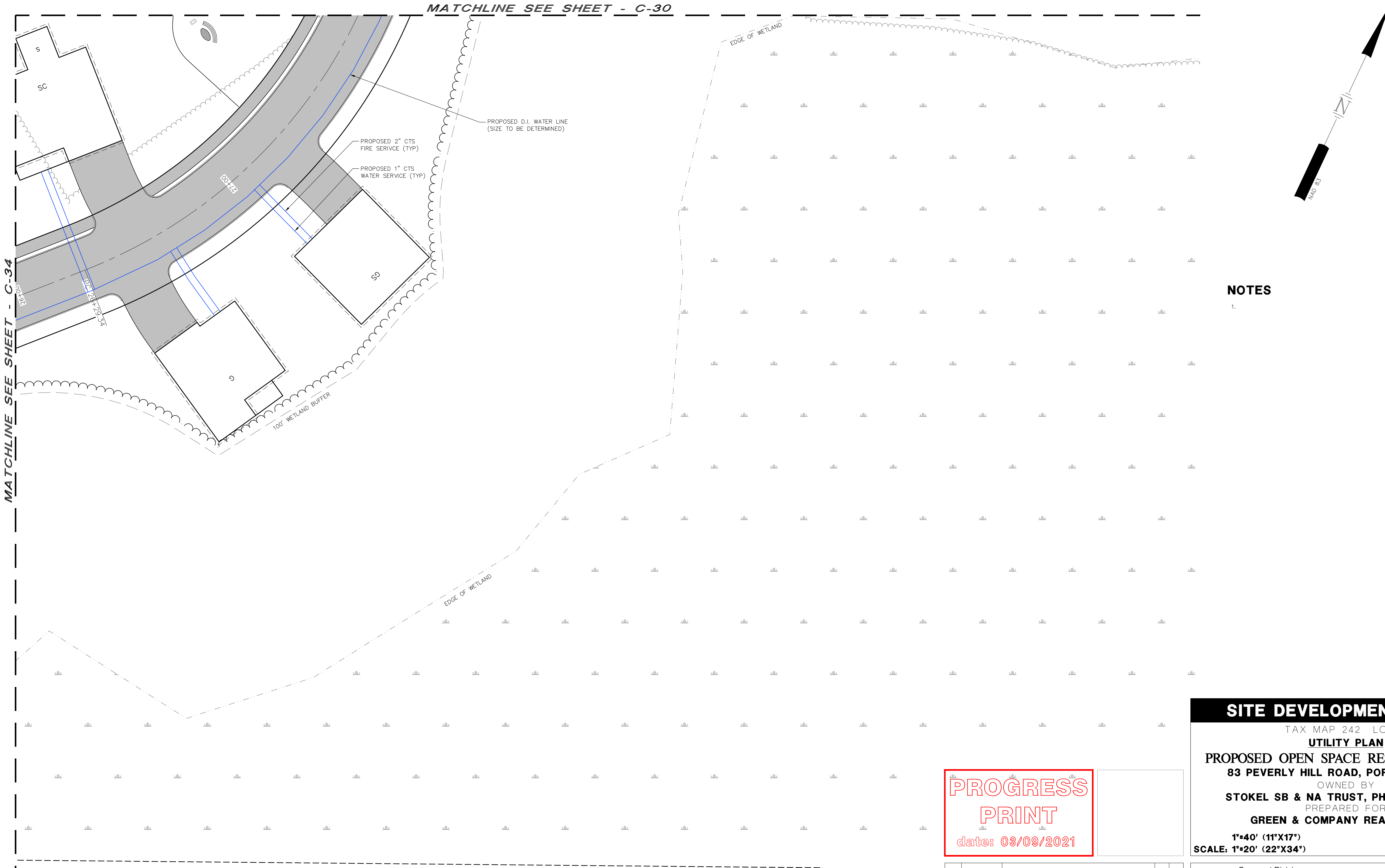
1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

FEBRUARY 25, 2021

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-32
		CK	JJM	CADFILE	47388-11_UTILITY	

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg



NOTES

1.

HORIZONTAL SCALE 1"=20'
20 10 0 20

PROGRESS PRINT
date: 03/09/2021

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR JSM	FB	–	C-33
		CK JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

NOTES

1.

PROGRESS PRINT
date: 03/09/2021

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

Seacoast Division

TFM®

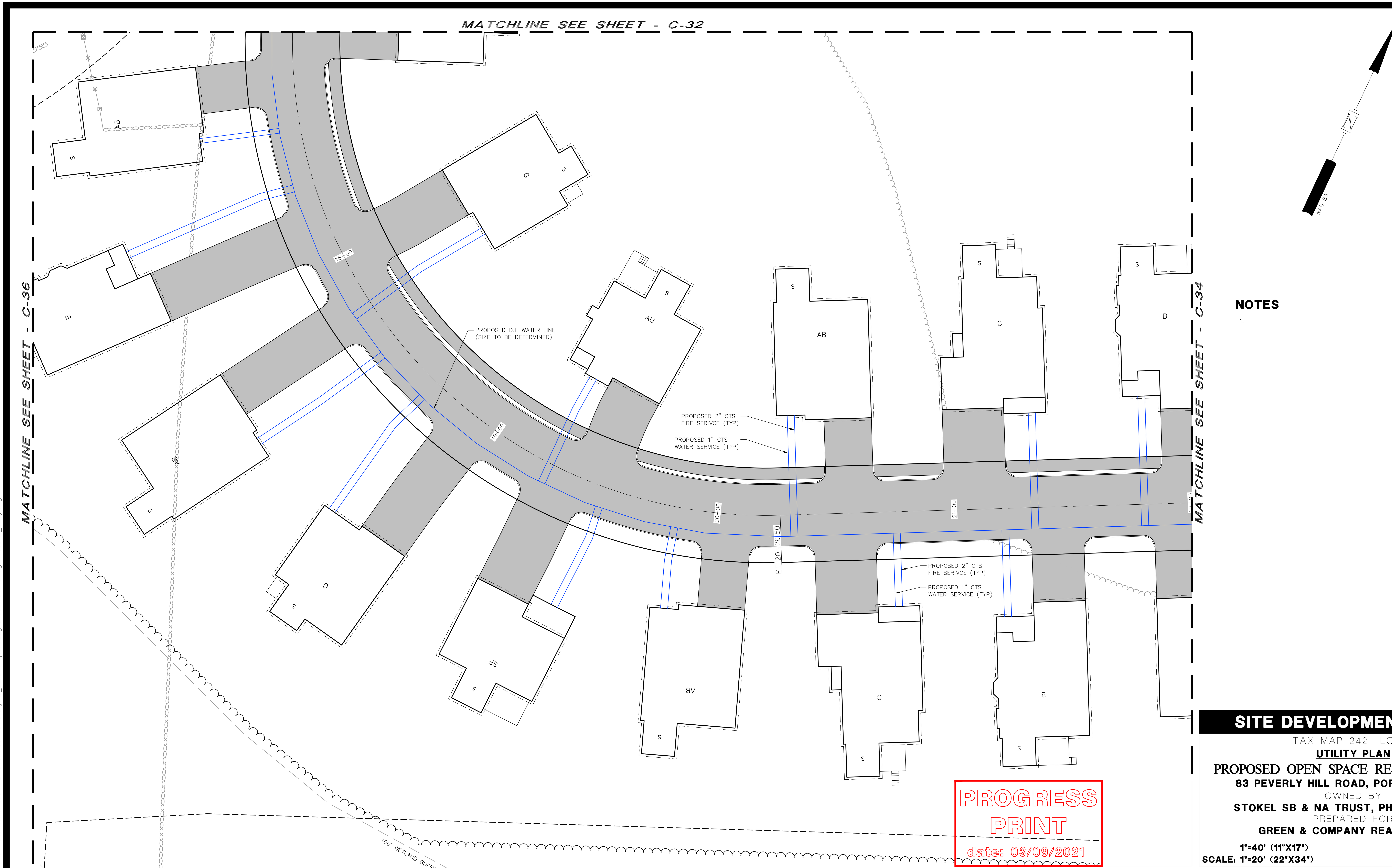
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-34
		CK	JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg



NOTES

1.

PROGRESS PRINT
date: 03/09/2021

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

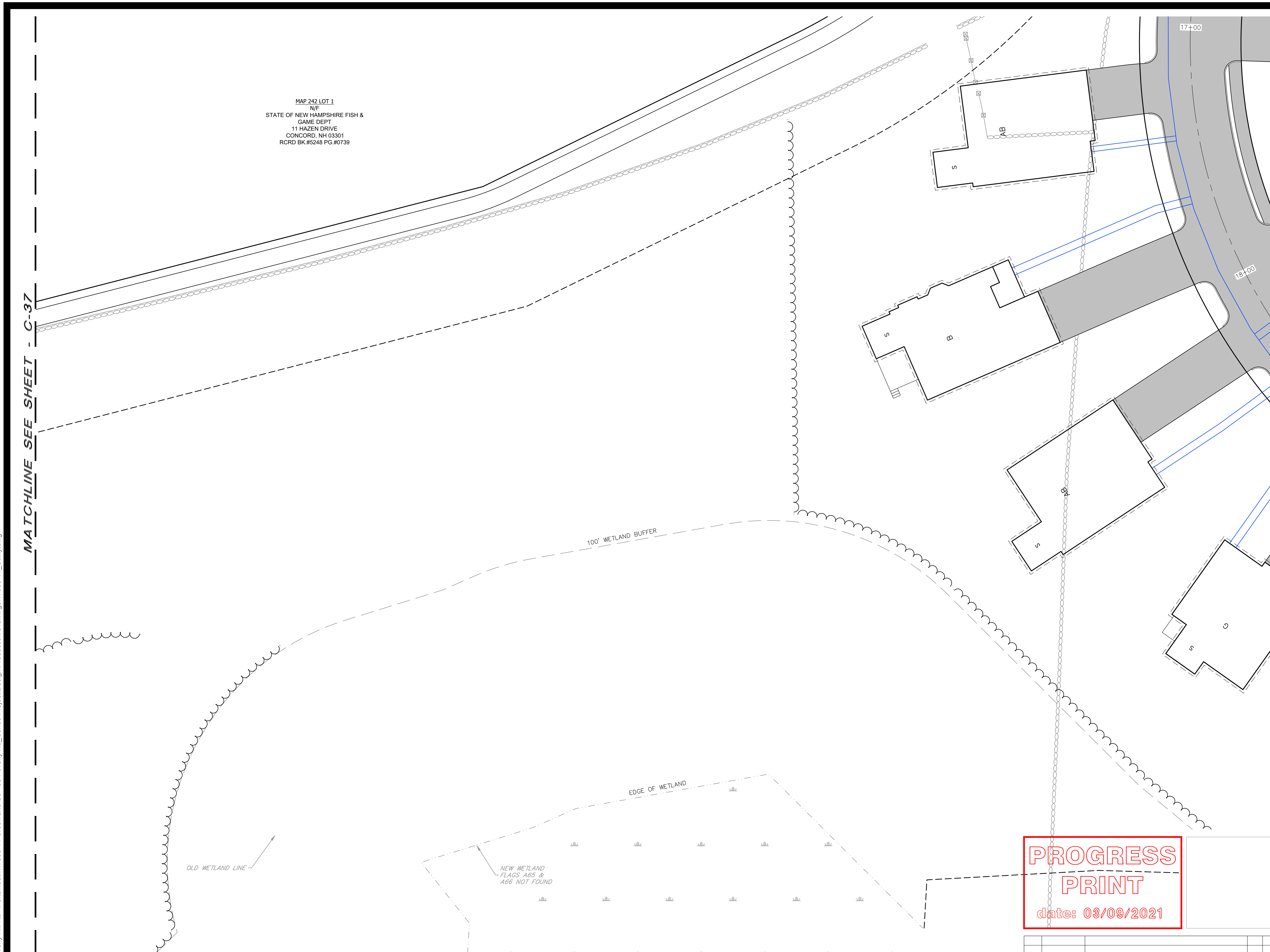
Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-35
		CK	JJM	CADFILE	47388-11_UTILITY	

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg



PROGRESS PRINT
date: 03/09/2021

NOTES

1.

REV.	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

UTILITY PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **FEBRUARY 25, 2021**

Seacoast Division

TFM®

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	DR	JSM	FB	–	
47388.11	CK	JJM	CADFILE	47388-11_UTILITY	C-36

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
811
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 12, 2021 - 12:32am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_Utility.dwg

Project	**Peverly Hill Rd Condominiums**	Date:	5/18/2021
Location	**Peverly Hill Rd**		
	Portsmouth, NH		

Unit Water Flows

Total Number of Units		56		
	Based on	100%	4 Bedroom Units	

4 Bedroom Houses	
Residences Single Family - 2 Bedroom	300
Additional Flow for 2 Additional Bedroom	300
Gallons Per Day per 4 Bedroom Unit	600

Household Water Flows (Based on NHDES Env-Wq 1008-3 Table 1008-1)

	Number of Units	GPD/ Unit	GPD	
Number of 4 Bedroom	56	600	33,600	
Total Household Flow	56		33,600	GPD for Development

Irrigation Flows (Eto x PF x SF x 0.62) / IE

Conversion Factor	0.62	Galloons per in*sf
Eto - Highest Evapotrans.	0.15	Eto per Portsmouth (June and July)
	Per Rainmaster Historic ET	
PF - Plant Factor	1.00	For Lawn
IE - Irrigation Efficiency	0.75	
Square Feet Per Yard	5,000	70'x100' (Lawn) - 2000sf (House)
Irrigation Flows	620	GPD/Unit

	Number of Units	GPD/ Unit	GPD	
Total Irrigation Flow	56	620	34,720	GPD for Development
Total Water Demand =			68,320	GPD for Development

(2) Metered water readings for uses that are as similar as possible to the proposed use, taking into consideration factors such as occupancy and frequency of use, determined as specified in (d), below.

(d) Design flows based on metered water readings shall be calculated:

(1) By finding the average of water meter readings over a period of time that is representative of the volume of water used and multiplying the average by a minimum peaking factor of 2 for commercial light flow or a maximum peaking factor of 3 for commercial heavy flow; or

(2) By measuring not less than 6 months of consecutive daily meter readings, including the month(s) of heaviest use for uses that are seasonal in nature, and using the highest daily flow without application of a peaking factor;

(e) The unit design flow figures referenced in (b) and (c), above, shall be as listed in Table 1008-1, below, subject to (f), below:

Table 1008-1: Unit Design Flow Figures

Use	**Unit Design Flow**
AIRPORTS	5 GPD/Transient plus 10 GPD/Employee
APARTMENTS	See Dwellings
BARS, LOUNGES	See Food Service
BED & BREAKFAST	60 GPD/Guest, based on the greater of 2 guests per room or the actual number of guests the room is designed to accommodate, plus 10 GPD/Employee
BUNKHOUSE	60 GPD/Person
CAMPS:	
Campground with Central Comfort Station	45 GPD/site, plus 20 GPD/Site for the dump station
Recreational Campgrounds with 3-way hookups	60 GPD/Site
Construction Camps	50 GPD/Person
Day Camps (not including meals)	15 GPD/Person
Dining Facility	3 GPD/Person/meal
Residential Youth Recreation Camps	25 GPD/Person plus 3 GPD/Person/meal
CATERERS – Function Rooms	12 GPD/patron
CHURCHES:	
Sanctuary Seating	3 GPD/Seat
Church Suppers	12 GPD/Seat
COUNTRY CLUBS – PRIVATE	
Dining Room	10 GPD/Seat
Snack Bar	10 GPD/Seat
Locker & Showers	20 GPD/Locker
DAY CARE CENTERS	10 GPD/Person
DENTISTS	10 GPD/Chair plus 35 GPD/Staff Member
DOCTOR'S OFFICES	250 GPD/Doctor
DOG KENNELS	50 GPD/Kennel, with one dog per kennel
DWELLINGS:	
Apartment - Studio or One-Bedroom	225 GPD
Apartment - 2 or More Bedrooms	150 GPD/Bedroom
Residence - Single-Family	300 GPD plus 150 GPD for each bedroom over 2
Residence - Duplex	300 GPD plus 150 GPD for each bedroom over 2 for each unit
Rooming House – With Meals	60 GPD/Person
Rooming House – Without Meals	40 GPD/Person
Senior Housing	See Senior Housing

Project #47388.11

DRAINAGE ANALYSIS

F O R

The Peverly Hill Road Condominiums

86 Peverly Hill Road
Portsmouth, NH
Rockingham County

Tax Map 242, Lot 4

Month April 19, 2021
Last Revised August 25, 2021

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

Prepared By:

TFM Since 1968
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

(This Page Is Intentionally Blank)

Contents

Table of Figures

(This Page Is Intentionally Blank)

1.0 - SUMMARY & PROJECT DESCRIPTION

The project includes the development of a 56-Unit PUD on 83 Peverly Hill Road, Portsmouth, NH. The existing Tax Map 242 Lot 6 is approximately 4,604,509 sf / 105.7 Acres and currently contains one residential building. The site is within the Single Residence A (SRA) & Single Residence B (SRB) Zoning district is adjacent to a Calvary Cemetery to the North and a wetland to the south. The majority of the buildings on Peverly Hill Road are residential and the surrounding area consists of residential neighborhoods.

The proposed project is to construct 56 single-family unit condominium in a planned unit development. Associated improvements include and are not limited to access, grading, utilities, stormwater management system, lighting, and landscaping. The project proposes 56 buildings and a roadway total 244,772 sf / 5.6 acres of impervious area with approximately 732,290 sf / 16.8 acres of disturbance to facilitate the development, this is approximately 5% effective impervious cover. Aside from the 16.8 acres of disturbance, the approximately 88.9 remaining acreage is to be undeveloped. A pedestrian/bike path is to be constructed connecting the neighborhood with the existing bike path that is under development along the Boston and Main Railroad Tracks. The majority of this path is to be constructed along an existing access drive that runs along the northern edge of the property.

This analysis has been completed to verify the project will not pose adverse stormwater effects on-site and off-site. The post-development stormwater management system has been designed to reduce peak runoff rates, reduces runoff volume, reduces the risk of erosion and sedimentation, and improves stormwater runoff quality. There are not increased in runoff from the post-development conditions compared to the pre-development conditions. In addition, Best Management Practices will be employed to assures stormwater quality both during and after construction. The following summarizes the findings from the study.

2.0 - CALCULATION METHODS

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour storm events. The software program, HydroCAD version 10.00[1] was utilized to calculate the peak runoff rates from these storm events. The program estimates the peak rates using the TR-20 method. A Type III storm pattern was used in the model. Rainfall frequencies for the analyzed region were also incorporated into the model. Rainfall frequencies from the higher of the Extreme Precipitation Rates from Cornell University's Northeast Regional Climate Center (see Appendix A) were used to determine the storm-event intensities, see Table 1. The site lies withing the Great Bay Region, and the rainfalls were increased to take this into account. Design standards were taken from the New Hampshire Stormwater Manual, December 2008[2].

[1] HydroCAD version 10.00, HydroCAD Software Solutions LLC, Chocorua, NH, 2013.
[2] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

	24-HOUR RAINFALL RATES		
Storm-Event (year)	Cornell University Rainfall (in)	Factor of Increase For the Great Bay Region	Design Rainfall (in)
2	3.22	115%	3.70
10	4.89	115%	5.62
50	7.43	115%	8.54

Table 1 – 24-Hour Rainfall Rates

Time of Concentration is the time it takes for water to flow from the hydraulically most remote point in the watershed (with the longest travel time) to the watershed outlet. This time is determined by calculating the time it takes runoff to travel this route under one of three hydrologic conditions: sheet flow, shallow concentrated flow, or channel flow. Because the Intensity-Duration-Frequency (IDF) curve is steep with short TC's, estimating the actual intensity is subject to error and overestimates actual runoff. Due to this, the TC's are adjusted to a minimum of 5 minutes.

3.0 – EXISTING SITE CONDITIONS

The soils within the proposed area of disturbance are identified in accordance with the Site-Specific Soil Survey (see Existing Conditions detail and soil locations). The Site-Specific Soil Survey identifies the soils within the disturbed project area as primarily Newfields sandy loam (HSG B), Hoosic gravelly loamy sand (HSG A), Deerfield loamy sand (HSG B) and Canton sandy loam (HSG B). Hydrologic Soil Group A is classified as having low runoff potential and Hydrologic Soil Group B is classified as moderately low runoff potential.

All other areas that contribute runoff to the project site are composed of Boxford silt loam (HSG C), Scitico silt loam (HSG C), Walpole sandy loam, (HSG C). Hydrologic Soil Group C is classified as having moderately high runoff potential when thoroughly wet.

Offsite soils draining onto the site are classified by the Natural Resource Conservation Service (NRCS) as Scitico Silt Loam (HSG C/D), Eldridge Fine Sandy Loam (HSG C/D), Maybid Silt Loam (HSG C/D), Deefield Loamy Fine Sand (HSG A), Pennichuck Channery Very Fine Sand Loam (HSG C), Natchaug Mucky Peat (HSG B/D), Hoosic Gravelly Fine Sandy Loam (HSG A) and Squamscott Fine Sandy Loam (HSG C/D). In dual group classifications, the first letter is for drained areas while the second is for un-drained areas.

4.0 - PRE-DEVELOPMENT CONDITIONS

The pre-development condition is characterized by seven watersheds. Pre-development subcatchment areas are depicted on the attached plan entitled "Pre-Development Drainage Map," Sheet D-01 in.

Stormwater runoff from the site that does not infiltrates into the soil, drains into the wetland along the south side of the property (EPOI-1, EPOI-2, EPOI-3 and EPOI-5). A small portion, along the northern edge of the property, drains into the woodlands on the abutting property (EPOI-4 and EPOI-6).

In the pre-development condition, taking into account the surrounding land that drain onto the property, the total impervious area is 78,335 sf over a total drainage analysis area of 3,958,156 sf.

5.0 - POST-DEVELOPMENT CONDITIONS

The post-development condition is characterized by six watershed divided into many subcatchment areas. Post-development subcatchment areas are depicted on the attached plan entitled "Post-Development Drainage Map," sheet D-02.

In the post-development condition, the total impervious area is 323,127 sf over a total drainage analysis area of 3,958,156 sf disturbed. Impervious area from the project consists of 56 single-family residential buildings, 2932 lf of roadway and associated improvements. Two bioretention areas and one subsurface gravel wetland are proposed to treat and mitigate the stormwater runoff from the impact of the new impervious area from the proposed development.

The proposed project maintains or reduces peak rates of runoff compared to existing conditions for all storm events, in accordance with AoT regulations and City stormwater regulations. For Channel protection, the State Regulations looks at the difference between the pre-development to post-development 2-year 24-hour storm event volumes that flow into major water bodies. The 3 areas that experienced changes in post development flows are PS-1, PS,2, PS-3 and PS-4. These flow into the wetland to the south of the property. Individual and as combined flows, none exceed the allowable 0.1 increase peak flow volumes. There will be no adverse effects on the abutting properties from the proposed stormwater management system. See Table 2.

Appendices B and D summarizes all 24-hour storm events for pre- and post-development drainage calculations using HydroCAD analysis. Appendices C and E provide a full summary of the 10-year, 24-hour storm for the pre- and post-development drainage calculations using HydroCAD analysis.

Area Number	2-Year (Flow - cfs)		2-Year (Volume – acre/ft)		10-Year (Flow - cfs)		25-Year (Flow - cfs)		50-Year (Flow - cfs)	
	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.
POI-1	5.2	5.1	0.9	1.0	22.5	18.2	40.5	38.9	59.3	58.9
POI-2	7.5	7.4	1.3	1.2	23.6	20.1	40.7	35.1	59.3	51.6
POI-3	3.0	3.0	0.7	0.7	8.8	8.8	14.3	14.3	19.7	19.7
POI-4	0.2	0.2	0	0	3.2	3.2	8.0	8.0	13.9	13.9
POI-5	2.7	2.7	0.4	0.4	7.9	7.9	12.8	12.8	17.7	17.7
POI-6	0.7	0.7	0.1	0.1	2.7	2.7	4.7	4.7	6.8	6.8
Total Volume			3.6	3.6						

Table 2- Pre and Post Flows

6.0 – REGULATORY COMPLIANCE

The project shall meet the stricter of the stormwater standards identified in the New Hampshire Department of Environmental Services (DES) Env-Wq 1500 Alteration of Terrain Regulations and City stormwater management regulations.

6.1 – ALTERATION OF TERRAIN (AOT) CRITERIA

The following regulatory requirements are provided to show the project conformance to the applicable criteria of the NHDES Env-Wq 1500 Alteration of Terrain Regulations which include and are not limited to the following:

Env-Wq 1507.03(a) Pollutant Discharge Minimization Requirements: Stormwater treatment practices described in Env-Wq 1508.03 through Env-Wq 1508.10 shall be acceptable methods for minimizing pollutant discharges to surface waters.

Stormwater is treated using an infiltration practice, specifically a subsurface infiltration basin. The subsurface infiltration basins are designed in accordance with the applicable criteria of Env-Wq 1508.06 as follows:

Per 1508.06(e), the volume of the practice shall be large enough to contain the WQV without depending on infiltration. Refer to the corresponding BMP Worksheet in Section 12 for verification.

Per 1508.06(f), the practice completely drains the WQV within 72 hours or less. Refer to the corresponding BMP Worksheet in Section 12 for verification.

Env-Wq 1507.03(c) Pollutant Discharge Minimization Requirements: Stormwater treatment practices shall be designed with infiltration rates in accordance with Env-Wq 1504.14

Per 1508.06(a), the design infiltration rate of underlaying native soil was considered in accordance with Env-Wq 1504.14. The design infiltration rate for each subsurface infiltration basin is the average from each infiltration test in each basin. Refer to the Infiltration Feasibility Report.

Env-Wq 1507.03(e) Pollutant Discharge Minimization Requirements: Stormwater treatment practices shall be designed for the WQV/WQF, calculated in accordance with Env-Wq 1504.10 and Env-Wq 1504.11.

The regulation is met. Refer to the corresponding BMP Worksheets.

Env-Wq 1507.04(a) Groundwater Recharge Requirements: The proposed development shall reduce to the maximum extent practicable by using groundwater recharge practices as described in Env-Wq 1508.16.

The regulation is met. Refer to the corresponding BMP Worksheet in Section 12 for verification.

Env-Wq 1507.04(c) Groundwater Recharge Requirements: Design Infiltration rates for groundwater recharge practices shall be determined in accordance with Env-Wq 1504.14.

Design infiltration rates were obtained per Ksat testing using a Guelph Permeameter (Amoozemeter) per Env-Wq 1504.14(d). The design infiltration rate for each subsurface infiltration basin is the average from each infiltration test in each basin. Refer to the Infiltration Feasibility Report in Section 16 for verification.

Env-Wq 1507.05 Channel Protection Requirements: The 2-year 24-hour post development peak rate shall not exceed the pre-development peak flow rate for all flows leaving the site and the conditions of Env-Wq 1507.05(b), Env-Wq 1507.05(b)(2), or Env-Wq 1507.05(b)(3).

The 2-year, 24-hour post-development peak flow rate generated from the proposed disturbance is equal to or less than the 2-year, 24-hour pre-development peak flow rate and the 2 year, 24-hour post-development storm volume, directed to the nearest water body has not increased over the pre-development volume by more than 0.1 acre-feet.

The regulation is met. Refer to Table 2 for peak discharge rate and 2-year stormwater volume comparisons.

Env-Wq 1507.06 Control Peak Runoff: The 2-year, 10-year and 50-year 24-hour post development peak rate shall not exceed the pre-development peak flow rate for all flows leaving the site.

The regulation is met. Refer to Table 2 for peak discharge rate comparison.

7.0 – BEST MANAGEMENT PRACTICES

Best Management Practices will be developed in accordance with the *New Hampshire Stormwater Manual, Volumes Two and Three, December 2008*[3] to formulate a plan that assures stormwater quality both during and after construction. The intent of the outlined measures is to minimize erosion and sedimentation during construction, stabilize and protect the site from erosion after construction is complete and mitigate any adverse impacts to stormwater quality resulting from development. Best Management Practices for this project include:

- Temporary practices to be implemented during construction.

- Permanent practices to be implemented after construction.

7.1 – TEMPORARY PRACTICES

1. Erosion, sediment, and stormwater detention measures must be installed as directed by the engineer.
2. All disturbed areas, as well as loam stockpiles, shall be seeded and contained by a silt barrier.
3. Silt barriers must be installed prior to any construction commencing. All erosion control devices including silt barriers and storm drain inlet filters shall be inspected at least once per week and following any rainfall. All necessary maintenance shall be completed within twenty-four (24) hours.
4. Any silt barriers found to be failing must be replaced immediately. Sediment is to be removed from behind the silt fence if found to be one-third the height of the silt barrier or greater.

[3] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

5. Any area of the site, which has been disturbed and where construction activity will not occur for more than twenty-one (21) days, shall be temporarily stabilized by mulching and seeding.
6. No construction materials shall be buried on-site.
7. After all areas have been stabilized, temporary practices are to be removed, and the area they are removed from must be smoothed and revegetated.
8. Areas must be temporarily stabilized within 14 days of disturbance or seeded and mulched within 3 days of final stabilization.
9. After November 15^{th}, incomplete driveways or parking areas must be protected with a minimum of 3" of crushed gravel, meeting the standards of NHDOT item 304.3.
10. An area shall be considered stable if one of the following has occurred:
    a) Base course gravels are installed in areas to be paved.
    b) A minimum of 85% vegetated growth has been established.
    c) A minimum of 3" of non-erosive material such as stone or rip rap has been installed.
    d) Erosion control blankets have been properly installed.

7.2 – PERMANENT PRACTICES

The objectives for developing permanent Best Management Practices for this site include the following:

1. Maintain existing runoff flow characteristics.
    a) Drainage is structured to minimize any offsite increase in runoff

2. Treatment BMP's are established to ensure the water quality.

3. Maintenance schedules are set to safeguard the long term working of the stormwater BMP's.

A Stormwater Management Operations & Maintenance Manual is provided to ensure the proper functioning of the system over time.

7.3 – BEST MANAGEMENT PRACTICE EFFICIENCIES

Appendix E of Volume 2 of the New Hampshire Stormwater [4] lists the pollutant removal efficiencies of various BMP's. All proposed BMP's meet all state and City requirements for total suspended solids (TSS) and pollutant removal, Total Nitrogen (TN), and Total Phosphorous (TP).

Bioretention Systems have a 90% TSS removal efficiency, 65% TN removal efficiency, and 65% TP efficiency.

---

[4] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

Subsurface Gravel Wetlands have a 95% TSS removal efficiency, 85% TN removal efficiency, and 64% TP efficiency. Subsurface Gravel Wetlands have the have the highest removal rating for total nitrogen. The surface of the wetland creates an aerobic zone allowing nitrification of the organic nitrogen and plant debris, and the rock area under the wetland soil allows for an anaerobic zone causing denitrification of the stormwater, releasing nitrogen gas back into the atmosphere.

Infiltration Basins have a 90% TSS removal efficiency, 60% TN removal efficiency, and 65% TP efficiency. The area treated by this BMP is mostly runoff from the abutting cemetery, grass runoff and roof runoff. While not as efficient at treating water Subsurface Gravel Wetlands, it allows the water to infiltrate into the ground, recharging the ground water.

Bioretention Area #1 and Subsurface Gravel Wetland #1 both use sediment forebays to pretreat the stormwater. Bioretention Area #2 And Infiltration Basin #1 only receives impervious runoff from roofs and not pretreatment is required. The pretreatment areas help to settle sediment and prevent clogging of treatment areas.

7.3.1 – LID PRACTICES

Subsurface Gravel Wetlands, Infiltration Basins, and Bioretention Areas are all Low Impact Design. The goal of LID systems is to mimic a site's precondition hydrology by infiltrating, filtering, storming, evaporating and detaining stormwater but use of natural landscape features. These treatments filter and detain the stormwater. They use natural processes, such as soil filtration, evapotranspiration (from the plants in the system) and anaerobic and aerobic treatment of stormwater. The detain the stormwater and release it to mimic the predevelopment storm flows.

The inclusion of the infiltration basin allows for stormwater to infiltrate back into the ground,

9.0 – CONCLUSION

The proposed stormwater management system will treat, infiltrate, and mitigate the runoff generated from the proposed development and provide protection of groundwater and surface waters as required through the Alteration of Terrain Bureau and City stormwater management regulations. The project has been designed in accordance with NHDES and City regulations. There is little change in the flow characteristics of the site. The proposed project has been designed to pose no adverse effects on surrounding properties.

Respectfully,
TFMoran, Inc.

Jack McTigue, PE, CPESC
Project Manager

(This Page Is Intentionally Blank)

APPENDIX A – EXTREME PRECIPITATION RATES

(This Page Is Intentionally Blank)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.783 degrees West
Latitude	43.056 degrees North
Elevation	0 feet
Date/Time	Mon, 19 Oct 2020 18:28:44 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.04	2.67	2.93	**1yr**	2.36	2.82	3.23	3.95	4.57	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.50	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.15	4.08	4.60	**5yr**	3.62	4.42	5.06	5.96	6.73	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.24	2.90	3.76	4.89	5.55	**10yr**	4.33	5.34	6.11	7.14	8.01	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.34	**25yr**	1.53	2.14	2.78	3.64	4.76	6.20	7.13	**25yr**	5.49	6.86	7.84	9.07	10.10	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.33	5.68	7.43	8.62	**50yr**	6.57	8.29	9.48	10.87	12.04	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.91	5.17	6.79	8.90	10.43	**100yr**	7.88	10.03	11.45	13.04	14.35	**100yr**
200yr	0.68	1.10	1.43	2.05	2.83	3.84	**200yr**	2.44	3.52	4.62	6.15	8.11	10.67	12.61	**200yr**	9.44	12.13	13.84	15.64	17.12	**200yr**
500yr	0.80	1.32	1.72	2.49	3.48	4.77	**500yr**	3.00	4.39	5.78	7.73	10.26	13.56	16.23	**500yr**	12.00	15.60	17.80	19.91	21.62	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.87	0.92	1.33	1.67	2.24	2.53	**1yr**	1.98	2.43	2.87	3.17	3.91	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.07	3.47	**2yr**	2.72	3.34	3.84	4.57	5.10	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.81	4.22	**5yr**	3.37	4.06	4.74	5.57	6.28	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.39	3.06	4.40	4.91	**10yr**	3.90	4.72	5.49	6.47	7.25	**10yr**
25yr	0.44	0.67	0.83	1.19	1.57	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.74	5.96	**25yr**	4.19	5.73	6.73	7.88	8.76	**25yr**
50yr	0.48	0.74	0.92	1.32	1.77	2.17	**50yr**	1.53	2.12	2.35	3.07	3.93	5.36	6.90	**50yr**	4.74	6.63	7.85	9.16	10.12	**50yr**
100yr	0.54	0.82	1.02	1.48	2.02	2.48	**100yr**	1.75	2.42	2.63	3.41	4.36	6.03	7.98	**100yr**	5.33	7.67	9.15	10.66	11.69	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.82	**200yr**	1.98	2.76	2.94	3.78	4.80	6.76	9.22	**200yr**	5.98	8.87	10.67	12.42	13.53	**200yr**
500yr	0.69	1.03	1.33	1.93	2.74	3.38	**500yr**	2.36	3.30	3.42	4.32	5.47	7.87	11.18	**500yr**	6.97	10.75	13.07	15.23	16.39	**500yr**

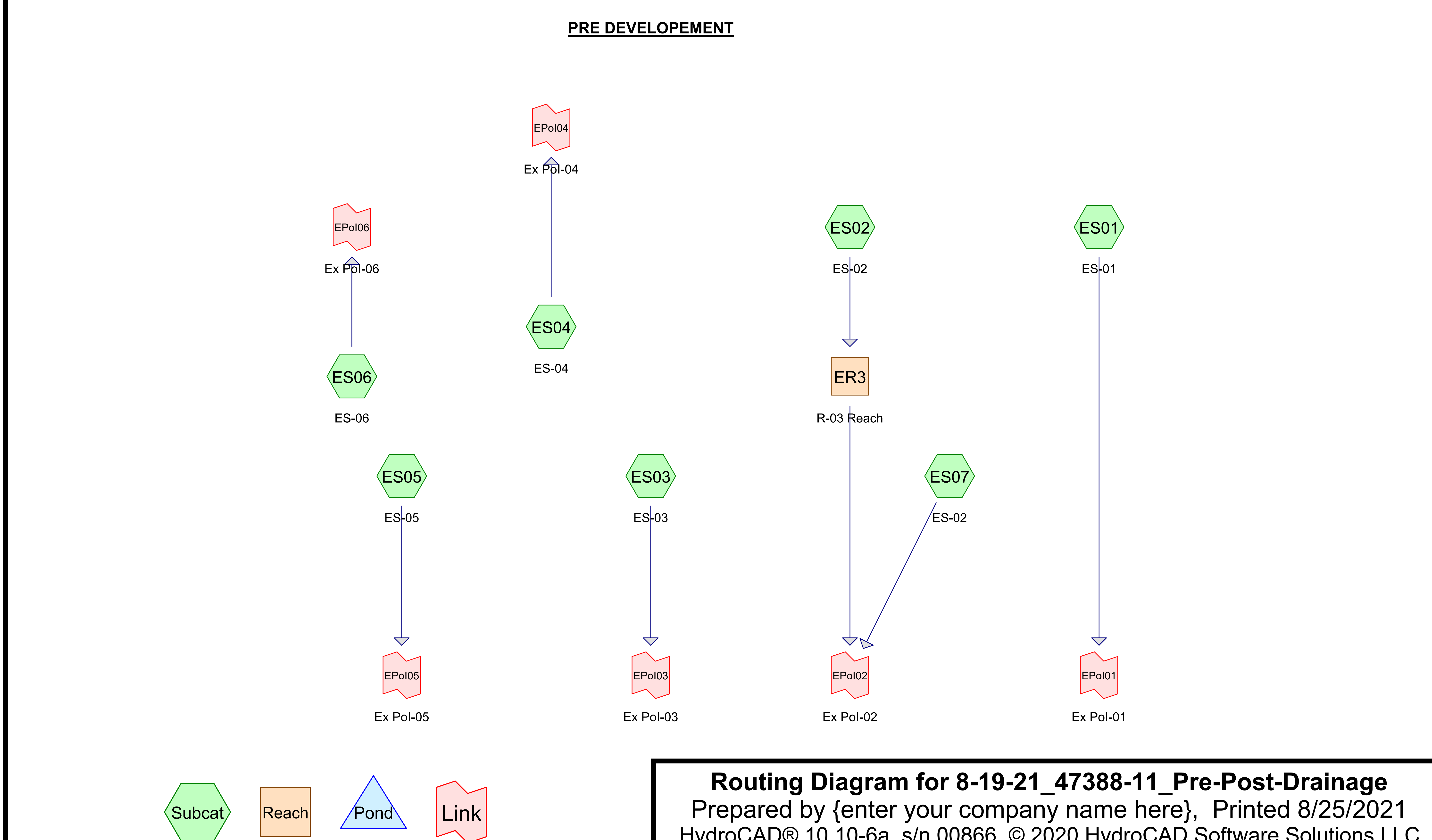
Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	3.00	3.16	**1yr**	2.66	3.04	3.60	4.39	5.07	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.44	3.71	**2yr**	3.04	3.57	4.09	4.85	5.65	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.35	4.96	**5yr**	3.85	4.77	5.39	6.38	7.16	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.10	3.94	5.36	6.20	**10yr**	4.74	5.96	6.81	7.84	8.76	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.51	2.95	4.06	5.14	7.82	8.32	**25yr**	6.92	8.00	9.11	10.34	11.41	**25yr**
50yr	0.67	1.02	1.27	1.83	2.46	3.13	**50yr**	2.12	3.06	3.59	4.99	6.30	9.79	10.42	**50yr**	8.66	10.02	11.37	12.72	13.96	**50yr**
100yr	0.79	1.19	1.49	2.16	2.96	3.81	**100yr**	2.55	3.72	4.37	6.14	7.73	12.25	13.04	**100yr**	10.84	12.54	14.19	15.67	17.07	**100yr**
200yr	0.92	1.39	1.76	2.55	3.55	4.65	**200yr**	3.07	4.55	5.33	7.57	9.49	15.37	16.34	**200yr**	13.60	15.71	17.73	19.31	20.89	**200yr**
500yr	1.14	1.70	2.19	3.18	4.53	6.03	**500yr**	3.91	5.90	6.91	10.00	12.48	20.76	22.02	**500yr**	18.37	21.17	23.80	25.43	27.29	**500yr**

(This Page Is Intentionally Blank)

APPENDIX B – PRE-DEVELOPMENT CALCULATIONS

(This Page Is Intentionally Blank)



Routing Diagram for 8-19-21_47388-11_Pre-Post-Drainage
Prepared by {enter your company name here}, Printed 8/25/2021
HydroCAD® 10.10-6a s/n 00866 © 2020 HydroCAD Software Solutions LLC

(This Page Is Intentionally Blank)

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
803,900	39	>75% Grass cover, Good, HSG A (ES01, ES02, ES04)
183,812	61	>75% Grass cover, Good, HSG B (ES01, ES04, ES07)
3,097	74	>75% Grass cover, Good, HSG C (ES01, ES04)
227	96	Gravel surface, HSG A (ES04)
6,625	96	Gravel surface, HSG B (ES04)
1,882	96	Gravel surface, HSG C (ES04)
76,964	98	Paved parking, HSG A (ES01, ES02, ES04)
1,391	98	Roofs, HSG A (ES01)
277,822	30	Woods, Good, HSG A (ES01, ES02, ES04)
1,407,239	55	Woods, Good, HSG B (ES01, ES03, ES04, ES05, ES06, ES07)
1,195,197	70	Woods, Good, HSG C (ES01, ES03, ES04, ES05, ES06, ES07)
3,958,156	**56**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,160,304	HSG A	ES01, ES02, ES04
1,597,676	HSG B	ES01, ES03, ES04, ES05, ES06, ES07
1,200,176	HSG C	ES01, ES03, ES04, ES05, ES06, ES07
0	HSG D	
0	Other	
3,958,156		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=1,086,569 sf 2.77% Impervious Runoff Depth>0.45"
Flow Length=1,030' Tc=22.6 min CN=56 Runoff=5.2 cfs 40,724 cf

Subcatchment ES02: ES-02 Runoff Area=399,877 sf 9.83% Impervious Runoff Depth>0.12"
Flow Length=724' Tc=14.3 min CN=45 Runoff=0.1 cfs 3,861 cf

Subcatchment ES03: ES-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>0.74"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=3.0 cfs 29,099 cf

Subcatchment ES04: ES-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>0.11"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=0.2 cfs 6,274 cf

Subcatchment ES05: ES-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>0.75"
Flow Length=720' Tc=34.6 min CN=63 Runoff=2.7 cfs 19,098 cf

Subcatchment ES06: ES-06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>0.53"
Flow Length=340' Tc=27.5 min CN=58 Runoff=0.7 cfs 5,510 cf

Subcatchment ES07: ES-02 Runoff Area=902,851 sf 0.00% Impervious Runoff Depth>0.70"
Flow Length=1,200' Tc=33.4 min CN=62 Runoff=7.5 cfs 52,941 cf

Reach ER3: R-03 Reach Avg. Flow Depth=0.03' Max Vel=0.17 fps Inflow=0.1 cfs 3,861 cf
n=0.100 L=1,421.0' S=0.0190 '/' Capacity=19.1 cfs Outflow=0.1 cfs 3,229 cf

Link EPol01: Ex Pol-01 Inflow=5.2 cfs 40,724 cf
Primary=5.2 cfs 40,724 cf

Link EPol02: Ex Pol-02 Inflow=7.5 cfs 56,170 cf
Primary=7.5 cfs 56,170 cf

Link EPol03: Ex Pol-03 Inflow=3.0 cfs 29,099 cf
Primary=3.0 cfs 29,099 cf

Link EPol04: Ex Pol-04 Inflow=0.2 cfs 6,274 cf
Primary=0.2 cfs 6,274 cf

Link EPol05: Ex Pol-05 Inflow=2.7 cfs 19,098 cf
Primary=2.7 cfs 19,098 cf

Link EPol06: Ex Pol-06 Inflow=0.7 cfs 5,510 cf
Primary=0.7 cfs 5,510 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 157,507 cf Average Runoff Depth = 0.48"
98.02% Pervious = 3,879,801 sf 1.98% Impervious = 78,355 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01	Runoff Area=1,086,569 sf 2.77% Impervious Runoff Depth>1.37" Flow Length=1,030' Tc=22.6 min CN=56 Runoff=22.5 cfs 123,847 cf
Subcatchment ES02: ES-02	Runoff Area=399,877 sf 9.83% Impervious Runoff Depth>0.65" Flow Length=724' Tc=14.3 min CN=45 Runoff=3.0 cfs 21,706 cf
Subcatchment ES03: ES-03	Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>1.88" Flow Length=1,040' Tc=62.6 min CN=63 Runoff=8.8 cfs 73,712 cf
Subcatchment ES04: ES-04	Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>0.64" Flow Length=1,040' Tc=49.8 min CN=45 Runoff=3.2 cfs 35,720 cf
Subcatchment ES05: ES-05	Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>1.90" Flow Length=720' Tc=34.6 min CN=63 Runoff=7.9 cfs 48,275 cf
Subcatchment ES06: ES-06	Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>1.51" Flow Length=340' Tc=27.5 min CN=58 Runoff=2.7 cfs 15,770 cf
Subcatchment ES07: ES-02	Runoff Area=902,851 sf 0.00% Impervious Runoff Depth>1.82" Flow Length=1,200' Tc=33.4 min CN=62 Runoff=22.7 cfs 136,840 cf
Reach ER3: R-03 Reach	Avg. Flow Depth=0.11' Max Vel=0.44 fps Inflow=3.0 cfs 21,706 cf n=0.100 L=1,421.0' S=0.0190 '/' Capacity=19.1 cfs Outflow=1.3 cfs 20,450 cf
Link EPol01: Ex Pol-01	Inflow=22.5 cfs 123,847 cf Primary=22.5 cfs 123,847 cf
Link EPol02: Ex Pol-02	Inflow=23.6 cfs 157,290 cf Primary=23.6 cfs 157,290 cf
Link EPol03: Ex Pol-03	Inflow=8.8 cfs 73,712 cf Primary=8.8 cfs 73,712 cf
Link EPol04: Ex Pol-04	Inflow=3.2 cfs 35,720 cf Primary=3.2 cfs 35,720 cf
Link EPol05: Ex Pol-05	Inflow=7.9 cfs 48,275 cf Primary=7.9 cfs 48,275 cf
Link EPol06: Ex Pol-06	Inflow=2.7 cfs 15,770 cf Primary=2.7 cfs 15,770 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 455,871 cf Average Runoff Depth = 1.38"
98.02% Pervious = 3,879,801 sf 1.98% Impervious = 78,355 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=1,086,569 sf 2.77% Impervious Runoff Depth>2.29"
Flow Length=1,030' Tc=22.6 min CN=56 Runoff=40.5 cfs 207,340 cf

Subcatchment ES02: ES-02 Runoff Area=399,877 sf 9.83% Impervious Runoff Depth>1.29"
Flow Length=724' Tc=14.3 min CN=45 Runoff=8.1 cfs 43,077 cf

Subcatchment ES03: ES-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>2.95"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=14.3 cfs 115,597 cf

Subcatchment ES04: ES-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>1.28"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=8.0 cfs 71,088 cf

Subcatchment ES05: ES-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>2.97"
Flow Length=720' Tc=34.6 min CN=63 Runoff=12.8 cfs 75,647 cf

Subcatchment ES06: ES-06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>2.48"
Flow Length=340' Tc=27.5 min CN=58 Runoff=4.7 cfs 25,857 cf

Subcatchment ES07: ES-02 Runoff Area=902,851 sf 0.00% Impervious Runoff Depth>2.87"
Flow Length=1,200' Tc=33.4 min CN=62 Runoff=37.0 cfs 216,234 cf

Reach ER3: R-03 Reach Avg. Flow Depth=0.21' Max Vel=0.66 fps Inflow=8.1 cfs 43,077 cf
n=0.100 L=1,421.0' S=0.0190 '/' Capacity=19.1 cfs Outflow=4.0 cfs 41,391 cf

Link EPol01: Ex Pol-01 Inflow=40.5 cfs 207,340 cf
Primary=40.5 cfs 207,340 cf

Link EPol02: Ex Pol-02 Inflow=40.7 cfs 257,626 cf
Primary=40.7 cfs 257,626 cf

Link EPol03: Ex Pol-03 Inflow=14.3 cfs 115,597 cf
Primary=14.3 cfs 115,597 cf

Link EPol04: Ex Pol-04 Inflow=8.0 cfs 71,088 cf
Primary=8.0 cfs 71,088 cf

Link EPol05: Ex Pol-05 Inflow=12.8 cfs 75,647 cf
Primary=12.8 cfs 75,647 cf

Link EPol06: Ex Pol-06 Inflow=4.7 cfs 25,857 cf
Primary=4.7 cfs 25,857 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 754,841 cf Average Runoff Depth = 2.29"
98.02% Pervious = 3,879,801 sf 1.98% Impervious = 78,355 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=1,086,569 sf 2.77% Impervious Runoff Depth>3.26"
Flow Length=1,030' Tc=22.6 min CN=56 Runoff=59.3 cfs 295,011 cf

Subcatchment ES02: ES-02 Runoff Area=399,877 sf 9.83% Impervious Runoff Depth>2.02"
Flow Length=724' Tc=14.3 min CN=45 Runoff=14.3 cfs 67,325 cf

Subcatchment ES03: ES-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>4.04"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=19.7 cfs 158,145 cf

Subcatchment ES04: ES-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>2.00"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=13.9 cfs 111,263 cf

Subcatchment ES05: ES-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>4.07"
Flow Length=720' Tc=34.6 min CN=63 Runoff=17.7 cfs 103,439 cf

Subcatchment ES06: ES-06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>3.49"
Flow Length=340' Tc=27.5 min CN=58 Runoff=6.8 cfs 36,339 cf

Subcatchment ES07: ES-02 Runoff Area=902,851 sf 0.00% Impervious Runoff Depth>3.95"
Flow Length=1,200' Tc=33.4 min CN=62 Runoff=51.5 cfs 297,199 cf

Reach ER3: R-03 Reach Avg. Flow Depth=0.31' Max Vel=0.83 fps Inflow=14.3 cfs 67,325 cf
n=0.100 L=1,421.0' S=0.0190 '/' Capacity=19.1 cfs Outflow=8.0 cfs 65,268 cf

Link EPol01: Ex Pol-01 Inflow=59.3 cfs 295,011 cf
Primary=59.3 cfs 295,011 cf

Link EPol02: Ex Pol-02 Inflow=59.3 cfs 362,467 cf
Primary=59.3 cfs 362,467 cf

Link EPol03: Ex Pol-03 Inflow=19.7 cfs 158,145 cf
Primary=19.7 cfs 158,145 cf

Link EPol04: Ex Pol-04 Inflow=13.9 cfs 111,263 cf
Primary=13.9 cfs 111,263 cf

Link EPol05: Ex Pol-05 Inflow=17.7 cfs 103,439 cf
Primary=17.7 cfs 103,439 cf

Link EPol06: Ex Pol-06 Inflow=6.8 cfs 36,339 cf
Primary=6.8 cfs 36,339 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 1,068,721 cf Average Runoff Depth = 3.24"
98.02% Pervious = 3,879,801 sf 1.98% Impervious = 78,355 sf

APPENDIX C – PRE-DEVELOPMENT CALCULATIONS (10-YEAR STORM EVENT)

(This Page Is Intentionally Blank)

Summary for Subcatchment ES01: ES-01

Run from top of graveyard, thru site, and into wetland.

Runoff = 22.5 cfs @ 12.36 hrs, Volume= 123,847 cf, Depth> 1.37"
Routed to Link EPoI01 : Ex PoI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
28,755	98	Paved parking, HSG A	Pavement
1,391	98	Roofs, HSG A	Roofs
107,595	30	Woods, Good, HSG A	Woods
333,961	55	Woods, Good, HSG B	Woods
284,601	70	Woods, Good, HSG C	Woods
190,112	39	>75% Grass cover, Good, HSG A	Open Space
139,756	61	>75% Grass cover, Good, HSG B	Brush
398	74	>75% Grass cover, Good, HSG C	Brush
1,086,569	56	Weighted Average	
1,056,423		97.23% Pervious Area	
30,146		2.77% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.9	210	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
12.0	720	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
22.6	1,030	Total			

Summary for Subcatchment ES02: ES-02

Runoff = 3.0 cfs @ 12.35 hrs, Volume= 21,706 cf, Depth> 0.65"
Routed to Reach ER3 : R-03 Reach

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
39,291	98	Paved parking, HSG A	Pavement
6,841	30	Woods, Good, HSG A	Woods
0	55	Woods, Good, HSG B	Woods
0	70	Woods, Good, HSG C	Woods
353,745	39	>75% Grass cover, Good, HSG A	Open Space
0	61	>75% Grass cover, Good, HSG B	Open Space
399,877	45	Weighted Average	
360,586		90.17% Pervious Area	
39,291		9.83% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
4.7	600	0.0200	2.12		**Shallow Concentrated Flow, Shallow Concentrated** Grassed Waterway Kv= 15.0 fps
0.5	24	0.0300	0.87		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
14.3	724	Total			

Summary for Subcatchment ES03: ES-03

Runoff = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf, Depth> 1.88"
Routed to Link EPoI03 : Ex PoI-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
218,042	55	Woods, Good, HSG B	Woods
251,840	70	Woods, Good, HSG C	Woods
469,882	63	Weighted Average	
469,882		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.8	100	0.0200	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
27.8	940	0.0127	0.56		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
62.6	1,040	Total			

Summary for Subcatchment ES04: ES-04

Runoff = 3.2 cfs @ 12.90 hrs, Volume= 35,720 cf, Depth> 0.64"
Routed to Link EPoI04 : Ex PoI-04

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
8,918	98	Paved parking, HSG A	Pavement
227	96	Gravel surface, HSG A	Roadway
6,625	96	Gravel surface, HSG B	Roadway
1,882	96	Gravel surface, HSG C	Roadway
163,386	30	Woods, Good, HSG A	Woods
163,096	55	Woods, Good, HSG B	Woods
22,827	70	Woods, Good, HSG C	Woods
260,043	39	>75% Grass cover, Good, HSG A	Open Space
38,989	61	>75% Grass cover, Good, HSG B	Open Space
2,699	74	>75% Grass cover, Good, HSG C	Open Space
668,692	45	Weighted Average	
659,774		98.67% Pervious Area	
8,918		1.33% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	100	0.0400	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
8.2	300	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
15.2	640	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
49.8	1,040	Total			

Summary for Subcatchment ES05: ES-05

Runoff = 7.9 cfs @ 12.52 hrs, Volume= 48,275 cf, Depth> 1.90"
Routed to Link EPoI05 : Ex PoI-05

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
141,482	55	Woods, Good, HSG B	Open Water
163,730	70	Woods, Good, HSG C	Woods
305,212	63	Weighted Average	
305,212		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.0800	0.08		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
1.4	120	0.0830	1.44		**Shallow Concentrated Flow, Shallow Concentrates** Woodland Kv= 5.0 fps
13.2	500	0.0160	0.63		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
34.6	720	Total			

Summary for Subcatchment ES06: ES-06

Runoff = 2.7 cfs @ 12.43 hrs, Volume= 15,770 cf, Depth> 1.51"
Routed to Link EPoI06 : Ex PoI-06

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
99,363	55	Woods, Good, HSG B	Woods
25,710	70	Woods, Good, HSG C	Woods
125,073	58	Weighted Average	
125,073		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0600	0.07		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
5.1	240	0.0250	0.79		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
27.5	340	Total			

Summary for Subcatchment ES07: ES-02

Runoff = 22.7 cfs @ 12.50 hrs, Volume= 136,840 cf, Depth> 1.82"
Routed to Link EPoI02 : Ex PoI-02

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Pavement
0	30	Woods, Good, HSG A	Woods
451,295	55	Woods, Good, HSG B	Woods
446,489	70	Woods, Good, HSG C	Woods
0	39	>75% Grass cover, Good, HSG A	Open Space
5,067	61	>75% Grass cover, Good, HSG B	Open Space
902,851	62	Weighted Average	
902,851		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0500	0.12		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.70"
19.6	1,100	0.0350	0.94		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
33.4	1,200	Total			

Summary for Reach ER3: R-03 Reach

Inflow Area = 399,877 sf, 9.83% Impervious, Inflow Depth > 0.65" for 10-Year event
Inflow = 3.0 cfs @ 12.35 hrs, Volume= 21,706 cf
Outflow = 1.3 cfs @ 12.86 hrs, Volume= 20,450 cf, Atten= 58%, Lag= 30.5 min
Routed to Link EPol02 : Ex Pol-02

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.44 fps, Min. Travel Time= 54.2 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 82.3 min

Peak Storage= 4,098 cf @ 12.86 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 29.25'
Bank-Full Depth= 0.50' Flow Area= 17.5 sf, Capacity= 19.1 cfs

25.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 45.00'
Length= 1,421.0' Slope= 0.0190 '/'
Inlet Invert= 53.00', Outlet Invert= 26.00'

‡

Summary for Link EPol01: Ex Pol-01

Inflow Area = 1,086,569 sf, 2.77% Impervious, Inflow Depth > 1.37" for 10-Year event
Inflow = 22.5 cfs @ 12.36 hrs, Volume= 123,847 cf
Primary = 22.5 cfs @ 12.36 hrs, Volume= 123,847 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol02: Ex Pol-02

Inflow Area = 1,302,728 sf, 3.02% Impervious, Inflow Depth > 1.45" for 10-Year event
Inflow = 23.6 cfs @ 12.51 hrs, Volume= 157,290 cf
Primary = 23.6 cfs @ 12.51 hrs, Volume= 157,290 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol03: Ex Pol-03

Inflow Area = 469,882 sf, 0.00% Impervious, Inflow Depth > 1.88" for 10-Year event
Inflow = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf
Primary = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol04: Ex Pol-04

Inflow Area =	668,692 sf,	1.33% Impervious,	Inflow Depth > 0.64"	for 10-Year event	
Inflow =	3.2 cfs @	12.90 hrs, Volume=	35,720 cf		
Primary =	3.2 cfs @	12.90 hrs, Volume=	35,720 cf,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol05: Ex Pol-05

Inflow Area =	305,212 sf,	0.00% Impervious,	Inflow Depth > 1.90"	for 10-Year event	
Inflow =	7.9 cfs @	12.52 hrs, Volume=	48,275 cf		
Primary =	7.9 cfs @	12.52 hrs, Volume=	48,275 cf,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

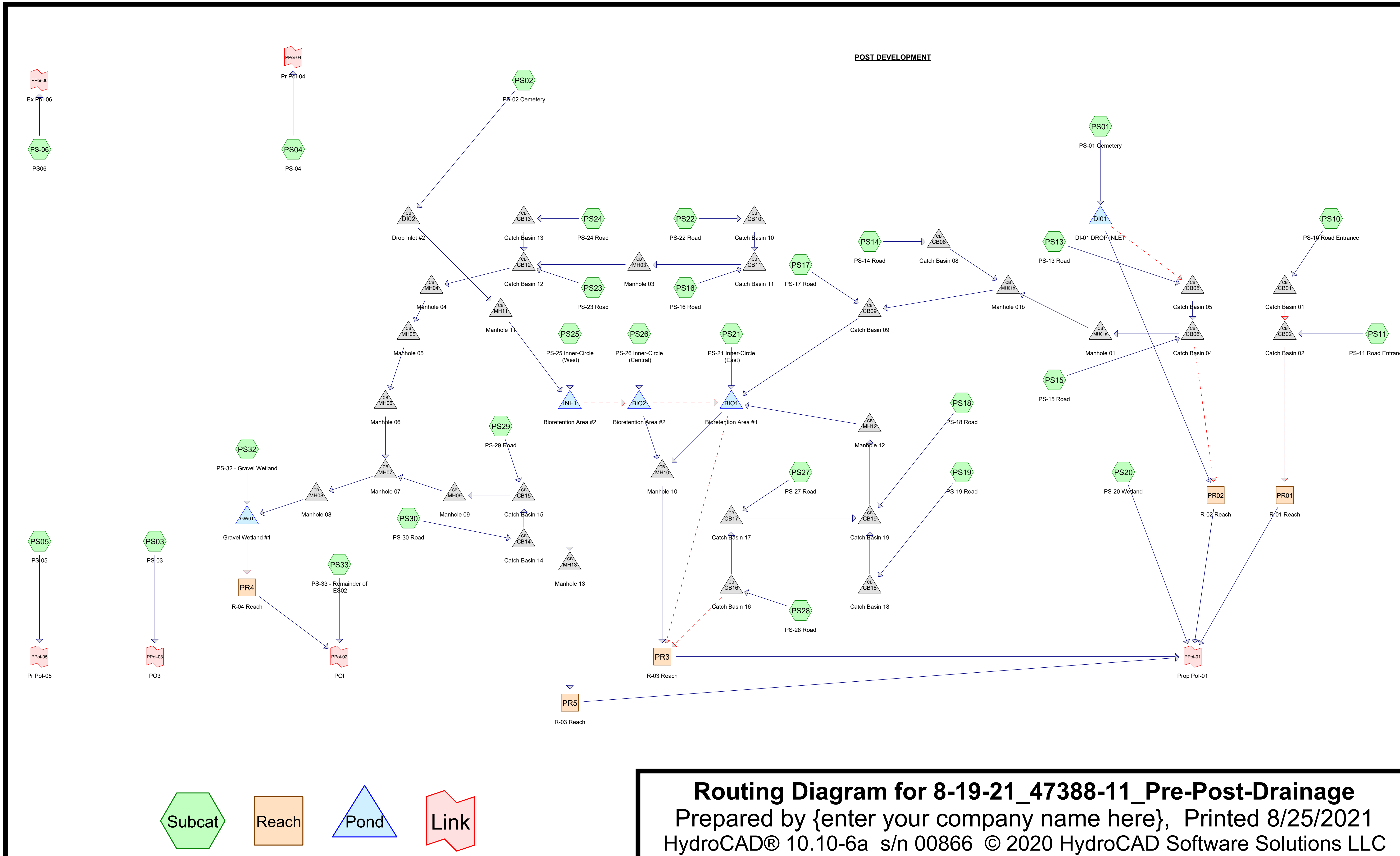
Summary for Link EPol06: Ex Pol-06

Inflow Area =	125,073 sf,	0.00% Impervious,	Inflow Depth > 1.51"	for 10-Year event	
Inflow =	2.7 cfs @	12.43 hrs, Volume=	15,770 cf		
Primary =	2.7 cfs @	12.43 hrs, Volume=	15,770 cf,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDIX D – POST-DEVELOPMENT CALCULATIONS

(This Page Is Intentionally Blank)



Routing Diagram for 8-19-21_47388-11_Pre-Post-Drainage
Prepared by {enter your company name here}, Printed 8/25/2021
HydroCAD® 10.10-6a s/n 00866 © 2020 HydroCAD Software Solutions LLC

(This Page Is Intentionally Blank)

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
851,890	39	>75% Grass cover, Good, HSG A (PS01, PS02, PS04, PS10, PS11, PS13, PS14, PS15, PS17, PS20, PS21)
474,447	61	>75% Grass cover, Good, HSG B (PS01, PS02, PS04, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21, PS22, PS23, PS24, PS25, PS26, PS27, PS28, PS29, PS30, PS32, PS33)
7,213	74	>75% Grass cover, Good, HSG C (PS04, PS20, PS32, PS33)
227	96	Gravel surface, HSG A (PS04)
17,722	96	Gravel surface, HSG B (PS03, PS04, PS17, PS18, PS21, PS23, PS24, PS25, PS26, PS29, PS30, PS33)
1,882	96	Gravel surface, HSG C (PS04)
103,504	98	Paved parking, HSG A (PS01, PS02, PS04, PS10, PS11, PS13, PS14, PS15, PS17)
98,708	98	Paved parking, HSG B (PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS22, PS23, PS24, PS27, PS28, PS29, PS30)
18,781	98	Roofs, HSG A (PS01, PS10, PS13, PS14)
102,134	98	Roofs, HSG B (PS01, PS02, PS14, PS20, PS21, PS22, PS23, PS24, PS25, PS26, PS27, PS29, PS30, PS33)
185,902	30	Woods, Good, HSG A (PS01, PS02, PS04, PS10, PS20)
904,665	55	Woods, Good, HSG B (PS-06, PS01, PS02, PS03, PS04, PS05, PS20, PS24, PS30, PS32, PS33)
1,191,081	70	Woods, Good, HSG C (PS-06, PS03, PS04, PS05, PS20, PS33)
3,958,156	**59**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,160,304	HSG A	PS01, PS02, PS04, PS10, PS11, PS13, PS14, PS15, PS17, PS20, PS21
1,597,676	HSG B	PS-06, PS01, PS02, PS03, PS04, PS05, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21, PS22, PS23, PS24, PS25, PS26, PS27, PS28, PS29, PS30, PS32, PS33
1,200,176	HSG C	PS-06, PS03, PS04, PS05, PS20, PS32, PS33
0	HSG D	
0	Other	
3,958,156		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-06: PS06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>0.53"
Flow Length=340' Tc=27.5 min CN=58 Runoff=0.7 cfs 5,510 cf

Subcatchment PS01: PS-01 Cemetery Runoff Area=301,519 sf 11.75% Impervious Runoff Depth>0.19"
Flow Length=517' Tc=11.5 min CN=48 Runoff=0.3 cfs 4,749 cf

Subcatchment PS02: PS-02 Cemetery Runoff Area=394,562 sf 8.81% Impervious Runoff Depth>0.14"
Flow Length=1,189' Tc=25.2 min CN=46 Runoff=0.2 cfs 4,516 cf

Subcatchment PS03: PS-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>0.74"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=3.0 cfs 29,099 cf

Subcatchment PS04: PS-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>0.11"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=0.2 cfs 6,274 cf

Subcatchment PS05: PS-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>0.75"
Flow Length=720' Tc=34.6 min CN=63 Runoff=2.7 cfs 19,098 cf

Subcatchment PS10: PS-10 Road Entrance Runoff Area=18,388 sf 32.87% Impervious Runoff Depth>0.53"
Flow Length=164' Tc=8.7 min CN=58 Runoff=0.2 cfs 816 cf

Subcatchment PS11: PS-11 Road Entrance Runoff Area=3,232 sf 78.99% Impervious Runoff Depth>2.27"
Flow Length=131' Tc=5.0 min CN=86 Runoff=0.2 cfs 613 cf

Subcatchment PS13: PS-13 Road Runoff Area=31,258 sf 59.25% Impervious Runoff Depth>1.38"
Flow Length=242' Tc=9.0 min CN=74 Runoff=1.0 cfs 3,588 cf

Subcatchment PS14: PS-14 Road Runoff Area=46,676 sf 50.48% Impervious Runoff Depth>1.44"
Flow Length=330' Tc=9.8 min CN=75 Runoff=1.5 cfs 5,610 cf

Subcatchment PS15: PS-15 Road Runoff Area=5,529 sf 78.57% Impervious Runoff Depth>2.19"
Flow Length=207' Tc=5.0 min CN=85 Runoff=0.3 cfs 1,009 cf

Subcatchment PS16: PS-16 Road Runoff Area=6,627 sf 55.82% Impervious Runoff Depth>1.95"
Flow Length=177' Tc=5.0 min CN=82 Runoff=0.3 cfs 1,076 cf

Subcatchment PS17: PS-17 Road Runoff Area=12,439 sf 58.98% Impervious Runoff Depth>1.87"
Flow Length=362' Tc=5.7 min CN=81 Runoff=0.6 cfs 1,939 cf

Subcatchment PS18: PS-18 Road Runoff Area=21,966 sf 41.08% Impervious Runoff Depth>1.58"
Flow Length=290' Tc=10.5 min CN=77 Runoff=0.8 cfs 2,887 cf

Subcatchment PS19: PS-19 Road Runoff Area=10,861 sf 67.42% Impervious Runoff Depth>2.27"
Flow Length=239' Tc=5.3 min CN=86 Runoff=0.7 cfs 2,059 cf

Subcatchment PS20: PS-20 Wetland Runoff Area=497,789 sf 3.51% Impervious Runoff Depth>0.85"
Flow Length=518' Tc=41.1 min CN=65 Runoff=4.8 cfs 35,186 cf

Subcatchment PS21: PS-21 Inner-Circle Runoff Area=68,052 sf 28.33% Impervious Runoff Depth>1.25"
Flow Length=138' Slope=0.0600 '/' Tc=6.1 min CN=72 Runoff=2.2 cfs 7,102 cf

Subcatchment PS22: PS-22 Road Runoff Area=12,972 sf 53.89% Impervious Runoff Depth>1.87"
Flow Length=215' Tc=9.5 min CN=81 Runoff=0.6 cfs 2,020 cf

Subcatchment PS23: PS-23 Road Runoff Area=21,891 sf 55.57% Impervious Runoff Depth>1.95"
Flow Length=333' Slope=0.0200 '/' Tc=6.1 min CN=82 Runoff=1.1 cfs 3,552 cf

Subcatchment PS24: PS-24 Road Runoff Area=55,697 sf 48.63% Impervious Runoff Depth>1.72"
Flow Length=375' Slope=0.0200 '/' Tc=9.6 min CN=79 Runoff=2.2 cfs 7,982 cf

Subcatchment PS25: PS-25 Inner-Circle Runoff Area=57,231 sf 16.32% Impervious Runoff Depth>1.02"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=68 Runoff=1.4 cfs 4,856 cf

Subcatchment PS26: PS-26 Inner-Circle Runoff Area=56,221 sf 27.09% Impervious Runoff Depth>1.31"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=73 Runoff=1.9 cfs 6,159 cf

Subcatchment PS27: PS-27 Road Runoff Area=12,543 sf 56.40% Impervious Runoff Depth>1.95"
Flow Length=378' Tc=10.1 min CN=82 Runoff=0.6 cfs 2,034 cf

Subcatchment PS28: PS-28 Road Runoff Area=13,299 sf 49.44% Impervious Runoff Depth>1.72"
Flow Length=364' Tc=7.9 min CN=79 Runoff=0.6 cfs 1,907 cf

Subcatchment PS29: PS-29 Road Runoff Area=31,769 sf 53.29% Impervious Runoff Depth>1.87"
Flow Length=355' Tc=9.6 min CN=81 Runoff=1.4 cfs 4,947 cf

Subcatchment PS30: PS-30 Road Runoff Area=43,899 sf 42.17% Impervious Runoff Depth>1.58"
Flow Length=446' Tc=13.0 min CN=77 Runoff=1.5 cfs 5,767 cf

Subcatchment PS32: PS-32 - Gravel Wetland Runoff Area=67,368 sf 0.00% Impervious Runoff Depth>0.49"
Flow Length=194' Tc=21.2 min CN=57 Runoff=0.4 cfs 2,747 cf

Subcatchment PS33: PS-33 - Remainder of Runoff Area=597,509 sf 0.83% Impervious Runoff Depth>0.96"
Flow Length=794' Tc=34.5 min CN=67 Runoff=7.4 cfs 47,552 cf

Reach PR01: R-01 Reach Avg. Flow Depth=0.03' Max Vel=0.19 fps Inflow=0.3 cfs 1,429 cf
n=0.100 L=501.0' S=0.0199 '/' Capacity=19.5 cfs Outflow=0.1 cfs 1,362 cf

Reach PR02: R-02 Reach Avg. Flow Depth=0.04' Max Vel=0.22 fps Inflow=0.3 cfs 4,748 cf
n=0.100 L=487.0' S=0.0189 '/' Capacity=19.0 cfs Outflow=0.2 cfs 4,545 cf

Reach PR3: R-03 Reach Avg. Flow Depth=0.03' Max Vel=0.14 fps Inflow=0.1 cfs 4,284 cf
n=0.100 L=487.0' S=0.0101 '/' Capacity=52.5 cfs Outflow=0.1 cfs 3,909 cf

Reach PR4: R-04 Reach Avg. Flow Depth=0.04' Max Vel=0.20 fps Inflow=0.2 cfs 6,583 cf
n=0.100 L=594.0' S=0.0126 '/' Capacity=15.6 cfs Outflow=0.2 cfs 6,073 cf

Reach PR5: R-03 Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.0 cfs 0 cf
n=0.100 L=40.0' S=0.0050 '/' Capacity=9.8 cfs Outflow=0.0 cfs 0 cf

Pond BIO1: Bioretention Area #1 Peak Elev=36.73' Storage=24,191 cf Inflow=7.9 cfs 28,106 cf
Primary=0.1 cfs 3,921 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 3,921 cf

Pond BIO2: Bioretention Area #2 Peak Elev=39.27' Storage=5,794 cf Inflow=1.9 cfs 6,159 cf
Primary=0.0 cfs 363 cf Secondary=0.0 cfs 0 cf Outflow=0.0 cfs 363 cf

Pond CB01: Catch Basin 01 Peak Elev=36.88' Inflow=0.2 cfs 816 cf
Primary=0.2 cfs 816 cf Secondary=0.0 cfs 0 cf Outflow=0.2 cfs 816 cf

Pond CB02: Catch Basin 02 Peak Elev=36.72' Inflow=0.3 cfs 1,429 cf
Primary=0.3 cfs 1,429 cf Secondary=0.0 cfs 0 cf Outflow=0.3 cfs 1,429 cf

Pond CB05: Catch Basin 05 Peak Elev=38.64' Inflow=1.0 cfs 3,588 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0075 '/' Outflow=1.0 cfs 3,588 cf

Pond CB06: Catch Basin 04 Peak Elev=38.18' Inflow=1.3 cfs 4,597 cf
Primary=1.3 cfs 4,597 cf Secondary=0.0 cfs 0 cf Outflow=1.3 cfs 4,597 cf

Pond CB08: Catch Basin 08 Peak Elev=39.33' Inflow=1.5 cfs 5,610 cf
18.0" Round Culvert n=0.013 L=24.0' S=0.0125 '/' Outflow=1.5 cfs 5,610 cf

Pond CB09: Catch Basin 09 Peak Elev=36.73' Inflow=3.4 cfs 12,145 cf
24.0" Round Culvert n=0.013 L=171.0' S=0.0056 '/' Outflow=3.4 cfs 12,136 cf

Pond CB10: Catch Basin 10 Peak Elev=45.44' Inflow=0.6 cfs 2,020 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=0.6 cfs 2,020 cf

Pond CB11: Catch Basin 11 Peak Elev=45.28' Inflow=0.9 cfs 3,096 cf
15.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=0.9 cfs 3,096 cf

Pond CB12: Catch Basin 12 Peak Elev=42.61' Inflow=4.2 cfs 14,630 cf
24.0" Round Culvert n=0.013 L=104.0' S=0.0058 '/' Outflow=4.2 cfs 14,630 cf

Pond CB13: Catch Basin 13 Peak Elev=43.03' Inflow=2.2 cfs 7,982 cf
16.0" Round Culvert n=0.013 L=16.0' S=0.0156 '/' Outflow=2.2 cfs 7,982 cf

Pond CB14: Catch Basin 14 Peak Elev=41.42' Inflow=1.5 cfs 5,767 cf
18.0" Round Culvert n=0.013 L=28.0' S=-0.0054 '/' Outflow=1.5 cfs 5,767 cf

Pond CB15: Catch Basin 15 Peak Elev=41.34' Inflow=2.8 cfs 10,714 cf
18.0" Round Culvert n=0.013 L=70.0' S=0.0057 '/' Outflow=2.8 cfs 10,714 cf

Pond CB16: Catch Basin 16 Peak Elev=37.17' Inflow=0.6 cfs 1,907 cf
Primary=0.6 cfs 1,907 cf Secondary=0.0 cfs 0 cf Outflow=0.6 cfs 1,907 cf

Pond CB17: Catch Basin 17 Peak Elev=36.87' Inflow=1.1 cfs 3,940 cf
18.0" Round Culvert n=0.013 L=225.0' S=0.0084 '/' Outflow=1.1 cfs 3,940 cf

Pond CB18: Catch Basin 18 Peak Elev=36.71' Inflow=0.7 cfs 2,059 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=0.7 cfs 2,056 cf

Pond CB19: Catch Basin 19 Peak Elev=36.72' Inflow=2.5 cfs 8,884 cf
24.0" Round Culvert n=0.013 L=76.0' S=0.0053 '/' Outflow=2.5 cfs 8,871 cf

Pond DI01: DI-01 DROP INLET Peak Elev=36.67' Storage=1 cf Inflow=0.3 cfs 4,749 cf
Primary=0.3 cfs 4,748 cf Secondary=0.0 cfs 0 cf Outflow=0.3 cfs 4,748 cf

Pond DI02: Drop Inlet #2 Peak Elev=46.59' Inflow=0.2 cfs 4,516 cf
24.0" Round Culvert n=0.013 L=185.0' S=0.0065 '/' Outflow=0.2 cfs 4,516 cf

Pond GW01: Gravel Wetland #1 Peak Elev=36.79' Storage=21,834 cf Inflow=6.9 cfs 28,091 cf
Primary=0.2 cfs 6,583 cf Secondary=0.0 cfs 0 cf Outflow=0.2 cfs 6,583 cf

Pond INF1: Bioretention Area #2 Peak Elev=43.22' Storage=798 cf Inflow=1.4 cfs 9,373 cf
Discarded=0.7 cfs 9,275 cf Primary=0.0 cfs 0 cf Secondary=0.0 cfs 0 cf Outflow=0.7 cfs 9,275 cf

Pond MH01a: Manhole 01 Peak Elev=37.10' Inflow=1.3 cfs 4,597 cf
18.0" Round Culvert n=0.013 L=87.0' S=0.0057 '/' Outflow=1.3 cfs 4,597 cf

Pond MH01b: Manhole 01b Peak Elev=36.73' Inflow=2.8 cfs 10,207 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=2.8 cfs 10,207 cf

Pond MH03: Manhole 03 Peak Elev=43.77' Inflow=0.9 cfs 3,096 cf
18.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=0.9 cfs 3,096 cf

Pond MH04: Manhole 04 Peak Elev=41.91' Inflow=4.2 cfs 14,630 cf
24.0" Round Culvert n=0.013 L=82.0' S=0.0061 '/' Outflow=4.2 cfs 14,630 cf

Pond MH05: Manhole 05 Peak Elev=41.29' Inflow=4.2 cfs 14,630 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=4.2 cfs 14,630 cf

Pond MH06: Manhole 06 Peak Elev=40.61' Inflow=4.2 cfs 14,630 cf
24.0" Round Culvert n=0.013 L=129.0' S=0.0058 '/' Outflow=4.2 cfs 14,630 cf

Pond MH07: Manhole 07 Peak Elev=39.64' Inflow=6.8 cfs 25,344 cf
30.0" Round Culvert n=0.013 L=285.0' S=0.0054 '/' Outflow=6.8 cfs 25,344 cf

Pond MH08: Manhole 08 Peak Elev=37.94' Inflow=6.8 cfs 25,344 cf
30.0" Round Culvert n=0.013 L=176.0' S=0.0068 '/' Outflow=6.8 cfs 25,344 cf

Pond MH09: Manhole 09 Peak Elev=40.46' Inflow=2.8 cfs 10,714 cf
24.0" Round Culvert n=0.013 L=143.0' S=0.0052 '/' Outflow=2.8 cfs 10,714 cf

Pond MH10: Manhole 10 Peak Elev=32.26' Inflow=0.1 cfs 4,284 cf
24.0" Round Culvert x 2.00 n=0.013 L=220.0' S=0.0052 '/' Outflow=0.1 cfs 4,284 cf

Pond MH11: Manhole 11 Peak Elev=45.28' Inflow=0.2 cfs 4,516 cf
24.0" Round Culvert n=0.013 L=178.0' S=0.0076 '/' Outflow=0.2 cfs 4,516 cf

Pond MH12: Manhole 12 Peak Elev=36.72' Inflow=2.5 cfs 8,871 cf
24.0" Round Culvert x 2.00 n=0.013 L=45.0' S=0.0051 '/' Outflow=2.5 cfs 8,861 cf

Pond MH13: Manhole 13 Peak Elev=37.30' Inflow=0.0 cfs 0 cf
24.0" Round Culvert n=0.013 L=148.0' S=0.0257 '/' Outflow=0.0 cfs 0 cf

Link PPoi-01: Prop Pol-01 Inflow=5.1 cfs 45,002 cf
Primary=5.1 cfs 45,002 cf

Link PPoi-02: POI Inflow=7.4 cfs 53,626 cf
Primary=7.4 cfs 53,626 cf

Link PPoi-03: PO3 Inflow=3.0 cfs 29,099 cf
Primary=3.0 cfs 29,099 cf

Link PPoi-04: Pr Pol-04 Inflow=0.2 cfs 6,274 cf
Primary=0.2 cfs 6,274 cf

Link PPoi-05: Pr Pol-05 Inflow=2.7 cfs 19,098 cf
Primary=2.7 cfs 19,098 cf

Link PPoi-06: Ex Pol-06 Inflow=0.7 cfs 5,510 cf
Primary=0.7 cfs 5,510 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 220,654 cf Average Runoff Depth = 0.67"
91.84% Pervious = 3,635,029 sf 8.16% Impervious = 323,127 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-06: PS06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>1.51"
Flow Length=340' Tc=27.5 min CN=58 Runoff=2.7 cfs 15,770 cf

Subcatchment PS01: PS-01 Cemetery Runoff Area=301,519 sf 11.75% Impervious Runoff Depth>0.83"
Flow Length=517' Tc=11.5 min CN=48 Runoff=3.7 cfs 20,895 cf

Subcatchment PS02: PS-02 Cemetery Runoff Area=394,562 sf 8.81% Impervious Runoff Depth>0.71"
Flow Length=1,189' Tc=25.2 min CN=46 Runoff=2.9 cfs 23,224 cf

Subcatchment PS03: PS-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>1.88"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=8.8 cfs 73,712 cf

Subcatchment PS04: PS-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>0.64"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=3.2 cfs 35,720 cf

Subcatchment PS05: PS-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>1.90"
Flow Length=720' Tc=34.6 min CN=63 Runoff=7.9 cfs 48,275 cf

Subcatchment PS10: PS-10 Road Entrance Runoff Area=18,388 sf 32.87% Impervious Runoff Depth>1.52"
Flow Length=164' Tc=8.7 min CN=58 Runoff=0.6 cfs 2,332 cf

Subcatchment PS11: PS-11 Road Entrance Runoff Area=3,232 sf 78.99% Impervious Runoff Depth>4.05"
Flow Length=131' Tc=5.0 min CN=86 Runoff=0.3 cfs 1,090 cf

Subcatchment PS13: PS-13 Road Runoff Area=31,258 sf 59.25% Impervious Runoff Depth>2.86"
Flow Length=242' Tc=9.0 min CN=74 Runoff=2.1 cfs 7,459 cf

Subcatchment PS14: PS-14 Road Runoff Area=46,676 sf 50.48% Impervious Runoff Depth>2.96"
Flow Length=330' Tc=9.8 min CN=75 Runoff=3.2 cfs 11,497 cf

Subcatchment PS15: PS-15 Road Runoff Area=5,529 sf 78.57% Impervious Runoff Depth>3.94"
Flow Length=207' Tc=5.0 min CN=85 Runoff=0.6 cfs 1,817 cf

Subcatchment PS16: PS-16 Road Runoff Area=6,627 sf 55.82% Impervious Runoff Depth>3.64"
Flow Length=177' Tc=5.0 min CN=82 Runoff=0.6 cfs 2,008 cf

Subcatchment PS17: PS-17 Road Runoff Area=12,439 sf 58.98% Impervious Runoff Depth>3.54"
Flow Length=362' Tc=5.7 min CN=81 Runoff=1.2 cfs 3,666 cf

Subcatchment PS18: PS-18 Road Runoff Area=21,966 sf 41.08% Impervious Runoff Depth>3.14"
Flow Length=290' Tc=10.5 min CN=77 Runoff=1.6 cfs 5,755 cf

Subcatchment PS19: PS-19 Road Runoff Area=10,861 sf 67.42% Impervious Runoff Depth>4.05"
Flow Length=239' Tc=5.3 min CN=86 Runoff=1.2 cfs 3,663 cf

Subcatchment PS20: PS-20 Wetland Runoff Area=497,789 sf 3.51% Impervious Runoff Depth>2.06"
Flow Length=518' Tc=41.1 min CN=65 Runoff=13.0 cfs 85,346 cf

Subcatchment PS21: PS-21 Inner-Circle Runoff Area=68,052 sf 28.33% Impervious Runoff Depth>2.68"
Flow Length=138' Slope=0.0600 '/' Tc=6.1 min CN=72 Runoff=4.8 cfs 15,214 cf

Subcatchment PS22: PS-22 Road Runoff Area=12,972 sf 53.89% Impervious Runoff Depth>3.53"
Flow Length=215' Tc=9.5 min CN=81 Runoff=1.1 cfs 3,820 cf

Subcatchment PS23: PS-23 Road Runoff Area=21,891 sf 55.57% Impervious Runoff Depth>3.64"
Flow Length=333' Slope=0.0200 '/' Tc=6.1 min CN=82 Runoff=2.1 cfs 6,633 cf

Subcatchment PS24: PS-24 Road Runoff Area=55,697 sf 48.63% Impervious Runoff Depth>3.34"
Flow Length=375' Slope=0.0200 '/' Tc=9.6 min CN=79 Runoff=4.4 cfs 15,489 cf

Subcatchment PS25: PS-25 Inner-Circle Runoff Area=57,231 sf 16.32% Impervious Runoff Depth>2.33"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=68 Runoff=3.5 cfs 11,113 cf

Subcatchment PS26: PS-26 Inner-Circle Runoff Area=56,221 sf 27.09% Impervious Runoff Depth>2.77"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=73 Runoff=4.1 cfs 12,994 cf

Subcatchment PS27: PS-27 Road Runoff Area=12,543 sf 56.40% Impervious Runoff Depth>3.63"
Flow Length=378' Tc=10.1 min CN=82 Runoff=1.1 cfs 3,798 cf

Subcatchment PS28: PS-28 Road Runoff Area=13,299 sf 49.44% Impervious Runoff Depth>3.34"
Flow Length=364' Tc=7.9 min CN=79 Runoff=1.1 cfs 3,700 cf

Subcatchment PS29: PS-29 Road Runoff Area=31,769 sf 53.29% Impervious Runoff Depth>3.53"
Flow Length=355' Tc=9.6 min CN=81 Runoff=2.6 cfs 9,355 cf

Subcatchment PS30: PS-30 Road Runoff Area=43,899 sf 42.17% Impervious Runoff Depth>3.14"
Flow Length=446' Tc=13.0 min CN=77 Runoff=2.9 cfs 11,495 cf

Subcatchment PS32: PS-32 - Gravel Wetland Runoff Area=67,368 sf 0.00% Impervious Runoff Depth>1.44"
Flow Length=194' Tc=21.2 min CN=57 Runoff=1.5 cfs 8,093 cf

Subcatchment PS33: PS-33 - Remainder of Runoff Area=597,509 sf 0.83% Impervious Runoff Depth>2.23"
Flow Length=794' Tc=34.5 min CN=67 Runoff=18.7 cfs 110,962 cf

Reach PR01: R-01 Reach Avg. Flow Depth=0.06' Max Vel=0.31 fps Inflow=0.9 cfs 3,422 cf
n=0.100 L=501.0' S=0.0199 '/' Capacity=19.5 cfs Outflow=0.5 cfs 3,321 cf

Reach PR02: R-02 Reach Avg. Flow Depth=0.17' Max Vel=0.58 fps Inflow=3.7 cfs 20,894 cf
n=0.100 L=487.0' S=0.0189 '/' Capacity=19.0 cfs Outflow=2.7 cfs 20,517 cf

Reach PR3: R-03 Reach Avg. Flow Depth=0.14' Max Vel=0.37 fps Inflow=1.5 cfs 27,765 cf
n=0.100 L=487.0' S=0.0101 '/' Capacity=52.5 cfs Outflow=1.4 cfs 27,061 cf

Reach PR4: R-04 Reach Avg. Flow Depth=0.21' Max Vel=0.54 fps Inflow=4.3 cfs 35,080 cf
n=0.100 L=594.0' S=0.0126 '/' Capacity=15.6 cfs Outflow=3.4 cfs 34,374 cf

Reach PR5: R-03 Reach Avg. Flow Depth=0.22' Max Vel=0.35 fps Inflow=2.3 cfs 5,692 cf
n=0.100 L=40.0' S=0.0050 '/' Capacity=9.8 cfs Outflow=2.3 cfs 5,692 cf

Pond BIO1: Bioretention Area #1 Peak Elev=37.75' Storage=35,121 cf Inflow=16.3 cfs 56,551 cf
Primary=1.4 cfs 22,860 cf Secondary=0.0 cfs 0 cf Outflow=1.4 cfs 22,860 cf

Pond BIO2: Bioretention Area #2 Peak Elev=39.76' Storage=8,904 cf Inflow=4.1 cfs 12,994 cf
Primary=0.2 cfs 4,906 cf Secondary=0.0 cfs 0 cf Outflow=0.2 cfs 4,906 cf

Pond CB01: Catch Basin 01 Peak Elev=37.15' Inflow=0.6 cfs 2,332 cf
Primary=0.6 cfs 2,332 cf Secondary=0.0 cfs 0 cf Outflow=0.6 cfs 2,332 cf

Pond CB02: Catch Basin 02 Peak Elev=36.98' Inflow=0.9 cfs 3,422 cf
Primary=0.9 cfs 3,422 cf Secondary=0.0 cfs 0 cf Outflow=0.9 cfs 3,422 cf

Pond CB05: Catch Basin 05 Peak Elev=39.00' Inflow=2.1 cfs 7,459 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0075 '/' Outflow=2.1 cfs 7,459 cf

Pond CB06: Catch Basin 04 Peak Elev=38.49' Inflow=2.6 cfs 9,276 cf
Primary=2.6 cfs 9,276 cf Secondary=0.0 cfs 0 cf Outflow=2.6 cfs 9,276 cf

Pond CB08: Catch Basin 08 Peak Elev=39.66' Inflow=3.2 cfs 11,497 cf
18.0" Round Culvert n=0.013 L=24.0' S=0.0125 '/' Outflow=3.2 cfs 11,497 cf

Pond CB09: Catch Basin 09 Peak Elev=37.75' Inflow=6.9 cfs 24,438 cf
24.0" Round Culvert n=0.013 L=171.0' S=0.0056 '/' Outflow=6.9 cfs 24,438 cf

Pond CB10: Catch Basin 10 Peak Elev=45.65' Inflow=1.1 cfs 3,820 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=1.1 cfs 3,820 cf

Pond CB11: Catch Basin 11 Peak Elev=45.47' Inflow=1.7 cfs 5,829 cf
15.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=1.7 cfs 5,829 cf

Pond CB12: Catch Basin 12 Peak Elev=43.15' Inflow=8.0 cfs 27,950 cf
24.0" Round Culvert n=0.013 L=104.0' S=0.0058 '/' Outflow=8.0 cfs 27,950 cf

Pond CB13: Catch Basin 13 Peak Elev=43.56' Inflow=4.4 cfs 15,489 cf
16.0" Round Culvert n=0.013 L=16.0' S=0.0156 '/' Outflow=4.4 cfs 15,489 cf

Pond CB14: Catch Basin 14 Peak Elev=41.93' Inflow=2.9 cfs 11,495 cf
18.0" Round Culvert n=0.013 L=28.0' S=-0.0054 '/' Outflow=2.9 cfs 11,495 cf

Pond CB15: Catch Basin 15 Peak Elev=41.80' Inflow=5.5 cfs 20,850 cf
18.0" Round Culvert n=0.013 L=70.0' S=0.0057 '/' Outflow=5.5 cfs 20,850 cf

Pond CB16: Catch Basin 16 Peak Elev=37.75' Inflow=1.1 cfs 3,700 cf
Primary=1.1 cfs 3,700 cf Secondary=0.0 cfs 0 cf Outflow=1.1 cfs 3,700 cf

Pond CB17: Catch Basin 17 Peak Elev=37.75' Inflow=2.1 cfs 7,497 cf
18.0" Round Culvert n=0.013 L=225.0' S=0.0084 '/' Outflow=2.1 cfs 7,497 cf

Pond CB18: Catch Basin 18 Peak Elev=37.75' Inflow=1.2 cfs 3,663 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=1.2 cfs 3,663 cf

Pond CB19: Catch Basin 19 Peak Elev=37.75' Inflow=4.7 cfs 16,915 cf
24.0" Round Culvert n=0.013 L=76.0' S=0.0053 '/' Outflow=4.7 cfs 16,915 cf

Pond DI01: DI-01 DROP INLET Peak Elev=37.21' Storage=3 cf Inflow=3.7 cfs 20,895 cf
Primary=3.7 cfs 20,894 cf Secondary=0.0 cfs 0 cf Outflow=3.7 cfs 20,894 cf

Pond DI02: Drop Inlet #2 Peak Elev=47.17' Inflow=2.9 cfs 23,224 cf
24.0" Round Culvert n=0.013 L=185.0' S=0.0065 '/' Outflow=2.9 cfs 23,224 cf

Pond GW01: Gravel Wetland #1 Peak Elev=37.17' Storage=26,590 cf Inflow=14.0 cfs 56,894 cf
Primary=4.3 cfs 35,080 cf Secondary=0.0 cfs 0 cf Outflow=4.3 cfs 35,080 cf

Pond INF1: Bioretention Area #2 Peak Elev=44.23' Storage=5,139 cf Inflow=4.0 cfs 34,337 cf
Discarded=1.1 cfs 28,383 cf Primary=2.3 cfs 5,692 cf Secondary=0.0 cfs 0 cf Outflow=3.4 cfs 34,075 cf

Pond MH01a: Manhole 01 Peak Elev=37.76' Inflow=2.6 cfs 9,276 cf
18.0" Round Culvert n=0.013 L=87.0' S=0.0057 '/' Outflow=2.6 cfs 9,276 cf

Pond MH01b: Manhole 01b Peak Elev=37.76' Inflow=5.8 cfs 20,772 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=5.8 cfs 20,772 cf

Pond MH03: Manhole 03 Peak Elev=44.02' Inflow=1.7 cfs 5,829 cf
18.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=1.7 cfs 5,829 cf

Pond MH04: Manhole 04 Peak Elev=42.45' Inflow=8.0 cfs 27,950 cf
24.0" Round Culvert n=0.013 L=82.0' S=0.0061 '/' Outflow=8.0 cfs 27,950 cf

Pond MH05: Manhole 05 Peak Elev=41.81' Inflow=8.0 cfs 27,950 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=8.0 cfs 27,950 cf

Pond MH06: Manhole 06 Peak Elev=41.12' Inflow=8.0 cfs 27,950 cf
24.0" Round Culvert n=0.013 L=129.0' S=0.0058 '/' Outflow=8.0 cfs 27,950 cf

Pond MH07: Manhole 07 Peak Elev=40.19' Inflow=13.1 cfs 48,801 cf
30.0" Round Culvert n=0.013 L=285.0' S=0.0054 '/' Outflow=13.1 cfs 48,801 cf

Pond MH08: Manhole 08 Peak Elev=38.44' Inflow=13.1 cfs 48,801 cf
30.0" Round Culvert n=0.013 L=176.0' S=0.0068 '/' Outflow=13.1 cfs 48,801 cf

Pond MH09: Manhole 09 Peak Elev=40.91' Inflow=5.5 cfs 20,850 cf
24.0" Round Culvert n=0.013 L=143.0' S=0.0052 '/' Outflow=5.5 cfs 20,850 cf

Pond MH10: Manhole 10 Peak Elev=32.54' Inflow=1.5 cfs 27,765 cf
24.0" Round Culvert x 2.00 n=0.013 L=220.0' S=0.0052 '/' Outflow=1.5 cfs 27,765 cf

Pond MH11: Manhole 11 Peak Elev=45.83' Inflow=2.9 cfs 23,224 cf
24.0" Round Culvert n=0.013 L=178.0' S=0.0076 '/' Outflow=2.9 cfs 23,224 cf

Pond MH12: Manhole 12 Peak Elev=37.75' Inflow=4.7 cfs 16,915 cf
24.0" Round Culvert x 2.00 n=0.013 L=45.0' S=0.0051 '/' Outflow=4.7 cfs 16,899 cf

Pond MH13: Manhole 13 Peak Elev=37.94' Inflow=2.3 cfs 5,692 cf
24.0" Round Culvert n=0.013 L=148.0' S=0.0257 '/' Outflow=2.3 cfs 5,692 cf

Link PPoi-01: Prop Pol-01 Inflow=18.2 cfs 141,937 cf
Primary=18.2 cfs 141,937 cf

Link PPoi-02: POI Inflow=20.1 cfs 145,336 cf
Primary=20.1 cfs 145,336 cf

Link PPoi-03: PO3 Inflow=8.8 cfs 73,712 cf
Primary=8.8 cfs 73,712 cf

Link PPoi-04: Pr Pol-04 Inflow=3.2 cfs 35,720 cf
Primary=3.2 cfs 35,720 cf

Link PPoi-05: Pr Pol-05 Inflow=7.9 cfs 48,275 cf
Primary=7.9 cfs 48,275 cf

Link PPoi-06: Ex Pol-06 Inflow=2.7 cfs 15,770 cf
Primary=2.7 cfs 15,770 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 554,895 cf Average Runoff Depth = 1.68"
91.84% Pervious = 3,635,029 sf 8.16% Impervious = 323,127 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-06: PS06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>2.48"
Flow Length=340' Tc=27.5 min CN=58 Runoff=4.7 cfs 25,857 cf

Subcatchment PS01: PS-01 Cemetery Runoff Area=301,519 sf 11.75% Impervious Runoff Depth>1.55"
Flow Length=517' Tc=11.5 min CN=48 Runoff=8.7 cfs 39,060 cf

Subcatchment PS02: PS-02 Cemetery Runoff Area=394,562 sf 8.81% Impervious Runoff Depth>1.37"
Flow Length=1,189' Tc=25.2 min CN=46 Runoff=7.2 cfs 45,144 cf

Subcatchment PS03: PS-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>2.95"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=14.3 cfs 115,597 cf

Subcatchment PS04: PS-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>1.28"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=8.0 cfs 71,088 cf

Subcatchment PS05: PS-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>2.97"
Flow Length=720' Tc=34.6 min CN=63 Runoff=12.8 cfs 75,647 cf

Subcatchment PS10: PS-10 Road Entrance Runoff Area=18,388 sf 32.87% Impervious Runoff Depth>2.49"
Flow Length=164' Tc=8.7 min CN=58 Runoff=1.1 cfs 3,821 cf

Subcatchment PS11: PS-11 Road Entrance Runoff Area=3,232 sf 78.99% Impervious Runoff Depth>5.49"
Flow Length=131' Tc=5.0 min CN=86 Runoff=0.5 cfs 1,478 cf

Subcatchment PS13: PS-13 Road Runoff Area=31,258 sf 59.25% Impervious Runoff Depth>4.15"
Flow Length=242' Tc=9.0 min CN=74 Runoff=3.1 cfs 10,809 cf

Subcatchment PS14: PS-14 Road Runoff Area=46,676 sf 50.48% Impervious Runoff Depth>4.26"
Flow Length=330' Tc=9.8 min CN=75 Runoff=4.6 cfs 16,560 cf

Subcatchment PS15: PS-15 Road Runoff Area=5,529 sf 78.57% Impervious Runoff Depth>5.37"
Flow Length=207' Tc=5.0 min CN=85 Runoff=0.8 cfs 2,476 cf

Subcatchment PS16: PS-16 Road Runoff Area=6,627 sf 55.82% Impervious Runoff Depth>5.04"
Flow Length=177' Tc=5.0 min CN=82 Runoff=0.9 cfs 2,781 cf

Subcatchment PS17: PS-17 Road Runoff Area=12,439 sf 58.98% Impervious Runoff Depth>4.92"
Flow Length=362' Tc=5.7 min CN=81 Runoff=1.6 cfs 5,103 cf

Subcatchment PS18: PS-18 Road Runoff Area=21,966 sf 41.08% Impervious Runoff Depth>4.48"
Flow Length=290' Tc=10.5 min CN=77 Runoff=2.3 cfs 8,192 cf

Subcatchment PS19: PS-19 Road Runoff Area=10,861 sf 67.42% Impervious Runoff Depth>5.49"
Flow Length=239' Tc=5.3 min CN=86 Runoff=1.5 cfs 4,967 cf

Subcatchment PS20: PS-20 Wetland Runoff Area=497,789 sf 3.51% Impervious Runoff Depth>3.17"
Flow Length=518' Tc=41.1 min CN=65 Runoff=20.6 cfs 131,633 cf

Subcatchment PS21: PS-21 Inner-Circle Runoff Area=68,052 sf 28.33% Impervious Runoff Depth>3.94"
Flow Length=138' Slope=0.0600 '/' Tc=6.1 min CN=72 Runoff=7.1 cfs 22,324 cf

Subcatchment PS22: PS-22 Road Runoff Area=12,972 sf 53.89% Impervious Runoff Depth>4.92"
Flow Length=215' Tc=9.5 min CN=81 Runoff=1.5 cfs 5,318 cf

Subcatchment PS23: PS-23 Road Runoff Area=21,891 sf 55.57% Impervious Runoff Depth>5.03"
Flow Length=333' Slope=0.0200 '/' Tc=6.1 min CN=82 Runoff=2.8 cfs 9,184 cf

Subcatchment PS24: PS-24 Road Runoff Area=55,697 sf 48.63% Impervious Runoff Depth>4.70"
Flow Length=375' Slope=0.0200 '/' Tc=9.6 min CN=79 Runoff=6.1 cfs 21,799 cf

Subcatchment PS25: PS-25 Inner-Circle Runoff Area=57,231 sf 16.32% Impervious Runoff Depth>3.51"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=68 Runoff=5.3 cfs 16,750 cf

Subcatchment PS26: PS-26 Inner-Circle Runoff Area=56,221 sf 27.09% Impervious Runoff Depth>4.04"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=73 Runoff=6.0 cfs 18,946 cf

Subcatchment PS27: PS-27 Road Runoff Area=12,543 sf 56.40% Impervious Runoff Depth>5.03"
Flow Length=378' Tc=10.1 min CN=82 Runoff=1.4 cfs 5,258 cf

Subcatchment PS28: PS-28 Road Runoff Area=13,299 sf 49.44% Impervious Runoff Depth>4.70"
Flow Length=364' Tc=7.9 min CN=79 Runoff=1.5 cfs 5,207 cf

Subcatchment PS29: PS-29 Road Runoff Area=31,769 sf 53.29% Impervious Runoff Depth>4.92"
Flow Length=355' Tc=9.6 min CN=81 Runoff=3.6 cfs 13,023 cf

Subcatchment PS30: PS-30 Road Runoff Area=43,899 sf 42.17% Impervious Runoff Depth>4.47"
Flow Length=446' Tc=13.0 min CN=77 Runoff=4.2 cfs 16,364 cf

Subcatchment PS32: PS-32 - Gravel Wetland Runoff Area=67,368 sf 0.00% Impervious Runoff Depth>2.39"
Flow Length=194' Tc=21.2 min CN=57 Runoff=2.7 cfs 13,404 cf

Subcatchment PS33: PS-33 - Remainder of Runoff Area=597,509 sf 0.83% Impervious Runoff Depth>3.39"
Flow Length=794' Tc=34.5 min CN=67 Runoff=28.8 cfs 168,558 cf

Reach PR01: R-01 Reach Avg. Flow Depth=0.08' Max Vel=0.38 fps Inflow=1.5 cfs 5,299 cf
n=0.100 L=501.0' S=0.0199 '/' Capacity=19.5 cfs Outflow=0.8 cfs 5,172 cf

Reach PR02: R-02 Reach Avg. Flow Depth=0.28' Max Vel=0.78 fps Inflow=8.7 cfs 39,059 cf
n=0.100 L=487.0' S=0.0189 '/' Capacity=19.0 cfs Outflow=6.7 cfs 38,561 cf

Reach PR3: R-03 Reach Avg. Flow Depth=0.31' Max Vel=0.61 fps Inflow=7.6 cfs 57,745 cf
n=0.100 L=487.0' S=0.0101 '/' Capacity=52.5 cfs Outflow=6.0 cfs 56,909 cf

Reach PR4: R-04 Reach Avg. Flow Depth=0.33' Max Vel=0.71 fps Inflow=8.4 cfs 59,871 cf
n=0.100 L=594.0' S=0.0126 '/' Capacity=15.6 cfs Outflow=7.4 cfs 59,029 cf

Reach PR5: R-03 Reach Avg. Flow Depth=0.44' Max Vel=0.52 fps Inflow=7.6 cfs 24,776 cf
n=0.100 L=40.0' S=0.0050 '/' Capacity=9.8 cfs Outflow=7.6 cfs 24,776 cf

Pond BIO1: Bioretention Area #1 Peak Elev=38.09' Storage=39,201 cf Inflow=23.3 cfs 80,883 cf
Primary=7.2 cfs 47,052 cf Secondary=0.0 cfs 0 cf Outflow=7.2 cfs 47,052 cf

Pond BIO2: Bioretention Area #2 Peak Elev=40.02' Storage=10,674 cf Inflow=6.0 cfs 18,946 cf
Primary=0.5 cfs 10,693 cf Secondary=0.0 cfs 0 cf Outflow=0.5 cfs 10,693 cf

Pond CB01: Catch Basin 01 Peak Elev=37.36' Inflow=1.1 cfs 3,821 cf
Primary=1.1 cfs 3,821 cf Secondary=0.0 cfs 0 cf Outflow=1.1 cfs 3,821 cf

Pond CB02: Catch Basin 02 Peak Elev=37.16' Inflow=1.5 cfs 5,299 cf
Primary=1.5 cfs 5,299 cf Secondary=0.0 cfs 0 cf Outflow=1.5 cfs 5,299 cf

Pond CB05: Catch Basin 05 Peak Elev=39.43' Inflow=3.1 cfs 10,809 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0075 '/' Outflow=3.1 cfs 10,809 cf

Pond CB06: Catch Basin 04 Peak Elev=38.77' Inflow=3.8 cfs 13,285 cf
Primary=3.8 cfs 13,285 cf Secondary=0.0 cfs 0 cf Outflow=3.8 cfs 13,285 cf

Pond CB08: Catch Basin 08 Peak Elev=39.89' Inflow=4.6 cfs 16,560 cf
18.0" Round Culvert n=0.013 L=24.0' S=0.0125 '/' Outflow=4.6 cfs 16,560 cf

Pond CB09: Catch Basin 09 Peak Elev=38.16' Inflow=9.9 cfs 34,947 cf
24.0" Round Culvert n=0.013 L=171.0' S=0.0056 '/' Outflow=9.9 cfs 34,947 cf

Pond CB10: Catch Basin 10 Peak Elev=45.80' Inflow=1.5 cfs 5,318 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=1.5 cfs 5,318 cf

Pond CB11: Catch Basin 11 Peak Elev=45.63' Inflow=2.3 cfs 8,098 cf
15.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=2.3 cfs 8,098 cf

Pond CB12: Catch Basin 12 Peak Elev=43.60' Inflow=11.0 cfs 39,080 cf
24.0" Round Culvert n=0.013 L=104.0' S=0.0058 '/' Outflow=11.0 cfs 39,080 cf

Pond CB13: Catch Basin 13 Peak Elev=44.39' Inflow=6.1 cfs 21,799 cf
16.0" Round Culvert n=0.013 L=16.0' S=0.0156 '/' Outflow=6.1 cfs 21,799 cf

Pond CB14: Catch Basin 14 Peak Elev=42.45' Inflow=4.2 cfs 16,364 cf
18.0" Round Culvert n=0.013 L=28.0' S=-0.0054 '/' Outflow=4.2 cfs 16,364 cf

Pond CB15: Catch Basin 15 Peak Elev=42.22' Inflow=7.7 cfs 29,386 cf
18.0" Round Culvert n=0.013 L=70.0' S=0.0057 '/' Outflow=7.7 cfs 29,386 cf

Pond CB16: Catch Basin 16 Peak Elev=38.14' Inflow=1.5 cfs 5,207 cf
Primary=1.5 cfs 5,207 cf Secondary=0.0 cfs 0 cf Outflow=1.5 cfs 5,207 cf

Pond CB17: Catch Basin 17 Peak Elev=38.13' Inflow=3.0 cfs 10,465 cf
18.0" Round Culvert n=0.013 L=225.0' S=0.0084 '/' Outflow=3.0 cfs 10,465 cf

Pond CB18: Catch Basin 18 Peak Elev=38.11' Inflow=1.5 cfs 4,967 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=1.5 cfs 4,966 cf

Pond CB19: Catch Basin 19 Peak Elev=38.12' Inflow=6.5 cfs 23,623 cf
24.0" Round Culvert n=0.013 L=76.0' S=0.0053 '/' Outflow=6.5 cfs 23,623 cf

Pond DI01: DI-01 DROP INLET Peak Elev=37.78' Storage=5 cf Inflow=8.7 cfs 39,060 cf
Primary=8.7 cfs 39,059 cf Secondary=0.0 cfs 0 cf Outflow=8.7 cfs 39,059 cf

Pond DI02: Drop Inlet #2 Peak Elev=47.69' Inflow=7.2 cfs 45,144 cf
24.0" Round Culvert n=0.013 L=185.0' S=0.0065 '/' Outflow=7.2 cfs 45,144 cf

Pond GW01: Gravel Wetland #1 Peak Elev=37.57' Storage=33,376 cf Inflow=19.9 cfs 81,870 cf
Primary=7.9 cfs 59,475 cf Secondary=0.6 cfs 396 cf Outflow=8.4 cfs 59,871 cf

Pond INF1: Bioretention Area #2 Peak Elev=44.52' Storage=6,527 cf Inflow=9.0 cfs 61,894 cf
Discarded=1.1 cfs 36,709 cf Primary=7.6 cfs 24,776 cf Secondary=0.0 cfs 0 cf Outflow=8.7 cfs 61,485 cf

Pond MH01a: Manhole 01 Peak Elev=38.21' Inflow=3.8 cfs 13,285 cf
18.0" Round Culvert n=0.013 L=87.0' S=0.0057 '/' Outflow=3.8 cfs 13,285 cf

Pond MH01b: Manhole 01b Peak Elev=38.22' Inflow=8.3 cfs 29,844 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=8.3 cfs 29,844 cf

Pond MH03: Manhole 03 Peak Elev=44.24' Inflow=2.3 cfs 8,098 cf
18.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=2.3 cfs 8,098 cf

Pond MH04: Manhole 04 Peak Elev=42.89' Inflow=11.0 cfs 39,080 cf
24.0" Round Culvert n=0.013 L=82.0' S=0.0061 '/' Outflow=11.0 cfs 39,080 cf

Pond MH05: Manhole 05 Peak Elev=42.24' Inflow=11.0 cfs 39,080 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=11.0 cfs 39,080 cf

Pond MH06: Manhole 06 Peak Elev=41.54' Inflow=11.0 cfs 39,080 cf
24.0" Round Culvert n=0.013 L=129.0' S=0.0058 '/' Outflow=11.0 cfs 39,080 cf

Pond MH07: Manhole 07 Peak Elev=40.61' Inflow=18.3 cfs 68,467 cf
30.0" Round Culvert n=0.013 L=285.0' S=0.0054 '/' Outflow=18.3 cfs 68,467 cf

Pond MH08: Manhole 08 Peak Elev=38.80' Inflow=18.3 cfs 68,467 cf
30.0" Round Culvert n=0.013 L=176.0' S=0.0068 '/' Outflow=18.3 cfs 68,467 cf

Pond MH09: Manhole 09 Peak Elev=41.28' Inflow=7.7 cfs 29,386 cf
24.0" Round Culvert n=0.013 L=143.0' S=0.0052 '/' Outflow=7.7 cfs 29,386 cf

Pond MH10: Manhole 10 Peak Elev=33.06' Inflow=7.6 cfs 57,745 cf
24.0" Round Culvert x 2.00 n=0.013 L=220.0' S=0.0052 '/' Outflow=7.6 cfs 57,745 cf

Pond MH11: Manhole 11 Peak Elev=46.31' Inflow=7.2 cfs 45,144 cf
24.0" Round Culvert n=0.013 L=178.0' S=0.0076 '/' Outflow=7.2 cfs 45,144 cf

Pond MH12: Manhole 12 Peak Elev=38.10' Inflow=6.5 cfs 23,623 cf
24.0" Round Culvert x 2.00 n=0.013 L=45.0' S=0.0051 '/' Outflow=6.5 cfs 23,612 cf

Pond MH13: Manhole 13 Peak Elev=38.53' Inflow=7.6 cfs 24,776 cf
24.0" Round Culvert n=0.013 L=148.0' S=0.0257 '/' Outflow=7.6 cfs 24,776 cf

Link PPoi-01: Prop PoI-01 Inflow=38.9 cfs 257,051 cf
Primary=38.9 cfs 257,051 cf

Link PPoi-02: POI Inflow=35.1 cfs 227,587 cf
Primary=35.1 cfs 227,587 cf

Link PPoi-03: PO3 Inflow=14.3 cfs 115,597 cf
Primary=14.3 cfs 115,597 cf

Link PPoi-04: Pr PoI-04 Inflow=8.0 cfs 71,088 cf
Primary=8.0 cfs 71,088 cf

Link PPoi-05: Pr PoI-05 Inflow=12.8 cfs 75,647 cf
Primary=12.8 cfs 75,647 cf

Link PPoi-06: Ex PoI-06 Inflow=4.7 cfs 25,857 cf
Primary=4.7 cfs 25,857 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 876,343 cf Average Runoff Depth = 2.66"
91.84% Pervious = 3,635,029 sf 8.16% Impervious = 323,127 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-06: PS06 Runoff Area=125,073 sf 0.00% Impervious Runoff Depth>3.49"
Flow Length=340' Tc=27.5 min CN=58 Runoff=6.8 cfs 36,339 cf

Subcatchment PS01: PS-01 Cemetery Runoff Area=301,519 sf 11.75% Impervious Runoff Depth>2.35"
Flow Length=517' Tc=11.5 min CN=48 Runoff=14.2 cfs 59,145 cf

Subcatchment PS02: PS-02 Cemetery Runoff Area=394,562 sf 8.81% Impervious Runoff Depth>2.12"
Flow Length=1,189' Tc=25.2 min CN=46 Runoff=12.2 cfs 69,797 cf

Subcatchment PS03: PS-03 Runoff Area=469,882 sf 0.00% Impervious Runoff Depth>4.04"
Flow Length=1,040' Tc=62.6 min CN=63 Runoff=19.7 cfs 158,145 cf

Subcatchment PS04: PS-04 Runoff Area=668,692 sf 1.33% Impervious Runoff Depth>2.00"
Flow Length=1,040' Tc=49.8 min CN=45 Runoff=13.9 cfs 111,263 cf

Subcatchment PS05: PS-05 Runoff Area=305,212 sf 0.00% Impervious Runoff Depth>4.07"
Flow Length=720' Tc=34.6 min CN=63 Runoff=17.7 cfs 103,439 cf

Subcatchment PS10: PS-10 Road Entrance Runoff Area=18,388 sf 32.87% Impervious Runoff Depth>3.50"
Flow Length=164' Tc=8.7 min CN=58 Runoff=1.5 cfs 5,368 cf

Subcatchment PS11: PS-11 Road Entrance Runoff Area=3,232 sf 78.99% Impervious Runoff Depth>6.85"
Flow Length=131' Tc=5.0 min CN=86 Runoff=0.6 cfs 1,845 cf

Subcatchment PS13: PS-13 Road Runoff Area=31,258 sf 59.25% Impervious Runoff Depth>5.40"
Flow Length=242' Tc=9.0 min CN=74 Runoff=4.0 cfs 14,076 cf

Subcatchment PS14: PS-14 Road Runoff Area=46,676 sf 50.48% Impervious Runoff Depth>5.52"
Flow Length=330' Tc=9.8 min CN=75 Runoff=6.0 cfs 21,483 cf

Subcatchment PS15: PS-15 Road Runoff Area=5,529 sf 78.57% Impervious Runoff Depth>6.73"
Flow Length=207' Tc=5.0 min CN=85 Runoff=1.0 cfs 3,102 cf

Subcatchment PS16: PS-16 Road Runoff Area=6,627 sf 55.82% Impervious Runoff Depth>6.37"
Flow Length=177' Tc=5.0 min CN=82 Runoff=1.1 cfs 3,518 cf

Subcatchment PS17: PS-17 Road Runoff Area=12,439 sf 58.98% Impervious Runoff Depth>6.25"
Flow Length=362' Tc=5.7 min CN=81 Runoff=2.0 cfs 6,478 cf

Subcatchment PS18: PS-18 Road Runoff Area=21,966 sf 41.08% Impervious Runoff Depth>5.76"
Flow Length=290' Tc=10.5 min CN=77 Runoff=2.9 cfs 10,548 cf

Subcatchment PS19: PS-19 Road Runoff Area=10,861 sf 67.42% Impervious Runoff Depth>6.85"
Flow Length=239' Tc=5.3 min CN=86 Runoff=1.9 cfs 6,201 cf

Subcatchment PS20: PS-20 Wetland Runoff Area=497,789 sf 3.51% Impervious Runoff Depth>4.30"
Flow Length=518' Tc=41.1 min CN=65 Runoff=28.1 cfs 178,246 cf

Subcatchment PS21: PS-21 Inner-Circle Runoff Area=68,052 sf 28.33% Impervious Runoff Depth>5.17"
Flow Length=138' Slope=0.0600 '/' Tc=6.1 min CN=72 Runoff=9.2 cfs 29,301 cf

Subcatchment PS22: PS-22 Road Runoff Area=12,972 sf 53.89% Impervious Runoff Depth>6.24"
Flow Length=215' Tc=9.5 min CN=81 Runoff=1.9 cfs 6,751 cf

Subcatchment PS23: PS-23 Road Runoff Area=21,891 sf 55.57% Impervious Runoff Depth>6.37"
Flow Length=333' Slope=0.0200 '/' Tc=6.1 min CN=82 Runoff=3.6 cfs 11,619 cf

Subcatchment PS24: PS-24 Road Runoff Area=55,697 sf 48.63% Impervious Runoff Depth>6.00"
Flow Length=375' Slope=0.0200 '/' Tc=9.6 min CN=79 Runoff=7.7 cfs 27,868 cf

Subcatchment PS25: PS-25 Inner-Circle Runoff Area=57,231 sf 16.32% Impervious Runoff Depth>4.69"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=68 Runoff=7.1 cfs 22,360 cf

Subcatchment PS26: PS-26 Inner-Circle Runoff Area=56,221 sf 27.09% Impervious Runoff Depth>5.29"
Flow Length=154' Slope=0.0600 '/' Tc=6.1 min CN=73 Runoff=7.8 cfs 24,769 cf

Subcatchment PS27: PS-27 Road Runoff Area=12,543 sf 56.40% Impervious Runoff Depth>6.36"
Flow Length=378' Tc=10.1 min CN=82 Runoff=1.8 cfs 6,653 cf

Subcatchment PS28: PS-28 Road Runoff Area=13,299 sf 49.44% Impervious Runoff Depth>6.01"
Flow Length=364' Tc=7.9 min CN=79 Runoff=2.0 cfs 6,656 cf

Subcatchment PS29: PS-29 Road Runoff Area=31,769 sf 53.29% Impervious Runoff Depth>6.24"
Flow Length=355' Tc=9.6 min CN=81 Runoff=4.6 cfs 16,533 cf

Subcatchment PS30: PS-30 Road Runoff Area=43,899 sf 42.17% Impervious Runoff Depth>5.76"
Flow Length=446' Tc=13.0 min CN=77 Runoff=5.3 cfs 21,071 cf

Subcatchment PS32: PS-32 - Gravel Wetland Runoff Area=67,368 sf 0.00% Impervious Runoff Depth>3.38"
Flow Length=194' Tc=21.2 min CN=57 Runoff=3.9 cfs 18,950 cf

Subcatchment PS33: PS-33 - Remainder of Runoff Area=597,509 sf 0.83% Impervious Runoff Depth>4.54"
Flow Length=794' Tc=34.5 min CN=67 Runoff=38.8 cfs 226,104 cf

Reach PR01: R-01 Reach Avg. Flow Depth=0.10' Max Vel=0.44 fps Inflow=2.0 cfs 7,213 cf
n=0.100 L=501.0' S=0.0199 '/' Capacity=19.5 cfs Outflow=1.3 cfs 7,068 cf

Reach PR02: R-02 Reach Avg. Flow Depth=0.38' Max Vel=0.93 fps Inflow=14.2 cfs 59,145 cf
n=0.100 L=487.0' S=0.0189 '/' Capacity=19.0 cfs Outflow=11.6 cfs 58,543 cf

Reach PR3: R-03 Reach Avg. Flow Depth=0.48' Max Vel=0.77 fps Inflow=14.6 cfs 89,490 cf
n=0.100 L=487.0' S=0.0101 '/' Capacity=52.5 cfs Outflow=12.9 cfs 88,539 cf

Reach PR4: R-04 Reach Avg. Flow Depth=0.45' Max Vel=0.84 fps Inflow=15.1 cfs 84,156 cf
n=0.100 L=594.0' S=0.0126 '/' Capacity=15.6 cfs Outflow=12.9 cfs 83,199 cf

Reach PR5: R-03 Reach Avg. Flow Depth=0.47' Max Vel=0.54 fps Inflow=8.9 cfs 45,926 cf
n=0.100 L=40.0' S=0.0050 '/' Capacity=9.8 cfs Outflow=8.9 cfs 45,926 cf

Pond BIO1: Bioretention Area #1 Peak Elev=38.43' Storage=43,505 cf Inflow=29.9 cfs 104,491 cf
Primary=13.9 cfs 70,532 cf Secondary=0.0 cfs 0 cf Outflow=13.9 cfs 70,532 cf

Pond BIO2: Bioretention Area #2 Peak Elev=40.73' Storage=15,914 cf Inflow=7.8 cfs 27,357 cf
Primary=0.9 cfs 18,958 cf Secondary=0.0 cfs 0 cf Outflow=0.9 cfs 18,958 cf

Pond CB01: Catch Basin 01 Peak Elev=37.57' Inflow=1.5 cfs 5,368 cf
Primary=1.5 cfs 5,368 cf Secondary=0.0 cfs 0 cf Outflow=1.5 cfs 5,368 cf

Pond CB02: Catch Basin 02 Peak Elev=37.35' Inflow=2.0 cfs 7,213 cf
Primary=2.0 cfs 7,213 cf Secondary=0.0 cfs 0 cf Outflow=2.0 cfs 7,213 cf

Pond CB05: Catch Basin 05 Peak Elev=40.97' Inflow=4.0 cfs 14,076 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0075 '/' Outflow=4.0 cfs 14,076 cf

Pond CB06: Catch Basin 04 Peak Elev=39.92' Inflow=4.9 cfs 17,178 cf
Primary=4.9 cfs 17,178 cf Secondary=0.0 cfs 0 cf Outflow=4.9 cfs 17,178 cf

Pond CB08: Catch Basin 08 Peak Elev=40.10' Inflow=6.0 cfs 21,483 cf
18.0" Round Culvert n=0.013 L=24.0' S=0.0125 '/' Outflow=6.0 cfs 21,483 cf

Pond CB09: Catch Basin 09 Peak Elev=38.89' Inflow=12.7 cfs 45,138 cf
24.0" Round Culvert n=0.013 L=171.0' S=0.0056 '/' Outflow=12.7 cfs 45,138 cf

Pond CB10: Catch Basin 10 Peak Elev=45.95' Inflow=1.9 cfs 6,751 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=1.9 cfs 6,751 cf

Pond CB11: Catch Basin 11 Peak Elev=45.78' Inflow=2.9 cfs 10,269 cf
15.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=2.9 cfs 10,269 cf

Pond CB12: Catch Basin 12 Peak Elev=44.26' Inflow=13.9 cfs 49,755 cf
24.0" Round Culvert n=0.013 L=104.0' S=0.0058 '/' Outflow=13.9 cfs 49,755 cf

Pond CB13: Catch Basin 13 Peak Elev=45.56' Inflow=7.7 cfs 27,868 cf
16.0" Round Culvert n=0.013 L=16.0' S=0.0156 '/' Outflow=7.7 cfs 27,868 cf

Pond CB14: Catch Basin 14 Peak Elev=43.36' Inflow=5.3 cfs 21,071 cf
18.0" Round Culvert n=0.013 L=28.0' S=-0.0054 '/' Outflow=5.3 cfs 21,071 cf

Pond CB15: Catch Basin 15 Peak Elev=42.98' Inflow=9.8 cfs 37,604 cf
18.0" Round Culvert n=0.013 L=70.0' S=0.0057 '/' Outflow=9.8 cfs 37,604 cf

Pond CB16: Catch Basin 16 Peak Elev=38.64' Inflow=2.0 cfs 6,656 cf
Primary=2.0 cfs 6,656 cf Secondary=0.0 cfs 0 cf Outflow=2.0 cfs 6,656 cf

Pond CB17: Catch Basin 17 Peak Elev=38.60' Inflow=3.7 cfs 13,309 cf
18.0" Round Culvert n=0.013 L=225.0' S=0.0084 '/' Outflow=3.7 cfs 13,309 cf

Pond CB18: Catch Basin 18 Peak Elev=38.51' Inflow=1.9 cfs 6,201 cf
15.0" Round Culvert n=0.013 L=16.0' S=0.0063 '/' Outflow=1.9 cfs 6,198 cf

Pond CB19: Catch Basin 19 Peak Elev=38.53' Inflow=8.2 cfs 30,055 cf
24.0" Round Culvert n=0.013 L=76.0' S=0.0053 '/' Outflow=8.2 cfs 30,055 cf

Pond DI01: DI-01 DROP INLET Peak Elev=39.48' Storage=12 cf Inflow=14.2 cfs 59,145 cf
Primary=14.2 cfs 59,145 cf Secondary=0.0 cfs 0 cf Outflow=14.2 cfs 59,145 cf

Pond DI02: Drop Inlet #2 Peak Elev=48.26' Inflow=12.2 cfs 69,797 cf
24.0" Round Culvert n=0.013 L=185.0' S=0.0065 '/' Outflow=12.2 cfs 69,797 cf

Pond GW01: Gravel Wetland #1 Peak Elev=37.84' Storage=38,288 cf Inflow=25.7 cfs 106,309 cf
Primary=9.1 cfs 75,818 cf Secondary=6.0 cfs 8,338 cf Outflow=15.1 cfs 84,156 cf

Pond INF1: Bioretention Area #2 Peak Elev=45.24' Storage=10,467 cf Inflow=14.8 cfs 92,157 cf
Discarded=1.3 cfs 43,089 cf Primary=8.9 cfs 45,926 cf Secondary=3.0 cfs 2,588 cf Outflow=13.1 cfs 91,603 cf

Pond MH01a: Manhole 01 Peak Elev=39.30' Inflow=4.9 cfs 17,178 cf
18.0" Round Culvert n=0.013 L=87.0' S=0.0057 '/' Outflow=4.9 cfs 17,178 cf

Pond MH01b: Manhole 01b Peak Elev=39.36' Inflow=10.8 cfs 38,660 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=10.8 cfs 38,660 cf

Pond MH03: Manhole 03 Peak Elev=44.60' Inflow=2.9 cfs 10,269 cf
18.0" Round Culvert n=0.013 L=209.0' S=0.0062 '/' Outflow=2.9 cfs 10,269 cf

Pond MH04: Manhole 04 Peak Elev=43.47' Inflow=13.9 cfs 49,755 cf
24.0" Round Culvert n=0.013 L=82.0' S=0.0061 '/' Outflow=13.9 cfs 49,755 cf

Pond MH05: Manhole 05 Peak Elev=42.76' Inflow=13.9 cfs 49,755 cf
24.0" Round Culvert n=0.013 L=81.0' S=0.0068 '/' Outflow=13.9 cfs 49,755 cf

Pond MH06: Manhole 06 Peak Elev=41.99' Inflow=13.9 cfs 49,755 cf
24.0" Round Culvert n=0.013 L=129.0' S=0.0058 '/' Outflow=13.9 cfs 49,755 cf

Pond MH07: Manhole 07 Peak Elev=41.03' Inflow=23.2 cfs 87,359 cf
30.0" Round Culvert n=0.013 L=285.0' S=0.0054 '/' Outflow=23.2 cfs 87,359 cf

Pond MH08: Manhole 08 Peak Elev=39.19' Inflow=23.2 cfs 87,359 cf
30.0" Round Culvert n=0.013 L=176.0' S=0.0068 '/' Outflow=23.2 cfs 87,359 cf

Pond MH09: Manhole 09 Peak Elev=41.66' Inflow=9.8 cfs 37,604 cf
24.0" Round Culvert n=0.013 L=143.0' S=0.0052 '/' Outflow=9.8 cfs 37,604 cf

Pond MH10: Manhole 10 Peak Elev=33.46' Inflow=14.6 cfs 89,490 cf
24.0" Round Culvert x 2.00 n=0.013 L=220.0' S=0.0052 '/' Outflow=14.6 cfs 89,490 cf

Pond MH11: Manhole 11 Peak Elev=46.83' Inflow=12.2 cfs 69,797 cf
24.0" Round Culvert n=0.013 L=178.0' S=0.0076 '/' Outflow=12.2 cfs 69,797 cf

Pond MH12: Manhole 12 Peak Elev=38.44' Inflow=8.2 cfs 30,055 cf
24.0" Round Culvert x 2.00 n=0.013 L=45.0' S=0.0051 '/' Outflow=8.2 cfs 30,052 cf

Pond MH13: Manhole 13 Peak Elev=38.64' Inflow=8.9 cfs 45,926 cf
24.0" Round Culvert n=0.013 L=148.0' S=0.0257 '/' Outflow=8.9 cfs 45,926 cf

Link PPoi-01: Prop PoI-01 Inflow=58.9 cfs 378,321 cf
Primary=58.9 cfs 378,321 cf

Link PPoi-02: POI Inflow=51.6 cfs 309,302 cf
Primary=51.6 cfs 309,302 cf

Link PPoi-03: PO3 Inflow=19.7 cfs 158,145 cf
Primary=19.7 cfs 158,145 cf

Link PPoi-04: Pr PoI-04 Inflow=13.9 cfs 111,263 cf
Primary=13.9 cfs 111,263 cf

Link PPoi-05: Pr PoI-05 Inflow=17.7 cfs 103,439 cf
Primary=17.7 cfs 103,439 cf

Link PPoi-06: Ex PoI-06 Inflow=6.8 cfs 36,339 cf
Primary=6.8 cfs 36,339 cf

Total Runoff Area = 3,958,156 sf Runoff Volume = 1,207,626 cf Average Runoff Depth = 3.66"
91.84% Pervious = 3,635,029 sf 8.16% Impervious = 323,127 sf

APPENDIX E – POST-DEVELOPMENT CALCULATIONS (10-YEAR STORM EVENT)

(This Page Is Intentionally Blank)

Summary for Subcatchment ES01: ES-01

Run from top of graveyard, thru site, and into wetland.

Runoff = 22.5 cfs @ 12.36 hrs, Volume= 123,847 cf, Depth> 1.37"
Routed to Link EPoI01 : Ex PoI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
28,755	98	Paved parking, HSG A	Pavement
1,391	98	Roofs, HSG A	Roofs
107,595	30	Woods, Good, HSG A	Woods
333,961	55	Woods, Good, HSG B	Woods
284,601	70	Woods, Good, HSG C	Woods
190,112	39	>75% Grass cover, Good, HSG A	Open Space
139,756	61	>75% Grass cover, Good, HSG B	Brush
398	74	>75% Grass cover, Good, HSG C	Brush
1,086,569	56	Weighted Average	
1,056,423		97.23% Pervious Area	
30,146		2.77% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.9	210	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
12.0	720	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
22.6	1,030	Total			

Summary for Subcatchment ES02: ES-02

Runoff = 3.0 cfs @ 12.35 hrs, Volume= 21,706 cf, Depth> 0.65"
Routed to Reach ER3 : R-03 Reach

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
39,291	98	Paved parking, HSG A	Pavement
6,841	30	Woods, Good, HSG A	Woods
0	55	Woods, Good, HSG B	Woods
0	70	Woods, Good, HSG C	Woods
353,745	39	>75% Grass cover, Good, HSG A	Open Space
0	61	>75% Grass cover, Good, HSG B	Open Space
399,877	45	Weighted Average	
360,586		90.17% Pervious Area	
39,291		9.83% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
4.7	600	0.0200	2.12		**Shallow Concentrated Flow, Shallow Concentrated** Grassed Waterway Kv= 15.0 fps
0.5	24	0.0300	0.87		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
14.3	724	Total			

Summary for Subcatchment ES03: ES-03

Runoff = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf, Depth> 1.88"
Routed to Link EPoI03 : Ex PoI-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
218,042	55	Woods, Good, HSG B	Woods
251,840	70	Woods, Good, HSG C	Woods
469,882	63	Weighted Average	
469,882		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.8	100	0.0200	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
27.8	940	0.0127	0.56		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
62.6	1,040	Total			

Summary for Subcatchment ES04: ES-04

Runoff = 3.2 cfs @ 12.90 hrs, Volume= 35,720 cf, Depth> 0.64"
Routed to Link EPoI04 : Ex PoI-04

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
8,918	98	Paved parking, HSG A	Pavement
227	96	Gravel surface, HSG A	Roadway
6,625	96	Gravel surface, HSG B	Roadway
1,882	96	Gravel surface, HSG C	Roadway
163,386	30	Woods, Good, HSG A	Woods
163,096	55	Woods, Good, HSG B	Woods
22,827	70	Woods, Good, HSG C	Woods
260,043	39	>75% Grass cover, Good, HSG A	Open Space
38,989	61	>75% Grass cover, Good, HSG B	Open Space
2,699	74	>75% Grass cover, Good, HSG C	Open Space
668,692	45	Weighted Average	
659,774		98.67% Pervious Area	
8,918		1.33% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	100	0.0400	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
8.2	300	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
15.2	640	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
49.8	1,040	Total			

Summary for Subcatchment ES05: ES-05

Runoff = 7.9 cfs @ 12.52 hrs, Volume= 48,275 cf, Depth> 1.90"
Routed to Link EPoI05 : Ex PoI-05

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
141,482	55	Woods, Good, HSG B	Open Water
163,730	70	Woods, Good, HSG C	Woods
305,212	63	Weighted Average	
305,212		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.0800	0.08		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
1.4	120	0.0830	1.44		**Shallow Concentrated Flow, Shallow Concentrates** Woodland Kv= 5.0 fps
13.2	500	0.0160	0.63		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
34.6	720	Total			

Summary for Subcatchment ES06: ES-06

Runoff = 2.7 cfs @ 12.43 hrs, Volume= 15,770 cf, Depth> 1.51"
Routed to Link EPoI06 : Ex PoI-06

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
99,363	55	Woods, Good, HSG B	Woods
25,710	70	Woods, Good, HSG C	Woods
125,073	58	Weighted Average	
125,073		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0600	0.07		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
5.1	240	0.0250	0.79		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
27.5	340	Total			

Summary for Subcatchment ES07: ES-02

Runoff = 22.7 cfs @ 12.50 hrs, Volume= 136,840 cf, Depth> 1.82"
Routed to Link EPoI02 : Ex PoI-02

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Pavement
0	30	Woods, Good, HSG A	Woods
451,295	55	Woods, Good, HSG B	Woods
446,489	70	Woods, Good, HSG C	Woods
0	39	>75% Grass cover, Good, HSG A	Open Space
5,067	61	>75% Grass cover, Good, HSG B	Open Space
902,851	62	Weighted Average	
902,851		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0500	0.12		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.70"
19.6	1,100	0.0350	0.94		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
33.4	1,200	Total			

Summary for Subcatchment PS-06: PS06

Runoff = 2.7 cfs @ 12.43 hrs, Volume= 15,770 cf, Depth> 1.51"
Routed to Link PPoi-06 : Ex PoI-06

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
99,363	55	Woods, Good, HSG B	Woods
25,710	70	Woods, Good, HSG C	Woods
125,073	58	Weighted Average	
125,073		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0600	0.07		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
5.1	240	0.0250	0.79		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
27.5	340	Total			

Summary for Subcatchment PS01: PS-01 Cemetery

Run from top of graveyard, thru site, and into wetland.

Runoff = 3.7 cfs @ 12.22 hrs, Volume= 20,895 cf, Depth> 0.83"
Routed to Pond DI01 : DI-01 DROP INLET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
33,245	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
1,260	98	Roofs, HSG A	Woods
924	98	Roofs, HSG B	Woods
11,085	30	Woods, Good, HSG A	Open Space
2,470	55	Woods, Good, HSG B	Open Space
227,444	39	>75% Grass cover, Good, HSG A	Open Space
25,091	61	>75% Grass cover, Good, HSG B	Open Space
301,519	48	Weighted Average	
266,090		88.25% Pervious Area	
35,429		11.75% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.9	210	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.4000	3.16		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
0.7	177	0.0100	4.22	46.39	**Channel Flow, Channel Flow** Area= 11.0 sf Perim= 22.3' r= 0.49' n= 0.022 Earth, clean & straight
11.5	517	Total			

Summary for Subcatchment PS02: PS-02 Cemetery

Runoff = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf, Depth> 0.71"
Routed to Pond DI02 : Drop Inlet #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
33,461	98	Paved parking, HSG A	Pavement
0	98	Paved parking, HSG B	Pavement
0	98	Roofs, HSG A	Pavement
1,316	98	Roofs, HSG B	Pavement
5,444	30	Woods, Good, HSG A	Brush
4,043	55	Woods, Good, HSG B	Woods
316,738	39	>75% Grass cover, Good, HSG A	Open Space
33,560	61	>75% Grass cover, Good, HSG B	Open Space
394,562	46	Weighted Average	
359,785		91.19% Pervious Area	
34,777		8.81% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0120	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
12.7	609	0.0130	0.80		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
1.3	480	0.0200	5.96	65.60	**Channel Flow, Channel Flow** Area= 11.0 sf Perim= 22.3' r= 0.49' n= 0.022 Earth, clean & straight
25.2	1,189	Total			

Summary for Subcatchment PS03: PS-03

Runoff = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf, Depth> 1.88"
Routed to Link PPoi-03 : PO3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
41	96	Gravel surface, HSG B	Roadway
218,001	55	Woods, Good, HSG B	Woods
251,840	70	Woods, Good, HSG C	Woods
469,882	63	Weighted Average	
469,882		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.8	100	0.0200	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
27.8	940	0.0127	0.56		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
62.6	1,040	Total			

Summary for Subcatchment PS04: PS-04

Runoff = 3.2 cfs @ 12.90 hrs, Volume= 35,720 cf, Depth> 0.64"
Routed to Link PPoi-04 : Pr PoI-04

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
8,918	98	Paved parking, HSG A	Pavement
227	96	Gravel surface, HSG A	Roadway
7,175	96	Gravel surface, HSG B	Roadway
1,882	96	Gravel surface, HSG C	Roadway
163,386	30	Woods, Good, HSG A	Woods
155,636	55	Woods, Good, HSG B	Woods
22,827	70	Woods, Good, HSG C	Woods
260,043	39	>75% Grass cover, Good, HSG A	Open Space
45,899	61	>75% Grass cover, Good, HSG B	Open Space
2,699	74	>75% Grass cover, Good, HSG C	Open Space
668,692	45	Weighted Average	
659,774		98.67% Pervious Area	
8,918		1.33% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	100	0.0400	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
8.2	300	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
15.2	640	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
49.8	1,040	Total			

Summary for Subcatchment PS05: PS-05

Runoff = 7.9 cfs @ 12.52 hrs, Volume= 48,275 cf, Depth> 1.90"
Routed to Link PPoi-05 : Pr PoI-05

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
141,482	55	Woods, Good, HSG B	Open Water
163,730	70	Woods, Good, HSG C	Woods
305,212	63	Weighted Average	
305,212		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.0800	0.08		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
1.4	120	0.0830	1.44		**Shallow Concentrated Flow, Shallow Concentrates** Woodland Kv= 5.0 fps
13.2	500	0.0160	0.63		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
34.6	720	Total			

Summary for Subcatchment PS10: PS-10 Road Entrance

Run from top of graveyard, thru site, and into wetland.

Runoff = 0.6 cfs @ 12.14 hrs, Volume= 2,332 cf, Depth> 1.52"
Routed to Pond CB01 : Catch Basin 01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
4,296	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
1,748	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
298	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
12,046	39	>75% Grass cover, Good, HSG A	Open Space
0	61	>75% Grass cover, Good, HSG B	Open Space
18,388	58	Weighted Average	
12,344		67.13% Pervious Area	
6,044		32.87% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	86	0.0200	0.18		**Sheet Flow, Sheet Flow**
					Grass: Short n= 0.150 P2= 3.70"
0.6	78	0.0150	2.10	3.57	**Channel Flow, Channel Flow**
					Area= 1.7 sf Perim= 13.3' r= 0.13'
					n= 0.022 Earth, clean & straight
8.7	164	Total			

Summary for Subcatchment PS11: PS-11 Road Entrance

Run from top of graveyard, thru site, and into wetland.

Runoff = 0.3 cfs @ 12.07 hrs, Volume= 1,090 cf, Depth> 4.05"
Routed to Pond CB02 : Catch Basin 02

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
2,553	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG A	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	30	Woods, Good, HSG A	Open Space
679	39	>75% Grass cover, Good, HSG A	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
3,232	86	Weighted Average	
679		21.01% Pervious Area	
2,553		78.99% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	3	0.0200	0.09		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.6	128	0.0150	3.55	6.04	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.013 Asphalt, smooth
3.8					**Direct Entry, Miniimum Tc of 5 Min**
5.0	131	Total			

Summary for Subcatchment PS13: PS-13 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 2.1 cfs @ 12.13 hrs, Volume= 7,459 cf, Depth> 2.86"
Routed to Pond CB05 : Catch Basin 05

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
8,908	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
9,613	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
12,737	39	>75% Grass cover, Good, HSG A	Open Space
0	61	>75% Grass cover, Good, HSG B	Open Space
31,258	74	Weighted Average	
12,737		40.75% Pervious Area	
18,521		59.25% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	89	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.7	153	0.0155	3.61	6.14	**Channel Flow, Channel** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.013 Asphalt, smooth
9.0	242	Total			

Summary for Subcatchment PS14: PS-14 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 3.2 cfs @ 12.14 hrs, Volume= 11,497 cf, Depth> 2.96"
Routed to Pond CB08 : Catch Basin 08

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

	Area (sf)	CN	Description	Land Use
	4,959	98	Paved parking, HSG A	Woods
*	6,051	98	Paved parking, HSG B	Woods
	6,160	98	Roofs, HSG A	Woods
	6,390	98	Roofs, HSG B	Woods
	0	30	Woods, Good, HSG A	Open Space
	0	55	Woods, Good, HSG B	Open Space
	10,189	39	>75% Grass cover, Good, HSG A	Open Space
	12,927	61	>75% Grass cover, Good, HSG B	Open Space
	46,676	75	Weighted Average	
	23,116		49.52% Pervious Area	
	23,560		50.48% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.7	230	0.0330	5.27	8.96	**Channel Flow, Street Gutter** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.013 Asphalt, smooth
9.8	330	Total			

Summary for Subcatchment PS15: PS-15 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 0.6 cfs @ 12.07 hrs, Volume= 1,817 cf, Depth> 3.94"
Routed to Pond CB06 : Catch Basin 04

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
4,333	98	Paved parking, HSG A	Woods
11	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
1,181	39	>75% Grass cover, Good, HSG A	Open Space
4	61	>75% Grass cover, Good, HSG B	Open Space
5,529	85	Weighted Average	
1,185		21.43% Pervious Area	
4,344		78.57% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	3	0.0200	0.09		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
1.0	204	0.0150	3.55	6.04	**Channel Flow, Roadway Gutter** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.013 Asphalt, smooth
3.4					**Direct Entry, Miniimum Tc of 5 Min**
5.0	207	Total			

Summary for Subcatchment PS16: PS-16 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 0.6 cfs @ 12.07 hrs, Volume= 2,008 cf, Depth> 3.64"
Routed to Pond CB11 : Catch Basin 11

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
3,699	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
2,928	61	>75% Grass cover, Good, HSG B	Open Space
6,627	82	Weighted Average	
2,928		44.18% Pervious Area	
3,699		55.82% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	37	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.7	140	0.0330	3.11	5.29	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
0.2					**Direct Entry, Miniimum Tc of 5 Min**
5.0	177	Total			

Summary for Subcatchment PS17: PS-17 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.2 cfs @ 12.09 hrs, Volume= 3,666 cf, Depth> 3.54"
Routed to Pond CB09 : Catch Basin 09

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
2,831	98	Paved parking, HSG A	Woods
4,505	98	Paved parking, HSG B	Woods
11	96	Gravel surface, HSG B	Roadway
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
1,020	39	>75% Grass cover, Good, HSG A	Open Space
4,072	61	>75% Grass cover, Good, HSG B	Open Space
12,439	81	Weighted Average	
5,103		41.02% Pervious Area	
7,336		58.98% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	36	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
1.7	326	0.0330	3.11	5.29	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
5.7	362	Total			

Summary for Subcatchment PS18: PS-18 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.6 cfs @ 12.15 hrs, Volume= 5,755 cf, Depth> 3.14"
Routed to Pond CB19 : Catch Basin 19

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
9,024	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
311	96	Gravel surface, HSG B	Roadway
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
12,631	61	>75% Grass cover, Good, HSG B	Open Space
21,966	77	Weighted Average	
12,942		58.92% Pervious Area	
9,024		41.08% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.2	27	0.0200	2.12		**Shallow Concentrated Flow, Shallow Concentrated** Grassed Waterway Kv= 15.0 fps
1.2	163	0.0175	2.27	3.85	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
10.5	290	Total			

Summary for Subcatchment PS19: PS-19 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.2 cfs @ 12.08 hrs, Volume= 3,663 cf, Depth> 4.05"
Routed to Pond CB18 : Catch Basin 18

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
7,322	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
3,539	61	>75% Grass cover, Good, HSG B	Open Space
10,861	86	Weighted Average	
3,539		32.58% Pervious Area	
7,322		67.42% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	30	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.1	7	0.0200	0.87		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.70"
1.5	202	0.0175	2.27	3.85	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
0.2					**Direct Entry, Miniimum Tc of 5 Min**
5.3	239	Total			

Summary for Subcatchment PS20: PS-20 Wetland

Run from top of graveyard, thru site, and into wetland.

Runoff = 13.0 cfs @ 12.60 hrs, Volume= 85,346 cf, Depth> 2.06"
Routed to Link PPoi-01 : Prop PoI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
330	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
17,137	98	Roofs, HSG B	Woods
5,689	30	Woods, Good, HSG A	Open Space
123,590	55	Woods, Good, HSG B	Open Space
284,601	70	Woods, Good, HSG C	Open Space
9,740	39	>75% Grass cover, Good, HSG A	Open Space
56,304	61	>75% Grass cover, Good, HSG B	Open Space
398	74	>75% Grass cover, Good, HSG C	Open Space
497,789	65	Weighted Average	
480,322		96.49% Pervious Area	
17,467		3.51% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	9	0.5000	0.41		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
27.4	91	0.0300	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
0.7	40	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
12.6	378	0.0100	0.50		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
41.1	518	Total			

Summary for Subcatchment PS21: PS-21 Inner-Circle (East)

Run from top of graveyard, thru site, and into wetland.

Runoff = 4.8 cfs @ 12.10 hrs, Volume= 15,214 cf, Depth> 2.68"
Routed to Pond BIO1 : Bioretention Area #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
19,277	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
73	39	>75% Grass cover, Good, HSG A	Open Space
46,891	61	>75% Grass cover, Good, HSG B	Open Space
1,811	96	Gravel surface, HSG B	Roadway
68,052	72	Weighted Average	
48,775		71.67% Pervious Area	
19,277		28.33% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0600	0.28		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.2	38	0.0600	3.67		**Shallow Concentrated Flow, Shallow Concentrated Flow** Grassed Waterway Kv= 15.0 fps
6.1	138	Total			

Summary for Subcatchment PS22: PS-22 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.1 cfs @ 12.14 hrs, Volume= 3,820 cf, Depth> 3.53"
Routed to Pond CB10 : Catch Basin 10

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

	Area (sf)	CN	Description	Land Use
	0	98	Paved parking, HSG A	Woods
*	2,919	98	Paved parking, HSG B	Woods
	0	98	Roofs, HSG A	Woods
	4,072	98	Roofs, HSG B	Woods
	0	30	Woods, Good, HSG A	Open Space
*	0	30	Woods, Good, HSG B	Open Space
	0	39	>75% Grass cover, Good, HSG A	Open Space
	5,981	61	>75% Grass cover, Good, HSG B	Open Space
	0	96	Gravel surface, HSG B	Roadway
	12,972	81	Weighted Average	
	5,981		46.11% Pervious Area	
	6,991		53.89% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.4	115	0.0330	5.27	8.96	**Channel Flow, Street Gutter** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.013 Asphalt, smooth
9.5	215	Total			

Summary for Subcatchment PS23: PS-23 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 2.1 cfs @ 12.09 hrs, Volume= 6,633 cf, Depth> 3.64"
Routed to Pond CB12 : Catch Basin 12

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
12,141	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
23	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
9,670	61	>75% Grass cover, Good, HSG B	Open Space
57	96	Gravel surface, HSG B	Roadway
21,891	82	Weighted Average	
9,727		44.43% Pervious Area	
12,164		55.57% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	37	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.0	296	0.0200	2.42	4.12	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
6.1	333	Total			

Summary for Subcatchment PS24: PS-24 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 4.4 cfs @ 12.14 hrs, Volume= 15,489 cf, Depth> 3.34"
Routed to Pond CB13 : Catch Basin 13

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

	Area (sf)	CN	Description	Land Use
	0	98	Paved parking, HSG A	Woods
*	12,683	98	Paved parking, HSG B	Woods
	0	98	Roofs, HSG A	Woods
	14,404	98	Roofs, HSG B	Woods
	0	30	Woods, Good, HSG A	Open Space
	32	55	Woods, Good, HSG B	Open Space
	0	39	>75% Grass cover, Good, HSG A	Open Space
	27,910	61	>75% Grass cover, Good, HSG B	Open Space
	668	96	Gravel surface, HSG B	Roadway
	55,697	79	Weighted Average	
	28,610		51.37% Pervious Area	
	27,087		48.63% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	91	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
1.2	284	0.0200	4.10	6.97	**Channel Flow, Street Gutter** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.013 Asphalt, smooth
9.6	375	Total			

Summary for Subcatchment PS25: PS-25 Inner-Circle (West)

Run from top of graveyard, thru site, and into wetland.

Runoff = 3.5 cfs @ 12.10 hrs, Volume= 11,113 cf, Depth> 2.33"
Routed to Pond INF1 : Bioretention Area #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
9,338	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
46,032	61	>75% Grass cover, Good, HSG B	Open Space
1,861	96	Gravel surface, HSG B	Roadway
57,231	68	Weighted Average	
47,893		83.68% Pervious Area	
9,338		16.32% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0600	0.28		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.2	54	0.0600	3.67		**Shallow Concentrated Flow, Shallow Concentrated Flow** Grassed Waterway Kv= 15.0 fps
6.1	154	Total			

Summary for Subcatchment PS26: PS-26 Inner-Circle (Central)

Run from top of graveyard, thru site, and into wetland.

Runoff = 4.1 cfs @ 12.10 hrs, Volume= 12,994 cf, Depth> 2.77"
Routed to Pond BIO2 : Bioretention Area #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
15,228	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
38,434	61	>75% Grass cover, Good, HSG B	Open Space
2,559	96	Gravel surface, HSG B	Roadway
56,221	73	Weighted Average	
40,993		72.91% Pervious Area	
15,228		27.09% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0600	0.28		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
0.2	54	0.0600	3.67		**Shallow Concentrated Flow, Shallow Concentrated Flow** Grassed Waterway Kv= 15.0 fps
6.1	154	Total			

Summary for Subcatchment PS27: PS-27 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.1 cfs @ 12.14 hrs, Volume= 3,798 cf, Depth> 3.63"
Routed to Pond CB17 : Catch Basin 17

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
7,060	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
14	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
5,469	61	>75% Grass cover, Good, HSG B	Open Space
12,543	82	Weighted Average	
5,469		43.60% Pervious Area	
7,074		56.40% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	83	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.2	295	0.0171	2.24	3.81	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
10.1	378	Total			

Summary for Subcatchment PS28: PS-28 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.1 cfs @ 12.11 hrs, Volume= 3,700 cf, Depth> 3.34"
Routed to Pond CB16 : Catch Basin 16

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
6,575	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
6,724	61	>75% Grass cover, Good, HSG B	Open Space
13,299	79	Weighted Average	
6,724		50.56% Pervious Area	
6,575		49.44% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	55	0.0200	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.3	309	0.0171	2.24	3.81	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
7.9	364	Total			

Summary for Subcatchment PS29: PS-29 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 2.6 cfs @ 12.14 hrs, Volume= 9,355 cf, Depth> 3.53"
Routed to Pond CB15 : Catch Basin 15

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
12,695	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
4,234	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
0	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
14,813	61	>75% Grass cover, Good, HSG B	Open Space
27	96	Gravel surface, HSG B	Roadway
31,769	81	Weighted Average	
14,840		46.71% Pervious Area	
16,929		53.29% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	78	0.0200	0.17		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.70"
2.1	277	0.0171	2.24	3.81	**Channel Flow, Channel Flow** Area= 1.7 sf Perim= 13.3' r= 0.13' n= 0.022 Earth, clean & straight
9.6	355	Total			

Summary for Subcatchment PS30: PS-30 Road

Run from top of graveyard, thru site, and into wetland.

Runoff = 2.9 cfs @ 12.18 hrs, Volume= 11,495 cf, Depth> 3.14"
Routed to Pond CB14 : Catch Basin 14

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
13,693	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
4,818	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
1,789	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
23,217	61	>75% Grass cover, Good, HSG B	Open Space
382	96	Gravel surface, HSG B	Roadway
43,899	77	Weighted Average	
25,388		57.83% Pervious Area	
18,511		42.17% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	58	0.0400	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.70"
3.2	388	0.0175	2.02	2.42	**Channel Flow, Channel Flow** Area= 1.2 sf Perim= 11.2' r= 0.11' n= 0.022 Earth, clean & straight
13.0	446	Total			

Summary for Subcatchment PS32: PS-32 - Gravel Wetland

Run from top of graveyard, thru site, and into wetland.

Runoff = 1.5 cfs @ 12.34 hrs, Volume= 8,093 cf, Depth> 1.44"
Routed to Pond GW01 : Gravel Wetland #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
0	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
44,245	55	Woods, Good, HSG B	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
22,093	61	>75% Grass cover, Good, HSG B	Open Space
1,030	74	>75% Grass cover, Good, HSG C	Open Space
67,368	57	Weighted Average	
67,368		100.00% Pervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.0800	0.08		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
1.2	94	0.0650	1.27		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
21.2	194	Total			

Summary for Subcatchment PS33: PS-33 - Remainder of ES02

Run from top of graveyard, thru site, and into wetland.

Runoff = 18.7 cfs @ 12.51 hrs, Volume= 110,962 cf, Depth> 2.23"
Routed to Link PPoi-02 : POI

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.62"

Area (sf)	CN	Description	Land Use
0	98	Paved parking, HSG A	Woods
0	98	Paved parking, HSG B	Woods
0	98	Roofs, HSG A	Woods
4,959	98	Roofs, HSG B	Woods
0	30	Woods, Good, HSG A	Open Space
114,014	55	Woods, Good, HSG B	Open Space
442,373	70	Woods, Good, HSG C	Open Space
0	39	>75% Grass cover, Good, HSG A	Open Space
30,258	61	>75% Grass cover, Good, HSG B	Open Space
3,086	74	>75% Grass cover, Good, HSG C	Open Space
2,819	96	Gravel surface, HSG B	Roadway
0	96	Gravel surface, HSG C	Roadway
597,509	67	Weighted Average	
592,550		99.17% Pervious Area	
4,959		0.83% Impervious Area	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.1	100	0.0700	0.08		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.70"
13.4	694	0.0300	0.87		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
34.5	794	Total			

Summary for Reach ER3: R-03 Reach

Inflow Area = 399,877 sf, 9.83% Impervious, Inflow Depth > 0.65" for 10-Year event
Inflow = 3.0 cfs @ 12.35 hrs, Volume= 21,706 cf
Outflow = 1.3 cfs @ 12.86 hrs, Volume= 20,450 cf, Atten= 58%, Lag= 30.5 min
Routed to Link EPoI02 : Ex PoI-02

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.44 fps, Min. Travel Time= 54.2 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 82.3 min

Peak Storage= 4,098 cf @ 12.86 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 29.25'
Bank-Full Depth= 0.50' Flow Area= 17.5 sf, Capacity= 19.1 cfs

25.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 45.00'
Length= 1,421.0' Slope= 0.0190 '/'
Inlet Invert= 53.00', Outlet Invert= 26.00'


‡

Summary for Reach PR01: R-01 Reach

Inflow Area = 21,620 sf, 39.76% Impervious, Inflow Depth > 1.90" for 10-Year event
Inflow = 0.9 cfs @ 12.11 hrs, Volume= 3,422 cf
Outflow = 0.5 cfs @ 12.36 hrs, Volume= 3,321 cf, Atten= 48%, Lag= 14.9 min
Routed to Link PPoi-01 : Prop PoI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.31 fps, Min. Travel Time= 27.2 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 76.2 min

Peak Storage= 766 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 27.34'
Bank-Full Depth= 0.50' Flow Area= 17.5 sf, Capacity= 19.5 cfs

25.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 45.00'
Length= 501.0' Slope= 0.0199 '/'
Inlet Invert= 35.95', Outlet Invert= 26.00'


‡

Summary for Reach PR02: R-02 Reach

Inflow Area = 301,519 sf, 11.75% Impervious, Inflow Depth > 0.83" for 10-Year event
Inflow = 3.7 cfs @ 12.22 hrs, Volume= 20,894 cf
Outflow = 2.7 cfs @ 12.46 hrs, Volume= 20,517 cf, Atten= 26%, Lag= 14.7 min
Routed to Link PPoi-01 : Prop PoI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.58 fps, Min. Travel Time= 14.1 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 29.4 min

Peak Storage= 2,311 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 31.69'
Bank-Full Depth= 0.50' Flow Area= 17.5 sf, Capacity= 19.0 cfs

25.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 45.00'
Length= 487.0' Slope= 0.0189 '/'
Inlet Invert= 35.20', Outlet Invert= 26.00'

‡

Summary for Reach PR3: R-03 Reach

Inflow Area = 278,844 sf, 42.41% Impervious, Inflow Depth > 1.19" for 10-Year event
Inflow = 1.5 cfs @ 13.76 hrs, Volume= 27,765 cf
Outflow = 1.4 cfs @ 14.13 hrs, Volume= 27,061 cf, Atten= 5%, Lag= 22.2 min
Routed to Link PPoi-01 : Prop PoI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.37 fps, Min. Travel Time= 21.9 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 37.3 min

Peak Storage= 1,834 cf @ 14.13 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 30.43'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 52.5 cfs

25.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 65.00'
Length= 487.0' Slope= 0.0101 '/'
Inlet Invert= 30.90', Outlet Invert= 26.00'

‡

Summary for Reach PR4: R-04 Reach

Inflow Area = 240,223 sf, 35.54% Impervious, Inflow Depth > 1.75" for 10-Year event
Inflow = 4.3 cfs @ 12.60 hrs, Volume= 35,080 cf
Outflow = 3.4 cfs @ 12.90 hrs, Volume= 34,374 cf, Atten= 22%, Lag= 17.9 min
Routed to Link PPoi-02 : POI

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.54 fps, Min. Travel Time= 18.3 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 43.4 min

Peak Storage= 3,675 cf @ 12.90 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 33.47'
Bank-Full Depth= 0.50' Flow Area= 17.5 sf, Capacity= 15.6 cfs

25.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 45.00'
Length= 594.0' Slope= 0.0126 '/'
Inlet Invert= 33.50', Outlet Invert= 26.00'

‡

Summary for Reach PR5: R-03 Reach

Inflow Area = 451,793 sf, 9.76% Impervious, Inflow Depth = 0.15" for 10-Year event
Inflow = 2.3 cfs @ 12.62 hrs, Volume= 5,692 cf
Outflow = 2.3 cfs @ 12.64 hrs, Volume= 5,692 cf, Atten= 1%, Lag= 1.4 min
Routed to Link PPoi-01 : Prop PoI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.35 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 6.3 min

Peak Storage= 264 cf @ 12.64 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 33.95'
Bank-Full Depth= 0.50' Flow Area= 17.5 sf, Capacity= 9.8 cfs

25.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 45.00'
Length= 40.0' Slope= 0.0050 '/'
Inlet Invert= 33.40', Outlet Invert= 33.20'

‡

Summary for Pond BIO1: Bioretention Area #1

Inflow Area = 222,623 sf, 46.28% Impervious, Inflow Depth > 3.05" for 10-Year event
Inflow = 16.3 cfs @ 12.11 hrs, Volume= 56,551 cf
Outflow = 1.4 cfs @ 13.70 hrs, Volume= 22,860 cf, Atten= 92%, Lag= 95.4 min
Primary = 1.4 cfs @ 13.70 hrs, Volume= 22,860 cf
Routed to Pond MH10 : Manhole 10
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach PR3 : R-03 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.70 hrs Surf.Area= 15,317 sf Storage= 35,121 cf

Plug-Flow detention time= 293.6 min calculated for 22,812 cf (40% of inflow)
Center-of-Mass det. time= 171.8 min (998.3 - 826.5)

Volume	Invert	Avail.Storage	Storage Description
#1	32.55'	491 cf	**Media (Irregular)** Listed below (Recalc) 1,636 cf Overall x 30.0% Voids
#2	33.00'	59,069 cf	**Pond Area (Irregular)** Listed below (Recalc)
		59,559 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.55	3,635	387.6	0	0	3,635
33.00	3,635	387.6	1,636	1,636	3,809

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
33.00	3,635	387.6	0	0	3,635
35.00	6,050	423.1	9,583	9,583	6,064
35.20	7,104	508.6	1,314	10,897	12,404
38.00	12,186	568.7	26,688	37,585	17,773
39.00	14,781	626.5	13,463	51,048	23,303
39.50	17,337	651.4	8,021	59,069	25,855

Device	Routing	Invert	Outlet Devices
#1	Primary	32.65'	**18.0" Round Culvert** L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.65' / 32.35' S= 0.0077 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	32.65'	**1.2" Vert. Lower UD Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	36.25'	**1.2" Vert. Upper UD Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	37.60'	**24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	39.50'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.4 cfs @ 13.70 hrs HW=37.75' TW=32.54' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.4 cfs of 17.8 cfs potential flow)
  ├─**2=Lower UD Orifice** (Orifice Controls 0.1 cfs @ 10.82 fps)
  ├─**3=Upper UD Orifice** (Orifice Controls 0.0 cfs @ 5.80 fps)
  └─**4=Grate** (Weir Controls 1.2 cfs @ 1.28 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=32.55' TW=30.90' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond BIO2: Bioretention Area #2

Inflow Area = 56,221 sf, 27.09% Impervious, Inflow Depth > 2.77" for 10-Year event
Inflow = 4.1 cfs @ 12.10 hrs, Volume= 12,994 cf
Outflow = 0.2 cfs @ 15.38 hrs, Volume= 4,906 cf, Atten= 95%, Lag= 197.3 min
Primary = 0.2 cfs @ 15.38 hrs, Volume= 4,906 cf
Routed to Pond MH10 : Manhole 10
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond BIO1 : Bioretention Area #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 39.76' @ 15.38 hrs Surf.Area= 11,700 sf Storage= 8,904 cf

Plug-Flow detention time= 353.2 min calculated for 4,895 cf (38% of inflow)
Center-of-Mass det. time= 228.4 min (1,062.2 - 833.8)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	1,520 cf	**Media (Irregular)** Listed below (Recalc) 5,068 cf Overall x 30.0% Voids
#2	38.50'	25,518 cf	**Pond Area (Irregular)** Listed below (Recalc)
		27,039 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
37.50	5,068	402.0	0	0	5,068
38.50	5,068	402.0	5,068	5,068	5,470

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.50	5,068	402.0	0	0	5,068
39.00	5,678	411.6	2,685	2,685	5,722
40.00	6,941	430.4	6,299	8,984	7,050
41.00	8,261	449.2	7,591	16,575	8,438
41.50	8,941	458.7	4,299	20,875	9,161
42.00	9,637	468.1	4,643	25,518	9,892

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**18.0" Round Culvert** L= 54.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.00' / 34.50' S= 0.0463 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	37.50'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	39.50'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	40.75'	**24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	41.50'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.2 cfs @ 15.38 hrs HW=39.76' TW=32.49' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.2 cfs of 12.1 cfs potential flow)
  ├─**2=Orifice** (Orifice Controls 0.0 cfs @ 7.21 fps)
  ├─**3=Orifice** (Orifice Controls 0.2 cfs @ 1.75 fps)
  └─**4=Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=37.50' TW=32.55' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB01: Catch Basin 01

Inflow Area = 18,388 sf, 32.87% Impervious, Inflow Depth > 1.52" for 10-Year event
Inflow = 0.6 cfs @ 12.14 hrs, Volume= 2,332 cf
Outflow = 0.6 cfs @ 12.14 hrs, Volume= 2,332 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.6 cfs @ 12.14 hrs, Volume= 2,332 cf
Routed to Pond CB02 : Catch Basin 02
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB02 : Catch Basin 02

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.15' @ 12.13 hrs
Flood Elev= 39.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.65'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.65' / 36.50' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	39.43'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.6 cfs @ 12.14 hrs HW=37.15' TW=36.96' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.6 cfs @ 2.27 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=36.65' TW=36.40' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB02: Catch Basin 02

Inflow Area = 21,620 sf, 39.76% Impervious, Inflow Depth > 1.90" for 10-Year event
Inflow = 0.9 cfs @ 12.11 hrs, Volume= 3,422 cf
Outflow = 0.9 cfs @ 12.11 hrs, Volume= 3,422 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.11 hrs, Volume= 3,422 cf
Routed to Reach PR01 : R-01 Reach
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach PR01 : R-01 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.98' @ 12.11 hrs
Flood Elev= 39.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.40'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.40' / 36.10' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	39.85'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.9 cfs @ 12.11 hrs HW=36.97' TW=35.99' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.9 cfs @ 2.78 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=36.40' TW=35.95' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB05: Catch Basin 05

Inflow Area = 31,258 sf, 59.25% Impervious, Inflow Depth > 2.86" for 10-Year event
Inflow = 2.1 cfs @ 12.13 hrs, Volume= 7,459 cf
Outflow = 2.1 cfs @ 12.13 hrs, Volume= 7,459 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.1 cfs @ 12.13 hrs, Volume= 7,459 cf
Routed to Pond CB06 : Catch Basin 04

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 39.00' @ 12.13 hrs
Flood Elev= 41.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.05'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.05' / 37.90' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.1 cfs @ 12.13 hrs HW=38.99' TW=38.47' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.1 cfs @ 3.52 fps)

Summary for Pond CB06: Catch Basin 04

Inflow Area = 36,787 sf, 62.16% Impervious, Inflow Depth > 3.03" for 10-Year event
Inflow = 2.6 cfs @ 12.12 hrs, Volume= 9,276 cf
Outflow = 2.6 cfs @ 12.12 hrs, Volume= 9,276 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.6 cfs @ 12.12 hrs, Volume= 9,276 cf
Routed to Pond MH01a : Manhole 01
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach PR02 : R-02 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 38.49' @ 12.12 hrs
Flood Elev= 41.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.60'	**18.0" Round Culvert** L= 191.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.60' / 36.60' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	42.06'	**50.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.6 cfs @ 12.12 hrs HW=38.47' TW=37.46' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.6 cfs @ 3.46 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=37.60' TW=35.20' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB08: Catch Basin 08

Inflow Area = 46,676 sf, 50.48% Impervious, Inflow Depth > 2.96" for 10-Year event
Inflow = 3.2 cfs @ 12.14 hrs, Volume= 11,497 cf
Outflow = 3.2 cfs @ 12.14 hrs, Volume= 11,497 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.2 cfs @ 12.14 hrs, Volume= 11,497 cf
Routed to Pond MH01b : Manhole 01b

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 39.66' @ 12.14 hrs
Flood Elev= 43.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.75'	**18.0" Round Culvert**

L= 24.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 38.75' / 38.45' S= 0.0125 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.2 cfs @ 12.14 hrs HW=39.65' TW=37.10' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.2 cfs @ 4.13 fps)

Summary for Pond CB09: Catch Basin 09

Inflow Area = 95,902 sf, 56.06% Impervious, Inflow Depth > 3.06" for 10-Year event
Inflow = 6.9 cfs @ 12.12 hrs, Volume= 24,438 cf
Outflow = 6.9 cfs @ 12.12 hrs, Volume= 24,438 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.9 cfs @ 12.12 hrs, Volume= 24,438 cf
Routed to Pond BIO1 : Bioretention Area #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.69 hrs
Flood Elev= 41.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.85'	**24.0" Round Culvert** L= 171.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.85' / 33.90' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.8 cfs @ 12.12 hrs HW=36.47' TW=35.87' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 6.8 cfs @ 3.40 fps)

Summary for Pond CB10: Catch Basin 10

Inflow Area = 12,972 sf, 53.89% Impervious, Inflow Depth > 3.53" for 10-Year event
Inflow = 1.1 cfs @ 12.14 hrs, Volume= 3,820 cf
Outflow = 1.1 cfs @ 12.14 hrs, Volume= 3,820 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.1 cfs @ 12.14 hrs, Volume= 3,820 cf
Routed to Pond CB11 : Catch Basin 11

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 45.65' @ 12.12 hrs
Flood Elev= 49.11'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**15.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.90' S= 0.0063 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.1 cfs @ 12.14 hrs HW=45.64' TW=45.45' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.1 cfs @ 2.45 fps)

Summary for Pond CB11: Catch Basin 11

Inflow Area = 19,599 sf, 54.54% Impervious, Inflow Depth > 3.57" for 10-Year event
Inflow = 1.7 cfs @ 12.11 hrs, Volume= 5,829 cf
Outflow = 1.7 cfs @ 12.11 hrs, Volume= 5,829 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.7 cfs @ 12.11 hrs, Volume= 5,829 cf
Routed to Pond MH03 : Manhole 03

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 45.47' @ 12.11 hrs
Flood Elev= 49.11'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**15.0" Round Culvert** L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 43.50' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.6 cfs @ 12.11 hrs HW=45.47' TW=44.01' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.6 cfs @ 3.54 fps)

Summary for Pond CB12: Catch Basin 12

Inflow Area = 97,187 sf, 51.39% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Outflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Routed to Pond MH04 : Manhole 04

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 43.15' @ 12.12 hrs
Flood Elev= 47.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.60'	**24.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.60' / 41.00' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.7 cfs @ 12.12 hrs HW=43.13' TW=42.42' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 7.7 cfs @ 4.13 fps)

Summary for Pond CB13: Catch Basin 13

Inflow Area = 55,697 sf, 48.63% Impervious, Inflow Depth > 3.34" for 10-Year event
Inflow = 4.4 cfs @ 12.14 hrs, Volume= 15,489 cf
Outflow = 4.4 cfs @ 12.14 hrs, Volume= 15,489 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.4 cfs @ 12.14 hrs, Volume= 15,489 cf
Routed to Pond CB12 : Catch Basin 12

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 43.56' @ 12.13 hrs
Flood Elev= 47.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.25'	**16.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.25' / 42.00' S= 0.0156 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.40 sf

Primary OutFlow Max=4.3 cfs @ 12.14 hrs HW=43.54' TW=43.12' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.3 cfs @ 3.93 fps)

Summary for Pond CB14: Catch Basin 14

Inflow Area = 43,899 sf, 42.17% Impervious, Inflow Depth > 3.14" for 10-Year event
Inflow = 2.9 cfs @ 12.18 hrs, Volume= 11,495 cf
Outflow = 2.9 cfs @ 12.18 hrs, Volume= 11,495 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.9 cfs @ 12.18 hrs, Volume= 11,495 cf
Routed to Pond CB15 : Catch Basin 15

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 41.93' @ 12.16 hrs
Flood Elev= 44.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.55'	**18.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.40' / 40.55' S= -0.0054 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.9 cfs @ 12.18 hrs HW=41.89' TW=41.76' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.9 cfs @ 1.74 fps)

Summary for Pond CB15: Catch Basin 15

Inflow Area = 75,668 sf, 46.84% Impervious, Inflow Depth > 3.31" for 10-Year event
Inflow = 5.5 cfs @ 12.16 hrs, Volume= 20,850 cf
Outflow = 5.5 cfs @ 12.16 hrs, Volume= 20,850 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.5 cfs @ 12.16 hrs, Volume= 20,850 cf
Routed to Pond MH09 : Manhole 09

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 41.80' @ 12.16 hrs
Flood Elev= 45.28'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.45'	**18.0" Round Culvert** L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.45' / 40.05' S= 0.0057 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.4 cfs @ 12.16 hrs HW=41.79' TW=40.90' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 5.4 cfs @ 4.31 fps)

Summary for Pond CB16: Catch Basin 16

Inflow Area = 13,299 sf, 49.44% Impervious, Inflow Depth > 3.34" for 10-Year event
Inflow = 1.1 cfs @ 12.11 hrs, Volume= 3,700 cf
Outflow = 1.1 cfs @ 12.11 hrs, Volume= 3,700 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.1 cfs @ 12.11 hrs, Volume= 3,700 cf
Routed to Pond CB17 : Catch Basin 17
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach PR3 : R-03 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.74 hrs
Flood Elev= 41.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.80'	**15.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.80' / 36.60' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	40.02'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.1 cfs @ 12.11 hrs HW=37.38' TW=37.13' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.1 cfs @ 2.84 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=36.80' TW=30.90' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB17: Catch Basin 17

Inflow Area = 25,842 sf, 52.82% Impervious, Inflow Depth > 3.48" for 10-Year event
Inflow = 2.1 cfs @ 12.13 hrs, Volume= 7,497 cf
Outflow = 2.1 cfs @ 12.13 hrs, Volume= 7,497 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.1 cfs @ 12.13 hrs, Volume= 7,497 cf
Routed to Pond CB19 : Catch Basin 19

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.74 hrs
Flood Elev= 41.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.40'	**18.0" Round Culvert** L= 225.0' CPP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 36.40' / 34.50' S= 0.0084 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.9 cfs @ 12.13 hrs HW=37.13' TW=36.05' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.9 cfs @ 3.15 fps)

Summary for Pond CB18: Catch Basin 18

Inflow Area = 10,861 sf, 67.42% Impervious, Inflow Depth > 4.05" for 10-Year event
Inflow = 1.2 cfs @ 12.08 hrs, Volume= 3,663 cf
Outflow = 1.2 cfs @ 12.08 hrs, Volume= 3,663 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.2 cfs @ 12.08 hrs, Volume= 3,663 cf
Routed to Pond CB19 : Catch Basin 19

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.75 hrs
Flood Elev= 38.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.80'	**15.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.80' / 34.70' S= 0.0063 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.0 cfs @ 12.08 hrs HW=35.63' TW=35.76' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.0 cfs)

Summary for Pond CB19: Catch Basin 19

Inflow Area = 58,669 sf, 51.13% Impervious, Inflow Depth > 3.46" for 10-Year event
Inflow = 4.7 cfs @ 12.12 hrs, Volume= 16,915 cf
Outflow = 4.7 cfs @ 12.12 hrs, Volume= 16,915 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.7 cfs @ 12.12 hrs, Volume= 16,915 cf
Routed to Pond MH12 : Manhole 12

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.70 hrs
Flood Elev= 38.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.10'	**24.0" Round Culvert** L= 76.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.10' / 33.70' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.7 cfs @ 12.12 hrs HW=36.01' TW=35.88' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 4.7 cfs @ 1.93 fps)

Summary for Pond DI01: DI-01 DROP INLET

Inflow Area = 301,519 sf, 11.75% Impervious, Inflow Depth > 0.83" for 10-Year event
Inflow = 3.7 cfs @ 12.22 hrs, Volume= 20,895 cf
Outflow = 3.7 cfs @ 12.22 hrs, Volume= 20,894 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.7 cfs @ 12.22 hrs, Volume= 20,894 cf
Routed to Reach PR02 : R-02 Reach
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB05 : Catch Basin 05

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.21' @ 12.22 hrs Surf.Area= 4 sf Storage= 3 cf
Flood Elev= 42.00' Surf.Area= 1,494 sf Storage= 690 cf

Plug-Flow detention time= 0.0 min calculated for 20,851 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (913.4 - 913.4)

Volume	Invert	Avail.Storage	Storage Description
#1	36.45'	17 cf	**2.00'W x 2.00'L x 4.29'H DI**
#2	40.74'	4,796 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		4,813 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
40.74	4	8.0	0	0	4
41.00	103	73.6	11	11	430
42.00	1,490	260.3	662	673	5,394
43.00	4,704	454.5	2,947	3,620	16,446
43.25	4,704	454.5	1,176	4,796	16,560

Device	Routing	Invert	Outlet Devices
#1	Primary	36.45'	**15.0" Round Culvert X 2.00** L= 144.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.45' / 35.70' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	42.90'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.6 cfs @ 12.22 hrs HW=37.20' TW=35.31' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.6 cfs @ 3.41 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=36.45' TW=38.05' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond DI02: Drop Inlet #2

Inflow Area = 394,562 sf, 8.81% Impervious, Inflow Depth > 0.71" for 10-Year event
Inflow = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf
Outflow = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf
Routed to Pond MH11 : Manhole 11

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 47.17' @ 12.51 hrs
Flood Elev= 49.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**24.0" Round Culvert** L= 185.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.40' / 45.20' S= 0.0065 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.9 cfs @ 12.51 hrs HW=47.16' TW=45.83' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.9 cfs @ 3.95 fps)

Summary for Pond GW01: Gravel Wetland #1

Inflow Area = 240,223 sf, 35.54% Impervious, Inflow Depth > 2.84" for 10-Year event
Inflow = 14.0 cfs @ 12.14 hrs, Volume= 56,894 cf
Outflow = 4.3 cfs @ 12.60 hrs, Volume= 35,080 cf, Atten= 69%, Lag= 27.4 min
Primary = 4.3 cfs @ 12.60 hrs, Volume= 35,080 cf
Routed to Reach PR4 : R-04 Reach
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach PR4 : R-04 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.17' @ 12.60 hrs Surf.Area= 25,535 sf Storage= 26,590 cf

Plug-Flow detention time= 204.1 min calculated for 35,007 cf (62% of inflow)
Center-of-Mass det. time= 97.3 min (927.0 - 829.7)

Volume	Invert	Avail.Storage	Storage Description
#1	34.40'	677 cf	**Media-1 - to Outlet Inv (Irregular)**Listed below (Recalc) 3,387 cf Overall x 20.0% Voids
#2	35.00'	29,326 cf	**Pond Area - 1 (Irregular)**Listed below (Recalc)
#3	34.40'	647 cf	**Media-2 - to Outlet Inv (Irregular)**Listed below (Recalc) 3,233 cf Overall x 20.0% Voids
#4	35.00'	31,526 cf	**Pond Area - 2 (Irregular)**Listed below (Recalc)
		62,177 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
34.40	5,645	356.4	0	0	5,645
35.00	5,645	366.4	3,387	3,387	6,260

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	5,557	362.7	0	0	5,557
37.00	4,441	398.5	9,977	9,977	7,855
37.33	8,971	437.5	2,170	12,147	10,453
38.00	9,858	450.1	6,305	18,452	11,392
38.25	11,021	492.1	2,609	21,061	14,543
39.00	11,021	492.1	8,266	29,326	14,912

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
34.40	5,388	380.7	0	0	5,388
35.00	5,388	380.7	3,233	3,233	5,616

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	5,388	380.7	0	0	5,388
38.00	9,069	437.3	21,447	21,447	9,271
38.25	10,225	483.0	2,410	23,858	12,620
39.00	10,225	483.0	7,669	31,526	12,982

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**18.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.40' / 33.97' S= 0.0172 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	34.40'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	35.75'	**2.0" Vert. Upper Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	36.75'	**18.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**12.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.3 cfs @ 12.60 hrs HW=37.17' TW=33.66' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.3 cfs of 12.1 cfs potential flow)
  ├─**2=Orifice** (Orifice Controls 0.0 cfs @ 7.98 fps)
  ├─**3=Upper Orifice** (Orifice Controls 0.1 cfs @ 5.56 fps)
  └─**4=Grate** (Weir Controls 4.2 cfs @ 2.11 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=34.40' TW=33.50' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond INF1: Bioretention Area #2

Inflow Area = 451,793 sf, 9.76% Impervious, Inflow Depth > 0.91" for 10-Year event
Inflow = 4.0 cfs @ 12.43 hrs, Volume= 34,337 cf
Outflow = 3.4 cfs @ 12.62 hrs, Volume= 34,075 cf, Atten= 15%, Lag= 11.3 min
Discarded = 1.1 cfs @ 12.62 hrs, Volume= 28,383 cf
Primary = 2.3 cfs @ 12.62 hrs, Volume= 5,692 cf
Routed to Pond MH13 : Manhole 13
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond BIO2 : Bioretention Area #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 44.23' @ 12.62 hrs Surf.Area= 4,787 sf Storage= 5,139 cf

Plug-Flow detention time= 39.0 min calculated for 34,075 cf (99% of inflow)
Center-of-Mass det. time= 35.0 min (940.1 - 905.1)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	15,259 cf	**Pond Area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.00	3,554	334.7	0	0	3,554
44.00	4,551	347.3	4,042	4,042	4,318
45.00	5,599	362.2	5,066	9,108	5,231
45.50	6,150	371.6	2,936	12,044	5,810
46.00	6,714	381.0	3,215	15,259	6,403

Device	Routing	Invert	Outlet Devices
#1	Primary	41.00'	**15.0" Round Culvert** L= 189.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 41.00' / 37.40' S= 0.0190 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	44.00'	**24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	45.00'	**10.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#4	Discarded	43.00'	**9.500 in/hr Exfiltration over Horizontal area** Phase-In= 0.25'

Discarded OutFlow Max=1.1 cfs @ 12.62 hrs HW=44.23' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 1.1 cfs)

Primary OutFlow Max=2.3 cfs @ 12.62 hrs HW=44.23' TW=37.93' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.3 cfs of 7.5 cfs potential flow)
  └─**2=Grate** (Weir Controls 2.3 cfs @ 1.58 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=43.00' TW=37.50' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond MH01a: Manhole 01

Inflow Area = 36,787 sf, 62.16% Impervious, Inflow Depth > 3.03" for 10-Year event
Inflow = 2.6 cfs @ 12.12 hrs, Volume= 9,276 cf
Outflow = 2.6 cfs @ 12.12 hrs, Volume= 9,276 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.6 cfs @ 12.12 hrs, Volume= 9,276 cf
Routed to Pond MH01b : Manhole 01b

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.76' @ 13.73 hrs
Flood Elev= 44.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.50'	**18.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.50' / 36.00' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.4 cfs @ 12.12 hrs HW=37.46' TW=37.06' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.4 cfs @ 2.87 fps)

Summary for Pond MH01b: Manhole 01b

Inflow Area = 83,463 sf, 55.62% Impervious, Inflow Depth > 2.99" for 10-Year event
Inflow = 5.8 cfs @ 12.13 hrs, Volume= 20,772 cf
Outflow = 5.8 cfs @ 12.13 hrs, Volume= 20,772 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.8 cfs @ 12.13 hrs, Volume= 20,772 cf
Routed to Pond CB09 : Catch Basin 09

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.76' @ 13.69 hrs
Flood Elev= 43.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.80'	**24.0" Round Culvert** L= 81.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.80' / 35.25' S= 0.0068 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.7 cfs @ 12.13 hrs HW=37.08' TW=36.50' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.7 cfs @ 3.82 fps)

Summary for Pond MH03: Manhole 03

Inflow Area = 19,599 sf, 54.54% Impervious, Inflow Depth > 3.57" for 10-Year event
Inflow = 1.7 cfs @ 12.11 hrs, Volume= 5,829 cf
Outflow = 1.7 cfs @ 12.11 hrs, Volume= 5,829 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.7 cfs @ 12.11 hrs, Volume= 5,829 cf
Routed to Pond CB12 : Catch Basin 12

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 44.02' @ 12.11 hrs
Flood Elev= 51.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.30'	**18.0" Round Culvert** L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.30' / 42.00' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.6 cfs @ 12.11 hrs HW=44.01' TW=43.13' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.6 cfs @ 2.88 fps)

Summary for Pond MH04: Manhole 04

Inflow Area = 97,187 sf, 51.39% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Outflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Routed to Pond MH05 : Manhole 05

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 42.45' @ 12.12 hrs
Flood Elev= 49.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.90'	**24.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.90' / 40.40' S= 0.0061 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.7 cfs @ 12.12 hrs HW=42.42' TW=41.79' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 7.7 cfs @ 4.12 fps)

Summary for Pond MH05: Manhole 05

Inflow Area = 97,187 sf, 51.39% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Outflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Routed to Pond MH06 : Manhole 06

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 41.81' @ 12.12 hrs
Flood Elev= 50.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.30'	**24.0" Round Culvert** L= 81.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.30' / 39.75' S= 0.0068 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.7 cfs @ 12.12 hrs HW=41.79' TW=41.10' (Dynamic Tailwater)
1=Culvert (Outlet Controls 7.7 cfs @ 4.28 fps)

Summary for Pond MH06: Manhole 06

Inflow Area = 97,187 sf, 51.39% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Outflow = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.0 cfs @ 12.12 hrs, Volume= 27,950 cf
Routed to Pond MH07 : Manhole 07

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 41.12' @ 12.12 hrs
Flood Elev= 50.47'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.65'	**24.0" Round Culvert** L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.65' / 38.90' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.8 cfs @ 12.12 hrs HW=41.10' TW=40.17' (Dynamic Tailwater)
1=Culvert (Outlet Controls 7.8 cfs @ 4.46 fps)

Summary for Pond MH07: Manhole 07

Inflow Area = 172,855 sf, 49.39% Impervious, Inflow Depth > 3.39" for 10-Year event
Inflow = 13.1 cfs @ 12.13 hrs, Volume= 48,801 cf
Outflow = 13.1 cfs @ 12.13 hrs, Volume= 48,801 cf, Atten= 0%, Lag= 0.0 min
Primary = 13.1 cfs @ 12.13 hrs, Volume= 48,801 cf
Routed to Pond MH08 : Manhole 08

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 40.19' @ 12.13 hrs
Flood Elev= 49.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.50'	**30.0" Round Culvert** L= 285.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.50' / 36.95' S= 0.0054 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=12.9 cfs @ 12.13 hrs HW=40.18' TW=38.43' (Dynamic Tailwater)
1=Culvert (Outlet Controls 12.9 cfs @ 5.23 fps)

Summary for Pond MH08: Manhole 08

Inflow Area = 172,855 sf, 49.39% Impervious, Inflow Depth > 3.39" for 10-Year event
Inflow = 13.1 cfs @ 12.13 hrs, Volume= 48,801 cf
Outflow = 13.1 cfs @ 12.13 hrs, Volume= 48,801 cf, Atten= 0%, Lag= 0.0 min
Primary = 13.1 cfs @ 12.13 hrs, Volume= 48,801 cf
Routed to Pond GW01 : Gravel Wetland #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 38.44' @ 12.13 hrs
Flood Elev= 40.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.85'	**30.0" Round Culvert** L= 176.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.85' / 35.65' S= 0.0068 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=12.9 cfs @ 12.13 hrs HW=38.43' TW=36.25' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 12.9 cfs @ 5.66 fps)

Summary for Pond MH09: Manhole 09

Inflow Area = 75,668 sf, 46.84% Impervious, Inflow Depth > 3.31" for 10-Year event
Inflow = 5.5 cfs @ 12.16 hrs, Volume= 20,850 cf
Outflow = 5.5 cfs @ 12.16 hrs, Volume= 20,850 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.5 cfs @ 12.16 hrs, Volume= 20,850 cf
Routed to Pond MH07 : Manhole 07

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 40.91' @ 12.15 hrs
Flood Elev= 46.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.65'	**24.0" Round Culvert** L= 143.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.65' / 38.90' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.4 cfs @ 12.16 hrs HW=40.90' TW=40.16' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.4 cfs @ 3.75 fps)

Summary for Pond MH10: Manhole 10

Inflow Area = 278,844 sf, 42.41% Impervious, Inflow Depth > 1.19" for 10-Year event
Inflow = 1.5 cfs @ 13.76 hrs, Volume= 27,765 cf
Outflow = 1.5 cfs @ 13.76 hrs, Volume= 27,765 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.5 cfs @ 13.76 hrs, Volume= 27,765 cf
Routed to Reach PR3 : R-03 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.54' @ 13.76 hrs
Flood Elev= 41.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.15'	**24.0" Round Culvert X 2.00** L= 220.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.15' / 31.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.5 cfs @ 13.76 hrs HW=32.54' TW=31.03' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.5 cfs @ 2.58 fps)

Summary for Pond MH11: Manhole 11

Inflow Area = 394,562 sf, 8.81% Impervious, Inflow Depth > 0.71" for 10-Year event
Inflow = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf
Outflow = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.9 cfs @ 12.51 hrs, Volume= 23,224 cf
Routed to Pond INF1 : Bioretention Area #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 45.83' @ 12.51 hrs
Flood Elev= 49.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**24.0" Round Culvert** L= 178.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 43.75' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.9 cfs @ 12.51 hrs HW=45.83' TW=44.20' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.9 cfs @ 4.21 fps)

Summary for Pond MH12: Manhole 12

Inflow Area = 58,669 sf, 51.13% Impervious, Inflow Depth > 3.46" for 10-Year event
Inflow = 4.7 cfs @ 12.12 hrs, Volume= 16,915 cf
Outflow = 4.7 cfs @ 12.12 hrs, Volume= 16,899 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.7 cfs @ 12.12 hrs, Volume= 16,899 cf
Routed to Pond BIO1 : Bioretention Area #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.75' @ 13.70 hrs
Flood Elev= 39.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.60'	**24.0" Round Culvert X 2.00** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.60' / 33.37' S= 0.0051 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.6 cfs @ 12.12 hrs HW=35.88' TW=35.86' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.6 cfs @ 0.73 fps)

Summary for Pond MH13: Manhole 13

Inflow Area = 451,793 sf, 9.76% Impervious, Inflow Depth = 0.15" for 10-Year event
Inflow = 2.3 cfs @ 12.62 hrs, Volume= 5,692 cf
Outflow = 2.3 cfs @ 12.62 hrs, Volume= 5,692 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.3 cfs @ 12.62 hrs, Volume= 5,692 cf
Routed to Reach PR5 : R-03 Reach

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.94' @ 12.62 hrs
Flood Elev= 49.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.30'	**24.0" Round Culvert** L= 148.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.30' / 33.50' S= 0.0257 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.3 cfs @ 12.62 hrs HW=37.93' TW=33.62' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.3 cfs @ 2.71 fps)

Summary for Link EPol01: Ex Pol-01

Inflow Area = 1,086,569 sf, 2.77% Impervious, Inflow Depth > 1.37" for 10-Year event
Inflow = 22.5 cfs @ 12.36 hrs, Volume= 123,847 cf
Primary = 22.5 cfs @ 12.36 hrs, Volume= 123,847 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol02: Ex Pol-02

Inflow Area = 1,302,728 sf, 3.02% Impervious, Inflow Depth > 1.45" for 10-Year event
Inflow = 23.6 cfs @ 12.51 hrs, Volume= 157,290 cf
Primary = 23.6 cfs @ 12.51 hrs, Volume= 157,290 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol03: Ex Pol-03

Inflow Area = 469,882 sf, 0.00% Impervious, Inflow Depth > 1.88" for 10-Year event
Inflow = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf
Primary = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol04: Ex Pol-04

Inflow Area = 668,692 sf, 1.33% Impervious, Inflow Depth > 0.64" for 10-Year event
Inflow = 3.2 cfs @ 12.90 hrs, Volume= 35,720 cf
Primary = 3.2 cfs @ 12.90 hrs, Volume= 35,720 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol05: Ex Pol-05

Inflow Area = 305,212 sf, 0.00% Impervious, Inflow Depth > 1.90" for 10-Year event
Inflow = 7.9 cfs @ 12.52 hrs, Volume= 48,275 cf
Primary = 7.9 cfs @ 12.52 hrs, Volume= 48,275 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPol06: Ex Pol-06

Inflow Area = 125,073 sf, 0.00% Impervious, Inflow Depth > 1.51" for 10-Year event
Inflow = 2.7 cfs @ 12.43 hrs, Volume= 15,770 cf
Primary = 2.7 cfs @ 12.43 hrs, Volume= 15,770 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPoi-01: Prop Pol-01

Inflow Area = 1,551,565 sf, 14.43% Impervious, Inflow Depth > 1.10" for 10-Year event
Inflow = 18.2 cfs @ 12.59 hrs, Volume= 141,937 cf
Primary = 18.2 cfs @ 12.59 hrs, Volume= 141,937 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPoi-02: POI

Inflow Area = 837,732 sf, 10.78% Impervious, Inflow Depth > 2.08" for 10-Year event
Inflow = 20.1 cfs @ 12.56 hrs, Volume= 145,336 cf
Primary = 20.1 cfs @ 12.56 hrs, Volume= 145,336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPoi-03: PO3

Inflow Area = 469,882 sf, 0.00% Impervious, Inflow Depth > 1.88" for 10-Year event
Inflow = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf
Primary = 8.8 cfs @ 12.90 hrs, Volume= 73,712 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPoi-04: Pr PoI-04

Inflow Area =	668,692 sf,	1.33% Impervious,	Inflow Depth > 0.64"	for 10-Year event
Inflow =	3.2 cfs @	12.90 hrs, Volume=	35,720 cf	
Primary =	3.2 cfs @	12.90 hrs, Volume=	35,720 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPoi-05: Pr PoI-05

Inflow Area =	305,212 sf,	0.00% Impervious,	Inflow Depth > 1.90"	for 10-Year event
Inflow =	7.9 cfs @	12.52 hrs, Volume=	48,275 cf	
Primary =	7.9 cfs @	12.52 hrs, Volume=	48,275 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPoi-06: Ex PoI-06

Inflow Area =	125,073 sf,	0.00% Impervious,	Inflow Depth > 1.51"	for 10-Year event
Inflow =	2.7 cfs @	12.43 hrs, Volume=	15,770 cf	
Primary =	2.7 cfs @	12.43 hrs, Volume=	15,770 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDIX F – BMP WORKSHEETS

(This Page Is Intentionally Blank)

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR
(UNH Stormwater Center Specification)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: **Bioretention Area #1 with ISR**

Enter the node name in the drainage analysis if applicable.

5.11	ac	A = Area draining to the practice	
2.37	ac	A_I = Impervious area draining to the practice	
0.46	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.47	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
2.38	ac-in	WQV= 1” x Rv x A	
8,655	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
865	cf	10% x WQV (check calc for sediment forebay)	
2,164	cf	25% x WQV (check calc for water stored in saturated zone)	
Forebay		Method of Pretreatment	
875	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**$\geq$ 10%WQV**
19,256	cf	Volume below lowest orifice[1]	**$\geq$ 100%WQV**
4,053	cf	Water stored in voids of saturated zone	**$\geq$ 26%WQV**
0.20	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
34.79	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.05	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
96.16	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**$\geq$ 24-hrs**
18.00	in	Depth of Filter Media	**$\geq$ 18"**
3.00	:1	Pond side slopes	**$\geq$ 3:1**
		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of $\leq$6”)?	
38.43	ft	Peak elevation of the 50-year storm event (E_{50})	
39.50	ft	Berm elevation of the pond	
YES		$E_{50} \leq$ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

Storage Below First Pond InvertVol at 36.25 = 19,747 - Vol. at Bottom of Pond 491 cf = 19,256 cf

WQV @ Elev. 34.79 (8,833 cf) - Vol. at Bottom of Pond (491 cf) = 8,342 cf

Water Stored in Saturated Zone

- Media Below Invert = 32.65 - 31.50 = 1.05 ft * 30% voids * 3,635 sf = 1,145 cf
- Crushed Stone Below Invert = (12"+9"+3") 2 ft * 40% Voids * 3,635 sf = 2,908 cf
- Total of 4,053 cf

(This Page Is Intentionally Blank)

Stage-Area-Storage for Pond BIO1: Bioretention Area #1

	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
	32.55	0	33.08	785	33.61	2,910
	32.56	11	33.09	822	33.62	2,953
	32.57	22	33.10	860	33.63	2,996
	32.58	33	33.11	897	33.64	3,040
	32.59	44	33.12	935	33.65	3,083
	32.60	55	33.13	972	33.66	3,127
	32.61	65	33.14	1,010	33.67	3,171
	32.62	76	33.15	1,048	33.68	3,214
	32.63	87	33.16	1,086	33.69	3,258
	32.64	98	33.17	1,124	33.70	3,302
	32.65	109	33.18	1,162	33.71	3,346
	32.66	120	33.19	1,201	33.72	3,391
	32.67	131	33.20	1,239	33.73	3,435
	32.68	142	33.21	1,278	33.74	3,480
	32.69	153	33.22	1,316	33.75	3,524
	32.70	164	33.23	1,355	33.76	3,569
	32.71	174	33.24	1,394	33.77	3,614
	32.72	185	33.25	1,433	33.78	3,659
	32.73	196	33.26	1,472	33.79	3,704
	32.74	207	33.27	1,511	33.80	3,749
	32.75	218	33.28	1,550	33.81	3,795
	32.76	229	33.29	1,590	33.82	3,840
	32.77	240	33.30	1,629	33.83	3,886
	32.78	251	33.31	1,669	33.84	3,931
	32.79	262	33.32	1,709	33.85	3,977
	32.80	273	33.33	1,749	33.86	4,023
	32.81	284	33.34	1,789	33.87	4,069
	32.82	294	33.35	1,829	33.88	4,115
	32.83	305	33.36	1,869	33.89	4,161
	32.84	316	33.37	1,909	33.90	4,208
	32.85	327	33.38	1,950	33.91	4,254
	32.86	338	33.39	1,990	33.92	4,301
	32.87	349	33.40	2,031	33.93	4,348
	32.88	360	33.41	2,071	33.94	4,395
	32.89	371	33.42	2,112	33.95	4,442
	32.90	382	33.43	2,153	33.96	4,489
	32.91	393	33.44	2,194	33.97	4,536
	32.92	403	33.45	2,236	33.98	4,583
	32.93	414	33.46	2,277	33.99	4,631
	32.94	425	33.47	2,318	34.00	4,678
	32.95	436	33.48	2,360	34.01	4,726
	32.96	447	33.49	2,401	34.02	4,774
	32.97	458	33.50	2,443	34.03	4,822
	32.98	469	33.51	2,485	34.04	4,870
	32.99	480	33.52	2,527	34.05	4,918
Bot of Basin	33.00	491	33.53	2,569	34.06	4,967
	33.01	527	33.54	2,611	34.07	5,015
	33.02	564	33.55	2,654	34.08	5,064
	33.03	600	33.56	2,696	34.09	5,112
	33.04	637	33.57	2,739	34.10	5,161
	33.05	674	33.58	2,781	34.11	5,210
	33.06	711	33.59	2,824	34.12	5,259
	33.07	748	33.60	2,867	34.13	5,308

Stage-Area-Storage for Pond BIO1: Bioretention Area #1 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
34.14	5,358	34.67	8,150	35.20	11,388
34.15	5,407	34.68	8,207	35.21	11,459
34.16	5,457	34.69	8,263	35.22	11,530
34.17	5,506	34.70	8,319	35.23	11,602
34.18	5,556	34.71	8,376	35.24	11,673
34.19	5,606	34.72	8,433	35.25	11,745
34.20	5,656	34.73	8,489	35.26	11,817
34.21	5,706	34.74	8,546	35.27	11,889
34.22	5,757	34.75	8,603	35.28	11,961
34.23	5,807	34.76	8,661	35.29	12,033
34.24	5,857	34.77	8,718	35.30	12,106
34.25	5,908	34.78	8,775	35.31	12,179
34.26	5,959	34.79	8,833	35.32	12,252
34.27	6,010	34.80	8,891	35.33	12,325
34.28	6,061	34.81	8,949	35.34	12,398
34.29	6,112	34.82	9,007	35.35	12,471
34.30	6,163	34.83	9,065	35.36	12,545
34.31	6,215	34.84	9,123	35.37	12,618
34.32	6,266	34.85	9,181	35.38	12,692
34.33	6,318	34.86	9,240	35.39	12,766
34.34	6,370	34.87	9,299	35.40	12,840
34.35	6,422	34.88	9,358	35.41	12,915
34.36	6,474	34.89	9,416	35.42	12,989
34.37	6,526	34.90	9,476	35.43	13,064
34.38	6,578	34.91	9,535	35.44	13,138
34.39	6,631	34.92	9,594	35.45	13,213
34.40	6,683	34.93	9,654	35.46	13,288
34.41	6,736	34.94	9,713	35.47	13,364
34.42	6,789	34.95	9,773	35.48	13,439
34.43	6,842	34.96	9,833	35.49	13,515
34.44	6,895	34.97	9,893	35.50	13,590
34.45	6,948	34.98	9,953	35.51	13,666
34.46	7,001	34.99	10,013	35.52	13,742
34.47	7,055	35.00	10,074	35.53	13,819
34.48	7,108	35.01	10,135	35.54	13,895
34.49	7,162	35.02	10,196	35.55	13,972
34.50	7,216	35.03	10,258	35.56	14,048
34.51	7,270	35.04	10,320	35.57	14,125
34.52	7,324	35.05	10,383	35.58	14,202
34.53	7,378	35.06	10,446	35.59	14,280
34.54	7,432	35.07	10,510	35.60	14,357
34.55	7,487	35.08	10,574	35.61	14,434
34.56	7,541	35.09	10,639	35.62	14,512
34.57	7,596	35.10	10,704	35.63	14,590
34.58	7,651	35.11	10,770	35.64	14,668
34.59	7,706	35.12	10,837	35.65	14,746
34.60	7,761	35.13	10,904	35.66	14,825
34.61	7,816	35.14	10,971	35.67	14,903
34.62	7,872	35.15	11,039	35.68	14,982
34.63	7,927	35.16	11,108	35.69	15,061
34.64	7,983	35.17	11,177	35.70	15,140
34.65	8,038	35.18	11,247	35.71	15,219
34.66	8,094	35.19	11,317	35.72	15,298

8,655 (WQV) + 491 (Vol. at Bottom of Basin) = 9,146 cf

Stage-Area-Storage for Pond BIO1: Bioretention Area #1 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
35.73	15,378	36.26	19,835	36.79	24,786
35.74	15,458	36.27	19,924	36.80	24,884
35.75	15,537	36.28	20,013	36.81	24,983
35.76	15,617	36.29	20,102	36.82	25,082
35.77	15,698	36.30	20,192	36.83	25,181
35.78	15,778	36.31	20,281	36.84	25,280
35.79	15,859	36.32	20,371	36.85	25,379
35.80	15,939	36.33	20,460	36.86	25,478
35.81	16,020	36.34	20,550	36.87	25,578
35.82	16,101	36.35	20,641	36.88	25,678
35.83	16,182	36.36	20,731	36.89	25,778
35.84	16,264	36.37	20,822	36.90	25,878
35.85	16,345	36.38	20,912	36.91	25,978
35.86	16,427	36.39	21,003	36.92	26,079
35.87	16,509	36.40	21,094	36.93	26,180
35.88	16,591	36.41	21,185	36.94	26,280
35.89	16,673	36.42	21,277	36.95	26,382
35.90	16,756	36.43	21,368	36.96	26,483
35.91	16,838	36.44	21,460	36.97	26,584
35.92	16,921	36.45	21,552	36.98	26,686
35.93	17,004	36.46	21,644	36.99	26,788
35.94	17,087	36.47	21,737	37.00	26,890
35.95	17,170	36.48	21,829	37.01	26,992
35.96	17,253	36.49	21,922	37.02	27,095
35.97	17,337	36.50	22,015	37.03	27,197
35.98	17,421	36.51	22,108	37.04	27,300
35.99	17,505	36.52	22,201	37.05	27,403
36.00	17,589	36.53	22,294	37.06	27,506
36.01	17,673	36.54	22,388	37.07	27,610
36.02	17,757	36.55	22,482	37.08	27,713
36.03	17,842	36.56	22,575	37.09	27,817
36.04	17,927	36.57	22,670	37.10	27,921
36.05	18,012	36.58	22,764	37.11	28,025
36.06	18,097	36.59	22,858	37.12	28,129
36.07	18,182	36.60	22,953	37.13	28,234
36.08	18,268	36.61	23,048	37.14	28,339
36.09	18,353	36.62	23,143	37.15	28,443
36.10	18,439	36.63	23,238	37.16	28,549
36.11	18,525	36.64	23,333	37.17	28,654
36.12	18,611	36.65	23,429	37.18	28,759
36.13	18,697	36.66	23,525	37.19	28,865
36.14	18,784	36.67	23,621	37.20	28,971
36.15	18,871	36.68	23,717	37.21	29,077
36.16	18,957	36.69	23,813	37.22	29,183
36.17	19,044	36.70	23,910	37.23	29,289
36.18	19,132	36.71	24,006	37.24	29,396
36.19	19,219	36.72	24,103	37.25	29,503
36.20	19,307	36.73	24,200	37.26	29,610
36.21	19,394	36.74	24,297	37.27	29,717
36.22	19,482	36.75	24,395	37.28	29,825
36.23	19,570	36.76	24,492	37.29	29,932
36.24	19,658	36.77	24,590	37.30	30,040
36.25	19,747	36.78	24,688	37.31	30,148

Lowest Orifice

Stage-Discharge for Pond BIO1: Bioretention Area #1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
32.55	0.00	0.00	**0.00**	33.08	0.02	0.02	0.00
32.56	0.00	0.00	0.00	33.09	0.02	0.02	0.00
32.57	0.00	0.00	0.00	33.10	0.02	0.02	0.00
32.58	0.00	0.00	0.00	33.11	0.02	0.02	0.00
32.59	0.00	0.00	0.00	33.12	0.02	0.02	0.00
32.60	0.00	0.00	0.00	33.13	0.02	0.02	0.00
32.61	0.00	0.00	0.00	33.14	0.03	0.03	0.00
32.62	0.00	0.00	0.00	33.15	0.03	0.03	0.00
32.63	0.00	0.00	0.00	33.16	0.03	0.03	0.00
32.64	0.00	0.00	0.00	33.17	0.03	0.03	0.00
32.65	0.00	0.00	0.00	33.18	0.03	0.03	0.00
32.66	0.00	0.00	0.00	33.19	0.03	0.03	0.00
32.67	0.00	0.00	0.00	33.20	0.03	0.03	0.00
32.68	0.00	0.00	0.00	33.21	0.03	0.03	0.00
32.69	0.00	0.00	0.00	33.22	0.03	0.03	0.00
32.70	0.00	0.00	0.00	33.23	0.03	0.03	0.00
32.71	0.00	0.00	0.00	33.24	0.03	0.03	0.00
32.72	0.01	0.01	0.00	33.25	0.03	0.03	0.00
32.73	0.01	0.01	0.00	33.26	0.03	0.03	0.00
32.74	0.01	0.01	0.00	33.27	0.03	0.03	0.00
32.75	0.01	0.01	0.00	33.28	0.03	0.03	0.00
32.76	0.01	0.01	0.00	33.29	0.03	0.03	0.00
32.77	0.01	0.01	0.00	33.30	0.03	0.03	0.00
32.78	0.01	0.01	0.00	33.31	0.03	0.03	0.00
32.79	0.01	0.01	0.00	33.32	0.03	0.03	0.00
32.80	0.01	0.01	0.00	33.33	0.03	0.03	0.00
32.81	0.01	0.01	0.00	33.34	0.03	0.03	0.00
32.82	0.01	0.01	0.00	33.35	0.03	0.03	0.00
32.83	0.01	0.01	0.00	33.36	0.03	0.03	0.00
32.84	0.01	0.01	0.00	33.37	0.03	0.03	0.00
32.85	0.01	0.01	0.00	33.38	0.03	0.03	0.00
32.86	0.02	0.02	0.00	33.39	0.03	0.03	0.00
32.87	0.02	0.02	0.00	33.40	0.03	0.03	0.00
32.88	0.02	0.02	0.00	33.41	0.03	0.03	0.00
32.89	0.02	0.02	0.00	33.42	0.03	0.03	0.00
32.90	0.02	0.02	0.00	33.43	0.03	0.03	0.00
32.91	0.02	0.02	0.00	33.44	0.03	0.03	0.00
32.92	0.02	0.02	0.00	33.45	0.03	0.03	0.00
32.93	0.02	0.02	0.00	33.46	0.03	0.03	0.00
32.94	0.02	0.02	0.00	33.47	0.03	0.03	0.00
32.95	0.02	0.02	0.00	33.48	0.03	0.03	0.00
32.96	0.02	0.02	0.00	33.49	0.03	0.03	0.00
32.97	0.02	0.02	0.00	33.50	0.03	0.03	0.00
32.98	0.02	0.02	0.00	33.51	0.03	0.03	0.00
32.99	0.02	0.02	0.00	33.52	0.03	0.03	0.00
33.00	0.02	0.02	0.00	33.53	0.03	0.03	0.00
33.01	0.02	0.02	0.00	33.54	0.03	0.03	0.00
33.02	0.02	0.02	0.00	33.55	0.03	0.03	0.00
33.03	0.02	0.02	0.00	33.56	0.04	0.04	0.00
33.04	0.02	0.02	0.00	33.57	0.04	0.04	0.00
33.05	0.02	0.02	0.00	33.58	0.04	0.04	0.00
33.06	0.02	0.02	0.00	33.59	0.04	0.04	0.00
33.07	0.02	0.02	0.00	33.60	0.04	0.04	0.00

Stage-Discharge for Pond BIO1: Bioretention Area #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
33.61	0.04	0.04	0.00	34.14	0.05	0.05	0.00
33.62	0.04	0.04	0.00	34.15	0.05	0.05	0.00
33.63	0.04	0.04	0.00	34.16	0.05	0.05	0.00
33.64	0.04	0.04	0.00	34.17	0.05	0.05	0.00
33.65	0.04	0.04	0.00	34.18	0.05	0.05	0.00
33.66	0.04	0.04	0.00	34.19	0.05	0.05	0.00
33.67	0.04	0.04	0.00	34.20	0.05	0.05	0.00
33.68	0.04	0.04	0.00	34.21	0.05	0.05	0.00
33.69	0.04	0.04	0.00	34.22	0.05	0.05	0.00
33.70	0.04	0.04	0.00	34.23	0.05	0.05	0.00
33.71	0.04	0.04	0.00	34.24	0.05	0.05	0.00
33.72	0.04	0.04	0.00	34.25	0.05	0.05	0.00
33.73	0.04	0.04	0.00	34.26	0.05	0.05	0.00
33.74	0.04	0.04	0.00	34.27	0.05	0.05	0.00
33.75	0.04	0.04	0.00	34.28	0.05	0.05	0.00
33.76	0.04	0.04	0.00	34.29	0.05	0.05	0.00
33.77	0.04	0.04	0.00	34.30	0.05	0.05	0.00
33.78	0.04	0.04	0.00	34.31	0.05	0.05	0.00
33.79	0.04	0.04	0.00	34.32	0.05	0.05	0.00
33.80	0.04	0.04	0.00	34.33	0.05	0.05	0.00
33.81	0.04	0.04	0.00	34.34	0.05	0.05	0.00
33.82	0.04	0.04	0.00	34.35	0.05	0.05	0.00
33.83	0.04	0.04	0.00	34.36	0.05	0.05	0.00
33.84	0.04	0.04	0.00	34.37	0.05	0.05	0.00
33.85	0.04	0.04	0.00	34.38	0.05	0.05	0.00
33.86	0.04	0.04	0.00	34.39	0.05	0.05	0.00
33.87	0.04	0.04	0.00	34.40	0.05	0.05	0.00
33.88	0.04	0.04	0.00	34.41	0.05	0.05	0.00
33.89	0.04	0.04	0.00	34.42	0.05	0.05	0.00
33.90	0.04	0.04	0.00	34.43	0.05	0.05	0.00
33.91	0.04	0.04	0.00	34.44	0.05	0.05	0.00
33.92	0.04	0.04	0.00	34.45	0.05	0.05	0.00
33.93	0.04	0.04	0.00	34.46	0.05	0.05	0.00
33.94	0.04	0.04	0.00	34.47	0.05	0.05	0.00
33.95	0.04	0.04	0.00	34.48	0.05	0.05	0.00
33.96	0.04	0.04	0.00	34.49	0.05	0.05	0.00
33.97	0.04	0.04	0.00	34.50	0.05	0.05	0.00
33.98	0.04	0.04	0.00	34.51	0.05	0.05	0.00
33.99	0.04	0.04	0.00	34.52	0.05	0.05	0.00
34.00	0.04	0.04	0.00	34.53	0.05	0.05	0.00
34.01	0.04	0.04	0.00	34.54	0.05	0.05	0.00
34.02	0.04	0.04	0.00	34.55	0.05	0.05	0.00
34.03	0.04	0.04	0.00	34.56	0.05	0.05	0.00
34.04	0.04	0.04	0.00	34.57	0.05	0.05	0.00
34.05	0.04	0.04	0.00	34.58	0.05	0.05	0.00
34.06	0.04	0.04	0.00	34.59	0.05	0.05	0.00
34.07	0.04	0.04	0.00	34.60	0.05	0.05	0.00
34.08	0.04	0.04	0.00	34.61	0.05	0.05	0.00
34.09	0.04	0.04	0.00	34.62	0.05	0.05	0.00
34.10	0.04	0.04	0.00	34.63	0.05	0.05	0.00
34.11	0.04	0.04	0.00	34.64	0.05	0.05	0.00
34.12	0.05	0.05	0.00	34.65	0.05	0.05	0.00
34.13	0.05	0.05	0.00	34.66	0.05	0.05	0.00

Stage-Discharge for Pond BIO1: Bioretention Area #1 (continued)

	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
	34.67	0.05	0.05	0.00
	34.68	0.05	0.05	0.00
	34.69	0.05	0.05	0.00
	34.70	0.05	0.05	0.00
	34.71	0.05	0.05	0.00
	34.72	0.05	0.05	0.00
	34.73	0.05	0.05	0.00
	34.74	0.05	0.05	0.00
	34.75	0.05	0.05	0.00
	34.76	0.05	0.05	0.00
	34.77	0.05	0.05	0.00
	34.78	0.05	0.05	0.00
	34.79	0.05	0.05	0.00
	34.80	0.05	0.05	0.00
	34.81	0.05	0.05	0.00
	34.82	0.06	0.06	0.00
	34.83	0.06	0.06	0.00
	34.84	0.06	0.06	0.00
Qwqv	34.85	0.06	0.06	0.00
	34.86	0.06	0.06	0.00
	34.87	0.06	0.06	0.00
	34.88	0.06	0.06	0.00
	34.89	0.06	0.06	0.00
	34.90	0.06	0.06	0.00
	34.91	0.06	0.06	0.00
	34.92	0.06	0.06	0.00
	34.93	0.06	0.06	0.00
	34.94	0.06	0.06	0.00
	34.95	0.06	0.06	0.00
	34.96	0.06	0.06	0.00
	34.97	0.06	0.06	0.00
	34.98	0.06	0.06	0.00
	34.99	0.06	0.06	0.00
	35.00	0.06	0.06	0.00
	35.01	0.06	0.06	0.00
	35.02	0.06	0.06	0.00
	35.03	0.06	0.06	0.00
	35.04	0.06	0.06	0.00
	35.05	0.06	0.06	0.00
	35.06	0.06	0.06	0.00
	35.07	0.06	0.06	0.00
	35.08	0.06	0.06	0.00
	35.09	0.06	0.06	0.00
	35.10	0.06	0.06	0.00
	35.11	0.06	0.06	0.00
	35.12	0.06	0.06	0.00
	35.13	0.06	0.06	0.00
	35.14	0.06	0.06	0.00
	35.15	0.06	0.06	0.00
	35.16	0.06	0.06	0.00
	35.17	0.06	0.06	0.00
	35.18	0.06	0.06	0.00
	35.19	0.06	0.06	0.00
	35.20	0.06	0.06	0.00
	35.21	0.06	0.06	0.00
	35.22	0.06	0.06	0.00
	35.23	0.06	0.06	0.00
	35.24	0.06	0.06	0.00
	35.25	0.06	0.06	0.00
	35.26	0.06	0.06	0.00
	35.27	0.06	0.06	0.00
	35.28	0.06	0.06	0.00
	35.29	0.06	0.06	0.00
	35.30	0.06	0.06	0.00
	35.31	0.06	0.06	0.00
	35.32	0.06	0.06	0.00
	35.33	0.06	0.06	0.00
	35.34	0.06	0.06	0.00
	35.35	0.06	0.06	0.00
	35.36	0.06	0.06	0.00
	35.37	0.06	0.06	0.00
	35.38	0.06	0.06	0.00
	35.39	0.06	0.06	0.00
	35.40	0.06	0.06	0.00
	35.41	0.06	0.06	0.00
	35.42	0.06	0.06	0.00
	35.43	0.06	0.06	0.00
	35.44	0.06	0.06	0.00
	35.45	0.06	0.06	0.00
	35.46	0.06	0.06	0.00
	35.47	0.06	0.06	0.00
	35.48	0.06	0.06	0.00
	35.49	0.06	0.06	0.00
	35.50	0.06	0.06	0.00
	35.51	0.06	0.06	0.00
	35.52	0.06	0.06	0.00
	35.53	0.06	0.06	0.00
	35.54	0.06	0.06	0.00
	35.55	0.06	0.06	0.00
	35.56	0.06	0.06	0.00
	35.57	0.06	0.06	0.00
	35.58	0.06	0.06	0.00
	35.59	0.06	0.06	0.00
	35.60	0.06	0.06	0.00
	35.61	0.06	0.06	0.00
	35.62	0.06	0.06	0.00
	35.63	0.06	0.06	0.00
	35.64	0.06	0.06	0.00
	35.65	0.06	0.06	0.00
	35.66	0.07	0.07	0.00
	35.67	0.07	0.07	0.00
	35.68	0.07	0.07	0.00
	35.69	0.07	0.07	0.00
	35.70	0.07	0.07	0.00
	35.71	0.07	0.07	0.00
	35.72	0.07	0.07	0.00

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR
(UNH Stormwater Center Specification)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: **Bioretention Area #2 with ISR**

Enter the node name in the drainage analysis if applicable.

1.60	ac	A = Area draining to the practice	
0.43	ac	A_I = Impervious area draining to the practice	
0.27	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.29	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.47	ac-in	WQV= 1" x Rv x A	
1,706	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
171	cf	10% x WQV (check calc for sediment forebay)	
426	cf	25% x WQV (check calc for water stored in saturated zone)	
Overland Flow		Method of Pretreatment	
NA	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
5,659	cf	Volume below lowest orifice[1]	**≥ 100%WQV**
5,574	cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.04	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
38.83	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
94.77	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**≥ 24-hrs**
18.00	in	Depth of Filter Media	**≥ 18"**
3.00	:1	Pond side slopes	**≥ 3:1**
		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
41.45	ft	Peak elevation of the 50-year storm event (E_{50})	
41.50	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

Storage Below First Pond InvertVol at 39.50 = 7,197 - 1,520 cf (Vol. at Bottom of Pond) = 5,659 cf

1,706 (WQV) + 1,520 (Vol. at Bottom of Basin) = 3,226 -> Vol @ 38.83 = 3,258

Water Stored in Saturated Zone

- Media Below Invert = 39.00 - 38.00 = 1.00 ft * 30% voids * 5,068 sf = 1520 cf
- Crushed Stone Below Invert = (12"+9"+3") 2 ft * 40% Voids * 5,068 sf = 4,054 cf
- Total of 5,574 cf

(This Page Is Intentionally Blank)

Stage-Area-Storage for Pond BIO2: Bioretention Area #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
37.50	0	38.03	806	38.56	1,827
37.51	15	38.04	821	38.57	1,878
37.52	30	38.05	836	38.58	1,930
37.53	46	38.06	851	38.59	1,981
37.54	61	38.07	867	38.60	2,033
37.55	76	38.08	882	38.61	2,085
37.56	91	38.09	897	38.62	2,137
37.57	106	38.10	912	38.63	2,189
37.58	122	38.11	927	38.64	2,242
37.59	137	38.12	943	38.65	2,294
37.60	152	38.13	958	38.66	2,347
37.61	167	38.14	973	38.67	2,399
37.62	182	38.15	988	38.68	2,452
37.63	198	38.16	1,003	38.69	2,505
37.64	213	38.17	1,019	38.70	2,558
37.65	228	38.18	1,034	38.71	2,611
37.66	243	38.19	1,049	38.72	2,664
37.67	258	38.20	1,064	38.73	2,718
37.68	274	38.21	1,079	38.74	2,771
37.69	289	38.22	1,095	38.75	2,825
37.70	304	38.23	1,110	38.76	2,879
37.71	319	38.24	1,125	38.77	2,932
37.72	334	38.25	1,140	38.78	2,986
37.73	350	38.26	1,156	38.79	3,041
37.74	365	38.27	1,171	38.80	3,095
37.75	380	38.28	1,186	38.81	3,149
37.76	395	38.29	1,201	38.82	3,204
37.77	411	38.30	1,216	38.83	3,258
37.78	426	38.31	1,232	38.84	3,313
37.79	441	38.32	1,247	38.85	3,368
37.80	456	38.33	1,262	38.86	3,423
37.81	471	38.34	1,277	38.87	3,478
37.82	487	38.35	1,292	38.88	3,533
37.83	502	38.36	1,308	38.89	3,588
37.84	517	38.37	1,323	38.90	3,644
37.85	532	38.38	1,338	38.91	3,700
37.86	547	38.39	1,353	38.92	3,755
37.87	563	38.40	1,368	38.93	3,811
37.88	578	38.41	1,384	38.94	3,867
37.89	593	38.42	1,399	38.95	3,923
37.90	608	38.43	1,414	38.96	3,979
37.91	623	38.44	1,429	38.97	4,036
37.92	639	38.45	1,444	38.98	4,092
37.93	654	38.46	1,460	38.99	4,149
37.94	669	38.47	1,475	39.00	4,205
37.95	684	38.48	1,490	39.01	4,262
37.96	699	38.49	1,505	39.02	4,319
37.97	715	38.50	1,520	39.03	4,376
37.98	730	38.51	1,571	39.04	4,434
37.99	745	38.52	1,622	39.05	4,491
38.00	760	38.53	1,673	39.06	4,548
38.01	775	38.54	1,724	39.07	4,606
38.02	791	38.55	1,775	39.08	4,664

1,706 (WQV) + 1,520 (Vol. at Bottom of Basin) = 3,226

Bottom of Basin

Stage-Area-Storage for Pond BIO2: Bioretention Area #2 (continued)

Lowest Orifice

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
39.09	4,721	39.62	7,961	40.15	11,560
39.10	4,779	39.63	8,026	40.16	11,631
39.11	4,837	39.64	8,091	40.17	11,703
39.12	4,895	39.65	8,155	40.18	11,774
39.13	4,954	39.66	8,220	40.19	11,846
39.14	5,012	39.67	8,285	40.20	11,918
39.15	5,071	39.68	8,350	40.21	11,990
39.16	5,129	39.69	8,416	40.22	12,062
39.17	5,188	39.70	8,481	40.23	12,134
39.18	5,247	39.71	8,547	40.24	12,207
39.19	5,306	39.72	8,612	40.25	12,279
39.20	5,365	39.73	8,678	40.26	12,352
39.21	5,424	39.74	8,744	40.27	12,425
39.22	5,484	39.75	8,810	40.28	12,498
39.23	5,543	39.76	8,876	40.29	12,571
39.24	5,603	39.77	8,943	40.30	12,644
39.25	5,663	39.78	9,009	40.31	12,717
39.26	5,723	39.79	9,076	40.32	12,791
39.27	5,783	39.80	9,143	40.33	12,864
39.28	5,843	39.81	9,209	40.34	12,938
39.29	5,903	39.82	9,276	40.35	13,012
39.30	5,963	39.83	9,343	40.36	13,086
39.31	6,024	39.84	9,411	40.37	13,160
39.32	6,085	39.85	9,478	40.38	13,234
39.33	6,145	39.86	9,546	40.39	13,309
39.34	6,206	39.87	9,613	40.40	13,383
39.35	6,267	39.88	9,681	40.41	13,458
39.36	6,328	39.89	9,749	40.42	13,532
39.37	6,390	39.90	9,817	40.43	13,607
39.38	6,451	39.91	9,885	40.44	13,682
39.39	6,512	39.92	9,953	40.45	13,757
39.40	6,574	39.93	10,022	40.46	13,833
39.41	6,636	39.94	10,090	40.47	13,908
39.42	6,698	39.95	10,159	40.48	13,984
39.43	6,760	39.96	10,228	40.49	14,059
39.44	6,822	39.97	10,297	40.50	14,135
39.45	6,884	39.98	10,366	40.51	14,211
39.46	6,946	39.99	10,435	40.52	14,287
39.47	7,009	40.00	10,504	40.53	14,363
39.48	7,071	40.01	10,574	40.54	14,440
39.49	7,134	40.02	10,643	40.55	14,516
39.50	7,197	40.03	10,713	40.56	14,593
39.51	7,260	40.04	10,783	40.57	14,669
39.52	7,323	40.05	10,853	40.58	14,746
39.53	7,386	40.06	10,923	40.59	14,823
39.54	7,450	40.07	10,993	40.60	14,900
39.55	7,513	40.08	11,064	40.61	14,978
39.56	7,577	40.09	11,134	40.62	15,055
39.57	7,641	40.10	11,205	40.63	15,133
39.58	7,705	40.11	11,276	40.64	15,210
39.59	7,769	40.12	11,346	40.65	15,288
39.60	7,833	40.13	11,417	40.66	15,366
39.61	7,897	40.14	11,489	40.67	15,444

Stage-Area-Storage for Pond BIO2: Bioretention Area #2 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
40.68	15,522	41.21	19,860	41.74	24,581
40.69	15,601	41.22	19,946	41.75	24,673
40.70	15,679	41.23	20,031	41.76	24,766
40.71	15,758	41.24	20,117	41.77	24,859
40.72	15,836	41.25	20,203	41.78	24,953
40.73	15,915	41.26	20,289	41.79	25,046
40.74	15,994	41.27	20,375	41.80	25,139
40.75	16,073	41.28	20,462	41.81	25,233
40.76	16,153	41.29	20,548	41.82	25,327
40.77	16,232	41.30	20,635	41.83	25,421
40.78	16,312	41.31	20,721	41.84	25,515
40.79	16,391	41.32	20,808	41.85	25,609
40.80	16,471	41.33	20,895	41.86	25,703
40.81	16,551	41.34	20,982	41.87	25,798
40.82	16,631	41.35	21,070	41.88	25,892
40.83	16,711	41.36	21,157	41.89	25,987
40.84	16,792	41.37	21,245	41.90	26,082
40.85	16,872	41.38	21,332	41.91	26,177
40.86	16,953	41.39	21,420	41.92	26,272
40.87	17,033	41.40	21,508	41.93	26,367
40.88	17,114	41.41	21,596	41.94	26,463
40.89	17,195	41.42	21,684	41.95	26,559
40.90	17,277	41.43	21,773	41.96	26,654
40.91	17,358	41.44	21,861	41.97	26,750
40.92	17,439	41.45	21,950	41.98	26,846
40.93	17,521	41.46	22,039	41.99	26,942
40.94	17,603	41.47	22,128	42.00	**27,039**
40.95	17,684	41.48	22,217		
40.96	17,766	41.49	22,306		
40.97	17,849	41.50	22,395		
40.98	17,931	41.51	22,485		
40.99	18,013	41.52	22,574		
41.00	18,096	41.53	22,664		
41.01	18,179	41.54	22,754		
41.02	18,261	41.55	22,844		
41.03	18,344	41.56	22,934		
41.04	18,427	41.57	23,024		
41.05	18,511	41.58	23,115		
41.06	18,594	41.59	23,205		
41.07	18,677	41.60	23,296		
41.08	18,761	41.61	23,387		
41.09	18,845	41.62	23,478		
41.10	18,929	41.63	23,569		
41.11	19,013	41.64	23,660		
41.12	19,097	41.65	23,752		
41.13	19,181	41.66	23,843		
41.14	19,265	41.67	23,935		
41.15	19,350	41.68	24,027		
41.16	19,435	41.69	24,119		
41.17	19,520	41.70	24,211		
41.18	19,605	41.71	24,303		
41.19	19,690	41.72	24,395		
41.20	19,775	41.73	24,488		

(This Page Is Intentionally Blank)

Stage-Discharge for Pond BIO2: Bioretention Area #2

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
37.50	0.00	0.00	0.00	38.03	0.00	0.00	0.00
37.51	0.00	0.00	0.00	38.04	0.00	0.00	0.00
37.52	0.00	0.00	0.00	38.05	0.00	0.00	0.00
37.53	0.00	0.00	0.00	38.06	0.00	0.00	0.00
37.54	0.00	0.00	0.00	38.07	0.00	0.00	0.00
37.55	0.00	0.00	0.00	38.08	0.00	0.00	0.00
37.56	0.00	0.00	0.00	38.09	0.00	0.00	0.00
37.57	0.00	0.00	0.00	38.10	0.00	0.00	0.00
37.58	0.00	0.00	0.00	38.11	0.01	0.01	0.00
37.59	0.00	0.00	0.00	38.12	0.01	0.01	0.00
37.60	0.00	0.00	0.00	38.13	0.01	0.01	0.00
37.61	0.00	0.00	0.00	38.14	0.01	0.01	0.00
37.62	0.00	0.00	0.00	38.15	0.01	0.01	0.00
37.63	0.00	0.00	0.00	38.16	0.01	0.01	0.00
37.64	0.00	0.00	0.00	38.17	0.01	0.01	0.00
37.65	0.00	0.00	0.00	38.18	0.01	0.01	0.00
37.66	0.00	0.00	0.00	38.19	0.01	0.01	0.00
37.67	0.00	0.00	0.00	38.20	0.01	0.01	0.00
37.68	0.00	0.00	0.00	38.21	0.01	0.01	0.00
37.69	0.00	0.00	0.00	38.22	0.01	0.01	0.00
37.70	0.00	0.00	0.00	38.23	0.01	0.01	0.00
37.71	0.00	0.00	0.00	38.24	0.01	0.01	0.00
37.72	0.00	0.00	0.00	38.25	0.01	0.01	0.00
37.73	0.00	0.00	0.00	38.26	0.01	0.01	0.00
37.74	0.00	0.00	0.00	38.27	0.01	0.01	0.00
37.75	0.00	0.00	0.00	38.28	0.01	0.01	0.00
37.76	0.00	0.00	0.00	38.29	0.01	0.01	0.00
37.77	0.00	0.00	0.00	38.30	0.01	0.01	0.00
37.78	0.00	0.00	0.00	38.31	0.01	0.01	0.00
37.79	0.00	0.00	0.00	38.32	0.01	0.01	0.00
37.80	0.00	0.00	0.00	38.33	0.01	0.01	0.00
37.81	0.00	0.00	0.00	38.34	0.01	0.01	0.00
37.82	0.00	0.00	0.00	38.35	0.01	0.01	0.00
37.83	0.00	0.00	0.00	38.36	0.01	0.01	0.00
37.84	0.00	0.00	0.00	38.37	0.01	0.01	0.00
37.85	0.00	0.00	0.00	38.38	0.01	0.01	0.00
37.86	0.00	0.00	0.00	38.39	0.01	0.01	0.00
37.87	0.00	0.00	0.00	38.40	0.01	0.01	0.00
37.88	0.00	0.00	0.00	38.41	0.01	0.01	0.00
37.89	0.00	0.00	0.00	38.42	0.01	0.01	0.00
37.90	0.00	0.00	0.00	38.43	0.01	0.01	0.00
37.91	0.00	0.00	0.00	38.44	0.01	0.01	0.00
37.92	0.00	0.00	0.00	38.45	0.01	0.01	0.00
37.93	0.00	0.00	0.00	38.46	0.01	0.01	0.00
37.94	0.00	0.00	0.00	38.47	0.01	0.01	0.00
37.95	0.00	0.00	0.00	38.48	0.01	0.01	0.00
37.96	0.00	0.00	0.00	38.49	0.01	0.01	0.00
37.97	0.00	0.00	0.00	38.50	0.01	0.01	0.00
37.98	0.00	0.00	0.00	38.51	0.01	0.01	0.00
37.99	0.00	0.00	0.00	38.52	0.01	0.01	0.00
38.00	0.00	0.00	0.00	38.53	0.01	0.01	0.00
38.01	0.00	0.00	0.00	38.54	0.01	0.01	0.00
38.02	0.00	0.00	0.00	38.55	0.01	0.01	0.00

Stage-Discharge for Pond BIO2: Bioretention Area #2 (continued)

	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
	38.56	0.01	0.01	0.00
	38.57	0.01	0.01	0.00
	38.58	0.01	0.01	0.00
	38.59	0.01	0.01	0.00
	38.60	0.01	0.01	0.00
	38.61	0.01	0.01	0.00
	38.62	0.01	0.01	0.00
	38.63	0.01	0.01	0.00
	38.64	0.01	0.01	0.00
	38.65	0.01	0.01	0.00
	38.66	0.01	0.01	0.00
	38.67	0.01	0.01	0.00
	38.68	0.01	0.01	0.00
	38.69	0.01	0.01	0.00
	38.70	0.01	0.01	0.00
	38.71	0.01	0.01	0.00
	38.72	0.01	0.01	0.00
	38.73	0.01	0.01	0.00
	38.74	0.01	0.01	0.00
	38.75	0.01	0.01	0.00
	38.76	0.01	0.01	0.00
	38.77	0.01	0.01	0.00
	38.78	0.01	0.01	0.00
	38.79	0.01	0.01	0.00
	38.80	0.01	0.01	0.00
	38.81	0.01	0.01	0.00
	38.82	0.01	0.01	0.00
Qwqv	38.83	0.01	0.01	0.00
	38.84	0.01	0.01	0.00
	38.85	0.01	0.01	0.00
	38.86	0.01	0.01	0.00
	38.87	0.01	0.01	0.00
	38.88	0.01	0.01	0.00
	38.89	0.01	0.01	0.00
	38.90	0.01	0.01	0.00
	38.91	0.01	0.01	0.00
	38.92	0.01	0.01	0.00
	38.93	0.01	0.01	0.00
	38.94	0.01	0.01	0.00
	38.95	0.01	0.01	0.00
	38.96	0.01	0.01	0.00
	38.97	0.01	0.01	0.00
	38.98	0.01	0.01	0.00
	38.99	0.01	0.01	0.00
	39.00	0.01	0.01	0.00
	39.01	0.01	0.01	0.00
	39.02	0.01	0.01	0.00
	39.03	0.01	0.01	0.00
	39.04	0.01	0.01	0.00
	39.05	0.01	0.01	0.00
	39.06	0.01	0.01	0.00
	39.07	0.01	0.01	0.00
	39.08	0.01	0.01	0.00
	39.09	0.01	0.01	0.00
	39.10	0.01	0.01	0.00
	39.11	0.01	0.01	0.00
	39.12	0.01	0.01	0.00
	39.13	0.01	0.01	0.00
	39.14	0.01	0.01	0.00
	39.15	0.01	0.01	0.00
	39.16	0.01	0.01	0.00
	39.17	0.01	0.01	0.00
	39.18	0.01	0.01	0.00
	39.19	0.01	0.01	0.00
	39.20	0.01	0.01	0.00
	39.21	0.01	0.01	0.00
	39.22	0.01	0.01	0.00
	39.23	0.01	0.01	0.00
	39.24	0.01	0.01	0.00
	39.25	0.01	0.01	0.00
	39.26	0.01	0.01	0.00
	39.27	0.01	0.01	0.00
	39.28	0.01	0.01	0.00
	39.29	0.01	0.01	0.00
	39.30	0.01	0.01	0.00
	39.31	0.01	0.01	0.00
	39.32	0.01	0.01	0.00
	39.33	0.01	0.01	0.00
	39.34	0.01	0.01	0.00
	39.35	0.01	0.01	0.00
	39.36	0.01	0.01	0.00
	39.37	0.01	0.01	0.00
	39.38	0.01	0.01	0.00
	39.39	0.01	0.01	0.00
	39.40	0.01	0.01	0.00
	39.41	0.01	0.01	0.00
	39.42	0.01	0.01	0.00
	39.43	0.01	0.01	0.00
	39.44	0.01	0.01	0.00
	39.45	0.01	0.01	0.00
	39.46	0.01	0.01	0.00
	39.47	0.01	0.01	0.00
	39.48	0.01	0.01	0.00
	39.49	0.01	0.01	0.00
	39.50	0.01	0.01	0.00
	39.51	0.01	0.01	0.00
	39.52	0.01	0.01	0.00
	39.53	0.01	0.01	0.00
	39.54	0.01	0.01	0.00
	39.55	0.02	0.02	0.00
	39.56	0.02	0.02	0.00
	39.57	0.02	0.02	0.00
	39.58	0.03	0.03	0.00
	39.59	0.03	0.03	0.00
	39.60	0.04	0.04	0.00
	39.61	0.05	0.05	0.00

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration Basin #1 (INF 1)**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
10.37	ac	A = Area draining to the practice	
0.21	ac	A_I = Impervious area draining to the practice	
0.02	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.07	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.71	ac-in	WQV= 1" x Rv x A	
2,583	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
646	cf	25% x WQV (check calc for sediment forebay volume)	
Roof and Clean		Method of pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
4,042	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
3,554	sf	A_{SA} = Surface area of the bottom of the pond	
9.50	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
0.9	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
43.00	feet	E_{BTM} = Elevation of the bottom of the basin	
40.58	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
34.25	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
2.42	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
8.8	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
NA	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
NA	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
NA	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
NA		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
Yes	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
3.0	:1	If a basin is proposed, pond side slopes.	≥3:1
44.23	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
45.24	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
45.50	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Impervious from Site: 9,338 sf roof runoff

Other impervious area is from offsite and is treated with overland flow.

Note, Only clean runoff or residential roof run off > 1 ft separation

(This Page Is Intentionally Blank)

Stage-Area-Storage for Pond INF1: Bioretention Area #2

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
43.00	3,554	3,554	0
43.01	3,563	3,563	36
43.02	3,573	3,573	71
43.03	3,582	3,582	107
43.04	3,592	3,592	143
43.05	3,601	3,601	179
43.06	3,610	3,610	215
43.07	3,620	3,620	251
43.08	3,629	3,629	287
43.09	3,639	3,639	324
43.10	3,648	3,648	360
43.11	3,658	3,658	397
43.12	3,667	3,667	433
43.13	3,677	3,677	470
43.14	3,686	3,686	507
43.15	3,696	3,696	544
43.16	3,705	3,705	581
43.17	3,715	3,715	618
43.18	3,724	3,724	655
43.19	3,734	3,734	692
43.20	3,744	3,744	730
43.21	3,753	3,753	767
43.22	3,763	3,763	805
43.23	3,772	3,772	842
43.24	3,782	3,782	880
43.25	3,792	3,792	918
43.26	3,801	3,801	956
43.27	3,811	3,811	994
43.28	3,821	3,821	1,032
43.29	3,830	3,830	1,070
43.30	3,840	3,840	1,109
43.31	3,850	3,850	1,147
43.32	3,860	3,860	1,186
43.33	3,869	3,869	1,224
43.34	3,879	3,879	1,263
43.35	3,889	3,889	1,302
43.36	3,899	3,899	1,341
43.37	3,909	3,909	1,380
43.38	3,918	3,918	1,419
43.39	3,928	3,928	1,458
43.40	3,938	3,938	1,498
43.41	3,948	3,948	1,537
43.42	3,958	3,958	1,577
43.43	3,968	3,968	1,616
43.44	3,978	3,978	1,656
43.45	3,987	3,987	1,696
43.46	3,997	3,997	1,736
43.47	4,007	4,007	1,776
43.48	4,017	4,017	1,816
43.49	4,027	4,027	1,856
43.50	4,037	4,037	1,896
43.51	4,047	4,047	1,937
43.52	4,057	4,057	1,977

Bottom of Basin

Stage-Area-Storage for Pond INF1: Bioretention Area #2 (continued)

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
43.53	4,067	4,067	2,018
43.54	4,077	4,077	2,059
43.55	4,087	4,087	2,100
43.56	4,097	4,097	2,141
43.57	4,107	4,107	2,182
43.58	4,117	4,117	2,223
43.59	4,127	4,127	2,264
43.60	4,137	4,137	2,305
43.61	4,148	4,148	2,347
43.62	4,158	4,158	2,388
43.63	4,168	4,168	2,430
43.64	4,178	4,178	2,472
43.65	4,188	4,188	2,513
43.66	4,198	4,198	2,555
43.67	4,208	4,208	2,597
43.68	4,219	4,219	2,639
43.69	4,229	4,229	2,682
43.70	4,239	4,239	2,724
43.71	4,249	4,249	2,766
43.72	4,259	4,259	2,809
43.73	4,270	4,270	2,852
43.74	4,280	4,280	2,894
43.75	4,290	4,290	2,937
43.76	4,300	4,300	2,980
43.77	4,311	4,311	3,023
43.78	4,321	4,321	3,066
43.79	4,331	4,331	3,110
43.80	4,342	4,342	3,153
43.81	4,352	4,352	3,197
43.82	4,362	4,362	3,240
43.83	4,373	4,373	3,284
43.84	4,383	4,383	3,328
43.85	4,394	4,394	3,371
43.86	4,404	4,404	3,415
43.87	4,414	4,414	3,460
43.88	4,425	4,425	3,504
43.89	4,435	4,435	3,548
43.90	4,446	4,446	3,592
43.91	4,456	4,456	3,637
43.92	4,467	4,467	3,682
43.93	4,477	4,477	3,726
43.94	4,488	4,488	3,771
43.95	4,498	4,498	3,816
43.96	4,509	4,509	3,861
43.97	4,519	4,519	3,906
43.98	4,530	4,530	3,951
43.99	4,540	4,540	3,997
44.00	4,551	4,551	4,042
44.01	4,561	4,561	4,088
44.02	4,571	4,571	4,133
44.03	4,581	4,581	4,179
44.04	4,591	4,591	4,225
44.05	4,601	4,601	4,271

Lowest Orifice

Stage-Area-Storage for Pond INF1: Bioretention Area #2 (continued)

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
44.06	4,611	4,611	4,317
44.07	4,621	4,621	4,363
44.08	4,631	4,631	4,410
44.09	4,641	4,641	4,456
44.10	4,651	4,651	4,502
44.11	4,661	4,661	4,549
44.12	4,671	4,671	4,596
44.13	4,681	4,681	4,642
44.14	4,691	4,691	4,689
44.15	4,701	4,701	4,736
44.16	4,711	4,711	4,783
44.17	4,722	4,722	4,830
44.18	4,732	4,732	4,878
44.19	4,742	4,742	4,925
44.20	4,752	4,752	4,972
44.21	4,762	4,762	5,020
44.22	4,772	4,772	5,068
44.23	4,782	4,782	5,115
44.24	4,793	4,793	5,163
44.25	4,803	4,803	5,211
44.26	4,813	4,813	5,259
44.27	4,823	4,823	5,308
44.28	4,834	4,834	5,356
44.29	4,844	4,844	5,404
44.30	4,854	4,854	5,453
44.31	4,864	4,864	5,501
44.32	4,875	4,875	5,550
44.33	4,885	4,885	5,599
44.34	4,895	4,895	5,648
44.35	4,905	4,905	5,697
44.36	4,916	4,916	5,746
44.37	4,926	4,926	5,795
44.38	4,936	4,936	5,844
44.39	4,947	4,947	5,894
44.40	4,957	4,957	5,943
44.41	4,968	4,968	5,993
44.42	4,978	4,978	6,043
44.43	4,988	4,988	6,092
44.44	4,999	4,999	6,142
44.45	5,009	5,009	6,192
44.46	5,020	5,020	6,243
44.47	5,030	5,030	6,293
44.48	5,040	5,040	6,343
44.49	5,051	5,051	6,394
44.50	5,061	5,061	6,444
44.51	5,072	5,072	6,495
44.52	5,082	5,082	6,546
44.53	5,093	5,093	6,597
44.54	5,103	5,103	6,648
44.55	5,114	5,114	6,699
44.56	5,125	5,125	6,750
44.57	5,135	5,135	6,801
44.58	5,146	5,146	6,852

Stage-Area-Storage for Pond INF1: Bioretention Area #2 (continued)

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
44.59	5,156	5,156	6,904
44.60	5,167	5,167	6,956
44.61	5,177	5,177	7,007
44.62	5,188	5,188	7,059
44.63	5,199	5,199	7,111
44.64	5,209	5,209	7,163
44.65	5,220	5,220	7,215
44.66	5,231	5,231	7,268
44.67	5,241	5,241	7,320
44.68	5,252	5,252	7,372
44.69	5,263	5,263	7,425
44.70	5,273	5,273	7,478
44.71	5,284	5,284	7,530
44.72	5,295	5,295	7,583
44.73	5,305	5,305	7,636
44.74	5,316	5,316	7,689
44.75	5,327	5,327	7,743
44.76	5,338	5,338	7,796
44.77	5,348	5,348	7,849
44.78	5,359	5,359	7,903
44.79	5,370	5,370	7,957
44.80	5,381	5,381	8,010
44.81	5,392	5,392	8,064
44.82	5,402	5,402	8,118
44.83	5,413	5,413	8,172
44.84	5,424	5,424	8,226
44.85	5,435	5,435	8,281
44.86	5,446	5,446	8,335
44.87	5,457	5,457	8,390
44.88	5,468	5,468	8,444
44.89	5,478	5,478	8,499
44.90	5,489	5,489	8,554
44.91	5,500	5,500	8,609
44.92	5,511	5,511	8,664
44.93	5,522	5,522	8,719
44.94	5,533	5,533	8,774
44.95	5,544	5,544	8,830
44.96	5,555	5,555	8,885
44.97	5,566	5,566	8,941
44.98	5,577	5,577	8,996
44.99	5,588	5,588	9,052
45.00	5,599	5,599	9,108
45.01	5,610	5,610	9,164
45.02	5,621	5,621	9,220
45.03	5,631	5,631	9,277
45.04	5,642	5,642	9,333
45.05	5,653	5,653	9,389
45.06	5,664	5,664	9,446
45.07	5,675	5,675	9,503
45.08	5,685	5,685	9,560
45.09	5,696	5,696	9,616
45.10	5,707	5,707	9,673
45.11	5,718	5,718	9,731

Stage-Area-Storage for Pond INF1: Bioretention Area #2 (continued)

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
45.12	5,729	5,729	9,788
45.13	5,740	5,740	9,845
45.14	5,751	5,751	9,903
45.15	5,762	5,762	9,960
45.16	5,773	5,773	10,018
45.17	5,783	5,783	10,076
45.18	5,794	5,794	10,134
45.19	5,805	5,805	10,192
45.20	5,816	5,816	10,250
45.21	5,827	5,827	10,308
45.22	5,838	5,838	10,366
45.23	5,849	5,849	10,425
45.24	5,860	5,860	10,483
45.25	5,871	5,871	10,542
45.26	5,882	5,882	10,601
45.27	5,893	5,893	10,659
45.28	5,904	5,904	10,718
45.29	5,915	5,915	10,778
45.30	5,926	5,926	10,837
45.31	5,938	5,938	10,896
45.32	5,949	5,949	10,956
45.33	5,960	5,960	11,015
45.34	5,971	5,971	11,075
45.35	5,982	5,982	11,135
45.36	5,993	5,993	11,194
45.37	6,004	6,004	11,254
45.38	6,015	6,015	11,314
45.39	6,027	6,027	11,375
45.40	6,038	6,038	11,435
45.41	6,049	6,049	11,495
45.42	6,060	6,060	11,556
45.43	6,071	6,071	11,617
45.44	6,083	6,083	11,677
45.45	6,094	6,094	11,738
45.46	6,105	6,105	11,799
45.47	6,116	6,116	11,860
45.48	6,127	6,127	11,922
45.49	6,139	6,139	11,983
45.50	6,150	6,150	12,044
45.51	6,161	6,161	12,106
45.52	6,172	6,172	12,168
45.53	6,183	6,183	12,229
45.54	6,194	6,194	12,291
45.55	6,205	6,205	12,353
45.56	6,216	6,216	12,415
45.57	6,227	6,227	12,478
45.58	6,239	6,239	12,540
45.59	6,250	6,250	12,602
45.60	6,261	6,261	12,665
45.61	6,272	6,272	12,728
45.62	6,283	6,283	12,790
45.63	6,294	6,294	12,853
45.64	6,305	6,305	12,916

Stage-Area-Storage for Pond INF1: Bioretention Area #2 (continued)

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
45.65	6,317	6,317	12,979
45.66	6,328	6,328	13,043
45.67	6,339	6,339	13,106
45.68	6,350	6,350	13,169
45.69	6,361	6,361	13,233
45.70	6,373	6,373	13,297
45.71	6,384	6,384	13,360
45.72	6,395	6,395	13,424
45.73	6,406	6,406	13,488
45.74	6,418	6,418	13,552
45.75	6,429	6,429	13,617
45.76	6,440	6,440	13,681
45.77	6,451	6,451	13,745
45.78	6,463	6,463	13,810
45.79	6,474	6,474	13,875
45.80	6,485	6,485	13,939
45.81	6,497	6,497	14,004
45.82	6,508	6,508	14,069
45.83	6,519	6,519	14,135
45.84	6,531	6,531	14,200
45.85	6,542	6,542	14,265
45.86	6,554	6,554	14,331
45.87	6,565	6,565	14,396
45.88	6,576	6,576	14,462
45.89	6,588	6,588	14,528
45.90	6,599	6,599	14,594
45.91	6,611	6,611	14,660
45.92	6,622	6,622	14,726
45.93	6,634	6,634	14,792
45.94	6,645	6,645	14,859
45.95	6,656	6,656	14,925
45.96	6,668	6,668	14,992
45.97	6,679	6,679	15,058
45.98	6,691	6,691	15,125
45.99	6,702	6,702	15,192
46.00	**6,714**	**6,714**	**15,259**

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Subsurface Gravel Wetland #1**

Enter the node name in the drainage analysis if applicable.

5.51	ac	A = Area draining to the practice	
1.96	ac	A_I = Impervious area draining to the practice	
0.36	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.37	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
2.04	ac-in	WQV= 1" x Rv x A	
7,404	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
740	cf	10% x WQV (check calc for sediment forebay)	
3,332	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
818	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
4,004	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
4,349	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.17	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
35.67	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
411.34	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥ 3:1**
34.16	ft	Elevation of SHWT	
32.16	ft	SHWT - 2 feet	
34.40	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
86.00	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Trash Rack		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
37.84	ft	Peak elevation of the 50-year storm event (E_{50})	
38.25	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan

Name, Profession: Michael Kraseminski

1. Volume stored above the wetland soil and below the high flow by-pass.
2. To ensure orifice is sized so that WQV is released at a relatively stable rate.
3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes:

High Flow By Bass at 35.75 - Bay 1 Vol = 4,004, Bay 2 = 4,349

7,404 cf (WQV) + 1,324 cf (Vol at Basin Bottom) = 8,728

(This Page Is Intentionally Blank)

Stage-Area-Storage for Pond GW01: Gravel Wetland #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
34.40	0	34.93	1,169	35.46	6,412
34.41	22	34.94	1,192	35.47	6,523
34.42	44	34.95	1,214	35.48	6,635
34.43	66	34.96	1,236	35.49	6,747
34.44	88	34.97	1,258	35.50	6,859
34.45	110	34.98	1,280	35.51	6,971
34.46	132	34.99	1,302	35.52	7,083
34.47	154	35.00	1,324	35.53	7,195
34.48	177	35.01	1,433	35.54	7,308
34.49	199	35.02	1,543	35.55	7,420
34.50	221	35.03	1,653	35.56	7,532
34.51	243	35.04	1,762	35.57	7,645
34.52	265	35.05	1,872	35.58	7,757
34.53	287	35.06	1,982	35.59	7,870
34.54	309	35.07	2,091	35.60	7,982
34.55	331	35.08	2,201	35.61	8,095
34.56	353	35.09	2,311	35.62	8,207
34.57	375	35.10	2,421	35.63	8,320
34.58	397	35.11	2,531	35.64	8,433
34.59	419	35.12	2,641	35.65	8,546
34.60	441	35.13	2,751	35.66	8,659
34.61	463	35.14	2,861	35.67	8,771
34.62	485	35.15	2,971	35.68	8,884
34.63	508	35.16	3,081	35.69	8,998
34.64	530	35.17	3,192	35.70	9,111
34.65	552	35.18	3,302	35.71	9,224
34.66	574	35.19	3,412	35.72	9,337
34.67	596	35.20	3,523	35.73	9,450
34.68	618	35.21	3,633	35.74	9,564
34.69	640	35.22	3,744	35.75	9,677
34.70	662	35.23	3,854	35.76	9,791
34.71	684	35.24	3,965	35.77	9,904
34.72	706	35.25	4,076	35.78	10,018
34.73	728	35.26	4,186	35.79	10,131
34.74	750	35.27	4,297	35.80	10,245
34.75	772	35.28	4,408	35.81	10,359
34.76	794	35.29	4,519	35.82	10,472
34.77	816	35.30	4,630	35.83	10,586
34.78	839	35.31	4,741	35.84	10,700
34.79	861	35.32	4,852	35.85	10,814
34.80	883	35.33	4,963	35.86	10,928
34.81	905	35.34	5,074	35.87	11,042
34.82	927	35.35	5,185	35.88	11,157
34.83	949	35.36	5,296	35.89	11,271
34.84	971	35.37	5,408	35.90	11,385
34.85	993	35.38	5,519	35.91	11,499
34.86	1,015	35.39	5,630	35.92	11,614
34.87	1,037	35.40	5,742	35.93	11,728
34.88	1,059	35.41	5,853	35.94	11,843
34.89	1,081	35.42	5,965	35.95	11,957
34.90	1,103	35.43	6,076	35.96	12,072
34.91	1,125	35.44	6,188	35.97	12,187
34.92	1,147	35.45	6,300	35.98	12,302

WQV
7,404 cf (WQV) + 1,324 cf (Vol at Basin Bottom) = 8,728

Stage-Area-Storage for Pond GW01: Gravel Wetland #1 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
35.99	12,416	36.52	18,594	37.05	24,980
36.00	12,531	36.53	18,712	37.06	25,109
36.01	12,646	36.54	18,831	37.07	25,239
36.02	12,761	36.55	18,949	37.08	25,370
36.03	12,876	36.56	19,068	37.09	25,503
36.04	12,991	36.57	19,186	37.10	25,638
36.05	13,107	36.58	19,305	37.11	25,774
36.06	13,222	36.59	19,424	37.12	25,911
36.07	13,337	36.60	19,543	37.13	26,050
36.08	13,453	36.61	19,662	37.14	26,190
36.09	13,568	36.62	19,780	37.15	26,331
36.10	13,684	36.63	19,900	37.16	26,474
36.11	13,799	36.64	20,019	37.17	26,619
36.12	13,915	36.65	20,138	37.18	26,765
36.13	14,031	36.66	20,257	37.19	26,913
36.14	14,146	36.67	20,376	37.20	27,062
36.15	14,262	36.68	20,496	37.21	27,213
36.16	14,378	36.69	20,615	37.22	27,365
36.17	14,494	36.70	20,735	37.23	27,519
36.18	14,610	36.71	20,854	37.24	27,674
36.19	14,726	36.72	20,974	37.25	27,831
36.20	14,842	36.73	21,094	37.26	27,990
36.21	14,959	36.74	21,214	37.27	28,150
36.22	15,075	36.75	21,334	37.28	28,312
36.23	15,191	36.76	21,454	37.29	28,476
36.24	15,308	36.77	21,574	37.30	28,641
36.25	15,424	36.78	21,694	37.31	28,808
36.26	15,541	36.79	21,814	37.32	28,977
36.27	15,657	36.80	21,934	37.33	29,148
36.28	15,774	36.81	22,054	37.34	29,319
36.29	15,891	36.82	22,175	37.35	29,491
36.30	16,007	36.83	22,295	37.36	29,663
36.31	16,124	36.84	22,416	37.37	29,835
36.32	16,241	36.85	22,536	37.38	30,008
36.33	16,358	36.86	22,657	37.39	30,180
36.34	16,475	36.87	22,778	37.40	30,353
36.35	16,592	36.88	22,899	37.41	30,527
36.36	16,710	36.89	23,020	37.42	30,700
36.37	16,827	36.90	23,141	37.43	30,874
36.38	16,944	36.91	23,262	37.44	31,048
36.39	17,062	36.92	23,383	37.45	31,223
36.40	17,179	36.93	23,504	37.46	31,397
36.41	17,297	36.94	23,625	37.47	31,572
36.42	17,414	36.95	23,747	37.48	31,747
36.43	17,532	36.96	23,868	37.49	31,923
36.44	17,650	36.97	23,990	37.50	32,098
36.45	17,767	36.98	24,111	37.51	32,274
36.46	17,885	36.99	24,233	37.52	32,451
36.47	18,003	37.00	24,355	37.53	32,627
36.48	18,121	37.01	24,477	37.54	32,804
36.49	18,239	37.02	24,601	37.55	32,981
36.50	18,357	37.03	24,726	37.56	33,158
36.51	18,476	37.04	24,852	37.57	33,336

Stage-Area-Storage for Pond GW01: Gravel Wetland #1 (continued)

Elevation (feet)	Storage (cubic-feet)
37.58	33,513
37.59	33,691
37.60	33,870
37.61	34,048
37.62	34,227
37.63	34,406
37.64	34,586
37.65	34,765
37.66	34,945
37.67	35,126
37.68	35,306
37.69	35,487
37.70	35,668
37.71	35,849
37.72	36,031
37.73	36,212
37.74	36,394
37.75	36,577
37.76	36,759
37.77	36,942
37.78	37,125
37.79	37,309
37.80	37,493
37.81	37,677
37.82	37,861
37.83	38,045
37.84	38,230
37.85	38,415
37.86	38,600
37.87	38,786
37.88	38,972
37.89	39,158
37.90	39,344
37.91	39,531
37.92	39,718
37.93	39,905
37.94	40,093
37.95	40,280
37.96	40,469
37.97	40,657
37.98	40,845
37.99	41,034
38.00	41,223
38.01	41,413
38.02	41,604
38.03	41,795
38.04	41,988
38.05	42,181
38.06	42,375
38.07	42,570
38.08	42,767
38.09	42,964
38.10	43,162
38.11	43,360
38.12	43,560
38.13	43,761
38.14	43,962
38.15	44,165
38.16	44,368
38.17	44,573
38.18	44,778
38.19	44,985
38.20	45,192
38.21	45,400
38.22	45,609
38.23	45,819
38.24	46,030
38.25	46,242
38.26	46,455
38.27	46,667
38.28	46,880
38.29	47,092
38.30	47,305
38.31	47,517
38.32	47,729
38.33	47,942
38.34	48,154
38.35	48,367
38.36	48,579
38.37	48,792
38.38	49,004
38.39	49,217
38.40	49,429
38.41	49,642
38.42	49,854
38.43	50,067
38.44	50,279
38.45	50,491
38.46	50,704
38.47	50,916
38.48	51,129
38.49	51,341
38.50	51,554
38.51	51,766
38.52	51,979
38.53	52,191
38.54	52,404
38.55	52,616
38.56	52,828
38.57	53,041
38.58	53,253
38.59	53,466
38.60	53,678
38.61	53,891
38.62	54,103
38.63	54,316
38.64	54,528
38.65	54,741
38.66	54,953
38.67	55,166
38.68	55,378
38.69	55,590
38.70	55,803
38.71	56,015
38.72	56,228
38.73	56,440
38.74	56,653
38.75	56,865
38.76	57,078
38.77	57,290
38.78	57,503
38.79	57,715
38.80	57,928
38.81	58,140
38.82	58,352
38.83	58,565
38.84	58,777
38.85	58,990
38.86	59,202
38.87	59,415
38.88	59,627
38.89	59,840
38.90	60,052
38.91	60,265
38.92	60,477
38.93	60,690
38.94	60,902
38.95	61,114
38.96	61,327
38.97	61,539
38.98	61,752
38.99	61,964
39.00	**62,177**

Stage-Discharge for Pond GW01: Gravel Wetland #1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.40	0.00	0.00	0.00	34.93	0.00	0.00	0.00
34.41	0.00	0.00	0.00	34.94	0.00	0.00	0.00
34.42	0.00	0.00	0.00	34.95	0.00	0.00	0.00
34.43	0.00	0.00	0.00	34.96	0.00	0.00	0.00
34.44	0.00	0.00	0.00	34.97	0.00	0.00	0.00
34.45	0.00	0.00	0.00	34.98	0.00	0.00	0.00
34.46	0.00	0.00	0.00	34.99	0.00	0.00	0.00
34.47	0.00	0.00	0.00	35.00	0.00	0.00	0.00
34.48	0.00	0.00	0.00	35.01	0.00	0.00	0.00
34.49	0.00	0.00	0.00	35.02	0.00	0.00	0.00
34.50	0.00	0.00	0.00	35.03	0.00	0.00	0.00
34.51	0.00	0.00	0.00	35.04	0.00	0.00	0.00
34.52	0.00	0.00	0.00	35.05	0.00	0.00	0.00
34.53	0.00	0.00	0.00	35.06	0.00	0.00	0.00
34.54	0.00	0.00	0.00	35.07	0.00	0.00	0.00
34.55	0.00	0.00	0.00	35.08	0.00	0.00	0.00
34.56	0.00	0.00	0.00	35.09	0.00	0.00	0.00
34.57	0.00	0.00	0.00	35.10	0.00	0.00	0.00
34.58	0.00	0.00	0.00	35.11	0.00	0.00	0.00
34.59	0.00	0.00	0.00	35.12	0.00	0.00	0.00
34.60	0.00	0.00	0.00	35.13	0.00	0.00	0.00
34.61	0.00	0.00	0.00	35.14	0.00	0.00	0.00
34.62	0.00	0.00	0.00	35.15	0.00	0.00	0.00
34.63	0.00	0.00	0.00	35.16	0.00	0.00	0.00
34.64	0.00	0.00	0.00	35.17	0.00	0.00	0.00
34.65	0.00	0.00	0.00	35.18	0.00	0.00	0.00
34.66	0.00	0.00	0.00	35.19	0.00	0.00	0.00
34.67	0.00	0.00	0.00	35.20	0.00	0.00	0.00
34.68	0.00	0.00	0.00	35.21	0.00	0.00	0.00
34.69	0.00	0.00	0.00	35.22	0.00	0.00	0.00
34.70	0.00	0.00	0.00	35.23	0.00	0.00	0.00
34.71	0.00	0.00	0.00	35.24	0.00	0.00	0.00
34.72	0.00	0.00	0.00	35.25	0.00	0.00	0.00
34.73	0.00	0.00	0.00	35.26	0.00	0.00	0.00
34.74	0.00	0.00	0.00	35.27	0.00	0.00	0.00
34.75	0.00	0.00	0.00	35.28	0.00	0.00	0.00
34.76	0.00	0.00	0.00	35.29	0.00	0.00	0.00
34.77	0.00	0.00	0.00	35.30	0.00	0.00	0.00
34.78	0.00	0.00	0.00	35.31	0.00	0.00	0.00
34.79	0.00	0.00	0.00	35.32	0.00	0.00	0.00
34.80	0.00	0.00	0.00	35.33	0.00	0.00	0.00
34.81	0.00	0.00	0.00	35.34	0.00	0.00	0.00
34.82	0.00	0.00	0.00	35.35	0.00	0.00	0.00
34.83	0.00	0.00	0.00	35.36	0.00	0.00	0.00
34.84	0.00	0.00	0.00	35.37	0.00	0.00	0.00
34.85	0.00	0.00	0.00	35.38	0.00	0.00	0.00
34.86	0.00	0.00	0.00	35.39	0.00	0.00	0.00
34.87	0.00	0.00	0.00	35.40	0.00	0.00	0.00
34.88	0.00	0.00	0.00	35.41	0.00	0.00	0.00
34.89	0.00	0.00	0.00	35.42	0.00	0.00	0.00
34.90	0.00	0.00	0.00	35.43	0.00	0.00	0.00
34.91	0.00	0.00	0.00	35.44	0.00	0.00	0.00
34.92	0.00	0.00	0.00	35.45	0.00	0.00	0.00

Stage-Discharge for Pond GW01: Gravel Wetland #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
35.46	0.00	0.00	0.00	35.99	0.04	0.04	0.00
35.47	0.00	0.00	0.00	36.00	0.04	0.04	0.00
35.48	0.00	0.00	0.00	36.01	0.05	0.05	0.00
35.49	0.00	0.00	0.00	36.02	0.05	0.05	0.00
35.50	0.00	0.00	0.00	36.03	0.05	0.05	0.00
35.51	0.00	0.00	0.00	36.04	0.05	0.05	0.00
35.52	0.00	0.00	0.00	36.05	0.05	0.05	0.00
35.53	0.00	0.00	0.00	36.06	0.05	0.05	0.00
35.54	0.00	0.00	0.00	36.07	0.05	0.05	0.00
35.55	0.00	0.00	0.00	36.08	0.05	0.05	0.00
35.56	0.00	0.00	0.00	36.09	0.05	0.05	0.00
35.57	0.00	0.00	0.00	36.10	0.06	0.06	0.00
35.58	0.00	0.00	0.00	36.11	0.06	0.06	0.00
35.59	0.00	0.00	0.00	36.12	0.06	0.06	0.00
35.60	0.00	0.00	0.00	36.13	0.06	0.06	0.00
35.61	0.00	0.00	0.00	36.14	0.06	0.06	0.00
35.62	0.00	0.00	0.00	36.15	0.06	0.06	0.00
35.63	0.00	0.00	0.00	36.16	0.06	0.06	0.00
35.64	0.00	0.00	0.00	36.17	0.06	0.06	0.00
35.65	0.00	0.00	0.00	36.18	0.06	0.06	0.00
35.66	0.00	0.00	0.00	36.19	0.06	0.06	0.00
35.67	0.00	0.00	0.00	36.20	0.07	0.07	0.00
35.68	0.00	0.00	0.00	36.21	0.07	0.07	0.00
35.69	0.00	0.00	0.00	36.22	0.07	0.07	0.00
35.70	0.00	0.00	0.00	36.23	0.07	0.07	0.00
35.71	0.00	0.00	0.00	36.24	0.07	0.07	0.00
35.72	0.00	0.00	0.00	36.25	0.07	0.07	0.00
35.73	0.00	0.00	0.00	36.26	0.07	0.07	0.00
35.74	0.00	0.00	0.00	36.27	0.07	0.07	0.00
35.75	0.00	0.00	0.00	36.28	0.07	0.07	0.00
35.76	0.00	0.00	0.00	36.29	0.07	0.07	0.00
35.77	0.00	0.00	0.00	36.30	0.07	0.07	0.00
35.78	0.00	0.00	0.00	36.31	0.07	0.07	0.00
35.79	0.00	0.00	0.00	36.32	0.07	0.07	0.00
35.80	0.01	0.01	0.00	36.33	0.08	0.08	0.00
35.81	0.01	0.01	0.00	36.34	0.08	0.08	0.00
35.82	0.01	0.01	0.00	36.35	0.08	0.08	0.00
35.83	0.01	0.01	0.00	36.36	0.08	0.08	0.00
35.84	0.01	0.01	0.00	36.37	0.08	0.08	0.00
35.85	0.02	0.02	0.00	36.38	0.08	0.08	0.00
35.86	0.02	0.02	0.00	36.39	0.08	0.08	0.00
35.87	0.02	0.02	0.00	36.40	0.08	0.08	0.00
35.88	0.02	0.02	0.00	36.41	0.08	0.08	0.00
35.89	0.03	0.03	0.00	36.42	0.08	0.08	0.00
35.90	0.03	0.03	0.00	36.43	0.08	0.08	0.00
35.91	0.03	0.03	0.00	36.44	0.08	0.08	0.00
35.92	0.03	0.03	0.00	36.45	0.08	0.08	0.00
35.93	0.03	0.03	0.00	36.46	0.08	0.08	0.00
35.94	0.04	0.04	0.00	36.47	0.09	0.09	0.00
35.95	0.04	0.04	0.00	36.48	0.09	0.09	0.00
35.96	0.04	0.04	0.00	36.49	0.09	0.09	0.00
35.97	0.04	0.04	0.00	36.50	0.09	0.09	0.00
35.98	0.04	0.04	0.00	36.51	0.09	0.09	0.00

Stage-Discharge for Pond GW01: Gravel Wetland #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
36.52	0.09	0.09	0.00	37.05	2.65	2.65	0.00
36.53	0.09	0.09	0.00	37.06	2.78	2.78	0.00
36.54	0.09	0.09	0.00	37.07	2.91	2.91	0.00
36.55	0.09	0.09	0.00	37.08	3.04	3.04	0.00
36.56	0.09	0.09	0.00	37.09	3.17	3.17	0.00
36.57	0.09	0.09	0.00	37.10	3.31	3.31	0.00
36.58	0.09	0.09	0.00	37.11	3.45	3.45	0.00
36.59	0.09	0.09	0.00	37.12	3.59	3.59	0.00
36.60	0.09	0.09	0.00	37.13	3.73	3.73	0.00
36.61	0.09	0.09	0.00	37.14	3.87	3.87	0.00
36.62	0.09	0.09	0.00	37.15	4.02	4.02	0.00
36.63	0.10	0.10	0.00	37.16	4.17	4.17	0.00
36.64	0.10	0.10	0.00	37.17	4.32	4.32	0.00
36.65	0.10	0.10	0.00	37.18	4.47	4.47	0.00
36.66	0.10	0.10	0.00	37.19	4.62	4.62	0.00
36.67	0.10	0.10	0.00	37.20	4.78	4.78	0.00
36.68	0.10	0.10	0.00	37.21	4.93	4.93	0.00
36.69	0.10	0.10	0.00	37.22	5.09	5.09	0.00
36.70	0.10	0.10	0.00	37.23	5.25	5.25	0.00
36.71	0.10	0.10	0.00	37.24	5.41	5.41	0.00
36.72	0.10	0.10	0.00	37.25	5.57	5.57	0.00
36.73	0.10	0.10	0.00	37.26	5.74	5.74	0.00
36.74	0.10	0.10	0.00	37.27	5.91	5.91	0.00
36.75	0.10	0.10	0.00	37.28	6.07	6.07	0.00
36.76	0.12	0.12	0.00	37.29	6.24	6.24	0.00
36.77	0.15	0.15	0.00	37.30	6.41	6.41	0.00
36.78	0.18	0.18	0.00	37.31	6.50	6.50	0.00
36.79	0.23	0.23	0.00	37.32	6.55	6.55	0.00
36.80	0.28	0.28	0.00	37.33	6.61	6.61	0.00
36.81	0.33	0.33	0.00	37.34	6.67	6.67	0.00
36.82	0.39	0.39	0.00	37.35	6.72	6.72	0.00
36.83	0.46	0.46	0.00	37.36	6.78	6.78	0.00
36.84	0.52	0.52	0.00	37.37	6.83	6.83	0.00
36.85	0.59	0.59	0.00	37.38	6.89	6.89	0.00
36.86	0.67	0.67	0.00	37.39	6.94	6.94	0.00
36.87	0.75	0.75	0.00	37.40	6.99	6.99	0.00
36.88	0.83	0.83	0.00	37.41	7.05	7.05	0.00
36.89	0.92	0.92	0.00	37.42	7.10	7.10	0.00
36.90	1.01	1.01	0.00	37.43	7.15	7.15	0.00
36.91	1.10	1.10	0.00	37.44	7.20	7.20	0.00
36.92	1.19	1.19	0.00	37.45	7.25	7.25	0.00
36.93	1.29	1.29	0.00	37.46	7.31	7.31	0.00
36.94	1.39	1.39	0.00	37.47	7.36	7.36	0.00
36.95	1.49	1.49	0.00	37.48	7.41	7.41	0.00
36.96	1.60	1.60	0.00	37.49	7.46	7.46	0.00
36.97	1.70	1.70	0.00	37.50	7.51	7.51	0.00
36.98	1.81	1.81	0.00	37.51	7.58	7.56	0.03
36.99	1.93	1.93	0.00	37.52	7.69	7.60	0.08
37.00	2.04	2.04	0.00	37.53	7.80	7.65	0.15
37.01	2.16	2.16	0.00	37.54	7.93	7.70	0.23
37.02	2.28	2.28	0.00	37.55	8.07	7.75	0.32
37.03	2.40	2.40	0.00	37.56	8.22	7.80	0.42
37.04	2.52	2.52	0.00	37.57	8.37	7.85	0.53

Stage-Discharge for Pond GW01: Gravel Wetland #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
37.58	8.54	7.89	0.65	38.11	25.46	10.08	15.38
37.59	8.71	7.94	0.77	38.12	25.87	10.12	15.75
37.60	8.89	7.99	0.90	38.13	26.29	10.16	16.13
37.61	9.07	8.03	1.04	38.14	26.71	10.19	16.52
37.62	9.27	8.08	1.19	38.15	27.13	10.23	16.90
37.63	9.46	8.12	1.34	38.16	27.55	10.27	17.29
37.64	9.67	8.17	1.50	38.17	27.98	10.30	17.68
37.65	9.87	8.22	1.66	38.18	28.41	10.34	18.07
37.66	10.09	8.26	1.83	38.19	28.84	10.37	18.47
37.67	10.31	8.31	2.00	38.20	29.28	10.41	18.87
37.68	10.53	8.35	2.18	38.21	29.72	10.45	19.27
37.69	10.76	8.39	2.37	38.22	30.16	10.48	19.68
37.70	10.99	8.44	2.55	38.23	30.60	10.52	20.08
37.71	11.24	8.48	2.76	38.24	31.05	10.55	20.50
37.72	11.49	8.53	2.97	38.25	31.49	10.59	20.91
37.73	11.75	8.57	3.18	38.26	31.95	10.62	21.32
37.74	12.02	8.61	3.40	38.27	32.40	10.66	21.74
37.75	12.29	8.66	3.63	38.28	32.85	10.69	22.16
37.76	12.56	8.70	3.86	38.29	33.31	10.73	22.59
37.77	12.84	8.74	4.10	38.30	33.77	10.76	23.01
37.78	13.13	8.78	4.35	38.31	34.24	10.79	23.44
37.79	13.42	8.83	4.60	38.32	34.70	10.83	23.87
37.80	13.72	8.87	4.85	38.33	35.17	10.86	24.30
37.81	14.02	8.91	5.11	38.34	35.64	10.90	24.74
37.82	14.33	8.95	5.38	38.35	36.11	10.93	25.18
37.83	14.64	8.99	5.65	38.36	36.59	10.97	25.62
37.84	14.96	9.03	5.93	38.37	37.06	11.00	26.06
37.85	15.29	9.08	6.21	38.38	37.54	11.03	26.51
37.86	15.62	9.12	6.50	38.39	38.02	11.07	26.96
37.87	15.95	9.16	6.80	38.40	38.51	11.10	27.41
37.88	16.29	9.20	7.09	38.41	38.99	11.13	27.86
37.89	16.64	9.24	7.40	38.42	39.48	11.17	28.32
37.90	16.99	9.28	7.71	38.43	39.97	11.20	28.77
37.91	17.34	9.32	8.03	38.44	40.47	11.23	29.23
37.92	17.70	9.36	8.35	38.45	40.96	11.27	29.70
37.93	18.07	9.40	8.67	38.46	41.46	11.30	30.16
37.94	18.44	9.44	9.00	38.47	41.96	11.33	30.63
37.95	18.81	9.48	9.34	38.48	42.46	11.36	31.10
37.96	19.19	9.51	9.68	38.49	42.96	11.40	31.57
37.97	19.58	9.55	10.02	38.50	43.47	11.43	32.04
37.98	19.97	9.59	10.38	38.51	43.98	11.46	32.52
37.99	20.36	9.63	10.73	38.52	44.50	11.49	33.01
38.00	20.76	9.67	11.09	38.53	45.02	11.53	33.49
38.01	21.17	9.71	11.46	38.54	45.54	11.56	33.98
38.02	21.58	9.75	11.83	38.55	46.06	11.59	34.47
38.03	22.00	9.78	12.21	38.56	46.59	11.62	34.97
38.04	22.42	9.82	12.59	38.57	47.12	11.65	35.46
38.05	22.84	9.86	12.98	38.58	47.65	11.69	35.96
38.06	23.27	9.90	13.38	38.59	48.18	11.72	36.46
38.07	23.71	9.93	13.78	38.60	48.71	11.75	36.96
38.08	24.15	9.97	14.18	38.61	49.25	11.78	37.47
38.09	24.60	10.01	14.59	38.62	49.79	11.81	37.98
38.10	25.05	10.05	15.00	38.63	50.33	11.84	38.49

Stage-Discharge for Pond GW01: Gravel Wetland #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
38.64	50.87	11.88	39.00
38.65	51.42	11.91	39.51
38.66	51.97	11.94	40.03
38.67	52.52	11.97	40.55
38.68	53.07	12.00	41.07
38.69	53.62	12.03	41.59
38.70	54.18	12.06	42.12
38.71	54.72	12.09	42.63
38.72	55.27	12.12	43.14
38.73	55.81	12.15	43.66
38.74	56.36	12.18	44.17
38.75	56.91	12.21	44.69
38.76	57.46	12.25	45.21
38.77	58.01	12.28	45.74
38.78	58.57	12.31	46.26
38.79	59.12	12.34	46.79
38.80	59.68	12.37	47.31
38.81	60.24	12.40	47.84
38.82	60.80	12.43	48.37
38.83	61.36	12.46	48.90
38.84	61.92	12.49	49.44
38.85	62.49	12.52	49.97
38.86	63.06	12.54	50.51
38.87	63.62	12.57	51.05
38.88	64.19	12.60	51.59
38.89	64.77	12.63	52.13
38.90	65.34	12.66	52.68
38.91	65.94	12.69	53.25
38.92	66.55	12.72	53.83
38.93	67.16	12.75	54.41
38.94	67.77	12.78	54.99
38.95	68.38	12.81	55.58
38.96	69.00	12.84	56.16
38.97	69.62	12.87	56.75
38.98	70.24	12.89	57.34
38.99	70.86	12.92	57.94
39.00	**71.48**	**12.95**	**58.53**

Stage-Area-Storage for Pond 4P: Gravel Wetland #1 - Bay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.00	5,557	0	35.53	5,249	2,863
35.01	5,551	56	35.54	5,243	2,916
35.02	5,545	111	35.55	5,238	2,968
35.03	5,539	166	35.56	5,232	3,020
35.04	5,533	222	35.57	5,226	3,073
35.05	5,528	277	35.58	5,220	3,125
35.06	5,522	332	35.59	5,215	3,177
35.07	5,516	388	35.60	5,209	3,229
35.08	5,510	443	35.61	5,203	3,281
35.09	5,504	498	35.62	5,198	3,333
35.10	5,498	553	35.63	5,192	3,385
35.11	5,492	608	35.64	5,186	3,437
35.12	5,487	663	35.65	5,181	3,489
35.13	5,481	717	35.66	5,175	3,541
35.14	5,475	772	35.67	5,169	3,593
35.15	5,469	827	35.68	5,164	3,644
35.16	5,463	882	35.69	5,158	3,696
35.17	5,457	936	35.70	5,152	3,747
35.18	5,451	991	35.71	5,147	3,799
35.19	5,446	1,045	35.72	5,141	3,850
35.20	5,440	1,100	35.73	5,135	3,902
35.21	5,434	1,154	35.74	5,130	3,953
35.22	5,428	1,208	35.75	5,124	4,004
35.23	5,422	1,263	35.76	5,118	4,055
35.24	5,416	1,317	35.77	5,113	4,107
35.25	5,411	1,371	35.78	5,107	4,158
35.26	5,405	1,425	35.79	5,101	4,209
35.27	5,399	1,479	35.80	5,096	4,260
35.28	5,393	1,533	35.81	5,090	4,311
35.29	5,387	1,587	35.82	5,084	4,362
35.30	5,382	1,641	35.83	5,079	4,412
35.31	5,376	1,695	35.84	5,073	4,463
35.32	5,370	1,748	35.85	5,067	4,514
35.33	5,364	1,802	35.86	5,062	4,564
35.34	5,358	1,856	35.87	5,056	4,615
35.35	5,353	1,909	35.88	5,051	4,666
35.36	5,347	1,963	35.89	5,045	4,716
35.37	5,341	2,016	35.90	5,039	4,766
35.38	5,335	2,069	35.91	5,034	4,817
35.39	5,330	2,123	35.92	5,028	4,867
35.40	5,324	2,176	35.93	5,023	4,917
35.41	5,318	2,229	35.94	5,017	4,968
35.42	5,312	2,282	35.95	5,011	5,018
35.43	5,307	2,335	35.96	5,006	5,068
35.44	5,301	2,388	35.97	5,000	5,118
35.45	5,295	2,441	35.98	4,995	5,168
35.46	5,289	2,494	35.99	4,989	5,218
35.47	5,284	2,547	36.00	4,983	5,268
35.48	5,278	2,600	36.01	4,978	5,317
35.49	5,272	2,653	36.02	4,972	5,367
35.50	5,266	2,705	36.03	4,967	5,417
35.51	5,261	2,758	36.04	4,961	5,466
35.52	5,255	2,811	36.05	4,956	5,516

(This Page Is Intentionally Blank)

Stage-Area-Storage for Pond 6P: Gravel Wetland #1 - Bay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.00	5,388	0	35.53	5,969	3,008
35.01	5,399	54	35.54	5,980	3,068
35.02	5,409	108	35.55	5,992	3,128
35.03	5,420	162	35.56	6,003	3,188
35.04	5,431	216	35.57	6,014	3,248
35.05	5,442	271	35.58	6,025	3,308
35.06	5,452	325	35.59	6,037	3,368
35.07	5,463	380	35.60	6,048	3,429
35.08	5,474	434	35.61	6,059	3,489
35.09	5,485	489	35.62	6,071	3,550
35.10	5,495	544	35.63	6,082	3,611
35.11	5,506	599	35.64	6,093	3,672
35.12	5,517	654	35.65	6,105	3,733
35.13	5,528	710	35.66	6,116	3,794
35.14	5,539	765	35.67	6,127	3,855
35.15	5,549	820	35.68	6,139	3,916
35.16	5,560	876	35.69	6,150	3,978
35.17	5,571	931	35.70	6,162	4,039
35.18	5,582	987	35.71	6,173	4,101
35.19	5,593	1,043	35.72	6,185	4,163
35.20	5,604	1,099	35.73	6,196	4,225
35.21	5,615	1,155	35.74	6,207	4,287
35.22	5,626	1,211	35.75	6,219	4,349
35.23	5,636	1,268	35.76	6,230	4,411
35.24	5,647	1,324	35.77	6,242	4,473
35.25	5,658	1,381	35.78	6,253	4,536
35.26	5,669	1,437	35.79	6,265	4,599
35.27	5,680	1,494	35.80	6,276	4,661
35.28	5,691	1,551	35.81	6,288	4,724
35.29	5,702	1,608	35.82	6,300	4,787
35.30	5,713	1,665	35.83	6,311	4,850
35.31	5,724	1,722	35.84	6,323	4,913
35.32	5,735	1,779	35.85	6,334	4,977
35.33	5,746	1,837	35.86	6,346	5,040
35.34	5,757	1,894	35.87	6,357	5,103
35.35	5,768	1,952	35.88	6,369	5,167
35.36	5,779	2,010	35.89	6,381	5,231
35.37	5,790	2,068	35.90	6,392	5,295
35.38	5,802	2,126	35.91	6,404	5,359
35.39	5,813	2,184	35.92	6,416	5,423
35.40	5,824	2,242	35.93	6,427	5,487
35.41	5,835	2,300	35.94	6,439	5,551
35.42	5,846	2,358	35.95	6,451	5,616
35.43	5,857	2,417	35.96	6,462	5,680
35.44	5,868	2,476	35.97	6,474	5,745
35.45	5,879	2,534	35.98	6,486	5,810
35.46	5,891	2,593	35.99	6,497	5,875
35.47	5,902	2,652	36.00	6,509	5,940
35.48	5,913	2,711	36.01	6,521	6,005
35.49	5,924	2,770	36.02	6,533	6,070
35.50	5,935	2,830	36.03	6,544	6,136
35.51	5,947	2,889	36.04	6,556	6,201
35.52	5,958	2,949	36.05	6,568	6,267

Stage-Area-Storage for Pond 6P: Gravel Wetland #1 - Bay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
36.06	6,580	6,332	36.59	7,220	9,988
36.07	6,592	6,398	36.60	7,233	10,060
36.08	6,603	6,464	36.61	7,245	10,133
36.09	6,615	6,530	36.62	7,257	10,205
36.10	6,627	6,597	36.63	7,270	10,278
36.11	6,639	6,663	36.64	7,282	10,351
36.12	6,651	6,729	36.65	7,295	10,424
36.13	6,663	6,796	36.66	7,307	10,497
36.14	6,675	6,863	36.67	7,320	10,570
36.15	6,686	6,929	36.68	7,332	10,643
36.16	6,698	6,996	36.69	7,344	10,716
36.17	6,710	7,063	36.70	7,357	10,790
36.18	6,722	7,130	36.71	7,369	10,863
36.19	6,734	7,198	36.72	7,382	10,937
36.20	6,746	7,265	36.73	7,394	11,011
36.21	6,758	7,333	36.74	7,407	11,085
36.22	6,770	7,400	36.75	7,419	11,159
36.23	6,782	7,468	36.76	7,432	11,233
36.24	6,794	7,536	36.77	7,445	11,308
36.25	6,806	7,604	36.78	7,457	11,382
36.26	6,818	7,672	36.79	7,470	11,457
36.27	6,830	7,740	36.80	7,482	11,532
36.28	6,842	7,809	36.81	7,495	11,607
36.29	6,854	7,877	36.82	7,507	11,682
36.30	6,866	7,946	36.83	7,520	11,757
36.31	6,878	8,015	36.84	7,533	11,832
36.32	6,890	8,083	36.85	7,545	11,907
36.33	6,902	8,152	36.86	7,558	11,983
36.34	6,914	8,221	36.87	7,571	12,059
36.35	6,927	8,291	36.88	7,583	12,134
36.36	6,939	8,360	36.89	7,596	12,210
36.37	6,951	8,429	36.90	7,609	12,286
36.38	6,963	8,499	36.91	7,621	12,362
36.39	6,975	8,569	36.92	7,634	12,439
36.40	6,987	8,638	36.93	7,647	12,515
36.41	6,999	8,708	36.94	7,660	12,592
36.42	7,012	8,778	36.95	7,672	12,668
36.43	7,024	8,849	36.96	7,685	12,745
36.44	7,036	8,919	36.97	7,698	12,822
36.45	7,048	8,989	36.98	7,711	12,899
36.46	7,060	9,060	36.99	7,723	12,976
36.47	7,073	9,131	37.00	7,736	13,054
36.48	7,085	9,201	37.01	7,749	13,131
36.49	7,097	9,272	37.02	7,762	13,209
36.50	7,109	9,343	37.03	7,775	13,286
36.51	7,122	9,414	37.04	7,787	13,364
36.52	7,134	9,486	37.05	7,800	13,442
36.53	7,146	9,557	37.06	7,813	13,520
36.54	7,159	9,629	37.07	7,826	13,598
36.55	7,171	9,700	37.08	7,839	13,677
36.56	7,183	9,772	37.09	7,852	13,755
36.57	7,196	9,844	37.10	7,865	13,834
36.58	7,208	9,916	37.11	7,878	13,912

Stage-Area-Storage for Pond 6P: Gravel Wetland #1 - Bay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
37.12	7,890	13,991	37.65	8,590	18,357
37.13	7,903	14,070	37.66	8,604	18,443
37.14	7,916	14,149	37.67	8,617	18,529
37.15	7,929	14,228	37.68	8,631	18,616
37.16	7,942	14,308	37.69	8,644	18,702
37.17	7,955	14,387	37.70	8,658	18,788
37.18	7,968	14,467	37.71	8,672	18,875
37.19	7,981	14,547	37.72	8,685	18,962
37.20	7,994	14,626	37.73	8,699	19,049
37.21	8,007	14,706	37.74	8,712	19,136
37.22	8,020	14,787	37.75	8,726	19,223
37.23	8,033	14,867	37.76	8,739	19,310
37.24	8,046	14,947	37.77	8,753	19,398
37.25	8,059	15,028	37.78	8,767	19,485
37.26	8,072	15,108	37.79	8,780	19,573
37.27	8,086	15,189	37.80	8,794	19,661
37.28	8,099	15,270	37.81	8,808	19,749
37.29	8,112	15,351	37.82	8,821	19,837
37.30	8,125	15,432	37.83	8,835	19,925
37.31	8,138	15,514	37.84	8,849	20,014
37.32	8,151	15,595	37.85	8,862	20,102
37.33	8,164	15,677	37.86	8,876	20,191
37.34	8,177	15,758	37.87	8,890	20,280
37.35	8,191	15,840	37.88	8,903	20,369
37.36	8,204	15,922	37.89	8,917	20,458
37.37	8,217	16,004	37.90	8,931	20,547
37.38	8,230	16,087	37.91	8,945	20,637
37.39	8,243	16,169	37.92	8,958	20,726
37.40	8,257	16,251	37.93	8,972	20,816
37.41	8,270	16,334	37.94	8,986	20,906
37.42	8,283	16,417	37.95	9,000	20,996
37.43	8,296	16,500	37.96	9,014	21,086
37.44	8,310	16,583	37.97	9,027	21,176
37.45	8,323	16,666	37.98	9,041	21,266
37.46	8,336	16,749	37.99	9,055	21,357
37.47	8,349	16,833	38.00	9,069	21,447
37.48	8,363	16,916	38.01	9,114	21,538
37.49	8,376	17,000	38.02	9,159	21,630
37.50	8,389	17,084	38.03	9,204	21,721
37.51	8,403	17,168	38.04	9,249	21,814
37.52	8,416	17,252	38.05	9,295	21,906
37.53	8,429	17,336	38.06	9,340	22,000
37.54	8,443	17,420	38.07	9,386	22,093
37.55	8,456	17,505	38.08	9,431	22,187
37.56	8,469	17,590	38.09	9,477	22,282
37.57	8,483	17,674	38.10	9,523	22,377
37.58	8,496	17,759	38.11	9,569	22,472
37.59	8,510	17,844	38.12	9,615	22,568
37.60	8,523	17,929	38.13	9,661	22,665
37.61	8,537	18,015	38.14	9,708	22,761
37.62	8,550	18,100	38.15	9,754	22,859
37.63	8,563	18,186	38.16	9,801	22,956
37.64	8,577	18,271	38.17	9,848	23,055

Stage-Area-Storage for Pond 6P: Gravel Wetland #1 - Bay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
38.18	9,894	23,153
38.19	9,941	23,253
38.20	9,988	23,352
38.21	10,035	23,452
38.22	10,083	23,553
38.23	10,130	23,654
38.24	10,177	23,756
38.25	**10,225**	23,858
38.26	10,225	23,960
38.27	10,225	24,062
38.28	10,225	24,164
38.29	10,225	24,267
38.30	10,225	24,369
38.31	10,225	24,471
38.32	10,225	24,573
38.33	10,225	24,676
38.34	10,225	24,778
38.35	10,225	24,880
38.36	10,225	24,982
38.37	10,225	25,085
38.38	10,225	25,187
38.39	10,225	25,289
38.40	10,225	25,391
38.41	10,225	25,494
38.42	10,225	25,596
38.43	10,225	25,698
38.44	10,225	25,800
38.45	10,225	25,903
38.46	10,225	26,005
38.47	10,225	26,107
38.48	10,225	26,209
38.49	10,225	26,312
38.50	10,225	26,414
38.51	10,225	26,516
38.52	10,225	26,618
38.53	10,225	26,721
38.54	10,225	26,823
38.55	10,225	26,925
38.56	10,225	27,027
38.57	10,225	27,130
38.58	10,225	27,232
38.59	10,225	27,334
38.60	10,225	27,436
38.61	10,225	27,539
38.62	10,225	27,641
38.63	10,225	27,743
38.64	10,225	27,845
38.65	10,225	27,948
38.66	10,225	28,050
38.67	10,225	28,152
38.68	10,225	28,254
38.69	10,225	28,357
38.70	10,225	28,459
38.71	10,225	28,561
38.72	10,225	28,663
38.73	10,225	28,766
38.74	10,225	28,868
38.75	10,225	28,970
38.76	10,225	29,072
38.77	10,225	29,175
38.78	10,225	29,277
38.79	10,225	29,379
38.80	10,225	29,481
38.81	10,225	29,584
38.82	10,225	29,686
38.83	10,225	29,788
38.84	10,225	29,890
38.85	10,225	29,993
38.86	10,225	30,095
38.87	10,225	30,197
38.88	10,225	30,299
38.89	10,225	30,402
38.90	10,225	30,504
38.91	10,225	30,606
38.92	10,225	30,708
38.93	10,225	30,811
38.94	10,225	30,913
38.95	10,225	31,015
38.96	10,225	31,117
38.97	10,225	31,220
38.98	10,225	31,322
38.99	10,225	31,424
39.00	10,225	**31,526**

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION
(Env-Wq 1507.04)

1.01	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
4.61	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.28	inches	Rd = Weighted groundwater recharge depth	
1.5561	ac-in	GRV = AI * Rd	
5,649	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Infiltration Pond #1 - 2yr Storm (Exfiltration) = 9,275 cf

9,275 cf >5,649 cf

(This Page Is Intentionally Blank)

APPENDIX G – RIPRAP CALCULATIONS

(This Page Is Intentionally Blank)

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES #1 - (CB-02) Outlet From CB #2

Design Flow =	Q =	1.5	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **4.5** feet

W_1 = Width = 3Do+(0.4)(La)= **5.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **3.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

$d_{50} = (0.02/Tw)(Q/Do)^{\wedge(4/3)}=$ **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

(See Last Page of Calculations
for 25-Year Flows)

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES#2 - (DI-01) Outlet from Drop Inlet #1

Design Flow =	Q =	8.7	cfs
Tailwater =	Tw =	0.833333	feet
Pipe Dia.=	Do =	1.25	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **23.5** feet

W_1 = Width = 3Do+(0.4)(La)= **13.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **3.8** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

$d_{50} = (0.02/Tw)(Q/Do)^{\wedge(4/3)}=$ **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

(See Last Page of Calculations
for 25-Year Flows)

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES#3 - (CB09)From CB #9 Into Forebay

Design Flow =	Q =	9.9	cfs
Tailwater =	Tw =	1.333333	feet
Pipe Dia.=	Do =	2	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **21.0** feet

W_1 = Width = 3Do+(0.4)(La)= **14.5** feet **(or Width of Channel)**

W_2 = Width = 3Do= **6.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

$d_{50} = (0.02/Tw)(Q/Do)^{\wedge(4/3)}=$ **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size		Size of stone (inches)		
100		9.00	-	12.00
85		7.80	-	10.80
50	(See Last Page of Calculations	6.00	-	9.00
15	for 25-Year Flows)	1.80	-	3.00

MSC Civil Engineers Land Surveyors, Inc.

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES#4 - (CB19)From CB #19 Into Forebay

Design Flow =	Q =	6.5	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **19.5** feet

W_1 = Width = 3Do+(0.4)(La)= **11.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **3.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

$d_{50} = (0.02/Tw)(Q/Do)^{\wedge(4/3)} =$ **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

(See Last Page of Calculations for 25-Year Flows)

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES#5 - (MH10) From Bioretention Area #1 &2

Design Flow =	Q =	7.6	cfs
Tailwater =	Tw =	1.333333	feet
Pipe Dia.=	Do =	2	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **16.0** feet

W_1 = Width = 3Do+(0.4)(La)= **12.5** feet **(or Width of Channel)**

W_2 = Width = 3Do= **6.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

$d_{50} = (0.02/Tw)(Q/Do)^{\wedge(4/3)}=$ **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES#6 - (MH13) From Infiltration Basin #1

Design Flow =	Q =	7.6	cfs
Tailwater =	Tw =	1.333333	feet
Pipe Dia.=	Do =	2	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **16.0** feet

W_1 = Width = 3Do+(0.4)(La)= **12.5** feet **(or Width of Channel)**

W_2 = Width = 3Do= **6.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)$^{\wedge(4/3)}$= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES #7 - (MH-11) From Drain MH #11

Design Flow =	Q =	7.2	cfs
Tailwater =	Tw =	1.333333	feet
Pipe Dia.=	Do =	2	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **15.5** feet

W_1 = Width = 3Do+(0.4)(La)= **12.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **6.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)^$^{(4/3)}$= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES #8 - (MH-08) From Drain MH #8 into Forebay

Design Flow =	Q =	18.3	cfs
Tailwater =	Tw =	1.666667	feet
Pipe Dia.=	Do =	2.5	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **34.5** feet

W_1 = Width = 3Do+(0.4)(La)= **21.5** feet **(or Width of Channel)**

W_2 = Width = 3Do= **7.5** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

$d_{50} = (0.02/Tw)(Q/Do)^{(4/3)}=$ **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

Parson Woods Condominiums
Portsmouth, NH
8/25/2021

RIPRAP OUTLET PROTECTION

Location: FES #9 - (GW01) Outlet From Subsurface Gravel Wetland #1

Design Flow =	Q =	7.9	cfs
Tailwater =	Tw =	1	feet
Pipe Dia.=	Do =	1.5	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **19.5** feet

W_1 = Width = 3Do+(0.4)(La)= **12.5** feet **(or Width of Channel)**

W_2 = Width = 3Do= **4.5** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)$^{\wedge(4/3)}$= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size	Size of stone (inches)		
100	9.00	-	12.00
85	7.80	-	10.80
50	6.00	-	9.00
15	1.80	-	3.00

(This Page Is Intentionally Blank)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond CB02: Catch Basin 02 Peak Elev=37.16' Inflow=1.5 cfs 5,299 cf
Primary=1.5 cfs 5,299 cf Secondary=0.0 cfs 0 cf Outflow=1.5 cfs 5,299 cf

Pond CB09: Catch Basin 09 Peak Elev=38.16' Inflow=9.9 cfs 34,947 cf
24.0" Round Culvert n=0.013 L=171.0' S=0.0056 '/' Outflow=9.9 cfs 34,947 cf

Pond DI01: DI-01 DROP INLET Peak Elev=37.78' Storage=5 cf Inflow=8.7 cfs 39,060 cf
Primary=8.7 cfs 39,059 cf Secondary=0.0 cfs 0 cf Outflow=8.7 cfs 39,059 cf

Pond GW01: Gravel Wetland #1 Peak Elev=37.57' Storage=33,376 cf Inflow=19.9 cfs 81,870 cf
Primary=7.9 cfs 59,475 cf Secondary=0.6 cfs 396 cf Outflow=8.4 cfs 59,871 cf

Pond MH08: Manhole 08 Peak Elev=38.80' Inflow=18.3 cfs 68,467 cf
30.0" Round Culvert n=0.013 L=176.0' S=0.0068 '/' Outflow=18.3 cfs 68,467 cf

Pond MH10: Manhole 10 Peak Elev=33.06' Inflow=7.6 cfs 57,745 cf
24.0" Round Culvert x 2.00 n=0.013 L=220.0' S=0.0052 '/' Outflow=7.6 cfs 57,745 cf

Pond MH11: Manhole 11 Peak Elev=46.31' Inflow=7.2 cfs 45,144 cf
24.0" Round Culvert n=0.013 L=178.0' S=0.0076 '/' Outflow=7.2 cfs 45,144 cf

Pond MH12: Manhole 12 Peak Elev=38.10' Inflow=6.5 cfs 23,623 cf
24.0" Round Culvert x 2.00 n=0.013 L=45.0' S=0.0051 '/' Outflow=6.5 cfs 23,612 cf

Pond MH13: Manhole 13 Peak Elev=38.53' Inflow=7.6 cfs 24,776 cf
24.0" Round Culvert n=0.013 L=148.0' S=0.0257 '/' Outflow=7.6 cfs 24,776 cf

(This Page Is Intentionally Blank)

APPENDIX H - NRCS WEB SOIL SURVEY

(This Page Is Intentionally Blank)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for
Rockingham County, New Hampshire

April 30, 2021

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map

70° 47' 47" W
70° 46' 33" W
43° 3' 30" N
43° 2' 55" N
353800
353900
354000
354100
354200
354300
354400
354500
354600
354700
354800
354900
355000
355100
355200
355300
4768800
4768700
4768600
4768500
4768400
4768300
4768200
4768100
4768000
4767900
4767800
33
Oxford Ave
Peverly Hill Rd
Sagamore Creek
510A
510B
38A
538A
510C
313A
33A
140C
510B
538A
460C
33A
495
134
Soil Map may not be valid at this scale.
N
Map Scale: 1:7,640 if printed on A landscape (11" x 8.5") sheet.
Meters
0
100
200
400
600
Feet
0
350
700
1400
2100
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 22, May 29, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
33A	Scitico silt loam, 0 to 5 percent slopes	15.6	17.7%
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	11.0	12.5%
134	Maybid silt loam	3.0	3.4%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	6.1	6.9%
313A	Deerfield loamy fine sand, 0 to 3 percent slopes	6.1	6.9%
460C	Pennichuck channery very fine sandy loam, 8 to 15 percent slopes	8.6	9.7%
495	Natchaug mucky peat, 0 to 2 percent slopes	1.0	1.1%
510A	Hoosic gravelly fine sandy loam, 0 to 3 percent slopes	0.7	0.8%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	29.4	33.4%
510C	Hoosic gravelly fine sandy loam, 8 to 15 percent slopes	5.2	5.9%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	1.5	1.7%
Totals for Area of Interest		**88.0**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

33A—Scitico silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cn6
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scitico and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scitico

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 12 inches: silty clay loam
H3 - 12 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Maybid

Percent of map unit: 5 percent
Landform: Marine terraces

Hydric soil rating: Yes

Boxford

Percent of map unit: 5 percent
Hydric soil rating: No

38A—Eldridge fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cn9
Elevation: 90 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eldridge and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eldridge

Setting

Parent material: Outwash over glaciolacustrine

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 23 inches: loamy fine sand
H3 - 23 to 62 inches: loamy very fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Squamscott

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Well drained inclusion

Percent of map unit: 5 percent
Hydric soil rating: No

134—Maybid silt loam

Map Unit Setting

National map unit symbol: 9cmg
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Maybid and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maybid

Setting

Landform: Marine terraces
Parent material: Silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 26 inches: silty clay loam
H3 - 26 to 63 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: F144AY020MA - Very Wet Coastal Lake Plain
Hydric soil rating: Yes

Minor Components

Ossipee
Percent of map unit: 10 percent
Landform: Swamps
Hydric soil rating: Yes

Scitico
Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Not named wet
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky

Map Unit Setting
National map unit symbol: 2w82s
Elevation: 0 to 980 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting
Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex

Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent
Landform: Bogs, marshes, depressions, kettles, swamps

Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Scarboro, very stony

Percent of map unit: 3 percent
Landform: Depressions, drainageways, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Ridges, hills
Hydric soil rating: Unranked

313A—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2xfg8
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Outwash plains, kame terraces, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave, convex
Across-slope shape: Concave, linear, convex

Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water capacity: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash plains, kame terraces, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave, convex
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, kame terraces, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Outwash plains, kame terraces, outwash terraces
Landform position (three-dimensional): Tread

Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

460C—Pennichuck channery very fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cp0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pennichuck and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pennichuck

Setting

Parent material: Till

Typical profile

H1 - 0 to 11 inches: channery very fine sandy loam
H2 - 11 to 25 inches: very channery fine sandy loam
H3 - 25 to 36 inches: very channery loamy coarse sand
R - 36 to 40 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent
Hydric soil rating: No

495—Natchaug mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w691
Elevation: 0 to 910 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Natchaug and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Natchaug

Setting

Landform: Depressions, depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Moderately decomposed organic material over loamy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy till

Typical profile

Oe1 - 0 to 12 inches: mucky peat
Oe2 - 12 to 31 inches: mucky peat
2Cg1 - 31 to 39 inches: silt loam
2Cg2 - 39 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.01 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY042NY - Semi-Rich Organic Wetlands
Hydric soil rating: Yes

Minor Components

Scarboro

Percent of map unit: 4 percent
Landform: Depressions, drainageways, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Walpole

Percent of map unit: 4 percent
Landform: Outwash plains, depressions, depressions, deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Maybid

Percent of map unit: 2 percent
Landform: Depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

510A—Hoosic gravelly fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cp3

Elevation: 100 to 1,100 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

510B—Hoosic gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cp4
Elevation: 100 to 1,100 feet

Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

510C—Hoosic gravelly fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cp5
Elevation: 100 to 1,100 feet
Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Hoosic and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

538A—Squamscott fine sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cp9
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Squamscott and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Squamscott

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 12 inches: loamy sand
H3 - 12 to 19 inches: fine sand
H4 - 19 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Maybid

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Peverly NCRS Soils Report)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

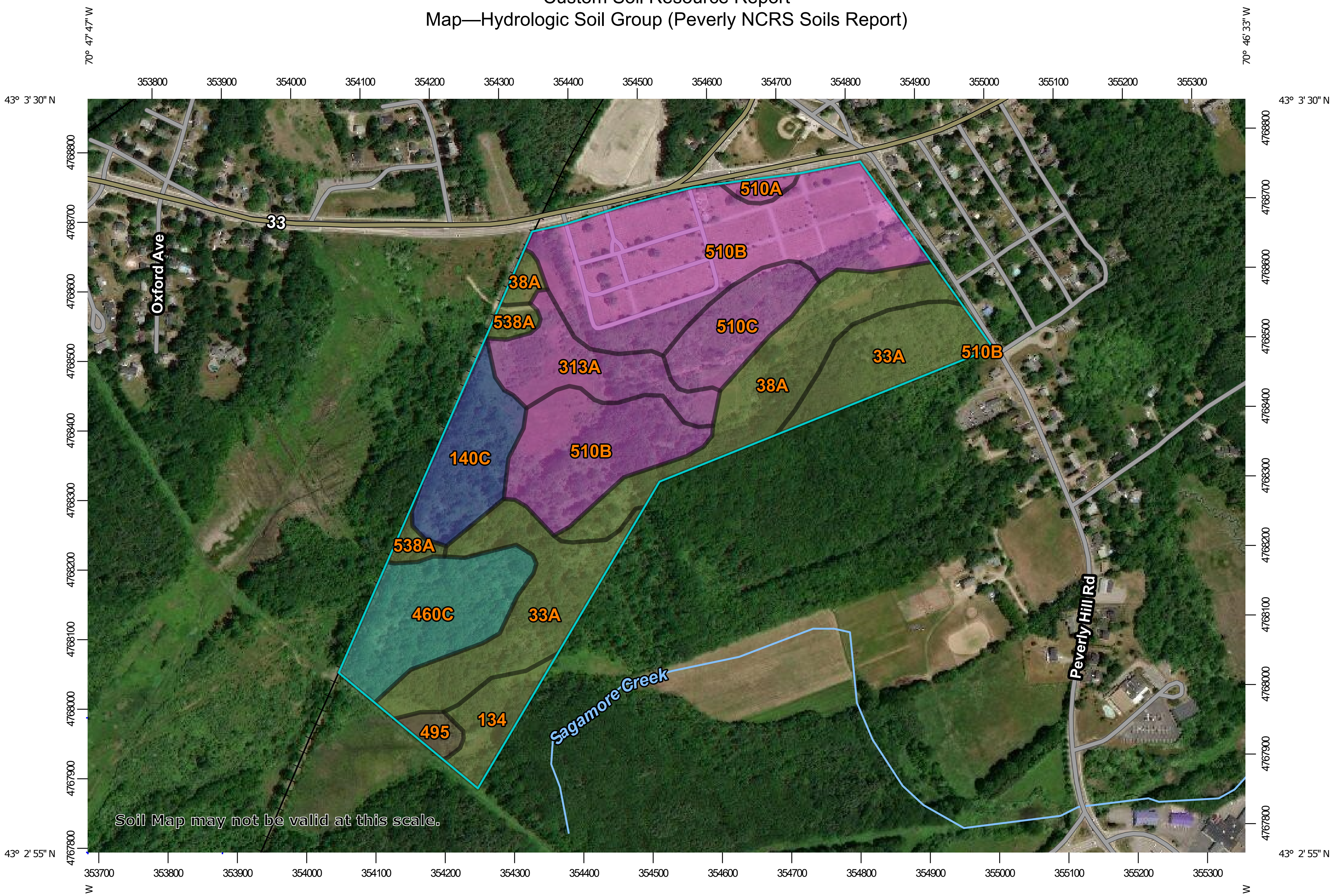
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group (Peverly NCRS Soils Report)



Map Scale: 1:7,640 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 100, 200, 400, 600

Feet: 0, 350, 700, 1400, 2100

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 22, May 29, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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

Table—Hydrologic Soil Group (Peverly NCRS Soils Report)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
33A	Scitico silt loam, 0 to 5 percent slopes	C/D	15.6	17.7%
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	C/D	11.0	12.5%
134	Maybid silt loam	C/D	3.0	3.4%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	6.1	6.9%
313A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	6.1	6.9%
460C	Pennichuck channery very fine sandy loam, 8 to 15 percent slopes	C	8.6	9.7%
495	Natchaug mucky peat, 0 to 2 percent slopes	B/D	1.0	1.1%
510A	Hoosic gravelly fine sandy loam, 0 to 3 percent slopes	A	0.7	0.8%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	A	29.4	33.4%
510C	Hoosic gravelly fine sandy loam, 8 to 15 percent slopes	A	5.2	5.9%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	C/D	1.5	1.7%
Totals for Area of Interest			**88.0**	**100.0%**

Rating Options—Hydrologic Soil Group (Peverly NCRS Soils Report)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: "National Soil Survey Handbook."

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or "washed out" from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5
Extremely acid: 3.5 to 4.4
Very strongly acid: 4.5 to 5.0
Strongly acid: 5.1 to 5.5
Moderately acid: 5.6 to 6.0
Slightly acid: 6.1 to 6.5
Neutral: 6.6 to 7.3
Slightly alkaline: 7.4 to 7.8
Moderately alkaline: 7.9 to 8.4
Strongly alkaline: 8.5 to 9.0
Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1

Moderate: 13-30:1

Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0

Coarse sand: 1.0 to 0.5

Medium sand: 0.5 to 0.25

Fine sand: 0.25 to 0.10

Very fine sand: 0.10 to 0.05

Silt: 0.05 to 0.002

Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated
Prismatic: Vertically elongated and having flat tops
Columnar: Vertically elongated and having rounded tops
Angular blocky: Having faces that intersect at sharp angles (planes)
Subangular blocky: Having subrounded and planar faces (no sharp angles)
Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand
Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth’s surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

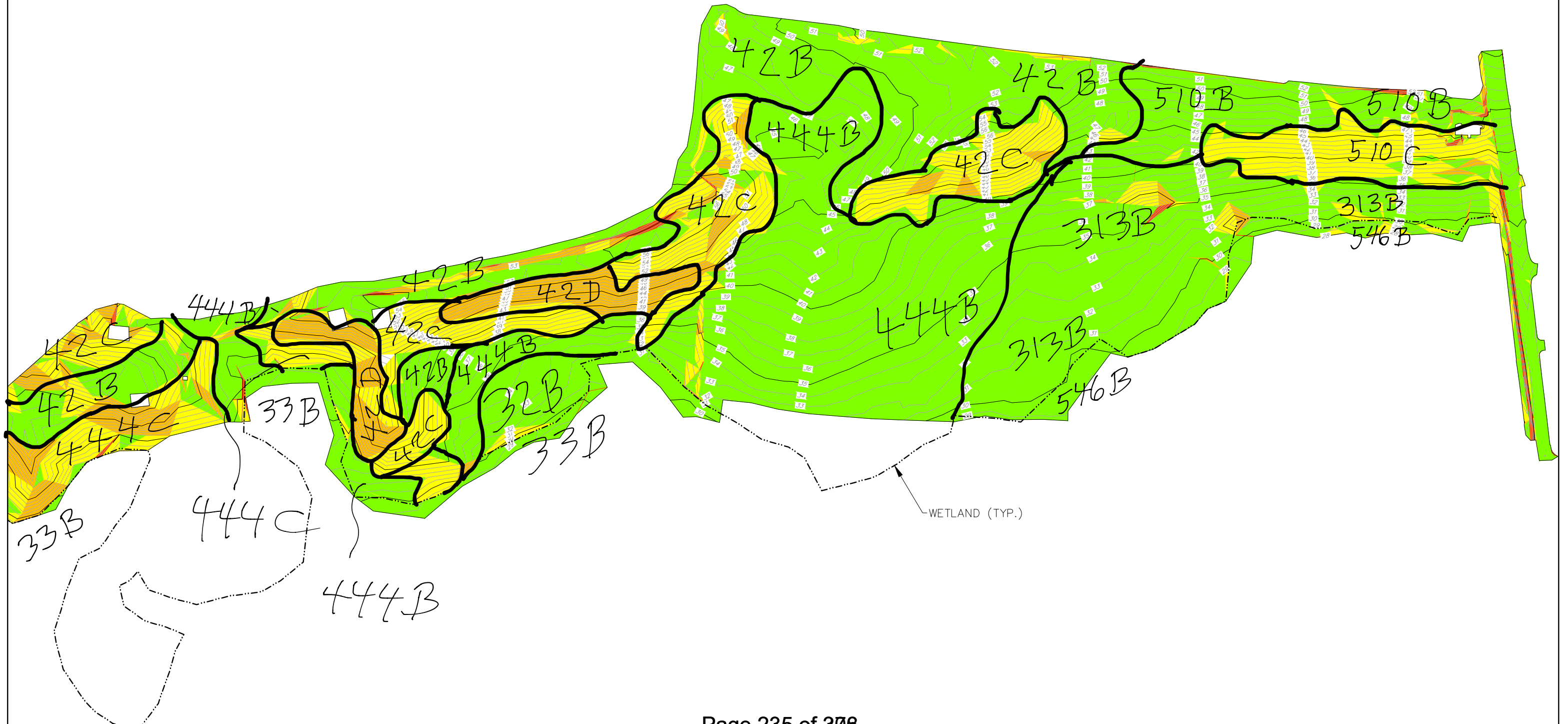
(This Page Is Intentionally Blank)

APPENDIX I - SITE SPECIFIC SOIL MAP & TEST PIT LOGS

(This Page Is Intentionally Blank)

PEVERLY HILL ROAD
EXISTING SLOPE ANALYSIS

Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0.01%	8.00%	
2	8.01%	15.00%	
3	15.01%	25.00%	
4	25.01%	10000.00%	



SCALE
1"=100'

(This Page Is Intentionally Blank)

TEST PIT DATA

Project	Peverly Hill Road, Portsmouth, NH
Client	Green and Company
GES Project No.	2019211
MM/DD/YY Staff	11-19-2020 JP Gove CSS# 004

Test Pit No. **601**
ESHWT: 49”
Termination @ 95”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-7”	10YR3/3	GRLS	GR	FR	NONE
7-49”	10YR4/6	GRLS	GR	FR	NONE
49-95”	10YR4/4	GRS	OM	FR	10YR2/1, C/P

GR (TEXTURE) = GRAVELLY	GR = GRANULAR	FR = FRIABLE
LS = LOAMY SAND	OM = MASSIVE	FI = FIRM
S = SAND	PL = PLATY	C = COMMON
FSL = FINE SANDY LOAM	BK = BLOCKY	P = PROMINENT
SL = SANDY LOAM		D = DISTINCT
SIL = SILT LOAM		
SICL = SILTY CLAY	VF (TEXTURE) = VERY FINE	F (TEXTURE) = FINE

Test Pit No. **602**
ESHWT: 44”
Termination @ 96”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-9”	10YR3/3	GRLS	GR	FR	NONE
9-44”	10YR4/6	GRLS	GR	FR	NONE
44-96”	10YR4/4	GRS	OM	FR	7.5YR5/8, C/P

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No. **603**
ESHWT: 36”
Termination @ 109”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/2	GRSL	GR	FR	NONE
12-36”	10YR4/6	GRSL	GR	FR	NONE
36-109”	2.5Y5/4	GRLS	PL	FI	7.5YR5/8, C/P

Test Pit No. **604**
ESHWT: 55”
Termination @ 95”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-14”	10YR3/3	GRSL	GR	FR	NONE
14-55”	10YR4/6	GRSL	GR	FR	NONE
55-95”	2.5Y5/4	GRLS	PL	FI	7.5YR5/8, C/P

Test Pit No. **605**
ESHWT: 37”
Termination @ 102”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-7”	10YR3/3	LS	GR	FR	NONE
7-37”	10YR5/6	LS	GR	FR	NONE
37-102”	2.5Y5/3	S	OM	FR	7.5YR5/8, C/P

Test Pit No. **606**
ESHWT: 30”
Termination @ 97”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-10”	10YR3/3	LS	GR	FR	NONE
10-30”	10YR5/6	LS	GR	FR	NONE
30-97”	2.5Y5/4	S	OM	FR	7.5YR5/8, C/P

Test Pit No. **607**
ESHWT: 30”
Termination @ 96”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-9”	10YR3/3	LS	GR	FR	NONE
9-30”	10YR5/6	LS	GR	FR	NONE
30-96”	2.5Y3/3	S	OM	FR	2.5Y6/6, C/D

Test Pit No. **608**
ESHWT: 23”
Termination @ 97”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-8”	10YR3/3	LS	GR	FR	NONE
8-23”	10YR4/6	LS	GR	FR	NONE
23-97”	2.5Y5/3	S	OM	FR	7.5YR5/8, C/P

Test Pit No. **609**
ESHWT: 35”
Termination @ 111”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/3	GRSL	GR	FR	NONE
12-35”	10YR4/6	GRSL	GR	FR	NONE
35-111”	2.5Y5/3	VFS	OM	FR	7.5YR5/8, C/P

Test Pit No. **610**
ESHWT: 30”
Termination @ 107”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/3	GRSL	GR	FR	NONE
12-30”	10YR5/6	GRSL	GR	FR	NONE
30-107”	2.5Y5/4	VFS	OM	FR	7.5YR5/8, C/P

Test Pit No. **611**
ESHWT: 29”
Termination @ 105”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/2	GRFSL	GR	FR	NONE
12-29”	10YR4/6	GRLS	GR	FR	NONE
29-105”	2.5Y5/4	VFS	OM	FR	7.5YR5/8, C/P

Test Pit No. **612**
ESHWT: 38”
Termination @ 92”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/2	GRSL	GR	FR	NONE
12-38”	10YR5/6	GRSL	GR	FR	NONE
38-92”	2.5Y5/4	GRS	PL	FI	7.5YR5/8, C/P

Test Pit No. **613**
ESHWT: 33”
Termination @ 110”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/2	GRSL	GR	FR	NONE
12-33”	10YR4/6	GRSL	GR	FR	NONE
33-110”	2.5Y5/3	GRFSL	PL	FI	7.5YR5/6, C/P

Test Pit No. **614**
ESHWT: 12”
Termination @ 105”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/2	FSL	GR	FR	NONE
12-40”	2.5y5/2	SIL	PL	FI	7.5YR5/8, C/P
40-73”	10YR5/6	FS	OM	FR	7.5YR5/8, C/P
73-105”	2.5Y4/2	GRFSL	PL	FI	2.5Y6/6, C/D

Test Pit No. **615**
ESHWT: 17”
Termination @ 108”
Refusal: 108”
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-8”	10YR3/2	FSL	GR	FR	NONE
8-17”	10YR4/6	FSL	GR	FR	NONE
17-44”	2.5Y5/2	SIL	PL	FI	7.5YR5/8, C/P
44-66”	10YR4/4	FS	OM	FR	7.5YR5/8, C/P
66-108”	2.5Y3/3	GRFSL	PL	FI	2.5Y6/6,C/D

108” - BEDROCK

Test Pit No. **616**
ESHWT: 26”
Termination @ 80”
Refusal: No
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-9”	10YR3/2	FSL	GR	FR	NONE
9-26”	10YR4/6	FSL	GR	FR	NONE
26-80”	2.5Y5/4	GRFSL	PL	FI	7.5YR5/8, C/P

Test Pit No. **617**
ESHWT: 35”
Termination @ 80”
Refusal: 80”
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-9”	10YR3/3	GRFSL	GR	FR	NONE
9-35”	10YR4/6	GRFSL	GR	FR	NONE
35-80”	2.5Y5/4	GRFSL	PL	FI	7.5YR5/8, C/P

80” = BEDROCK

Test Pit No.	**618**
ESHWT:	22”
Termination @	57”
Refusal:	57”
Obs. Water:	None

Depth	Color	Texture	Structure	Consistence	REDOX; Quantity/Contrast
0-12”	10YR3/2	GRFSL	GR	FR	NONE
12-22”	10YR4/6	GRFSL	GR	FR	NONE
22-57”	2.5Y5/4	GRFSL	PL	FI	7.5YR5/8, C/P

57” = BEDROCK

(This Page Is Intentionally Blank)

TEST PIT & INFILTRATION TEST	
TEST PIT	
#	DEPTH
TP–1	8 FT
TP–2	8 FT
TP–3	8 FT
TP–4	8 FT
TP–5	6 FT
TP–6	6 FT
TP–7	6 FT
TP–8	6 FT
TP–9	6 FT
TP–10	8 FT
TP–11	6 FT
TP–12	10 FT
TP–13	10 FT
TP–14	6 FT
TP–15	6 FT
TP–16	10 FT
TP–17	8 FT
TP–18	8 FT

NOTES

1. TEST PIT LOCATIONS HAVE BEEN CHOSEN TO SATISFY AOT REQUIREMENTS PER ENV-WQ 1504.13(C).
2. TEST PITS DEPTHS LISTED ARE MINIMUM DEPTHS. IF SEASONAL HIGH WATER TABLE IS ENCOUNTERED, THE TEST PITS CAN BE STOPPED.
3. EACH TEST PIT LOCATION SHALL RECORD SHWT PER ENV-WQ 1504.13(D).
4. EACH TEST PIT LOCATION SHALL INCLUDE SOIL PROFILE DESCRIPTIONS PER ENV-WQ 1504.13(F).
5. INFILTRATION TESTING SHALL BE CONDUCTED PER ENV-WQ 1504.14(d)(1) AND AT LEAST 1 FOOT ABOVE SEASONAL HIGH WATER.
6. TEST PIT AND INFILTRATION TEST LOCATIONS ARE NUMBERED IN ORDER OF PRIORITY. PLEASE CONDUCT TESTING IN CHRONOLOGICAL ORDER. PLEASE COMPLETE AS MANY TEST PITS AND INFILTRATION TESTS AS POSSIBLE IN ONE DAY AND REPORT RESULTS TO TFMORAN. FURTHER TEST PITS & INFILTRATION TESTS MAY BE CONDUCTED ON A SEPERATE DAY AND SUBJECT TO REVISION BASED ON RESULTS.
7. INFILTRATION TESTS SHALL BE PERFORMED IN EACH TEST PIT TO DEPTHS OF 3 FEET ABOVE THE OBSERVED WATER TABLE.

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

TEST PIT & INFILTRATION TEST LOCATION PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLEY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

1"=200' (11"X17")
SCALE: 1"=100' (22"X34")

NOVEMBER 9, 2020

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV.	DATE	DESCRIPTION	DR	CK

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431–2222
Fax (603) 431–0910
www.tfmoran.com

FILE	47388_11	DR	JSM	FB	–	TP–01
		CK	JJM	CADFILE	47388–11_TEST PIT_PRELIMINARY DESIGN	

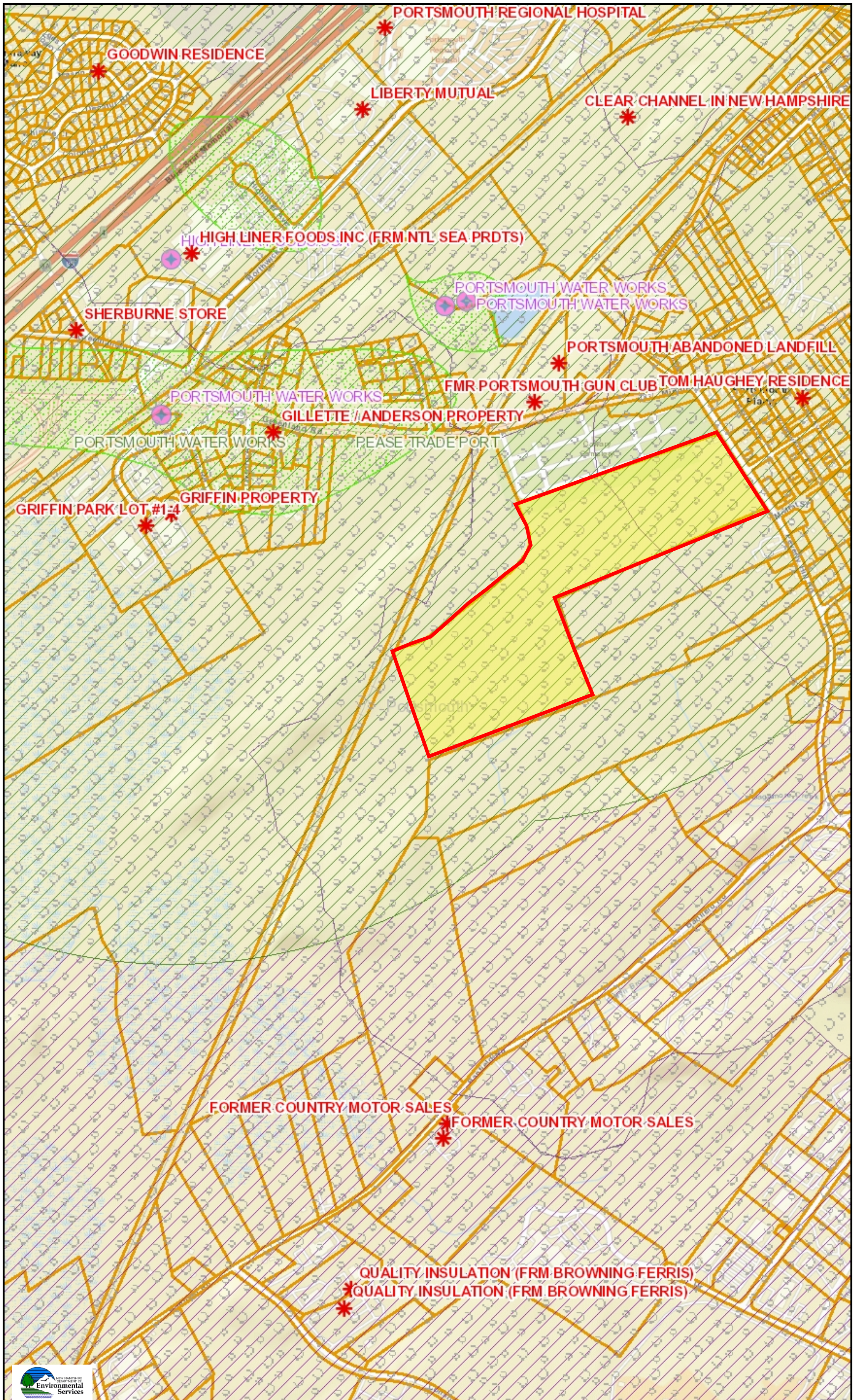
DIG SAFE
MA ME NH RI VT
CALL 811 TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

(This Page Is Intentionally Blank)

APPENDIX J – NHDES ONE STOP DATAMAPPER

(This Page Is Intentionally Blank)

83 Perverly Road



Legend

- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Watersheds with Chloride Impairments 2016

Parcels
- Parcel Polygons
- Attributes for Additional Lines

Map Scale

1: 12,988

© NH DES, http://des.nh.gov

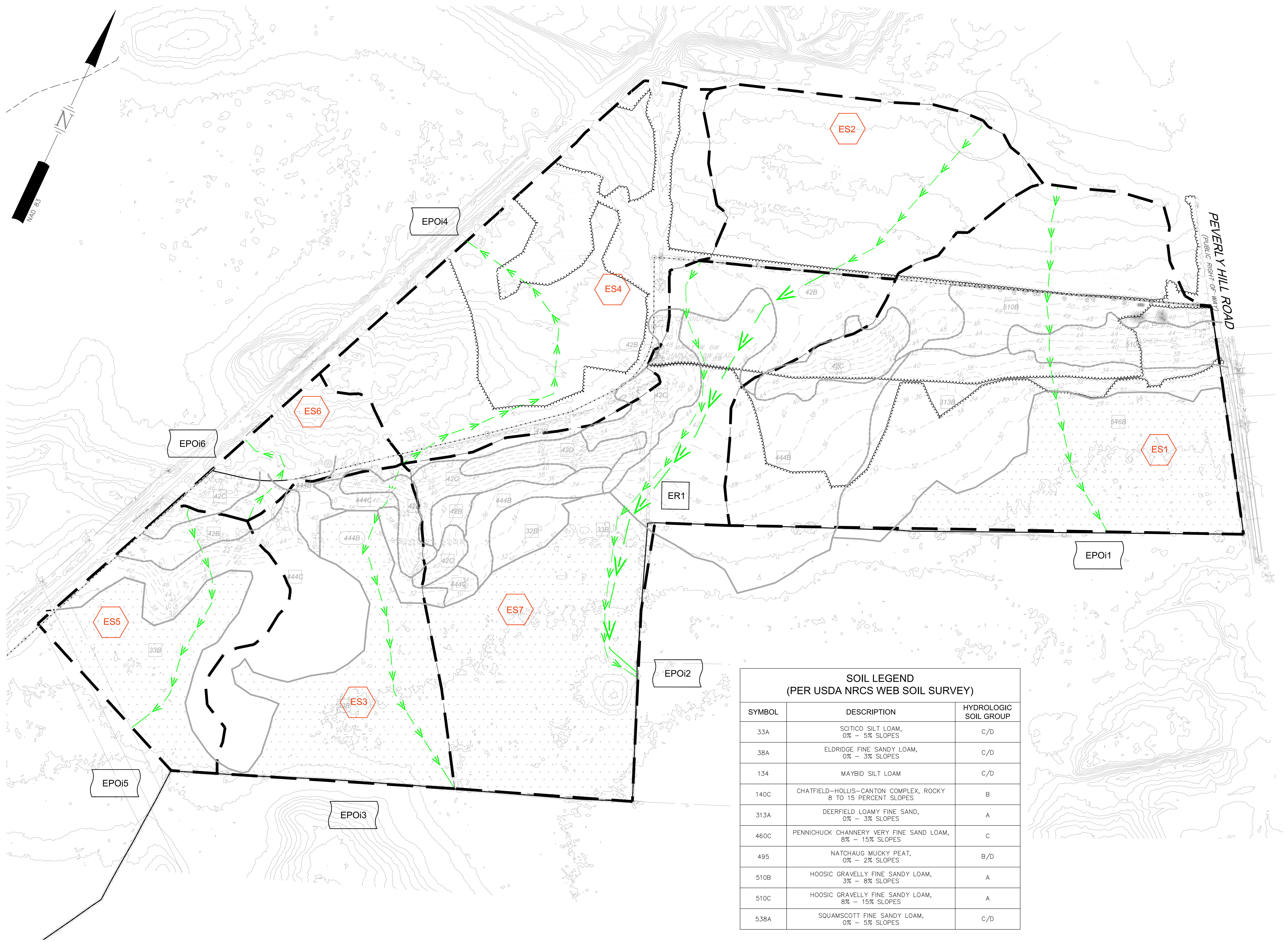
Map Generated: 4/19/2021

Notes

(This Page Is Intentionally Blank)

APPENDIX K - PRE AND POST-DEVELOPMENT DRAINAGE PLANS

(This Page Is Intentionally Blank)



LEGEND

	FLOW PATH (Tc LINE)
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
ES4	EXISTING SUBCATCHMENT NODE
EC1	EXISTING POND AREA AND CULVERT NODE
ER1	EXISTING REACH
EPOi3	POINT OF INTEREST

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
32	BOXFORD SILT LOAM	C
33	SCITICO SILT LOAM	C
42	CANTON SANDY LOAM	B
313	DEERFIELD LOAMY SAND	B
444	NEWFIELDS SANDY LOAM	B
510	HOOSIC GRAVELLY LOAMY SAND	A
546	WALPOLE SANDY LOAM	C

SOIL LEGEND (PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
33A	SCITICO SILT LOAM, 0% – 5% SLOPES	C/D
38A	ELDRIDGE FINE SANDY LOAM, 0% – 3% SLOPES	C/D
134	MAYBID SILT LOAM	C/D
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, ROCKY 8 TO 15 PERCENT SLOPES	B
313A	DEERFIELD LOAMY FINE SAND, 0% – 3% SLOPES	A
460C	PENNICHUCK CHANNERY VERY FINE SAND LOAM, 8% – 15% SLOPES	C
495	NATCHAUG MUCKY PEAT, 0% – 2% SLOPES	B/D
510B	HOOSIC GRAVELLY FINE SANDY LOAM, 3% – 8% SLOPES	A
510C	HOOSIC GRAVELLY FINE SANDY LOAM, 8% – 15% SLOPES	A
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5% SLOPES	C/D

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 6

PRE-DEVELOPEMENT DRAINAGE AREAS

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

1"=300" (11"X17")

SCALE: 1"=150" (22"X34") **APRIL 19, 2021**

REV.	DATE	DESCRIPTION	DR	CK

TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

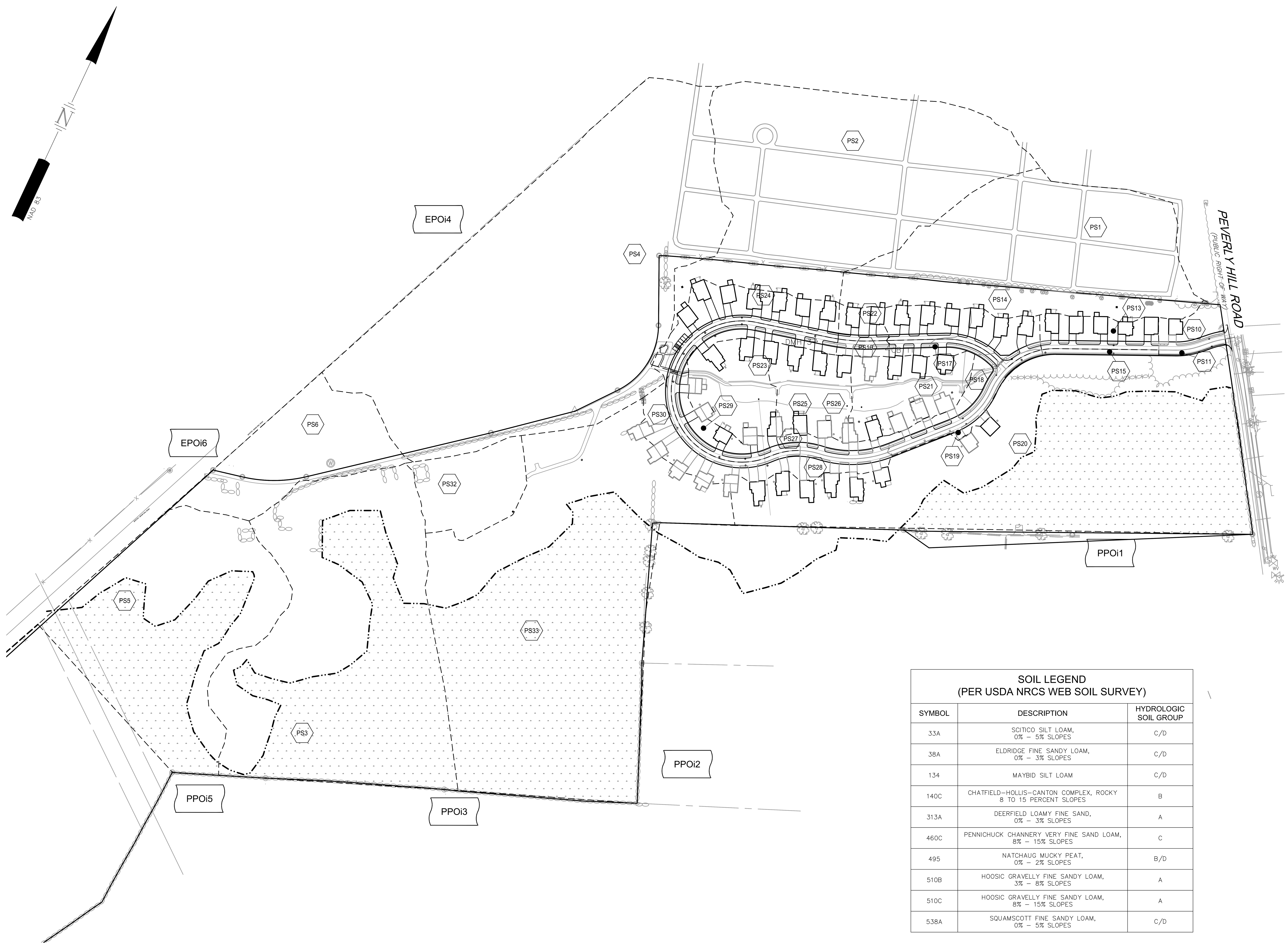
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	47388	DR	JSM	FB	–	D-1
		CK	JJM	CADFILE		

DIG SAFE MA ME NH RI VT CALL 811 TOLL FREE UTILITIES UNDER GROUND PLANT DAMAGE PREVENTION SYSTEM

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Aug 25, 2021 - 1:08am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_DrainagePre.dwg



LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
PS4	PROPOSED SUBCATCHMENT NODE
PR1	PROPOSED REACH
PC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
32	BOXFORD SILT LOAM	C
33	SCITICO SILT LOAM	C
42	CANTON SANDY LOAM	B
313	DEERFIELD LOAMY SAND	B
444	NEWFIELDS SANDY LOAM	B
510	HOOSIC GRAVELLY LOAMY SAND	A
546	WALPOLE SANDY LOAM	C

SOIL LEGEND (PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
33A	SCITICO SILT LOAM, 0% – 5% SLOPES	C/D
38A	ELDRIDGE FINE SANDY LOAM, 0% – 3% SLOPES	C/D
134	MAYBID SILT LOAM	C/D
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, ROCKY 8 TO 15 PERCENT SLOPES	B
313A	DEERFIELD LOAMY FINE SAND, 0% – 3% SLOPES	A
460C	PENNICHUCK CHANNERY VERY FINE SAND LOAM, 8% – 15% SLOPES	C
495	NATCHAUG MUCKY PEAT, 0% – 2% SLOPES	B/D
510B	HOOSIC GRAVELLY FINE SANDY LOAM, 3% – 8% SLOPES	A
510C	HOOSIC GRAVELLY FINE SANDY LOAM, 8% – 15% SLOPES	A
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5% SLOPES	C/D

HORIZONTAL SCALE 1"=150'
150 75 0 150

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 6

OVERALL POST-DEVELOPEMENT DRAINAGE AREAS

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

1"=300" (11"X17")
SCALE: 1"=150" (22"X34")

APRIL 19, 2021

REV.	DATE	DESCRIPTION	DR	CK

TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	47388	DR JSM	FB	–	D-2
		CK JJM	CADFILE		

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Aug 25, 2021 - 1:09am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_DrainagePost.dwg

LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
PS4	PROPOSED SUBCATCHMENT NODE
PR1	PROPOSED REACH
PC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
32	BOXFORD SILT LOAM	C
33	SCITICO SILT LOAM	C
42	CANTON SANDY LOAM	B
313	DEERFIELD LOAMY SAND	B
444	NEWFIELDS SANDY LOAM	B
510	HOOSIC GRAVELLY LOAMY SAND	A
546	WALPOLE SANDY LOAM	C

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 6

POST-DEVELOPEMENT DRAINAGE AREAS

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

SCALE: **APRIL 19, 2021**

HORIZONTAL SCALE 1"=150'

150 75 0 150

REV.	DATE	DESCRIPTION	DR	CK

TFM

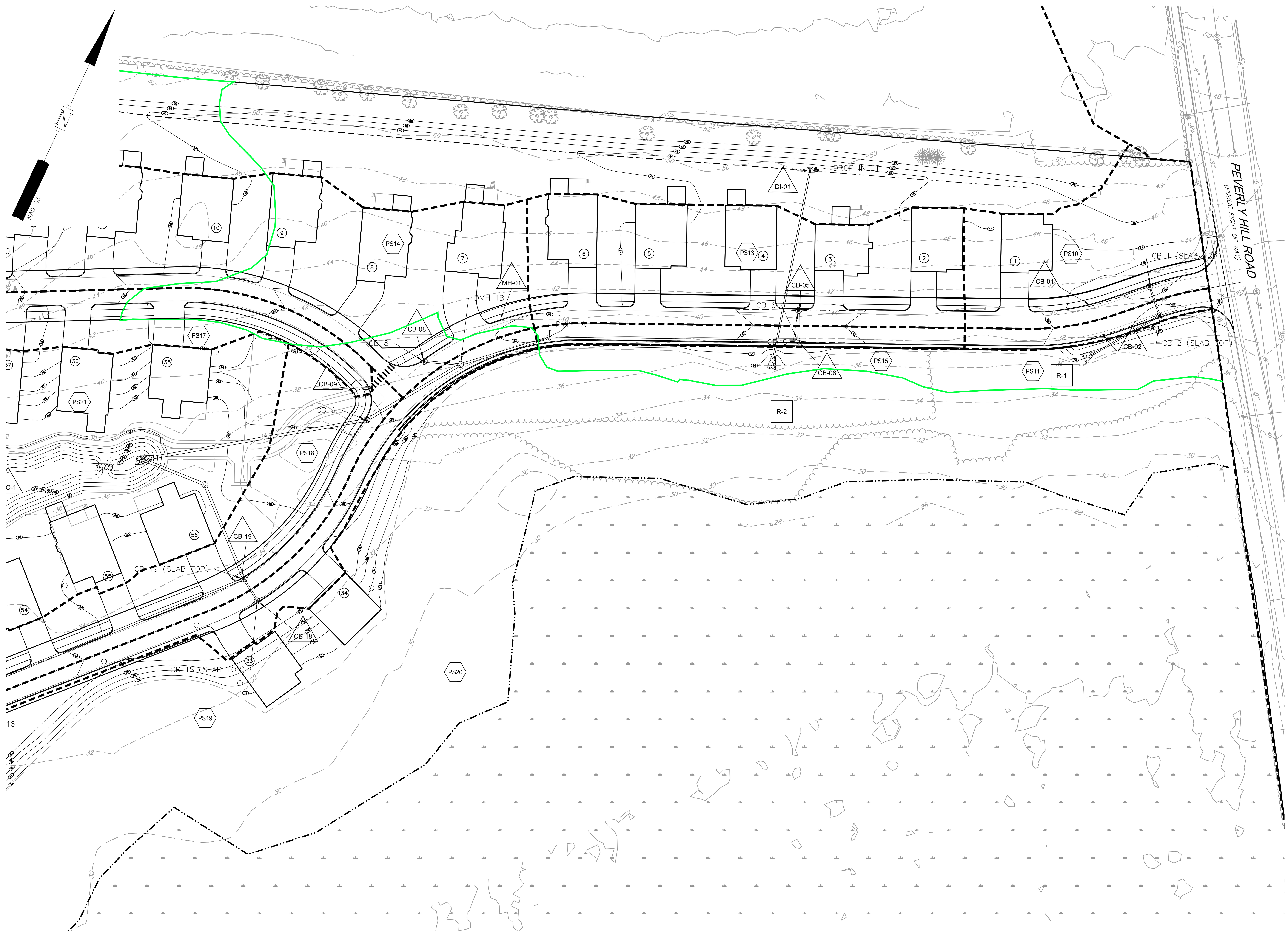
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	47388	DR JSM	FB	–	D-3
		CK JJM	CADFILE		

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Aug 25, 2021 - 1:09am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_DrainagePost.dwg



LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
PS4	PROPOSED SUBCATCHMENT NODE
PR1	PROPOSED REACH
PC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
32	BOXFORD SILT LOAM	C
33	SCITICO SILT LOAM	C
42	CANTON SANDY LOAM	B
313	DEERFIELD LOAMY SAND	B
444	NEWFIELDS SANDY LOAM	B
510	HOOSIC GRAVELLY LOAMY SAND	A
546	WALPOLE SANDY LOAM	C

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 6

POST-DEVELOPEMENT DRAINAGE AREAS

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

SCALE: **APRIL 19, 2021**

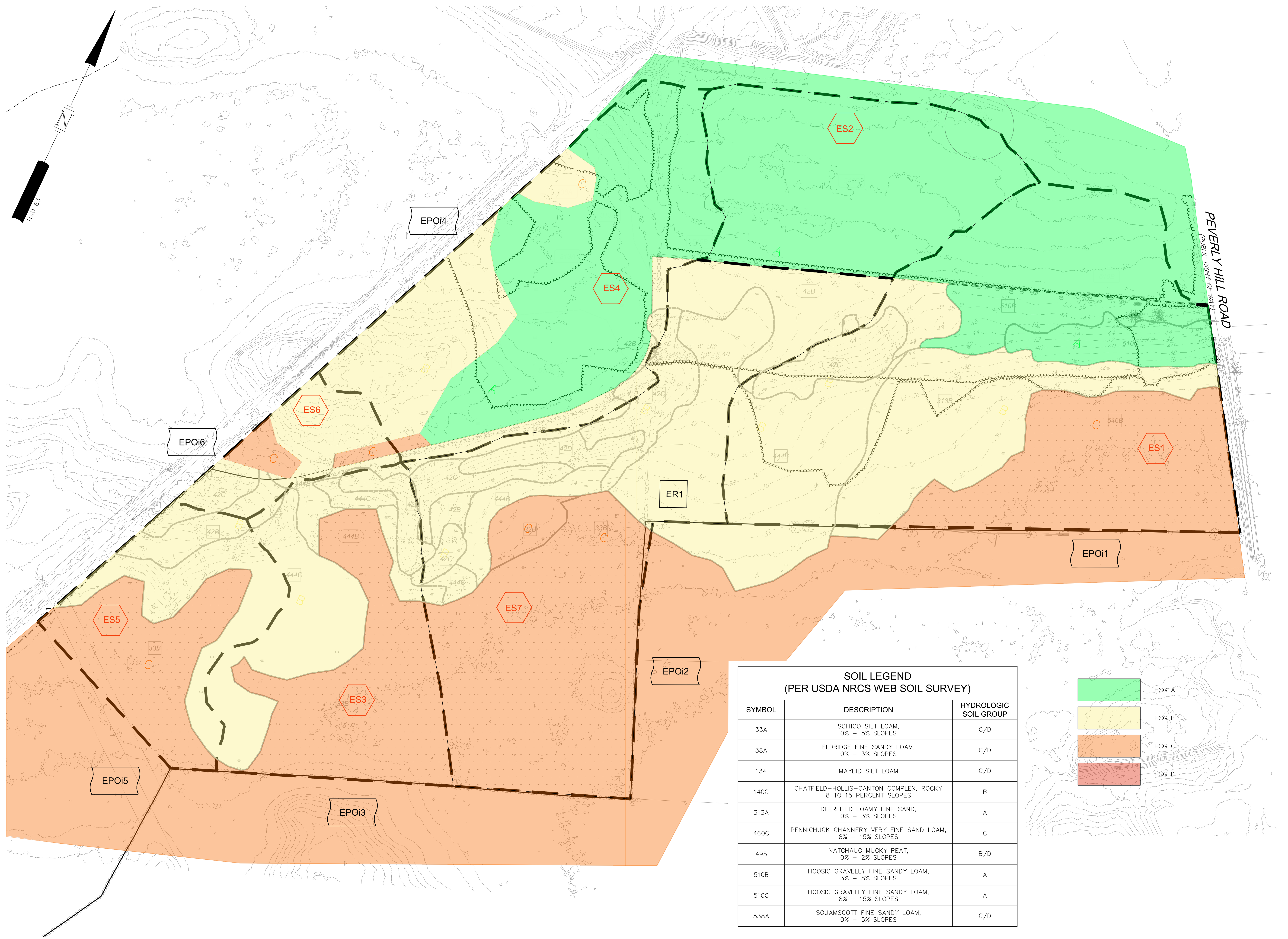
REV.	DATE	DESCRIPTION	DR	CK

TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	JSM	FB	–	
47388	CK	JJM	CADFILE		D-4

Aug 25, 2021 - 1:09am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_DrainagePost.dwg



LEGEND

	FLOW PATH (Tc LINE)
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
ES4	EXISTING SUBCATCHMENT NODE
EC1	EXISTING POND AREA AND CULVERT NODE
ER1	EXISTING REACH
EPOi3	POINT OF INTEREST

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
32	BOXFORD SILT LOAM	C
33	SCITICO SILT LOAM	C
42	CANTON SANDY LOAM	B
313	DEERFIELD LOAMY SAND	B
444	NEWFIELDS SANDY LOAM	B
510	HOOSIC GRAVELLY LOAMY SAND	A
546	WALPOLE SANDY LOAM	C

SUFFIX
B slope = 0–8%
C slope = 8–15%
D slope = 15–25%

SOIL LEGEND (PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
33A	SCITICO SILT LOAM, 0% – 5% SLOPES	C/D
38A	ELDRIDGE FINE SANDY LOAM, 0% – 3% SLOPES	C/D
134	MAYBID SILT LOAM	C/D
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, ROCKY 8 TO 15 PERCENT SLOPES	B
313A	DEERFIELD LOAMY FINE SAND, 0% – 3% SLOPES	A
460C	PENNICHUCK CHANNERY VERY FINE SAND LOAM, 8% – 15% SLOPES	C
495	NATCHAUG MUCKY PEAT, 0% – 2% SLOPES	B/D
510B	HOOSIC GRAVELLY FINE SANDY LOAM, 3% – 8% SLOPES	A
510C	HOOSIC GRAVELLY FINE SANDY LOAM, 8% – 15% SLOPES	A
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5% SLOPES	C/D

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 6

HYDROLOGIC SOIL GROUPS

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

1"=2X' (11"X17")
SCALE: 1"=1X' (22"X34")

APRIL 19, 2021

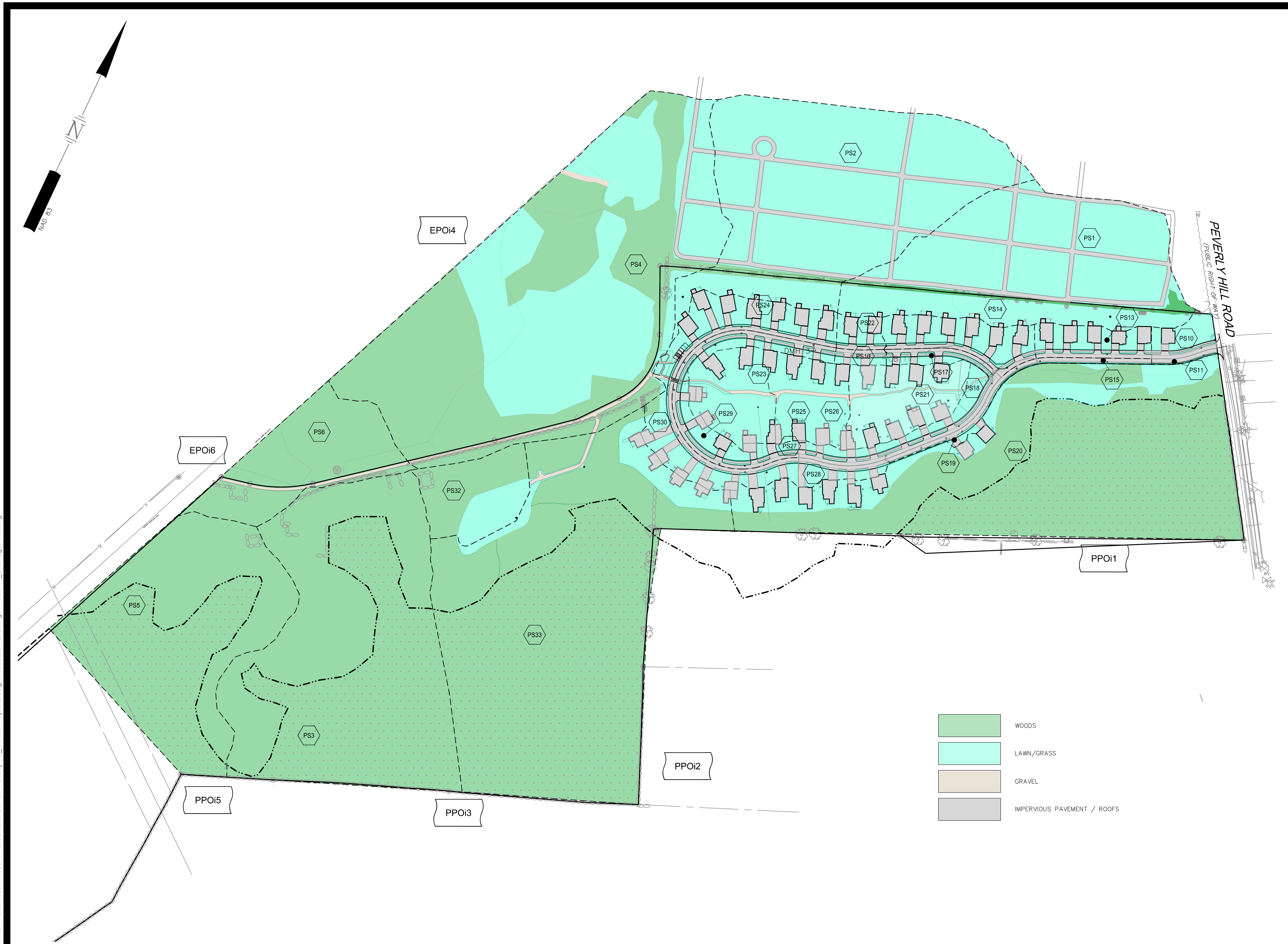
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

REV.	DATE	DESCRIPTION	DR	CK

FILE	47388	DR	JSM	FB	–	D-5
		CK	JJM	CADFILE		

Aug 25, 2021 - 1:09am
F:\MSC Projects\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_DrainagePre.dwg



LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
PS4	PROPOSED SUBCATCHMENT NODE
PR1	PROPOSED REACH
PC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 6

POST-DEVELOPEMENT GROUND COVER

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

SCALE: **APRIL 19, 2021**

REV.	DATE	DESCRIPTION	DR	CK

TFM

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

47388	DR JSM	FB	-	D-6
	CK JJM	CADFILE		

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Aug 23, 2021 - 9:55pm
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Production Drawings\47388-11_DrainagePost.dwg

APPENDIX L – OPERATION AND MAINTENANCE MANUAL

(This Page Is Intentionally Blank)

Project #47388.11

STORMWATER MANAGEMENT SYSTEM OPERATION & MAINENANCE MANUAL

F O R

The Peverly Hill Road Condominiums

86 Peverly Hill Road
Portsmouth, New Hampshire
Rockingham County

Tax Map 242, Lot 4

Month August 25, 2021

Prepared By:

TFM® Since 1968
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

(This Page Is Intentionally Blank)

Table of Contents

(This Page Is Intentionally Blank)

Maintenance of Property

TFMoran, Inc., has prepared the following Stormwater Management System Operation & Maintenance Plan for Parson Woods Condominium, LCC at 83 Peverly Hill Road, Portsmouth, New Hampshire. The intent of this plan is to provide the owner, and future property managers/owners of the site with a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this development. This includes all temporary and permanent stormwater and erosion control measure during and post construction.

Plans

Refer to the Site Development Plans prepared by MSC a divisions TFMoran, Inc. for Tax Map 242 Lot 4, Parson Woods Condominium, LLC, 83 Peverly Hill Road, Portsmouth, New Hampshire, dated April 19, 2021 and last revised on August 25, 2021. See Appendix A for the "Stormwater Operation and Maintenance Plan" identifying locations of stormwater practices described hereon.

Owner Responsibility

The owner shall be responsible for the following inspection and maintenance program which is necessary in order to keep the Stormwater Management System functioning properly. These measures will help greatly to reduce potential environmental impacts. By following the enclosed procedures, Parson Woods Condominium, LLC and its successors will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site-generated stormwater runoff.

The owner and future owners are the responsible party for the following record keeping activities further identified in this Operation & Maintenance Manual:

- Conduct reporting, inspection, and maintenance activities in accordance with the "Inspection and Maintenance Checklist Requirements" and if applicable "Regular Inspection and Maintenance Guidance" provided by University of New Hampshire Stormwater Center (UNHSC);
- Document each inspection and maintenance activity with the "Inspection and Maintenance Log" and if applicable "Checklist for Inspection" provided by University of New Hampshire Stormwater Center (UNHSC);
- Photograph each practice that is subject to the "Inspection and Maintenance Checklist Requirements" at each inspection of that stormwater practice;
- Document actions taken if invasive species begin to grow in the stormwater management system; and
- Document each application of deicing material applied to the site with the "Deicing Log"

All record keeping required by the Operation & Maintenance Manual shall be maintained by the responsible party and be made available to the applicable regulatory agencies (i.e. NHDES AoT Bureau, City of Portsmouth, etc.) upon request. Logs and reports required by this Operation & Maintenance Manual should be prepared by a qualified inspector with working knowledge of the site. This manual and associated records shall be transferred to any future owners. All current and future owners must comply with RSA 485-A:17, Env-Wq 1500, the permit, and all conditions contained in the permit.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. These measures will greatly help to reduce potential environmental impacts. By following the enclosed procedures, Parson Woods Condominium, LLC and its successors will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site-generated stormwater runoff.

General Inspection and Maintenance Requirements

Temporary stormwater, sediment and erosion control measures that require maintenance on the site during construction include, but are not limited, to the following:

- Stabilized construction entrance;
- Silt sock barriers;
- Inlet protection; and
- Construction dumpster area, if used.

Permanent stormwater, sediment and erosion control measures that require maintenance on the site include, but are not limited, to the following:

- Litter/trash removal;
- Dumpster area maintenance;
- Pavement sweeping;
- Surface maintenance related to deicing/plowing;
- Rip-rap protection;
- Gravel wetlands;
- Bioretention systems;
- Infiltration basins;
- Forebays;
- Outlet control structures;
- Emergency spillway;
- Stone berm level spreader;
- Catch basins, drop inlets, and/or drain manholes;
- Drip line stone trench; and
- Culvert pipes.

Inspection and Maintenance Checklist Requirements

By implementing the following procedures, current owners will be able to maintain the functional design of the Stormwater Management System and maximize the systems ability to remove sediment and other contaminants from site-generated stormwater runoff. The owner shall conduct inspection and maintenance activities in accordance with the following checklist:

	Frequency	***Inspect***	***Action***
Temporary Controls			
Stabilized Construction Entrance	Weekly	• Inspect adjacent roadway for sediment tracking • Inspect stone for sediment accumulation	• Sweep adjacent roadways as soon as sediment is tracked • Top dress with additional stone when necessary to prevent tracking
Litter/Trash Removal	Routinely	• Inspect site especially construction areas	• Remove debris and clean areas as necessary
Construction Dumpster Area Maintenance (if used)	Routinely	• Dumpster Areas	• Remove any accumulated debris and dispose of properly
Silt Sock Barrier	Weekly	• Inspect accumulated sediment level, rips and tears	• Repair or replace damaged lengths • Remove and dispose accumulated sediment once level reaches 1/3 of barrier
Gravel	Spring and Fall	• Inspect gravel for ruts and depth	• Replace gravel as necessary, regrade as necessary to maintain design grades, remove any accumulated gravel washed from roadway

	Frequency	***Inspect***	***Action***
Permanent Controls			
Rip Rap Outlet Protection	Spring and Fall and after rainstorms exceeding 2.5 inches in 24 hrs	• Inspect for damage or displaced stones • Inspect for torn or visible fabric	• Repair and replace stone and / or fabric immediately • Remove accumulated sediment, trash and blocking materials

	Frequency	*Inspect*	*Action*
Permanent Controls			
Infiltration Basin	Spring and Fall and after rainstorms exceeding 2.5 inches in 24 hrs	• Inspect level of accumulated sediment • Inspect for debris • Inspect outlet structures • Inspect vegetative cover • Inspect embankments and spillways • Inspect infiltration function within 72-hrs following a rainfall event	• Remove accumulated sediment • Remove debris from inlet and outlets • Repair as necessary • Mow embankments and removed woody vegetation • Repair embankments and spillways as necessary • Restore infiltration by removing accumulated sediments and reconstruction of the infiltration basin if deemed necessary
Landscape (not including Bioretention Systems)	Spring	• Mulch: Inspect mulch areas for trash and debris and thickness of mulch	• Remove weeds and debris. Top dress with new mulch when necessary
	Spring	• Trees and Shrubs: Inspect for broken, weak or diseased branches and debris	• Prune to maintain shape to avoid splitting, remove broken, weak or diseased branches, replace as necessary
	As necessary	• Lawn	• Mow as required
	Spring and Fall	• Inspect landscaped areas for debris and litter	• Remove debris and litter as necessary
Bioretention System	1st few months when rainfall exceeds 2.5" in a 24 hr period	• Inspect drawdown time: required to drawdown in 72 hrs or the standing water covers more than 15% of the surface after 48 hrs	• Remove the top few inches of discolored material and rake or till the remaining material as needed

	Frequency	*Inspect*	*Action*
Permanent Controls			
	4 times for 1st yr, then Spring and Fall	• Inspect for animal burrows and short circuits in the system • Inspect inlet and outlet for debris and leaves • Inspect the filter bed • Inspect vegetation for distress during extended periods without rain	• Repair soil erosion from and fill holes and lightly compact • Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface • Remove sediment as necessary. If more than 2” of filter material is removed, replace with the design filter media specified • Water as necessary
	Spring and Fall	• Inspect Drawdown time: required to drawdown in 72 hrs or the standing water covers more than 15% of the surface after 48 hrs	• Remove the top few inches of discolored material and rake or till the remaining material as needed
	Annually	• Inspect inlet and outlet for erosion • Inspect vegetative cover	• Repair or replace as necessary • Reinforcement plantings should be performed if 50% cover is not established in 2 yrs.
	Additionally, refer to the most currently available documents from UNHSC (attached for reference): “Regular Inspection Maintenance Guidance” and “Checklist for Inspection”. If there are discrepancies between the UNHSC documents and this Manual’s checklist requirements, the stricter requirements shall override.		
Conventional Pavement	Spring and Fall	• Inspect pavement for debris	• Sweeping as required

	Frequency	*Inspect*	*Action*
Permanent Controls			
Gravel Wetland	4 times per year for the 1st year	• Inspect for animal burrows and short circuits • Inspect for depth of sediment in the sedimentation chamber is <12" or 10% of the pretreatment volume • Inspect draw down time	• Repair soil erosion, fill holes and lightly compact • Remove material with rakes to avoid compaction • When drawdown >36 hrs – remove material with rakes to avoid compaction of the gravel wetland surface
	Spring and Fall following the 1st year	• Inspect for animal burrows and short circuits • Inspect for depth of sediment in the sedimentation chamber is <12" or 10% of the pretreatment volume • Inspect draw down time	
	Annually	• Inspection outlet control devices and high-flow bypass for erosion • Inspect vegetation cover	• Repair and Replace as necessary • If 50% cover is not established in two years, reinforcement planting should be performed
	Every 3 years	• Inspection growth of vegetation	• Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance

	Frequency	*Inspect*	*Action*
Permanent Controls			
	Additionally, refer to the most currently available documents from UNHSC (attached for reference): "Regular Inspection Maintenance Guidance" and "Checklist for Inspection". If there are discrepancies between the UNHSC documents and this Manual's checklist requirements, the stricter requirements shall override.		
Forebay	Annually	• Inspect for debris and accumulated sediment • Inspect for damage or displaced stones	• Remove debris and accumulated sediment as necessary • Repair and replace stones as needed
Drainage (Catch Basins / Drop Inlets)	Spring and Fall	• Inspect for sediment • Inspect for hydrocarbons • Inspect Hoods	• If sump is more than half full of sediment, remove sediment as necessary • Remove and dispose of properly • Repair and replace as necessary
Drip Line Stone Trench	Spring and Fall	• Inspect for debris and vegetation	• Clean and remove debris and vegetation as necessary
Drain Manholes and Yard Drains	Spring and Fall	• Inspect for accumulated sediment and debris	• Clean any material upon inspection and deposit of properly
Inlet Protection (temporary during construction)	During construction and after measurable rainfall	• Inspect for accumulated sediment	• Empty sediment bag if more than ½ filled with sediment or debris. Replace bag if torn or punctured to ½" diameter or greater on the lower half of the bag
Culvert Pipe	Spring and Fall	• Inspect for obstructions	• Remove and dispose of debris properly, Remove upstream debris to prevent future clogging • Repair/replace if pipe becomes crushed or deteriorated

	Frequency	*Inspect*	*Action*
Permanent Controls			
Stone Berm Level Spreader	Annually	• Inspect for sediment accumulation, debris or signs of erosion	• Remove debris • Remove sediment when accumulation exceeds 25% of spreader channel depth • Mow annually at a min. • Repair erosion and regrade or replace stone berm material
Emergency Spillway	Spring and Fall	• Inspect for erosion, sediment accumulation, stone loss, and presence of invasive species	• Remove debris and accumulated sediment (sediment accumulation should not exceed 3") • Repair eroded areas • Remove invasive species and vegetation • Replace stone as necessary
Outlet Control Structure	Annually	• Inspection for debris or sediment buildup • Inspect structure	• Remove sediment and debris as necessary • Remove debris covering orifice or v-notch • Repair as necessary

Inspection and Maintenance Records

A detailed, written record of all logs, reports, photographs required by this Operation & Maintenance Manual must be kept by the owner.

The attached forms are provided to assist the property manager with the inspection and maintenance of the Stormwater Management System. The "Inspection and Maintenance Log" (Attachment 1) and "Deicing Log" (Attachment 2) on the following pages are a blank copies to aid in record keeping required by this Operation & Maintenance Manual.

Supplement the "Inspection and Maintenance Log" with the most currently available "Checklist for Inspections" from UNHSC (attached to this Manual for reference). Each inspection or maintenance activity shall include photographs of each practice that is subject to the "Inspection and Maintenance Checklist Requirements" at each inspection of that stormwater practice. Log actions taken if invasive species begin to grow in the stormwater management system as required per the attached "Control of Invasive Plants".

For all surface maintenance related activities related to deicing/plowing, complete the "Deicing Log" to track the amount and type of deicing materials applied to the site. Snow shall be stored in designated snow storage areas which have been designed to drain on-site and receive treatment via the stormwater management system prior to infiltration or discharge. At the request of Portsmouth Conservation Commission, the subject property is subject to chloride impairment; maintenance related to snow and ice shall adhere to the Chloride Management Plan (attached to this Manual for reference).

Owner’s Certification

Contact Information

Owner:	Parson Woods Condominium, LLC
Contact Person	Rick Green 11 Lafayette Road North Hampton, NH 03868 (603) 964-7572 grousewing1@gmail.com

I have reviewed this document and understand the responsibilities contained. I agree to perform the required maintenance on the stormwater management system.

Owner’s Signature (future owner’s and successors, if applicable)

Print Name

Title

Date

Any inquiries in regards to the design, function, and/or maintenance of any one of the above mentioned facilities or tasks shall be directed to the project engineer:

MSC a division of TFMoran, Inc.
170 Commerce Way, Suite 102
Portsmouth, NH 03801
(603) 431-2222

ATTACHMENT 1

Inspection and Maintenance Log

Attachment 1

Inspection and Maintenance Log

BMP/System Component	Date Inspected	Inspector	Cleaning/Repair Needed (list items/comments)	Date of Cleaning/Repair	Performed By

<u>ATTACHMENT 2</u>

Deicing Log

Attachment 2

Deicing Log

Deicing Material Used	Amount of Deicing Material Applied	Date of Application	Logged By

APPENDIX A

Stormwater Operation & Maintenance Plan

SITE DEVELOPMENT PLANS

TAX MAP 242 LOT 4

STORMWATER OPERATION & MAINTENANCE PLAN

PARSON WOODS CONDOMINIUM LLC

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") APRIL 19, 2021

REV.	DATE	DESCRIPTION	DR	CK
6	8/25/2021	REVISE PER TAC COMMENTS.	JSM	JJM
5	8/11/2021	REVISE PER TAC COMMENTS.	JSM	JJM
4	7/21/2021	REVISE PER TAC COMMENTS.	JSM	JCC
3	7/2/2021	REVISED SEWER LOCATION.	JSM	JCC
2	6/23/2021	REVISED FOR PLANNING BOARD SUBMITTAL.	JSM	JJM
1	6/21/2021	REVISED PER TAC COMMENTS.	JSM	JJM

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	DR	JSM	FB	–	
47388.11	CK	JJM	CADFILE	47388-11_O&M PLAN	O&M-1

Aug 25, 2021 - 12:22pm
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Exhibits\47388-11_O&M Plan.dwg

APPENDIX B

UNHSC Regular Inspection and Maintenance Guidelines
for Bioretention Systems

Regular Inspection and Maintenance Guidance for Bioretention Systems / Tree Filters

Maintenance of bioretention systems and tree filters can typically be performed as part of standard landscaping. Regular inspection and maintenance is critical to the effective operation of bioretention systems and tree filters to insure they remain clear of leaves and debris and free draining. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less frequent maintenance needs depending on a variety of factors including but not limited to: the occurrence of large storm events, overly wet or dry periods, regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of sediment and organic debris from the system and bypass structures. Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system, including infiltration rate and nutrient uptake. Vegetation care is important to system productivity and health.

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
A record should be kept of the time to drain for the system completely after a storm event. The system should drain completely within 72 hours.	After every major storm in the first few months, then annually at minimum.
Check to insure the filter surface remains well draining after storm events. **Remedy**: If filter bed is clogged, draining poorly, or standing water covers more than 50% of the surface 48 hours after a precipitation event, then remove top few inches of discolored material. Till, or rake remaining material as needed.	
Check inlets and outlets for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet and overflow if obstructed.	Quarterly initially, annually as a minimum thereafter.
Check for animal burrows and short-circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets, outlets, sidewalls.	
VEGETATION	
Check for robust vegetation coverage throughout the system and dead or dying plants. **Remedy:** Vegetation should cover > 75% of the system and should be cared for as needed.	Annually or as needed

APPENDIX C

UNHSC Regular Inspection and Maintenance Guidelines
for Subsurface Gravel Wetlands

Regular Inspection and Maintenance Guidance for
The Subsurface Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Subsurface Gravel Wetland (SGW) systems. It is the responsibility of the owner to maintain the SGW in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including but not limited to: the occurrence of large storm events, overly wet or dry periods, regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of sediment and organic debris from the system and bypass structures. Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system. A SGW system is a subsurface horizontal filtration system and does not rely on surface soil infiltration capacity for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of a hydraulic inlet. It is important to ensure these inlets are performing properly.

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets. Clear or remove debris or restrictions.	Annually, more frequently in the first year of operation
Check for internal erosion, evidence of short circuiting, and animal burrows. **Remedy:** Soil erosion from short-circuiting or animal boroughs should be repaired when they occur.	
Check that the system is fully draining within a 24 - 48 hour period after rain events **Remedy:** Repair or restore hydraulic inlet or outlet function.	
VEGETATION	
Check for robust vegetation coverage throughout the system and dead or dying plants. **Remedy:** Vegetation should cover > 75% of the system and should be reseeded and cared for as needed.	Annually or as needed
Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

APPENDIX D

UNHSC Checklist for Inspection of Bioretention System

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location:
Inspector:
Date:
Time:
Site Conditions:
Days Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1. Initial Inspection After Planting		
Plants are stable, roots not exposed	S U	
Surface is at design level, no evidence of preferential flow/shoving	S U	
Inlet and outlet/bypass are functional	S U	
2. Debris Cleanup (1 time/year minimum, Spring/Fall)		
Litter, leaves, and dead vegetation removed from the system	S U	
Prune/mow vegetation	S U	
3. Standing Water (1 time/year and/or after large storm events)		
No evidence of standing water after 24-48 hours since rainfall	S U	
4. Vegetation Condition and Coverage		
Vegetation condition good with good coverage (typically > 75%)	S U	
5. Other Issues		
Note any additional issues not previously covered.	S U	
Corrective Action Needed		**Due Date**
1.		
2.		
3.		
Inspector Signature		**Date**

Last Revised 02/2017

APPENDIX E

UNHSC Checklist for Inspection of Subsurface Gravel Wetlands

CHECKLIST FOR INSPECTION OF SUBSURFACE GRAVEL WETLAND SYSTEMS

Location:
Inspector:
Date:
Time:
Site Conditions:
Days Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1. Initial Inspection After Planting		
Plants are stable, roots not exposed	S U	
Surface is at design level, no evidence of preferential flow/shoving	S U	
Inlet and outlet/bypass are functional	S U	
2. Operation (1 time/year minimum, Spring/Fall)		
Flow is unobstructed in openings (grates, orifices, etc)	S U	
Structures are operational with no evidence of deterioration	S U	
3. Standing Water (1 time/year minimum)		
No evidence of standing water after 24-48 hours since rainfall	S U	
4. Vegetation Condition and Coverage		
Vegetation condition good with good coverage (typically > 75%)	S U	
5. Vegetation removal (once every 3 years)		
Prune dead, diseased, or decaying plants	S U	
6. Other Issues		
Note any additional issues not previously covered.	S U	

Corrective Action Needed	Due Date
1.	
2.	
3.	
Inspector Signature	**Date**

Last Revised 02/2017

APPENDIX F

Control of Invasive Plants

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

<u>Background:</u>

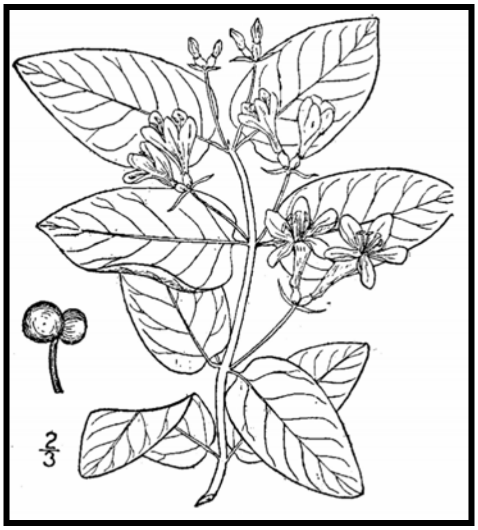
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

University of New Hampshire
Cooperative Extension

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions.* Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

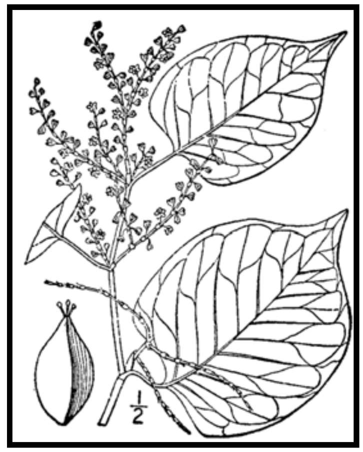
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions.* Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple *(Acer platanoides)* European barberry *(Berberis vulgaris)* Japanese barberry *(Berberis thunbergii)* autumn olive *(Elaeagnus umbellata)* burning bush *(Euonymus alatus)* Morrow's honeysuckle *(Lonicera morrowii)* Tatarian honeysuckle *(Lonicera tatarica)* showy bush honeysuckle *(Lonicera x bella)* common buckthorn *(Rhamnus cathartica)* glossy buckthorn *(Frangula alnus)*	**Fruit and Seeds**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet *(Celastrus orbiculatus)* multiflora rose *(Rosa multiflora)*	**Fruits, Seeds, Plant Fragments**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds**	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

APPENDIX G

Chloride Management Plan

August 25, 2021

August 25, 2021

Juliet Walker, Planning Director
Portsmouth Planning Board
1 Junkins Avenue
Portsmouth, NH 03801

Re: Open Space Planned Unit Development, 83 Peverly Hill Road - Section 7 of the Site Plan Regulations
TFMoran Project: 47388.11

Dear Juliet:

This letter concerns over Section 7 of the Portsmouth Site Plan Review Regulations dealing with Stormwater Management. Below are the areas listed in the regulations and how the project conforms to those.

Section 7.10 – Low Impact Development (LIP)

- This project uses a combination of two bioretention areas with internal storage reservoirs, a subsurface gravel wetland and an infiltration basin as best management practices (BMP's) to treat and attenuate post development flows. These BMP's help maintain pre-development hydrology. The roadway was narrowed to 26' from the beginning of the roadway to the first intersection. It was narrowed down to 22' for the loop area of the roadway. This helped decrease the amount of new impervious area being constructed on this site. In addition to this, the project uses the City's PUD ordinance to limit the impact on the lot, further decreasing the footprint and leaving the majority of the lot undisturbed.

Section 7.2 – General Water Quality and Stormwater Manage Provisions

- This stormwater system was set to treat the Water Quality Volume (WQV) for the impervious area that is on this site.
- The project was designed to limit the impact to the abutting wetland. Special effort was made, including the installation of retaining walls along the roadway, to limit impact. There is no impact to wetlands or wetland buffers from this project. Handling of Hazardous Material is included in the Erosion Control Notes. City, state and federal regulations concerning stormwater management have been incorporated into this project and there will be no adverse impacts on abutting properties.
- There are no 20,0000 gallon per day on-site water systems proposed or existing. The BMP's used on this project, bioretention areas with internal storage reservoirs and the subsurface gravel wetlands, have some of the highest nitrogen removal efficiencies according the NH Stormwater Manual, Appendix F.
- This project does not propose conveying stormwater into the City's infrastructure.

Section 7.3 Wellhead Protection Areas

- The site is located in a wellhead protection zone. Only one infiltration practice is proposed, this treats a large are of lawn and some roof run-off. No roadway runoff is directed to this BMP.

Section 7.4 Stormwater Management and Erosion Control Plan (SMECP)

- A Stormwater Management and Erosion Control Plan was submitted with the plans. The drainage analysis, Existing Conditions, Erosion Control Plans, Erosion Control Notes and the Grading and Drainage Plans include the items listed in section 7.4. Note, though no impairments showed on the NHDES One Stop Data Mapper, Sagamore Creek is near the project. It has a 5-P rating, which included nitrogen impairments. Three of the four BMP's used have the highest nitrogen removal efficiencies.

Section 7.6.1 - Post-Construction Stormwater Management Standards

- A Stormwater Management and Erosion Control Plan was included with the submittal to the Planning Board.

Section 7.6.2 - Enhanced Stormwater Treatment Standards for New and Redevelopment Disturbing More than 15,000 square feet of Area

- Not applicable to this submission.

Section 7.6.3 - Additional Pollutant Tracking and Accounting Program (PTAP) Submittal Requirements

- This is to be submitted subsequent to the Planning Board Approval.

Section 7.6.4 Responsibility for Installation and Construction

- The responsibility is noted and the developer plans to meet the requirements as set forth. The developers name and contact information is listed on the Cover Sheet and in the operation and maintenance manual.

Section 7.6.5 Inspection and Maintenance Plans

- An Inspection and Maintenance Plan or Operation and Maintenance Plan is included in the drainage report. This includes the Owner's / Operator's responsibilities and steps required in the annual maintenance. A Developers agreement shall be agreed upon between the Developer and the City prior to the commencement of work on the property.

This project meets the requirements as set out in Section 7 of the Site Plan Review Regulations and will pose no adverse impact to the abutting properties and wetlands.

Sincerely,
TFMoran, Inc.

Jack McTigue, PE, CPESC
Project Manager

cc: Rick Green, Michael Green and Jenna Green

Job #47388.11

NHDES

Application for Sewer Connection Permit

FOR

Peverly Hill Road Development

Peverly Road
Portsmouth, New Hampshire
Rockingham County

Tax Map 242, Lot 04

April 19, 2021

Last Revised August 25, 2021

Prepared By:

TFM
Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

(This Page is Intentionally Blank)

TFM
Since 1968
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

NEW HAMPSHIRE 200

August 25, 2021

TFM Project No: 47388.11

Dennis Greene, PE
NHDES WWEB
PO Box 95
Concord, NH 03302-0095

Re: Sewer Connection Permit – Peverly Hill Road Portsmouth, NH – Tax Map 242 Lot 4
Peverly Hill Road Development
TFM PIN: 47388.11

Dear Mr. Greene:

On behalf of Green and Company Building and Development Corp., we respectfully submit an Application for Sewer Connection Permit relative to the above referenced project. The following materials are included in this submission:

- Application for Sewer Connection Permit;
- Check for the amount of $2,760.00 for the Sewer Connection Permit;
- Table 1008-1, Unit Design Flow from Pages 47-49 from the NH Code of Administrative Rules, ENV-Wq 1000;
- Calculated Design Sewer Flow
- Full Flow and Approximate Partial Flow Calculations for gravity sewer, Dated April 19, 2021;
- Environmental One Corporation Pressure Sewer Design Analysis for Peverly Hill Road Development;
- Cover Sheet, Existing Conditions, Utility Plans, Sewer Profile and Details of the Site Plan Set titled, “Peverly Hill Road Condominiums; Peverly Hill Road; Tax Map 242, Lot 4; 83 Peverly Hill Road; Portsmouth, New Hampshire; County of Rockingham; Prepared for Green and Company Real Estate. dated April 19, 2021” prepared by TFMoran, Inc.”

This project consists of 56 single unit homes. The homes are serviced by a combination of low-pressure sewers and gravity sewers. 20 of the low-pressure systems discharges into Sewer Manhole 15, after which the flow

TFMoran, Inc.
48 Constitution Drive, Bedford, NH 03110
T(603) 472-4488 www.tfmoran.com

BEST OF BUSINESS 2020 BOB AWARDS

TFMoran, Inc. Seacoast Division
170 Commerce Way–Suite 102, Portsmouth, NH 03801
T(603) 431-2222

becomes gravity. 3 of the low-pressure systems discharges into Sewer Manhole 5, subsequently the flow becomes gravity. The remaining 33 residences are gravity flow.

The proposed project consists of 800 linear feet 2” low-pressure SDR 11 line, 270 linear feet of 1-1/2” low-pressure SDR11 line, 1,789 linear feet of 8” SDR 35 gravity sewer main, 15 proposed sewer manholes and 2 cleanouts for the low-pressure lines.

The City of Portsmouth concurrently reviewing this application. Any revisions based on their comments will be circled on the plans and forwarded to you.

On behalf of our client, we respectfully request review of the application package for approval.

Sincerely,
MSC a division of TFMoran, Inc.

Jack McTigue, PE, CPESC
Project Manager

cc: Rick Green (Green and Company), Michael Green (Green and Company), Jenna Green (Green and Company), and Juliet Walker (City of Portsmouth)

NHDES-W-09-008

APPLICATION FOR SEWER CONNECTION PERMIT

Water Division/Wastewater

Engineering Bureau Design Review Section

RSA/Rule: RSA 485-A:37 / Env-Wq 703.07

TYPE OR PRINT CLEARLY

Use this application for Sewer Connection Permit to request NHDES review/approval for any proposed sewerage design. Under RSAs 485 and 485-A, design plans for new sewerage facilities – whether publicly or privately owned, and regardless of design flow – must be submitted to NHDES for review/approval action at least 30 days prior to construction. Pursuant to Env-Wq 703, design submittals must include 1 set of engineering plans/specifications, pertinent design calculations, the required fee, and a Municipal Certification (signed by an authorized municipal official, see page 2).

1. Engineer of Record - Contact Information		
Engineer / Contact: Jack McTigue, PE	*Company: TFMoran, Inc.*	
Mailing Address: 170 Commerce Way		
Town/City: Portsmouth	*State:* NH	*ZIP:* 03801
Phone Number: (603) 431-2222	*Email: jmctigue@TFMoran.com*	

2. Description of Proposed Work (check all that apply)	
☐	An extension of a collector or interceptor;
☐	A sewage pumping station greater than 50 gpm or serving more than one building;
☒	A proposed sewer that serves more than one building or that requires a manhole at the connection.
Project Name or Description: 56 3-bedroom single family unit resdiential condominium	
Project Location - Street Address: 83 Peverly Hill Road	
Project Location - Town / City: Portsmouth, NH	
Name Of Receiving WWTF: Sewer Division of the Portsmouth NH Department of Public Works	
Average Design Flow (ADF, gal/day): 25,200 GPD	

Proposed Sewer Length (Linear ft)	Pipe Diameter (inches)	Pipe Material
256	1-1/2" Pressure Sewer Services	HDPE SDR-11
856	2" Pressure Sewer Main	HDPE SDR-11
1,750	8" Gravity Sewer	SDR-35

3. Required Fee	
☒	Sewer connection design submittals must be accompanied by a review fee payment based on the project's average design flow - $0.10 per gal/day ("a dime a gallon") for design flows up to 10,000 gal/day, plus $0.05 per gal/day for any flows in excess thereof.
☐	A fee of $200 per plan sheet shall be paid for review of modifications to privately owned pump stations, force mains, interceptors, and wastewater treatment facilities which are not associated with an increase in wastewater flow.
☐	Fees are not required of municipalities for municipal projects.
Fee Enclosed: $2760.00	Please make checks payable to "Treasurer State of NH".

Italics indicate items are optional.

4. Municipal Certification	
On behalf of Parson Woods Condominium LLC,the Town or City of Portsmouth hereby provides the following municipal certification.	
The municipal sewage collection system and wastewater treatment facilities have been demonstrated, pursuant to Env-Wq 703.07(d), to have adequate processing capability for the proposed added hydraulic flow and organic flow at the time of connection. The proposed sewer connection and/or sewerage design meet with the approval of the local jurisdictional authority.	
Name Of Municipal Official (Project Location):	Title:
Signature:	Date:
Email Address:	
When the Receiving WWTF is in a different Municipality from that of the Project Location, the following additional certification is required.	
Name Of WWTF Official (Host Community):	Title:
Signature:	Date:
Email Address:	

Submit completed application package to:

NHDES Wastewater Engineering Bureau
Design Review Section
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095

NOTE: A Separate INDUSTRIAL WASTEWATER INDIRECT DISCHARGE REQUEST (IDR) May be Required For Industrial Waste Contributions, Depending On Quantity And Quality. For Further Information, Contact The Industrial Pretreatment Supervisor Of The Wastewater Engineering Bureau At (603)-271-2052.

Italics indicate items are optional.

Project	**Peverly Hill Rd Condominiums**	Date:	4/9/2021
Location	**Peverly Hill Rd**		
	Portsmouth, NH		

Unit Sewer Flows

Total Number of Units		56	
	Based on	100%	3 Bedroom Units

3 Bedroom Houses	
Residences Single Family - 2 Bedroom	300
Additional Flow for 1 Additional Bedroom	150
Gallons Perd Day per 3 Bedroom Unit	450
4 Bedroom Houses	
Residences Single Family - 2 Bedroom	300
Additional Flow for 2 Additional Bedroom	300
Gallons Perd Day per 4 Bedroom Unit	600

Design Sewer Flows

	Number of Units	GPD/ Unit	GPD
Number of 3 Bedroom	56	450	25,200
Number of 4 Bedroom	-	600	-
Total Design Flow	56		25,200

State Fee

Cost per GPD	$ 0.10	10,000	$ 1,000.00
In Excess of 10,000 GPD	$ 0.05	15,200	$ 760.00
Pump Station	$200.00	5	$ 1,000.00
Total Cost			$ 2,760.00

(THIS PAGE IS INTENTIONALLY BLANK)

(2) Metered water readings for uses that are as similar as possible to the proposed use, taking into consideration factors such as occupancy and frequency of use, determined as specified in (d), below.

(d) Design flows based on metered water readings shall be calculated:

(1) By finding the average of water meter readings over a period of time that is representative of the volume of water used and multiplying the average by a minimum peaking factor of 2 for commercial light flow or a maximum peaking factor of 3 for commercial heavy flow; or

(2) By measuring not less than 6 months of consecutive daily meter readings, including the month(s) of heaviest use for uses that are seasonal in nature, and using the highest daily flow without application of a peaking factor;

(e) The unit design flow figures referenced in (b) and (c), above, shall be as listed in Table 1008-1, below, subject to (f), below:

Table 1008-1: Unit Design Flow Figures

Use	Unit Design Flow
AIRPORTS	5 GPD/Transient plus 10 GPD/Employee
APARTMENTS	See Dwellings
BARS, LOUNGES	See Food Service
BED & BREAKFAST	60 GPD/Guest, based on the greater of 2 guests per room or the actual number of guests the room is designed to accommodate, plus 10 GPD/Employee
BUNKHOUSE	60 GPD/Person
CAMPS:	
Campground with Central Comfort Station	45 GPD/site, plus 20 GPD/Site for the dump station
Recreational Campgrounds with 3-way hookups	60 GPD/Site
Construction Camps	50 GPD/Person
Day Camps (not including meals)	15 GPD/Person
Dining Facility	3 GPD/Person/meal
Residential Youth Recreation Camps	25 GPD/Person plus 3 GPD/Person/meal
CATERERS – Function Rooms	12 GPD/patron
CHURCHES:	
Sanctuary Seating	3 GPD/Seat
Church Suppers	12 GPD/Seat
COUNTRY CLUBS – PRIVATE	
Dining Room	10 GPD/Seat
Snack Bar	10 GPD/Seat
Locker & Showers	20 GPD/Locker
DAY CARE CENTERS	10 GPD/Person
DENTISTS	10 GPD/Chair plus 35 GPD/Staff Member
DOCTOR'S OFFICES	250 GPD/Doctor
DOG KENNELS	50 GPD/Kennel, with one dog per kennel
DWELLINGS:	
Apartment - Studio or One-Bedroom	225 GPD
Apartment - 2 or More Bedrooms	150 GPD/Bedroom
Residence - Single-Family	300 GPD plus 150 GPD for each bedroom over 2
Residence - Duplex	300 GPD plus 150 GPD for each bedroom over 2 for each unit
Rooming House – With Meals	60 GPD/Person
Rooming House – Without Meals	40 GPD/Person
Senior Housing	See Senior Housing

(THIS PAGE IS INTENTIONALLY BLANK)

Sewer Flow Calculations
Peverly Hill Road Condominiums
PIN # 47388.11

8/11/2021

Areas to be filled in are highlighted in yellow

P_f	6	Peak Factor	
I/I	300	gpd/in/mile	5.28E-07 cfs
n_f	0.010	Manning	
k	1.485	Converstion Factor	

Q_{full} Full Pipe Flow
Q_{cal} Calculated Flow - Based on Flow Height
Q_{needed} Required Flow ($Q_{per\text{-}use}$+Q_{inf})
Q_{inf} Flow needed for infiltration
$Q_{per\text{-}use}$ Flow Needed Per Use
ΔQ Difference between Q_{needed} and Q_{cal}

V_{cal1} Velocity from the approximate flow depth
V_{cal2} Velocity based on the iterative flow depth
K_h Constant used to calculate the approximate flow depth
Based on an approximation method presented by Esen (1993)
y Depth of flow
∅ Angle of partial flow based on flow depth
A Area of partial flow
P Wetted Perimeter
R_h Hydraulic Radius

		Flow (cfs)	Flow with Peaking Factor
Residence (4-Bedroom)	600 gpd	0.0009 cfs	0.0056 cfs

TABLE 1 - FULL FLOW AND APPROXIMATE PARTIAL FLOW CALCULATIONS

From	To	Length	Inverts		Slope	Dia		Full Flow V_{full}	Full Flow Q_{full}	K_h	∅ full	∅	y/Y	y	A	Units	Partial Flow Q (cfs)			Partial Flow V_{cal1}	Notes
		(ft)	Out	In	(ft/ft)	(in)	(ft)	fps	cfs		rad.	rad.		ft	sf	#	$Q_{per\text{-}use}$	Q_{inf}	Q_{needed}	fps	
Pressure Sewer #1															0.02	22.00	0.123	0.0000	0.123	NA	Units 22-32, 45-55
PSMH-14	PSMH-13	83	43.50	43.05	0.005	8	0.67	3.31	1.16	0.033	1.99	1.99	0.23	0.15	0.06	0.00	0.000	0.0004	0.123	2.07	
PSMH-13	PSMH-12	83	42.95	42.50	0.005	8	0.67	3.31	1.16	0.033	1.99	1.99	0.23	0.15	0.06	0.00	0.000	0.0004	0.123	2.07	
PSMH-12	PSMH-11	83	42.40	41.65	0.009	8	0.67	4.28	1.49	0.029	1.92	1.92	0.21	0.14	0.05	3.00	0.017	0.0004	0.140	2.56	Units 20-21 & 44
PSMH-11	PSMH-10	83	41.55	40.90	0.008	8	0.67	3.98	1.39	0.033	1.98	1.98	0.23	0.15	0.06	1.00	0.006	0.0004	0.146	2.48	Unit 19
PSMH-10	PSMH-9	244	40.80	39.55	0.005	8	0.67	3.22	1.12	0.053	2.25	2.25	0.28	0.19	0.08	8.00	0.045	0.0010	0.192	2.35	Units 15-18 & 40-43
PSMH-9	PSMH-8	108	39.45	38.90	0.005	8	0.67	3.21	1.12	0.057	2.29	2.29	0.29	0.20	0.09	2.00	0.011	0.0005	0.203	2.39	Units 14 & 39
PSMH-8	PSMH-7	222	38.80	37.70	0.005	8	0.67	3.17	1.11	0.069	2.41	2.41	0.32	0.21	0.10	7.00	0.039	0.0009	0.243	2.51	Units 10-13 & 36-38
PSMH-7	PSMH-6	78	37.60	36.95	0.008	8	0.67	4.11	1.43	0.054	2.26	2.26	0.29	0.19	0.08	1.00	0.006	0.0003	0.249	3.01	Unit 35
PSMH-6	PSMH-4	99	36.85	36.05	0.008	8	0.67	4.04	1.41	0.058	2.30	2.30	0.30	0.20	0.09	2.00	0.011	0.0004	0.261	3.03	Units 8-9
Pressure Sewer #2																3.00	0.017	0.0000	0.278	NA	Units 56 and 33-34
PSMH-4	PSMH-3	90	35.95	35.55	0.004	8	0.67	3.00	1.05	0.084	2.56	2.56	0.36	0.24	0.11	1.00	0.006	0.0004	0.283	2.54	Unit 7
PSMH-3	PSMH-2	75	35.45	35.10	0.005	8	0.67	3.07	1.07	0.084	2.56	2.56	0.36	0.24	0.11	1.00	0.006	0.0003	0.289	2.60	Unit 6
PSMH-2	PSMH-1	286	35.00	33.80	0.004	8	0.67	2.91	1.02	0.096	2.66	2.66	0.38	0.25	0.12	4.00	0.022	0.0012	0.313	2.57	Units 2-5
PSMH-1	SMH-E1	212	33.70	32.80	0.004	8	0.67	2.93	1.02	0.097	2.67	2.67	0.38	0.26	0.12	1.00	0.006	0.0009	0.319	2.60	Unit 1

Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

Peverly Hill Road Condominiums
Peverly Hill Road

Prepared For:
TFMoran
170 Commerce Way - Suite 102
Portsmouth NH 03801
Tel: (603) 431-2222
Fax:
Prepared By: Jack McTigue
August 25, 2021

Peverly Hill Road Condominiums
Peverly Hill Road

Prepared by : Jack McTigue **On:** August 25, 2021

Notes :
Two Zones

Zone 1 - Units Units 22-32, 45-55 - Connecting to MH-14

Zone 2 - Units 56 and 33-34 - Connecting to MH-04

<<<<< E N D O F N O T E S >>>>>

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Peverly Hill Road Condominiums

Peverly Hill Road

Prepared By:
Jack McTigue

August 25, 2021

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE										Friction loss calculations were based on a Constant for inside roughness "C" of: 150							
1.00	1.00	20	20	450	11.90	5	59.50	2.00	6.44	856.00	7.51	64.25	64.25	43.50	34.00	9.50	73.75
2.00	2.00	3	3	450	14.00	2	28.00	1.50	4.74	256.00	5.51	14.11	14.11	37.05	34.00	3.05	17.16

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

PRELIMINARY PRESSURE SEWER- ACCUMULATED RETENTION TIME(HR)

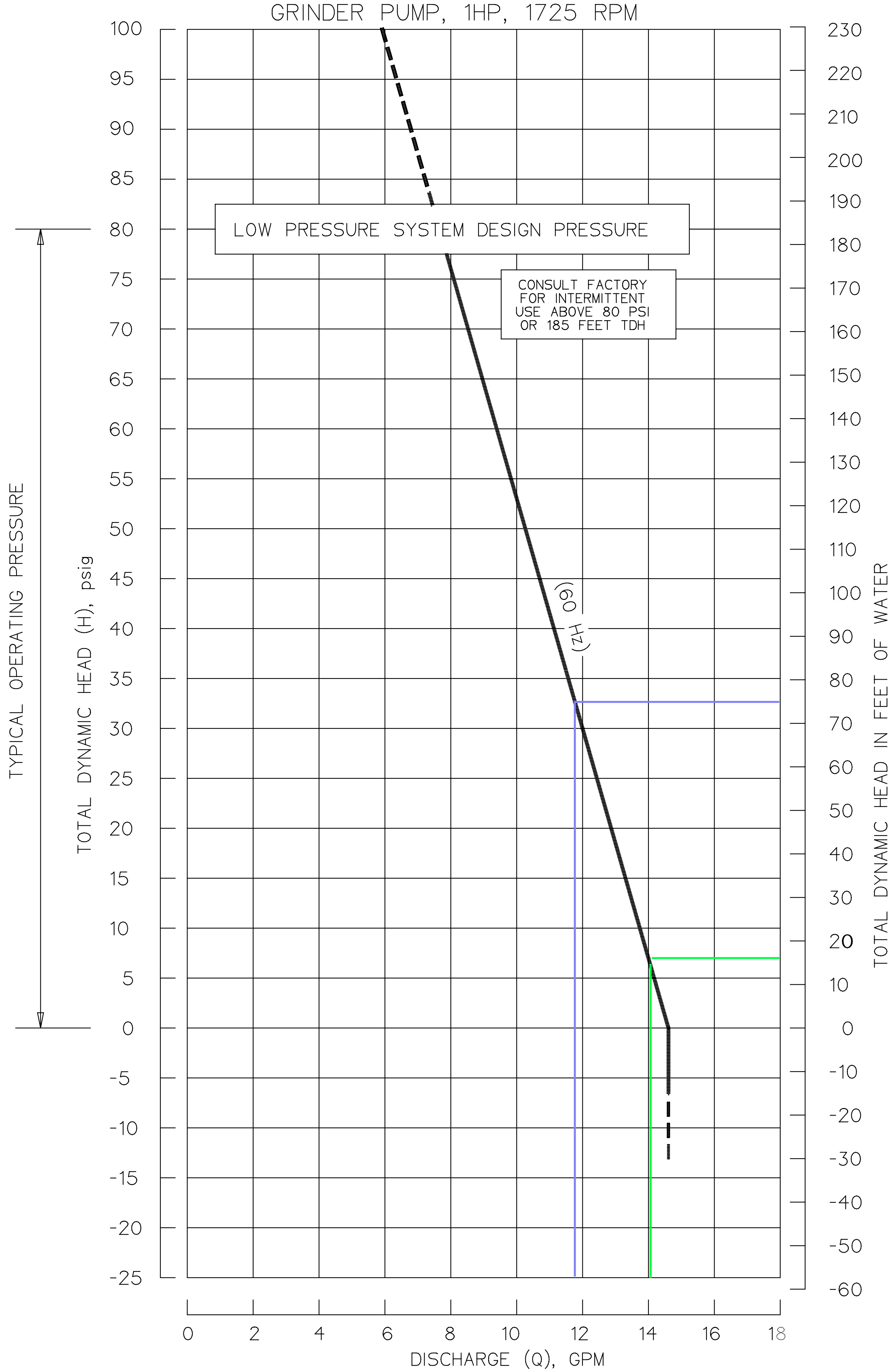
Prepared By: Peverly Hill Road Condominiums

Jack McTigue Peverly Hill Road August 25, 2021

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE								Gals per Day per Dwelling		450
1.00	1.00	20	2.00	15.40	856.00	131.85	9,000	68.26	0.35	0.35
2.00	2.00	3	1.50	9.85	256.00	25.22	1,350	53.52	0.45	0.45

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

E|ONE SPD PUMP PERFORMANCE CURVE

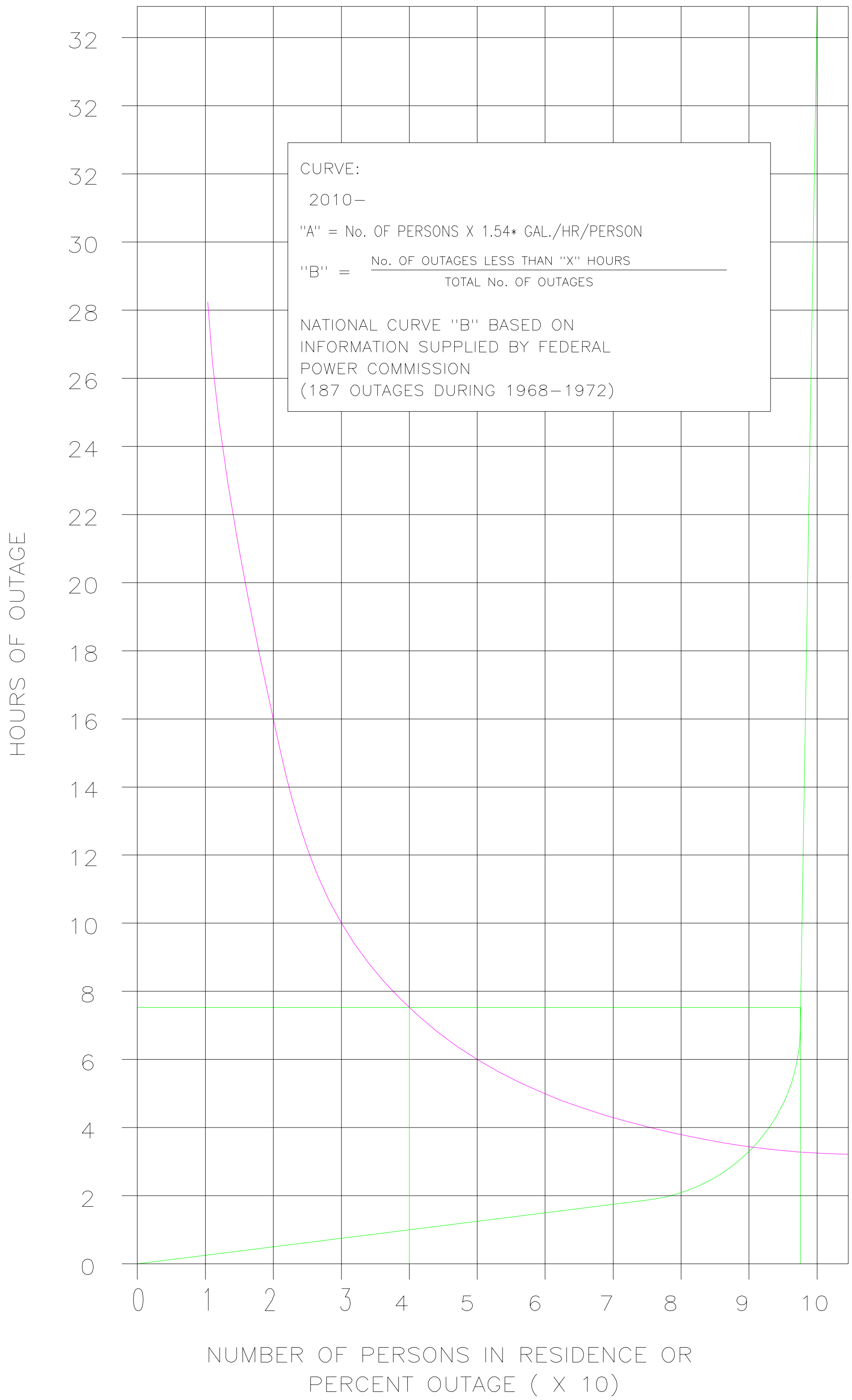


ESD 08-0022 REV. 2, 6/08

(THIS PAGE IS INTENTIONALLY BLANK)

Figure 2

Relationship of GP Storage Capacity to Power Outage Experience



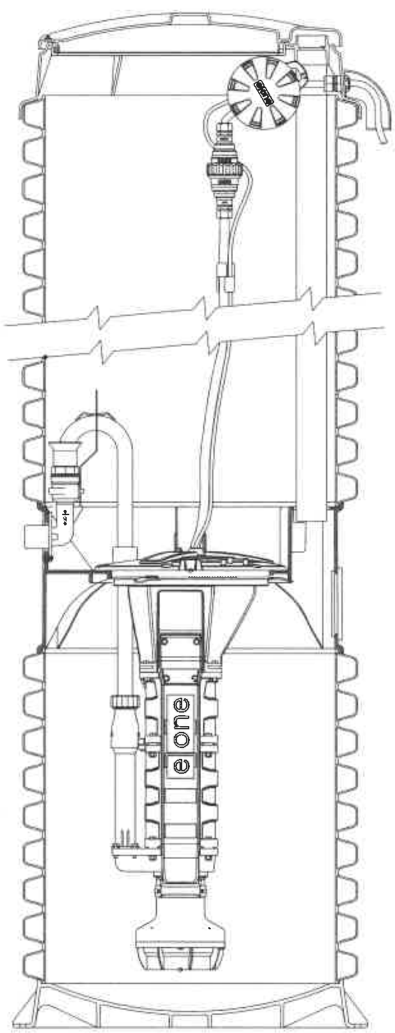
EXAMPLE:

1. GP 2010 INSTALLED
2. FOUR PERSONS IN RESIDENCE
3. FOLLOW VERTICAL LINE 4 UPWARD TO CURVE "A" FOR GP 2010
4. HORIZONTALLY LEFT SHOWS 7–1/2 HOURS OF STORAGE CAPACITY
5. HORIZONTALLY RIGHT TO CURVE "B"
6. VERTICALLY DOWN SHOWS 97% OF THE NATIONS OUTAGES ARE SATISFIED

(THIS PAGE IS INTENTIONALLY BLANK)

E/ONE EXTREME SERIES

DH071/DR071



General Features

The model DH071 or DR071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel. A single DH071 or DR071 is a popular choice for one, average single-family home [redacted]

- Rated for flows of 700 gpd (2650 lpd)
- 70 gallons (265 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 61 inches to 160 inches

The DH071 is the "hardwired," or "wired," model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR071 is the "radio frequency identification" (RFID), or "wireless," model that uses wireless technology to communicate between the level controls and the motor controls.

Operational Information

Motor
1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections
4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections
Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge
15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

E/One requires that the Uni-Lateral, E/One's own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

Patent Numbers: 5,752,315
5,562,254 5,439,180

NA0050P01 Rev C

E/ONE EXTREME SERIES

E/One Sentry™

Alarm Panel — Basic Package

Description

The E/One Sentry panels are custom designed for use with Environment One grinder pump stations. They can be configured to meet the needs of your application, from basic alarm indication to advanced warning of pending service requirements.

E/One Sentry panels are supplied with audible and visual high level alarms. They are easily installed in accordance with relevant national and local codes. Standard panels are approved by UL, CSA, CE and NSF to ensure high quality and safety.

The panel features a corrosion-proof, NEMA 4X-rated, thermoplastic enclosure. A padlock is provided to prevent unauthorized entry (safety front).

Standard Features

Circuit breakers, 240 or 120 VAC service

Terminal blocks and ground lugs

Audible alarm with manual silence

Manual run feature and run indicator

Redundant "Start" function with high level alarm

Conformal-coated alarm board (both sides)

Alarm board overload protection

Optional Features

Contact group (dry, powered and Remote Sentry)

Inner cover (dead front)

Hour meter

Generator receptacle with auto transfer

GFCI

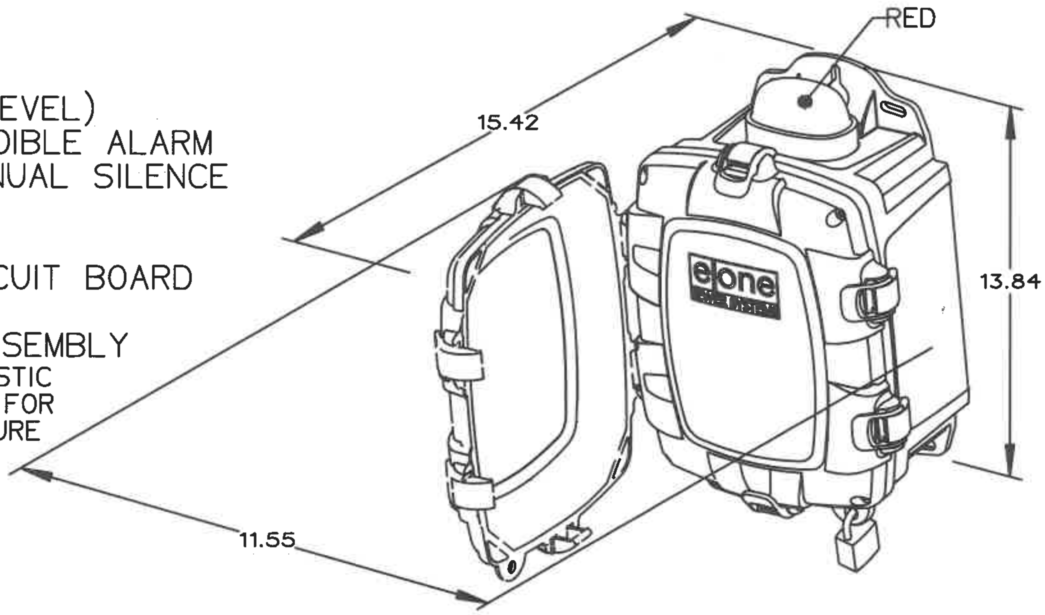
Main service disconnect

Brownout protection

Please consult factory for special applications.

SIMPLEX SENTRY

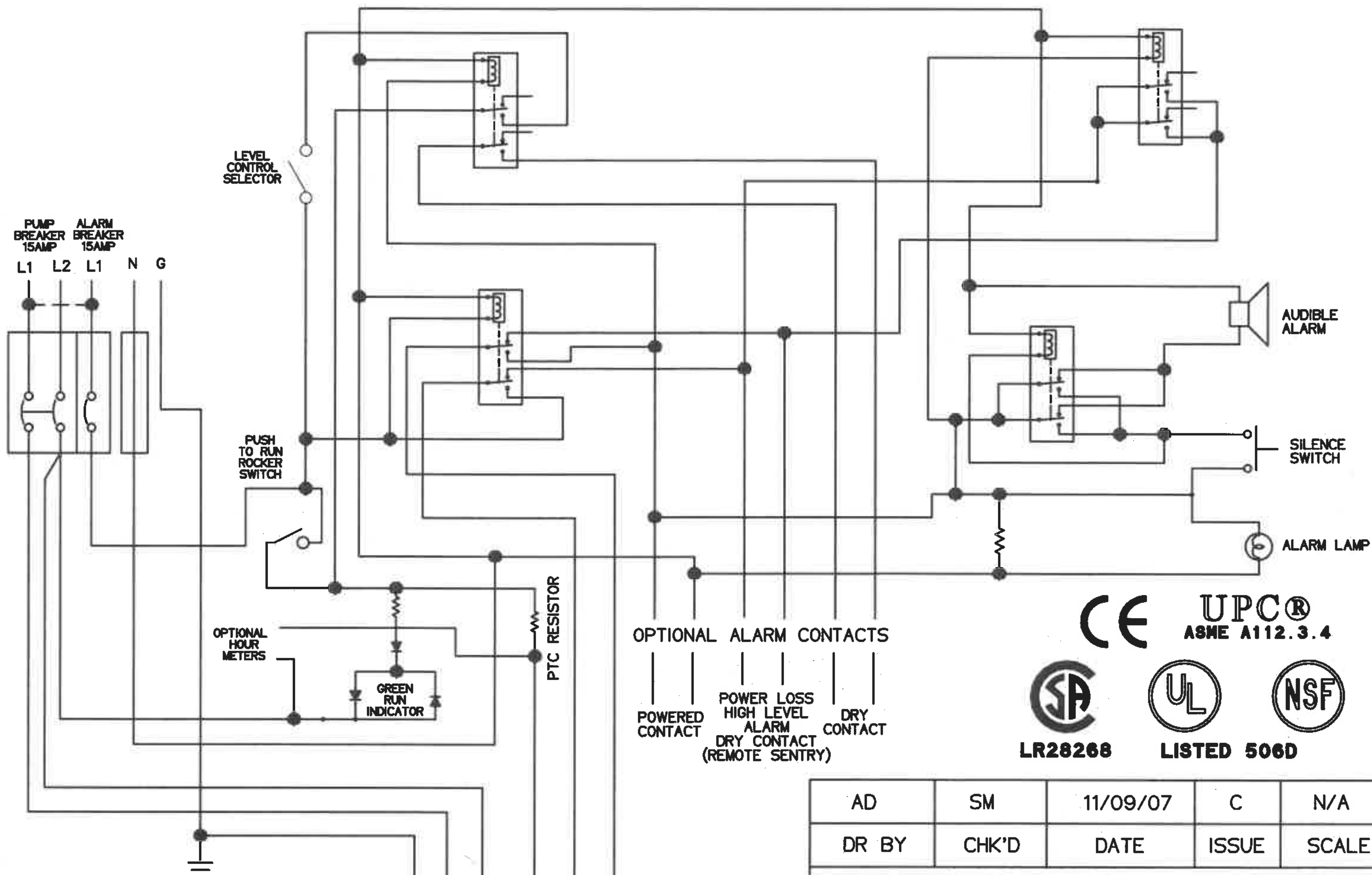
REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
EXTERNAL LATCHING MANUAL SILENCE
MANUAL RUN
PUMP RUN INDICATOR
CONFORMAL COATED CIRCUIT BOARD
PADLOCK
NEMA 4X ENCLOSURE ASSEMBLY
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE



OPTIONS:

☐ ALARM CONTACTS

☐ HOUR METER



CE
UPC®
ASME A112.3.4
LR28268
LISTED 506D

TO PUMP

GND L1 L2 — PUMP POWER

MANUAL RUN — MANUAL RUN

FEED RETURN — ALARM

PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	L2	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:

TYPE TC: DIRECT BURIAL, 12AWG, SIX CONDUCTOR

AD	SM	11/09/07	C	N/A
DR BY	CHK'D	DATE	ISSUE	SCALE

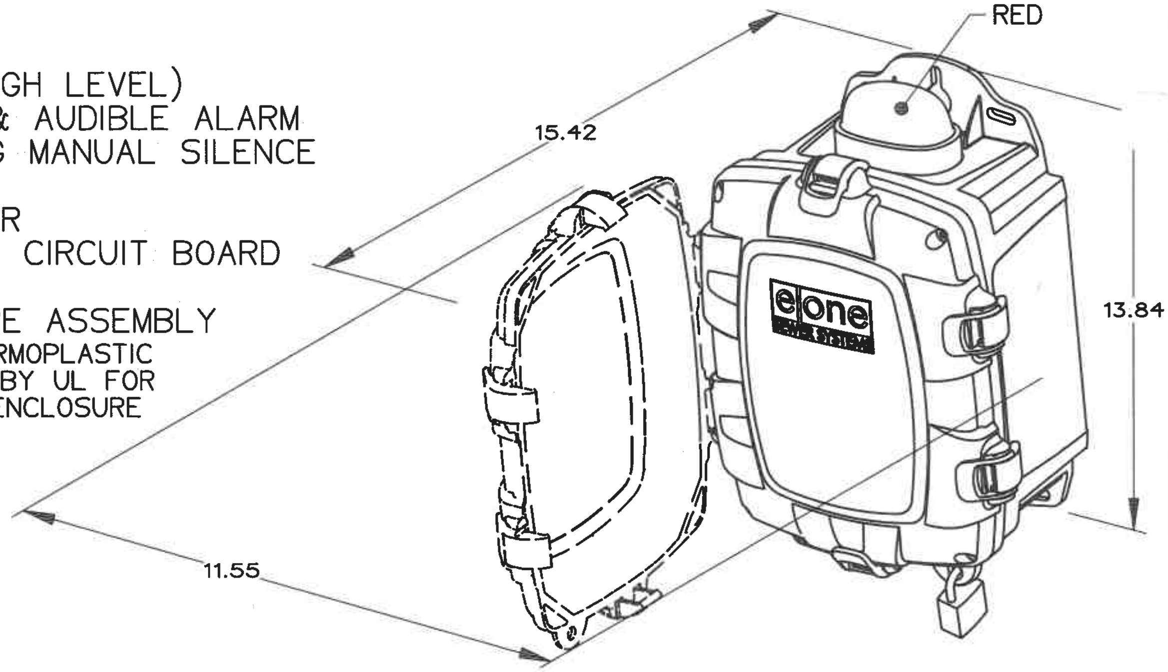
eone
SEWER SYSTEMS

SIMPLEX SENTRY, 240V 60Hz.
DOUBLE POLE POWER

LM000326

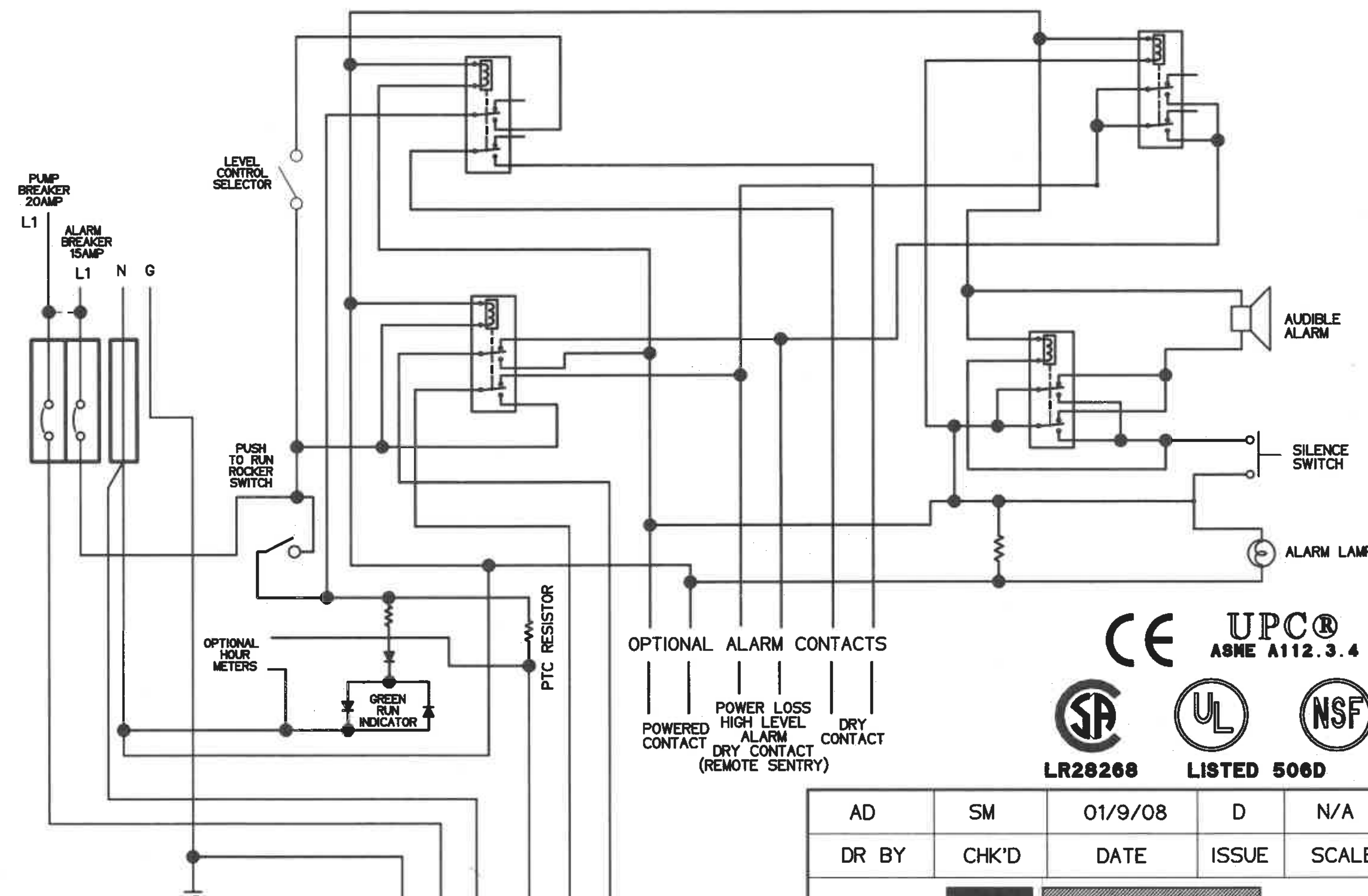
SIMPLEX SENTRY

REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
EXTERNAL LATCHING MANUAL SILENCE
MANUAL RUN
PUMP RUN INDICATOR
CONFORMAL COATED CIRCUIT BOARD
PADLOCK
NEMA 4X ENCLOSURE ASSEMBLY
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE



OPTIONS:

- [ ] ALARM CONTACTS
- [ ] HOUR METER



TO PUMP

GND | L1 | N | MANUAL RUN | FEED | RETURN

PUMP POWER

MANUAL RUN

ALARM

UPC®
ASME A112.3.4

LR28268

LISTED 506D

PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	N	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:
TYPE TC: DIRECT BURIAL, 12AWG, SIX CONDUCTOR

AD	SM	01/9/08	D	N/A
DR BY	CHK'D	DATE	ISSUE	SCALE

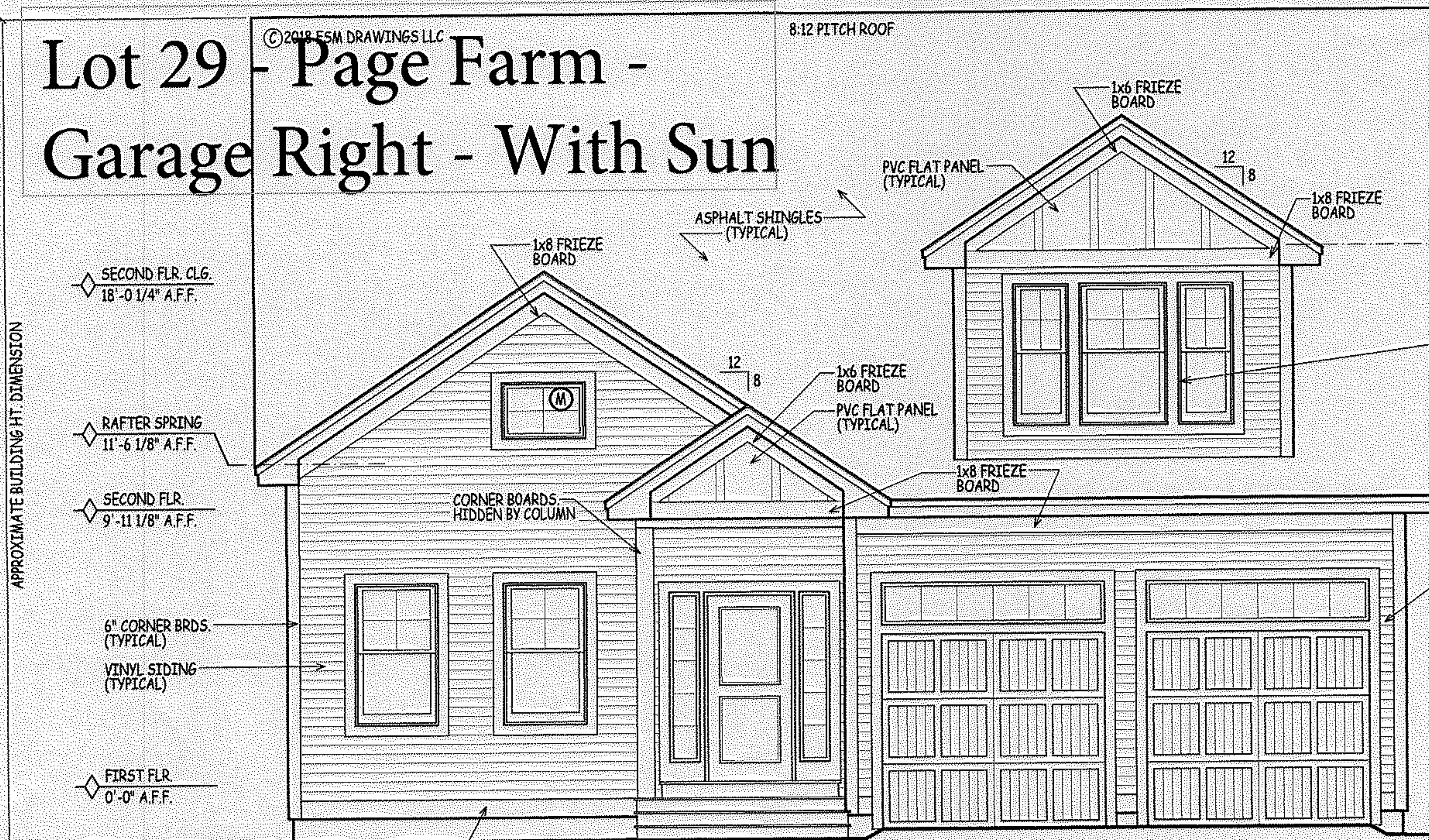
SEWER SYSTEMS

SIMPLEX SENTRY, 120V 60Hz. SINGLE POLE POWER

LM000327

Lot 29 Page Farm (Abbot w/Sun, Garage Right)

Lot 29 - Page Farm - Garage Right - With Sun



FRONT ELEVATION (THE ABBOT)

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

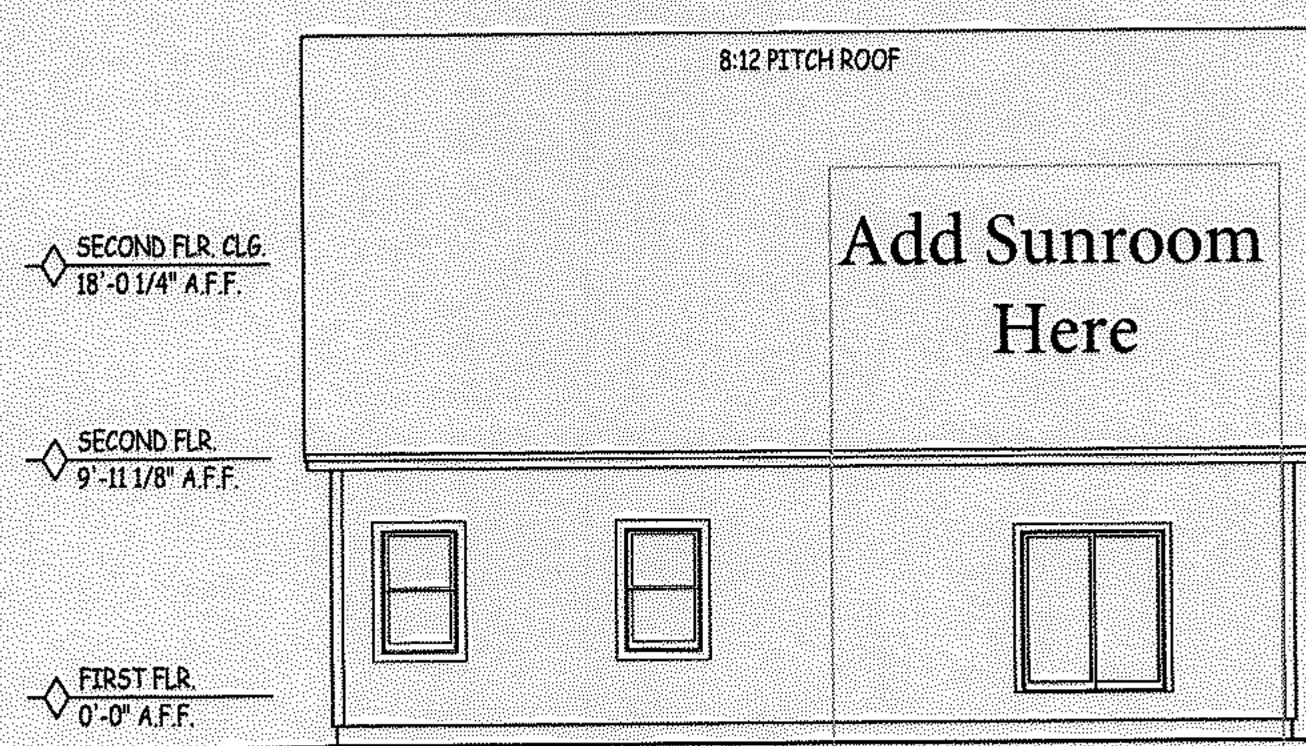
NOTE:
THESE ELEVATIONS TO BE USED WITH FLOOR PLANS SHEET 2a & 3a.

EGRESS NOTE:
AT LEAST ONE WINDOW PER SLEEPING ROOM TO MEET MINIMUM LOCAL, STATE, AND NATIONAL REQUIREMENTS OF NET CLEAR OPENING WIDTH, HEIGHT, AREA AND SILL HEIGHT FOR EGRESS - IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24" ABOVE THE FINISHED FLOOR IN WHICH THE WINDOW IS LOCATED (REFER TO SECTION R612.2 OF THE I.R.C. 2009)

REFER TO SECTIONS R612.2 FOR WINDOW SILL HEIGHT ABOVE GROUND (OR SURFACE BELOW) AND TO SECTION 310 FOR EGRESS WINDOWS & BASEMENTS PRIOR TO PLACING WINDOW ORDER

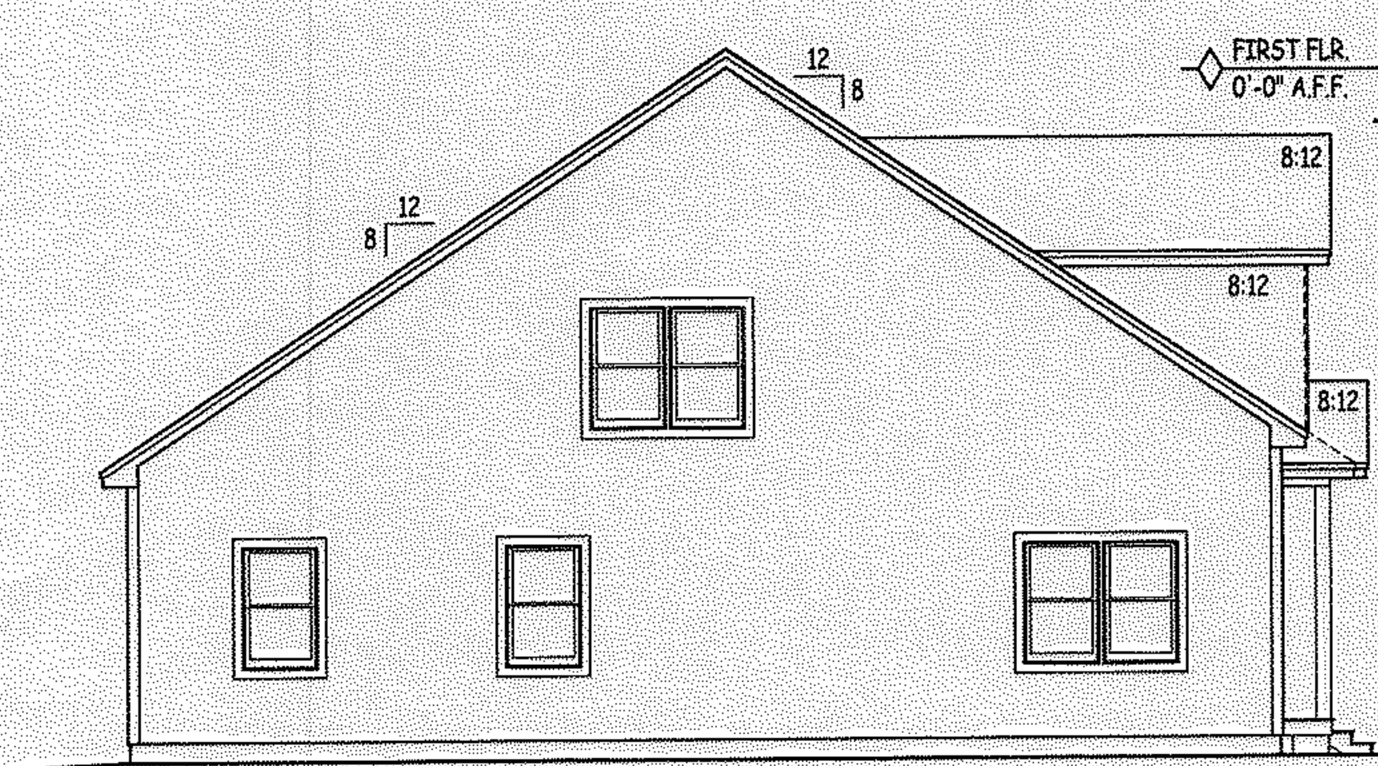
REFER TO SECTION 311 FOR MEANS OF EGRESS PRIOR TO ORDERING DOORS

NOTE:
PLANS DESIGNED TO THE 2009 INTERNATIONAL RESIDENTIAL CODE.



REAR ELEVATION

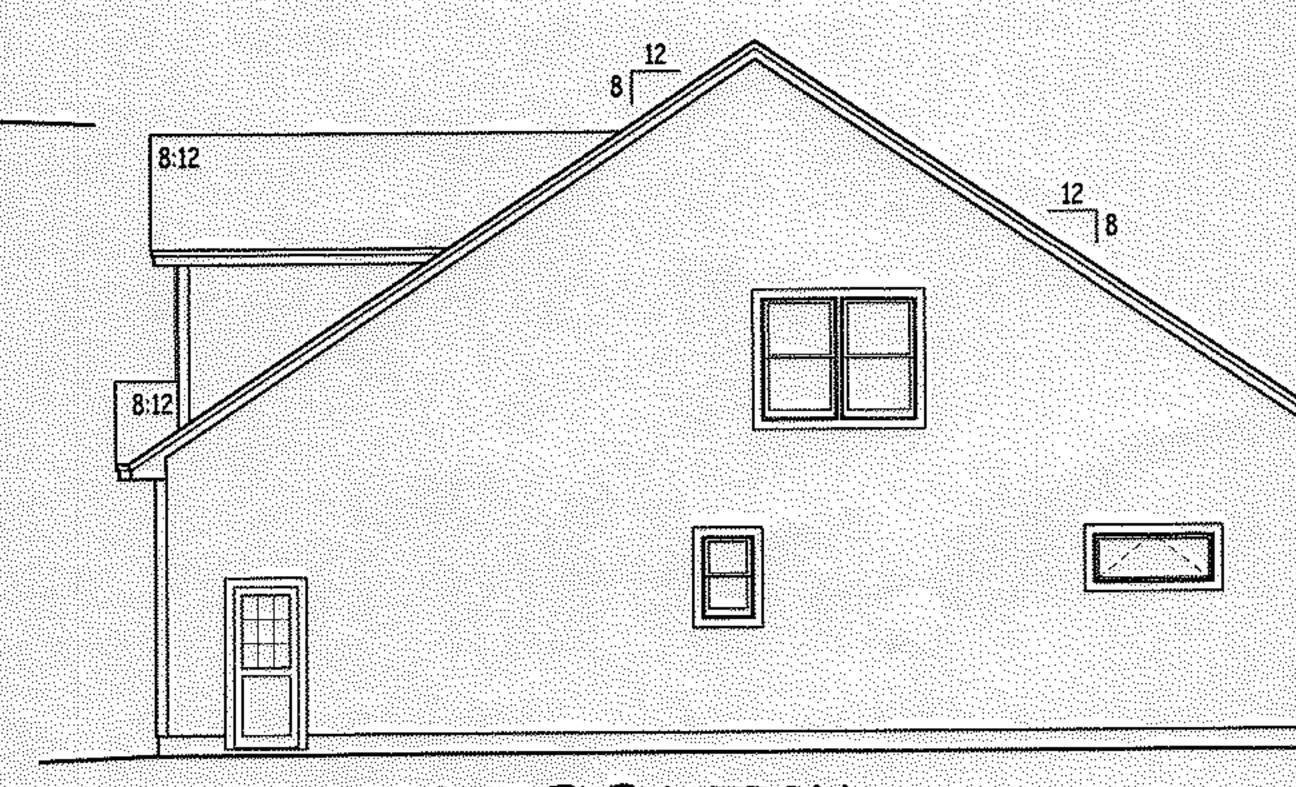
SCALE: 1/8" = 1'-0"



LEFT ELEVATION

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

NOTES:
1. DECK(S) NOT SHOWN FOR CLARITY - CONSULT CONTRACTOR IN FIELD FOR EXACT SIZE & LOCATION
2. REFER TO FLOOR PLANS FOR EXACT LOCATION OF WINDOWS & DOORS - DO NOT SCALE FROM ELEVATIONS



RIGHT ELEVATION

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

FSM DRAWINGS

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

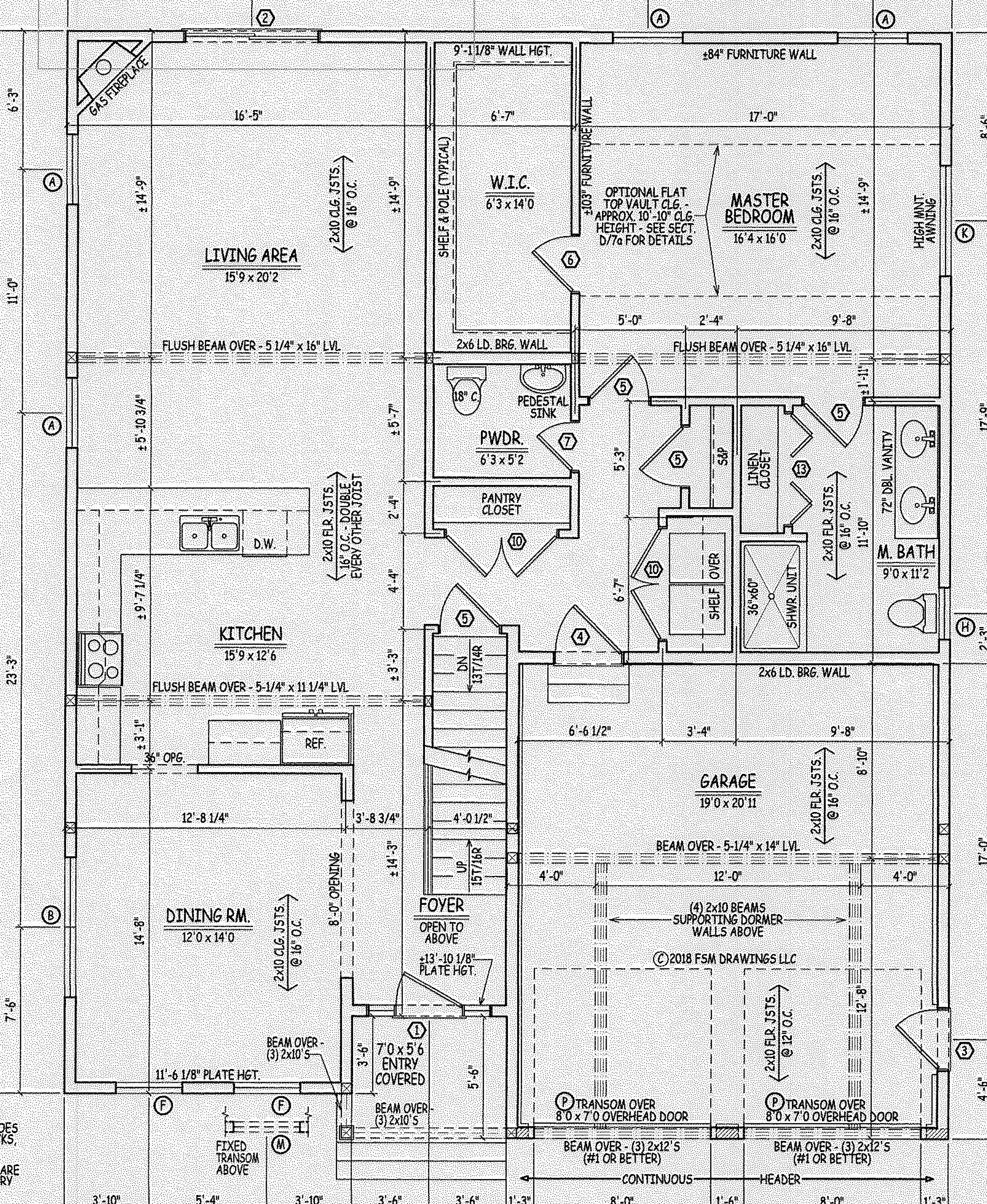
REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

1a

NOTE:
PLANS DESIGNED TO THE 2009 INTERNATIONAL RESIDENTIAL CODE.

Add Sunroom - See Page 10A



NOTE:
SQUARE FOOTAGE INCLUDES ALL WALL STRUCTURE, LIVING SPACE, CLOSETS, & STAIRS. HOWEVER, DOES NOT INCLUDE GARAGE SPACE, DECKS, OR PATIO'S.

TAKE NOTE THAT BUILDER'S SQUARE FOOTAGE CALCULATIONS MAY VARY FROM DRAFTER'S.

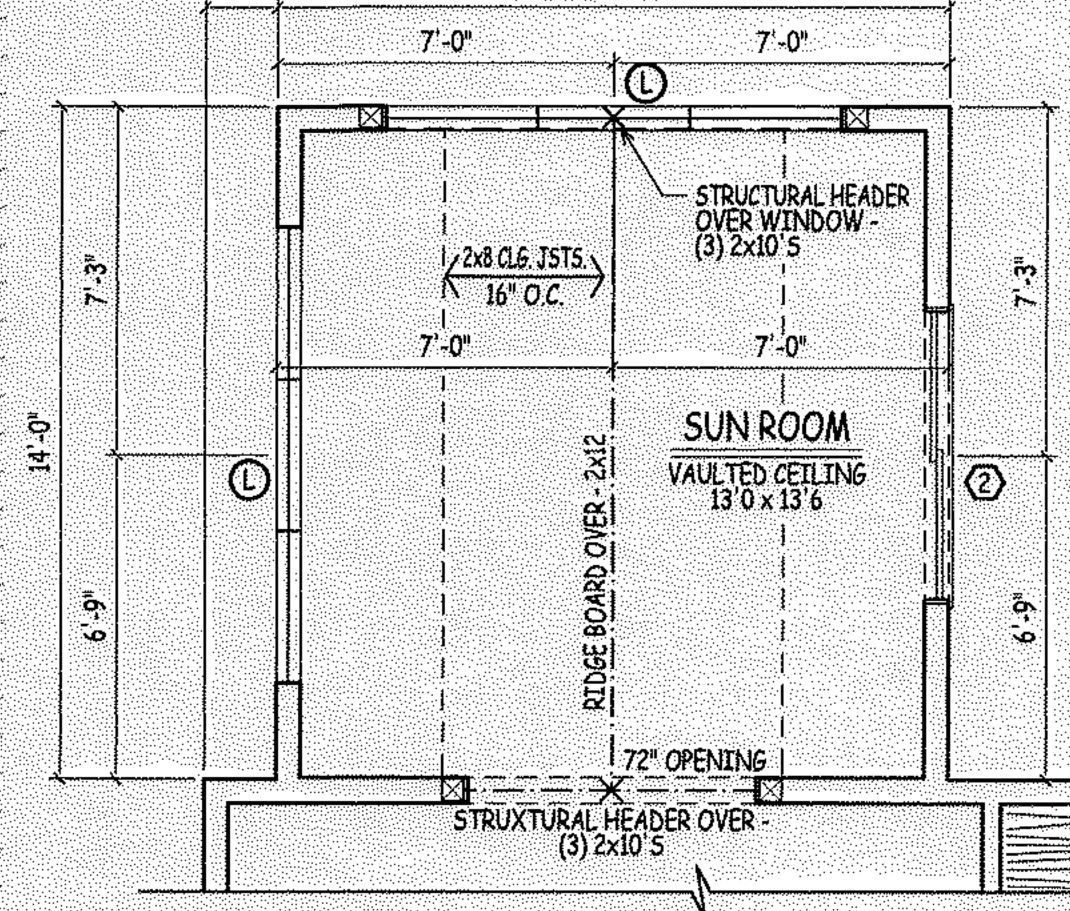
EGRESS NOTE:
AT LEAST ONE WINDOW PER SLEEPING ROOM TO MEET MINIMUM LOCAL, STATE, AND NATIONAL REQUIREMENTS OF NET CLEAR OPENING WIDTH, HEIGHT, AREA AND SILL HEIGHT FOR EGRESS -
IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24" ABOVE THE FINISHED FLOOR IN WHICH THE WINDOW IS LOCATED.
(REFER TO SECTION R612.2 OF THE I.R.C. 2009)

FIRST FLOOR PLAN

APPROX. 1,515 S.F.

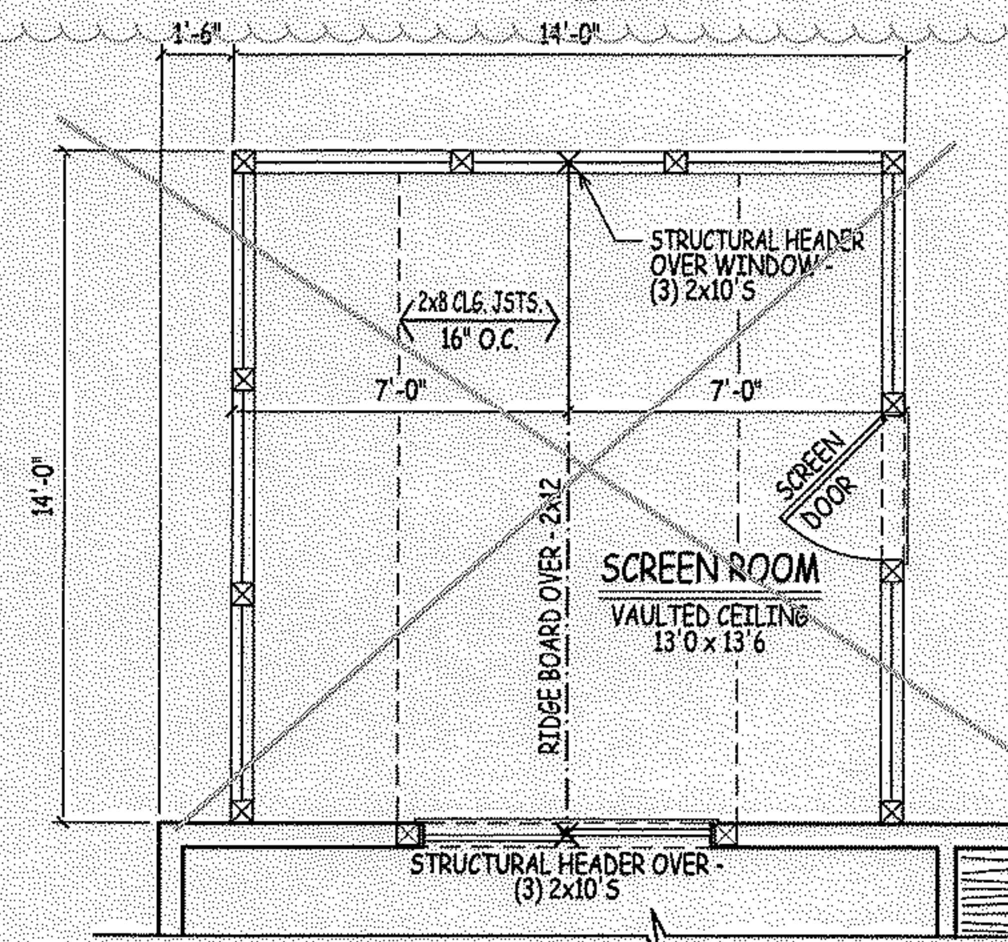
SCALE: 1/4" = 1'-0"

NOTE:
THIS FLOOR PLAN TO BE USED WITH SECOND FLOOR PLAN SHEET 3a.



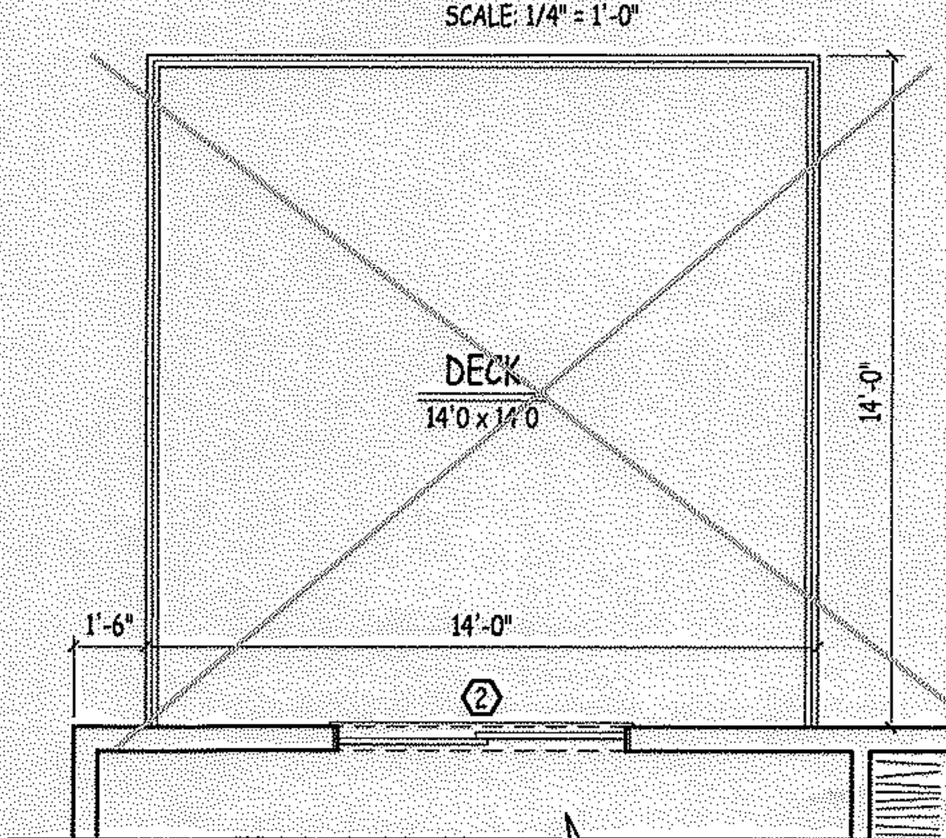
SUN ROOM OPTION

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



SCREEN ROOM OPTION

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



DECK OPTION

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

FSM DRAWINGS

©2017 FSM DRAWINGS LLC

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

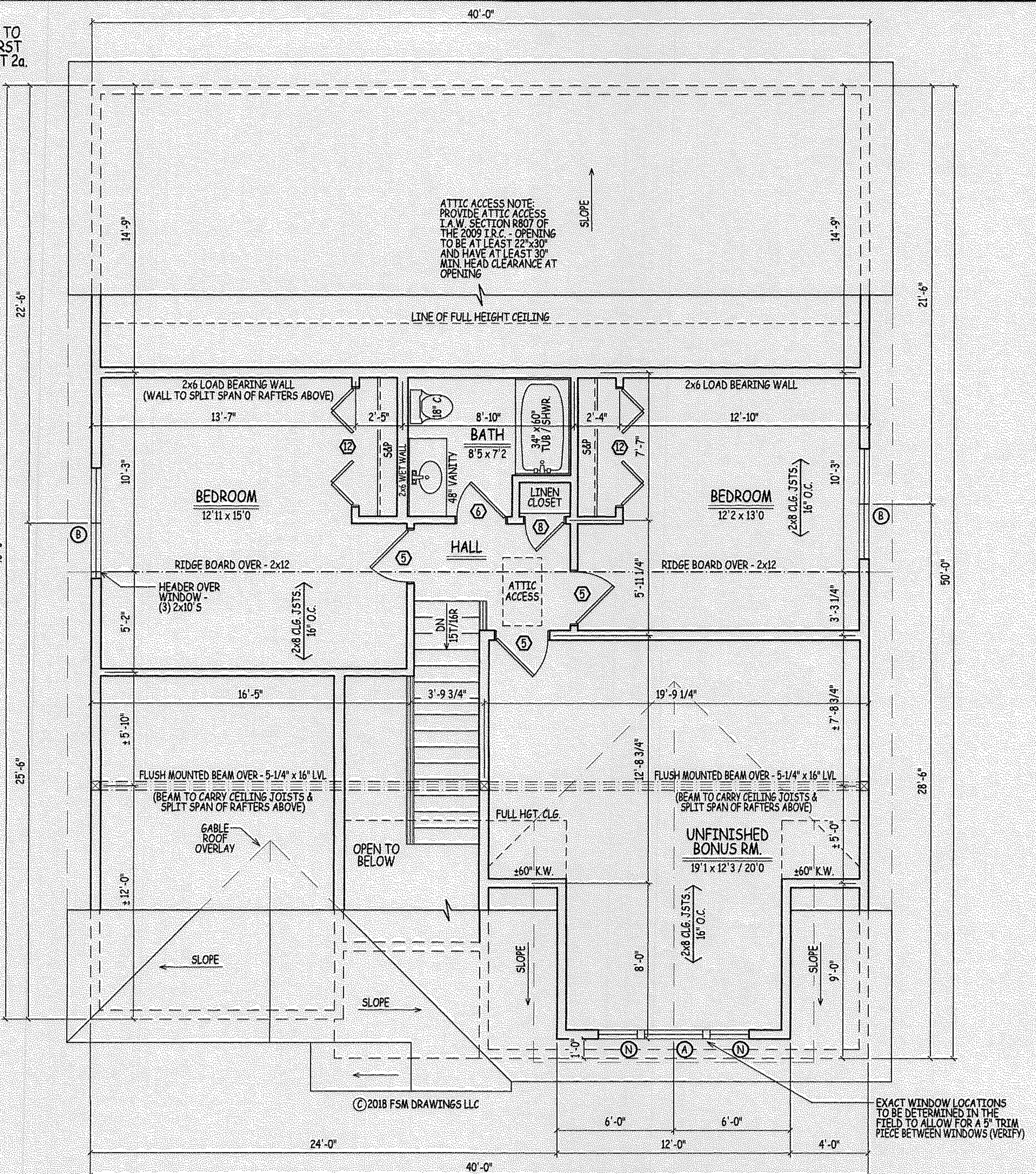
DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

2a

NOTE:
THIS FLOOR PLAN TO BE USED WITH FIRST FLOOR PLAN SHEET 2a.



SECOND FLOOR PLAN

APPROX. 590 S.F.
(BONUS RM. 330 S.F.)

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

NOTE:
PLANS DESIGNED TO THE 2009 INTERNATIONAL RESIDENTIAL CODE.

NOTE:
THESE SCHEDULES ARE TO BE USED WITH FIRST FLOOR PLAN SHEET 2a, & 3a.

DOOR SCHEDULE

MARK	QTY	SIZE	RSO	NOTES
1		3'-0" x 6'-8"		EXT. ENTRY DOOR W/ SIDELITES
2		6'-0" x 6'-8"		EXT. GLASS SLIDER
3		2'-8" x 6'-8"		EXT. 9-LITE
4		3'-0" x 6'-8"		FIRE RATED DOOR
5		2'-8" x 6'-8"		INTERIOR
6		2'-6" x 6'-8"		INTERIOR
7		2'-4" x 6'-8"		INTERIOR
8		2'-0" x 6'-8"		INTERIOR
9		5'-0" x 6'-8"		INT. DBL. FRENCH DOORS
10		5'-0" x 6'-8"		INT. DBL. DOORS
11		4'-0" x 6'-8"		INT. DBL. DOORS
12		6'-0" x 6'-8"		INT. BI-FOLDS
13		5'-0" x 6'-8"		INT. BI-FOLDS
14		4'-0" x 6'-8"		INT. BI-FOLDS

RSO TO BE DETERMINED BY DOOR MANUFACTURER-
CONTRACTOR TO DETERMINE FINAL DOOR COUNT

WINDOW SCHEDULE

MARK	QTY	UNIT	RSO	NOTES
A		DH3862		DOUBLE HUNG (EGRESS)
B		DH3862-2		2 WIDE DBL. HUNG (EGRESS)
C		DH3462		DOUBLE HUNG
D		DH3462-2		2 WIDE DBL. HUNG
E		DH3469-2		2 WIDE DBL. HUNG
F		DH3662		DOUBLE HUNG
G		DH3442		DOUBLE HUNG
H		DH2842		DOUBLE HUNG
J		C4445		DOUBLE CASEMENT
K		A6024		AWNING WINDOW
L		DH3862-3		3 WIDE DBL. HUNG
M		CF3624		FIXED TRANSOM
N		DH2462		DOUBLE HUNG
P				6-LITE GARAGE DOOR TRANSOM

RSO TO BE DETERMINED BY WINDOW MANUFACTURER-
CONTRACTOR TO DETERMINE FINAL WINDOW COUNT
(NOTE: HARVEY WINDOW (VERIFY SERIES WITH CONTRACTOR) SIZES ARE GIVEN ABOVE ONLY FOR THE PURPOSE OF PROVIDING A REFERENCE FOR COMPARING ROUGH OPENING SIZES WITH ANOTHER MANUFACTURER. CONSULT HOME-OWNER FOR THE EXACT WINDOW MANUFACTURER CHOSEN FOR THIS HOME)

NOTE:
SQUARE FOOTAGE INCLUDES ALL WALL STRUCTURE, LIVING SPACE, CLOSETS, & STAIRS, HOWEVER, DOES NOT INCLUDE GARAGE SPACE, DECKS, OR PATIO'S.

TAKE NOTE THAT BUILDER'S SQUARE FOOTAGE CALCULATIONS MAY VARY FROM DRAFTER'S.

EGRESS NOTE:
AT LEAST ONE WINDOW PER SLEEPING ROOM TO MEET MINIMUM LOCAL, STATE, AND NATIONAL REQUIREMENTS OF NET CLEAR OPENING WIDTH, HEIGHT, AREA AND SILL HEIGHT FOR EGRESS -
IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24" ABOVE THE FINISHED FLOOR IN WHICH THE WINDOW IS LOCATED (REFER TO SECTION R612.2 OF THE I.R.C. 2009)

FSM DRAWINGS
27 Lowell Street, Suite 503
Manchester, New Hampshire 03101

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

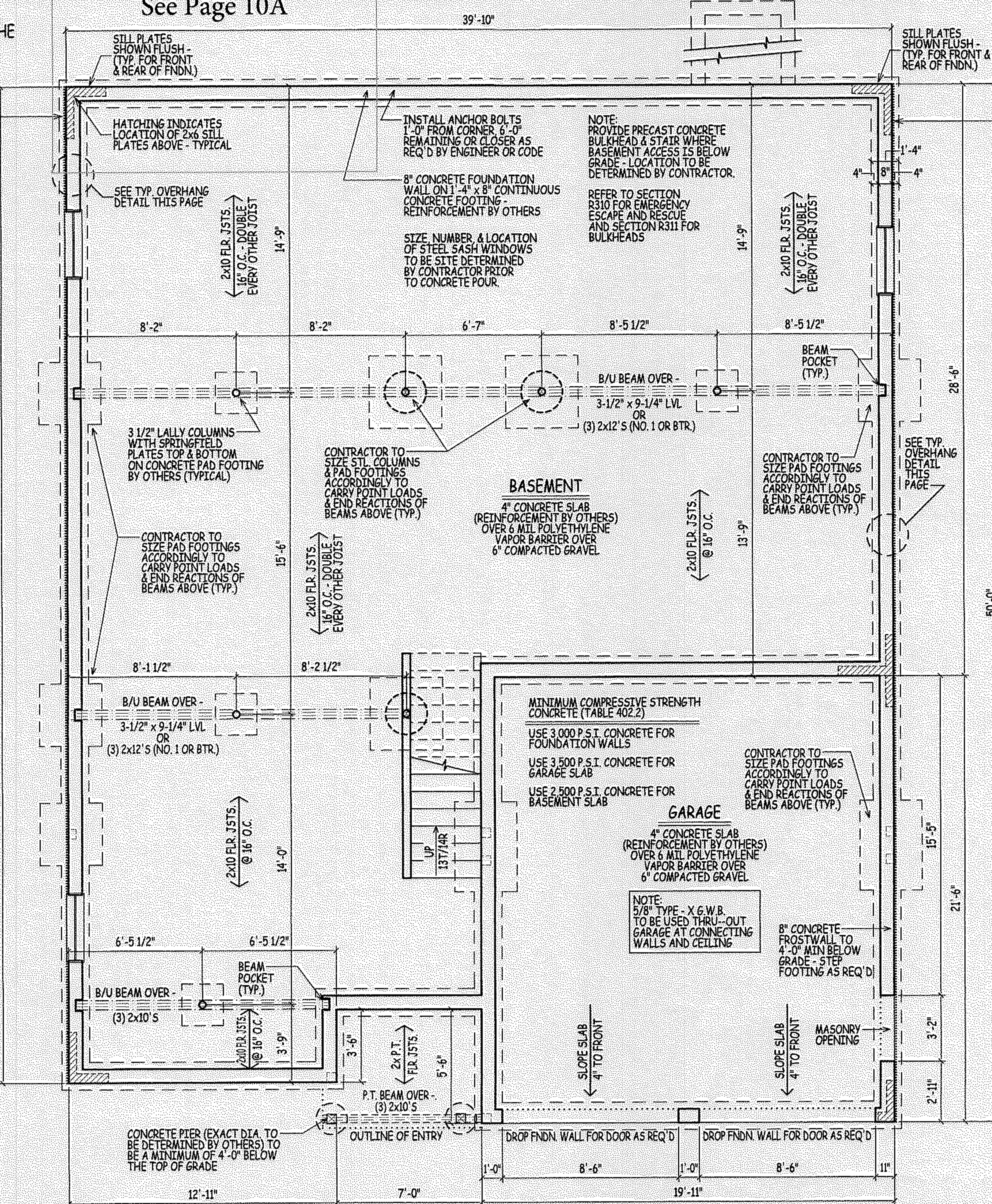
REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

3a

Add Sunroom Foundation
See Page 10A

NOTE:
PLANS DESIGNED TO THE 2009 INTERNATIONAL RESIDENTIAL CODE.

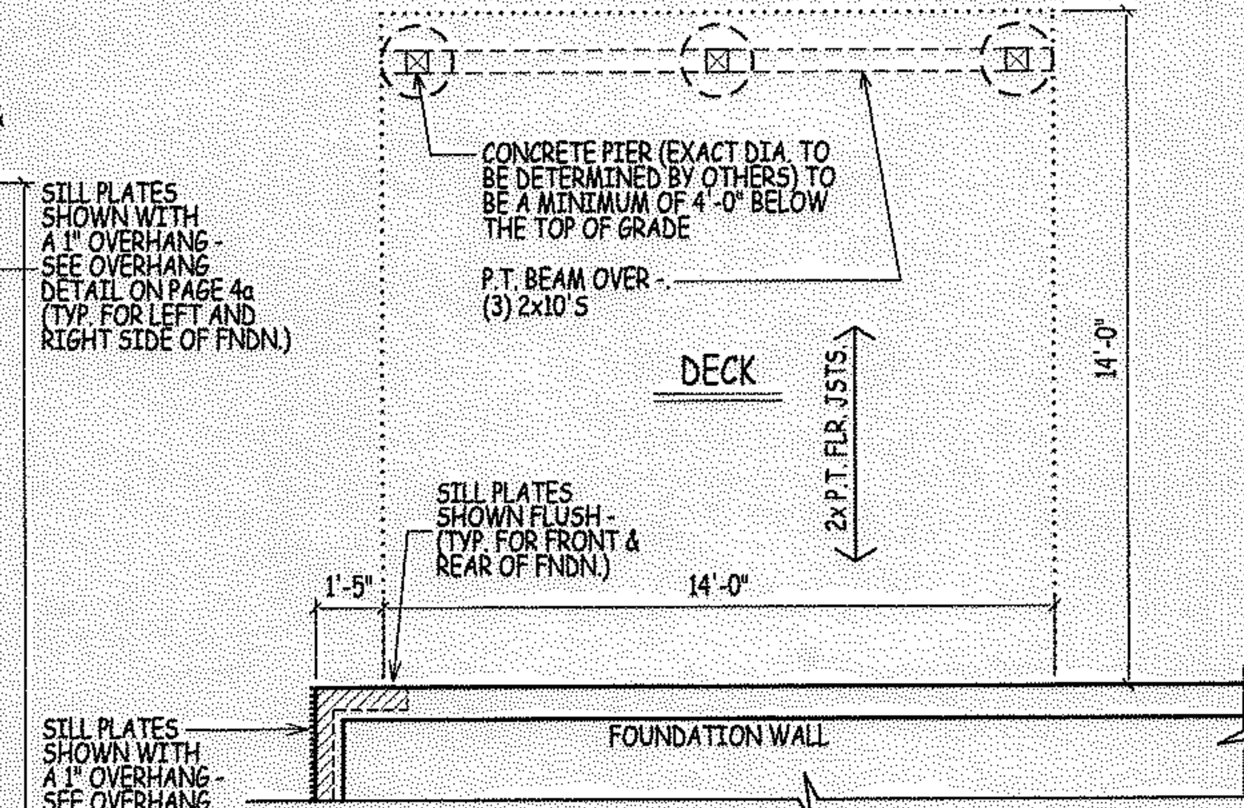


NOTE:
WHEN ONE SIDE OF THE DECK IS SUPPORTED BY THE HOUSE, A LATERAL LOAD CONNECTION IS REQUIRED. HOLD-DOWN TENSION DEVICES SHALL BE INSTALLED IN AT LEAST 2 LOCATIONS WITH A MINIMUM LATERAL-LOAD CAPACITY OF 1,500 LBS. PER DEVICE. (SEE SECTION 502.2.2 OF THE 2009 IRC.)

FOUNDATION PLAN

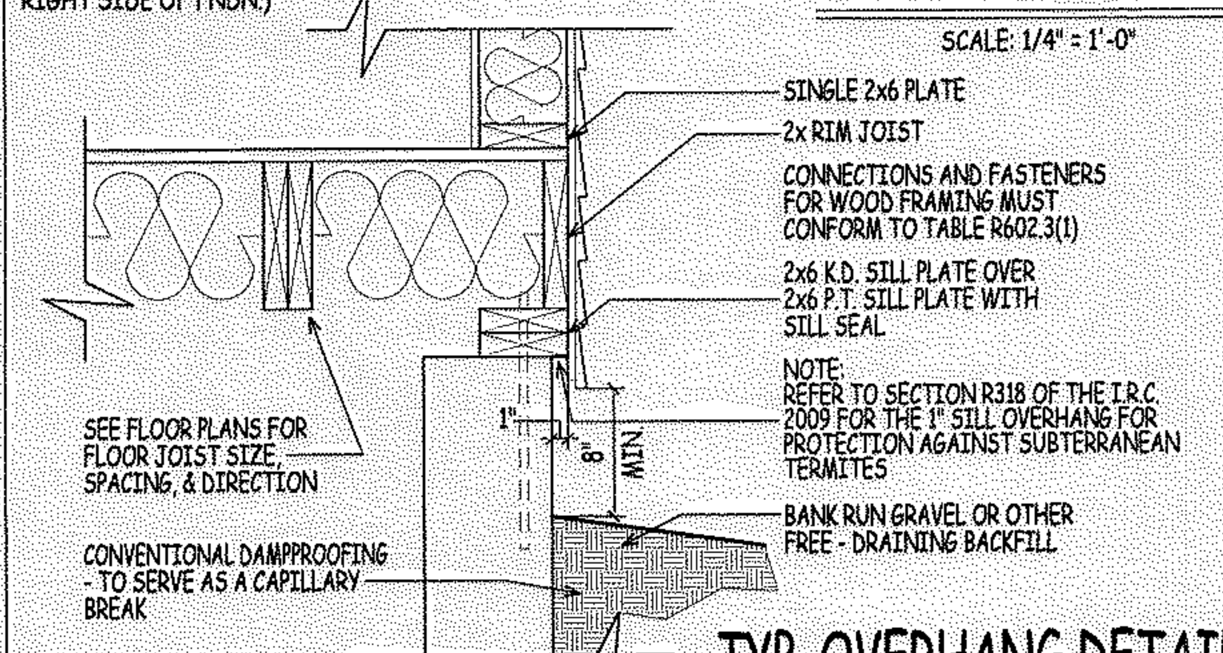
SCALE: 1/4" = 1'-0"

NOTE:
THIS FOUNDATION PLAN TO BE USED WITH FIRST FLOOR PLAN SHEET 2a.



DECK OPTION

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



TYP. OVERHANG DETAIL

SCALE: 1" = 1'-0"

FOUNDATION GENERAL NOTES:

CONCRETE FOUNDATIONS:
CONCRETE FOUNDATIONS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH CHAPTER 4 OF THE I.R.C. 2009 - PAY PARTICULAR ATTENTION TO SECTION R404 (FOUNDATION WALLS) AND TABLE R405.1 (PROPERTIES OF SOILS). REINFORCE FOUNDATION AS PER CODE

FOR VERTICAL REINFORCEMENT OF FOUNDATION REFER TO TABLES R405.1 (FOR SOILS CLASSIFICATIONS) AND R404.1.1(2) - R404.1.1(4) OF THE IRC 2009 FOR 8", 10", & 12" WALLS

SEE TABLE R401.4.1 FOR PRESUMPTIVE LOAD-BEARING VALUES OF FOUNDATION MATERIALS

SEE SECTIONS R401 - R408 (IRC) FOR DETAILS ON THE DESIGN AND CONSTRUCTION OF THE FOUNDATION AND FOUNDATION SPACES FOR ALL BUILDINGS
-FOUNDATION WALLS SHALL BE CONSTRUCTED AS SET FORTH IN TABLES R404.1.1(1) - R404.1.1(4) AND SHALL ALSO COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS R606 - R608
-FOUNDATION CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS ACCORDING TO SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING SOIL.

CONCRETE FOOTINGS SHALL BE OF SUFFICIENT DESIGN TO ACCOMMODATE ALL LOADS ACCORDING TO SECTION R301
-FOOTINGS SHALL BE SUPPORTED ON UNDISTURBED NATURAL SOILS OR ENGINEERED FILL
-SEE TABLE R401.4.1 FOR PRESUMPTIVE LOAD BEARING VALUES OF FOUNDATION MATERIALS
-MINIMUM SIZES FOR CONCRETE AND MASONRY FOOTINGS SHALL BE AS SET FORTH IN TABLE R403.1 AND FIGURE R403.1(1)

THE LOAD BEARING VALUE OF THE SOIL IN ACCORDANCE WITH TABLE R401.4.1

ALL ENGINEERED STEEL/WOOD BEAMS TO BE CHECKED AND VERIFIED FOR LOCATION AND SPAN PRIOR TO START OF BUILDING CODES, INCLUDING ENERGY CODES, CONSTRUCTION BY CONTRACTOR AND OR BEAM MANUFACTURER (TYPICAL)

CONTRACTOR TO PROVIDE ADEQUATE HEADERS OVER ALL WINDOWS AND DOORS ON EXTERIOR LOAD-BEARING WALLS (TYP.)

FABRICATION AND MATERIALS SUPPLIED AND INSTALLED SHALL CONFORM TO ALL APPLICABLE LOCAL, STATE & NATIONAL BUILDING CODES, INCLUDING ENERGY CODES, LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

DECK NOTE:
VERIFY EXACT SIZE & LOCATION OF DECK WITH THE CONTRACTOR
-EXACT DIA./SIZE OF CONCRETE PIERS AND LOCATIONS TO BE DETERMINED BY OTHERS

2x FLOOR JSTS. (SEE FRAMING NOTES FOR EXACT SIZES)
-SEE SECTIONS R501 - R506 (IRC) FOR DETAILS ON THE DESIGN AND CONSTRUCTION OF ALL FLOORS FOR ALL BUILDINGS

FOUNDATION NOTES:
FOUNDATION DROPS, PLACEMENT OF BULKHEAD (IF REQUIRED), AND NUMBER, SIZE & LOCATION OF BASEMENT WINDOWS TO BE SITE DETERMINED - VERIFY IN FIELD WITH CONTRACTOR PRIOR TO POUR.

BASEMENT WALK-OUT:
THESE PLANS ARE NOT SITE SPECIFIC. IF SITE GRADING ALLOWS FOR A WALK-OUT IT IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO COORDINATE THE EXACT LOCATION, TYPE, AND NUMBER OF DOOR(S), WINDOWS, AND REQUIRED STEPPING OF FOUNDATION WALL, FROST WALL & FOOTING.

ADMISSION OF ERROR, OMISSION AND/OR OVERSIGHT:
WHILE IT IS OUR INTENT TO DELIVER OUR SERVICES FREE OF ERROR, OMISSION OR OVERSIGHT, WE WILL ADMIT TO BE HUMAN. ANY AND ALL WORK IS DONE BY PERSONNEL IN THE DRAFTING COMPANY. WE WILL RELY ON THE EXPERIENCED CONTRACTOR USING THESE PLANS TO THOROUGHLY REVIEW THEM FOR DIMENSIONAL ACCURACY, COORDINATION AND CODE COMPLIANCE. THE CONTRACTOR USING THESE PLANS ASSUMES ALL RESPONSIBILITY FOR THEM AND WILL IF HE/SHE DEEMS NECESSARY HIRE A LICENSED PROFESSIONAL ENGINEER TO ASSIST IN THE REVIEW.

FSM DRAWINGS
©2017 FSM DRAWINGS LLC

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO:	FSM17-206CA

REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

4a

GENERAL NOTES:

SEE SECTIONS R401 - R408 (IRC) FOR DETAILS ON THE DESIGN AND CONSTRUCTION OF THE FOUNDATION AND FOUNDATION SPACES FOR ALL BUILDINGS
-FOUNDATION WALLS SHALL BE CONSTRUCTED AS SET FORTH IN TABLES R404.1.1(1) - R404.1.1(4) AND SHALL ALSO COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS R606 - R608
-FOUNDATION CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS ACCORDING TO SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING SOIL.

CONCRETE FOOTINGS SHALL BE OF SUFFICIENT DESIGN TO ACCOMMODATE ALL LOADS ACCORDING TO SECTION R301
-FOOTINGS SHALL BE SUPPORTED ON UNDISTURBED NATURAL SOILS OR ENGINEERED FILL
-SEE TABLE R401.4.1 FOR PRESUMPTIVE LOAD BEARING VALUES OF FOUNDATION MATERIALS
-MINIMUM SIZES FOR CONCRETE AND MASONRY FOOTINGS SHALL BE AS SET FORTH IN TABLE R403.1 AND FIGURE R403.1(1)

THE LOAD BEARING VALUE OF THE SOIL IN ACCORDANCE WITH TABLE R401.4.1

CONTRACTOR TO PROVIDE ADEQUATE VAPOR BARRIERS UNDER ALL CONCRETE SLABS

CONTRACTOR TO PROVIDE ADEQUATE HEADERS OVER ALL WINDOWS AND DOORS ON EXTERIOR LOAD-BEARING WALLS (TYP.)

LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

DOUBLE UP FLOOR JOISTS @ LOCATIONS OF NON-LOAD BEARING WALLS AND UNDER ALL BATHROOMS (I.E. BATHING TUBS/WHIRLPOOLS), KITCHENS, LAUNDRY ROOMS, ETC. (TYPICAL)

CONTRACTOR TO PROVIDE ADEQUATE BLOCKING AND BRIDGING BETWEEN FLOOR JOISTS AS REQUIRED (TYPICAL)

NOTE:
SEE THE NEW HAMPSHIRE BUILDING CODE (IBC, IPC, IMC, IECC, IRC, & IEBC) AS PUBLISHED BY THE ICC AND THE NATIONAL ELECTRICAL CODE AS PUBLISHED BY THE NFPA FOR IN DEPTH DETAILS ON BUILDING IN ACCORDANCE WITH CITY BUILDING REGULATIONS

IBC INTERNATIONAL BUILDING CODE
IPC INTERNATIONAL PLUMBING CODE
IMC INTERNATIONAL MECHANICAL CODE
IECC INTERNATIONAL ENERGY CONSERVATION CODE
IRC INTERNATIONAL RESIDENTIAL CODE
IEBC INTERNATIONAL EXISTING BUILDING CODE
ICC INTERNATIONAL CODE COUNCIL
NFPA NATIONAL FIRE PROTECTION ASSOCIATION
NEC NATIONAL ELECTRICAL CODE

FABRICATION AND MATERIALS SUPPLIED AND INSTALLED SHALL CONFORM TO ALL APPLICABLE LOCAL, STATE & NATIONAL BUILDING CODES, INCLUDING ENERGY CODES, LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

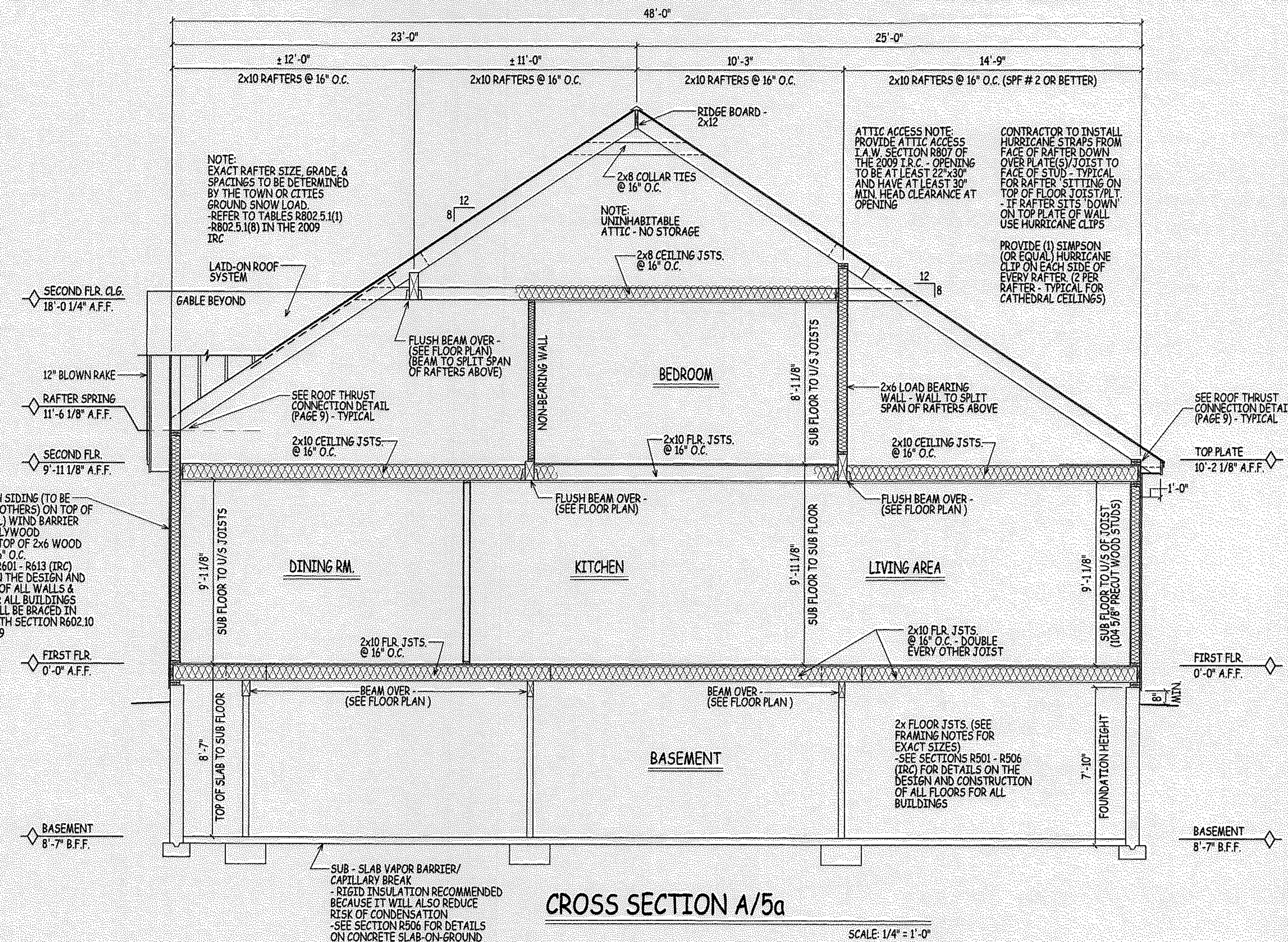
ENERGY EFFICIENCY NOTE:
COMPLIANCE SHALL BE DEMONSTRATED BY EITHER MEETING THE REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE 2009 OR MEETING THE REQUIREMENTS OF CHAPTER 11 IN THE 2009 INTERNATIONAL RESIDENTIAL CODE

ALL ENGINEERED STEEL/WOOD BEAMS TO BE CHECKED AND VERIFIED FOR LOCATION AND SPAN PRIOR TO START OF CONSTRUCTION BY CONTRACTOR AND OR BEAM MANUFACTURER (TYPICAL)

THE CONTRACTOR IS TO ENSURING WINDOWS MEET PREVAILING BUILDING AND LIFESAFETY CODES FOR MINIMUM EGRESS CLEAR OPENING HEIGHT, WIDTH, AND AREA - THE CONTRACTOR WILL ADJUST WINDOW SCHEDULE ACCORDINGLY.

REFER TO SECTIONS R612.2 FOR WINDOW SILL HEIGHT ABOVE GROUND (OR SURFACE BELOW) AND TO SECTION 310 FOR EGRESS WINDOWS & BASEMENTS PRIOR TO PLACING WINDOW ORDER

REFER TO SECTION 311 FOR MEANS OF EGRESS PRIOR TO ORDERING DOORS



CROSS SECTION A/5a

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

ROOF CONSTRUCTION:

VERIFY RIDGE BOARD SIZE IN FIELD (LENGTH TO EXCEED PLUM CUT OF RAFTER)

2 x 10 RAFTERS @ 16" O.C. (U.N.O.)

2 x 8 COLLAR TIES @ 16" O.C.

2 x 8 CEILING JOISTS @ 16"

235# ASPHALT SHINGLES ON 15# BUILDING PAPER ON 5/8" PLYWOOD SHEATHING

ICE & WEATHER SHIELD AT RAFTER TAILS & VALLEYS

EAVE/RAKE: METAL DRIP EDGE
1x4 PINE BLOCKING (SUB-FASCIA)
1x8 PINE BD. FASCIA
3/8" AC EXT. GD. PLYWD SOFFIT W/2" CONT. LOUVERED VENT (SOFFIT ONLY)

EXTERIOR WALL CONSTRUCTION:

2 x 6 WOOD STUDS @ 16" O.C. W/TYVEK (OR EQUAL) WIND BARRIER AND 1/2" PLYWD.

2 x 6 DOUBLE TOP PLATE

2 x 6 SINGLE BOTTOM PLATE

INTERIOR CONSTRUCTION:

2 x 4 WOOD STUDS @ 16" O.C.

2 x 4 DOUBLE TOP PLATE (LD. BRG. ONLY)

2 x 4 SINGLE BOTTOM PLATE

WALL- 1/2" GYPSUM WALL BOARD EA. SIDE STUD - MOISTURE-RESISTANT / FIRE-RATED WHERE REQUIRED

CLG.- 1/2" G.W.B. ON 1x3 WOOD STRAPPING @ 16"O.C.- MOISTURE-RESISTANT / FIRE-RATED WHERE REQUIRED

2x12 STAIR STRINGERS @ 12" O.C.

FLOOR CONSTRUCTION:

2x10 FLOOR JOISTS @ 16" O.C. WITH 3/4" TONGUE & GROOVE PLYWD. GLUED & NAILED (TYP. U.O.N.)

BUILT-UP BEAMS SIZED BY CONTRACTOR

FOUNDATION CONSTRUCTION:

8" CONCRETE FOUNDATION WALL WITH DBL. 2x6 P.T. SILL WITH SILL SEAL

8" CONC. FROST WALLS (WHERE SHOWN) TO 48" BELOW GD.

CONTINUOUS CONCRETE FOOTING - SIZE BY OTHERS

REFER TO SECTION R404.1.2.2 FOR HORIZONTAL AND VERTICAL REINFORCEMENT FOR FOUNDATION WALLS

PROVIDE MATCHING CORNER DOWELS LAP 50 BAR DIAMETERS (TYPICAL)

PROVIDE 3 1/2" DIA. STEEL COLUMNS OVER CONCRETE FOOTINGS AS REQ'D FOR BEAMS SHOWN ON PLAN

INSULATION

WALLS: R-20 CAVITY INSULATION OR R-13 PLUS R-5

FLOOR: R-30 OR INSULATION SUFFICIENT TO FILL JOIST CAVITY

CEILING: R-38 (ZONE 5) OR R-49 (ZONE 6) - HOWEVER, IF MAINTAINING THE FULL R VALUE OVER THE PLATES (RAISED) R-30 (ZONE 5) OR R-38 (ZONE 6)

NOTE:
THESE SECTIONS TO BE USED WITH FLOOR PLANS SHEET 2a, 3a & 4a.

ADMISSION OF ERROR, OMISSION AND/OR OVERSIGHT:
WHILE IT IS OUR INTENT TO DELIVER OUR SERVICES FREE OF ERROR, OMISSION OR OVERSIGHT, WE WILL ADMIT TO BE HUMAN AND THEREFORE FSM DRAWINGS LLC ACTING SOLELY AS THE DRAFTING COMPANY, WILL RELY ON THE EXPERIENCED CONTRACTOR USING THESE PLANS TO THOROUGHLY REVIEW THEM FOR ERRORS, OMISSIONS, ACCURACY, COMPLETENESS AND APPROPRIATENESS. THE CONTRACTOR USING THESE PLANS ASSUMES ALL RESPONSIBILITY FOR THEM AND WILL IF HE/SHE DEEMS NECESSARY, HIRE A LICENSED PROFESSIONAL ENGINEER TO ASSIST IN THE REVIEW.

FSM DRAWINGS

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

5a

GENERAL NOTES:

SEE SECTIONS R401 - R408 (IRC) FOR DETAILS ON THE DESIGN AND CONSTRUCTION OF THE FOUNDATION AND FOUNDATION SPACES FOR ALL BUILDINGS
-FOUNDATION WALLS SHALL BE CONSTRUCTED AS SET FORTH IN TABLES R404.1.1(1) - R404.1.1(4) AND SHALL ALSO COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS R606 - R608
-FOUNDATION CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS ACCORDING TO SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING SOIL.

CONCRETE FOOTINGS SHALL BE OF SUFFICIENT DESIGN TO ACCOMMODATE ALL LOADS ACCORDING TO SECTION R301
-FOOTINGS SHALL BE SUPPORTED ON UNDISTURBED NATURAL SOILS OR ENGINEERED FILL
-SEE TABLE R401.4.1 FOR PRESUMPTIVE LOAD BEARING VALUES OF FOUNDATION MATERIALS
-MINIMUM SIZES FOR CONCRETE AND MASONRY FOOTINGS SHALL BE AS SET FORTH IN TABLE R403.1 AND FIGURE R403.1(1)

THE LOAD BEARING VALUE OF THE SOIL IN ACCORDANCE WITH TABLE R401.4.1

CONTRACTOR TO PROVIDE ADEQUATE VAPOR BARRIERS UNDER ALL CONCRETE SLABS

CONTRACTOR TO PROVIDE ADEQUATE HEADERS OVER ALL WINDOWS AND DOORS ON EXTERIOR LOAD-BEARING WALLS (TYP.)

LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

DOUBLE UP FLOOR JOISTS @ LOCATIONS OF NON-LOAD BEARING WALLS AND UNDER ALL BATHROOMS (I.E. BATHING TUBS/WHIRLPOOLS), KITCHENS, LAUNDRY ROOMS, ETC. (TYPICAL)

CONTRACTOR TO PROVIDE ADEQUATE BLOCKING AND BRIDGING BETWEEN FLOOR JOISTS AS REQUIRED (TYPICAL)

NOTE:
SEE THE NEW HAMPSHIRE BUILDING CODE (IBC, IPC, IMC, IECC, IRC, & IEBC) AS PUBLISHED BY THE ICC AND THE NATIONAL ELECTRICAL CODE AS PUBLISHED BY THE NFPA FOR IN DEPTH DETAILS ON BUILDING IN ACCORDANCE WITH CITY BUILDING REGULATIONS

IBC	INTERNATIONAL BUILDING CODE
IPC	INTERNATIONAL PLUMBING CODE
IMC	INTERNATIONAL MECHANICAL CODE
IECC	INTERNATIONAL ENERGY CONSERVATION CODE
IRC	INTERNATIONAL RESIDENTIAL CODE
IEBC	INTERNATIONAL EXISTING BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NEC	NATIONAL ELECTRICAL CODE

FABRICATION AND MATERIALS SUPPLIED AND INSTALLED SHALL CONFORM TO ALL APPLICABLE LOCAL, STATE & NATIONAL BUILDING CODES, INCLUDING ENERGY CODES, LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

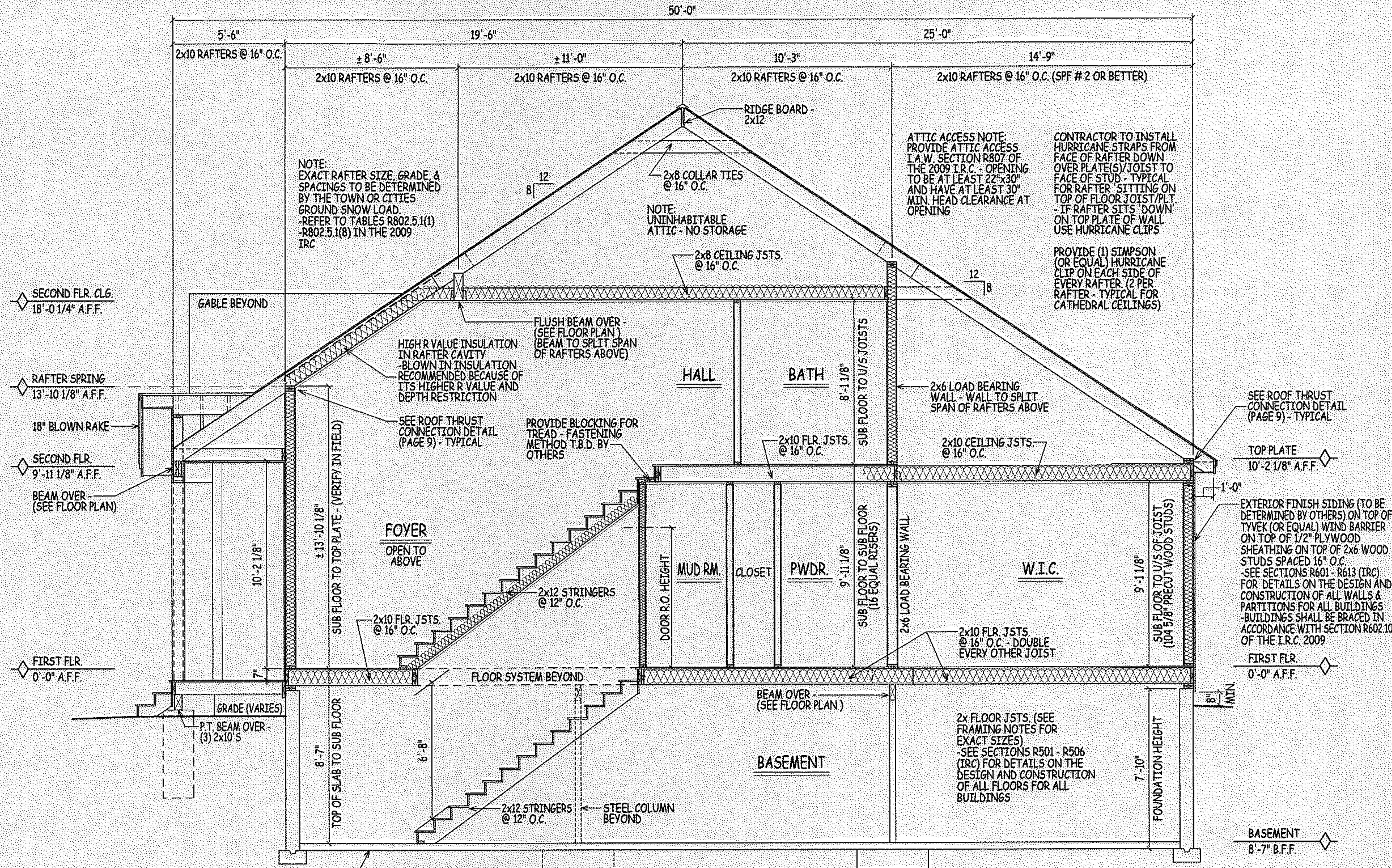
ENERGY EFFICIENCY NOTE:
COMPLIANCE SHALL BE DEMONSTRATED BY EITHER MEETING THE REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE 2009 OR MEETING THE REQUIREMENTS OF CHAPTER 11 IN THE 2009 INTERNATIONAL RESIDENTIAL CODE

ALL ENGINEERED STEEL/WOOD BEAMS TO BE CHECKED AND VERIFIED FOR LOCATION AND SPAN PRIOR TO START OF CONSTRUCTION BY CONTRACTOR AND OR BEAM MANUFACTURER (TYPICAL)

THE CONTRACTOR IS TO ENSURING WINDOWS MEET PREVAILING BUILDING AND LIFESAFETY CODES FOR MINIMUM EGRESS CLEAR OPENING HEIGHT, WIDTH, AND AREA - THE CONTRACTOR WILL ADJUST WINDOW SCHEDULE ACCORDINGLY.

REFER TO SECTIONS R612.2 FOR WINDOW SILL HEIGHT ABOVE GROUND (OR SURFACE BELOW) AND TO SECTION 310 FOR EGRESS WINDOWS & BASEMENTS PRIOR TO PLACING WINDOW ORDER

REFER TO SECTION 311 FOR MEANS OF EGRESS PRIOR TO ORDERING DOORS



CROSS SECTION B/6a

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

ROOF CONSTRUCTION:

VERIFY RIDGE BOARD SIZE IN FIELD (LENGTH TO EXCEED PLUM CUT OF RAFTER)

2 x 10	RAFTERS @ 16" O.C. (U.N.O.)
2 x 8	COLLAR TIES @ 16" O.C.
2 x 8	CEILING JOISTS @ 16"

235# ASPHALT SHINGLES ON 15# BUILDING PAPER ON 5/8" PLYWOOD SHEATHING

ICE & WEATHER SHIELD AT RAFTER TAILS & VALLEYS

EAVE/RAKE: METAL DRIP EDGE
1x4 PINE BLOCKING (SUB-FASCIA)
1x8 PINE BD. FASCIA
3/8" AC EXT. GD. PLYWD SOFFIT W/2" CONT. LOUVERED VENT (SOFFIT ONLY)

EXTERIOR WALL CONSTRUCTION:

2 x 6	WOOD STUDS @ 16" O.C. W/TYVEK (OR EQUAL) WIND BARRIER AND 1/2" PLYWD.
2 x 6	DOUBLE TOP PLATE
2 x 6	SINGLE BOTTOM PLATE

INTERIOR CONSTRUCTION:

2 x 4	WOOD STUDS @ 16" O.C.
2 x 4	DOUBLE TOP PLATE (LD. BRG. ONLY)
2 x 4	SINGLE BOTTOM PLATE
WALL-	1/2" GYPSUM WALL BOARD EA. SIDE STUD - MOISTURE-RESISTANT / FIRE-RATED WHERE REQUIRED
CLG.-	1/2" G.W.B. ON 1x3 WOOD STRAPPING @ 16"O.C.- MOISTURE-RESISTANT / FIRE-RATED WHERE REQUIRED

2x12 STAIR STRINGERS @ 12" O.C.

FLOOR CONSTRUCTION:

2x10 FLOOR JOISTS @ 16" O.C. WITH 3/4" TONGUE & GROOVE PLYWD. GLUED & NAILED (TYP. U.O.N.)

BUILT-UP BEAMS SIZED BY CONTRACTOR

FOUNDATION CONSTRUCTION:

8" CONCRETE FOUNDATION WALL WITH DBL. 2x6 P.T. SILL WITH SILL SEAL

8" CONC. FROST WALLS (WHERE SHOWN) TO 48" BELOW GD.

CONTINUOUS CONCRETE FOOTING - SIZE BY OTHERS

REFER TO SECTION R404.1.2.2 FOR HORIZONTAL AND VERTICAL REINFORCEMENT FOR FOUNDATION WALLS

PROVIDE MATCHING CORNER DOWELS LAP 50 BAR DIAMETERS (TYPICAL)

PROVIDE 3 1/2" DIA. STEEL COLUMNS OVER CONCRETE FOOTINGS AS REQ'D FOR BEAMS SHOWN ON PLAN

INSULATION

WALLS:	R-20 CAVITY INSULATION OR R-13 PLUS R-5
FLOOR:	R-30 OR INSULATION SUFFICIENT TO FILL JOIST CAVITY
CEILING:	R-38 (ZONE 5) OR R-49 (ZONE 6) - HOWEVER, IF MAINTAINING THE FULL R VALUE OVER THE PLATES (RAISED) R-30 (ZONE 5) OR R-38 (ZONE 6)

NOTE:
THESE SECTIONS TO BE USED WITH FLOOR PLANS SHEET 2a, 3a & 4a.

FSM DRAWINGS
27 Lowell Street Suite 503
Manchester, New Hampshire 03101
T|603.836.5060 info@fsmdrawings.com
F|603.836.5061 www.fsmdrawings.com

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

6a

GENERAL NOTES:

SEE SECTIONS R401 - R408 (IRC) FOR DETAILS ON THE DESIGN AND CONSTRUCTION OF THE FOUNDATION AND FOUNDATION SPACES FOR ALL BUILDINGS
-FOUNDATION WALLS SHALL BE CONSTRUCTED AS SET FORTH IN TABLES R404.1.1(1) - R404.1.1(4) AND SHALL ALSO COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS R606 - R608
-FOUNDATION CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS ACCORDING TO SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING SOIL.

CONCRETE FOOTINGS SHALL BE OF SUFFICIENT DESIGN TO ACCOMMODATE ALL LOADS ACCORDING TO SECTION R301
-FOOTINGS SHALL BE SUPPORTED ON UNDISTURBED NATURAL SOILS OR ENGINEERED FILL
-SEE TABLE R401.4.1 FOR PRESUMPTIVE LOAD BEARING VALUES OF FOUNDATION MATERIALS
-MINIMUM SIZES FOR CONCRETE AND MASONRY FOOTINGS SHALL BE AS SET FORTH IN TABLE R403.1 AND FIGURE R403.1(1)

THE LOAD BEARING VALUE OF THE SOIL IN ACCORDANCE WITH TABLE R401.4.1

CONTRACTOR TO PROVIDE ADEQUATE VAPOR BARRIERS UNDER ALL CONCRETE SLABS

CONTRACTOR TO PROVIDE ADEQUATE HEADERS OVER ALL WINDOWS AND DOORS ON EXTERIOR LOAD-BEARING WALLS (TYP.)

LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

DOUBLE UP FLOOR JOISTS @ LOCATIONS OF NON-LOAD BEARING WALLS AND UNDER ALL BATHROOMS (I.E. BATHING TUBS/WHIRLPOOLS), KITCHENS, LAUNDRY ROOMS, ETC. (TYPICAL)

CONTRACTOR TO PROVIDE ADEQUATE BLOCKING AND BRIDGING BETWEEN FLOOR JOISTS AS REQUIRED (TYPICAL)

NOTE:
SEE THE NEW HAMPSHIRE BUILDING CODE (IBC, IPC, IMC, IECC, IRC, & IEBC) AS PUBLISHED BY THE ICC AND THE NATIONAL ELECTRICAL CODE AS PUBLISHED BY THE NFPA FOR IN DEPTH DETAILS ON BUILDING IN ACCORDANCE WITH CITY BUILDING REGULATIONS

IBC INTERNATIONAL BUILDING CODE
IPC INTERNATIONAL PLUMBING CODE
IMC INTERNATIONAL MECHANICAL CODE
IECC INTERNATIONAL ENERGY CONSERVATION CODE
IRC INTERNATIONAL RESIDENTIAL CODE
IEBC INTERNATIONAL EXISTING BUILDING CODE
ICC INTERNATIONAL CODE COUNCIL
NFPA NATIONAL FIRE PROTECTION ASSOCIATION
NEC NATIONAL ELECTRICAL CODE

FABRICATION AND MATERIALS SUPPLIED AND INSTALLED SHALL CONFORM TO ALL APPLICABLE LOCAL, STATE & NATIONAL BUILDING CODES, INCLUDING ENERGY CODES, LIFE SAFETY CODES, AND WHERE APPLICABLE THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

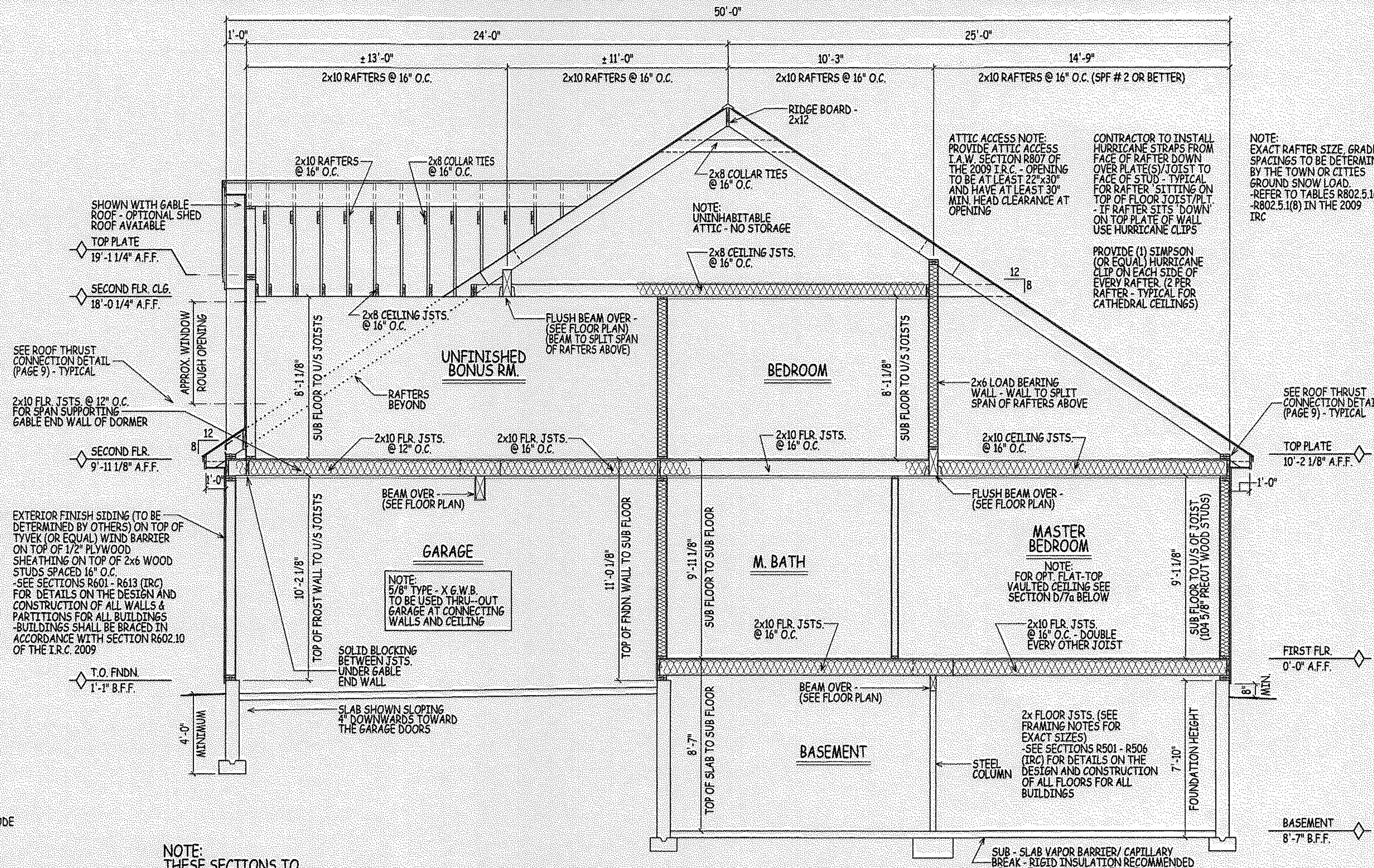
ENERGY EFFICIENCY NOTE:
COMPLIANCE SHALL BE DEMONSTRATED BY EITHER MEETING THE REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE 2009 OR MEETING THE REQUIREMENTS OF CHAPTER 11 IN THE 2009 INTERNATIONAL RESIDENTIAL CODE

ALL ENGINEERED STEEL/WOOD BEAMS TO BE CHECKED AND VERIFIED FOR LOCATION AND SPAN PRIOR TO START OF CONSTRUCTION BY CONTRACTOR AND OR BEAM MANUFACTURER (TYPICAL)

THE CONTRACTOR IS TO ENSURING WINDOWS MEET PREVAILING BUILDING AND LIFESAFETY CODES FOR MINIMUM EGRESS CLEAR OPENING HEIGHT, WIDTH, AND AREA - THE CONTRACTOR WILL ADJUST WINDOW SCHEDULE ACCORDINGLY.

REFER TO SECTIONS R612.2 FOR WINDOW SILL HEIGHT ABOVE GROUND (OR SURFACE BELOW) AND TO SECTION 310 FOR EGRESS WINDOWS & BASEMENTS PRIOR TO PLACING WINDOW ORDER

REFER TO SECTION 311 FOR MEANS OF EGRESS PRIOR TO ORDERING DOORS



NOTE:
THESE SECTIONS TO BE USED WITH FLOOR PLANS SHEET 2a, 3a & 4a.

CROSS SECTION C/7a

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

ROOF CONSTRUCTION:

VERIFY RIDGE BOARD SIZE IN FIELD (LENGTH TO EXCEED PLUM CUT OF RAFTER)

2 x 10	RAFTERS @ 16" O.C. (U.N.O.)
2 x 8	COLLAR TIES @ 16" O.C.
2 x 8	CEILING JOISTS @ 16"

235# ASPHALT SHINGLES ON 15# BUILDING PAPER ON 5/8" PLYWOOD SHEATHING

ICE & WEATHER SHIELD AT RAFTER TAILS & VALLEYS

EAVE/RAKE: METAL DRIP EDGE
1x4 PINE BLOCKING (SUB-FASCIA)
1x8 PINE BD. FASCIA
3/8" AC EXT. GD. PLYWD SOFFIT W/2" CONT. LOUVERED VENT (SOFFIT ONLY)

EXTERIOR WALL CONSTRUCTION:

2 x 6	WOOD STUDS @ 16" O.C. W/TYVEK (OR EQUAL) WIND BARRIER AND 1/2" PLYWD.
2 x 6	DOUBLE TOP PLATE
2 x 6	SINGLE BOTTOM PLATE

INTERIOR CONSTRUCTION:

2 x 4	WOOD STUDS @ 16" O.C.
2 x 4	DOUBLE TOP PLATE (LD. BRG. ONLY)
2 x 4	SINGLE BOTTOM PLATE
WALL-	1/2" GYPSUM WALL BOARD EA. SIDE STUD - MOISTURE-RESISTANT / FIRE-RATED WHERE REQUIRED
CLG.-	1/2" G.W.B. ON 1x3 WOOD STRAPPING @ 16"O.C.- MOISTURE-RESISTANT / FIRE-RATED WHERE REQUIRED

2x12 STAIR STRINGERS @ 12" O.C.

FLOOR CONSTRUCTION:

2x10 FLOOR JOISTS @ 16" O.C. WITH 3/4" TONGUE & GROOVE PLYWD. GLUED & NAILED (TYP. U.O.N.)

BUILT-UP BEAMS SIZED BY CONTRACTOR

FOUNDATION CONSTRUCTION:

8" CONCRETE FOUNDATION WALL WITH DBL. 2x6 P.T. SILL WITH SILL SEAL

8" CONC. FROST WALLS (WHERE SHOWN) TO 48" BELOW GD.

CONTINUOUS CONCRETE FOOTING - SIZE BY OTHERS

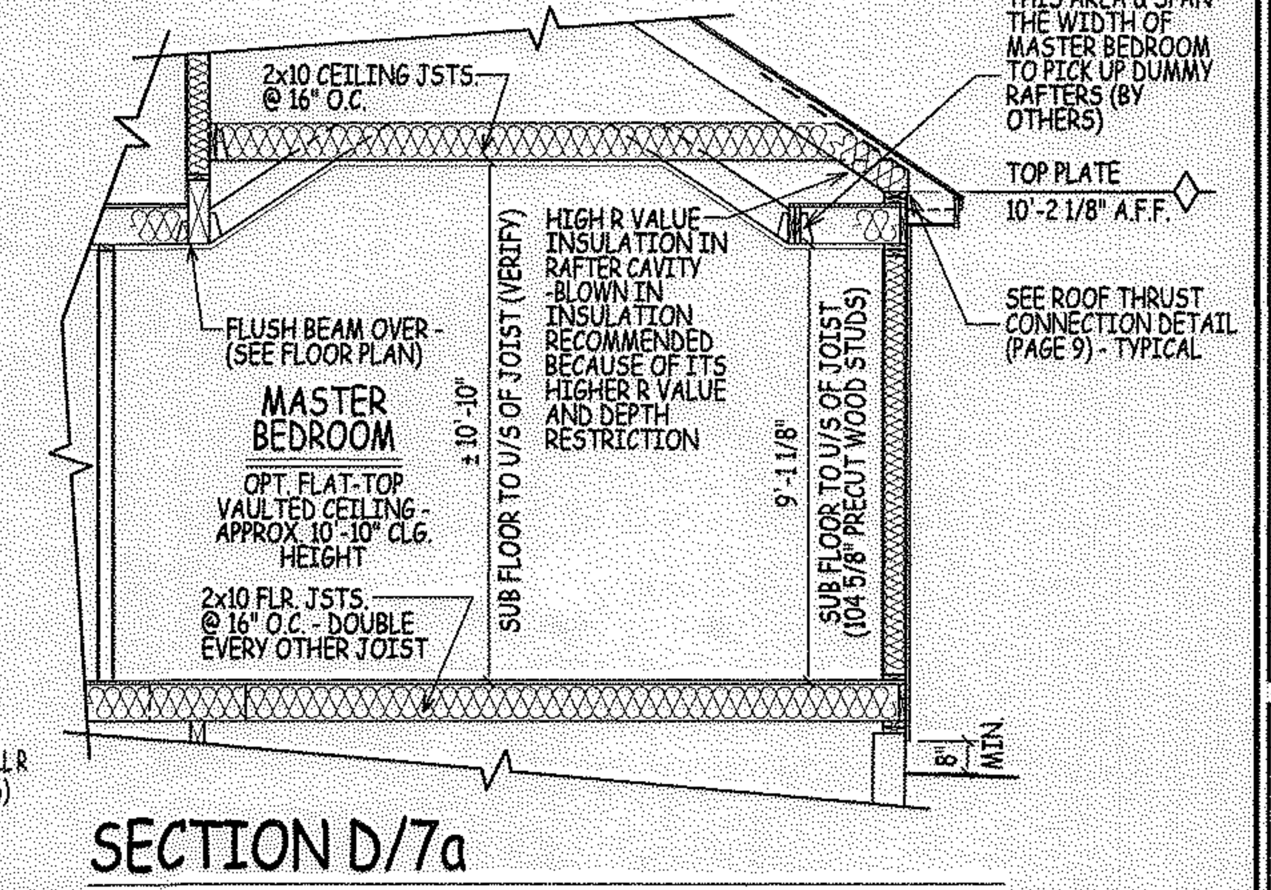
REFER TO SECTION R404.1.2.2 FOR HORIZONTAL AND VERTICAL REINFORCEMENT FOR FOUNDATION WALLS

PROVIDE MATCHING CORNER DOWELS LAP 50 BAR DIAMETERS (TYPICAL)

PROVIDE 3 1/2" DIA. STEEL COLUMNS OVER CONCRETE FOOTINGS AS REQ'D FOR BEAMS SHOWN ON PLAN

INSULATION

WALLS:	R-20 CAVITY INSULATION OR R-13 PLUS R-5
FLOOR:	R-30 OR INSULATION SUFFICIENT TO FILL JOIST CAVITY
CEILING:	R-38 (ZONE 5) OR R-49 (ZONE 6) - HOWEVER, IF MAINTAINING THE FULL R VALUE OVER THE PLATES (RAISED) R-30 (ZONE 5) OR R-38 (ZONE 6)



SECTION D/7a

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

ADMISSION OF ERROR, OMISSION AND/OR OVERSIGHT:
WHILE IT IS OUR INTENT TO DELIVER OUR SERVICES FREE OF ERROR, OMISSION OR OVERSIGHT, WE WILL ADMIT TO BE HUMAN. IN USING THESE DRAWINGS, IT IS AGREED THAT AS THE DRAFTING COMPANY WILL RELY ON THE EXPERIENCED CONTRACTOR USING THESE PLANS TO THOROUGHLY REVIEW THEM FOR ERRORS, OMISSIONS AND/OR OVERSIGHTS. IF ANY ARE FOUND, THE CONTRACTOR USING THESE PLANS ASSUMES ALL RESPONSIBILITY FOR THEM AND WILL IF HE/SHE DEEMS NECESSARY HIRE A LICENSED PROFESSIONAL ENGINEER TO ASSIST IN THE REVIEW.

FSM DRAWINGS

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

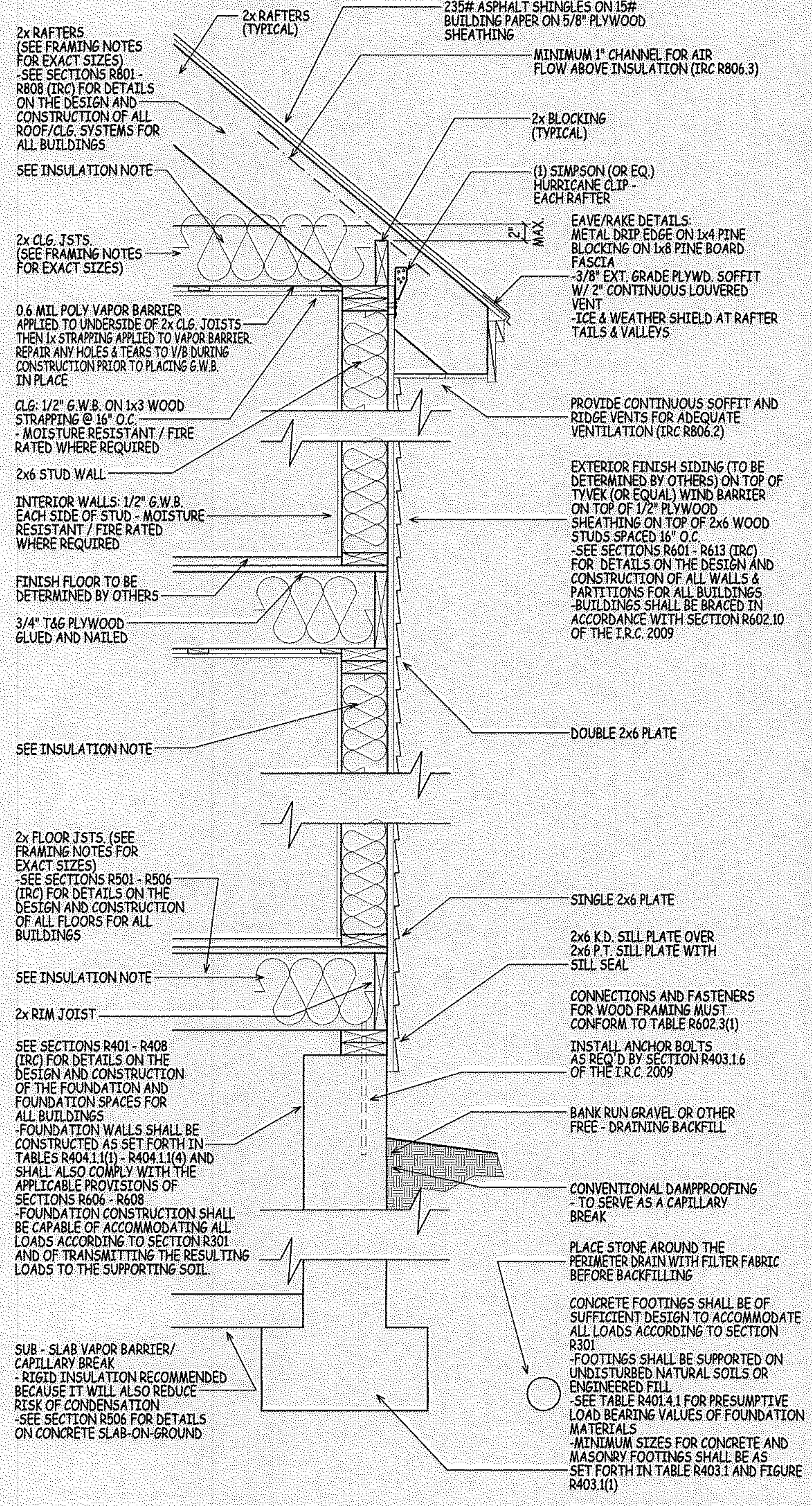
PREPARED FOR: GREEN & CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO:	FSM17-206CA

REVISIONS

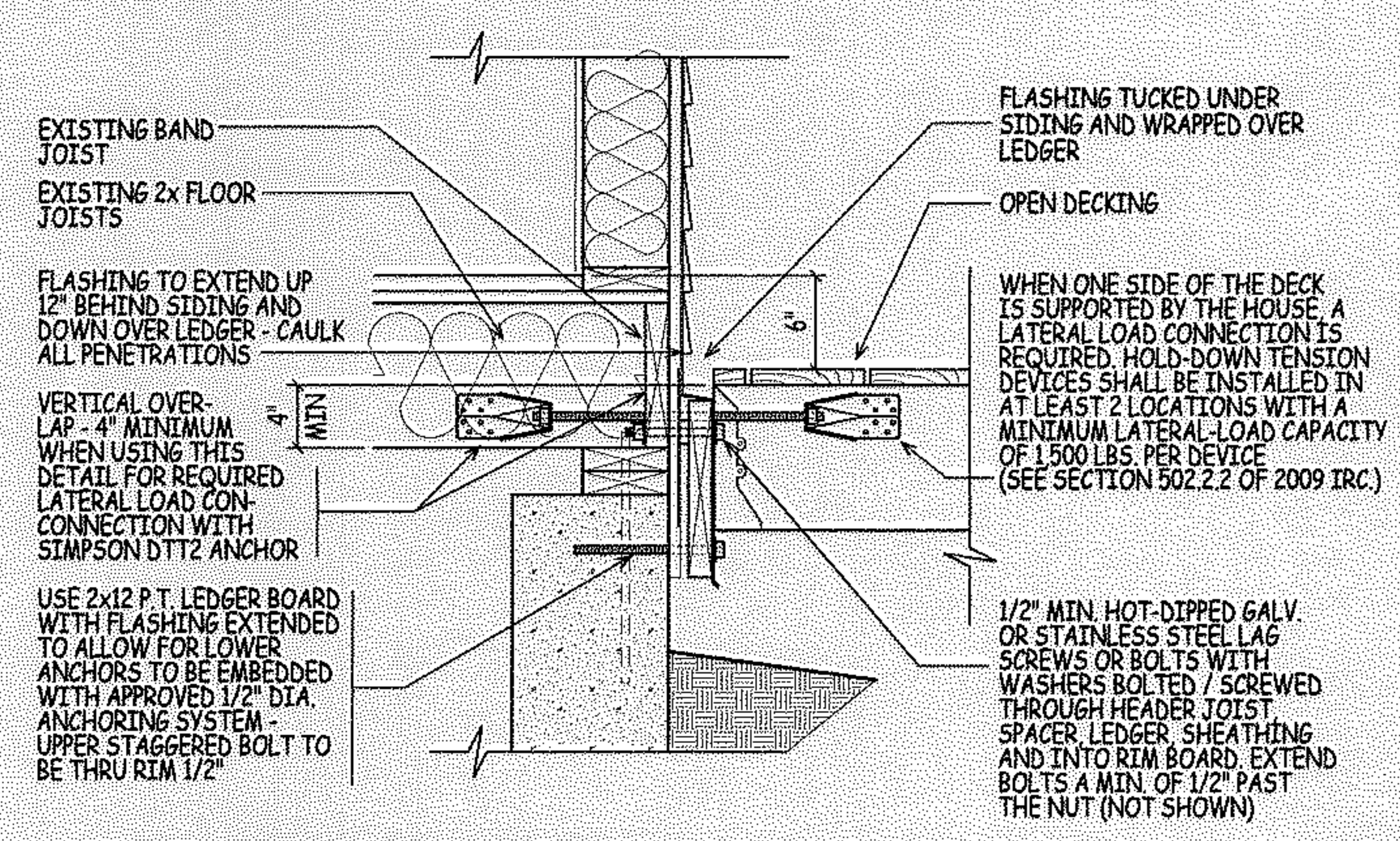
16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

7a



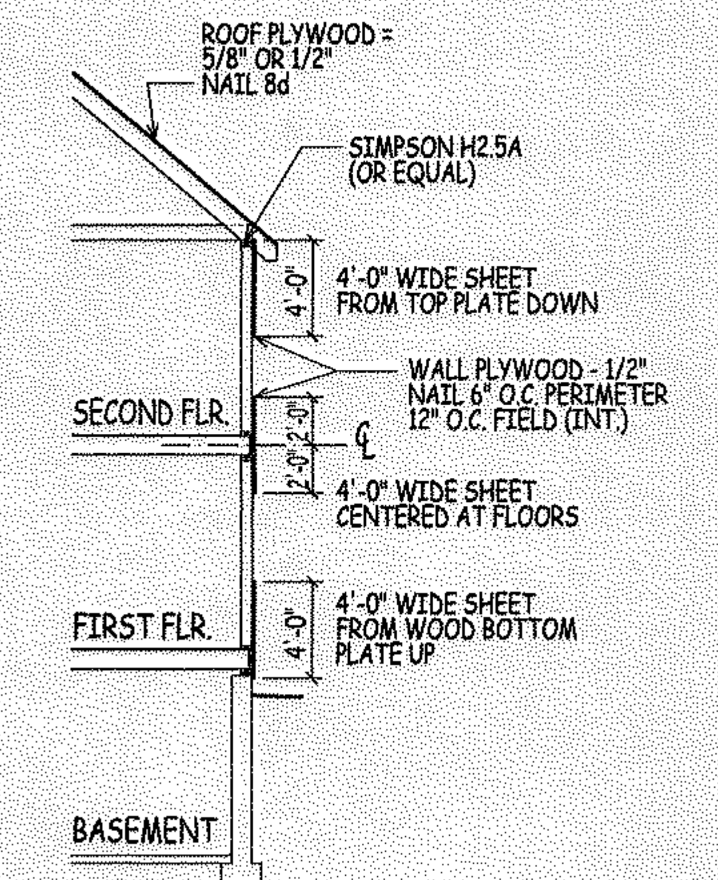
TYPICAL WALL SECTION

SCALE: 1" = 1'-0"



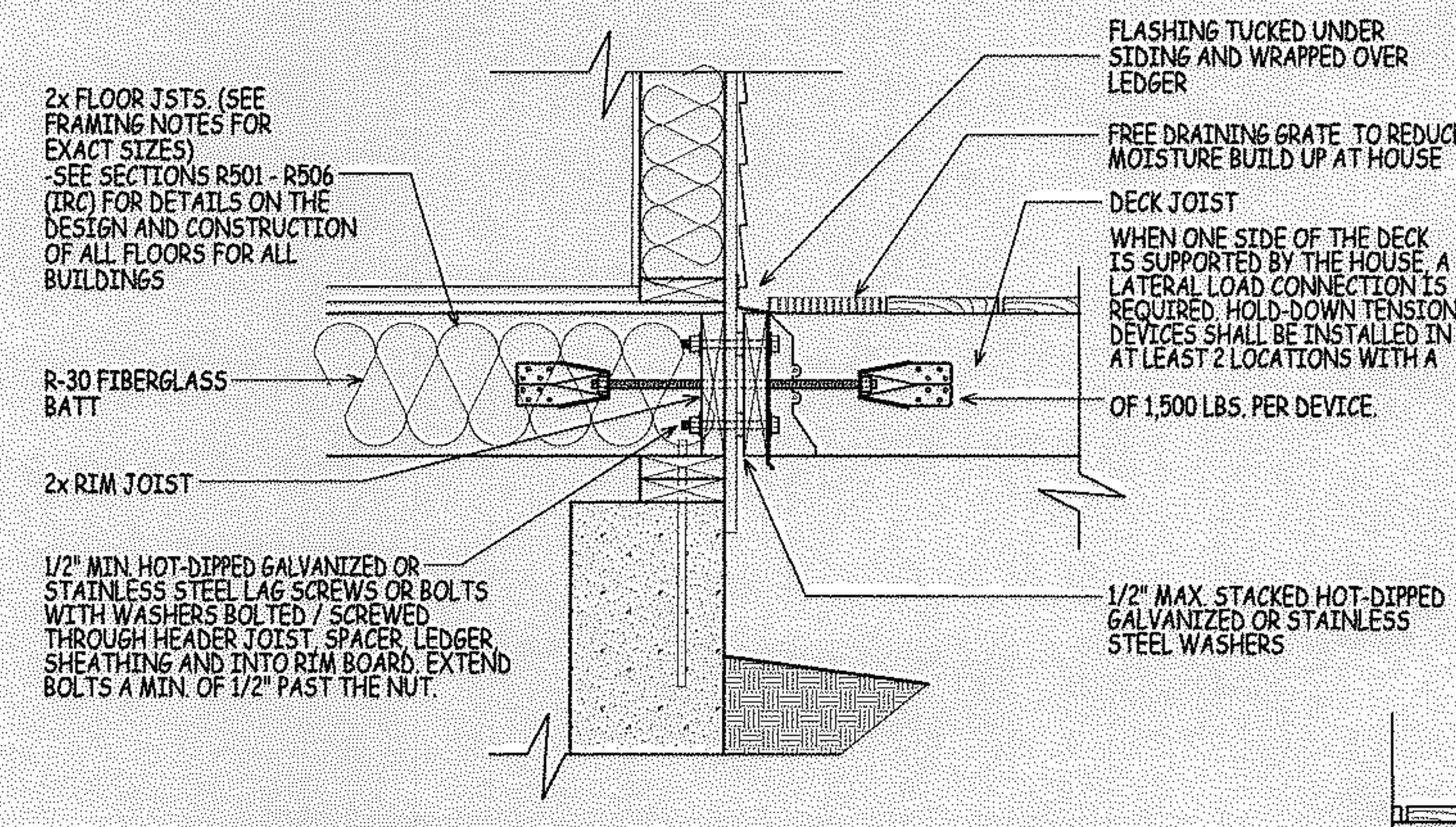
DECK DETAIL - STEP DN. OPTION CONNECTION

SCALE: 1" = 1'-0"



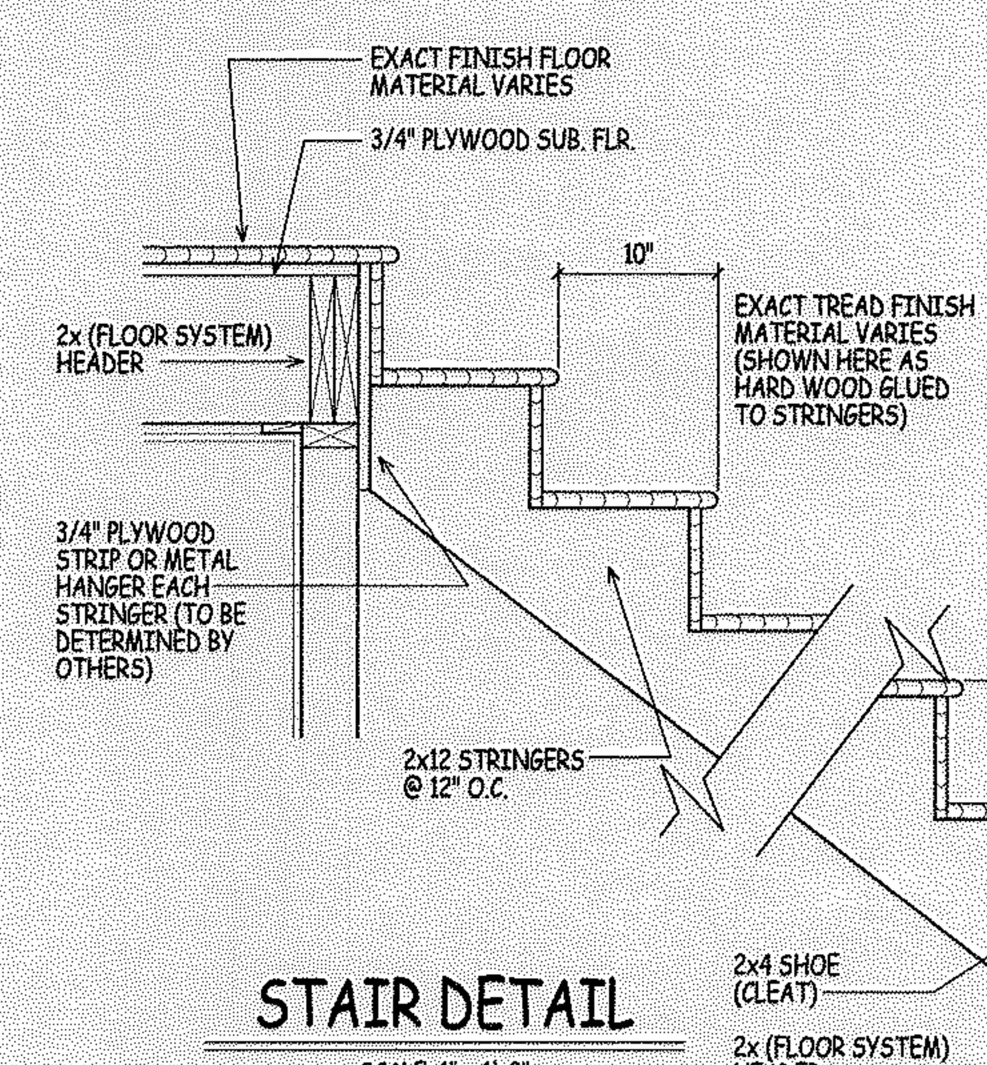
PLYWOOD LAP DETAIL

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



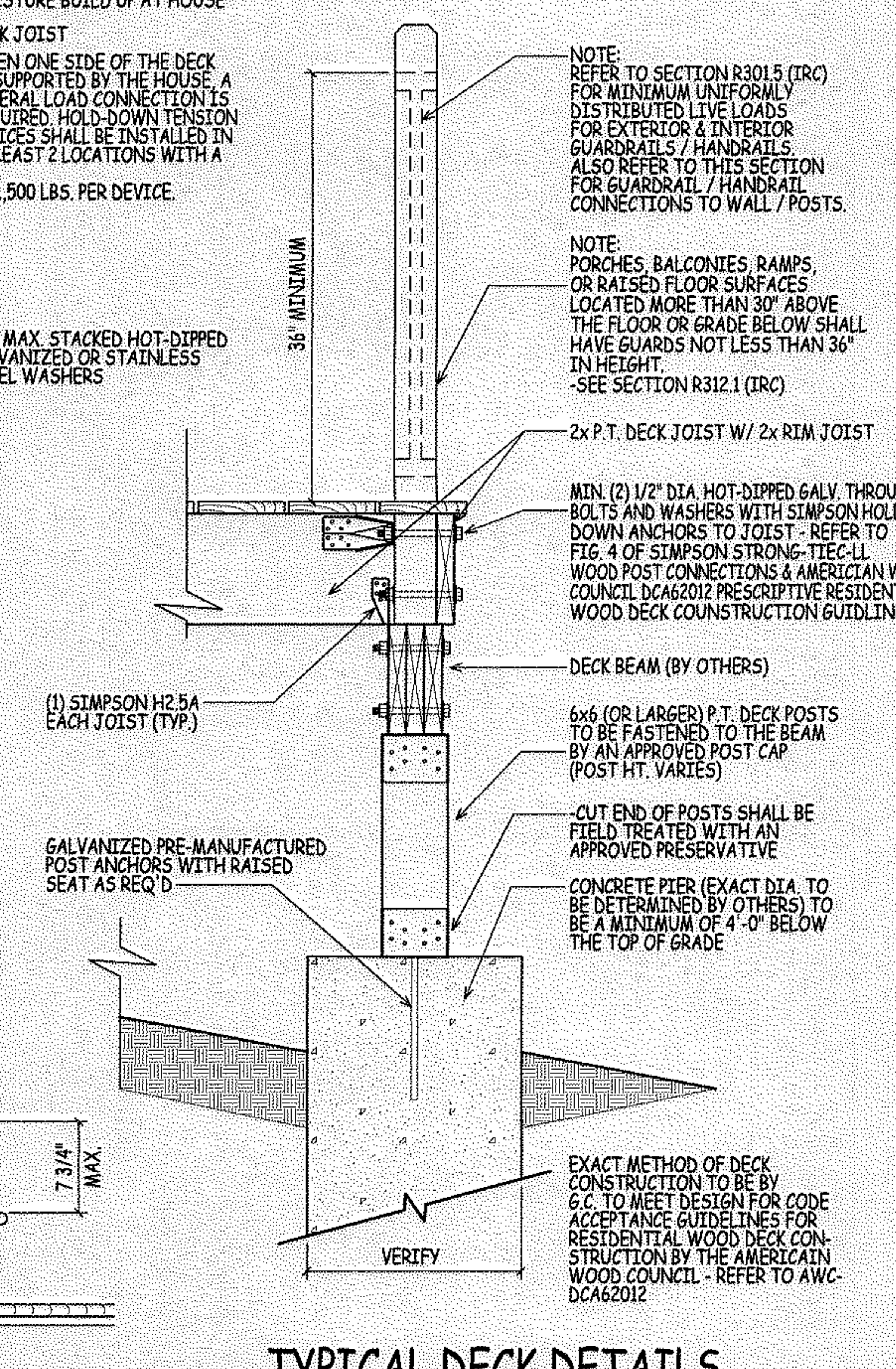
DECK DETAIL - NO STEP OPTION CONNECTION

SCALE: 1" = 1'-0"



STAIR DETAIL

SCALE: 1" = 1'-0"



TYPICAL DECK DETAILS

SCALE: 1" = 1'-0"

ADMISSION OF ERROR, OMISSION AND/OR OVERSIGHT:

WHILE IT IS OUR INTENT TO DELIVER OUR SERVICES FREE OF ERROR, OMISSION OR OVERSIGHT, WE WILL ADMIT TO BE HUMAN, AND THEREFORE FSM DRAWINGS LLC, ACTING SOLELY AS THE DRAFTING COMPANY, WILL RELY ON THE EXPERIENCED CONTRACTOR USING THESE PLANS TO THOROUGHLY REVIEW THEM FOR DIMENSIONAL ACCURACY, COMPLETENESS AND APPROPRIATENESS. THE CONTRACTOR USING THESE PLANS ASSUMES ALL RESPONSIBILITY FOR THEM AND WILL IF HE/SHE DEEMS NECESSARY HIRE A LICENSED PROFESSIONAL ENGINEER TO ASSIST IN THE REVIEW.

FSM DRAWINGS

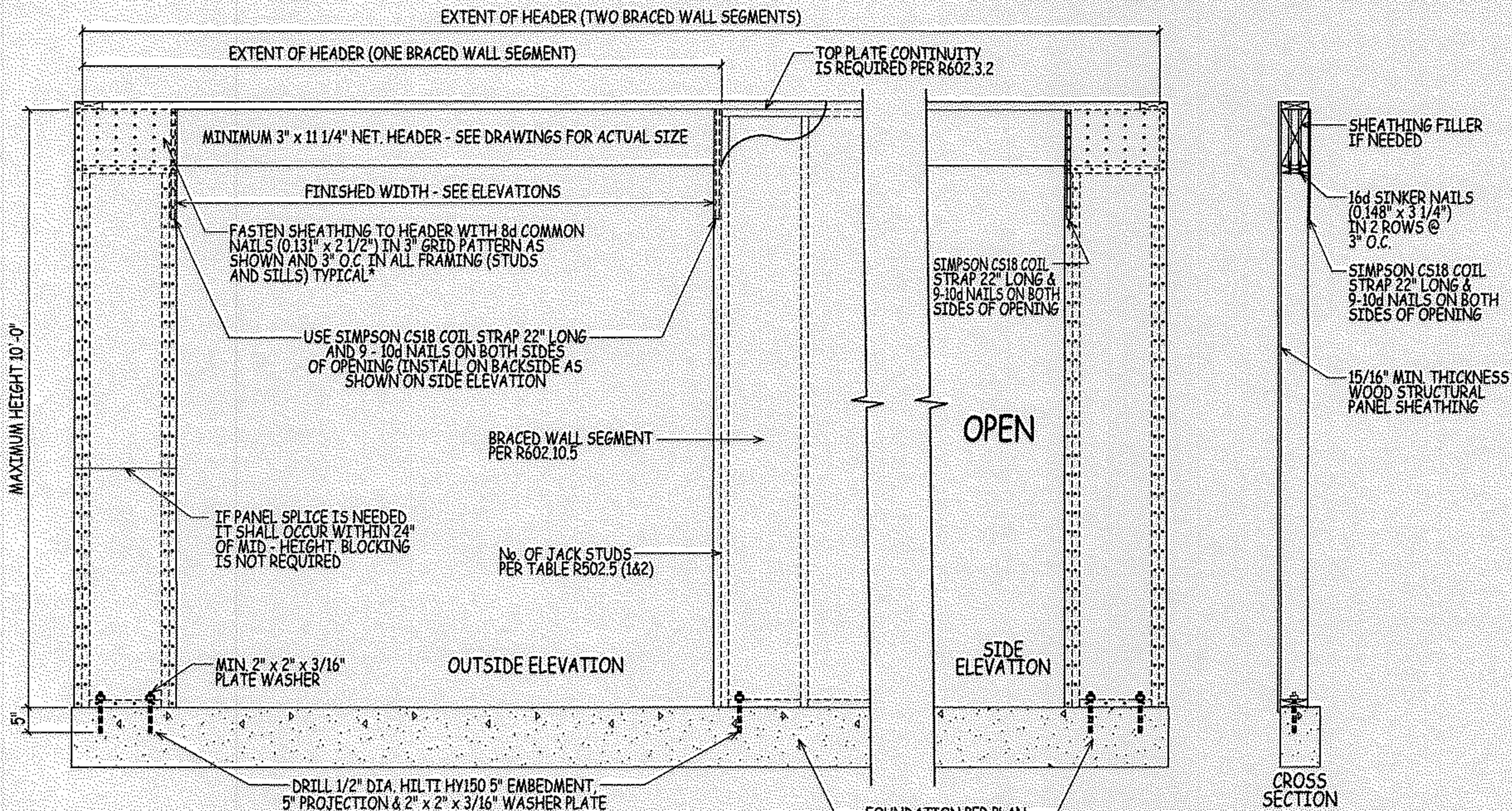
PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

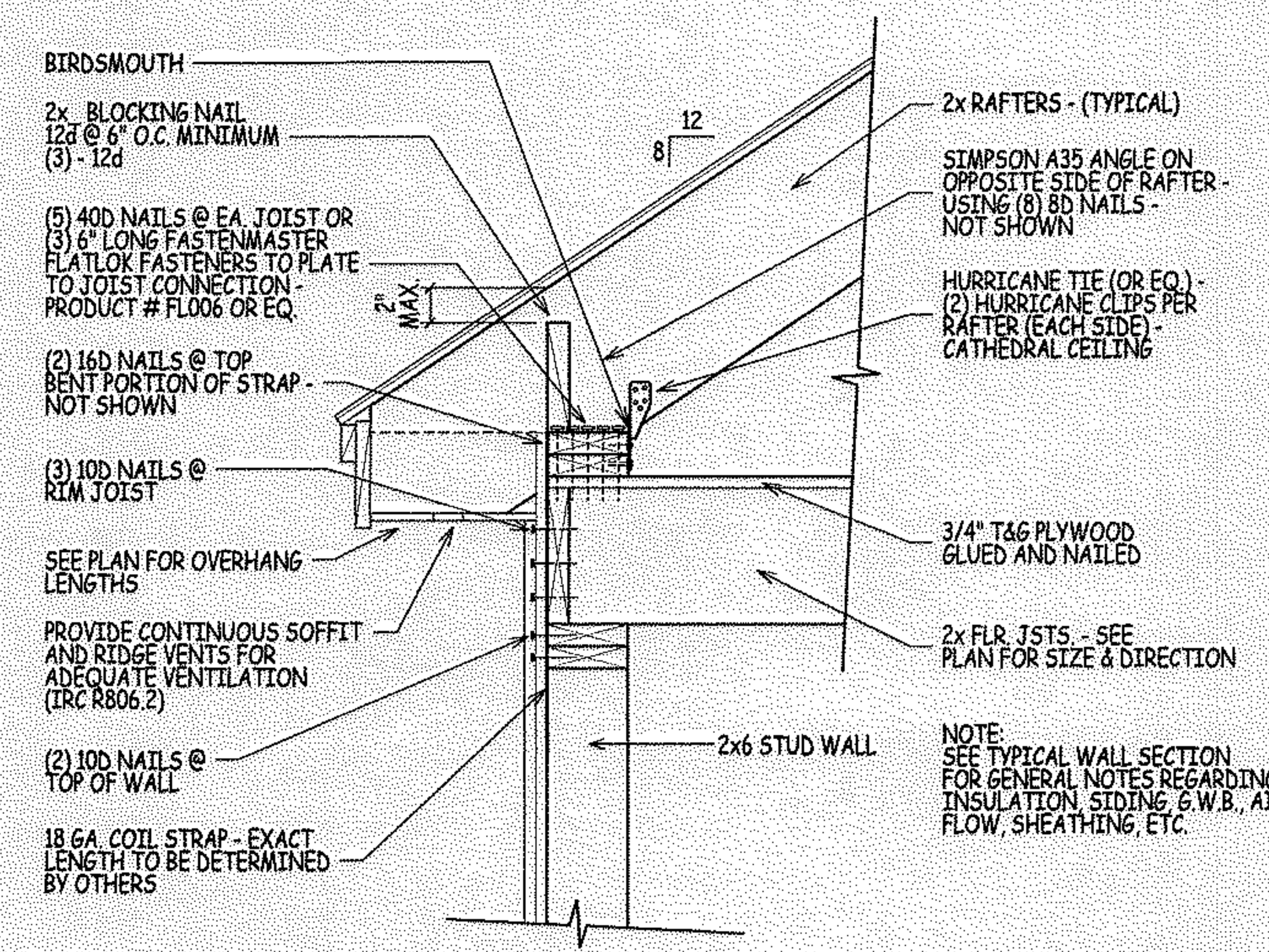


DETAIL AT GARAGE OVERHEAD DOORS

NOT TO SCALE

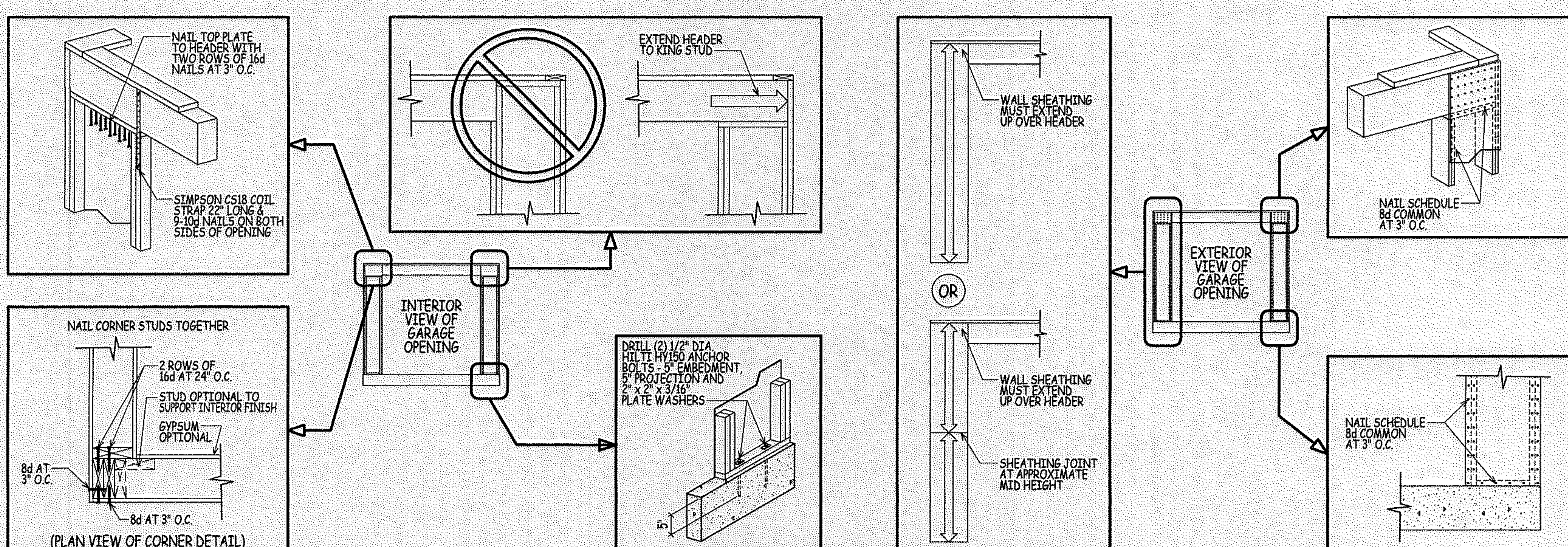
NARROW WALL OVER CONCRETE OR MASONRY BLOCK FOUNDATION

FIGURE R602.10.3.4



ROOF THRUST CONNECTION DETAIL

SCALE: 1" = 1'-0"



APA NARROW WALL BRACING METHOD FRAMING TIPS (FORM F435)

THE APA NARROW WALL BRACING METHOD IS A SIMPLE, SITE - BUILT SOLUTION THAT ALLOWS BUILDERS TO CONSTRUCT SEGMENTS AS NARROW AS 16" NEXT TO WINDOW AND DOOR OPENINGS. BE SURE TO CHECK FOR THESE ESSENTIAL DETAILS WHEN CONSTRUCTING THE APA NARROW WALL BRACING METHOD AROUND GARAGE OPENINGS.

APA PUBLICATION G440 "WHOLE HOUSE BRACING" IS AVAILABLE FOR ADDITIONAL INFORMATION.

FSM DRAWINGS
27 Lowell Street Suite 502
Manchester, New Hampshire 03101
T | 603.856.3860 info@fsmdrawings.com
F | 603.556.5861 www.fsmdrawings.com

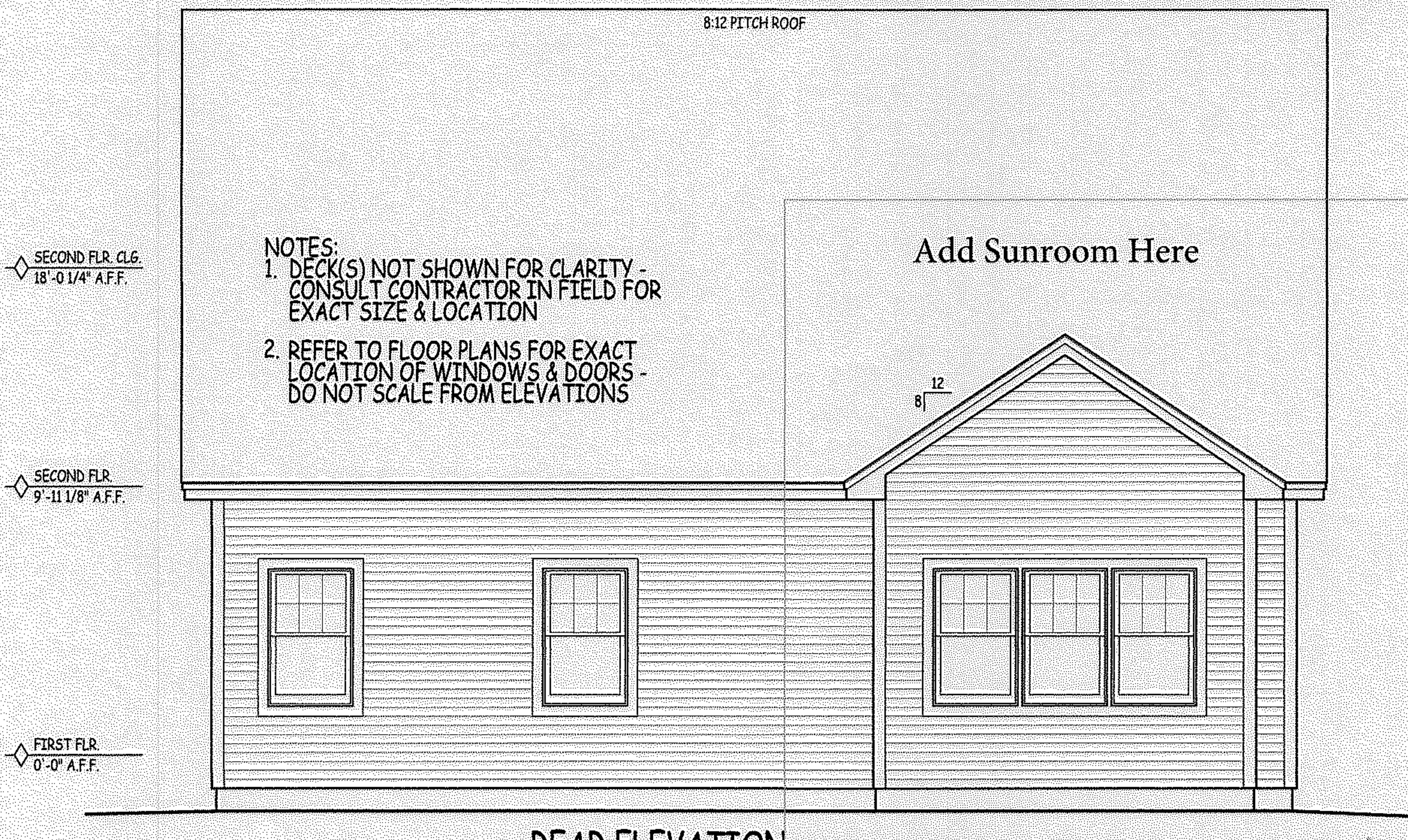
PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

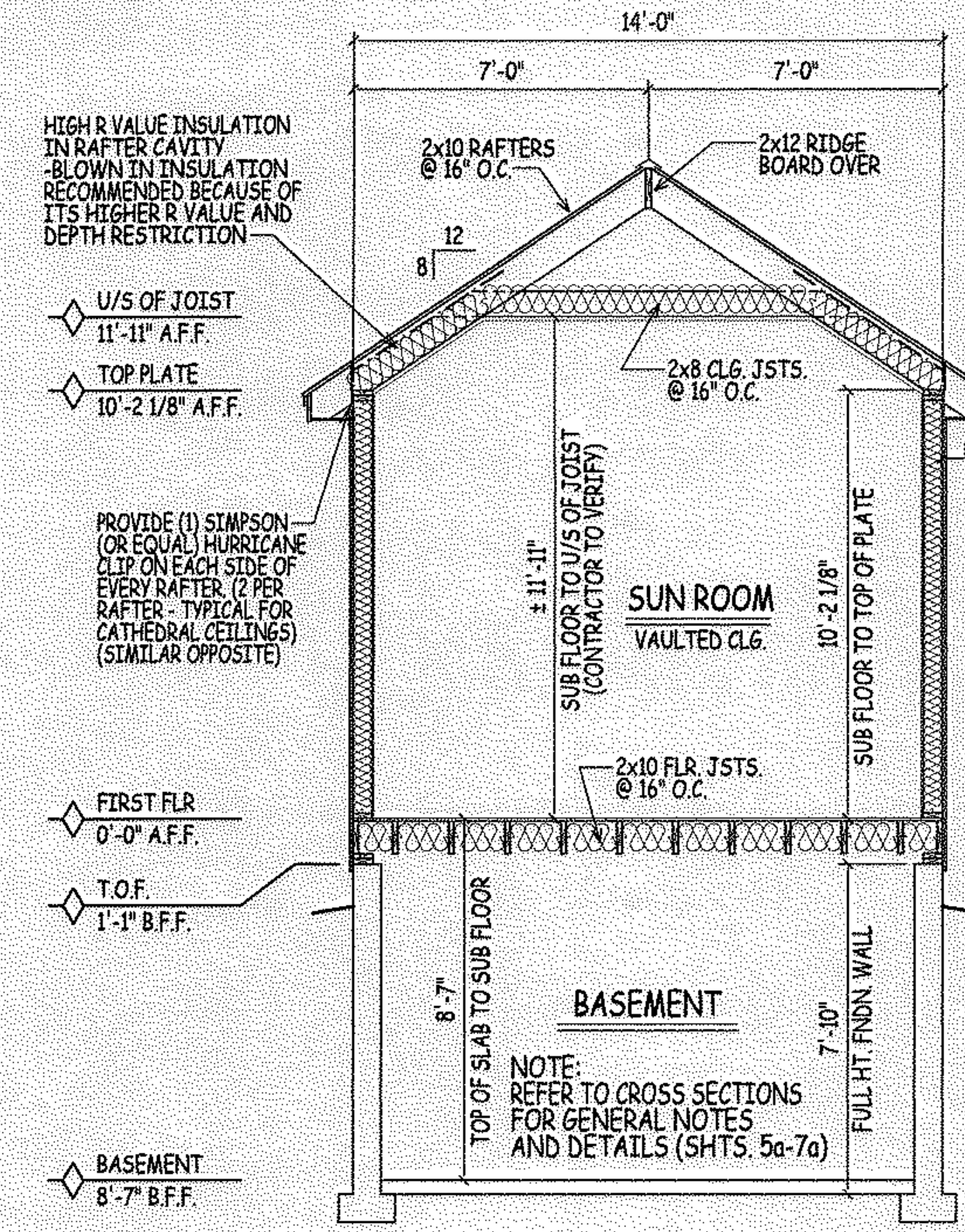
DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

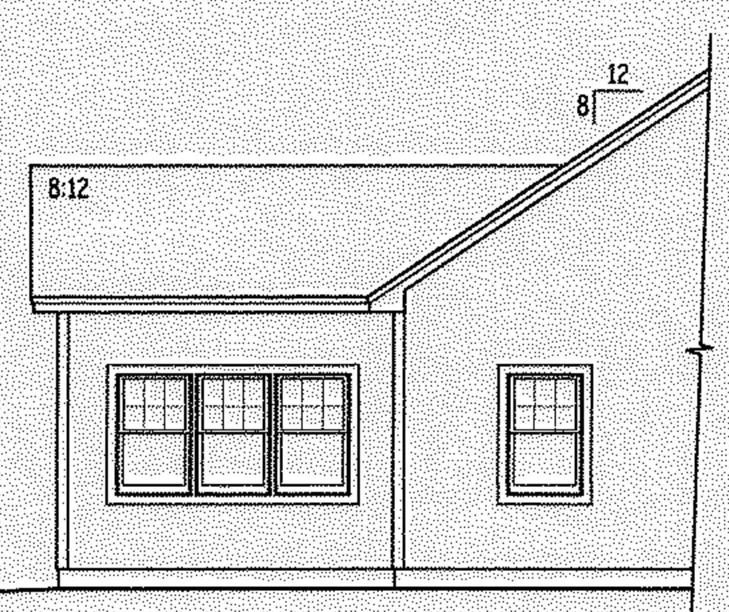
16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP



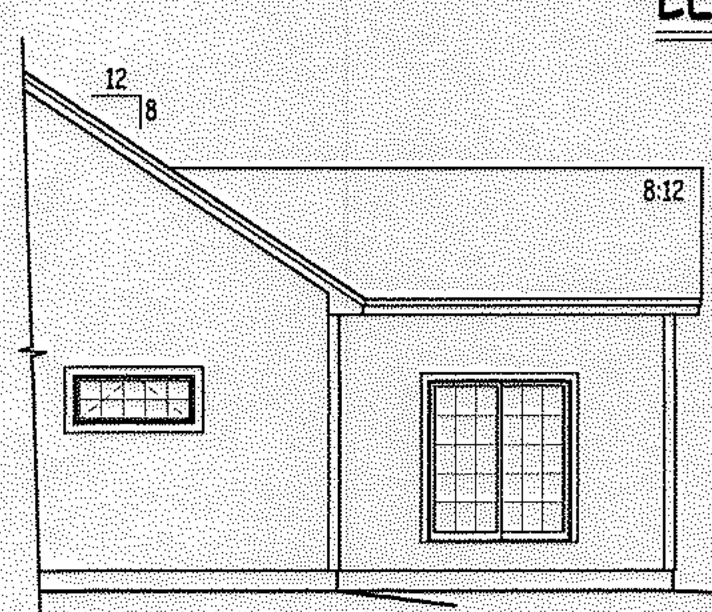
REAR ELEVATION
(SUN ROOM OPTION)
SCALE: 1/4" = 1'-0"



SUN ROOM CROSS SECTION
SCALE: 1/4" = 1'-0"

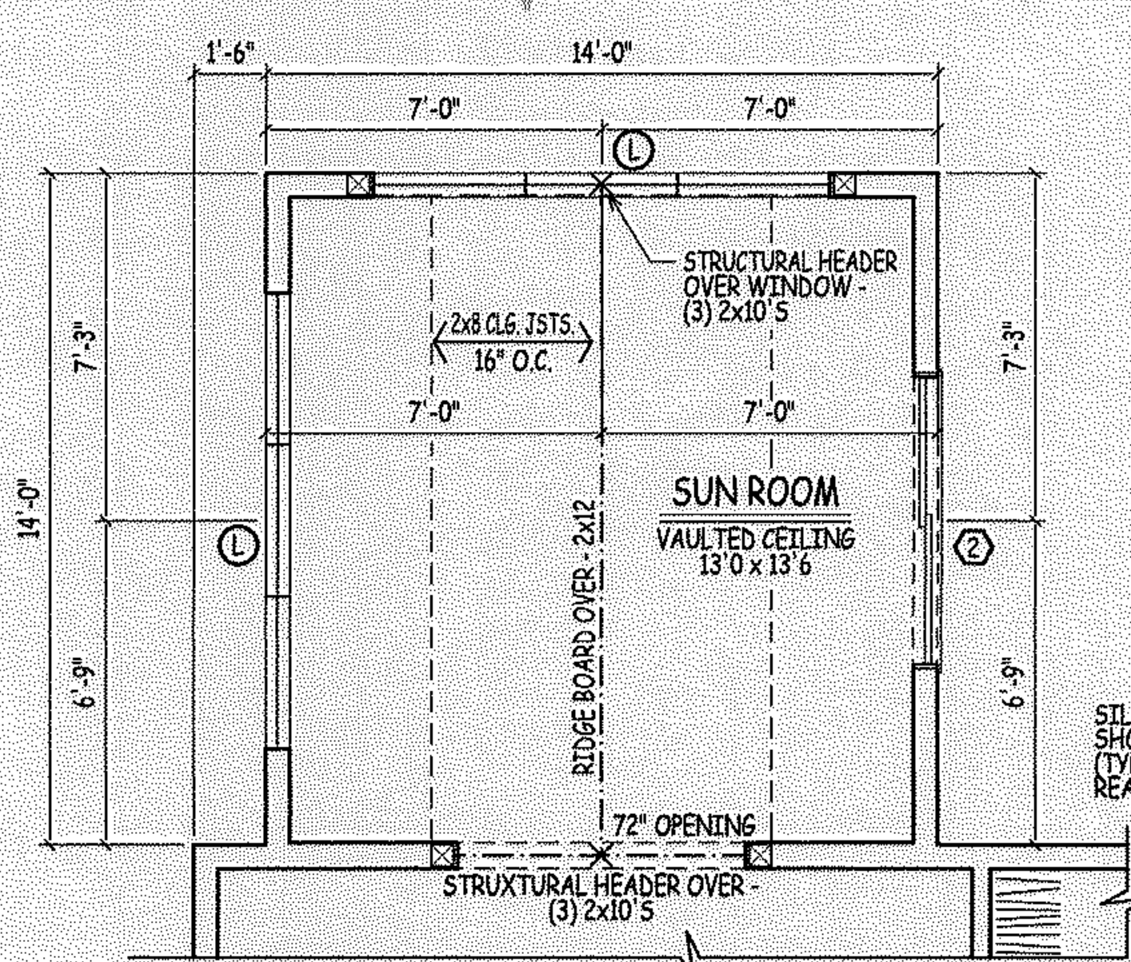


LEFT ELEVATION
SCALE: 1/8" = 1'-0"

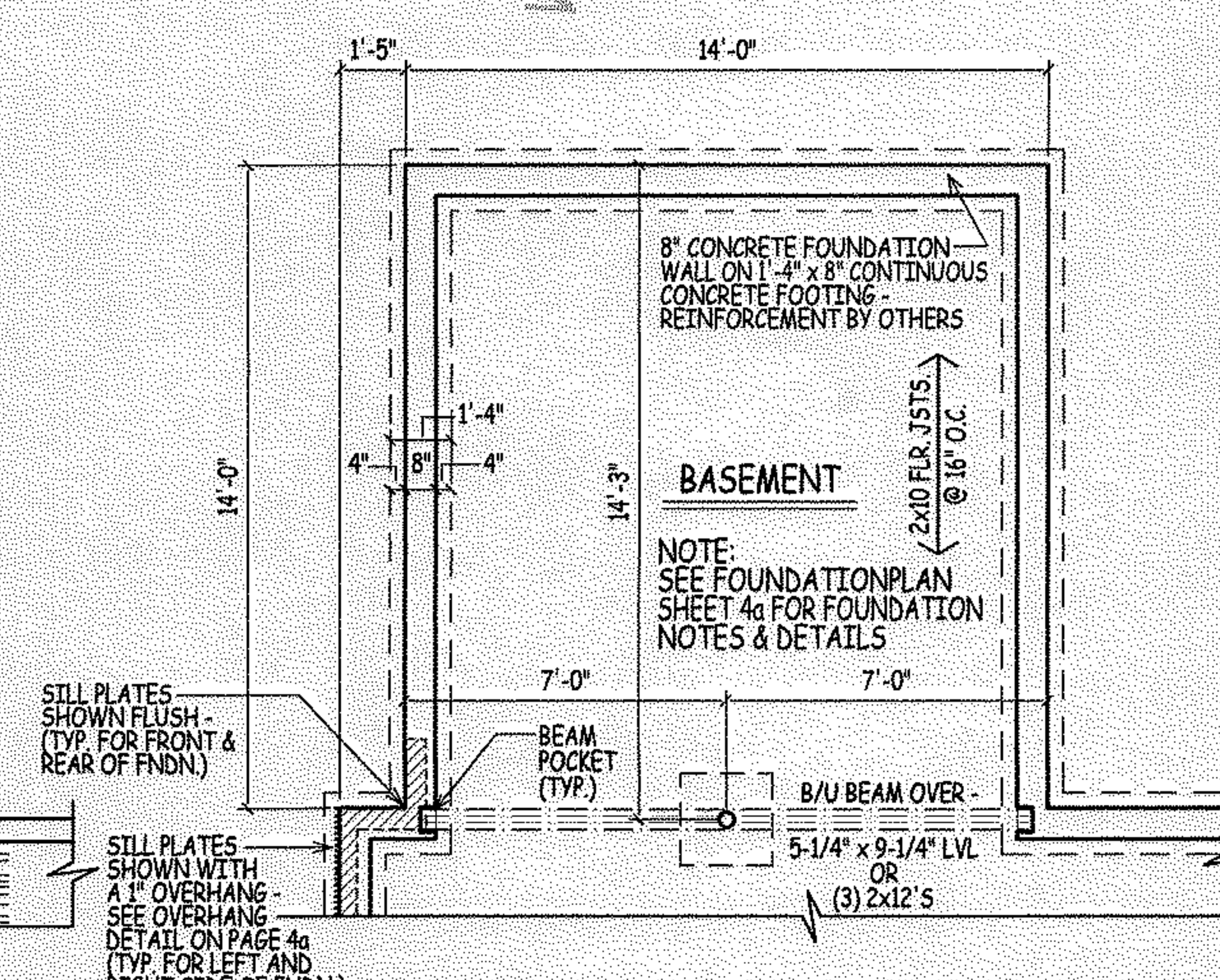


RIGHT ELEVATION
SCALE: 1/8" = 1'-0"

NOTE:
THIS PAGE TO BE USED
WITH SHEETS 1a, 2a, 3a, & 4a



FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"



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

FSM DRAWINGS
27 Lowell Street Suite 302
Manchester, New Hampshire 03101
T| 603.836.5660 info@fsmdrawings.com
F| 603.836.5661 www.fsmdrawings.com

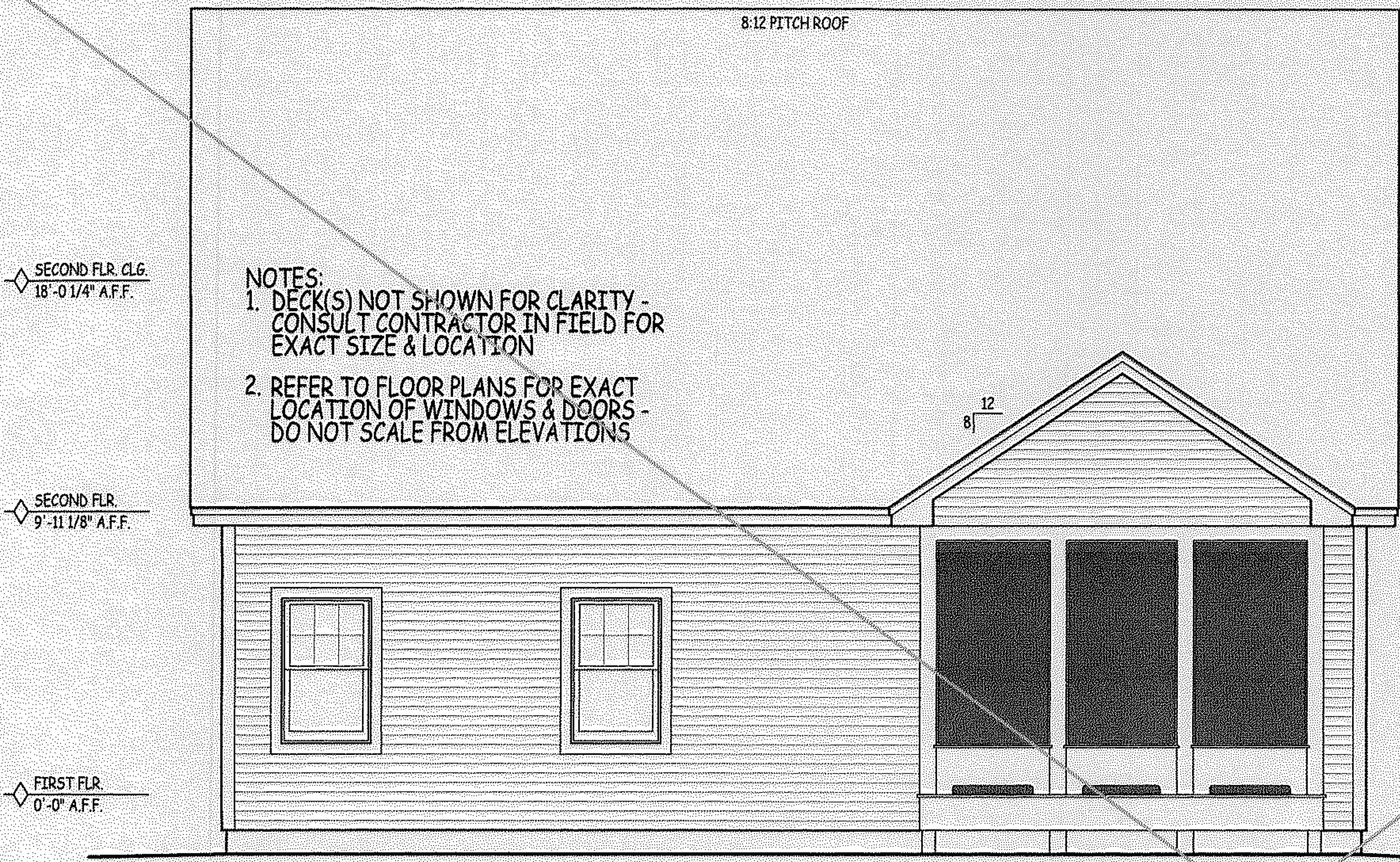
PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

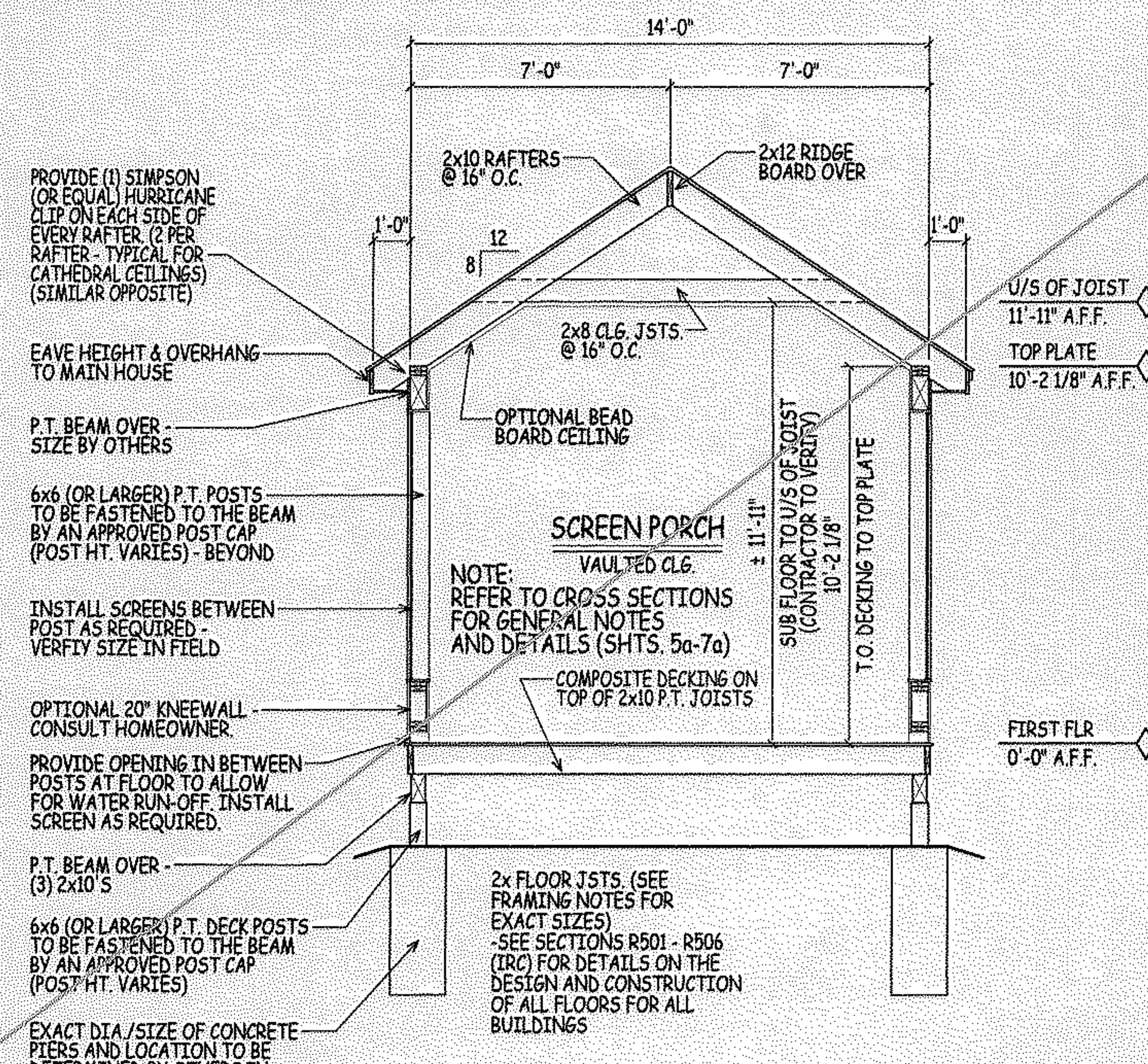
16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP



REAR ELEVATION

(SCREEN ROOM OPTION)

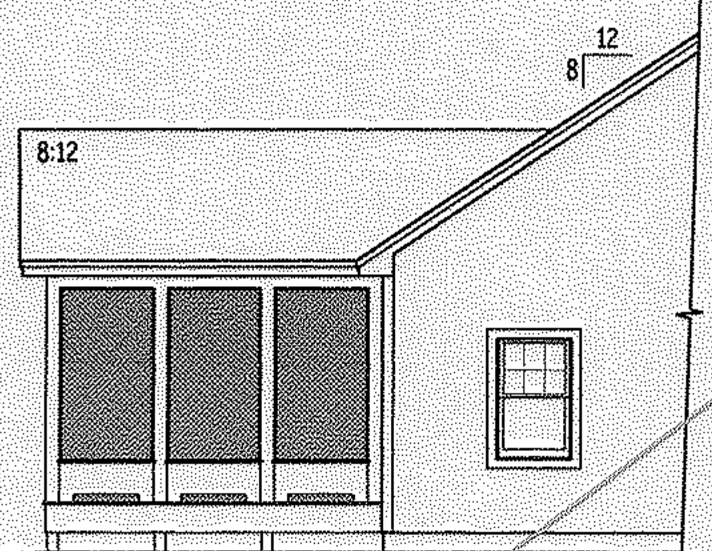
SCALE: 1/4" = 1'-0"



SCREEN ROOM CROSS SECTION

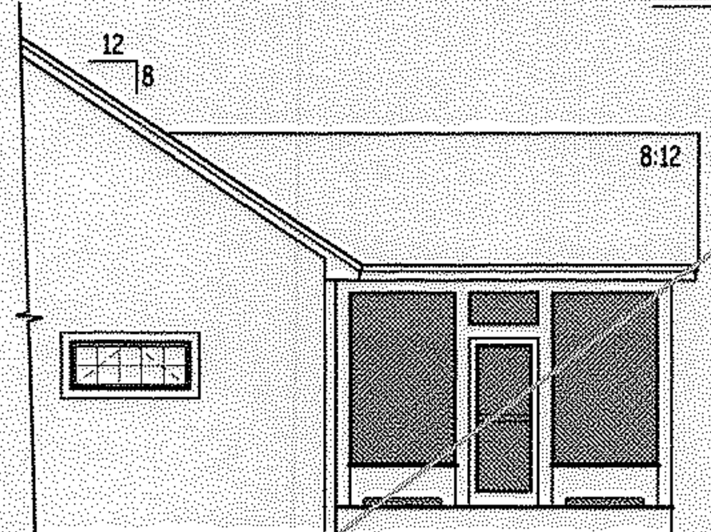
SCALE: 1/4" = 1'-0"

NOTE:
THIS PAGE TO BE USED WITH SHEETS 1a, 2a, 3a, & 4a



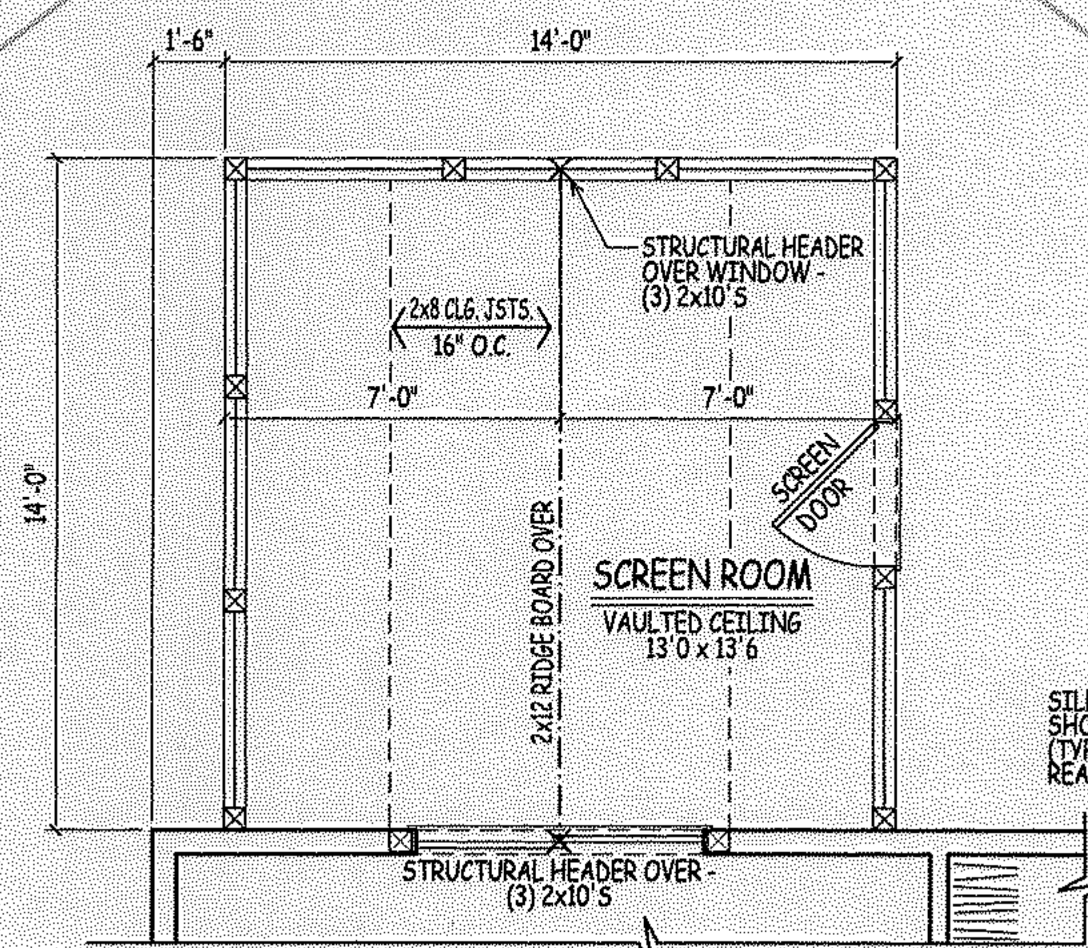
LEFT ELEVATION

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



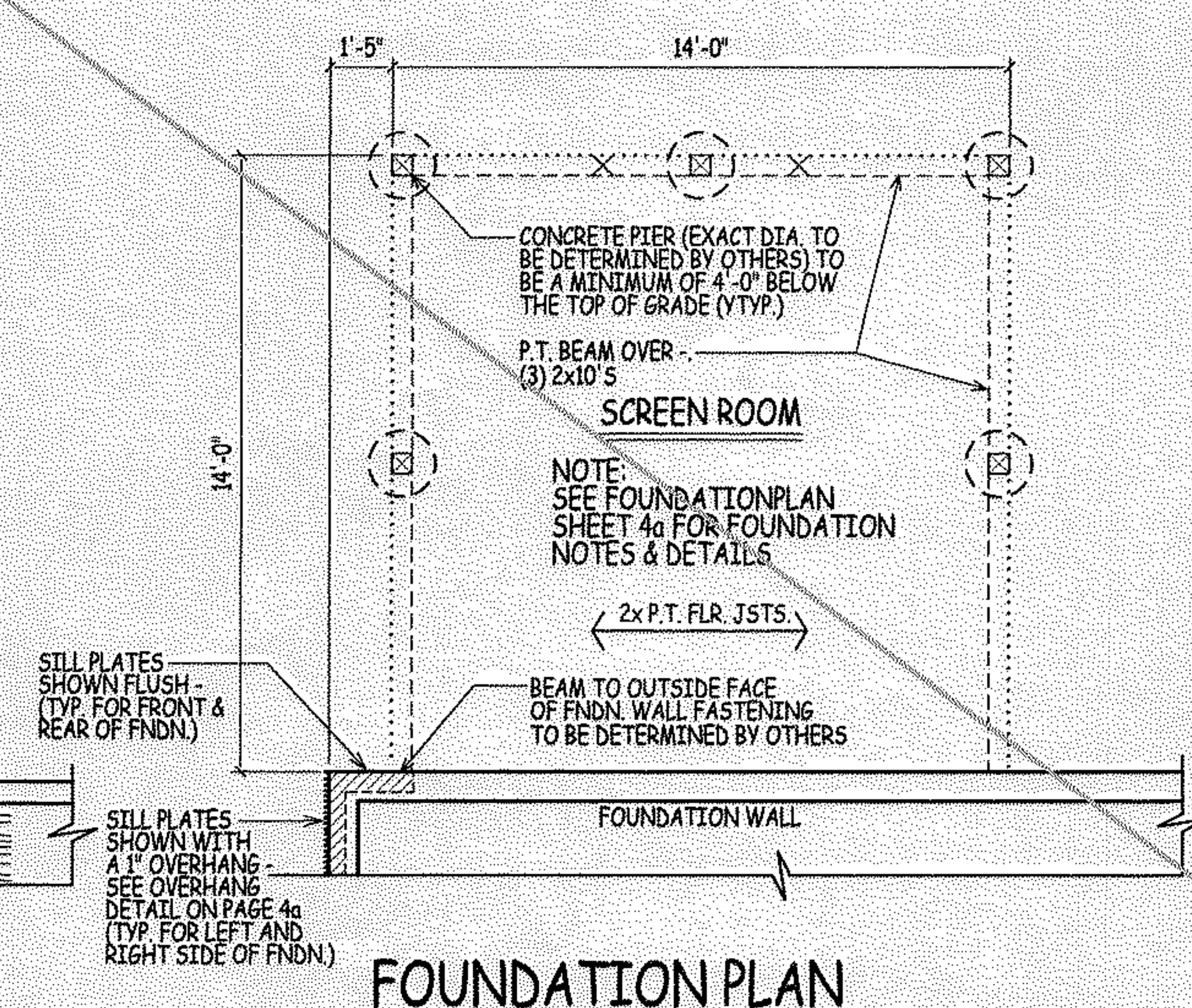
RIGHT ELEVATION

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



FIRST FLOOR PLAN

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



FOUNDATION PLAN

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

FSM DRAWINGS
27 Lowell Street Suite 602
Manchester, New Hampshire 03101
T | 603.836.8660 info@fsmdrawings.com
F | 603.836.3661 www.fsmdrawings.com

PROJECT: THE ABBOT
PAGE FARM - ATKINSON, NH

PREPARED FOR: GREEN&CO.

DRAWN BY:	MM/JW
CHECKED BY:	MM
DATE DRAWN:	09/06/18
DATE ISSUED:	09/06/18
SCALE:	AS INDICATED
JOB NO.:	FSM17-206CA

REVISIONS

16	08/27/18	THE CALLAWAY & RILEY REVISED PER REQUEST - ISSUED FOR REVIEW AND STAMP
17	09/06/18	BEAM LOCATION UPDATED ON THE ABBOT - ISSUED FOR REVIEW AND STAMP
13	08/03/18	THE CALLAWAY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
14	08/15/18	THE RILEY REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP
15	08/15/18	THE ABBOT REVISED PER MARK-UPS - ISSUED FOR REVIEW AND STAMP

934.126 GL Aurelia

Artform Home Plans

	Main	Future	Apt	Main + Future	Main + Apt	All
Living Area	2302 SF	0 SF	0 SF	2302 SF	2302 SF	2302 SF
Bedrooms	3	1	0	4	3	4
Baths	2.5	0.0	0.0	2.5	2.5	2.5

Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

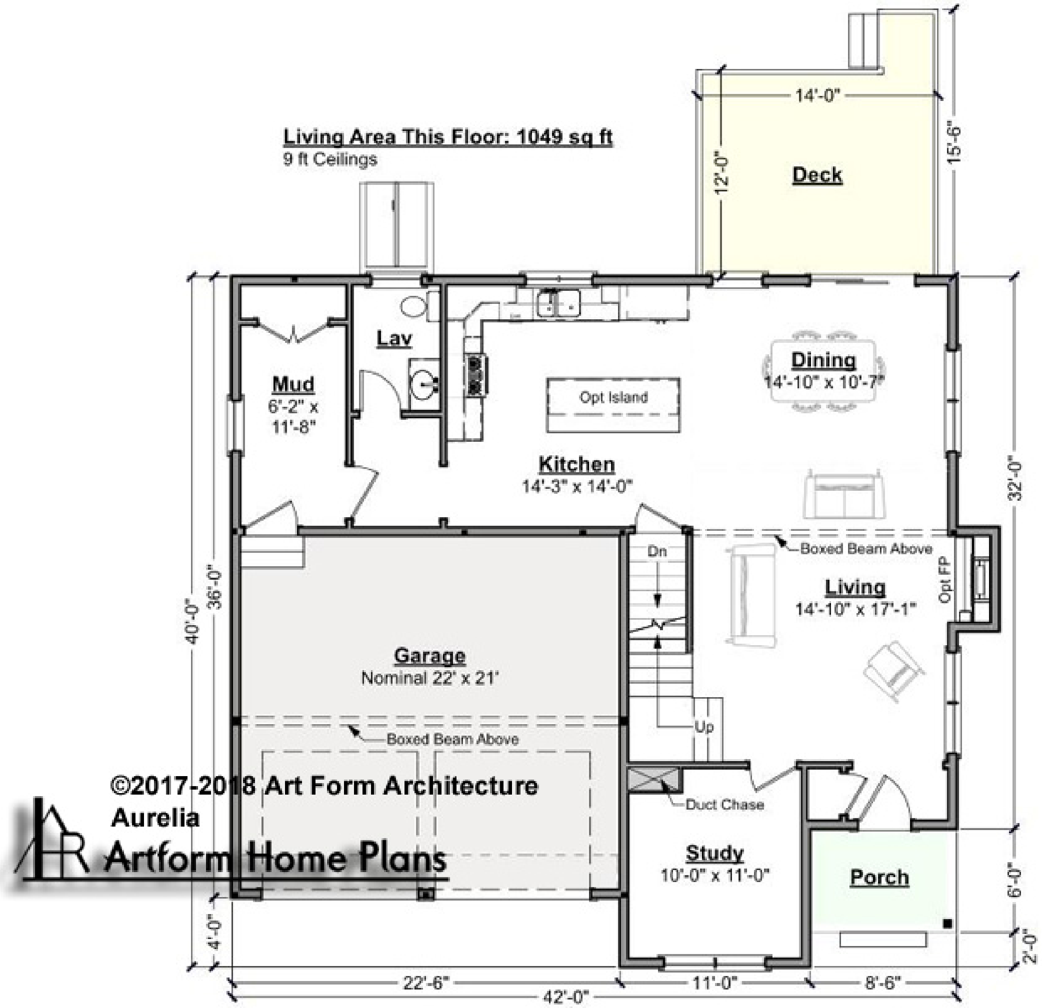
934.126 GL Aurelia

First Floor

	Area	Beds	Baths
Main	1049 SF	0	0.5
Future	0 SF	1	0
Apt	0 SF	0	0
Total	**1049 SF**	**1**	**0.5**

Ceiling Height	
Shown	9'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost



934.126 GL Aurelia

Second Floor

	Area	Beds	Baths
Main	1253 SF	3	2
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1253 SF**	**3**	**2**

Ceiling Height	
Shown	8'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost

Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

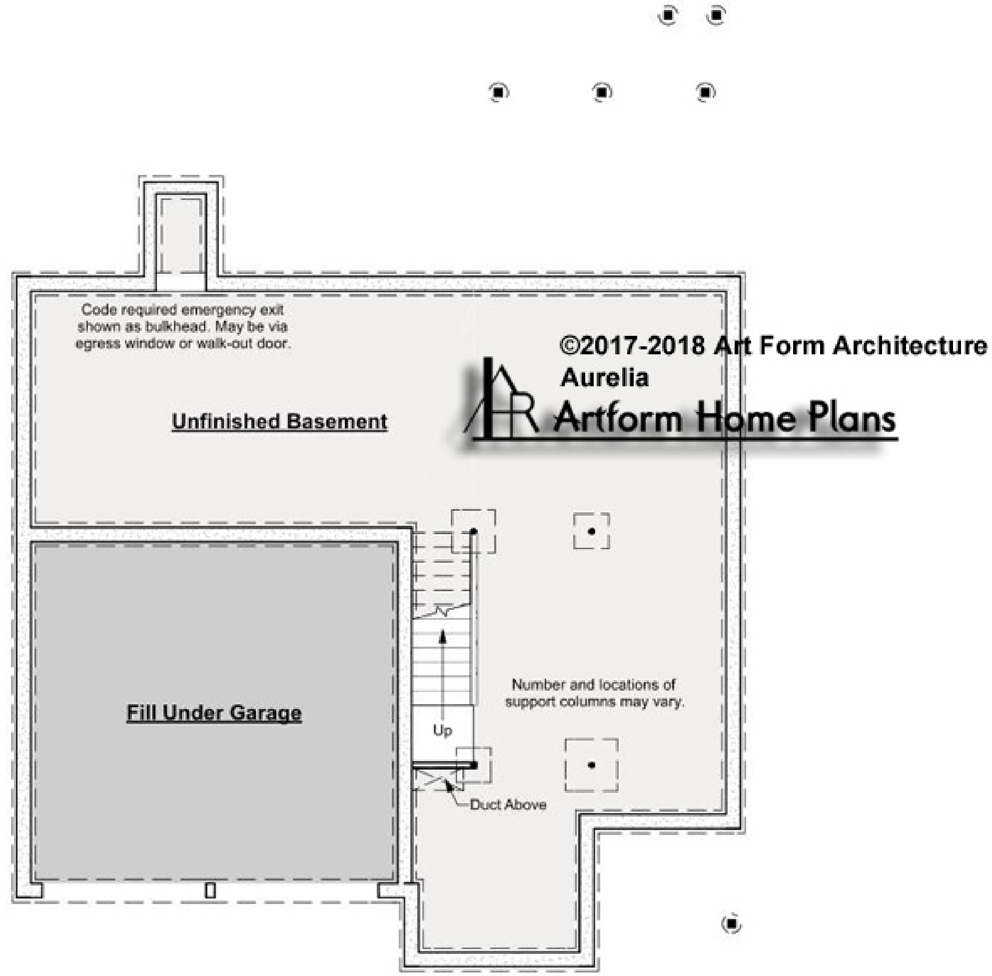
934.126 GL Aurelia

Basement Floor

	Area	Beds	Baths
Main	0 SF	0	0
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**0 SF**	**0**	**0**

Ceiling Height	
Shown	7'-8"
Possible*	9'-0"

* See Major Change information on plan page for cost



Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

934.126 GL Aurelia

Front Elevation

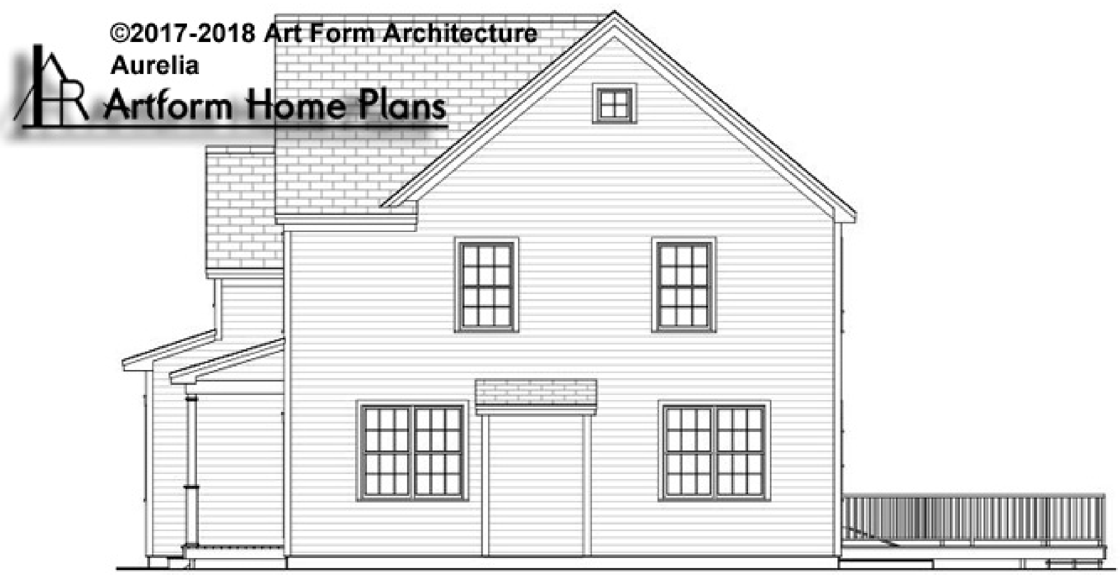
Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

934.126 GL Aurelia

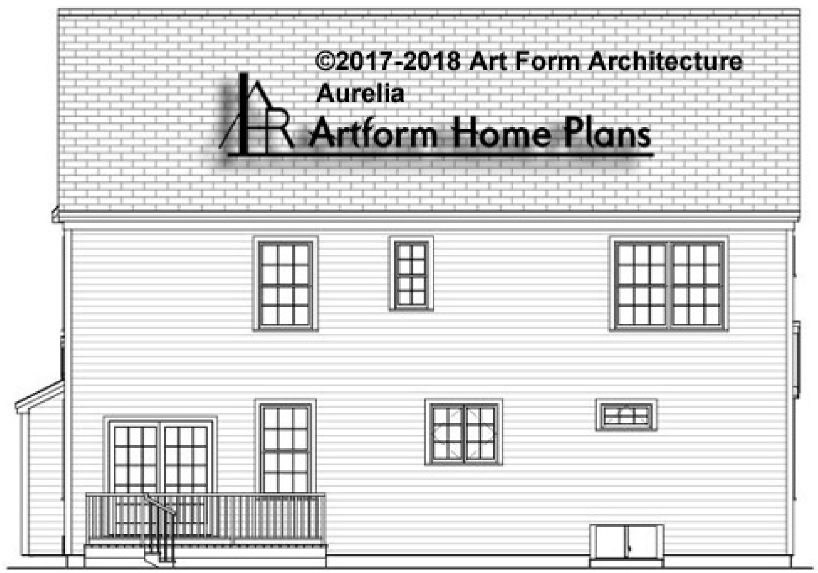
Right Elevation



934.126 GL Aurelia

Artform Home Plans

Rear Elevation



Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

934.126 GL Aurelia

Left Elevation

1016.124 GL Carter

Artform Home Plans

	Main	Future	Apt	Main + Future	Main + Apt	All
Living Area	2670 SF	0 SF	0 SF	2670 SF	2670 SF	2670 SF
Bedrooms	3	0	0	3	3	3
Baths	2.5	0.0	0.0	2.5	2.5	2.5

Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

1016.124 GL Carter

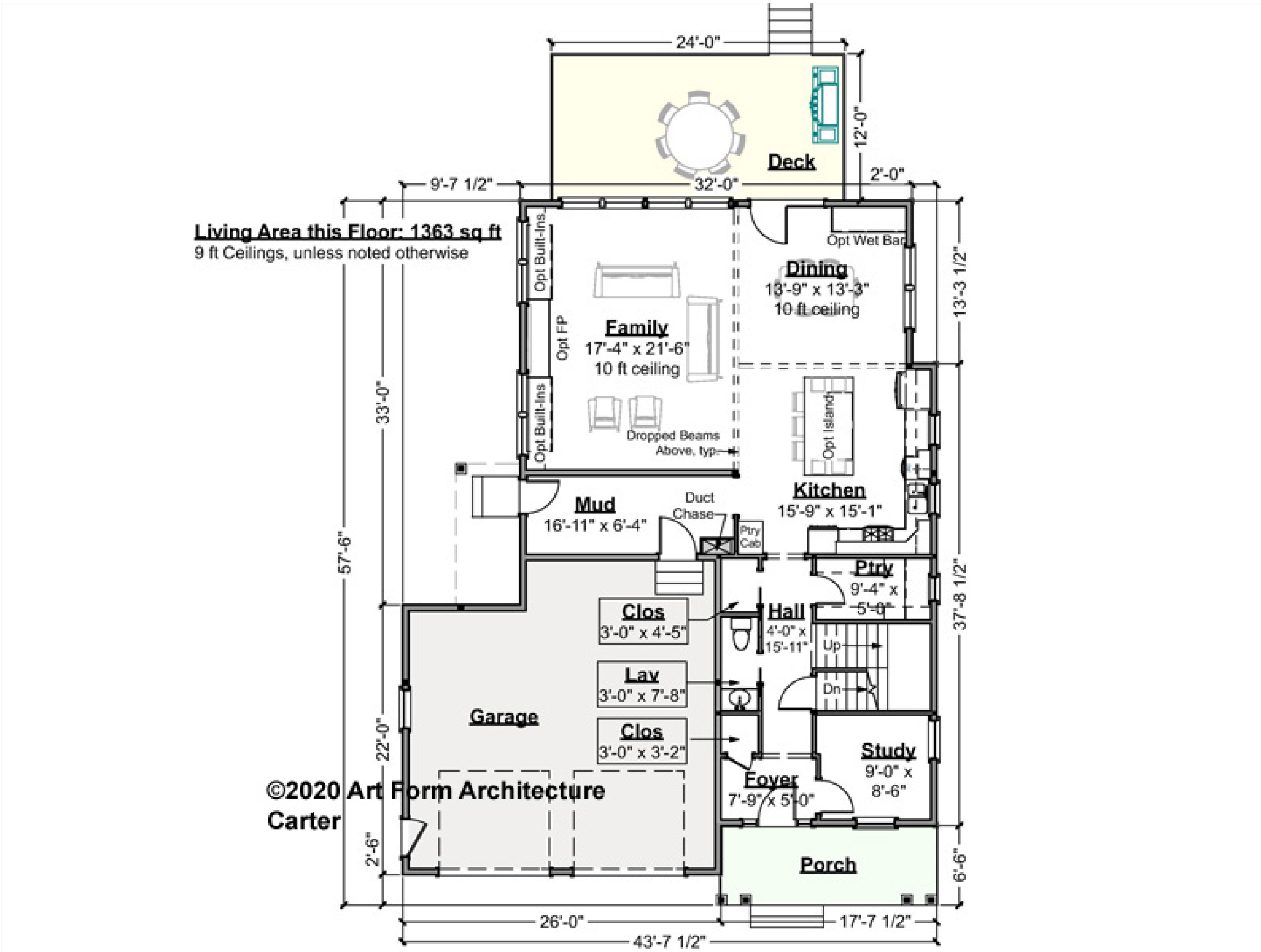
Artform Home Plans

First Floor

	Area	Beds	Baths
Main	1363 SF	0	0.5
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1363 SF**	**0**	**0.5**

Ceiling Height	
Shown	9'-0"
Possible*	9'-0"

* See Major Change information on plan page for cost



Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

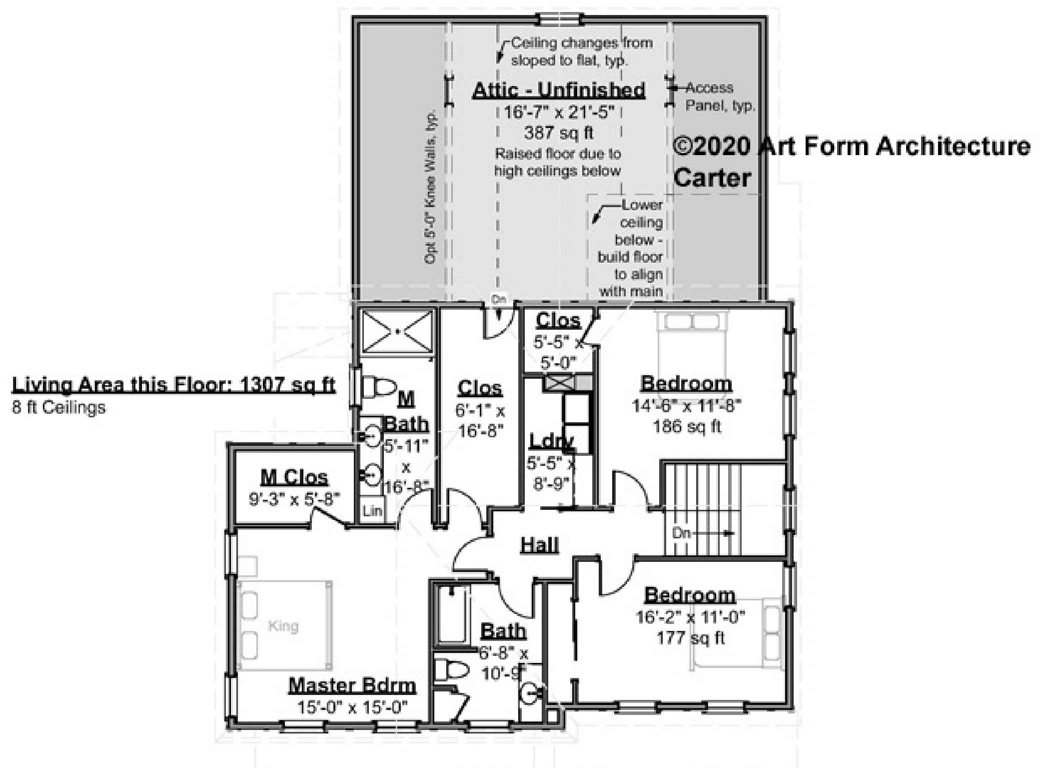
1016.124 GL Carter

Second Floor

	Area	Beds	Baths
Main	1307 SF	3	2
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1307 SF**	**3**	**2**

Ceiling Height	
Shown	8'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost



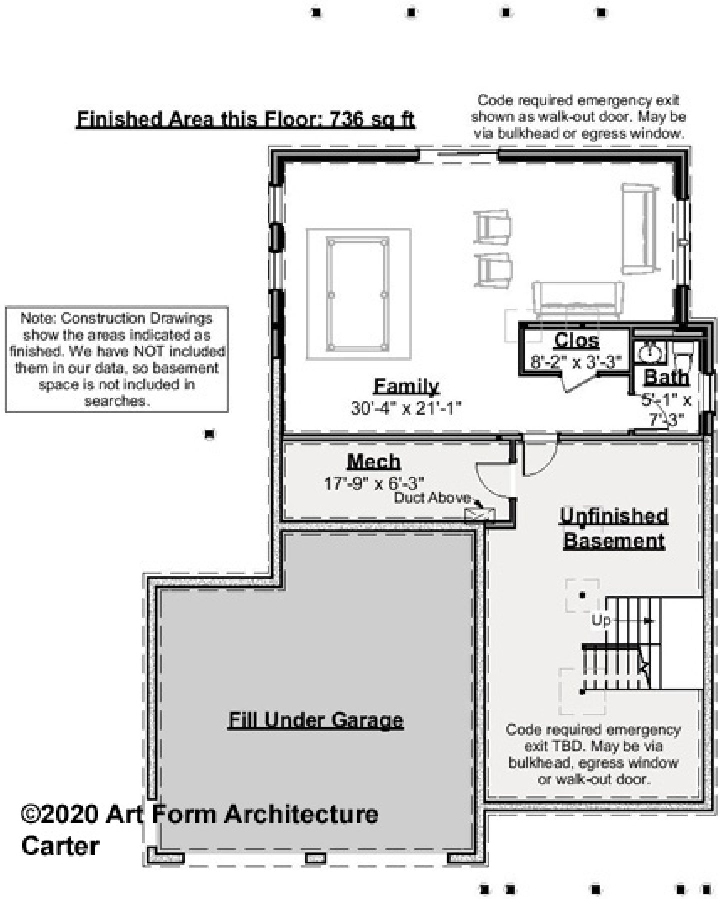
1016.124 GL Carter

Basement Floor

	Area	Beds	Baths
Main	0 SF	0	0
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**0 SF**	**0**	**0**

Ceiling Height	
Shown	7'-8"
Possible*	8'-4"

* See Major Change information on plan page for cost



Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

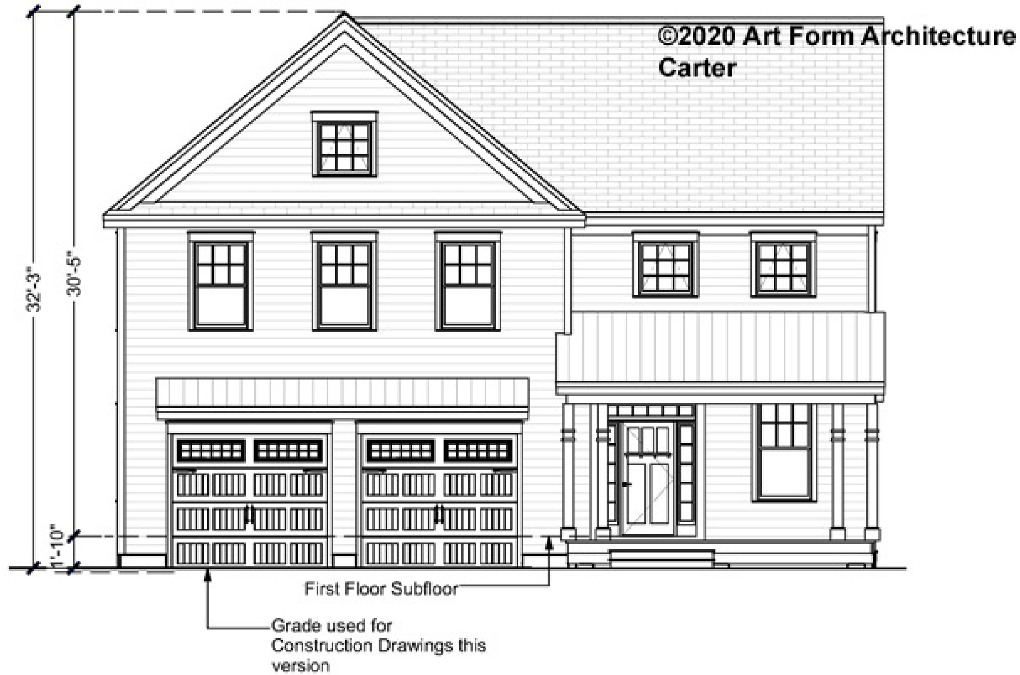
Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1016.124 GL Carter

Artform Home Plans

Front Elevation



Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1016.124 GL Carter

Right Elevation

Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1016.124 GL Carter

Rear Elevation

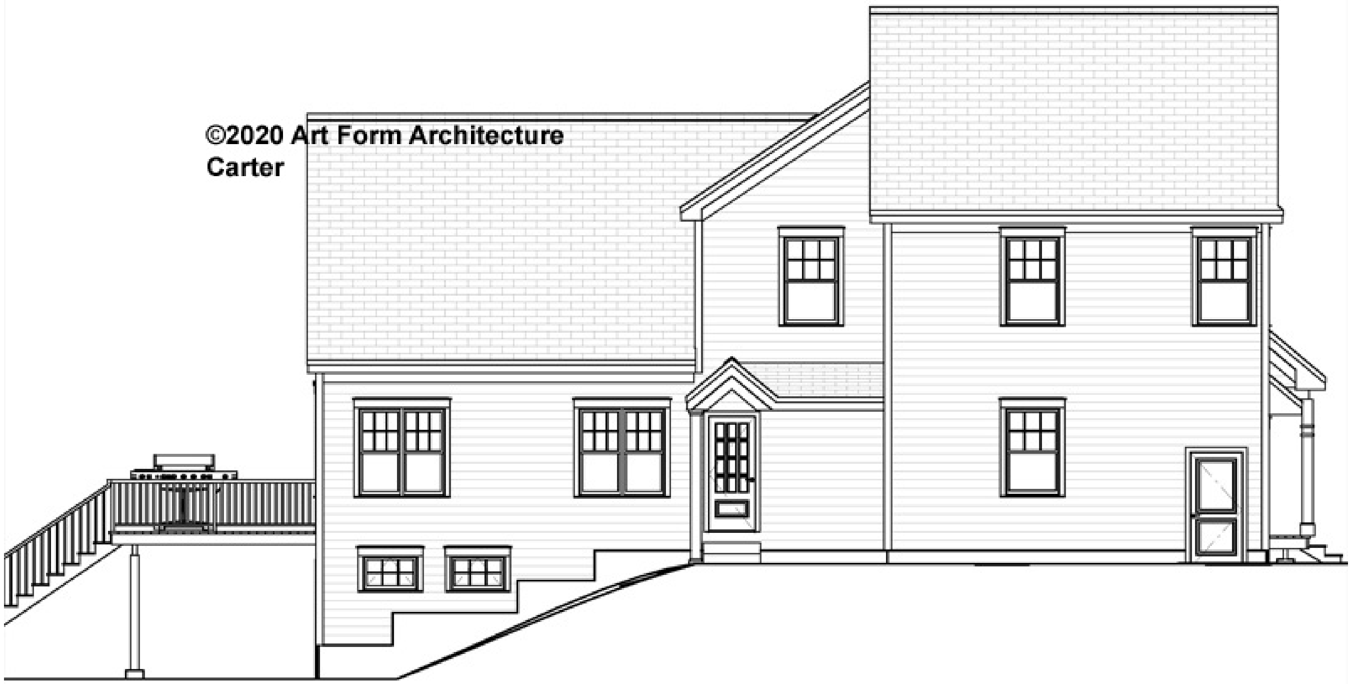
Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1016.124 GL Carter

Left Elevation



Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1016.124 GL Carter

Rear Render

6/13/2019 8:33:51 AM

\\afdiskstation\AFA Staff\Access\~Home Designs\by Project\Green & Co - Page Farm\Balmalcolm 540\540.126.v16 Bigger Garage & Porch\CD 540.126.v16 ER 2573 Balmalcolm - Lot 32 Page Farm.layout

Wall Types

Exterior walls 2x6 wood stud
Interior walls 2x4 wood stud, unless noted otherwise

Wall Keys

(2) 2x wood studs on the flat
(3) 2x3 wood stud wall, 16" oc
(6) 2x6 wood stud wall, 16" oc

Note: 2x4 wood stud wall, 16" oc unless otherwise noted

Key Notes

- A — 30" x 22" Minimum Attic Access Panel - Insulated (RO 34" x 26")
- F — Field locate for plumbing or mechanical
- V — Verify size of fixture or appliance Adjust dimensions to accommodate
- S — Snug - Door or Window trim will be snug and may need to be cut down
- C — Center - Place door or window centered on wall
- D — Double Stud or structural mull – adapt to suit chosen window brand. Object is to have some "bite" for curtain hardware and exterior aesthetics.
- SD — Smoke Detector
- CO — Carbon Monoxide Detector
- HD — Heat Detector

Dimensions

1. Dimensions are to face of stud, unless noted otherwise.
2. Closets are 24" clear inside, unless dimensioned otherwise.

Square Footages

1. Sq ft numbers are interior to room for use in calculating finishes.
2. Cabinets and fixtures not subtracted.
3. Add for doorways when floor finishes run through.

Notes

1. Exterior walls 2x6 wood stud @ 16" oc. Provide insulation & vapor barrier conforming to state or local codes. Interior sheathing 1/2" gypsum board. Provide 1/2" exterior rated sheathing, house wrap with drainage plane and siding. Provide step flashing at walls adjacent to roof planes.

2. Interior walls 2x4 wood stud @ 16" oc, unless noted otherwise.

3. Roof - see structural for rafter sizes. Provide 5/8" exterior rated roof sheathing 15# roofing felt, ice & water shield at eaves and valleys, aluminum drip edge and asphalt shingles or metal roofing. Structure not calculated to support slate or tile. Flash all penetrations. Provide cricket at any added chimneys.

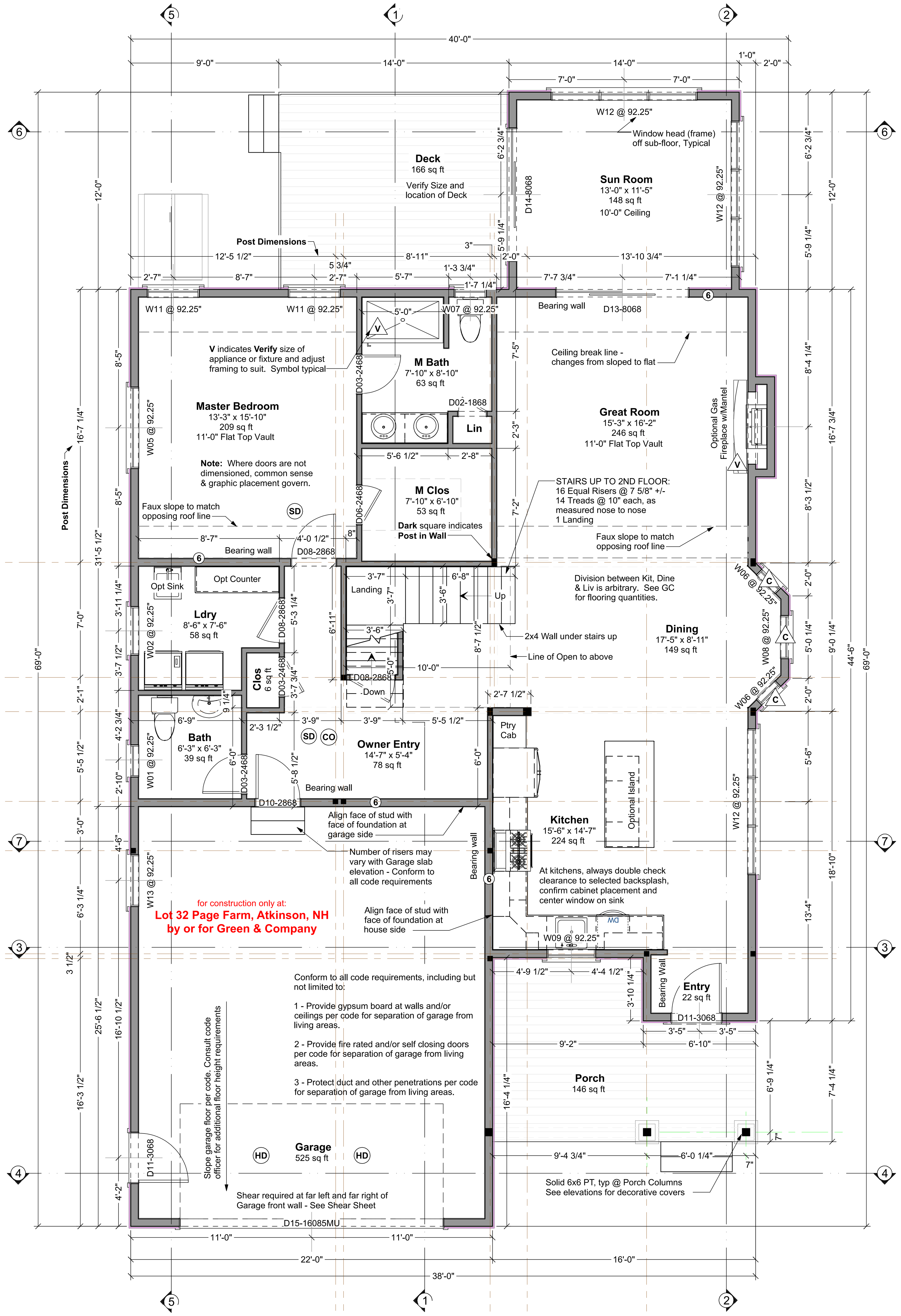
4. Provide roof and/or ceiling insulation per code. Provide soffit and ridge vents where required for insulation strategy. (Verify with code officer - closed cell spray foam or dense-pack cellulose installed at rafters and filling ridge and eaves generally contra-indicates venting, batt insulation always requires venting).

5. Provide smoke detectors where shown, where required by code and where required by local authorities.

6. Provide fire resistive materials where required by code, including but not limited to, firestopping at penetrations, 1/2" drywall on walls and 5/8" drywall on ceilings to separate garage (where garage present in design) from dwelling, and separation of dwellings (where more than one dwelling present in design), and protection of flammable insulation materials.

7. Compliance with code requirements for rooms size and clearances, (hallway widths, room sizes, etc) assume 1/2" drywall on walls and 1/2" drywall on 3/4" strapping on ceilings. Adjust as required if materials differ.

8. Shear is only called out where Continuous Portal Frame will not suffice. See Section R602.10.4 (Pages 173 - 179) of the IRC 2009.



First Floor Plan

Living Area this Floor: 1562 sq ft
9ft Finished Ceilings (Unless Noted Otherwise)

NOTE TO HOMEOWNER:
These construction plans ARE NOT a part of your construction contract with your builder, unless your P&S agreement specifies that they are. Your P&S and it's attachments (like the builder's specifications or a review set of this design) describes what you and your builder agreed the builder would build for you. We here at Artform Home Plans do not have the authority to obligate your builder to provide you with amenities like fireplaces and spa tubs. The contract between you and your builder governs.

Balmalcolm

Dear Code Officer,

These are predesigned home plans, designed to bring good design and construction drawings to people at more affordable prices and faster time frames than traditional architecture. Where traditional "Internet" home plans disclaim all responsibility, we split responsibility between us (Artform) and the owner. We encourage the future homeowners to use a quality builder who can assist them with this. They are responsible for thermal and moisture decisions and for meeting code in ways that a quality builder should know without an explicit detail. We are responsible for things that are directly related to the design and/or that a quality builder couldn't reasonably figure out on their own - specifically the following IRC 2009 code sections:

1 - Room sizes (Section R304)
2 - Ceiling Height (Section R305)
3 - Floor space & ceiling height at Toilet, Bath and Shower Spaces (Section R307)
4 - Hallway widths (Section R311.6)
5 - Door types & sizes (Section R311.2)
6 - Floor space in front of doors (Section R311.3)
7 - Stair width - The stairs in our designs will be a minimum of 36" wide measured wall surface to wall surface, allowing compliance with R311.7.1 with installation of correct handrail.
8 - Stairway headroom (Section R311.7.2)
9 - Stair treads and risers (Section R311.7.5)
10 - Landings for stairways (Section R311.7.6)
11 - Emergency Escape Window Sizes (Section R310.2.1, R310.2.2, R310.2.3 and R310.2.4). Casement windows may require manufacturer's emergency escape window hardware. Will also comply with NFPA 101.
12 - Structural Floor Framing (Section R502.3) Where dimensional lumber is shown, framing members will be sized according to this section of the code. Where engineered wood products are shown, those framing members will be size according to the manufacturer's tables for loads and spans, or sizes will have been calculating using manufacturer's published materials properties.
13 - See structural sheets for additional notes.

The builder can and should add information to this set, such as Rescheck, a hand markup of our generic thermal and moisture section, additional information about doors and windows (such as fire rating, tempering, etc), foundation drops relative to site grading, and sometimes their chosen method of basement egress. These drawings are not intended to be used without that additional information.

Where a construction address is shown on the drawings, it is for copyright control only. We have not inspected the site, adapted the design to state specific laws (except where it says so in the drawings) or site or region specific climate conditions. Homeowner and/or Builder shall be responsible for thermal and moisture control strategies, materials choices and compliance with applicable laws and ordinances.

Please do feel free to call us with any questions. We can and do update our drawings and standard notes to address specific concerns, especially in jurisdictions where our clients will be building again.

Dear Everybody,

With these drawings a copyright license is granted for a single construction only at Lot 32 Page Farm, Atkinson, NH by or for Green & Company. This is a License to Build, and does not include a License to Modify, except as required to conform to building code or fulfill builder's/owners responsibilities.

Permissible uses of these drawings:
1. All activities associated with construction at the listed address.
2. Pricing or preliminary discussions with zoning or code officials for construction at other addresses, with prior notification to Artform Home Plans - just use the Contact form on the web site – http://www.artformhomeplans.com/contact.a5w

Not Permitted:
1. Application for any permits or other approvals for construction at properties other than the listed address, including but not limited to construction, zoning, conservation, or design review.
2. Modification of the basic design.

Use of these drawings outside these parameters is a violation of federal copyright law, punishable by both civil action and criminal prosecution, as it is stealing or enabling theft of "intellectual property". Making modifications to plans, even significant ones, does not change this, under copyright law, that's considered "derivative works".

We can provide drawings suitable for use in obtaining design or zoning approvals without incurring the expense of a full set of construction drawings. Contact us for more information.

AFHP CD Commons 18.4 X10

These drawings are intended for use by an experienced professional builder in responsible charge of the entire project, including but not limited to mechanical, electrical and sitework. Any additional adaptation for these trades or other trades must be determined prior to start of construction. Contact Artform for any adjustments needed.

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans
AFHP Design # 540.126.v16 ER

Balmalcolm
Lot 32 Page Farm
Atkinson, NH

1

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for: Construction

...

6/13/2019 8:33:51 AM

\\afdiskstation\AFA StaffAccess\-Home Designs\by Project\Green & Co - Page Farm\Balmalcolm 540\540.126.v16 Bigger Garage & Porch\CD 540.126.v16 ER 2573 Balmalcolm - Lot 32 Page Farm.layout

Door & Window Notes

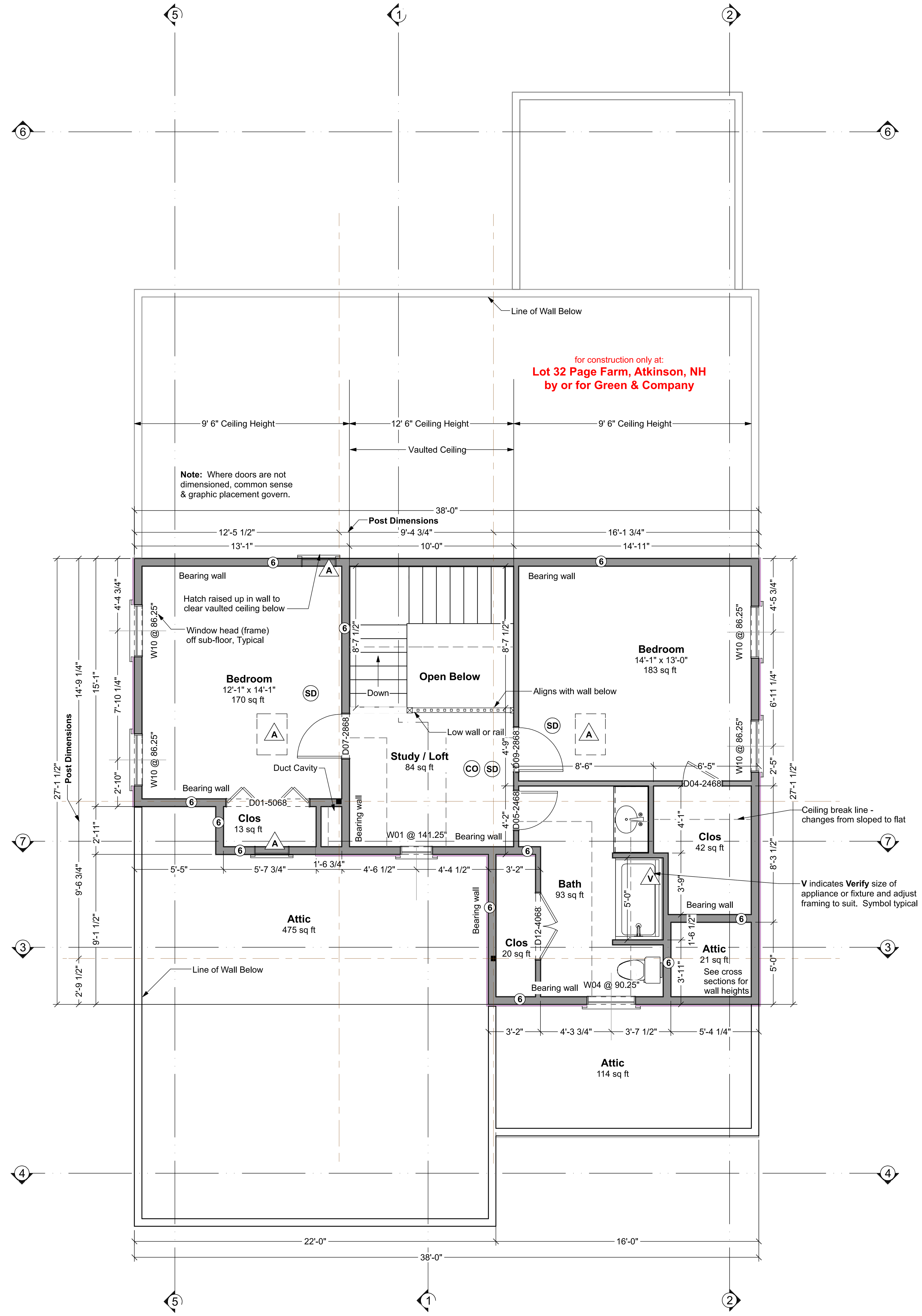
1. **Rated Doors:** Provide fire rated and/or self-closing doors where required by local codes or local authorities
2. **Trimmed Openings:** Trimmed openings not shown on schedule. See Plan.
3. **Window Tempering:** Provide tempered windows where required by local codes or local authorities. Tempering column provided here for convenience. Windows have not been reviewed for tempering requirements.
4. **Window RO's:** 1/4" or 1/2" on each of 4 sides allowed for window RO's, typical. Review framing size vs RO size. Adjust per manufacturer's requirements and/or builder preference.
5. **Egress Windows:** Provide minimum one door or window meeting egress requirements in basement, in each sleeping room, in each potential sleeping room, and other locations required by local code, in sizes required by local code. Note that casement windows coded by manufacturer as meeting IRC 2006 egress requirements typically need to be ordered with specific hardware. Emergency Escape Window Sizes (Section R310.1.1, R310.1.2, R310.1.3 and R310.1.4). Will also comply with NFPA 101.
6. **Basement Windows:** Add basement windows as required to meet state or local code requirements, including but not limited to egress and light/ventilation.
7. **Skylights:** Skylights are not shown on this schedule, but may be required. Consult builder and/or see floor plan.
8. **Minimum window sill height:** IRC 2009 and later requires that floor window sills be 24" from floor. Confirm bottom of window opening relative to frame. Adjust head heights as required to conform to IRC

DOOR SCHEDULE

NUMBER	QTY	FLOOR	SIZE	WIDTH	HEIGHT	TYPE	COMMENTS
D01	1	2	5068 L/R	60 "	80 "	4 DR. BIFOLD	
D02	1	1	1868 R IN	20 "	80 "	HINGED	
D03	3	1	2468 L IN	28 "	80 "	HINGED	
D04	1	2	2468 R IN	28 "	80 "	HINGED	
D05	1	2	2468 L IN	28 "	80 "	HINGED	
D06	1	1	2468 R IN	28 "	80 "	HINGED	
D07	1	2	2868 L IN	32 "	80 "	HINGED	
D08	3	1	2868 R IN	32 "	80 "	HINGED	
D09	1	2	2868 R IN	32 "	80 "	HINGED	
D10	1	1	2868 L EX	32 "	80 "	HINGED	
D11	2	1	3068 R EX	36 "	80 "	HINGED	
D12	1	2	4068 L/R IN	48 "	80 "	DOUBLE HINGED	
D13	1	1	8068 R IN	96 "	80 "	SLIDER	
D14	1	1	8068 L EX	96 "	80 "	SLIDER	
D15	1	1	16085	192 "	101 "	MULLED UNIT	GARAGE W/ TRANSOM

WINDOW SCHEDULE

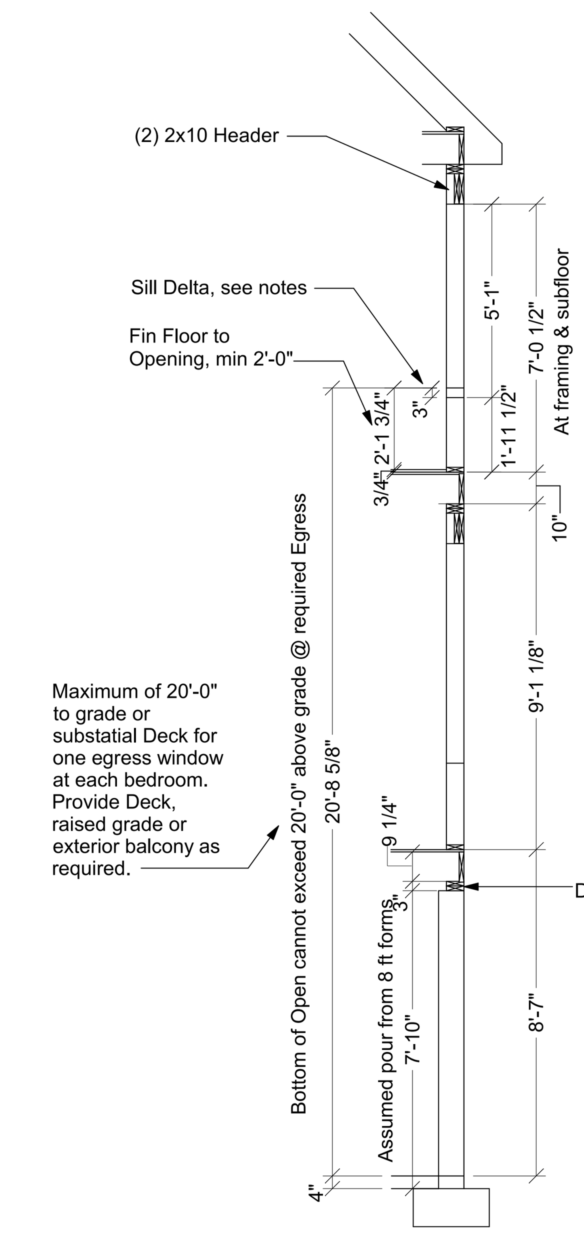
NUMBER	QTY	WIDTH	HEIGHT	R/O	EGRESS	TEMPERED	DESCRIPTION	MANUFACTURER	COMMENTS
W01	2	23 1/2 "	23 1/2 "	24"X24"			SINGLE AWNING		
W02	1	35 1/2 "	23 1/2 "	36"X24"			SINGLE AWNING		
W03	1	35 1/2 "	35 1/2 "	36"X36"			SINGLE AWNING		
W04	1	35 1/2 "	35 1/2 "	36"X36"		YES	SINGLE AWNING		
W05	1	59 1/2 "	23 1/2 "	60"X24"			SINGLE AWNING		
W06	2	19 1/2 "	65 1/2 "	20"X66"			DOUBLE HUNG		
W07	1	23 1/2 "	51 1/2 "	24"X52"		YES	DOUBLE HUNG		
W08	1	31 1/2 "	65 1/2 "	32"X66"			DOUBLE HUNG		
W09	1	35 1/2 "	47 1/2 "	36"X48"			DOUBLE HUNG		
W10	4	38 "	61 1/2 "	38 1/2"X62"	YES		DOUBLE HUNG		
W11	2	38 "	65 1/2 "	38 1/2"X66"	YES		DOUBLE HUNG		
W12	3	106 1/2 "	65 1/2 "	107"X66"			3X DH		
W13	1	38 "	65 1/2 "	38 1/2"X66"			DOUBLE HUNG		



Second Floor Plan

1 0 1 2 3 4

Living Area this Floor: 793 sq ft
9'-6" Ceilings, unless noted otherwise



Purpose of story pole is to demonstrate compliance with 20 ft exterior maximum and 24" interior minimum.

Sill Delta - distance from bottom of frame to window opening. Sill Delta Varies from 2¾" to 4" in most brands. Confirm Sill Delta with window manufacturer.

Dimensions shown apply to typical Double Hung windows. Manually adjust dimensions where alternate brand/type chosen and/or planned foundation or framing height differ from these drawings.

Window Story Pole

Scale ¼"=1'-0"

Artform Home Plans
AFHP Design # 540.126.v16 ER

Balmalcolm
Lot 32 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for: Construction

...

Structural General Notes:

1. Builder shall consult and follow the building code and other regulations in effect for the building site for all construction details not shown in these drawings. Requirements described here are specific to this design and/or are provided as reference. Additional building code or local requirements may apply.

2. Builder shall maintain a safe worksite, including but not limited to, provision of temporary supports where appropriate and adherence to applicable safety standards.

3. Design is based on the snow load listed on the framing plans, 100 mph basic wind speed, Exposure type B, soil bearing capacity of 2000 psf, and Seismic Category C, unless otherwise noted on the framing plans. Builder shall promptly inform Artform Home Plans of differing conditions.

Foundations

1. No footing shall be poured on loose or unsuitable soils, in water or on frozen ground.

2. All exterior footings to conform to all applicable code requirements for frost protection.

3. All concrete shall have a minimum compressive strength of at least 3000 PSI at 28 days.

4. Foundation anchorage to comply with IRC 2009 Section R403.1.6, it shall consist of minimum size 1/2" diameter anchor bolts with 3/16" x 2" x 2" washers at a maximum of 72" oc for two stories or 48" oc for more than two stories, max of 12" from each corner, min of 2 bolts per wall. Anchor bolt shall extend 7" into concrete or grouted cells of concrete masonry units. Be aware that a garage under may be counted by your code officer as a story. Additional anchorage may be required at braced walls.

Wood Framing

1. All structural wood shall be identified by a grade mark or certificate of inspection by a recognized inspection agency.

2. Structural wood shall be Spruce-Pine-Fir (SPF) #2 or better.

3. When used, LVL or PSL indicate Laminated Veneer Lumber or Parallel Strand Lumber, respectively. Products used shall equal or exceed the strength properties for the size indicated as manufactured by TrusJoist.

4. When used, AJS indicates wood I-joists as manufactured by Boise Cascade. Products of alternate manufacturers may be substituted provided they meet or exceed the strength properties for the member specified.

5. All floor joists shall have bridging installed at mid-span or at 8'-0" oc maximum.

6. Floor systems are designed for performance with subfloor glued and screwed.

7. At posts, provide solid framing/blocking to supports below. Provide minimum 1 1/2" bearing length for all beams and headers, unless noted otherwise.

8. All wood permanently exposed to the weather, in contact with concrete or in contact with the ground shall meet code requirements for wood in these environments.

9. Deck ledgers shall be securely attached to the structure and/ or independently supported, including against lateral movement, per building code requirements and best practices. Unless otherwise noted, decks shall have solid 4x4 pt posts up to 6 ft above grade, and solid 8x8 for heights above that.

10. Wherever beams are noted as Flush framed, install joist hangers at all joists, sized appropriately for the members being connected.

11. Support the lower end of roof beams via minimum 2" horizontal bearing on a post, ledger or via an appropriately sized and configured hanger.

12. Where multiple beams are supported on one post, provide min 2" bearing for each, via either appropriately sized post cap or additional post(s).

13. Hangers, post caps, ties and other connectors shall be as manufactured by Simpson Strong Tie, as designed to connect the members shown, and shall be installed per manufacturer's instructions.

Foundation Contractor Check List

Confirm or review the following prior to forming & pouring foundation

Initials Date Checked

____ ________ Confirmed soil bearing

____ ________ Checked w/GC for added foundation steps to suit grade

____ ________ Confirm sill plate thickness (foundation bolts to extend through all)

____ ________ Confirmed garage door size

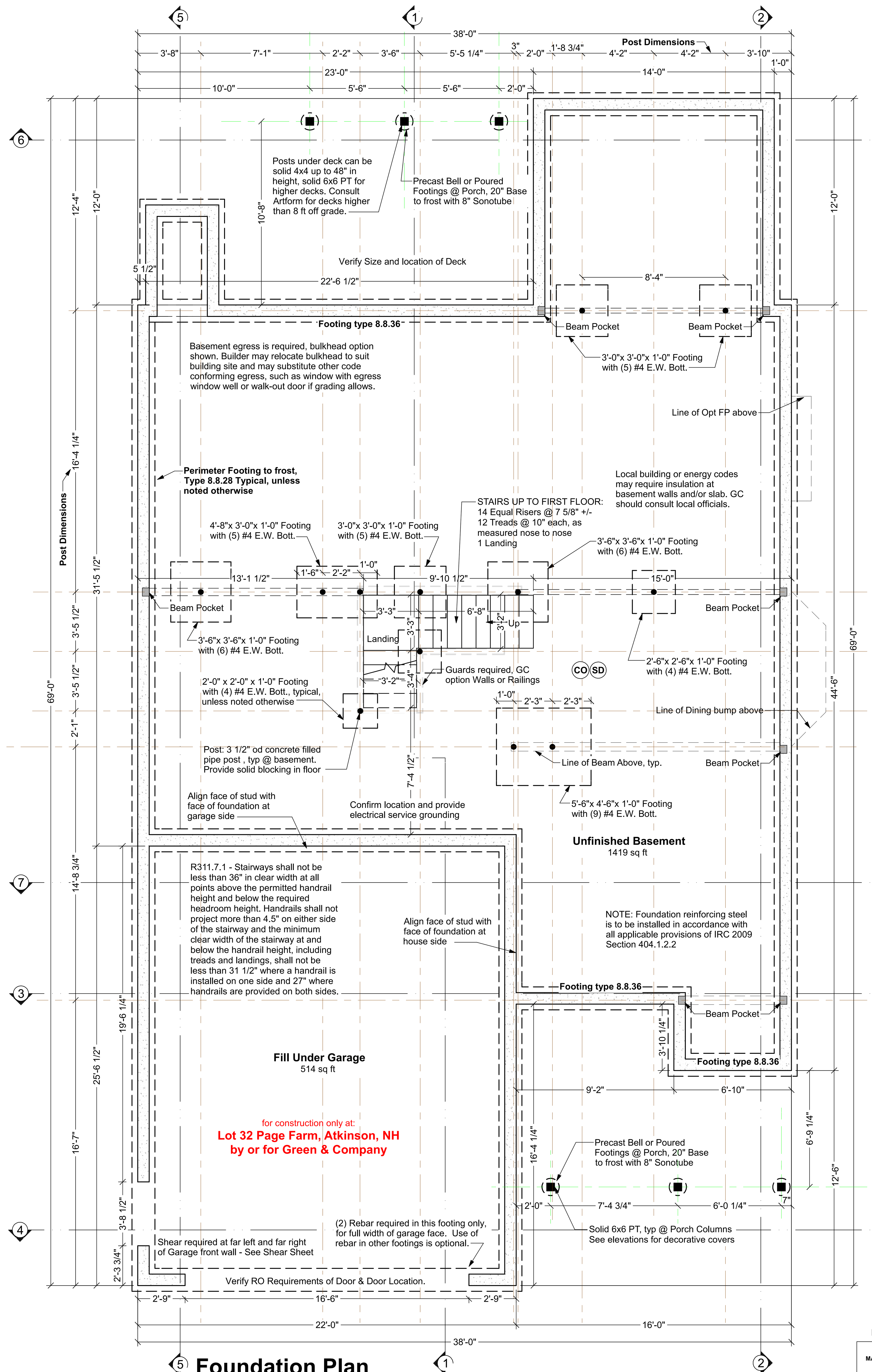
____ ________ Checked w/GC for added basement windows

____ ________ Checked w/GC for added basement man doors

____ ________ Confirmed sizes & locations mech/plbg penetrations

____ ________ Confirmed sizes and locations of beams w/GC, added or adjusted beam pockets

____ ________ Confirmed location and installed electrical service grounding - See GC for location

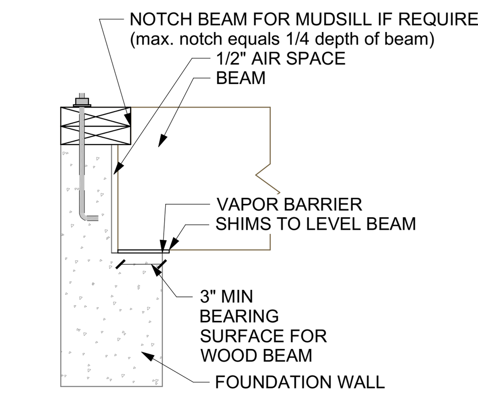


Foundation Plan

Structure designed for Snow Load of 55 PSF

Ceiling height may vary: 8 ft Forms

Post Caps: Typically supplier calculates weights based on these framing plans. Contact Art Form if additional information is needed.



Beam Pocket

Scale 1/2"=1'-0"

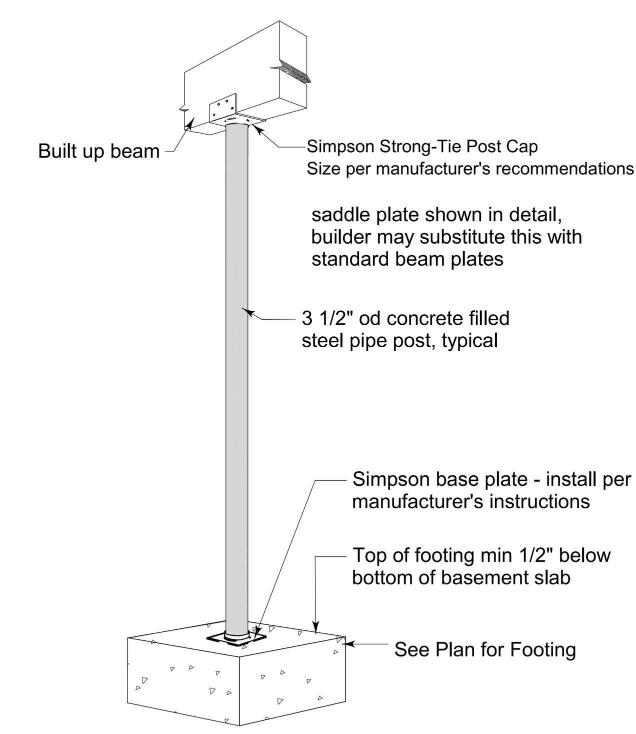
TYPICAL PERIMETER FOUNDATION WALL:

- 8" poured concrete, 8 ft forms, min 7'-10" finished, with total of 3 rebar, as follows:
- (1) #4 rebar, 4" from top
- (1) #4 rebar @ vertical midpoint. Omit this rebar at walls 4 ft high or less.
- (1) #4 rebar, min 3" from bottom or per code
- Lap corners & splices of rebar per code.
- Secure sill to foundation with 1/2" diameter anchor bolts that extend 7" into concrete and tightened with a nut and washer @ 6' oc & max 12" from each corner & each end @ wood sill splices - if built-up sill, bolts must extend through all sill plates or straps must secure all sill plates.

TYPICAL PERIMETER FOOTING:

1. Verify that depth of home matches chart. Depth is foundation dimension eave to eave. Contact Artform Home Plans if you believe the chart does not match the plan.
2. Select column for snow load shown on the structural plans.
3. Select soil bearing pressure based on soil type and/or consultation with code officer.
4. The required footing size is at the intersection of the Snow Load and Soil PSI. Rebar is not required. Key or pin foundation wall to footing per code. For the purposes of permitting, soil bearing for New England is assumed to be 2,000 PSI.

FAQ - Adding rebar to footings does not reduce the required width. Rebar affects performance with earth movement, like an earthquake and has near zero effect on bearing capacity.



Typical Basement Post

Not to Scale

Guide to Soil PSI

3,000	Sandy gravel and/or gravel (GW and GP)
2,000	Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)
1,500	Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)

Footing Size Type 8.8.28 — up to 28 ft plan depth; 8 ft nominal basement height; 8" foundation wall; Full basement plus 2 stories

Soil PSI	Snow Load 50	60	70	80
3,000	16" x 8"	16" x 8"	16" x 8"	16" x 8"
2,000	18" x 8"	18" x 8"	18" x 8"	20" x 8"
1,500	22" x 8"	22" x 8"	24" x 8"	24" x 8"

Footing Size Type 8.8.32 — 29-32 ft plan depth; 8 ft nominal basement height; 8" foundation wall; Full basement plus 2 stories

Soil PSI	Snow Load 50	60	70	80
3,000	16" x 8"	16" x 8"	16" x 8"	16" x 8"
2,000	18" x 8"	20" x 8"	20" x 8"	22" x 8"
1,500	24" x 8"	26" x 8"	26" x 8"	28" x 8"

Footing Size Type 8.8.36 — 33-36 ft plan depth; 8 ft nominal basement height; 8" foundation wall; Full basement plus 2 stories

Soil PSI	Snow Load 50	60	70	80
3,000	16" x 8"	16" x 8"	16" x 8"	16" x 8"
2,000	20" x 8"	20" x 8"	22" x 8"	24" x 8"
1,500	26" x 8"	28" x 8"	30" x 8"	30" x 8"

MINIMUM VERTICAL REINFORCEMENT FOR 8-INCH (203MM) NOMINAL FLAT CONCRETE BASEMENT WALL

MAXIMUM UNSUPPORTED WALL HEIGHT (feet)	MIAXIMUM UNBALANCED BACKFILL HEIGHT (feet)	MINIMUM VERTICAL REINFORCEMENT - BAR SIZE AND SPACING (inches) — Soil classes and design lateral soil (psf per foot of depth): GW, GP, SW, SP 30	GM, GC, SM, SM-SC and ML 45	SC, ML-CL and inorganic CL 60
8	4	NR	NR	NR
	5	NR	NR	NR
	6	NR	NR	6 @ 37
	7	NR	6 @ 36	6 @ 35
	8	6 @ 41	6 @ 35	6 @ 26

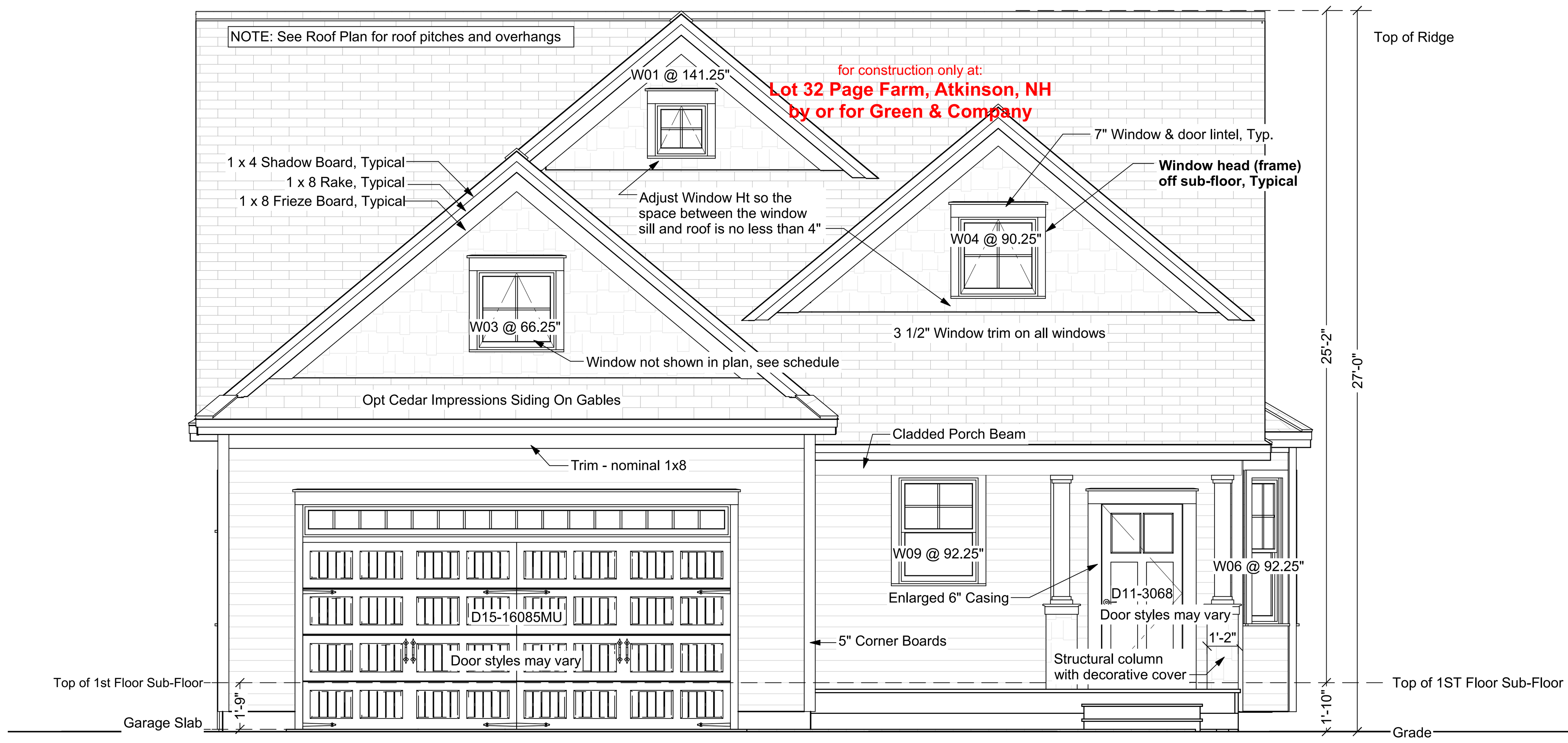
Artform Home Plans
AFHP Design # 540.126.v16 ER

Balmalcolm
Lot 32 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for: Construction

...

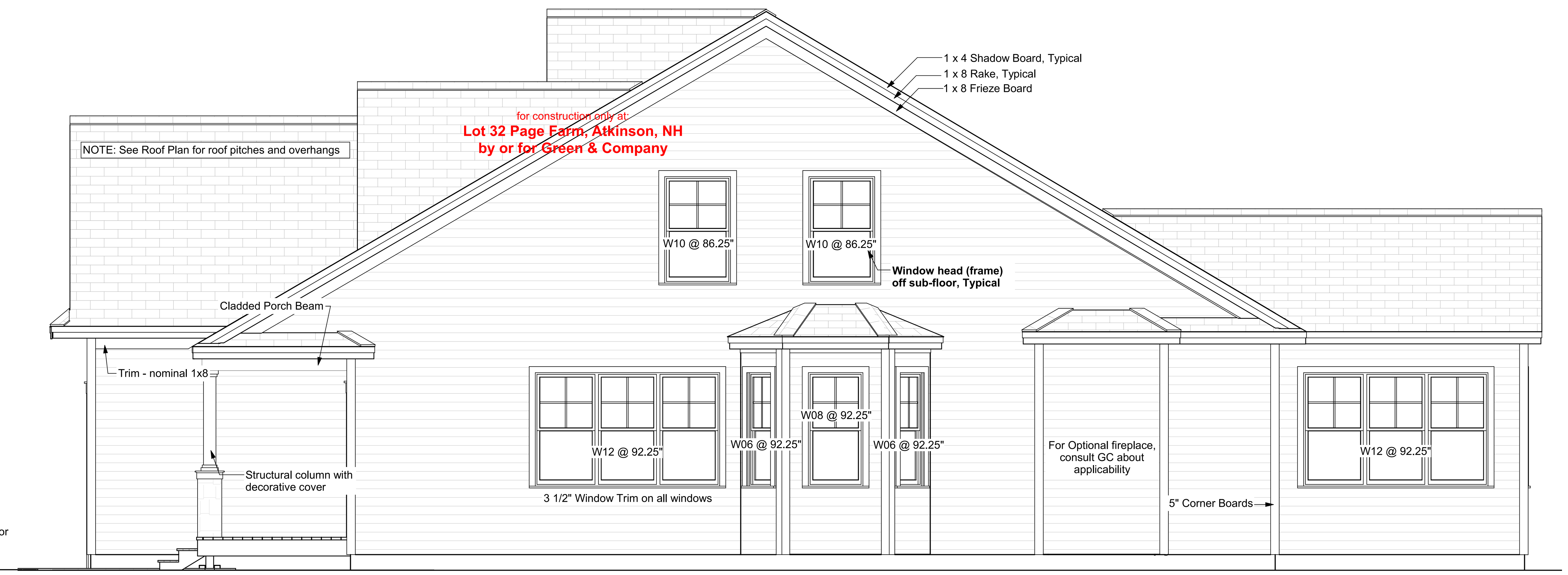


Garage slab height may vary. If garage slab height is lower than shown, consult Artform for aesthetic direction. Taller garage doors, transoms, lintels and/or additional frieze boards may be required to achieve desired look.

Not shown - number of steps may vary - handrail may be required per code.

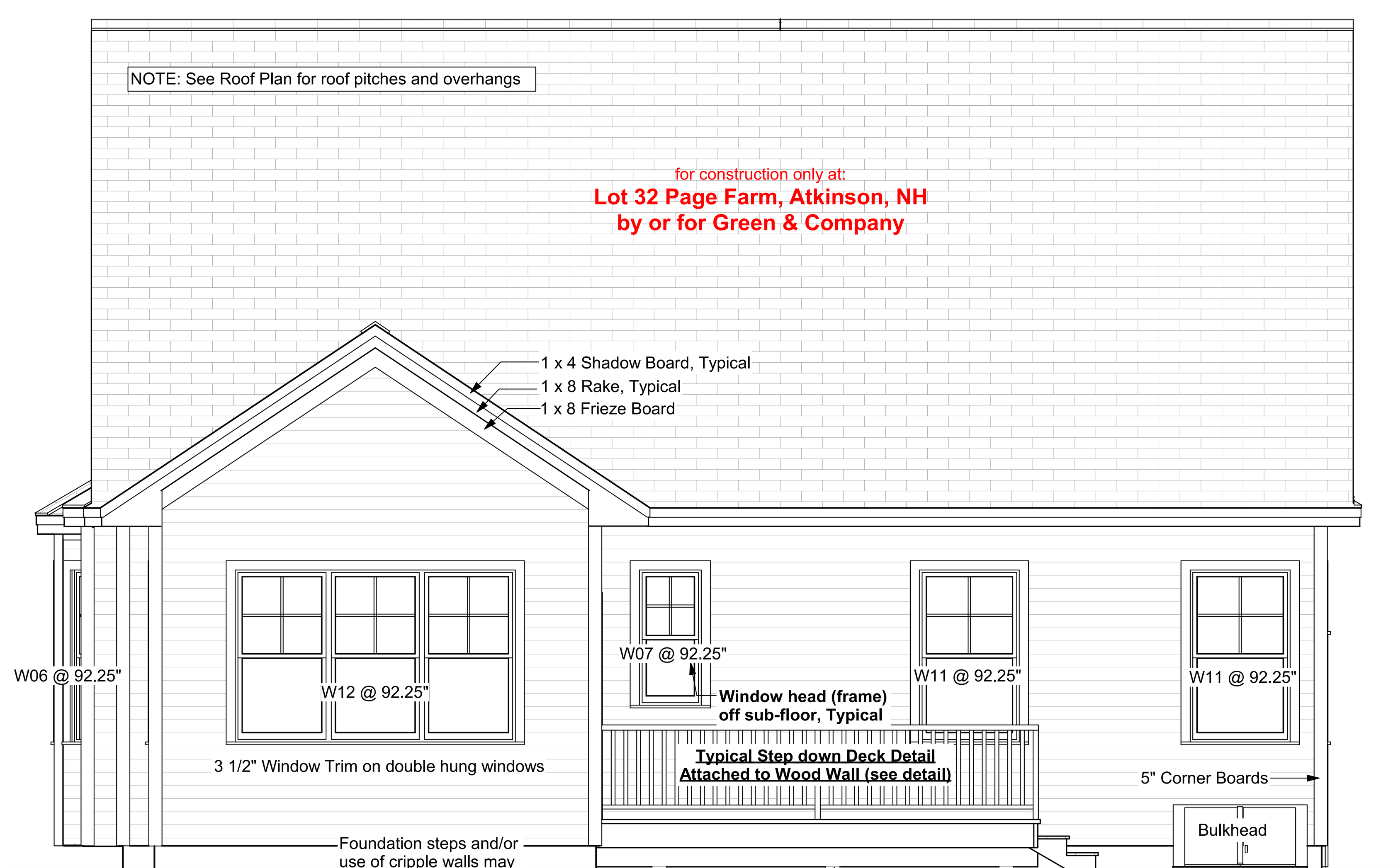
Front Elevation

Note - Actual grade level may vary. Where zoning height restrictions apply, builder shall verify conformance. Manual markup of drawings to demonstrate compliance is recommended.



Right Elevation

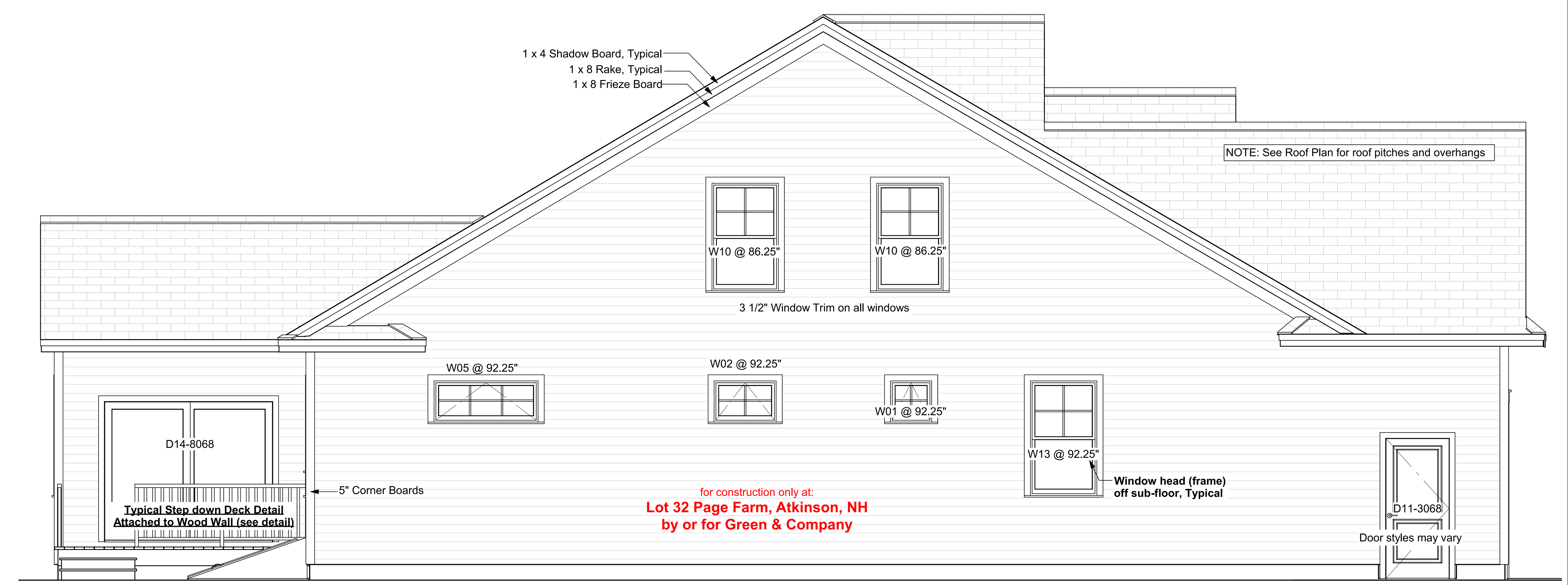
Foundation steps and/or use of cripple walls may be added to suit grade.



Rear Elevation

Posts under deck can be solid 4x4 up to 48" in height, solid 6x6 PT for higher decks. Consult Artform for decks higher than 8 ft off grade.

Basement egress is required, bulkhead option shown. Builder may relocate bulkhead to suit building site and may substitute other code conforming egress, such as window with egress window well or walk-out door if grading allows.



Left Elevation

Foundation steps and/or use of cripple walls may be added to suit grade.

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 540.126.v16 ER

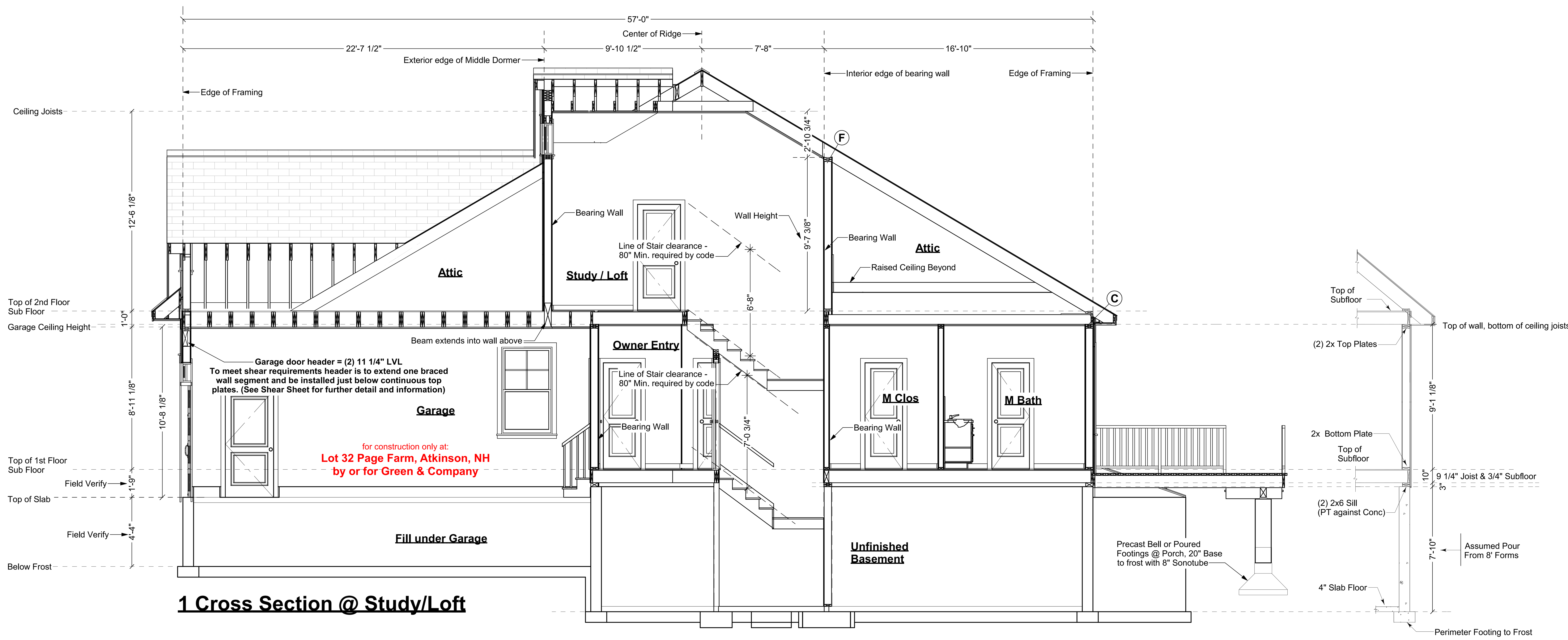
Balmalcolm
Lot 32 Page Farm
Atkinson, NH

4

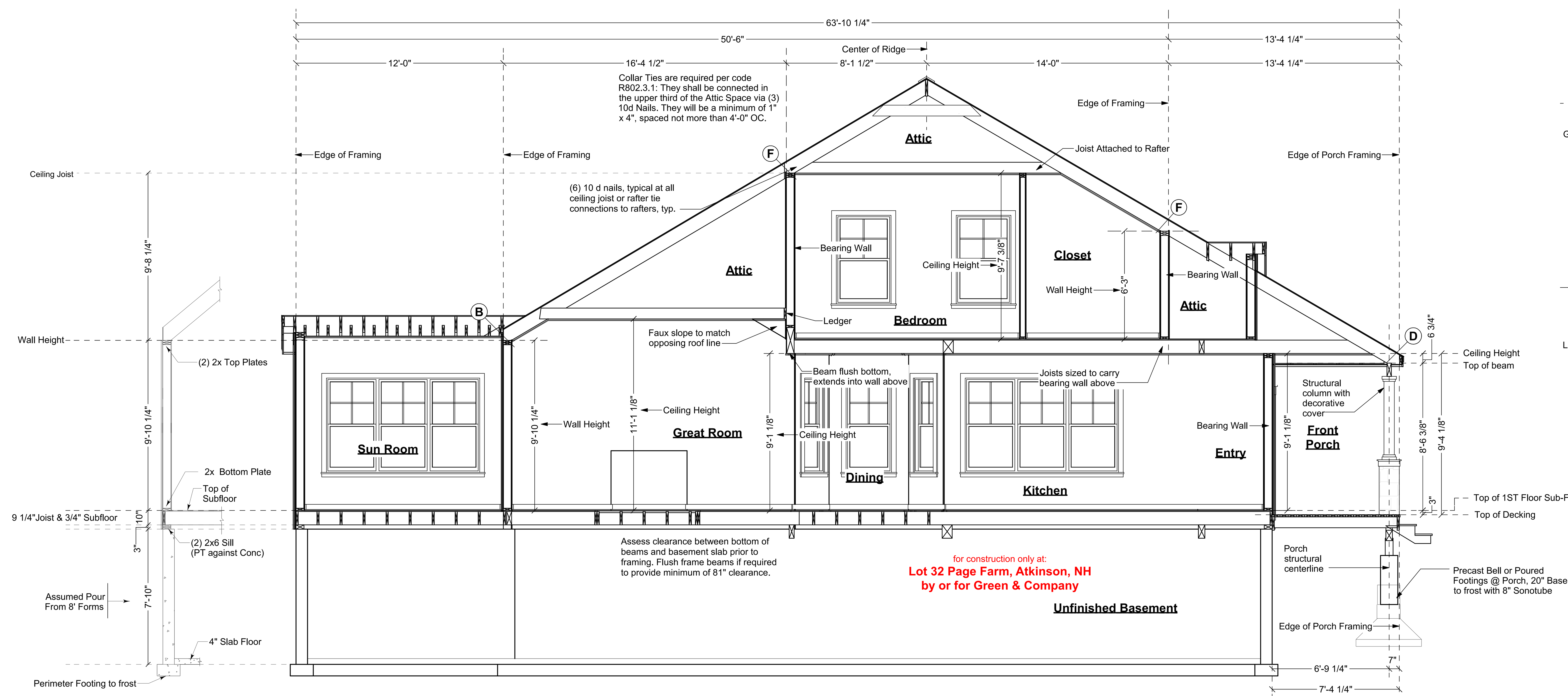
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for: Construction

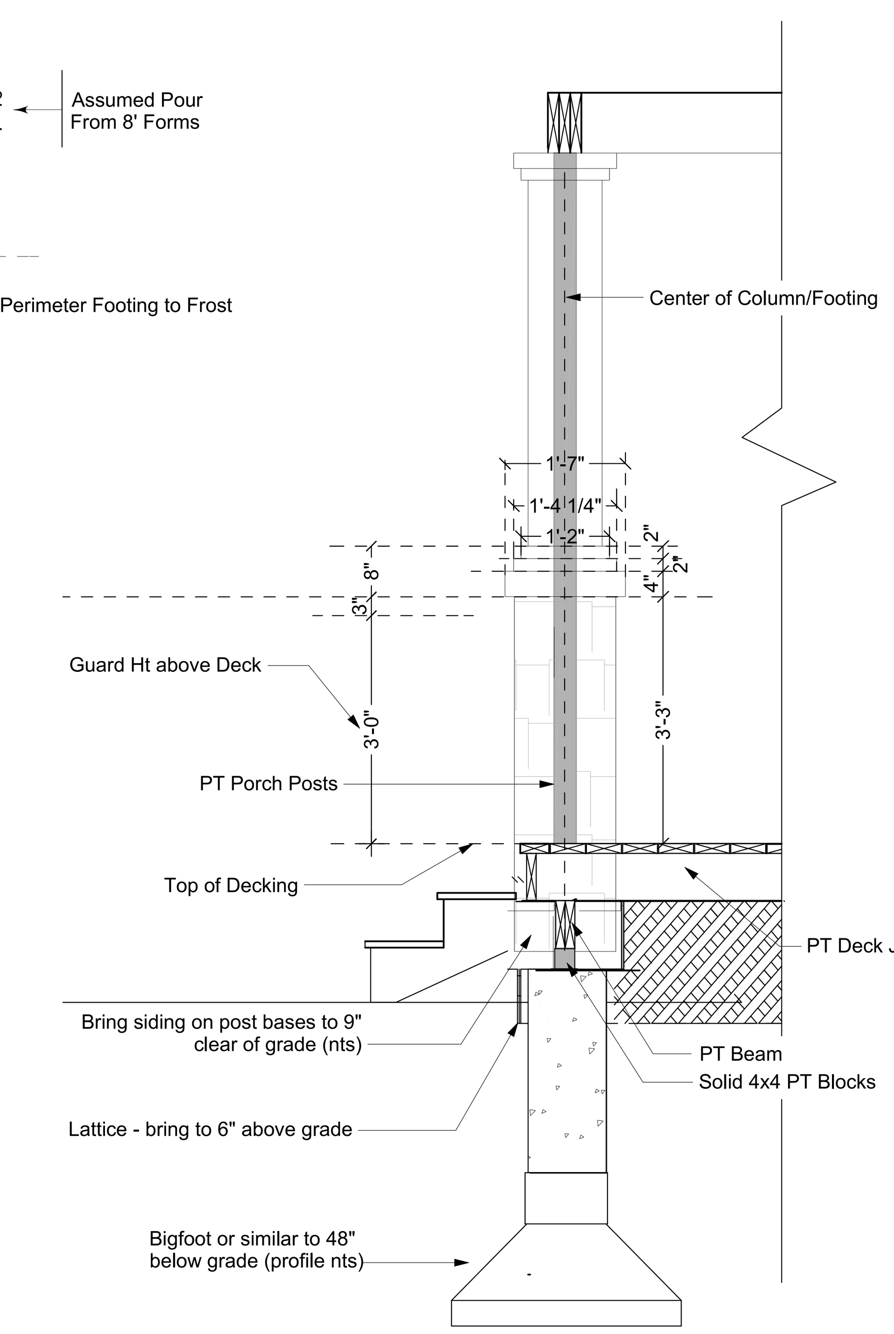
...



1 Cross Section @ Study/Loft



2 Cross Section @ Main



Column Detail

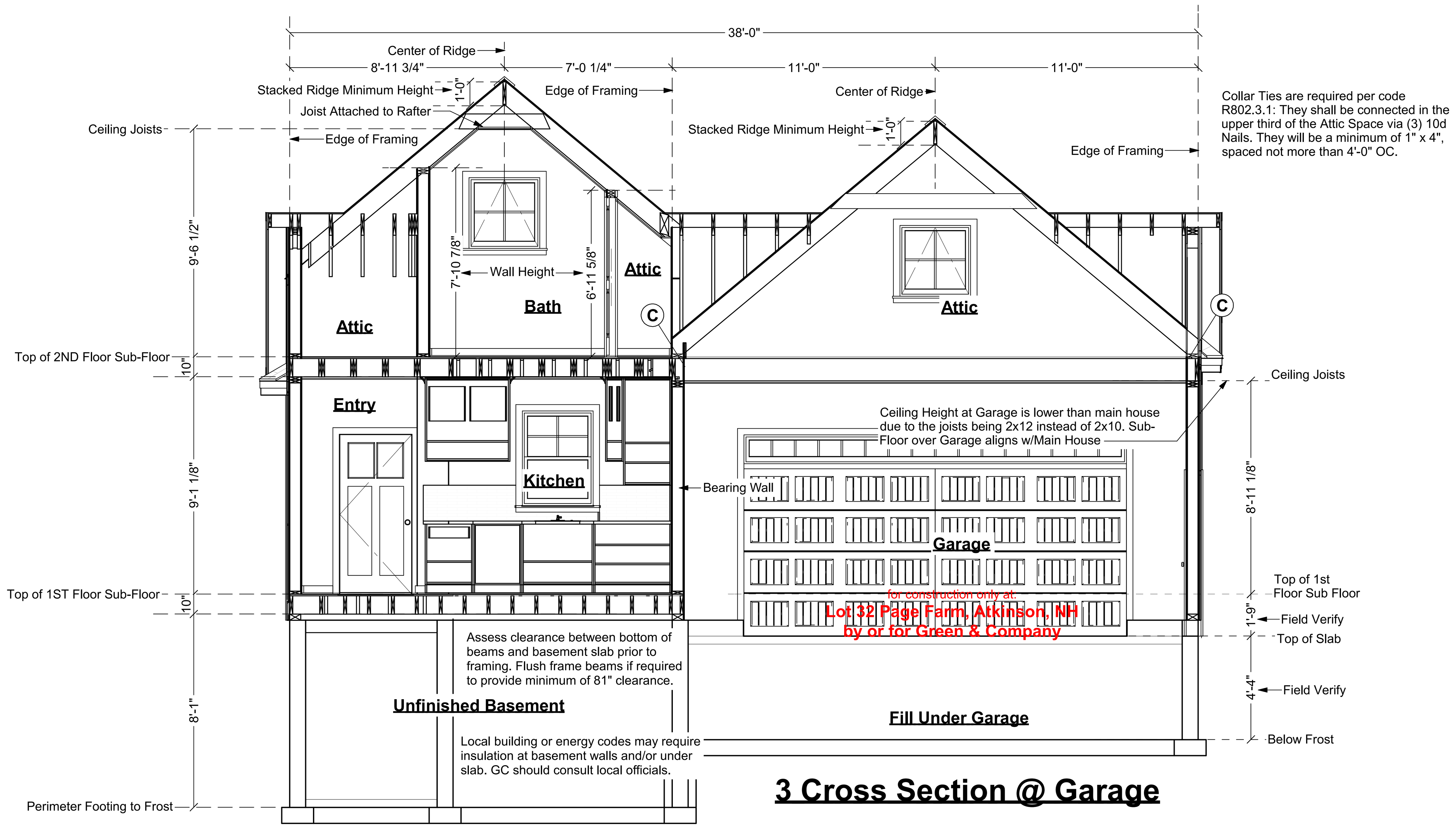
From Column Center = 5" to Edge of Decking, 4" to Edge of Deck Framing.

Artform Home Plans
AFHP Design # 540.126.v16 ER
© 2008-2019 Art Form Architecture 603.431.9559

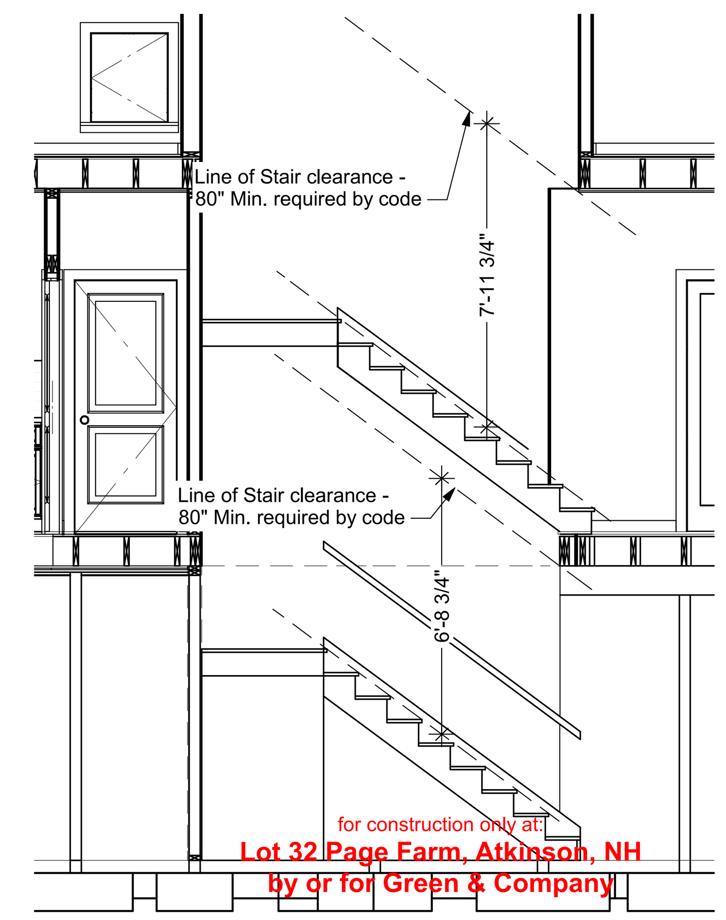
Balmalcolm
Lot 32 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

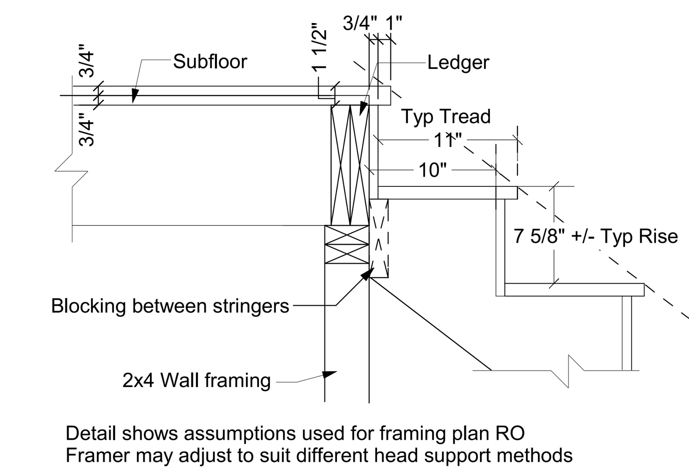
Issued for:
Construction



3 Cross Section @ Garage

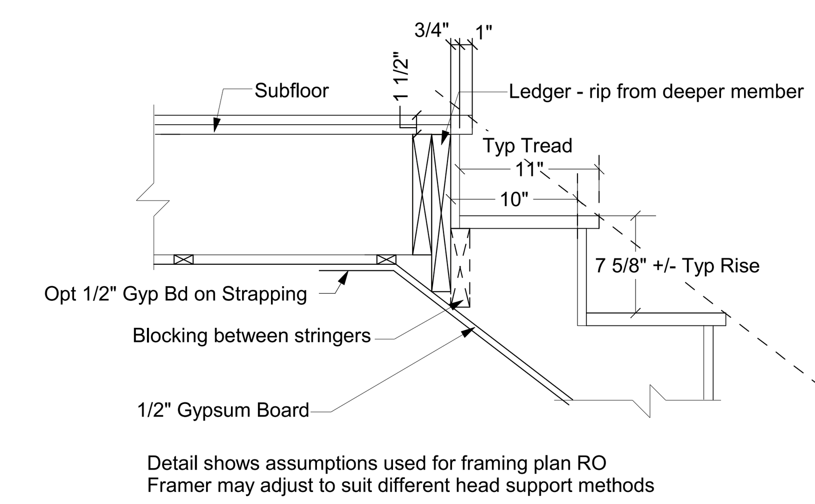


Line of Stair Clearance (Lower)



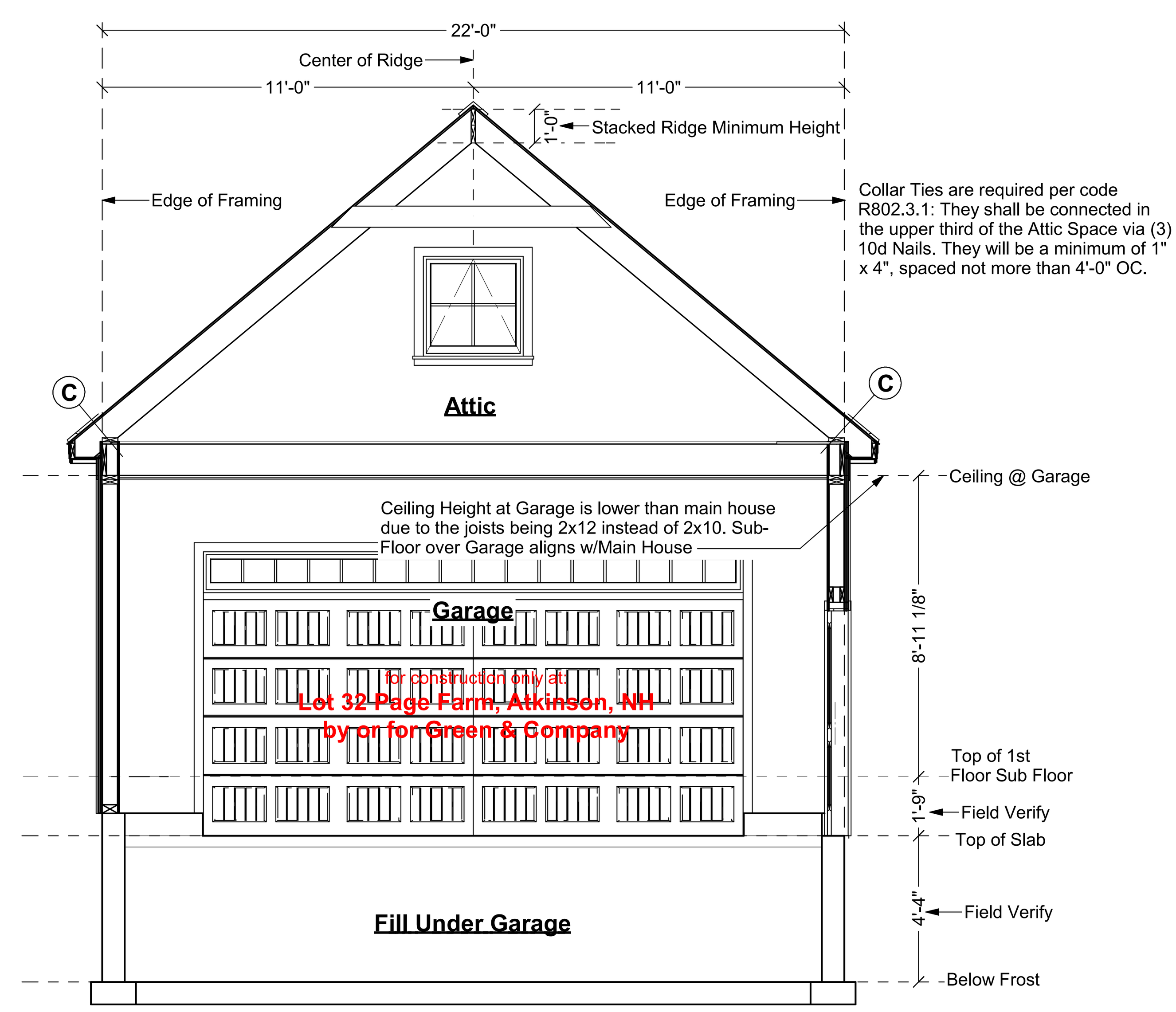
Top of Carriage (B)

Scale: 1" = 1'-0"



Top of Carriage (C)

Scale: 1" = 1'-0"



4 Cross Section @ Front Porch

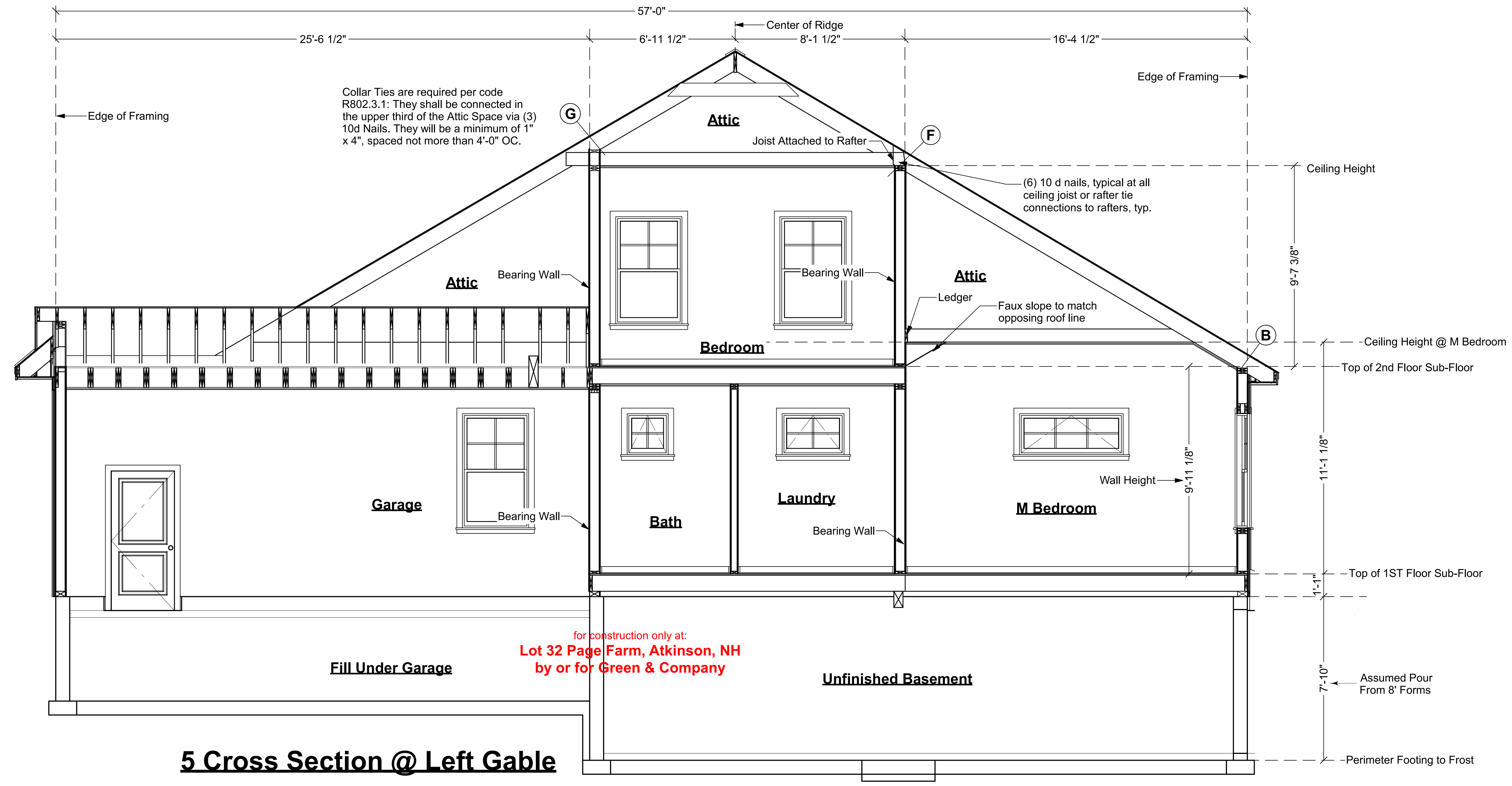
Artform Home Plans
AFHP Design # 540.126.v16 ER
© 2008-2019 Art Form Architecture 603.431.9559

Balmalcolm
Lot 32 Page Farm
Atkinson, NH

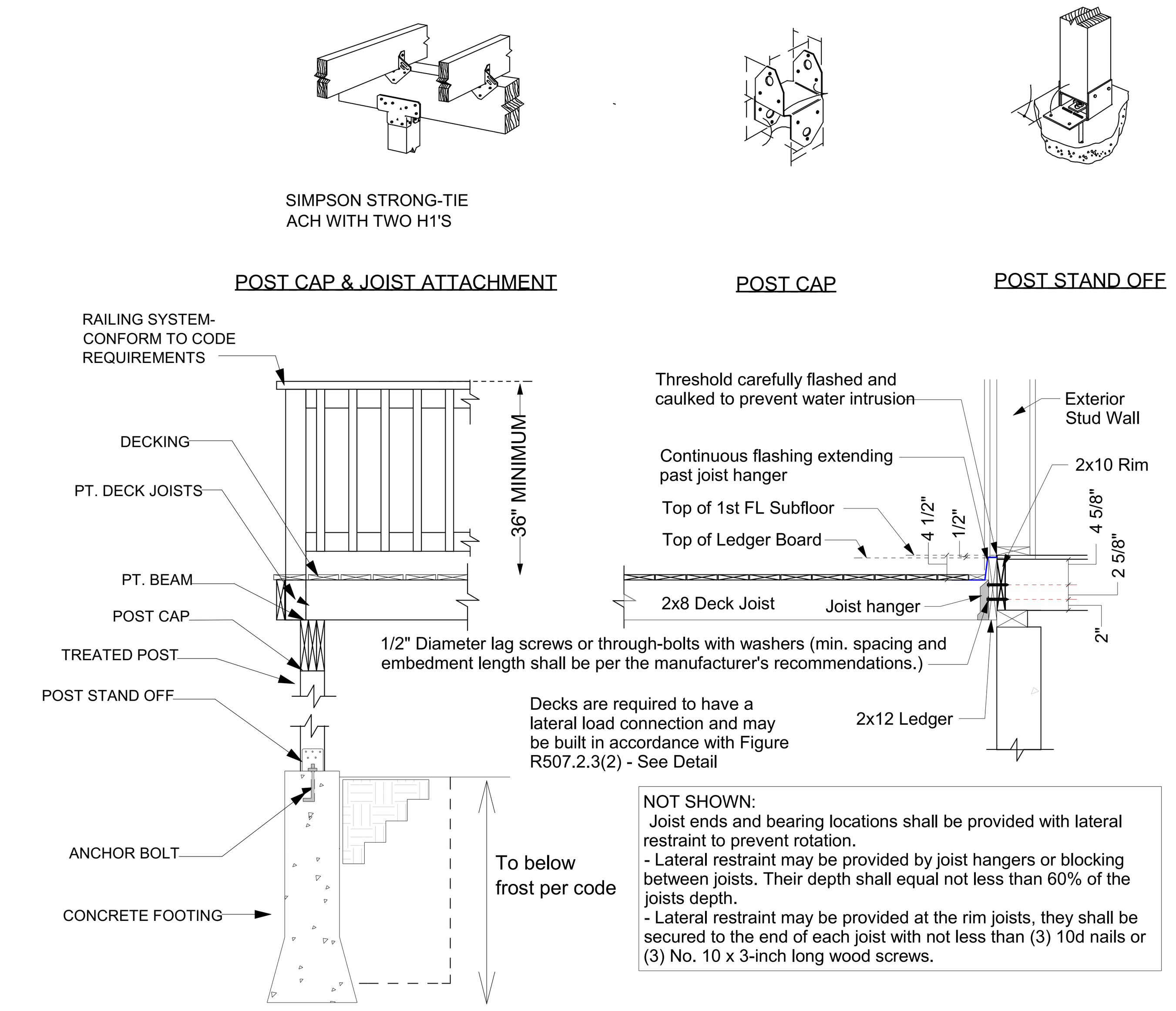
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for:
Construction

6/13/2019 8:33:54 AM

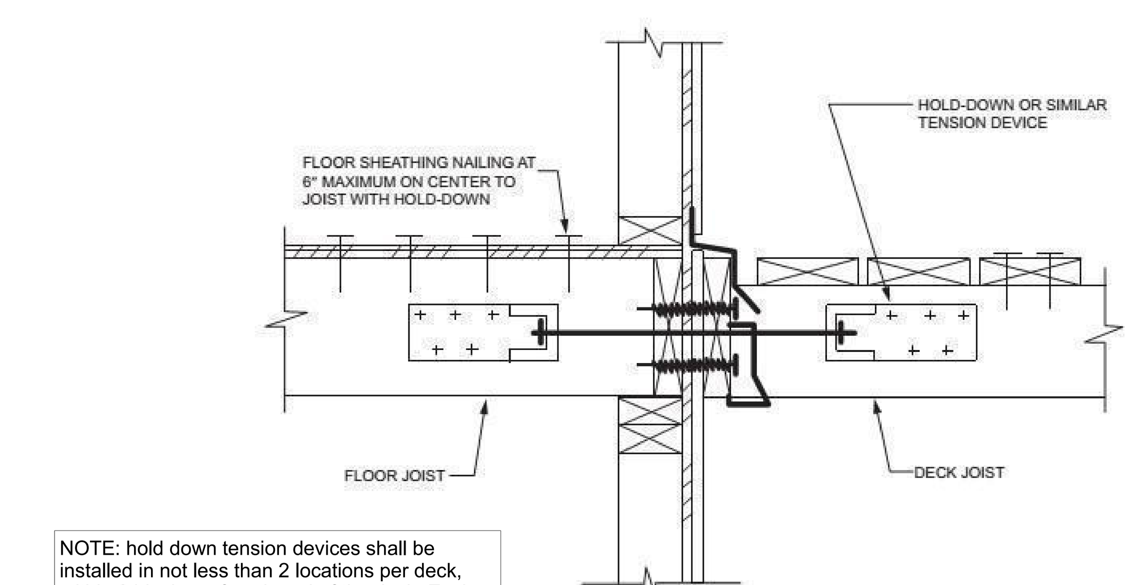


5 Cross Section @ Left Gable



Deck Ledger Attachment Detail for Step Down

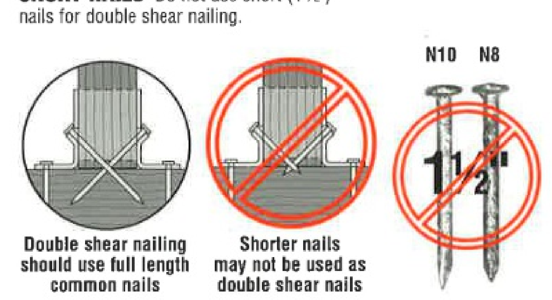
Scale: 1/2" = 1'-0"

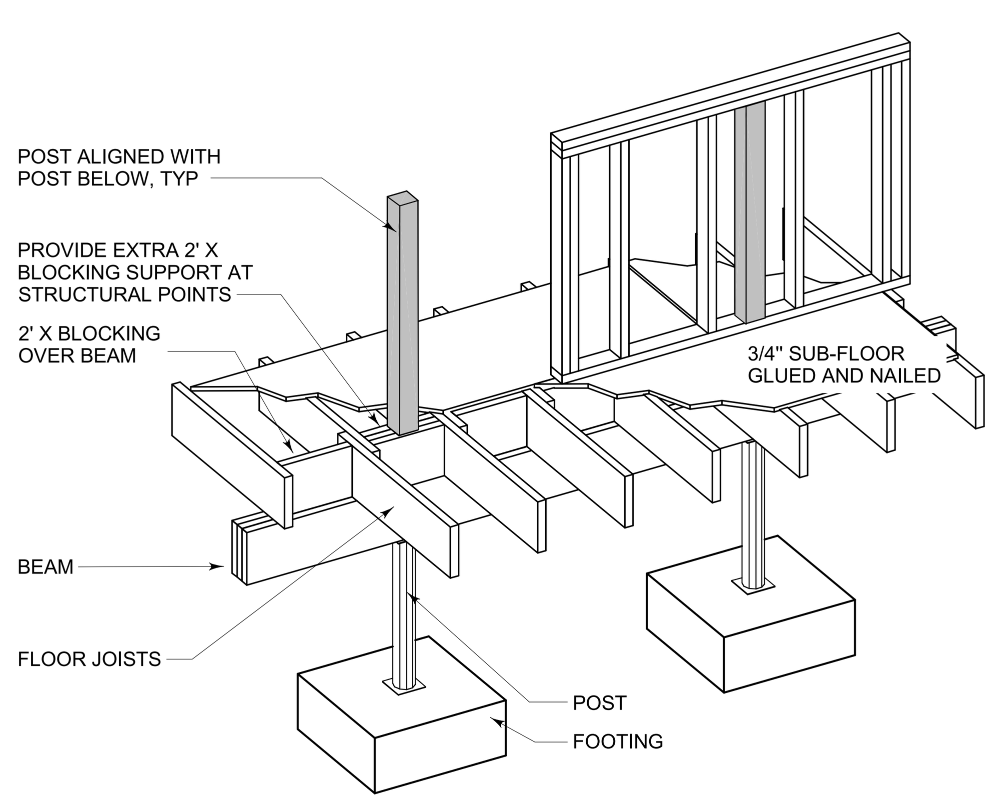


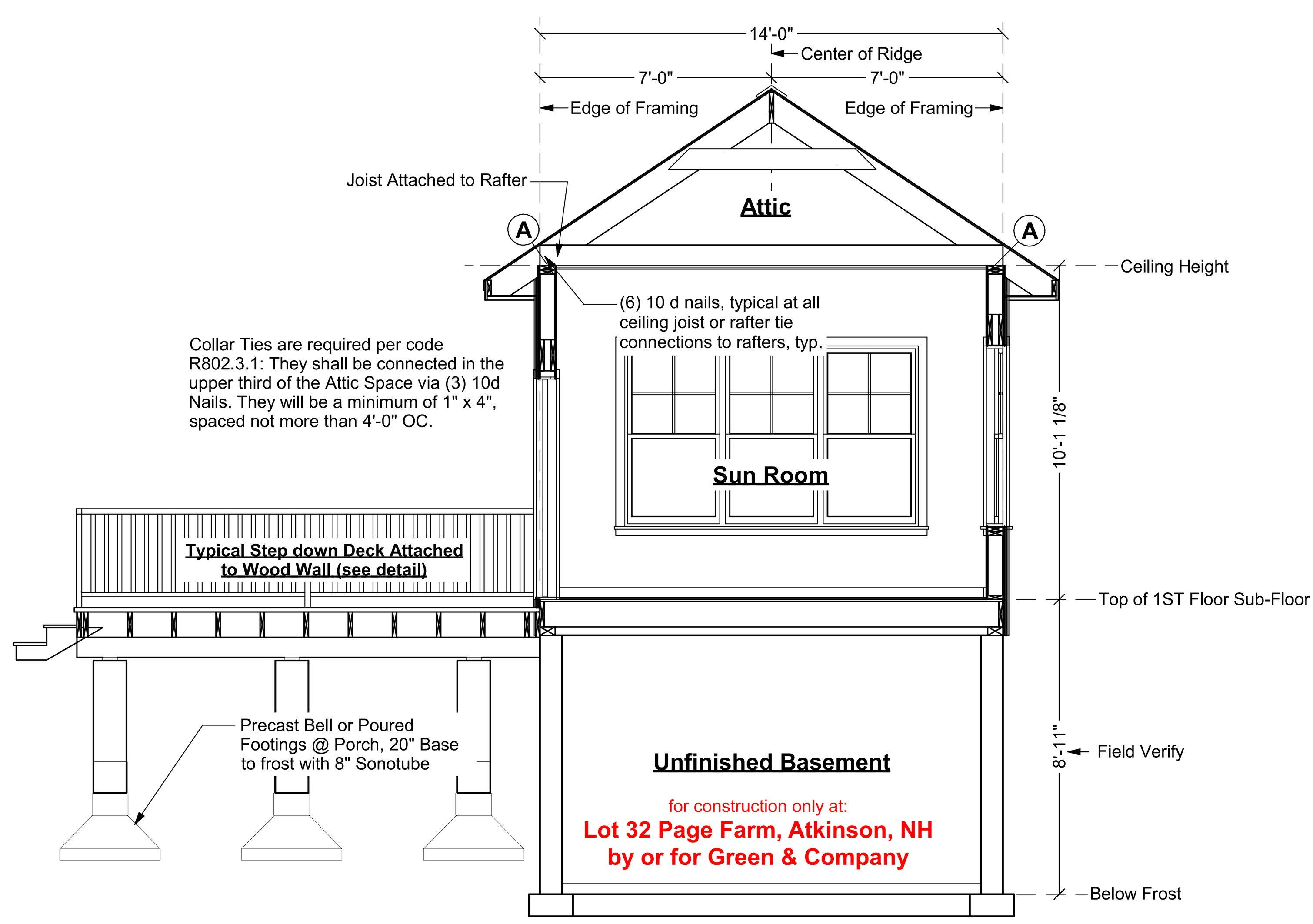
NOTE: hold down tension devices shall be installed in not less than 2 locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 lbs.

FIGURE R507.2.3(2) DECK ATTACHMENT FOR LATERAL LOADS

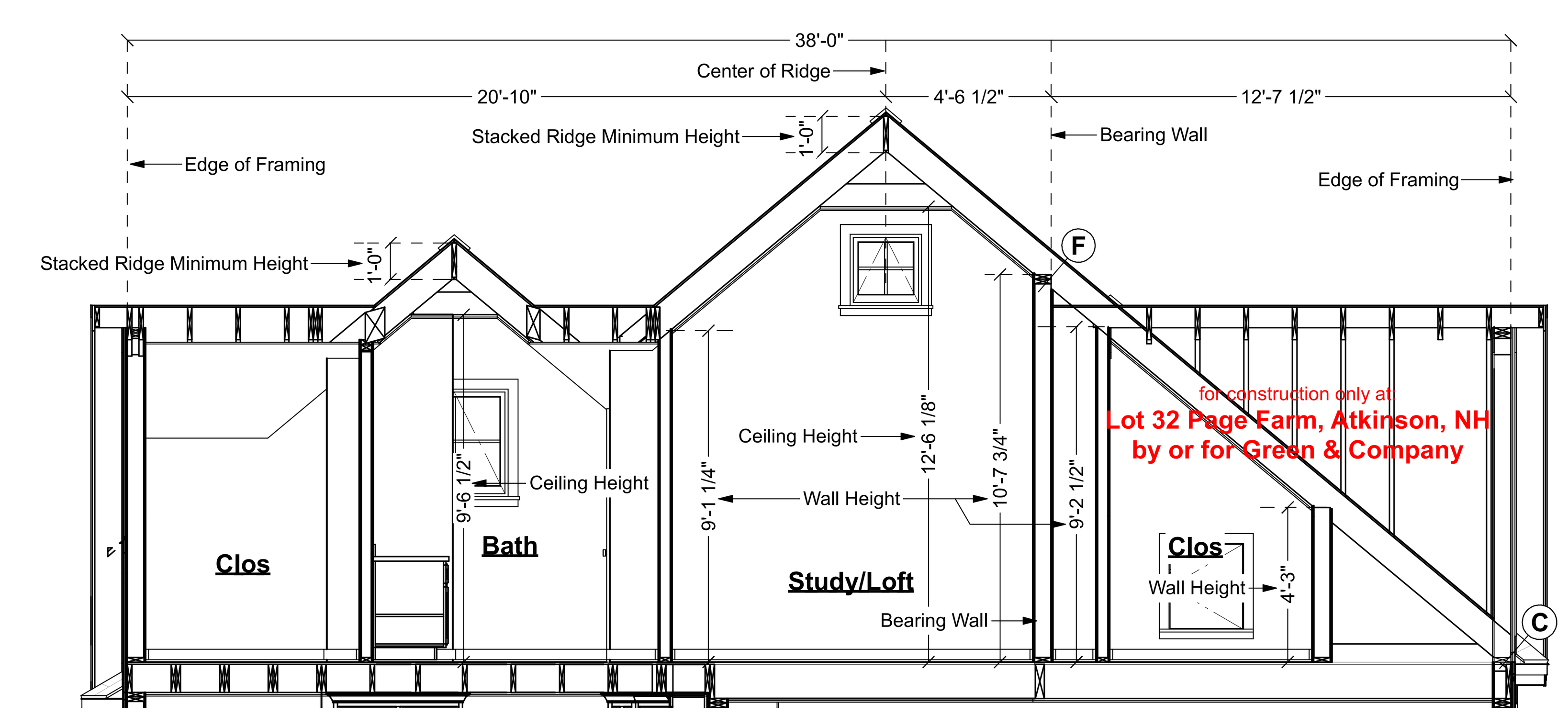
Follow manufacturer's instructions both for installation of joist hangers to joist and to beam. The illustration below, by Simpson Strong Tie, is provided as a courtesy. Consult their full manual for acceptable fastener sizes and other important instructions.







6 Cross Section @ Sun Room



7 Cross Section @ Bath

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 540.126.v16 ER

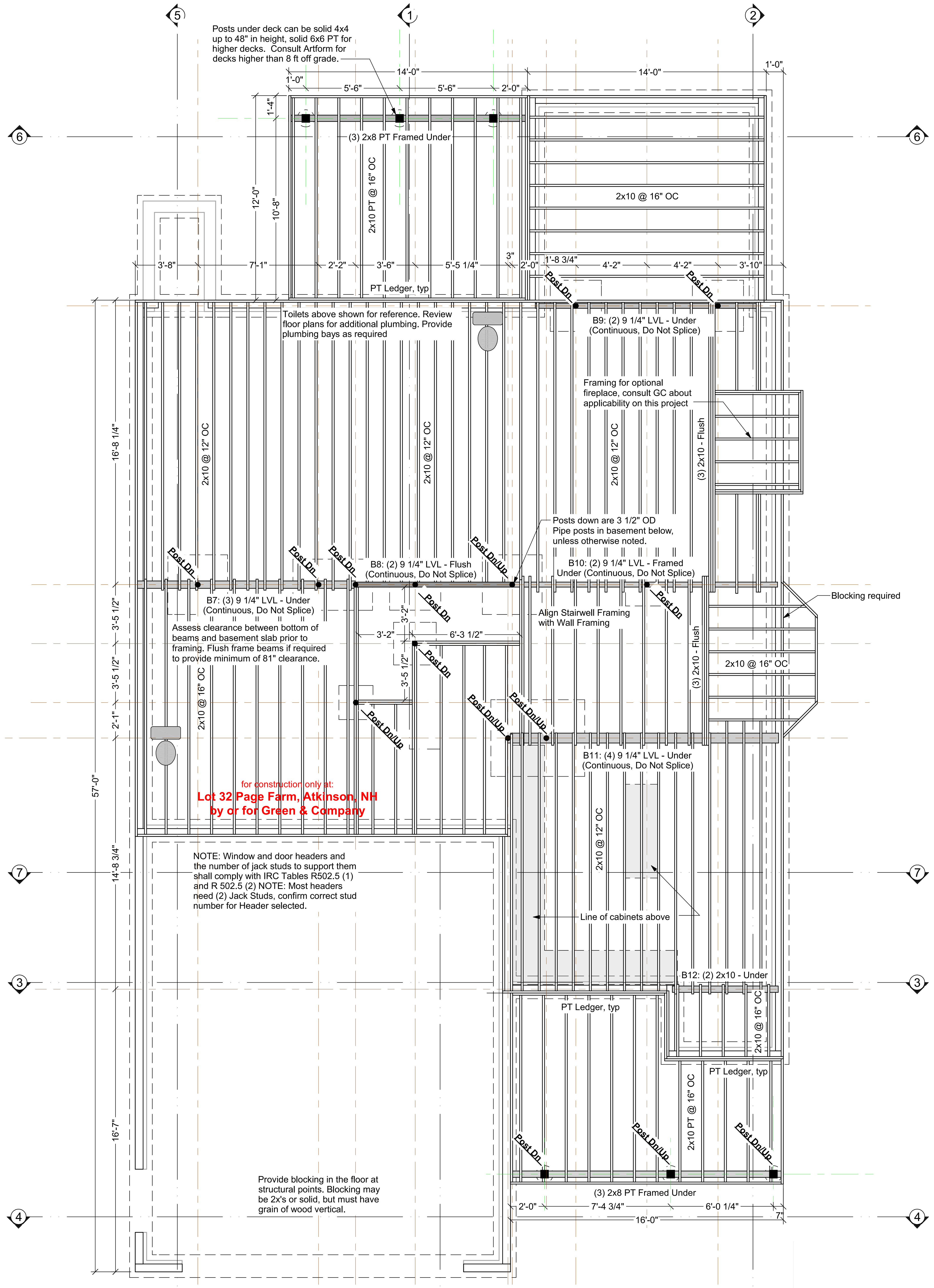
Balmalcolm
Lot 32 Page Farm
Atkinson, NH

7

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for: Construction

\\afdskstation\AFA Staff\Access\-Home Designs\by Project\Green & Co - Page Farm\Balmalcolm 540\540.126.v16 Bigger Garage & Porch\CD 540.126.v16 ER 2573 Balmalcolm - Lot 32 Page Farm.layout



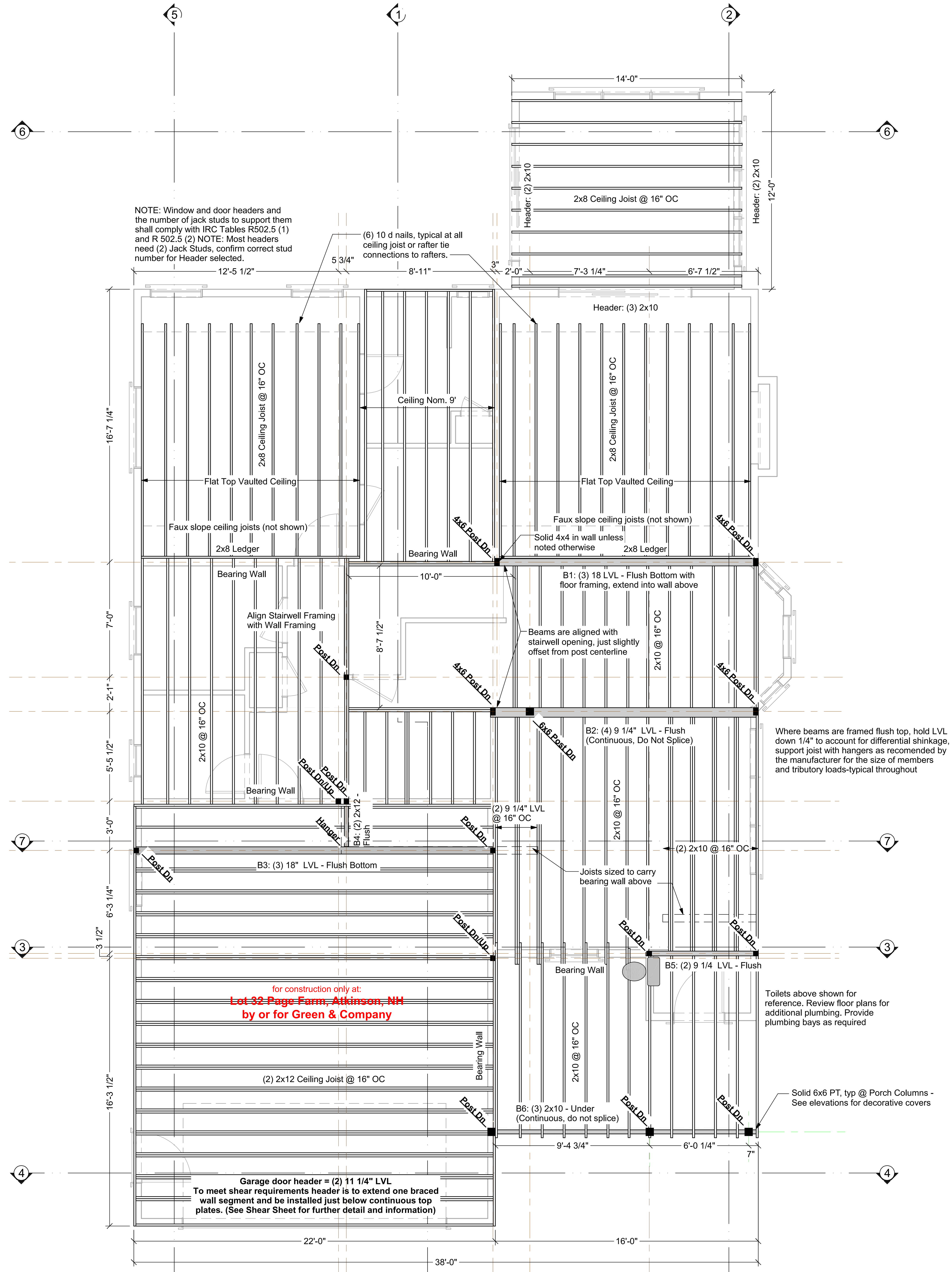
Framing is sized for normal residential conditions. Contact Art Form if additional loads are anticipated, including but not limited to waterbeds, large fish tanks, indoor hot tubs, multiple framed soffits or coffers.

NOTE: Our beams sizes often differ from prescriptive code, because our designs are rarely the old style box colonial or cape with a center bearing wall upon which prescriptive code is based. We size our beams via calculations for this specific design, which may carry those loads separately via second floor beams and/or roof transfer beams. Beam sizes may not be reduced or alternates substituted without our express permission. In states where the designer is a licensed architect, (NH, MA, ME & NY as of the date of issue) we are happy to stamp our drawings at no additional charge. In other states we are happy to provide calculations. Administration fees apply with provision of calculations. Code officer is encouraged to call with any questions about our methodology.

First Floor Framing

Structure designed for
Snow Load of 55 PSF

1 0 1 2 3 4



Second Floor Framing

Structure designed for
Snow Load of 55 PSF

1 0 1 2 3 4

Framing is sized for normal residential conditions. Contact Art Form if additional loads are anticipated, including but not limited to waterbeds, large fish tanks, indoor hot tubs, multiple framed soffits or coffers.

Built-up Beams:
Unless otherwise noted, connect multiple 1 3/4" ply beams as follows:
3 ply & up, fasteners are per side

(2) 9 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 24" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 24" oc
- Framed under (2) rows 10d nails @ 24" oc

(2) 11 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(2) 16" LVL or greater:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 9 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 11 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 14" LVL:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 16" LVL or greater:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(4) 9 1/4" LVL:
- Flush framed
  - (2) rows 5" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(4) 11 1/4" LVL:
- Flush framed
  - (2) rows 5" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 12" oc

(4) 16" LVL or greater:
- Flush framed
  - (3) rows 5" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 12" oc

Beam Substitutions:

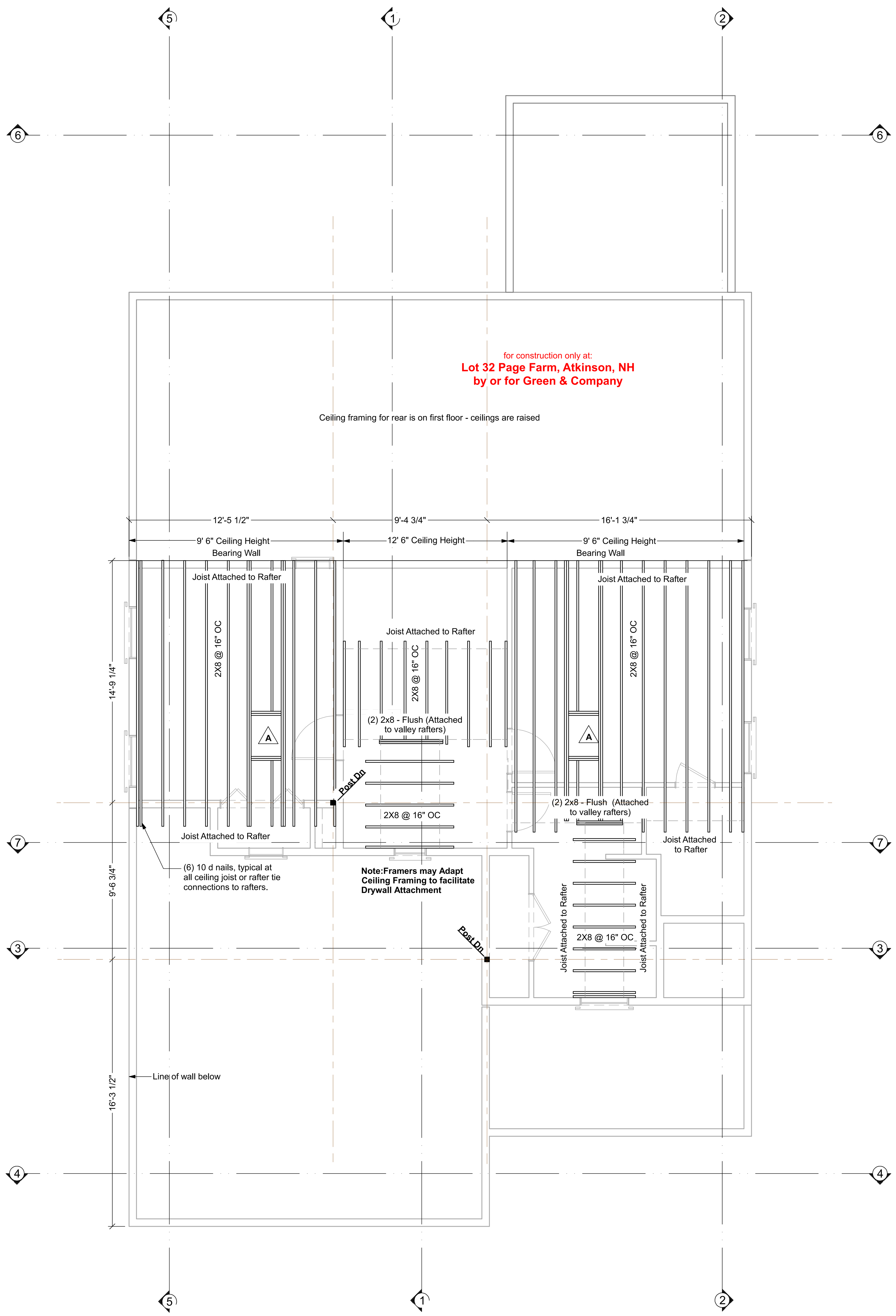
(2) 9 1/4" LVL may replace a double or triple 2x10 beam. No other substitutions are allowed. Conventional lumber beams MAY NOT be substituted for LVL beams by any "rule of thumb". Substitutions must be calculated by either Artform or a structural engineer. If calculated by a structural engineer, provide stamped plans and/or calculations.

We specify LVL beams as built up members to allow framers to use existing stock. You may substitute single piece LVLs of equivalent overall size for built-up members, unless otherwise noted.

Built-up members MAY NOT replace single piece LVL's where specified.

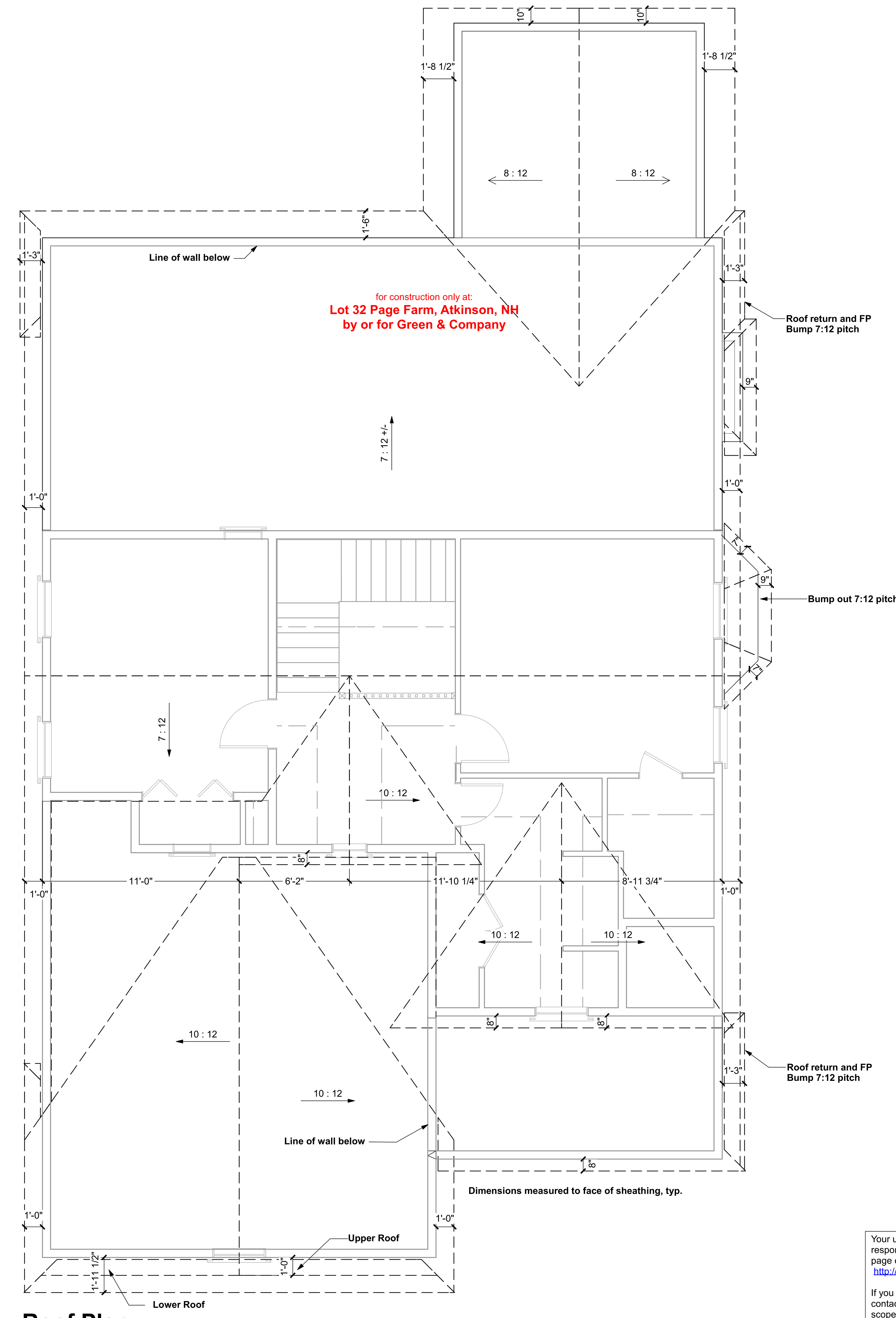
Where a beam of 1 3/4" or less in width is specified as framed under, either brace at 48" or double member for lateral stability.

Artform Home Plans
AFHP Design # 540.126.v16 ER
© 2008-2019 Art Form Architecture 603.431.9559
Balmalcolm
Lot 32 Page Farm
Atkinson, NH
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ
Issued for:
Construction



Ceiling Framing

Structure designed for
Snow Load of 55 PSF



Roof Plan

In case of conflict exterior trim alignment takes precedence over overhang dimensions

Balmalcolm
Lot 32 Page Farm
Atkinson, NH

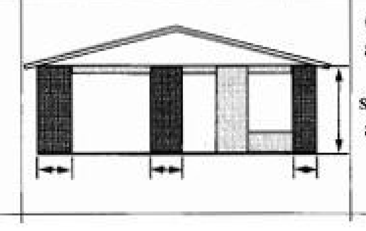
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

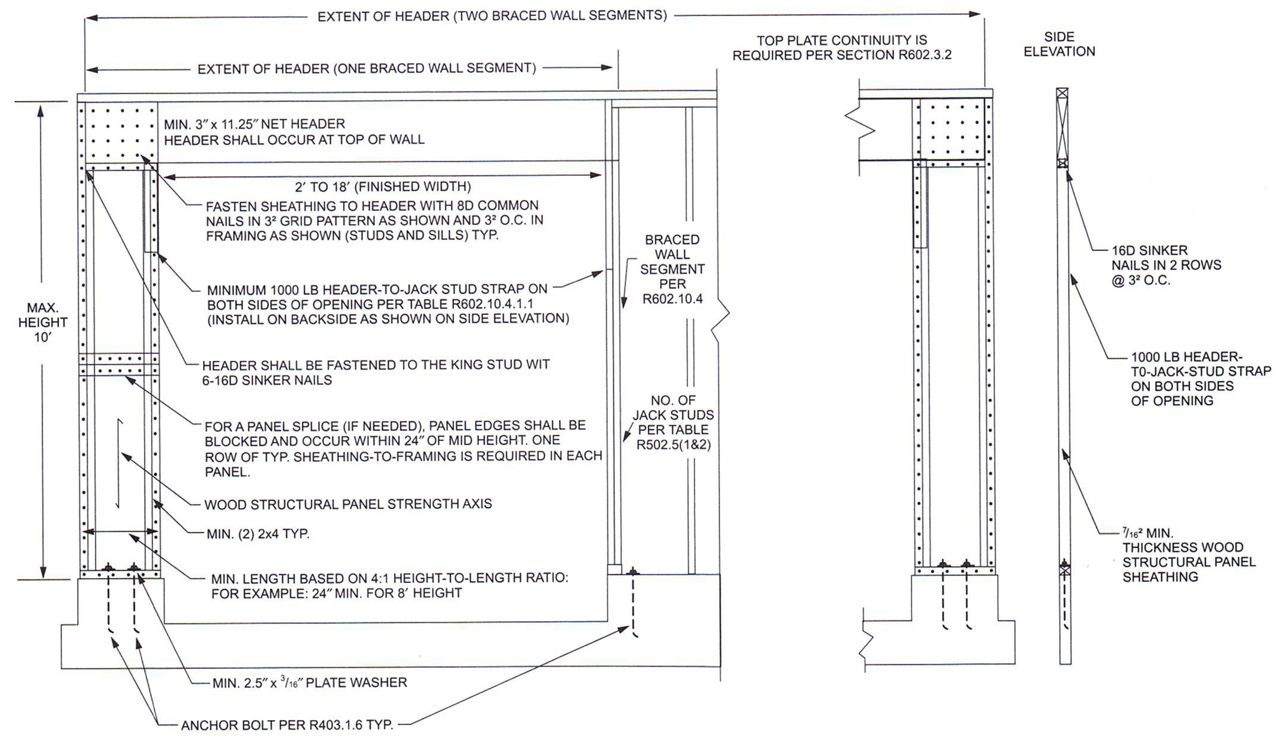
Issued for:
Construction

6/13/2019 8:33:55 AM

\\afdiskstation\AFA Staff\Access\-Home Designs\by Project\Green & Co - Page Farm\Balmalcolm 540\540.126.v16 Bigger Garage & Porch\CD 540.126.v16 ER 2573 Balmalcolm - Lot 32 Page Farm.layout

TABLE R602.10.4.1
CONTINUOUS SHEATHING METHODS

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
CS-WSP	Wood structural panel	3/8"		6d common (2" × 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports) or 16 ga. × 1 3/4 staples at 3" spacing (panel edges) and 6" spacing (intermediate supports)



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound force = 4.448 N.

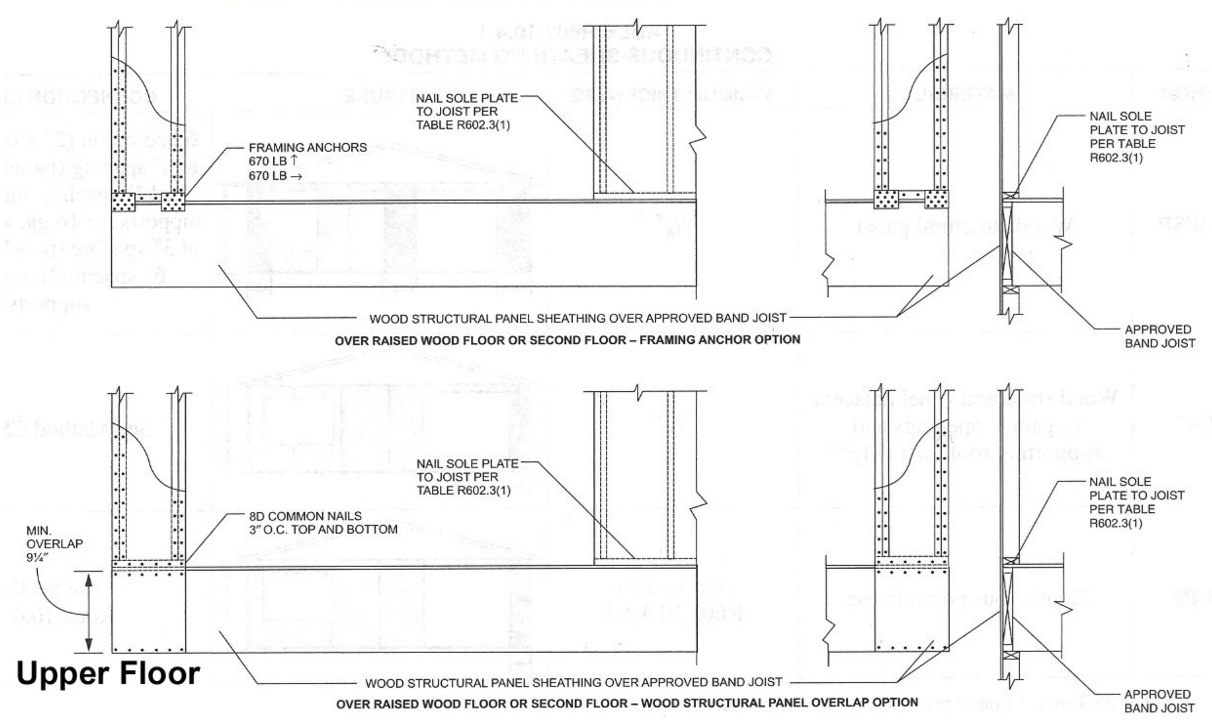
FIGURE R602.10.3.4
METHOD PFG PORTAL FRAME AT GARAGE DOOR OPENINGS IN SEISMIC DESIGN CATEGORIES A, B AND C

Shear Wall Details

Not to Scale

Notes:

- See plans for locations where shear panels are required.
- Details shown here are for one method and for typical conditions. An alternate shear method allowed per code or approved by the code officer may be substituted.
- If the method at left is used at Garages where width of panel is 20" or more, wall height may be 10 ft as shown in detail at left. Where panel width is 18"-20", wall height may be 9 ft. Where panel is 16"-18", wall height may be 8 ft. Where panel is less, consult architect for additional design.
- If the method at left is used, increase foundation wall height at front and for 2 ft along wall returns as required to meet maximum wood stud wall heights, and extend sheathing and siding in front of wall to achieve desired aesthetics. Untreaded wood may not be in direct contact with concrete - use treated wood or provide a barrier, such as a rubber membrane or felt paper.
- Note that if sheathing is to be used as wall bracing all vertical joints in required braced wall panels must be blocked. [2009 IRC section R602.1.8]



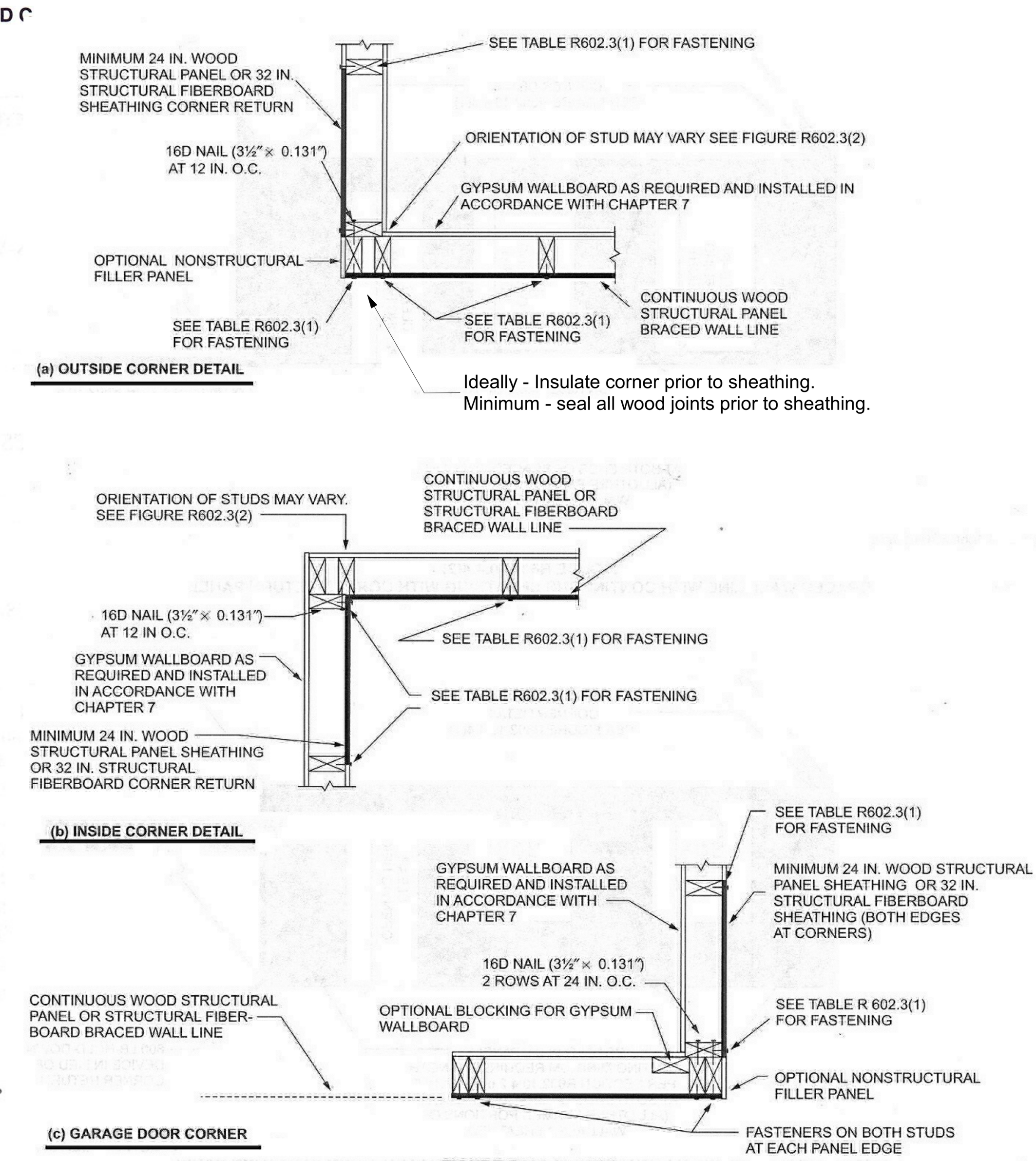
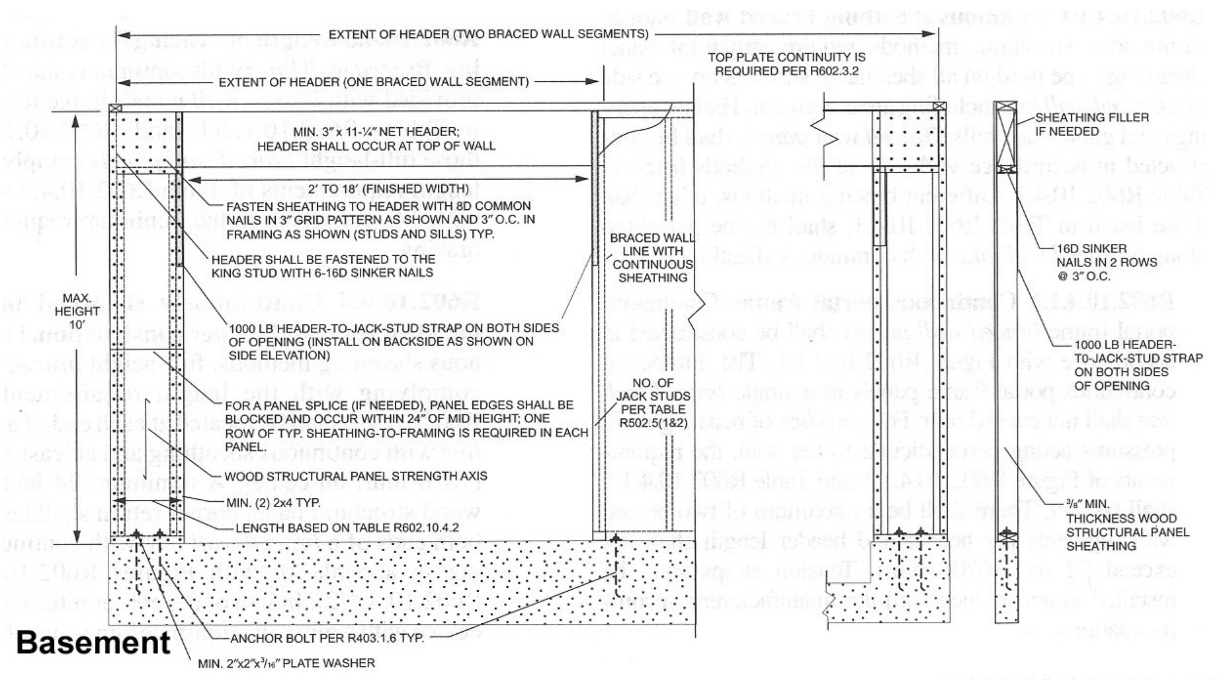


FIGURE R602.10.4.4(1)
TYPICAL EXTERIOR CORNER FRAMING FOR CONTINUOUS SHEATHING

2009 INTERNATIONAL RESIDENTIAL CODE®

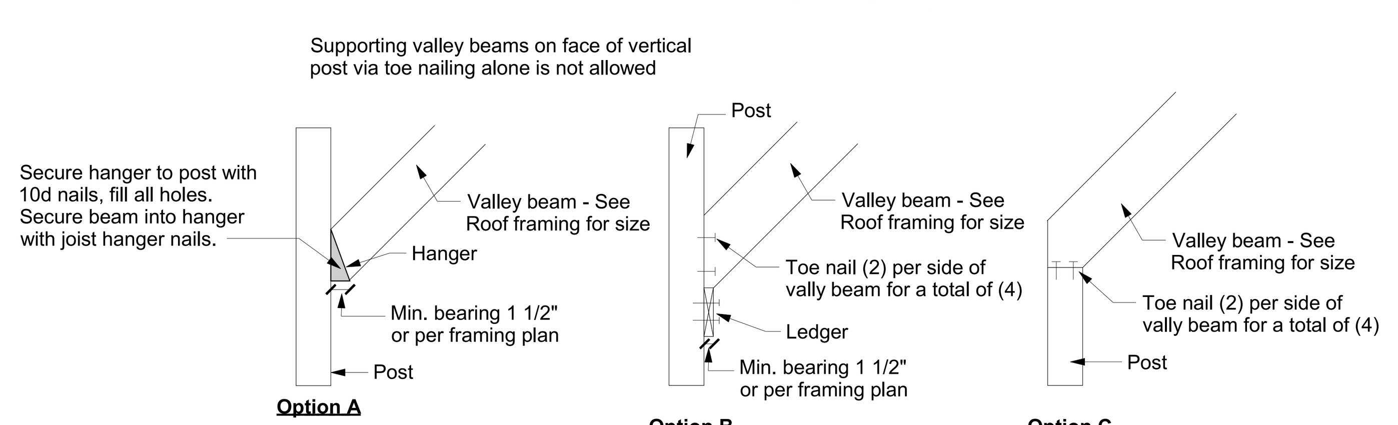
177



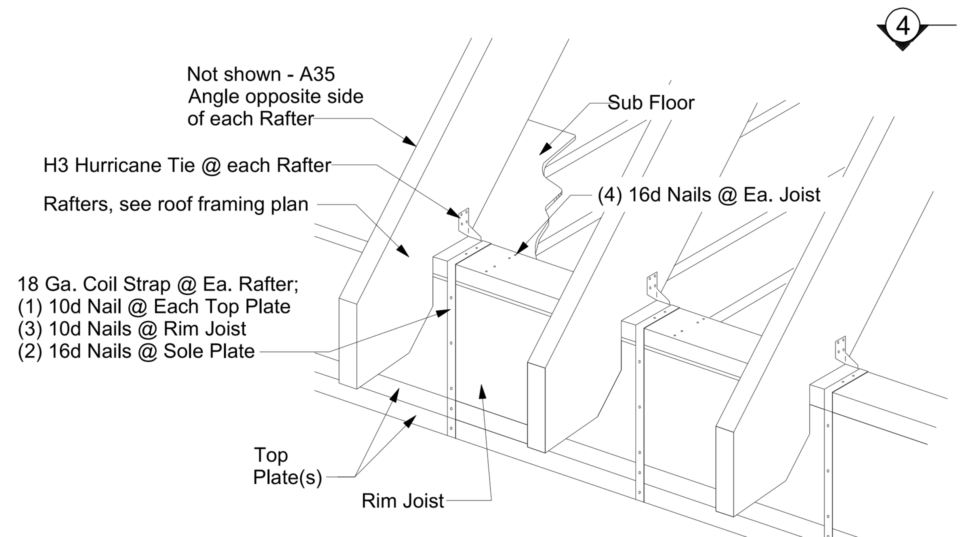
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound force = 4.448 N.

FIGURE R602.10.4.1.1
METHOD CS-PF: CONTINUOUS PORTAL FRAME PANEL CONSTRUCTION

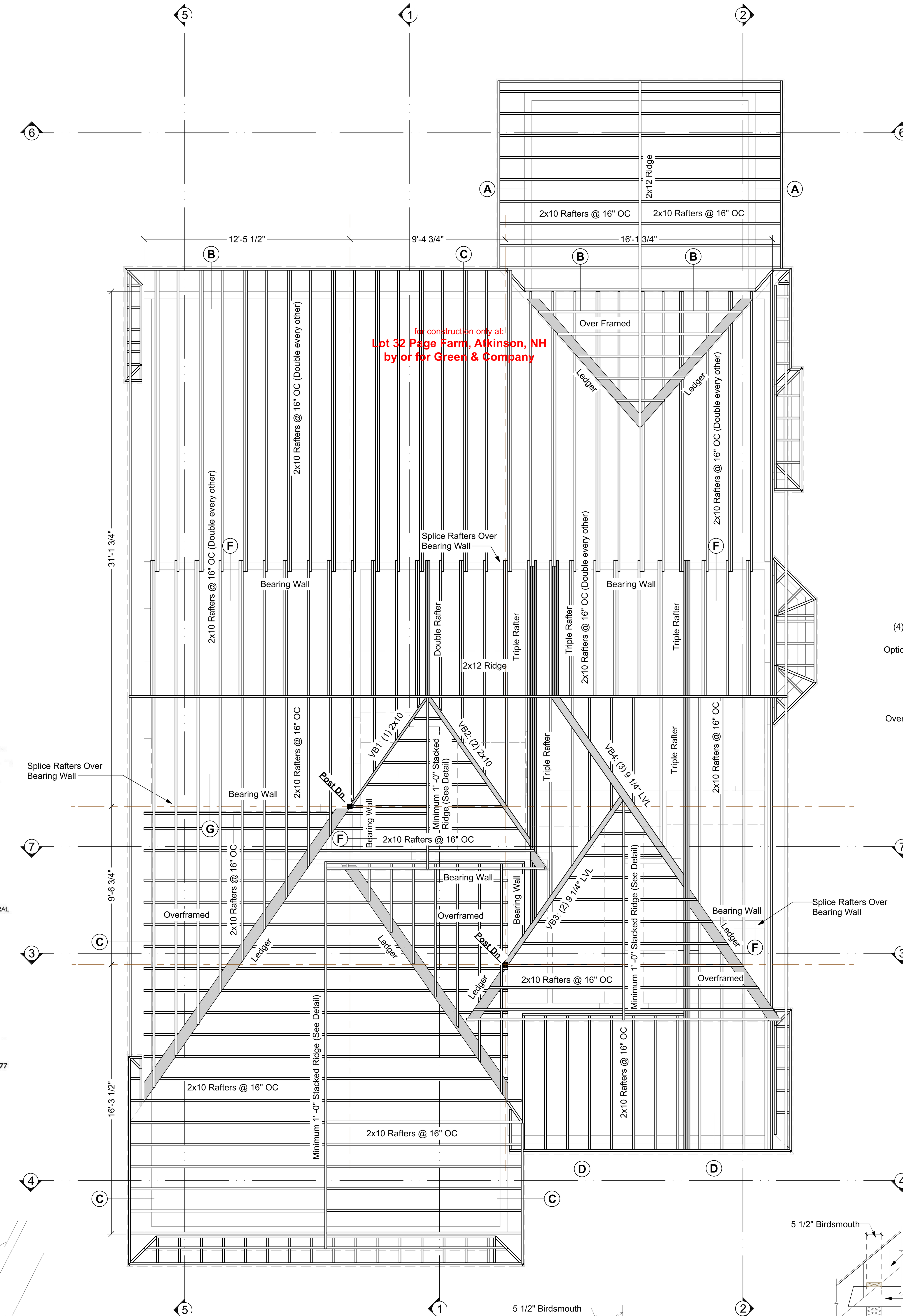
174 2009 INTERNATIONAL RESIDENTIAL CODE®



Valley Beam Attachment Options



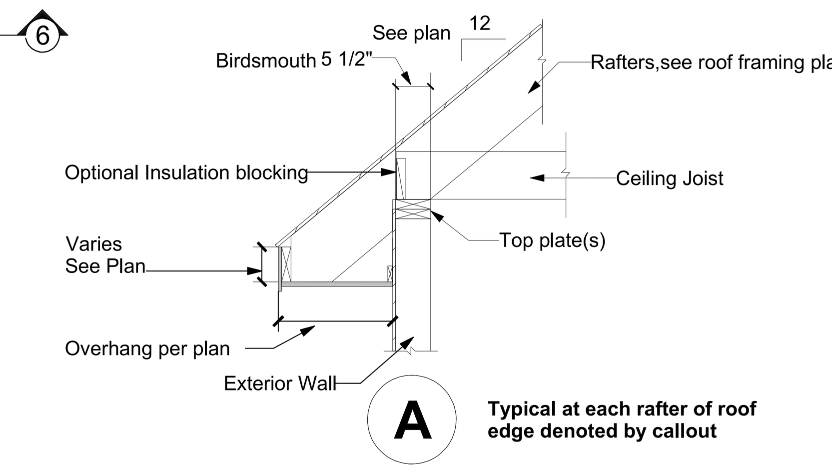
Perspective View of Detail C

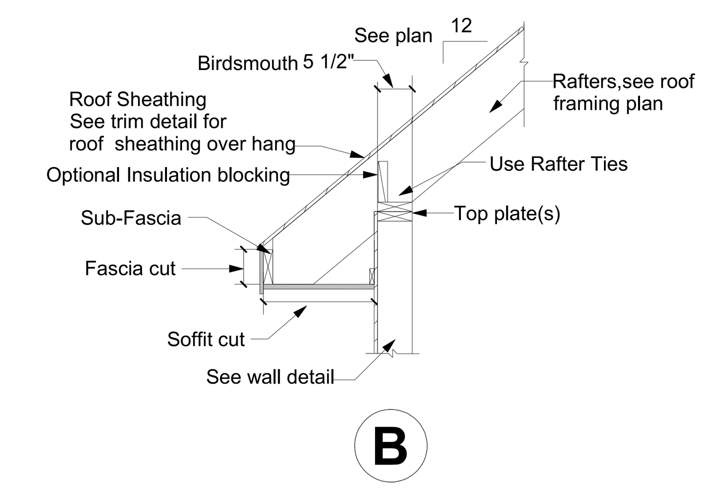


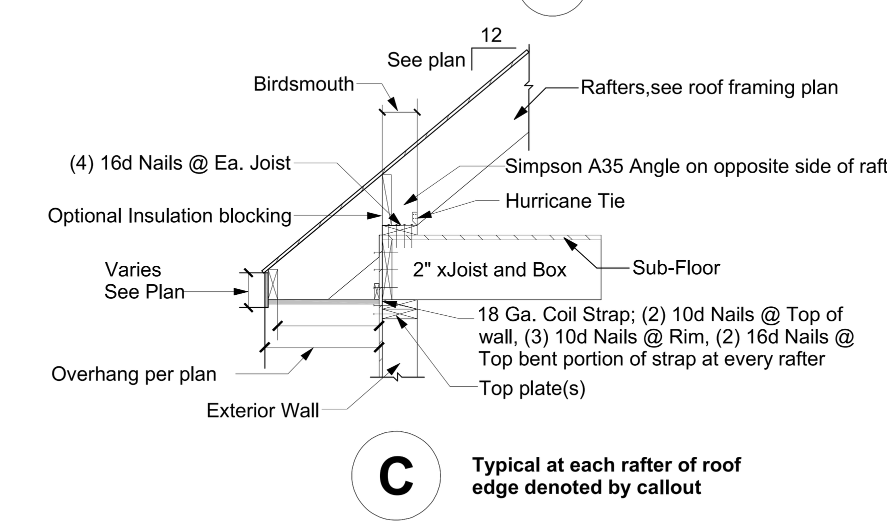
Roof Framing

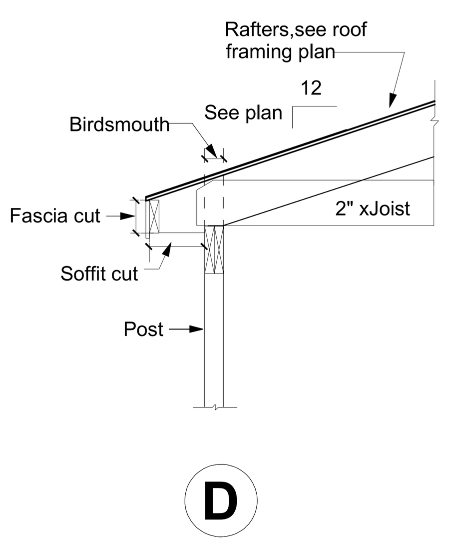
Structure designed for Snow Load of 55 PSF

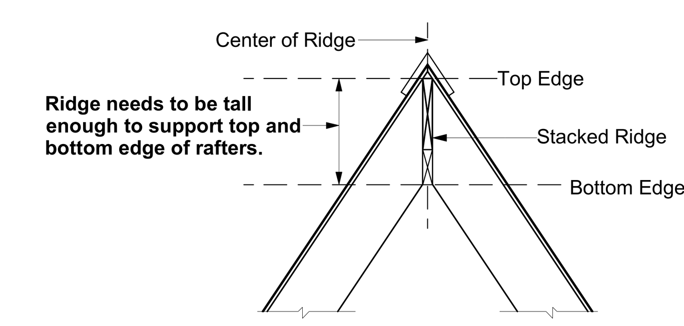
0 1 2 3 4



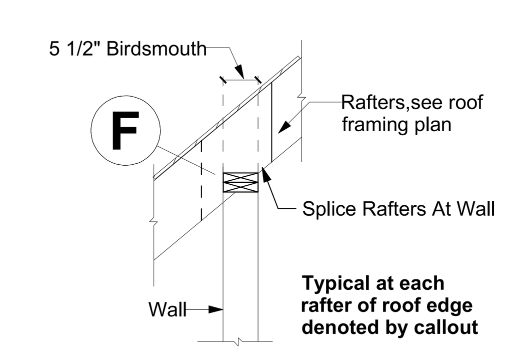


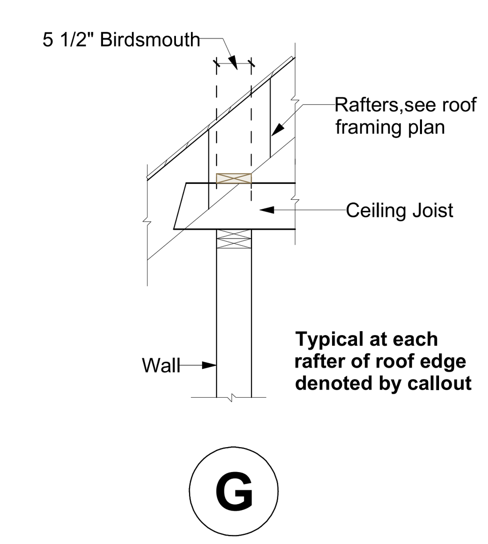






Stacked Ridge Detail





Artform Home Plans
AFHP Design # 540.126.v16 ER
© 2008-2019 Art Form Architecture 603.431.9559

Balmalcolm
Lot 32 Page Farm
Atkinson, NH

10

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 6/13/2019, drawn by ACJ

Issued for:
Construction

10/7/2019 3:09:34 PM

//AFDISKSTATION/AFA StaffAccess/-Home Designs/by Project/Green & Co - Page Farm/40 FT Wide Series/Gaira 742/CD 742.124.v6 KL 2638 Gaira 40x46 - Lot 19 Page Farm.layout

Wall Types

Exterior walls 2x6 wood stud
Interior walls 2x4 wood stud, unless noted otherwise

Wall Keys

(2) 2x wood studs on the flat

(6) 2x6 wood stud wall, 16" oc

Note: 2x4 wood stud wall, 16" oc unless otherwise noted

Key Notes

A — 30" x 22" Minimum Attic Access Panel - Insulated (RO 34" x 26")

F — Field locate for plumbing or mechanical

V — Verify size of fixture or appliance. Adjust dimensions to accommodate

C — Center - Place door or window centered on wall

SD — Smoke Detector

HD — Heat Detector

CO — Carbon Monoxide Detector

Dimensions

1. Dimensions are to face of stud, unless noted otherwise.
2. Closets are 24" clear inside, unless dimensioned otherwise.

Square Footages

1. Sq ft numbers are interior to room for use in calculating finishes.
2. Cabinets and fixtures not subtracted.
3. Add for doorways when floor finishes run through.

Notes

1. Exterior walls 2x6 wood stud @ 16" oc. Provide insulation & vapor barrier conforming to state or local codes. Interior sheathing 1/2" gypsum board. Provide 1/2" exterior rated sheathing, house wrap with drainage plane and siding. Provide step flashing at walls adjacent to roof planes.

2. Interior walls 2x4 wood stud @ 16" oc, unless noted otherwise.

3. Roof - see structural for rafter sizes. Provide 5/8" exterior rated roof sheathing 15# roofing felt, ice & water shield at eaves and valleys, aluminum drip edge and asphalt shingles or metal roofing. Structure not calculated to support slate or tile. Flash all penetrations. Provide cricket at any added chimneys.

4. Provide roof and/or ceiling insulation per code. Provide soffit and ridge vents where required for insulation strategy. (Verify with code officer - closed cell spray foam or dense-pack cellulose installed at rafters and filling ridge and eaves generally contra-indicates venting, batt insulation always requires venting).

5. Provide smoke, carbon monoxide, and heat detectors where shown and where required by code and where required by local authorities.

6. Provide fire resistive materials where required by code, including but not limited to, firestopping at penetrations, 5/8" Type X drywall on walls and ceilings to separate garage (where garage present in design) from dwelling, and separation of dwellings (where more than one dwelling present in design), and protection of flammable insulation materials. See Table R306.6 IRC 2015.

7. Compliance with code requirements for rooms size and clearances, (hallway widths, room sizes, etc) assume 1/2" drywall on walls and 1/2" drywall on 3/4" strapping on ceilings. Adjust as required if materials differ.

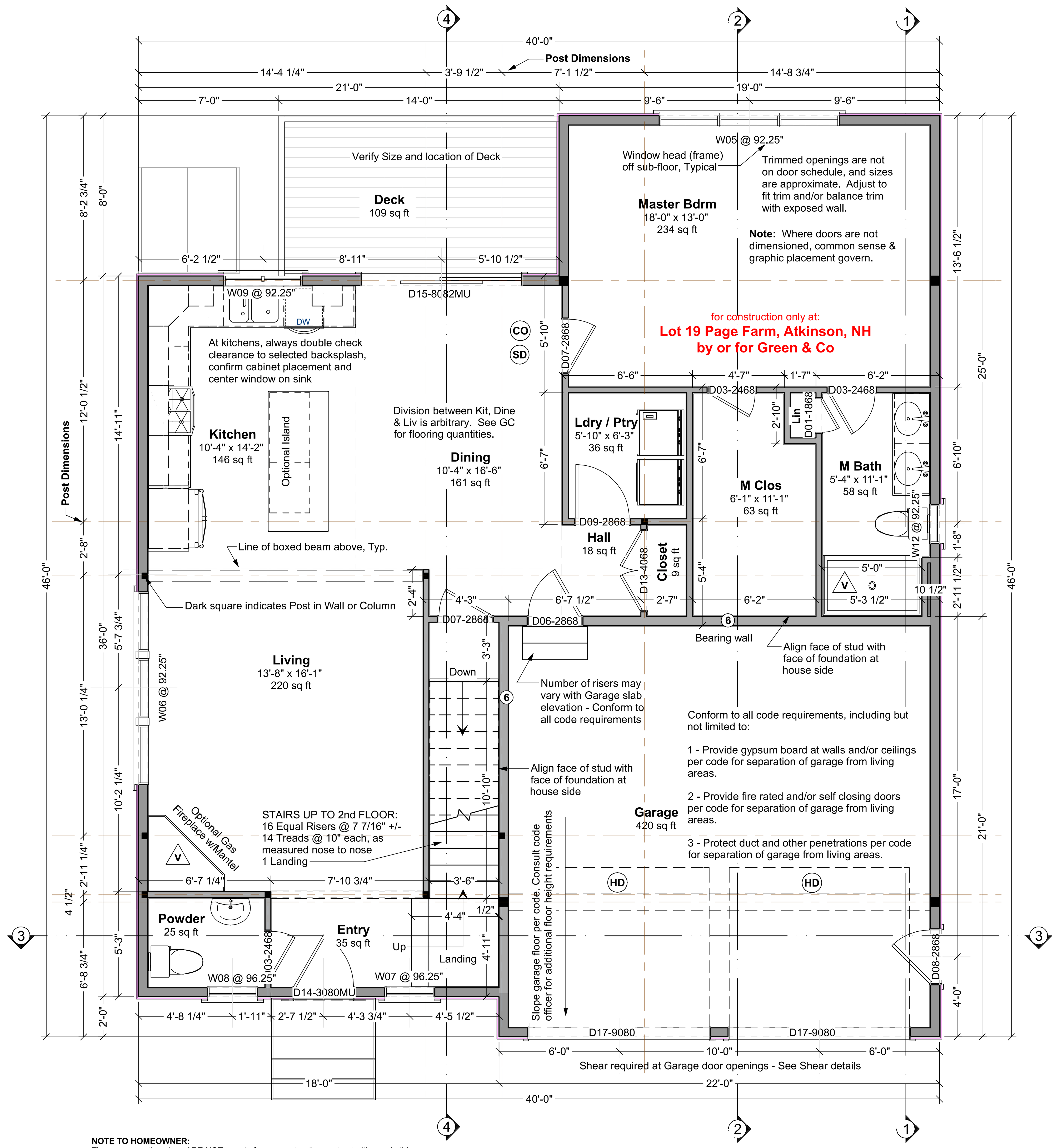
8. Shear is only called out where Continuous Portal Frame will not suffice. See Section R602.10.4 (Pages 177 - 188) of the IRC 2015.

General Design Notes

1 Builder shall consult and follow the building code and other regulations in effect for the building site for all construction details not shown in these drawings. Requirements described here are specific to this design and/or are provided as reference. Additional building code or local requirements may apply.

2 Builder shall maintain a safe worksite, including but not limited to, provision of temporary supports where appropriate and adherence to applicable safety standards.

3 Design is based on the snow load listed on the framing plans, 100 mph basic wind speed, Exposure type B, soil bearing capacity of 2000 psf, and Seismic Category C, unless otherwise noted on the framing plans. Builder shall promptly inform Artform Home Plans of differing conditions.



NOTE TO HOMEOWNER:
These construction plans ARE NOT a part of your construction contract with your builder, unless your P&S agreement specifies that they are. Your P&S and it's attachments (like the builder's specifications or a review set of this design) describes what you and your builder agreed the builder would build for you. We here at Artform Home Plans do not have the authority to obligate your builder to provide you with amenities like fireplaces and spa tubs. The contract between you and your builder governs.

First Floor Plan

1 0 1 2 3 4

Living Area this Floor: 1193 sq ft
9 ft Finished Ceiling Height

Gaira
40x46

Dear Code Officer,

These are predesigned home plans, designed to bring good design and construction drawings to people at more affordable prices and faster time frames than traditional architecture. Where traditional "internet" home plans disclaim all responsibility, we split responsibility between us (Artform) and the owner. We encourage the future homeowners to use a quality builder who can assist them with this. They are responsible for thermal and moisture decisions and for meeting code in ways that a quality builder should know without an explicit detail. We are responsible for things that are directly related to the design and/or that a quality builder couldn't reasonably figure out on their own - specifically the following IRC 2015 code sections:

1 - Room sizes (Section R304)
2 - Ceiling Height (Section R305)
3 - Floor space & ceiling height at Toilet, Bath and Shower Spaces (Section R307)
4 - Hallway widths (Section R311.6)
5 - Door types & sizes (Section R311.2)
6 - Floor space in front of doors (Section R311.3)
7 - Stair width - The stairs in our designs will be a minimum of 36" wide measured wall surface to wall surface, allowing compliance with R311.7.1 with installation of correct handrail.
8 - Stairway headroom (Section R311.7.2)
9 - Stair treads and risers (Section R311.7.5)
10 - Landings for stairways (Section R311.7.6)
11 - Emergency Escape Window Sizes (Section R310.2.1, R310.2.2, R310.2.3 and R310.2.4). Casement windows may require manufacturer's emergency escape window hardware. Will also comply with NFPA 101.
12 - Structural Floor Framing (Section R502.3) Where dimensional lumber is shown, framing members will be sized according to this section of the code. Where engineered wood products are shown, those framing members will be size according to the manufacturer's tables for loads and spans, or sizes will have been calculating using manufacturer's published materials properties.
13 - See structural sheets for additional notes.

The builder can and should add information to this set, such as Rescheck, a hand markup of our generic thermal and moisture section, additional information about doors and windows (such as fire rating, tempering, etc), foundation drops relative to site grading, and sometimes their chosen method of basement egress. These drawings are not intended to be used without that additional information.

Where a construction address is shown on the drawings, it is for copyright control only. We have not inspected the site, adapted the design to state specific laws (except where it says so in the drawings) or site or region specific climate conditions. Homeowner and/or Builder shall be responsible for thermal and moisture control strategies, materials choices and compliance with applicable laws and ordinances.

Please do feel free to call us with any questions. We can and do update our drawings and standard notes to address specific concerns, especially in jurisdictions where our clients will be building again.

Dear Everybody,

With these drawings a copyright license is granted for a single construction only at Lot 19 Page Farm, Atkinson, NH by or for Green & Co. This is a License to Build, and does not include a License to Modify, except as required to conform to building code or fulfill builder's/owners responsibilities.

Permissible uses of these drawings:
1. All activities associated with construction at the listed address.
2. Pricing or preliminary discussions with zoning or code officials for construction at other addresses, with prior notification to Artform Home Plans - just use the Contact form on the web site – http://www.artformhomeplans.com/contact.a5w

Not Permitted:
1. Application for any permits or other approvals for construction at properties other than the listed address, including but not limited to construction, zoning, conservation, or design review.
2. Modification of the basic design.

Use of these drawings outside these parameters is a violation of federal copyright law, punishable by both civil action and criminal prosecution, as it is stealing or enabling theft of "intellectual property". Making modifications to plans, even significant ones, does not change this, under copyright law, that's considered "derivative works".

We can provide drawings suitable for use in obtaining design or zoning approvals without incurring the expense of a full set of construction drawings. Contact us for more information.

AFHP CD Commons 19.2 X11 - IRC 2015

These drawings are intended for use by an experienced professional builder in responsible charge of the entire project, including but not limited to mechanical, electrical and sitework. Any additional adaptation for these trades or other trades must be determined prior to start of construction. Contact Artform for any adjustments needed.

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

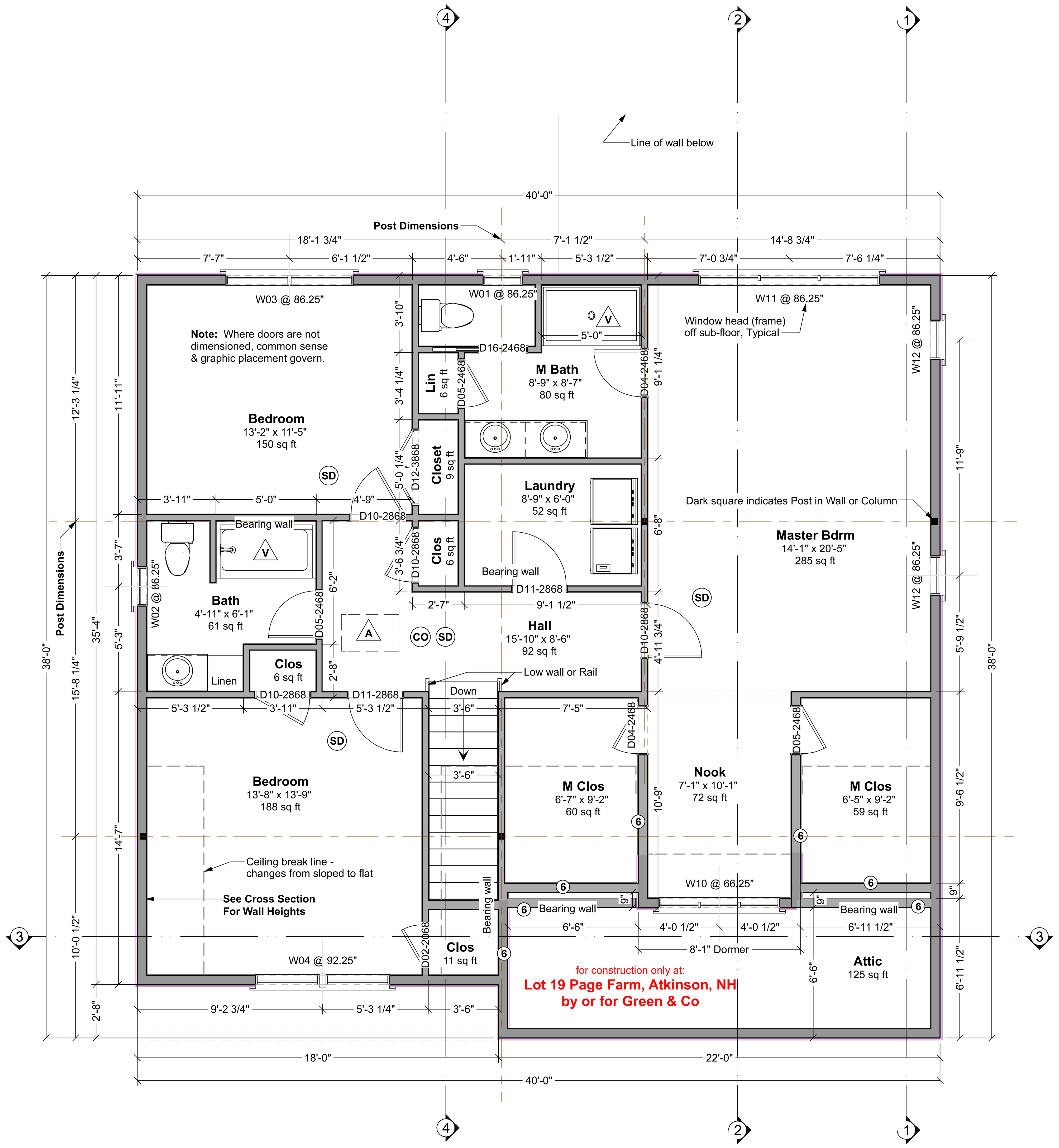
If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 742.124.v6 KL

Gaira 40x46 Lot 19 Page Farm Atkinson, NH	1
1/4"=1'-0" unless noted otherwise / Print @ 1:1 PDF created on: 10/7/2019, drawn by ACJ	Issued for: Construction

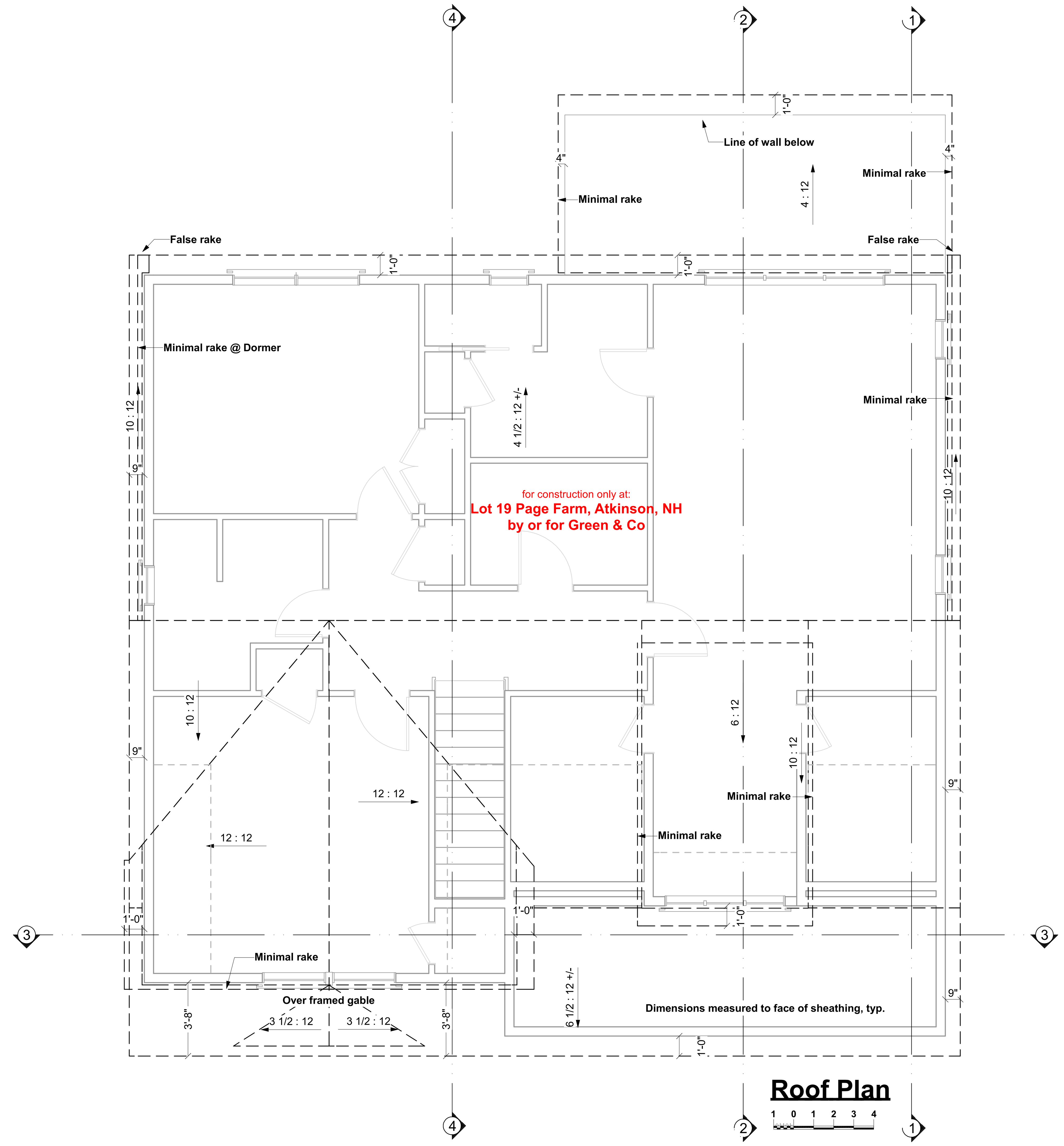
...



Second Floor Plan

1 0 1 2 3 4

Living Area this Floor: 1321 sq ft
8 ft Finished Ceiling Height



Roof Plan

1 0 1 2 3 4

Door & Window Notes

1. **Rated Doors:** Provide fire rated and/or self-closing doors where required by local codes or local authorities
2. **Trimmed Openings:** Trimmed openings not shown on schedule. See Plan.
3. **Window Tempering:** Provide tempered windows where required by local codes or local authorities. Tempering column provided here for convenience. Windows have not been reviewed for tempering requirements.
4. **Window RO's:** 1/4" or 1/2" on each of 4 sides allowed for window RO's, typical. Review framing size vs RO size. Adjust per manufacturer's requirements and/or builder preference.
5. **Egress Windows:** Provide minimum one door or window meeting egress requirements in basement, in each sleeping room, in each potential sleeping room, and other locations required by local code, in sizes required by local code. Note that casement windows coded by manufacturer as meeting IRC 2015 egress requirements typically need to be ordered with specific hardware. Emergency Escape Window Sizes (Section R310.2.1, R310.2.2, R310.2.3 and R310.2.4). Will also comply with NFPA 101.
6. **Basement Windows:** Add basement windows as required to meet state or local code requirements, including but not limited to egress and light/ventilation.
7. **Skylights:** Skylights are not shown on this schedule, but may be required. Consult builder and/or see floor plan.
8. **Minimum window sill height:** IRC 2015 requires that floor window sills be 24" from floor. Confirm bottom of window opening relative to frame. Conform to IRC 2015 R312.1.

DOOR SCHEDULE

NUMBER	QTY	FLOOR	SIZE	WIDTH	HEIGHT	TYPE	COMMENTS
D01	1	1	1868 L IN	20 "	80 "	HINGED	
D02	1	2	2068 L IN	24 "	80 "	HINGED	
D03	3	1	2468 R IN	28 "	80 "	HINGED	
D04	2	2	2468 R IN	28 "	80 "	HINGED	
D05	3	2	2468 L IN	28 "	80 "	HINGED	
D06	1	1	2868 R EX	32 "	80 "	HINGED	
D07	2	1	2868 R IN	32 "	80 "	HINGED	
D08	1	1	2868 L EX	32 "	80 "	HINGED	
D09	1	1	2868 L IN	32 "	80 "	HINGED	
D10	4	2	2868 R IN	32 "	80 "	HINGED	
D11	2	2	2868 L IN	32 "	80 "	HINGED	
D12	1	2	3868 L/R IN	44 "	80 "	DOUBLE HINGED	
D13	1	1	4068 L/R IN	48 "	80 "	DOUBLE HINGED	
D14	1	1	3080	36 "	95 7/8 "	MULLED UNIT	HINGED W/TRANSOM
D15	1	1	8082	96 "	98 "	MULLED UNIT	SLIDER W/TRANSOM
D16	1	2	2468 R	28 "	80 "	POCKET	
D17	2	1	9080	108 "	96 "	GARAGE	

WINDOW SCHEDULE

NUMBER	QTY	WIDTH	HEIGHT	R/O	EGRESS	TEMPERED	DESCRIPTION	COMMENTS
W01	1	23 1/2 "	35 1/2 "	24"X36"			DOUBLE HUNG	
W02	1	23 1/2 "	47 1/2 "	24"X48"		YES	DOUBLE HUNG	
W03	1	76 "	61 1/2 "	76 1/2"X62"	YES		2X DH	
W04	1	80 "	61 1/2 "	80 1/2"X62"			2X DH	
W05	1	108 "	61 1/2 "	108 1/2"X62"	YES		3X DH	
W06	1	115 1/2 "	61 1/2 "	116"X62"			3X DH	
W07	1	30 "	41 1/2 "	30 1/2"X42"		YES	SINGLE CASEMENT-HR	
W08	1	30 "	41 1/2 "	30 1/2"X42"			SINGLE CASEMENT-HL	
W09	1	47 "	47 1/2 "	47 1/2"X48"			DOUBLE CASEMENT-LHL/RHR	
W10	1	72 "	23 1/2 "	72 1/2"X24"			TRIPLE CASEMENT-LHL/RHR	
W11	1	108 "	47 1/2 "	108 1/2"X48"	YES		TRIPLE CASEMENT-LHL/RHR	
W12	3	23 1/2 "	23 1/2 "	24"X24"			SINGLE AWNING	

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site:
http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 742.124.v6 KL
 603.431.9559

Gaira 40x46
Lot 19 Page Farm
Atkinson, NH

2

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 10/7/2019, drawn by ACJ

Issued for:
Construction

...

10/7/2019 3:09:36 PM

//AFDISKSTATION/AFA Staff/Access/-Home Designs/by Project/Green & Co - Page Farm/40 FT Wide Series/Gaira 742/CD 742.124.v6 KL 2638 Gaira 40x46 - Lot 19 Page Farm.layout

Foundations

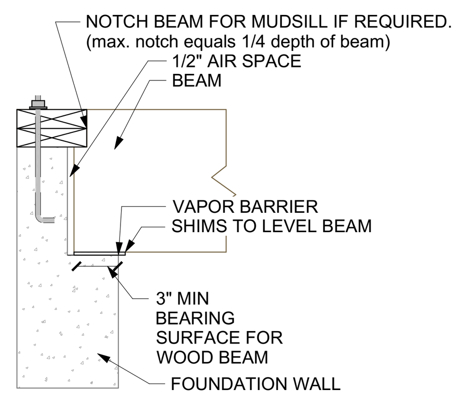
1. No footing shall be poured on loose or unsuitable soils, in water or on frozen ground.

2. All exterior footings to conform to all applicable code requirements for frost protection.

3. All concrete shall have a minimum compressive strength of at least 5000 PSI at 28 days.

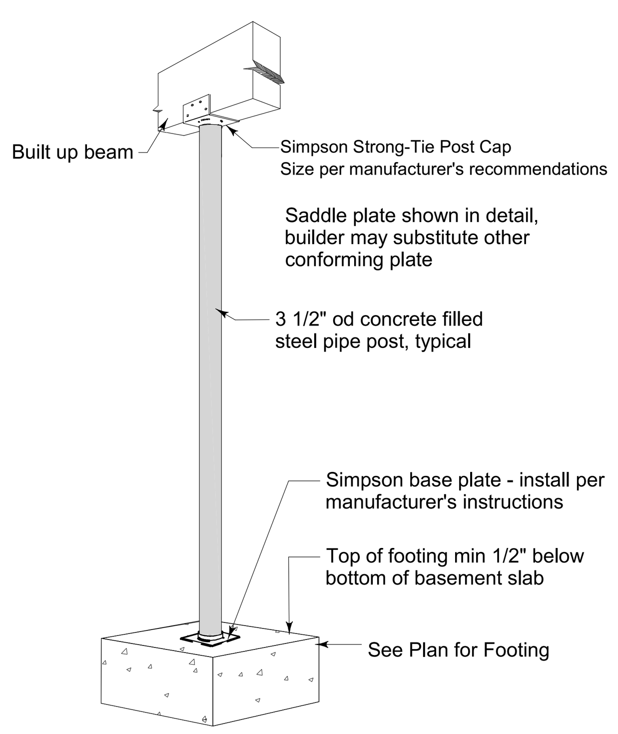
4. Foundation anchorage to comply with IRC 2015 Section R403.1.6, it shall consist of minimum size 1/2" diameter anchor bolts with 3/16" x 2" x 2" washers at a maximum of 72" oc for two stories or 48" oc for more than two stories, max of 12" from each corner, min of 2 bolts per wall. Anchor bolt shall extend 7" into concrete and grouted cells of concrete masonry units. Be aware that a garage under may be counted by your code officer as a story. Additional anchorage may be required at braced walls.

5. Foundation reinforcing steel is to be installed in accordance with all applicable provisions of IRC 2015 Section 404.1.3.2



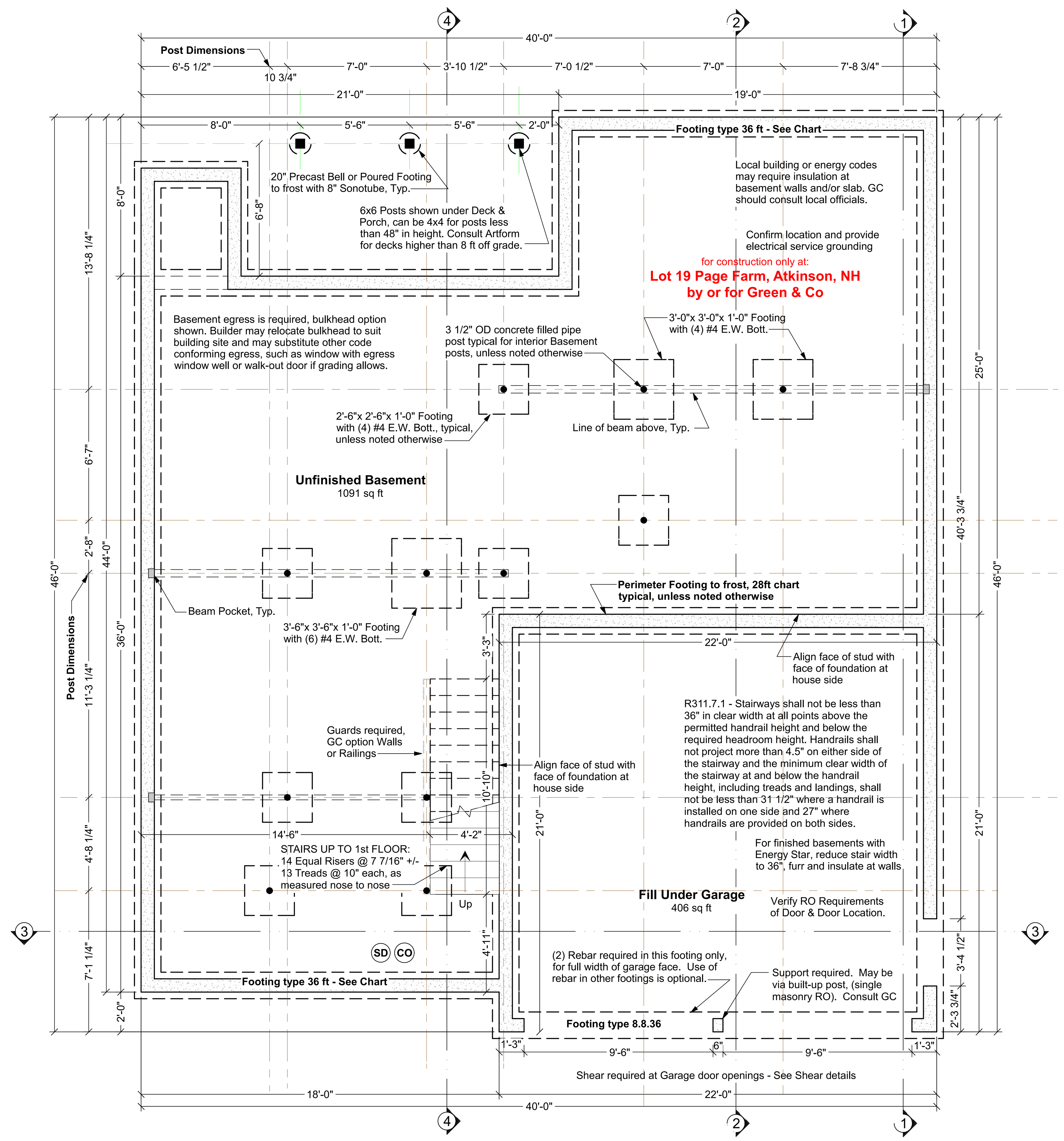
Beam Pocket

Scale 1/2"=1'-0"



Typical Basement Post

Not to Scale



Foundation Plan

Structure designed for Snow Load of 55 psf

1 0 1 2 3 4

Ceiling Height may vary: 8 ft forms

TYPICAL PERIMETER FOUNDATION WALL:

- 8" poured concrete, 8 ft forms, min 7'-10" finished, with total of 3 rebar, as follows:
- (1) #4 rebar, 4" from top
- (1) #4 rebar @ vertical midpoint. Omit this rebar at walls 4 ft high or less.
- (1) #4 rebar, min 3" from bottom or per code
- Lap corners & splices of rebar per code.
- Secure sill to foundation with 1/2" diameter anchor bolts that extend 7" into concrete and tightened with a nut and washer @ 6' oc & max 12" from each corner & each end @ wood sill splices - if built-up sill, bolts must extend through all sill plates or straps must secure all sill plates.

TYPICAL PERIMETER FOOTING:

1. Use Footing chart(s) below to verify that depth of home matches chart. Depth is foundation dimension eave to eave. Contact Artform Home Plans if you believe the chart does not match the plan.
2. Select row for snow load shown on the structural plans.
3. Select a column for soil bearing pressure based on soil type and/or consultation with code officer.
4. The required footing size is at the intersection of the Snow Load and Soil PSF. Rebar is not required. Key or pin foundation wall to footing per code.

FAQ - Adding rebar to footings does not reduce the required width. Rebar affects performance with earth movement, like an earthquake and has near zero effect on bearing capacity.

8" wall - Footing Size for 28 Ft wide house

Snow Load	Story and type of structure	Load Bearing Value of Soil (PSF)		
		1500 PSF	2000 PSF	3000 PSF
50 PSF	2 Story – Plus Basement	23 x 7.5	17 x 6	12 x 6
55 PSF	2 Story – Plus Basement	23.5 x 7.75	17.25 x 6	12 x 6
60 PSF	2 Story – Plus Basement	24 x 8	17.5 x 6	12 x 6
65 PSF	2 Story – Plus Basement	24.5 x 8.25	17.75 x 6	12 x 6
70 PSF	2 Story – Plus Basement	25 x 8.5	18 x 6	12 x 6

8" wall - Footing Size for 32 Ft wide house

Snow Load	Story and type of structure	Load Bearing Value of Soil (PSF)		
		1500 PSF	2000 PSF	3000 PSF
50 PSF	2 Story – Plus Basement	25 x 8.5	19 x 6	12 x 6
55 PSF	2 Story – Plus Basement	25.5 x 8.75	19.25 x 6	12.5 x 6
60 PSF	2 Story – Plus Basement	26 x 9	19.5 x 6	13 x 6
65 PSF	2 Story – Plus Basement	26.5 x 9.25	19.75 x 6	13.5 x 6
70 PSF	2 Story – Plus Basement	27 x 9.5	20 x 6	14 x 6

8" wall - Footing Size for 36 Ft wide house

Snow Load	Story and type of structure	Load Bearing Value of Soil (PSF)		
		1500 PSF	2000 PSF	3000 PSF
50 PSF	2 Story – Plus Basement	27 x 9.5	21 x 7	14 x 7
55 PSF	2 Story – Plus Basement	27.5 x 9.75	21.25 x 7	14.5 x 7
60 PSF	2 Story – Plus Basement	28 x 10	21.5 x 7	15 x 7
65 PSF	2 Story – Plus Basement	28.5 x 10.25	21.75 x 7	15.5 x 7
70 PSF	2 Story – Plus Basement	29 x 10.5	22 x 7	16 x 7

Foundation Contractor Check List

Confirm or review the following prior to forming & pouring foundation

Initials	Date Checked	
____	________	Confirmed soil bearing
____	________	Checked w/GC for added foundation steps to suit grade
____	________	Confirm sill plate thickness (foundation bolts to extend through all)
____	________	Confirmed garage door size
____	________	Checked w/GC for added basement windows
____	________	Checked w/GC for added basement man doors
____	________	Confirmed sizes & locations mech/plbg penetrations
____	________	Confirmed sizes and locations of beams w/GC, added or adjusted beam pockets
____	________	Confirmed location and installed electrical service grounding - See GC for location

MINIMUM VERTICAL REINFORCEMENT FOR 8-INCH (203MM) NOMINAL FLAT CONCRETE BASEMENT WALL

MAXIMUM UNSUPPORTED WALL HEIGHT (feet)	MIAXIMUM UNBALANCED BACKFILL HEIGHT (feet)	MINIMUM VERTICAL REINFORCEMENT - BAR SIZE AND SPACING (inches) Soil classes and design lateral soil (psf per foot of depth)		
		GW, GP, SW, SP 30	GM, GC, SM, SM-SC and ML 45	SC, ML-CL and inorganic CL 60
8	4	NR	NR	NR
	5	NR	NR	NR
	6	NR	NR	6 @ 37
	7	NR	6 @ 36	6 @ 35
	8	6 @ 41	6 @ 35	6 @ 26

Artform Home Plans

AFHP Design # 742.124.v6 KL

Gaira 40x46
Lot 19 Page Farm
Atkinson, NH

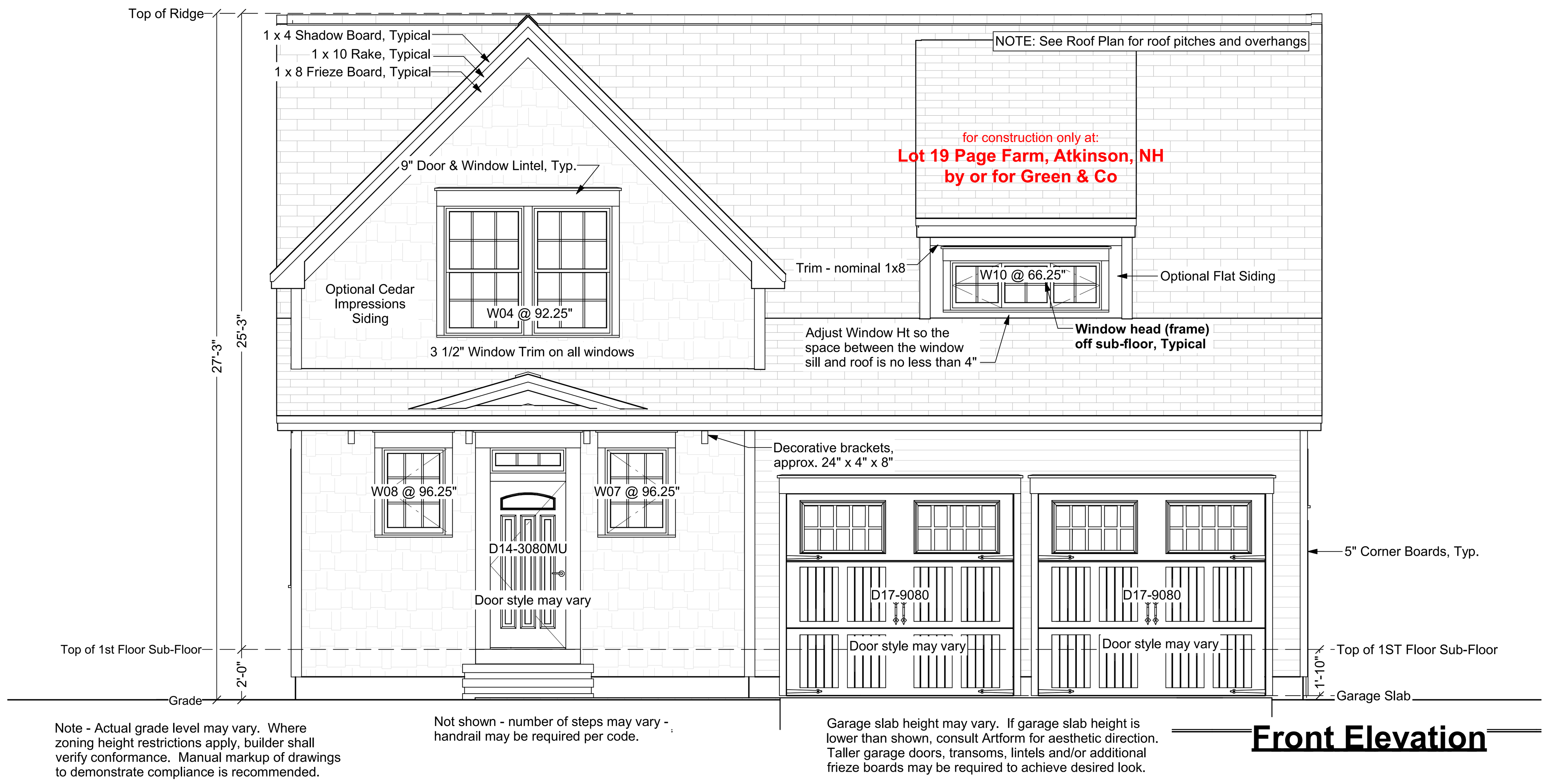
3

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 10/7/2019, drawn by ACJ

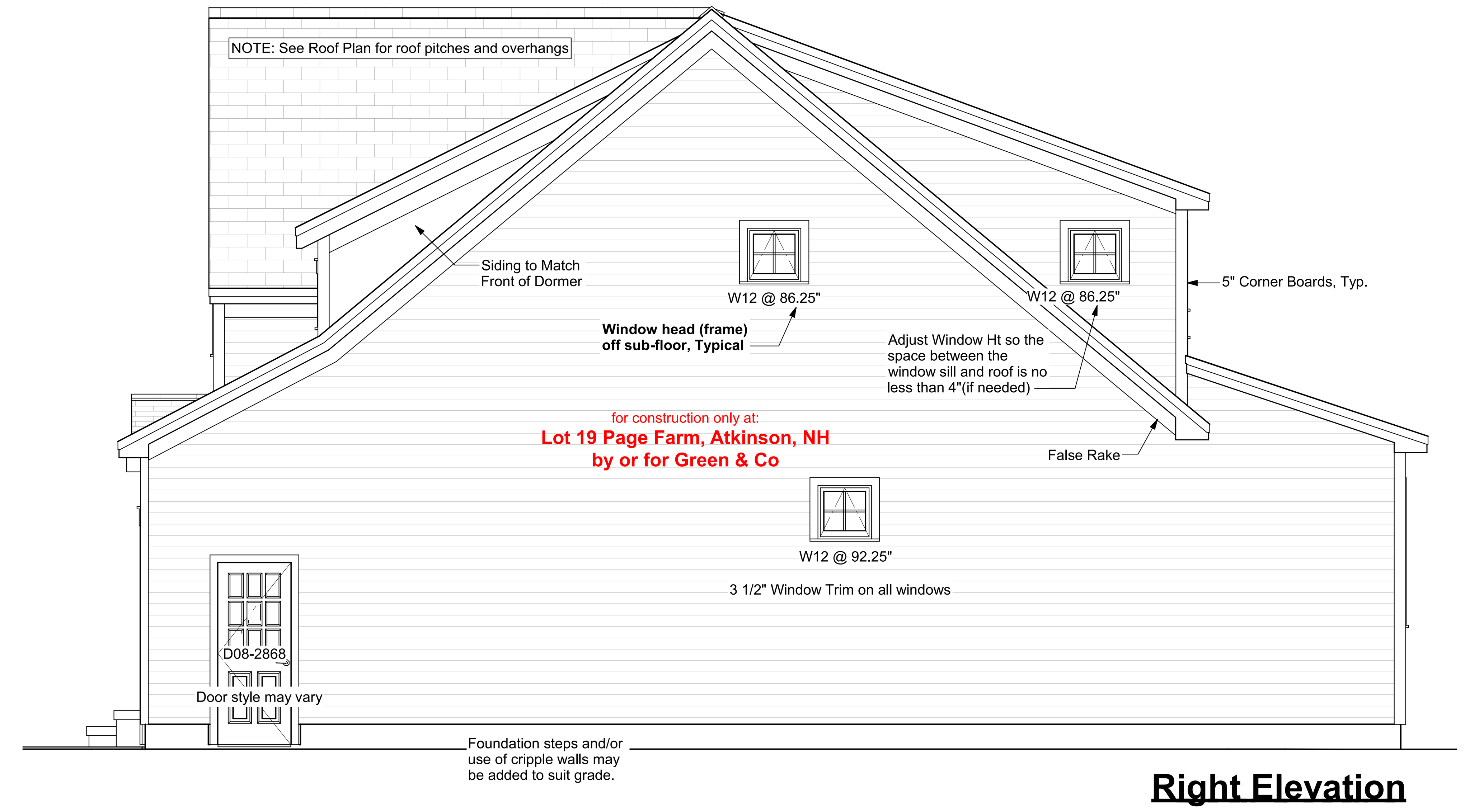
Issued for: Construction

...

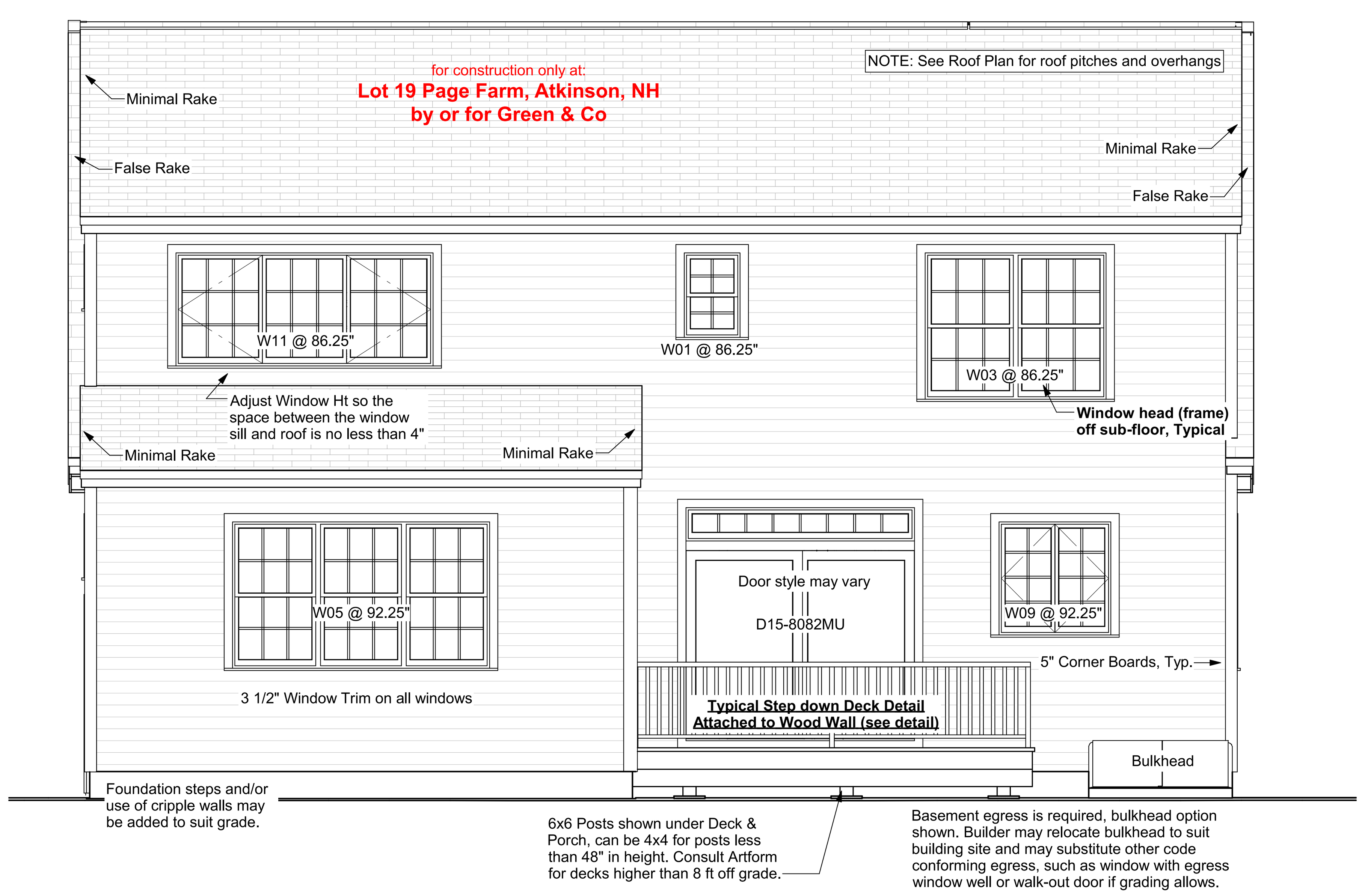
10/7/2019 3:09:36 PM



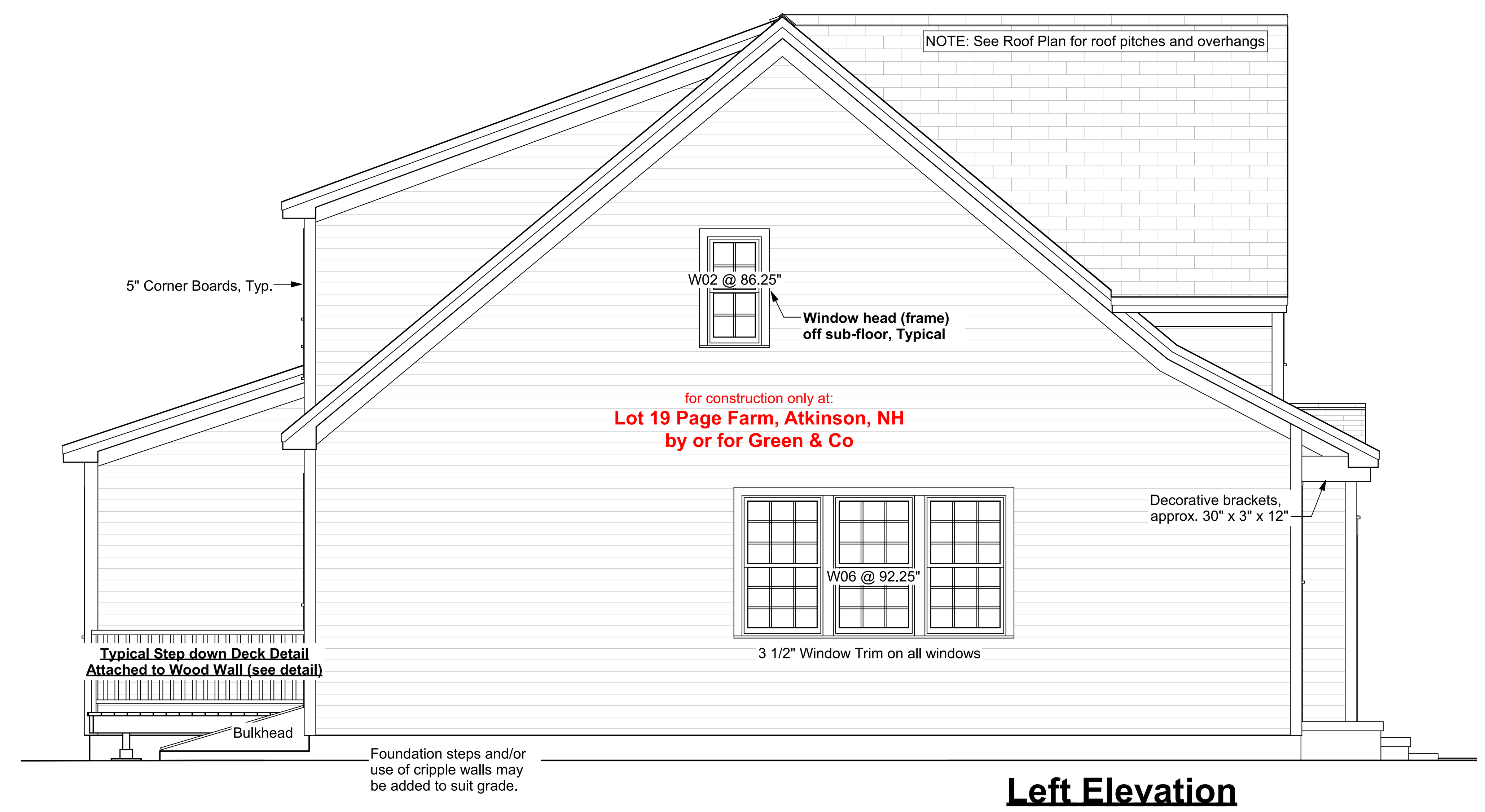
Front Elevation



Right Elevation



Rear Elevation



Left Elevation

Artform Home Plans

AFHP Design # 742.124.v6 KL

Gaira 40x46

Lot 19 Page Farm

Atkinson, NH

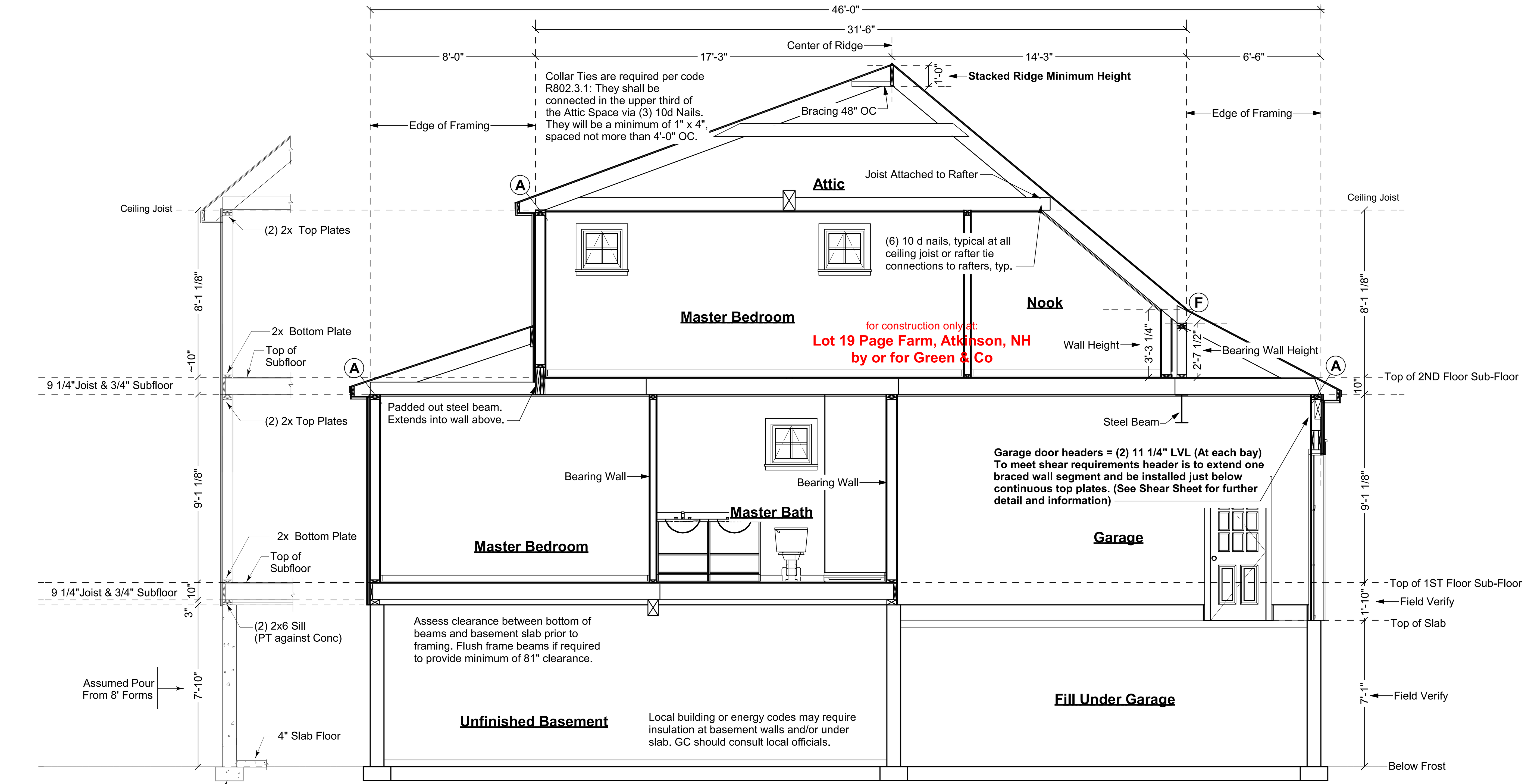
1/4"=1'-0" unless noted otherwise / Print @ 1:1

PDF created on: 10/7/2019, drawn by ACJ

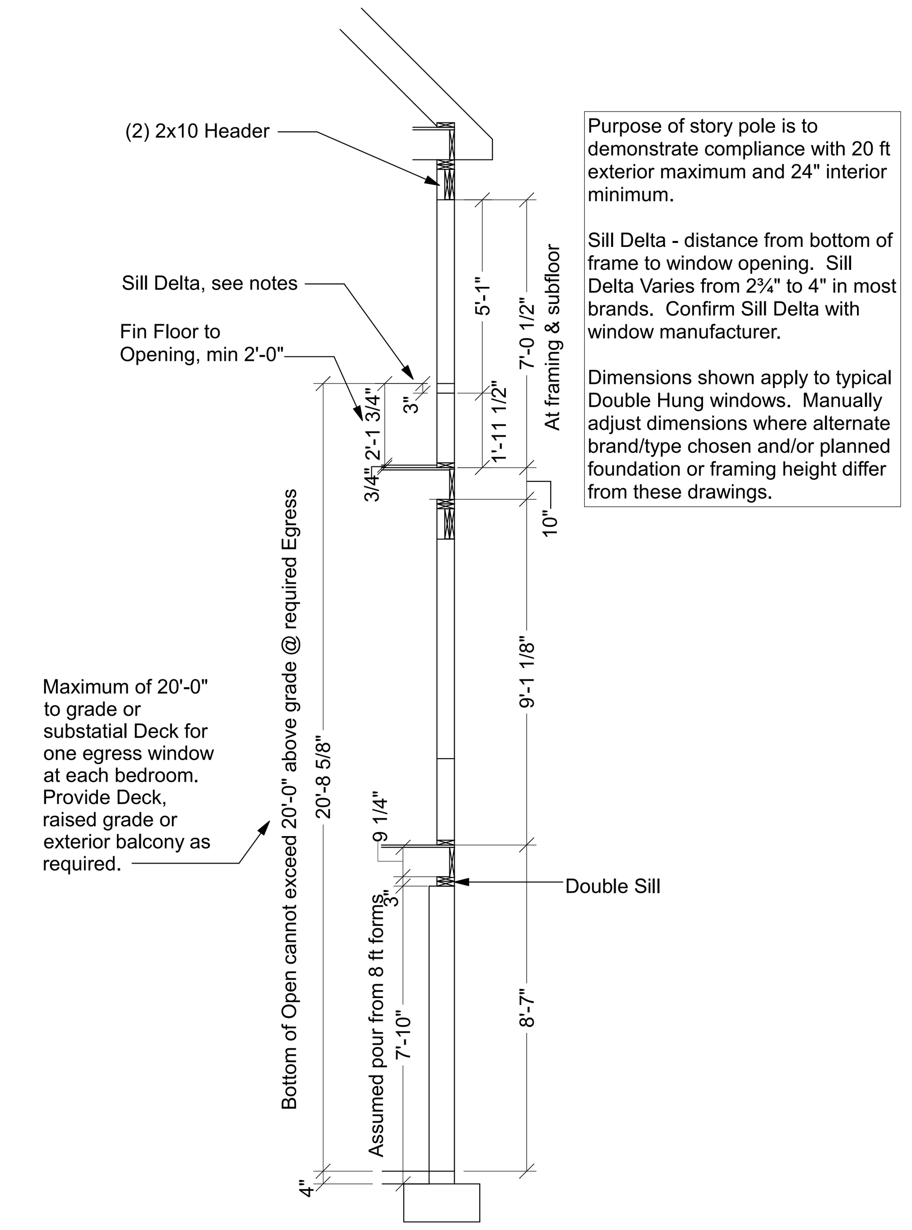
Issued for: Construction

//AFDISKSTATION/AFA StaffAccess/~Home Designs/by Project/Green & Co - Page Farm/40 FT Wide Series/Gaira 742/CD 742.124.v6 KL 2638 Gaira 40x46 - Lot 19 Page Farm.layout

10/7/2019 3:09:37 PM

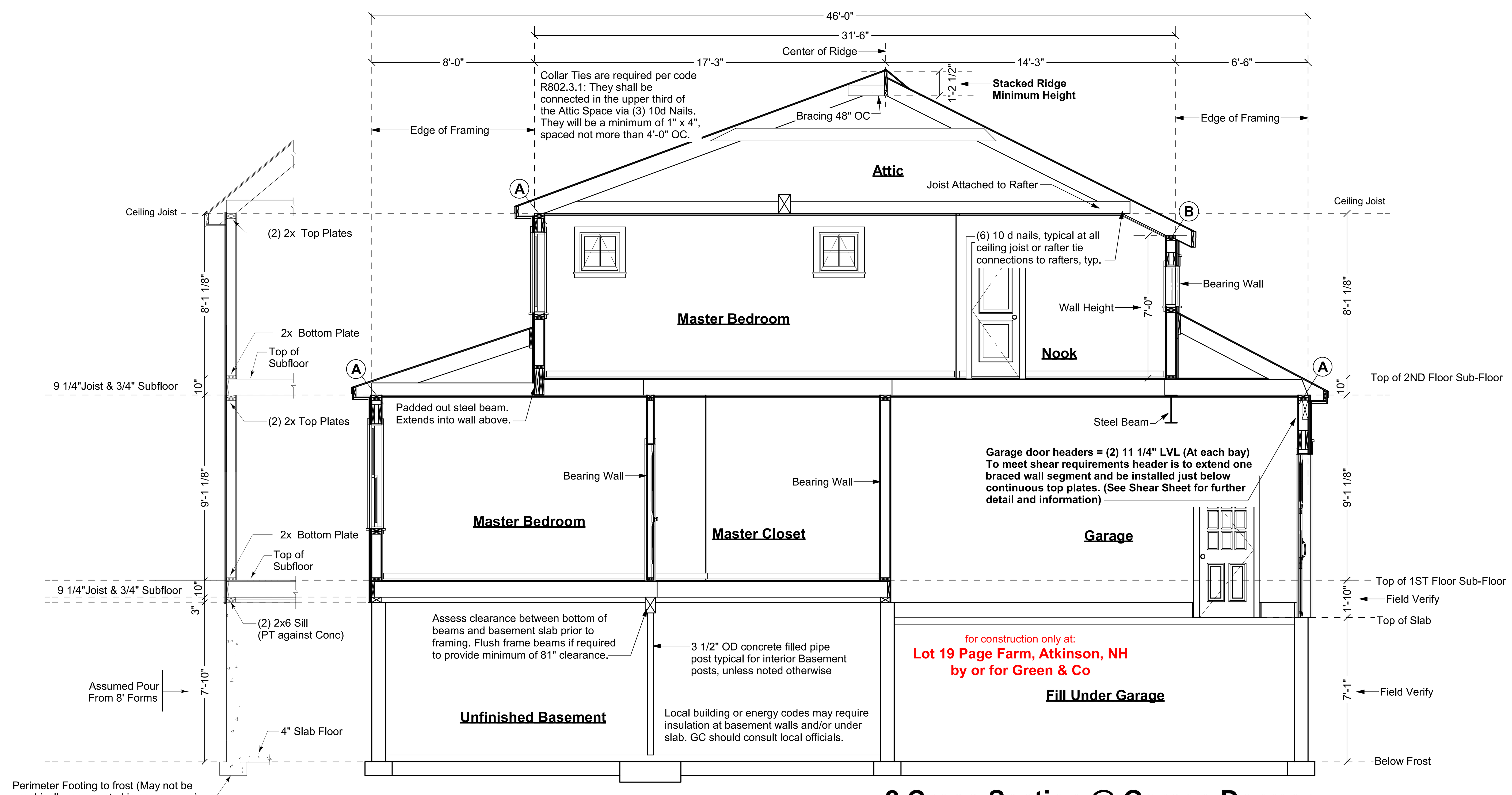


1 Cross Section @ Garage



Window Story Pole

Scale ¼"=1'-0"



2 Cross Section @ Garage Dormer

//AFDISKSTATION/AFA StaffAccess/-Home Designs/by Project/Green & Co - Page Farm/40 FT Wide Series/Gaira 742/CD 742.124.v6 KL 2638 Gaira 40x46 - Lot 19 Page Farm.layout

Artform Home Plans

AFHP Design # 742.124.v6 KL

Gaira 40x46

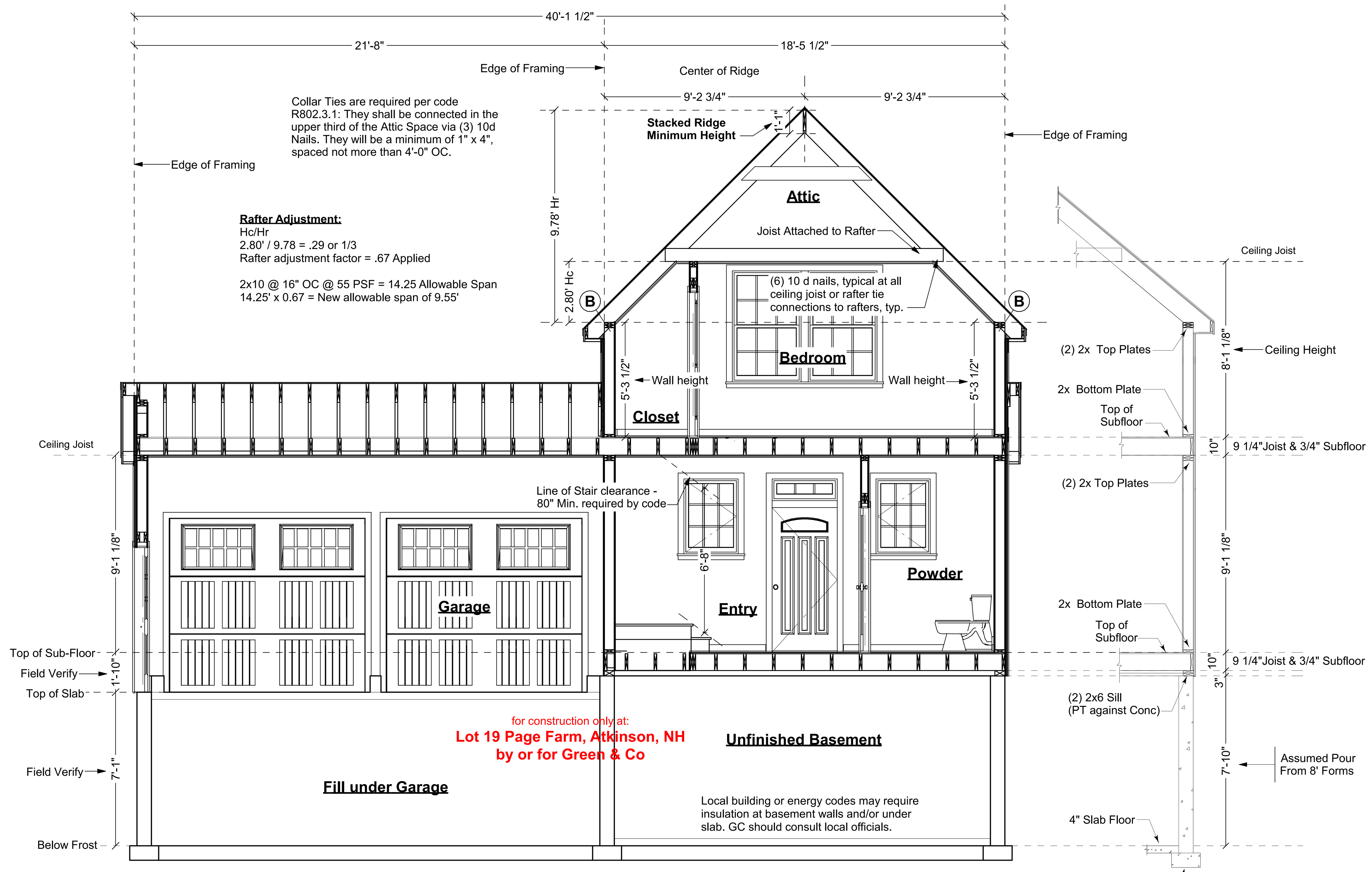
Lot 19 Page Farm

Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1

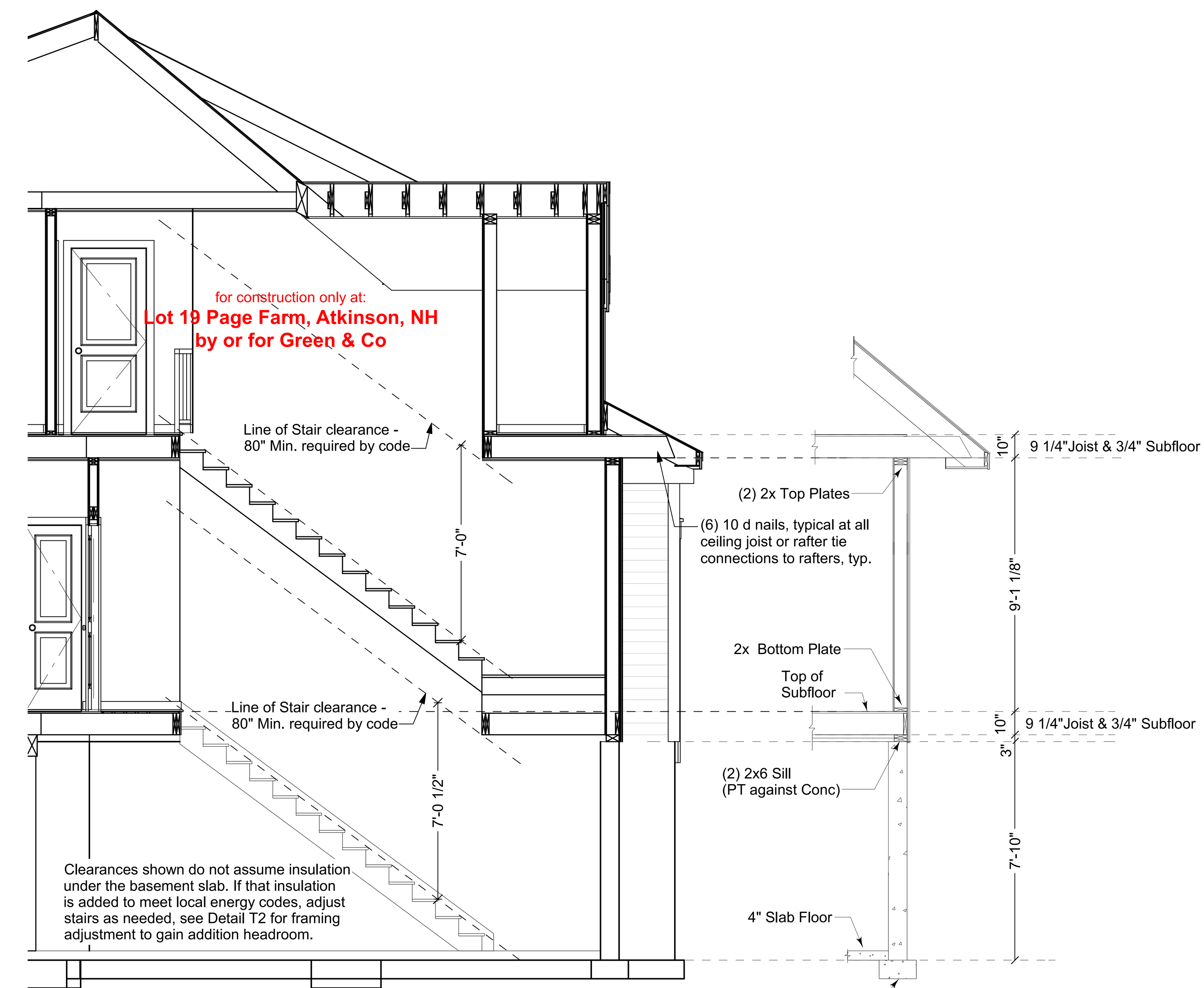
PDF created on: 10/7/2019, drawn by ACJ

Issued for: Construction



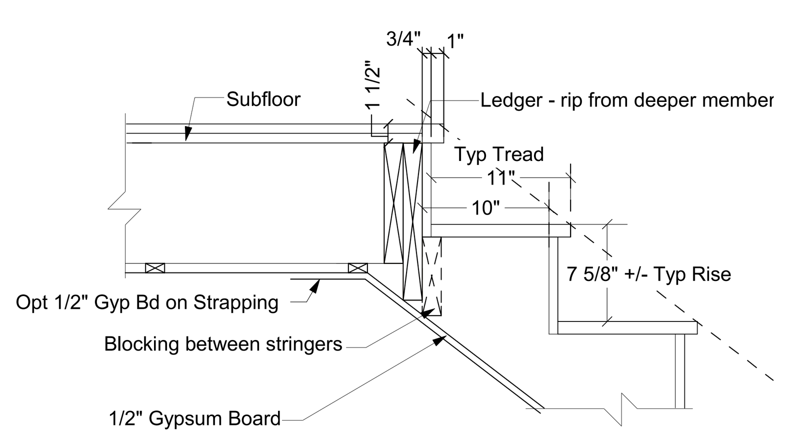
3 Cross Section @ Front Gable

Perimeter Footing to frost (May not be graphically represented in some areas)



Perimeter Footing to frost (May not be graphically represented in some areas)

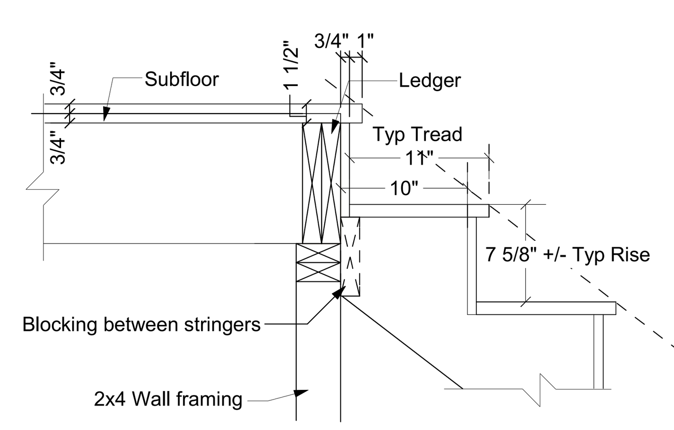
4 Line of Stair Clearance



Detail shows assumptions used for framing plan RO
Framer may adjust to suit different head support methods

Top of Carriage (C)

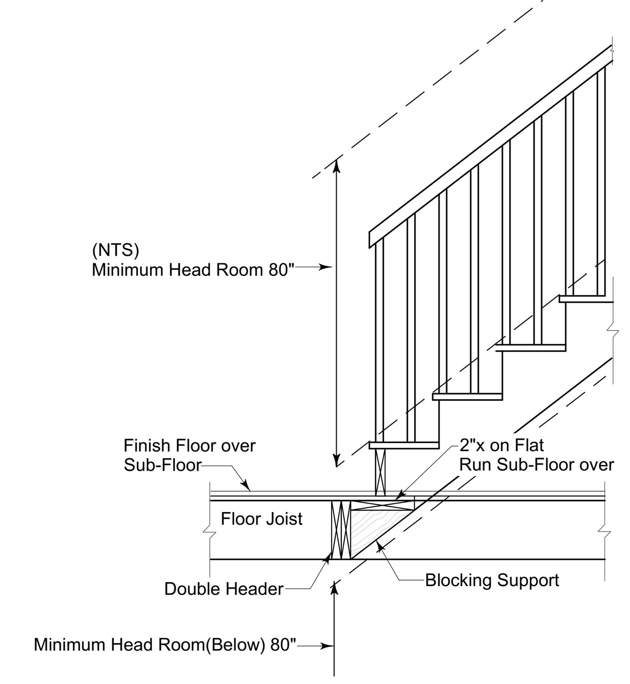
Scale: 1" = 1'-0"



Detail shows assumptions used for framing plan RO
Framer may adjust to suit different head support methods

Top of Carriage (B)

Scale: 1" = 1'-0"



T2

1/2" = 1'

Artform Home Plans

AFHP Design # 742.124.v6 KL

Gaira 40x46
Lot 19 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 10/7/2019, drawn by ACJ

Issued for:
Construction

...

TABLE R602.10.4
BRACING METHODS

METHODS, MATERIAL		MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA[a]	
				Fasteners	Spacing
Continuous Sheathing Methods	CS-WSP Continuously sheathed wood structural panel	3/8"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
				Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener

Method PFG: Portal frame at garage door openings shall be constructed in accordance with Figure R602.10.6.3. Note this method is allowed on either side of garage door openings.

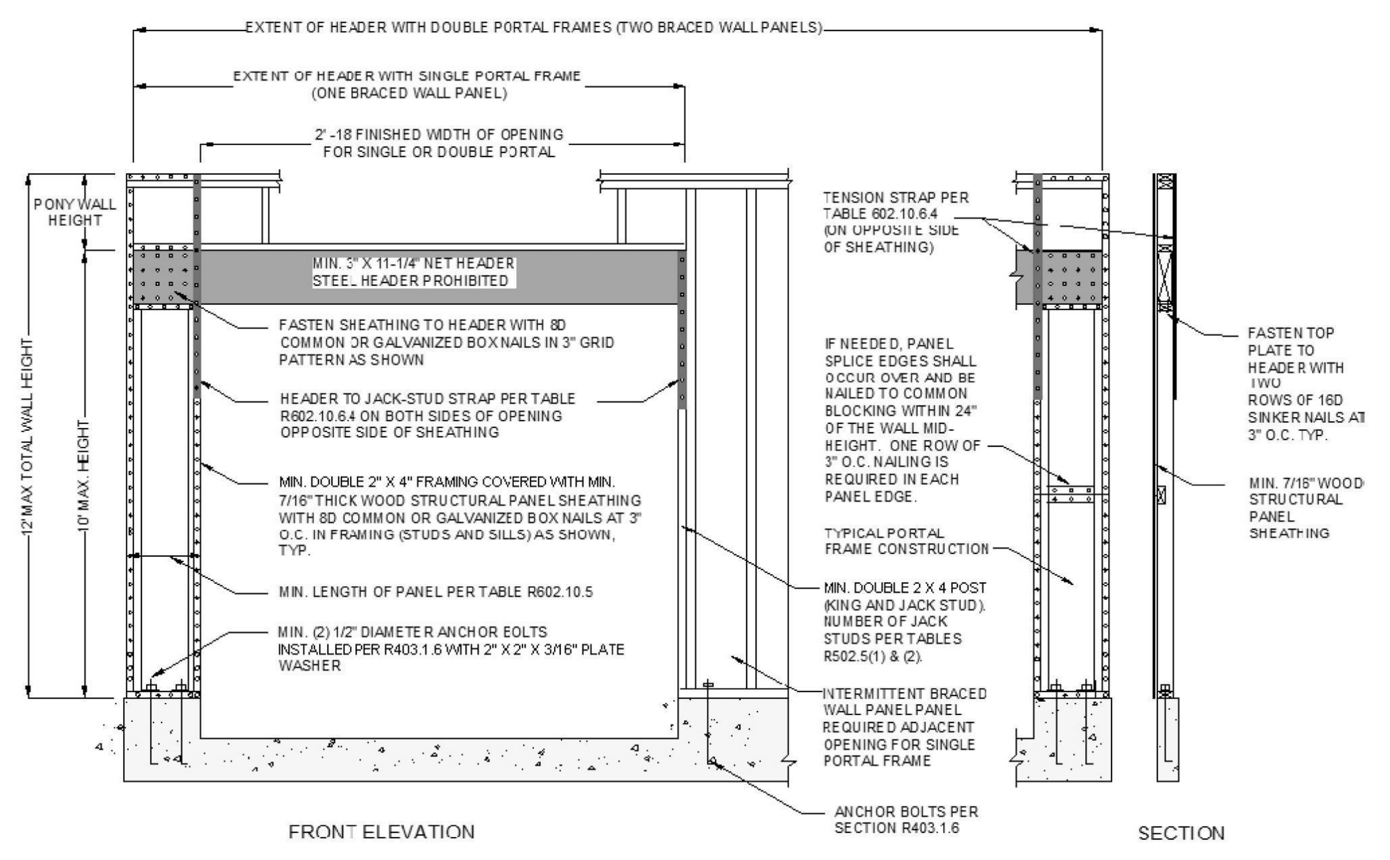


FIGURE R602.10.6.3
METHOD PFG—PORTAL FRAME AT GARAGE DOOR OPENINGS IN SEISMIC DESIGN CATEGORIES A, B AND C

Method CS-PF: Continuously sheathe portal frame shall be constructed in accordance with Figure 602.10.6.4. The number of continuously sheathed portal frame panels in a single braced wall line shall not exceed four.

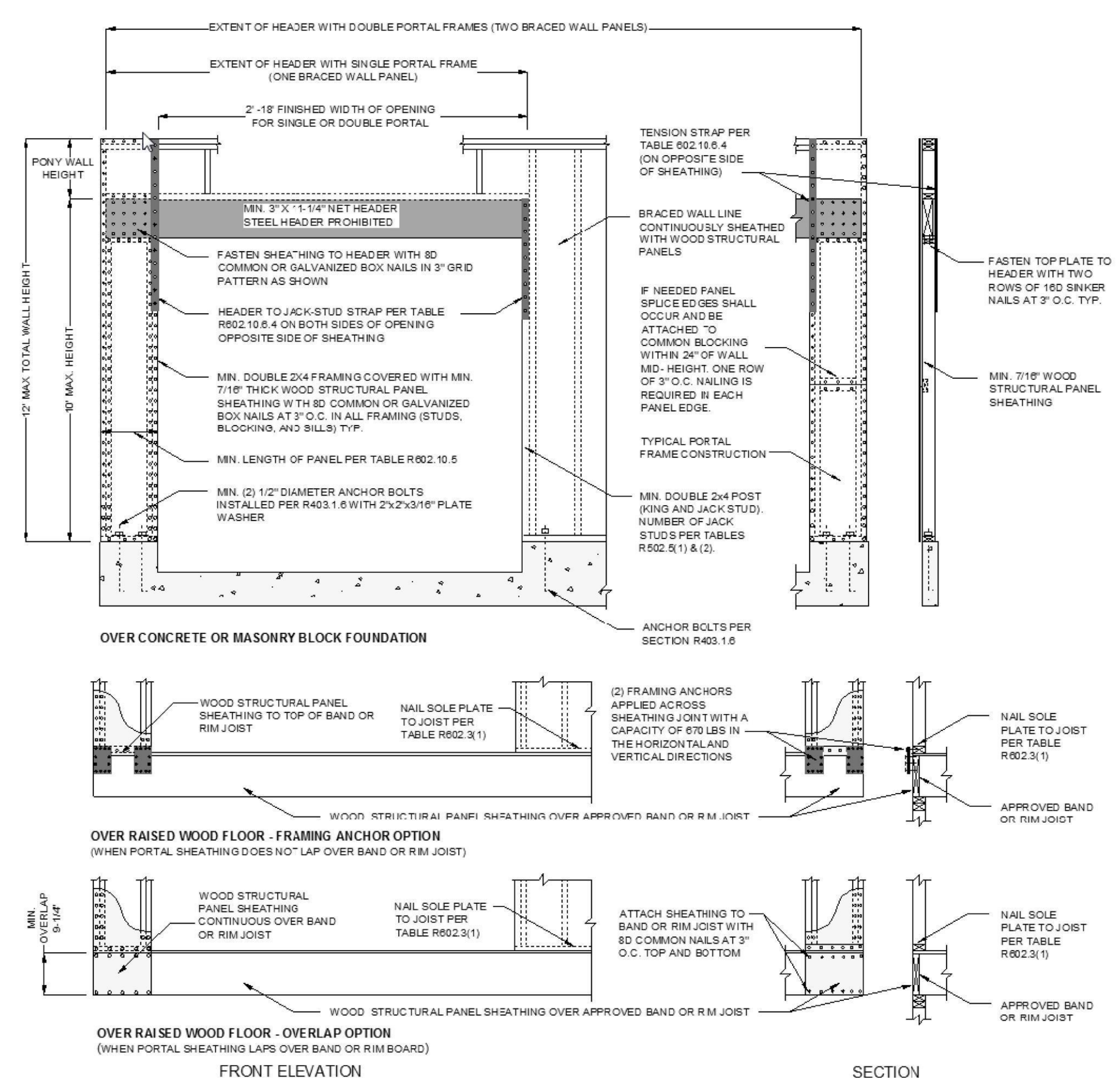
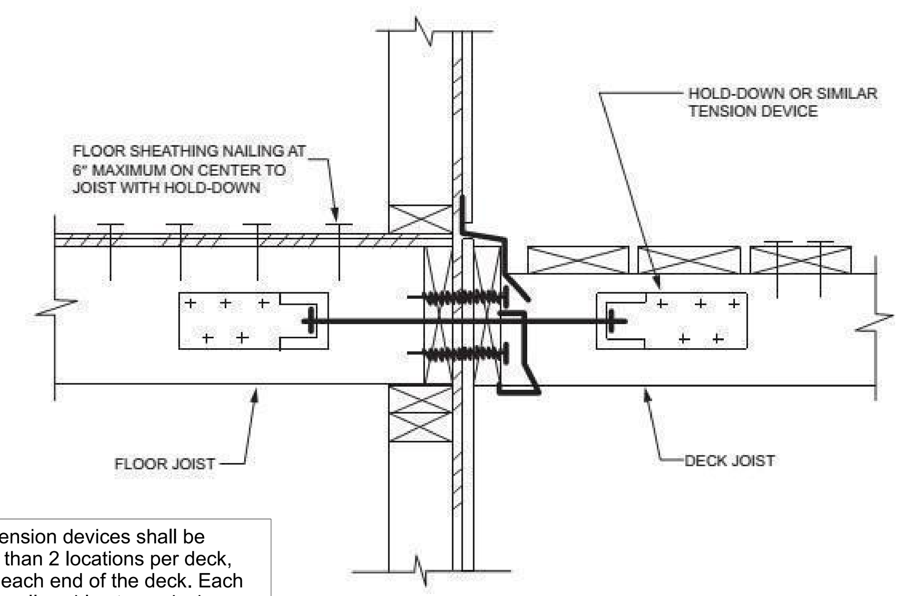


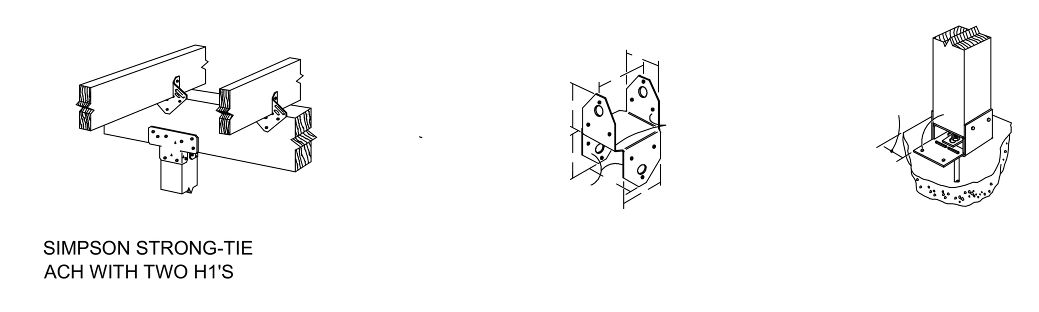
FIGURE R602.10.6.4
METHOD CS-PF—CONTINUOUSLY SHEATHED PORTAL FRAME PANEL CONSTRUCTION

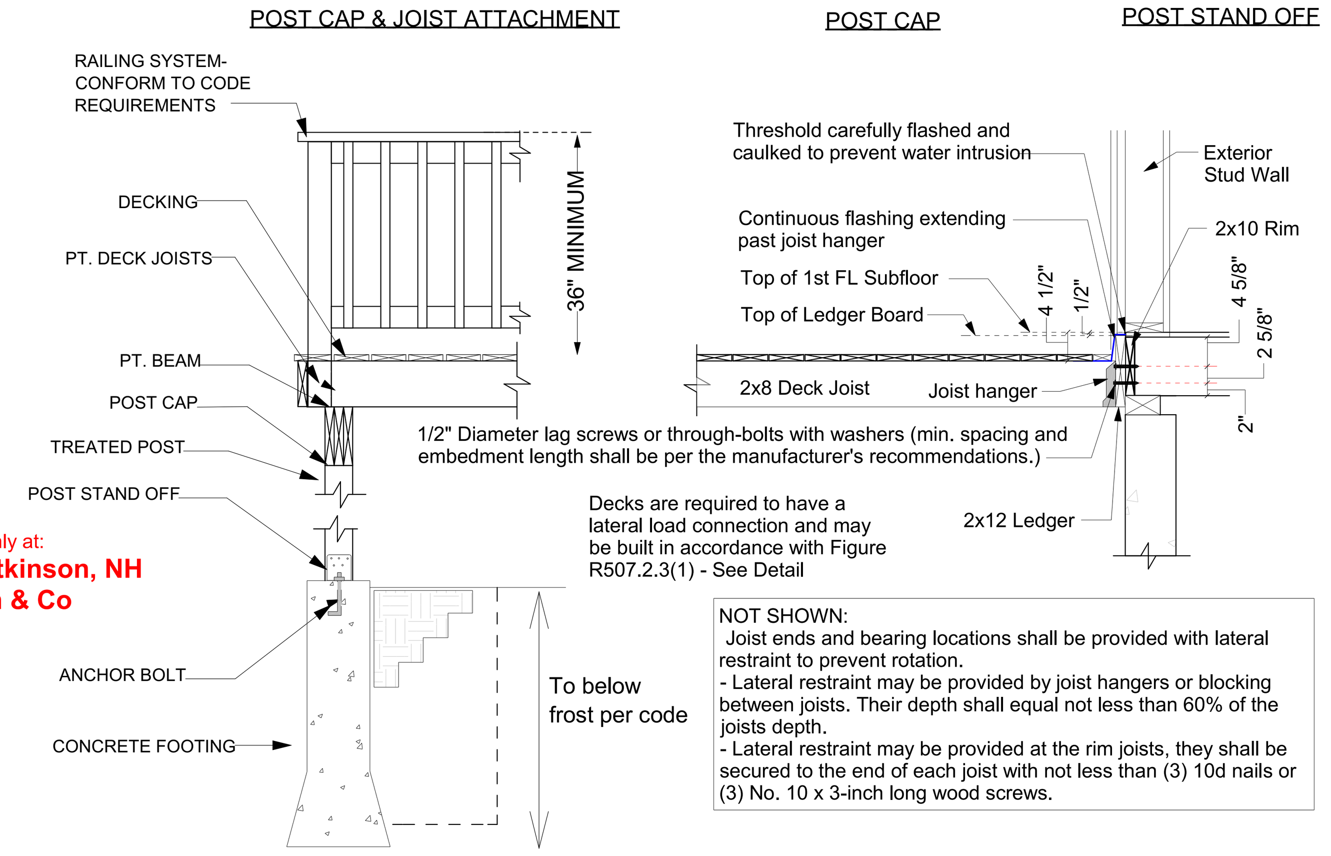


NOTE: hold down tension devices shall be installed in not less than 2 locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 lbs.

FIGURE R507.2.3(1)
DECK ATTACHMENT FOR LATERAL LOADS

Follow manufacturer's instructions both for installation of joist hangers to joist and to beam. The illustration below, by Simpson Strong Tie, is provided as a courtesy. Consult their full manual for acceptable fastener sizes and other important instructions.

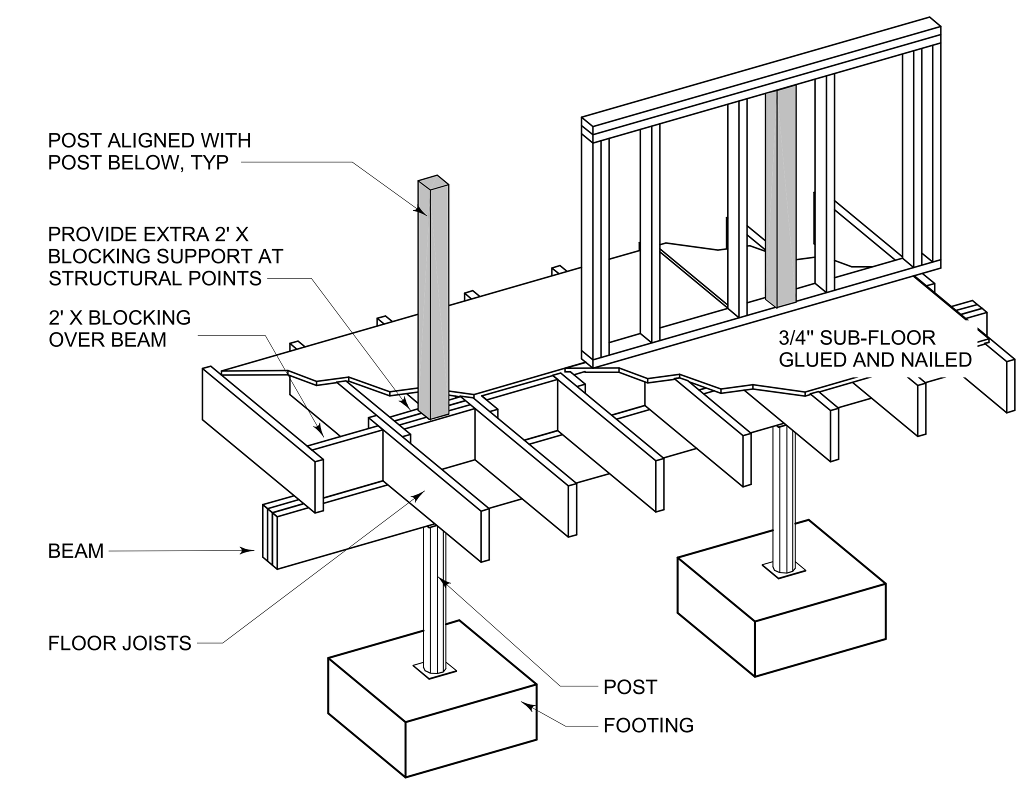




for construction only at:
Lot 19 Page Farm, Atkinson, NH
by or for Green & Co

Deck Ledger Attachment Detail for Step Down

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



Shear Wall Details

Not to Scale

Notes:

- See plans for locations where shear panels are required.
- Details shown here are for one method and for typical conditions. An alternate shear method allowed per code or approved by the code officer may be substituted.
- If the method at left is used at Garages where width of panel is 20" or more, wall height may be 10 ft as shown in detail at left. Where panel width is 18"-20", wall height may be 9 ft. Where panel is 16"-18", wall height may be 8 ft. Where panel is less, consult architect for additional design.
- If the method at left is used, increase foundation wall height at front and for 2 ft along wall returns as required to meet maximum wood stud wall heights, and extend sheathing and siding in front of wall to achieve desired aesthetics. Untreaded wood may not be in direct contact with concrete - use treated wood or provide a barrier, such as a rubber membrane or felt paper.
- Note that if sheathing is to be used as wall bracing all vertical joints in required braced wall panels must be blocked. [2015 IRC section R602.10.10]

Artform Home Plans
AFHP Design # 742.124.v6 KL

Gaira 40x46
Lot 19 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 10/7/2019, drawn by ACJ

Issued for: Construction

10/7/2019 3:09:39 PM

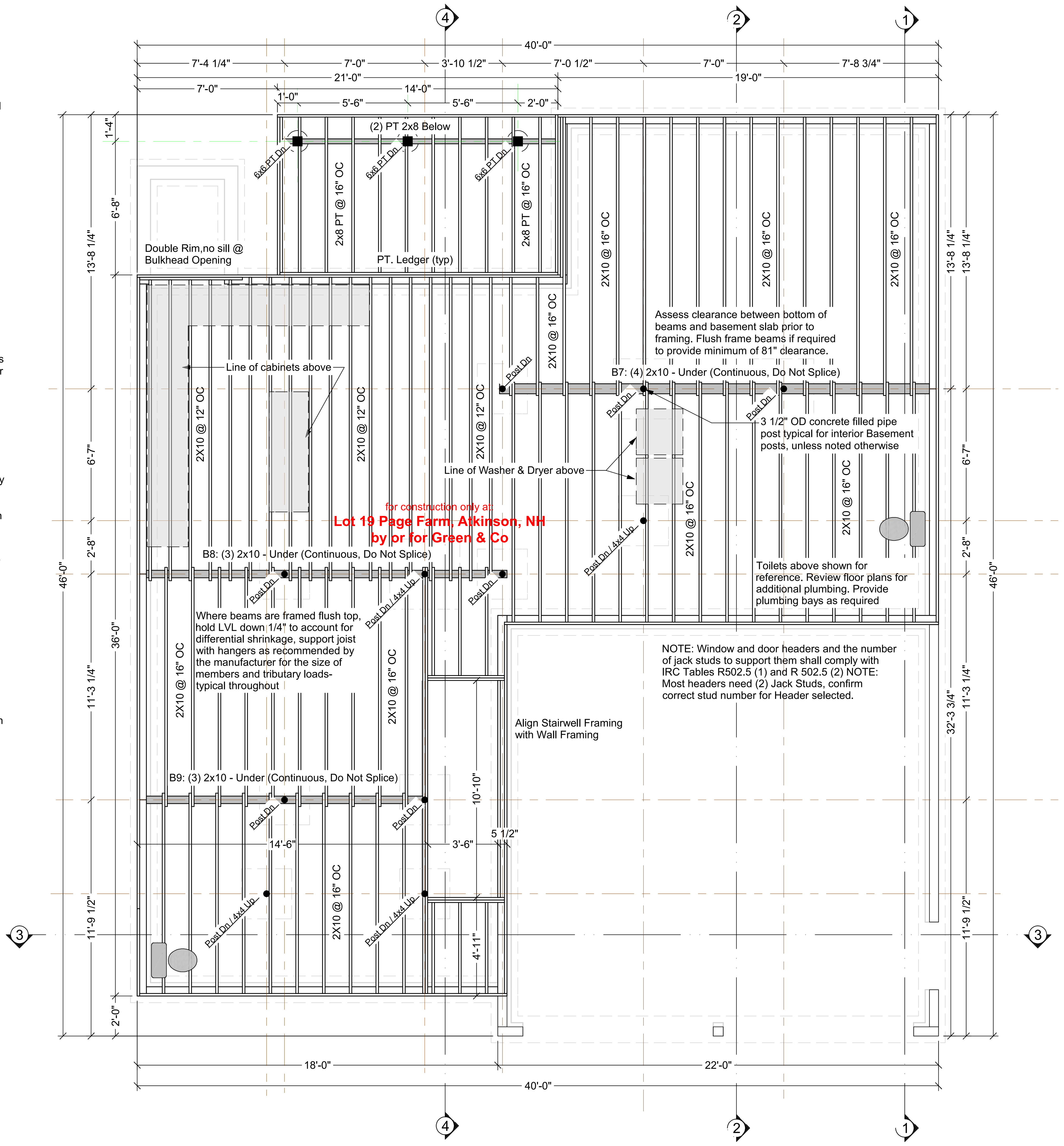
Wood Framing Notes:

1. All structural wood shall be identified by a grade mark or certificate of inspection by a recognized inspection agency.
2. Structural wood shall be Spruce-Pine-Fir (SPF) #2 or better.
3. When used, LVL or PSL indicate Laminated Veneer Lumber or Parallel Strand Lumber, respectively. Products used shall equal or exceed the strength properties for the size indicated as manufactured by TrusJoist.
4. When used, TJI indicates wood I-joists as manufactured by TrusJoist. Products of alternate manufacturers may be substituted provided they meet or exceed the strength properties for the member specified.
5. All floor joists shall have bridging installed at mid-span or at 8'-0" oc maximum.
6. Floor systems are designed for performance with subfloor glued and screwed.
7. Per code R502.6.1 Floor joists splicing over bearing walls allowed, shall lap a min 3" over walls and shall be nailed together with a minimum of (3) 10d face nails. Also permitted is a wood or metal splice with strength equal to or greater than that provided by the nailed lap.
8. Per code R802.3.2 Ceiling joists splicing over bearing walls is allowed, shall lap a min 3" or butted over bearing partitions or beams and toenailed to the bearing member. Where ceiling joists are used to provide resistance to rafter thrust, lapped joists shall be nailed together in accordance with Table R802.5.1(9), and butted joists shall be tied together in a manner to resist such thrust. Joists that do not resist thrust shall be permitted to be nailed together in accordance with Table R602.3(1).
9. Provide blocking in the floor at structural points. Blocking may be 2x's or solid, but must have grain of wood vertical.
10. All wood permanently exposed to the weather, in contact with concrete or in contact with the ground shall meet code requirements for wood in these environments.
11. Deck ledgers shall be securely attached to the structure and/or independently supported. Deck lateral load connection required see IRC 2015 Section R507.2.4
12. Wherever beams are noted as Flush framed, install joist hangers at all joists, sized appropriately for the members being connected.
13. Support the lower end of roof beams via minimum 2" horizontal bearing on a post, ledger or via an appropriately sized and configured hanger.
14. The ends of each joist, beam or girder shall have not less than 1.5" of bearing on wood or metal and not less then 3" on masonry or concrete except where supported on a 1" x 4" ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers.
15. Post caps where required are typically calculated by supplier using weights based on these framing plans. Contact Art Form if additional information is needed.
16. Hangers, post caps, post bases, ties and other connectors shall be as manufactured by Simpson Strong Tie, as designed to connect the members shown, and shall be installed per manufacturer's instructions.

Prefabricated Wood Trusses

1. Where trusses are indicated on the drawings, truss design shall be provided by truss manufacturer.
2. Trusses shall be designed in accordance with applicable provisions of the latest edition of the National Design Specifications for Wood Construction (NDS), American Forst and Paper Association (APA), and Design Specifications for Metal Plate Connected Wood Trusses (ANSI/TPI 1), Truss Plate Institute (TPI) and code of jurisdiction.
3. Manufacturer shall furnish design drawings bearing seal and registration number of a structural engineer licensed in the state where project will be built.

//AFDISKSTATION/AFA StaffAccess/-Home Designs/by Project/Green & Co - Page Farm/40 FT Wide Series/Gaira 742/CD 742.124.v6 KL 2638 Gaira 40x46 - Lot 19 Page Farm.layout



First Floor Framing

Structure designed for Snow Load of 55 psf

Second Floor Framing

Structure designed for Snow Load of 55 psf

Built-up Beams:
Unless otherwise noted, connect multiple 1 3/4" ply beams as follows:
3 ply & up, fasteners are per side

(2) 9 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 24" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 24" oc
- Framed under (2) rows 10d nails @ 24" oc

(2) 11 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(2) 16" LVL or greater:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 9 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 11 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 14" LVL:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 16" LVL or greater:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(4) 9 1/4" LVL:
- Flush framed
  - (2) rows 5" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(4) 11 1/4" LVL:
- Flush framed
  - (2) rows 5" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 12" oc

(4) 16" LVL or greater:
- Flush framed
  - (3) rows 5" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 12" oc

Beam Substitutions:

(2) 9 1/4" LVL may replace a double or triple 2x10 beam. No other substitutions are allowed. Conventional lumber beams MAY NOT be substituted for LVL beams by any "rule of thumb". Substitutions must be calculated by either Artform or a structural engineer. If calculated by a structural engineer, provide stamped plans and/or calculations.

We specify LVL beams as built up members to allow framers to use existing stock. You may substitute single piece LVLs of equivalent overall size for built-up members, unless otherwise noted.

Built-up members MAY NOT replace single piece LVL's where specified.

Where a beam of 1 3/4" or less in width is specified as framed under, either brace at 48" or double member for lateral stability.

Notes: Beam & Joist Sizing

1. Our beams sizes often differ from prescriptive code, because our designs are rarely the old style box colonial or cape with a center bearing wall upon which prescriptive code is based. We size our beams via calculations for this specific design, which may carry those loads separately via second floor beams and/or roof transfer beams. Beam or joist sizes, types and/or spacing may not be reduced or alternates substituted without our express permission.
2. Walls intended to be bearing are labeled as such. This information is provided to aid code officer in understanding the framing. It does not indicate permission to add loads to those walls, or any other walls.
3. Framing is sized for normal residential conditions. Contact Artform if additional loads are anticipated, including but not limited to waterbeds, large fish tanks, indoor hot tubs, multiple framed soffits or coffers.
4. In states where the designer is a licensed architect, (NH, MA, ME, CT & NY as of the date of issue) we are happy to stamp our drawings at no additional charge. In other states we are happy to provide calculations. Administration fees apply with provision of calculations. Code officer is encouraged to call with any questions about our methodology.

Artform Home Plans
AFHP Design # 742.124.v6 KL
 603.431.9559

Gaira 40x46
Lot 19 Page Farm
Atkinson, NH

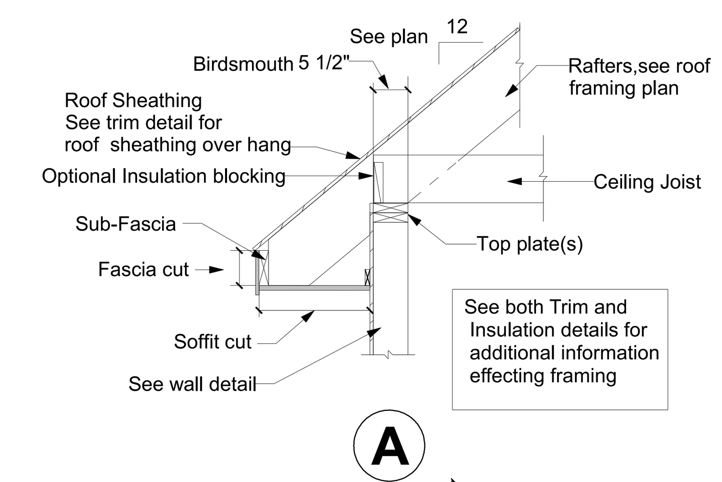
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 10/7/2019, drawn by ACJ

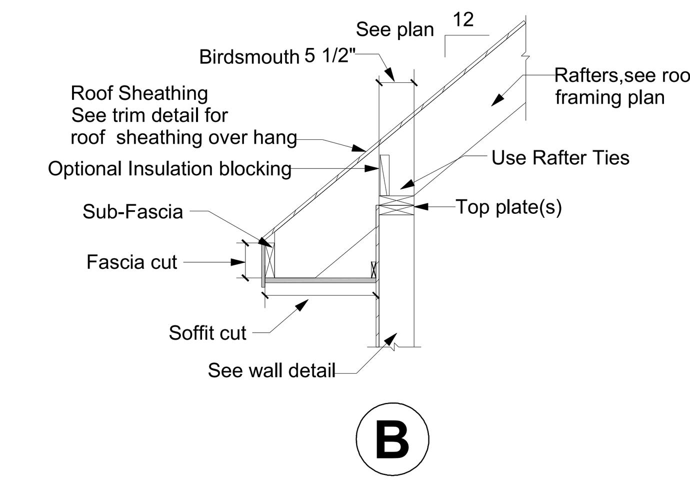
Issued for:
Construction

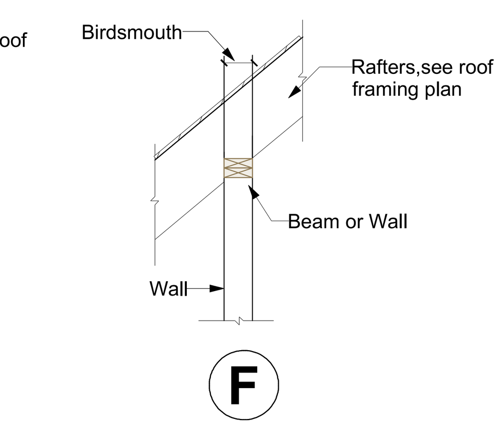
...

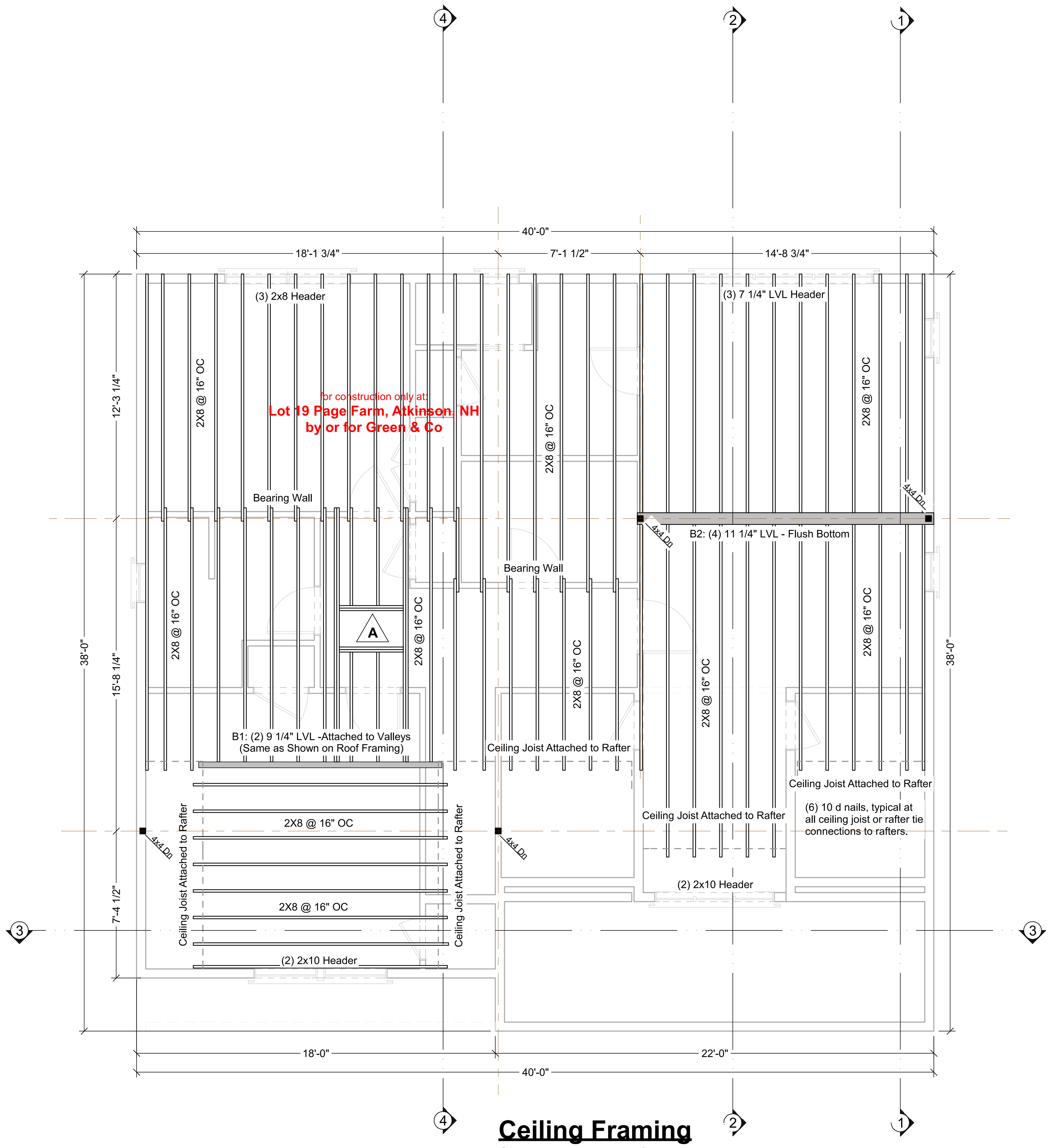
10/7/2019 3:09:39 PM

//AFDISKSTATION/AFA StaffAccess/-Home Designs/by Project/Green & Co - Page Farm/40 FT Wide Series/Gaira 742/CD 742.124.v6 KL 2638 Gaira 40x46 - Lot 19 Page Farm.layout



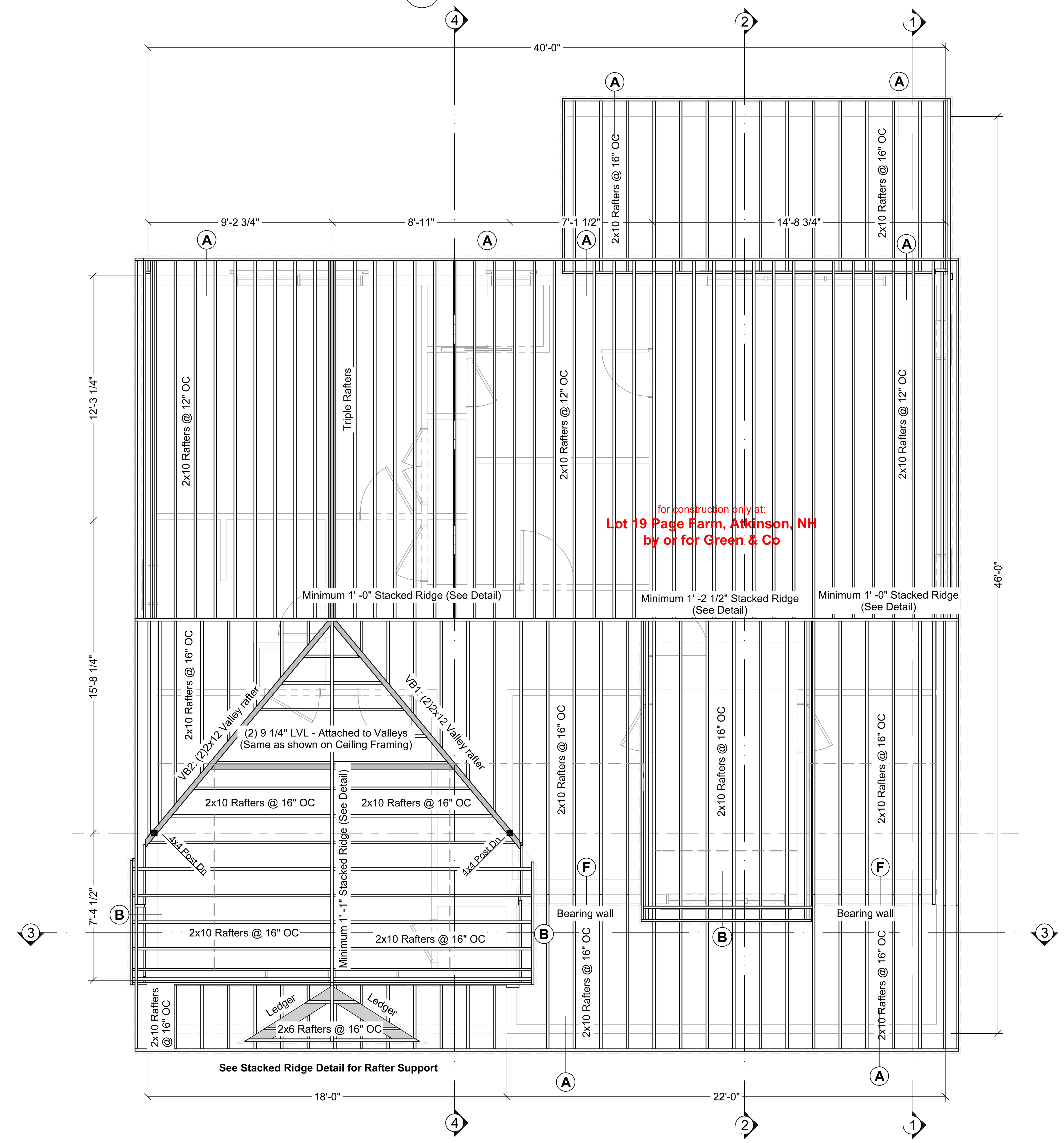






Ceiling Framing

Structure designed for
Snow Load of 55 psf

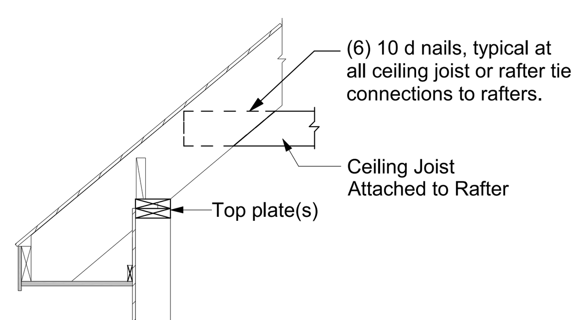


Roof Framing

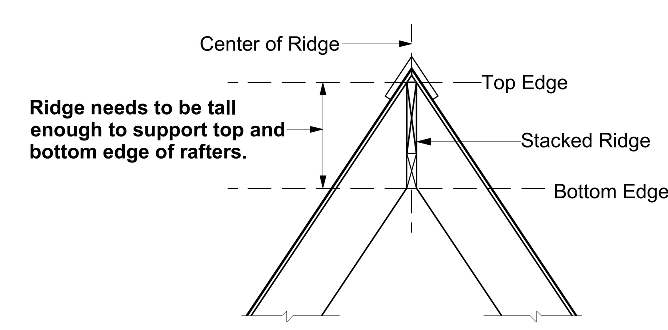
Provide Hurricane ties per code

Structure designed for
Snow Load of 55 psf

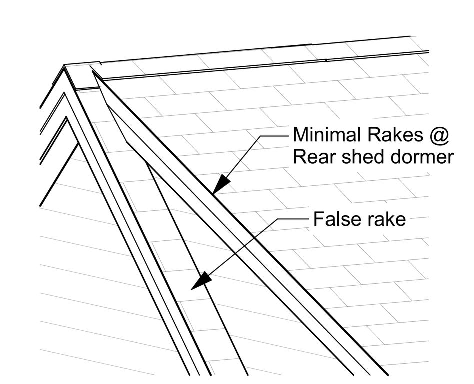
NOTE: See Roof Plan for roof pitches and overhangs



Joist Attached to Rafter



Stacked Ridge Detail



Alternate:
12" False Rake and a 6" Shed Dormer Rake

Artform Home Plans

AFHP Design # 742.124.v6 KL
© 2008-2019 Art Form Architecture 603.431.9559

Gaira 40x46
Lot 19 Page Farm
Atkinson, NH

9

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 10/7/2019, drawn by ACJ

Issued for:
Construction

481.124.v10 KR Sweet Cherry Pie

	Main	Future	Apt	Main + Future	Main + Apt	All
Living Area	2404 SF	0 SF	0 SF	2404 SF	2404 SF	2404 SF
Bedrooms	3	1	0	4	3	4
Baths	2.5	0.0	0.0	2.5	2.5	2.5

Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Artform Home Plans

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

481.124.v10 KR Sweet Cherry Pie

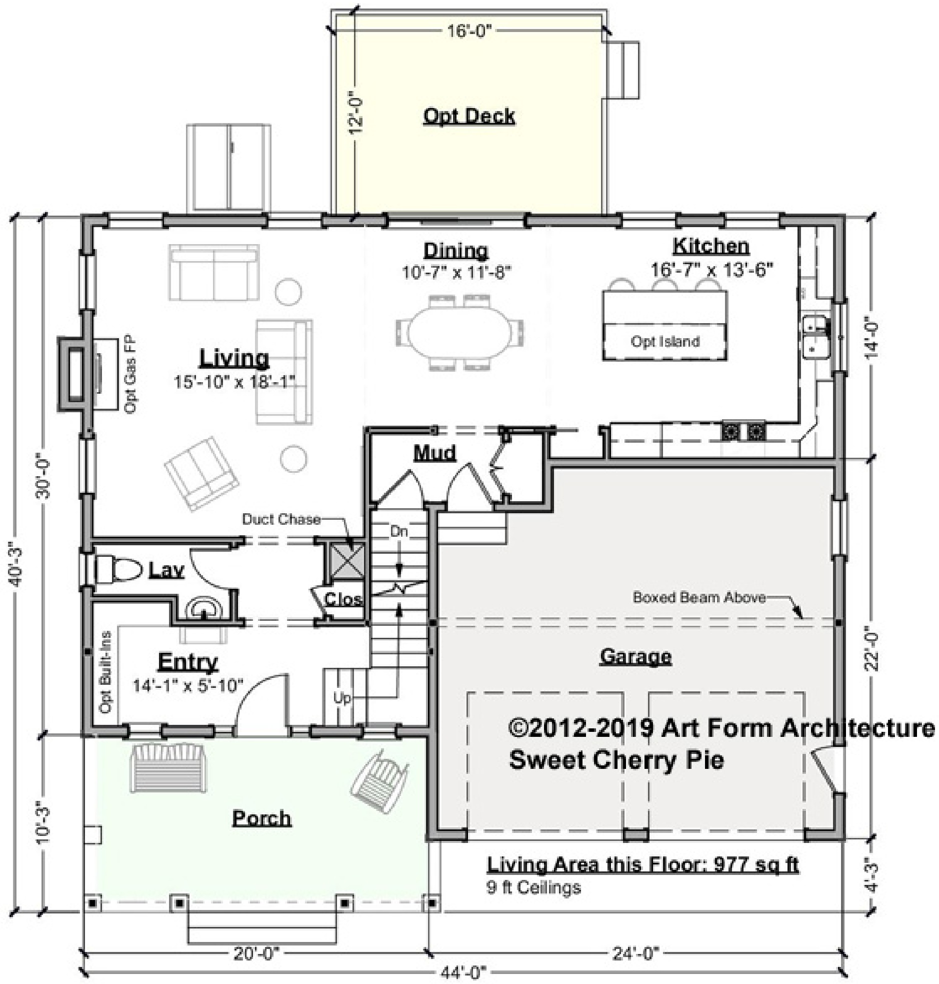
Artform Home Plans

First Floor

	Area	Beds	Baths
Main	977 SF	0	0.5
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**977 SF**	**0**	**0.5**

Ceiling Height	
Shown	9'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost



481.124.v10 KR Sweet Cherry Pie

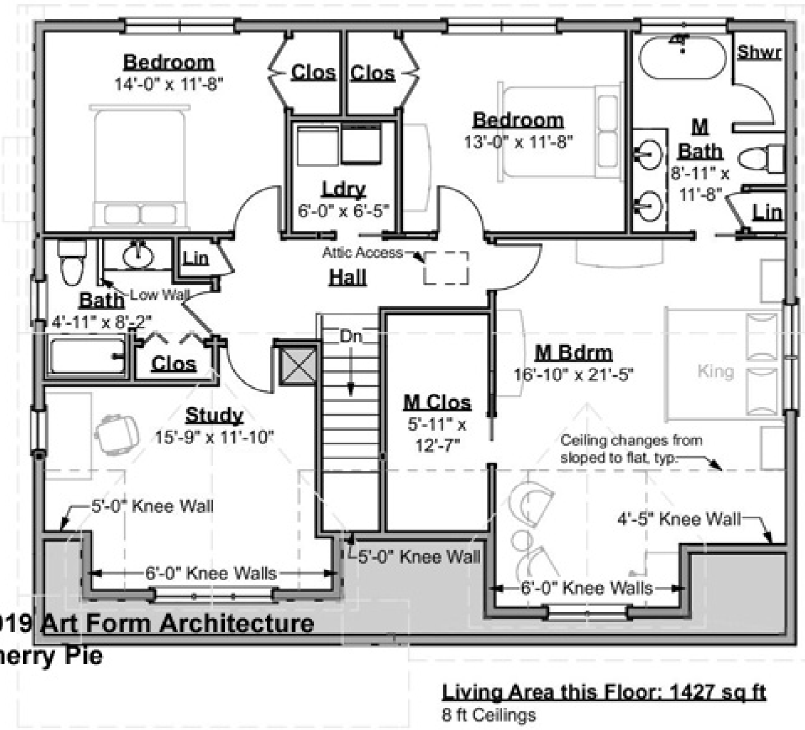
Artform Home Plans

Second Floor

	Area	Beds	Baths
Main	1427 SF	3	2
Future	0 SF	1	0
Apt	0 SF	0	0
Total	**1427 SF**	**4**	**2**

Ceiling Height	
Shown	8'-0"
Possible*	9'-0"

* See Major Change information on plan page for cost



481.124.v10 KR Sweet Cherry Pie

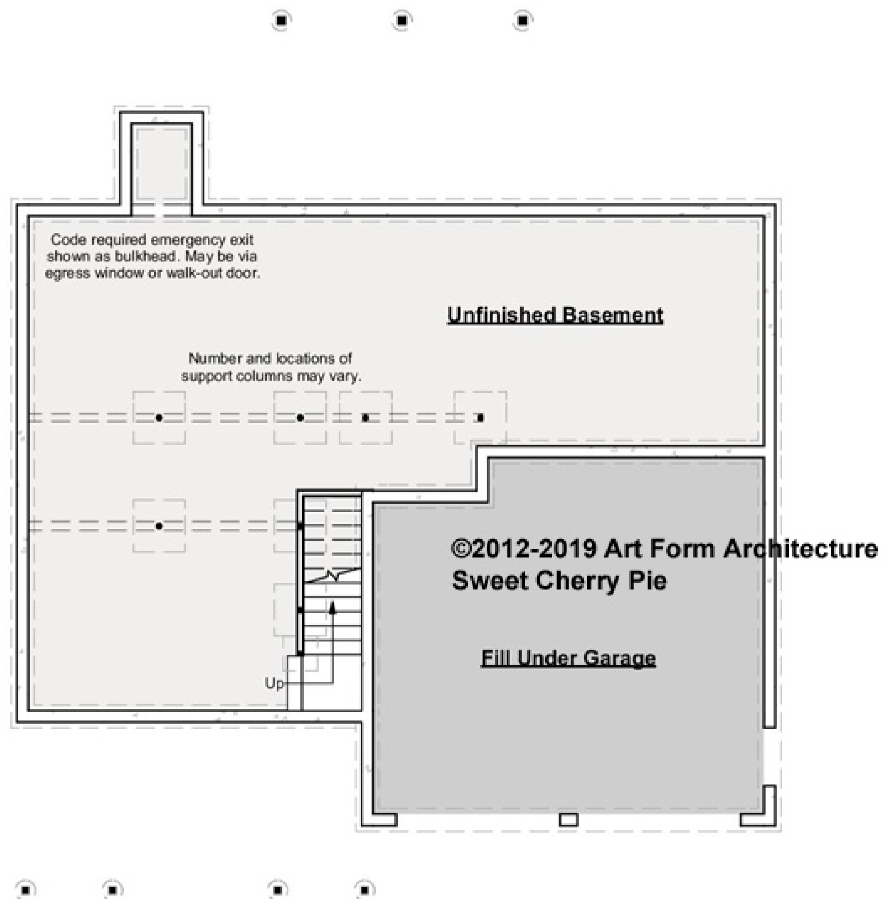
Artform Home Plans

Basement Floor

	Area	Beds	Baths
Main	0 SF	0	0
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**0 SF**	**0**	**0**

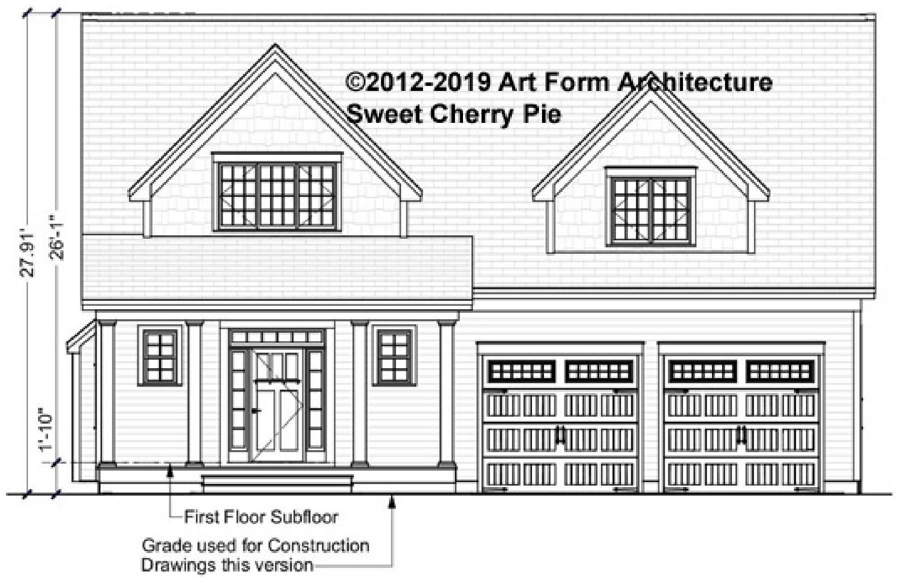
Ceiling Height	
Shown	7'-8"
Possible*	9'-0"

* See Major Change information on plan page for cost



481.124.v10 KR Sweet Cherry Pie

Front Elevation



Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

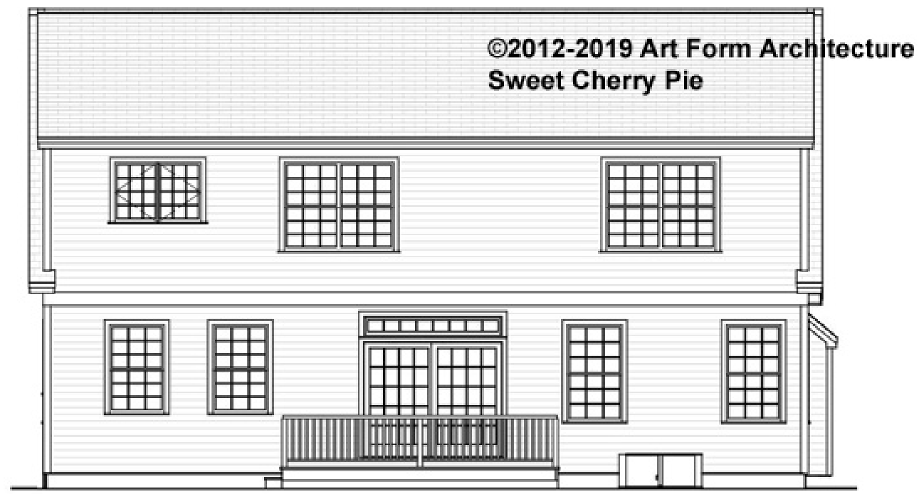
481.124.v10 KR Sweet Cherry Pie

Artform Home Plans

Right Elevation

481.124.v10 KR Sweet Cherry Pie

Rear Elevation



481.124.v10 KR Sweet Cherry Pie

Artform Home Plans

Left Elevation

Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1032.124 GL Sinclair

	Main	Future	Apt	Main + Future	Main + Apt	All
Living Area	2886 SF	0 SF	0 SF	2886 SF	2886 SF	2886 SF
Bedrooms	4	1	0	5	4	5
Baths	3.5	0.0	0.0	3.5	3.5	3.5

Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Artform Home Plans

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

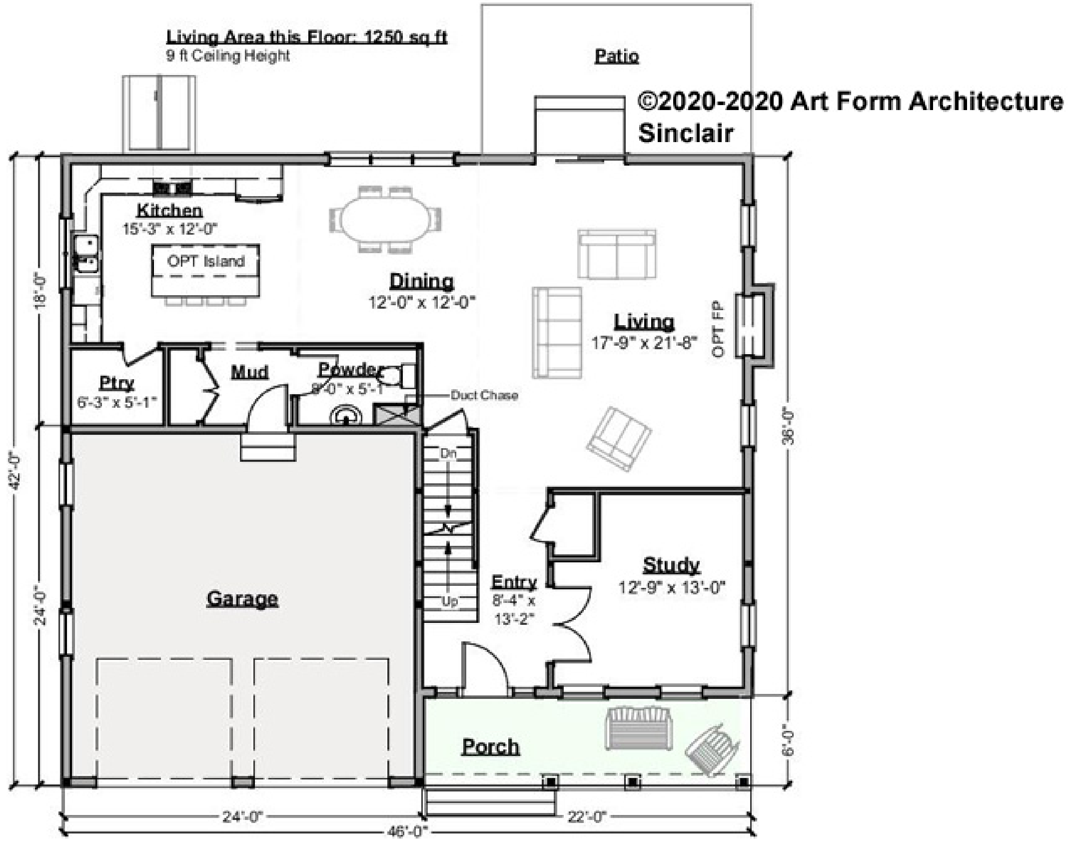
1032.124 GL Sinclair

First Floor

	Area	Beds	Baths
Main	1250 SF	0	0.5
Future	0 SF	1	0
Apt	0 SF	0	0
Total	**1250 SF**	**1**	**0.5**

	Ceiling Height
Shown	9'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost



Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1032.124 GL Sinclair

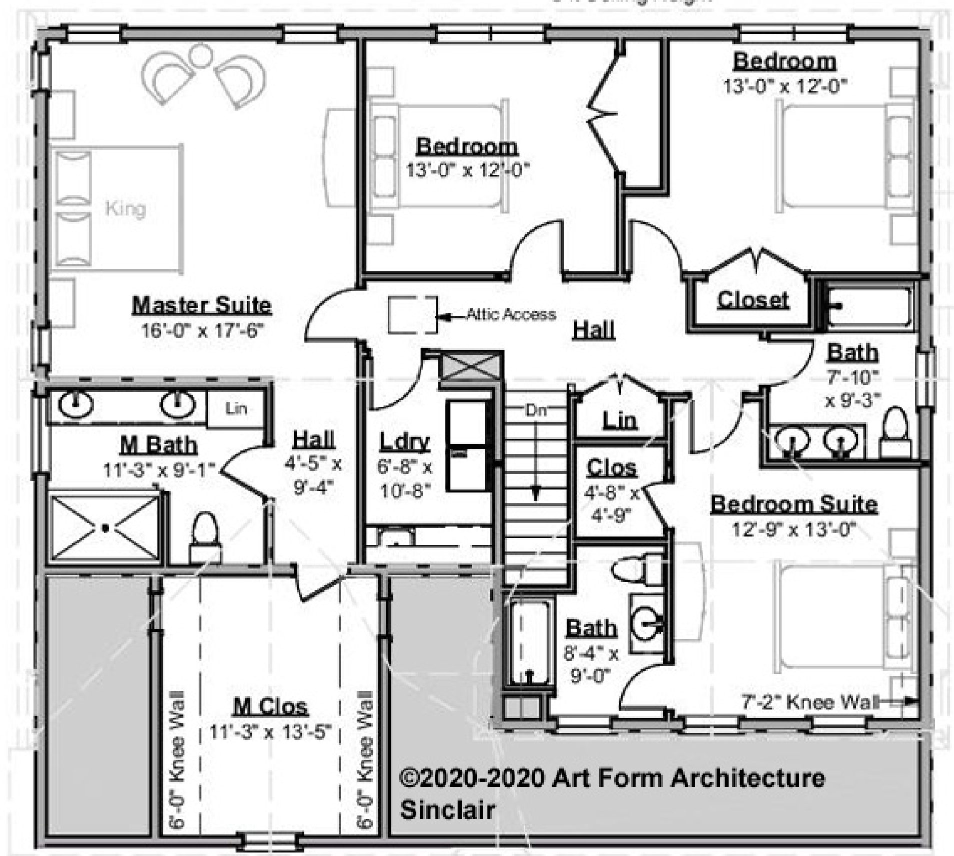
Second Floor

	Area	Beds	Baths
Main	1636 SF	4	3
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1636 SF**	**4**	**3**

Ceiling Height	
Shown	8'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost

Living Area this Floor: 1636 sq ft
8 ft Ceiling Height



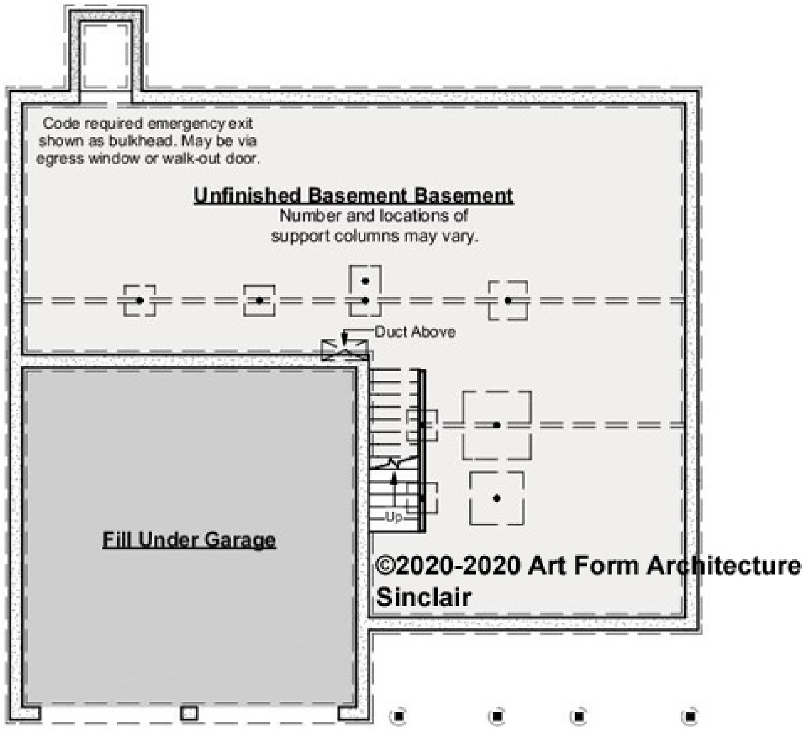
1032.124 GL Sinclair

Basement Floor

	Area	Beds	Baths
Main	0 SF	0	0
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**0 SF**	**0**	**0**

Ceiling Height	
Shown	7'-8"
Possible*	9'-0"

* See Major Change information on plan page for cost



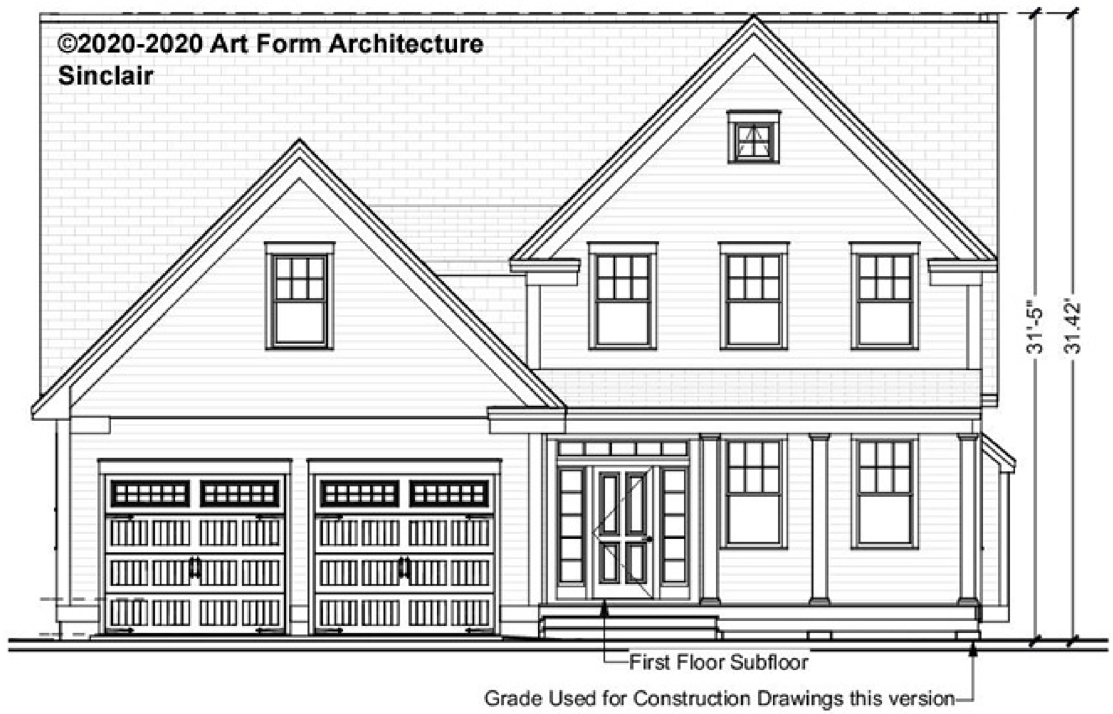
Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1032.124 GL Sinclair

Front Elevation



Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

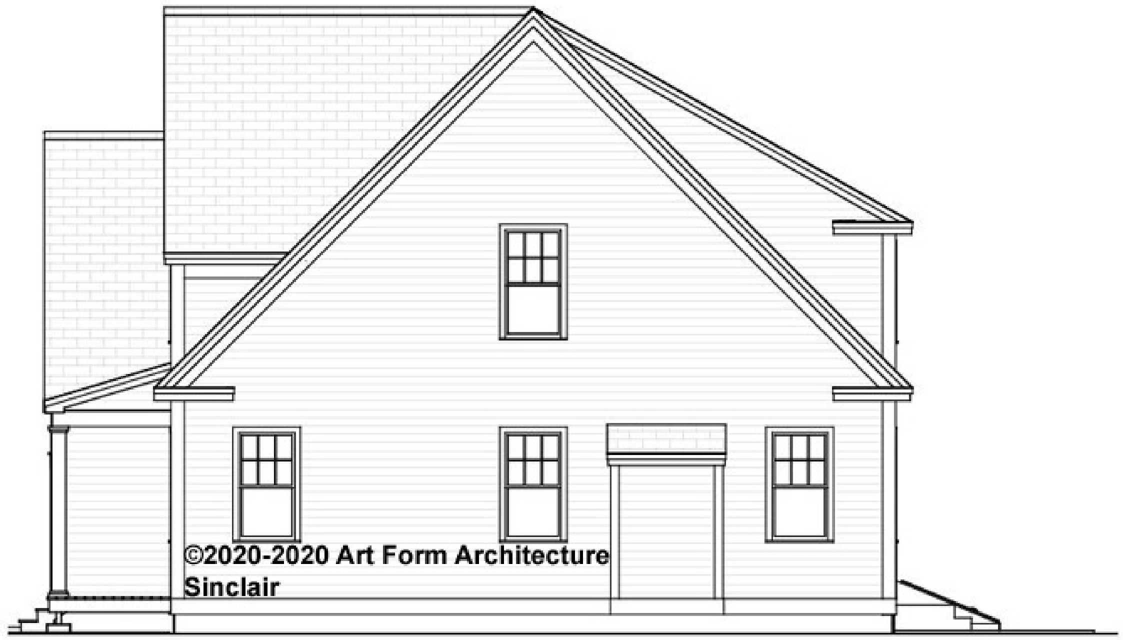
Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

1032.124 GL Sinclair

Artform Home Plans

Right Elevation



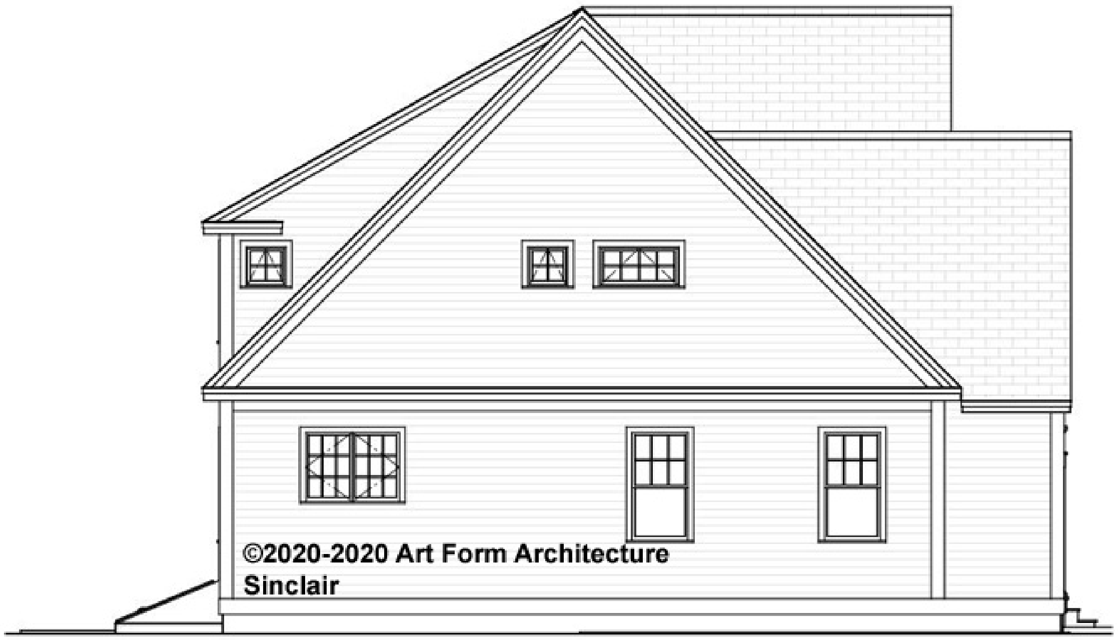
1032.124 GL Sinclair

Artform Home Plans

Rear Elevation

1032.124 GL Sinclair

Left Elevation



Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

405.124.v2 KR Stephanie

	Main	Future	Apt	Main + Future	Main + Apt	All
Living Area	1797 SF	0 SF	0 SF	1797 SF	1797 SF	1797 SF
Bedrooms	3	1	0	4	3	4
Baths	2.5	0.0	0.0	2.5	2.5	2.5

Use of this document is governed by our **Terms and Conditions**, found on our website:
http://www.artformhomeplans.com/TermsConditions.a5w

Artform Home Plans

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

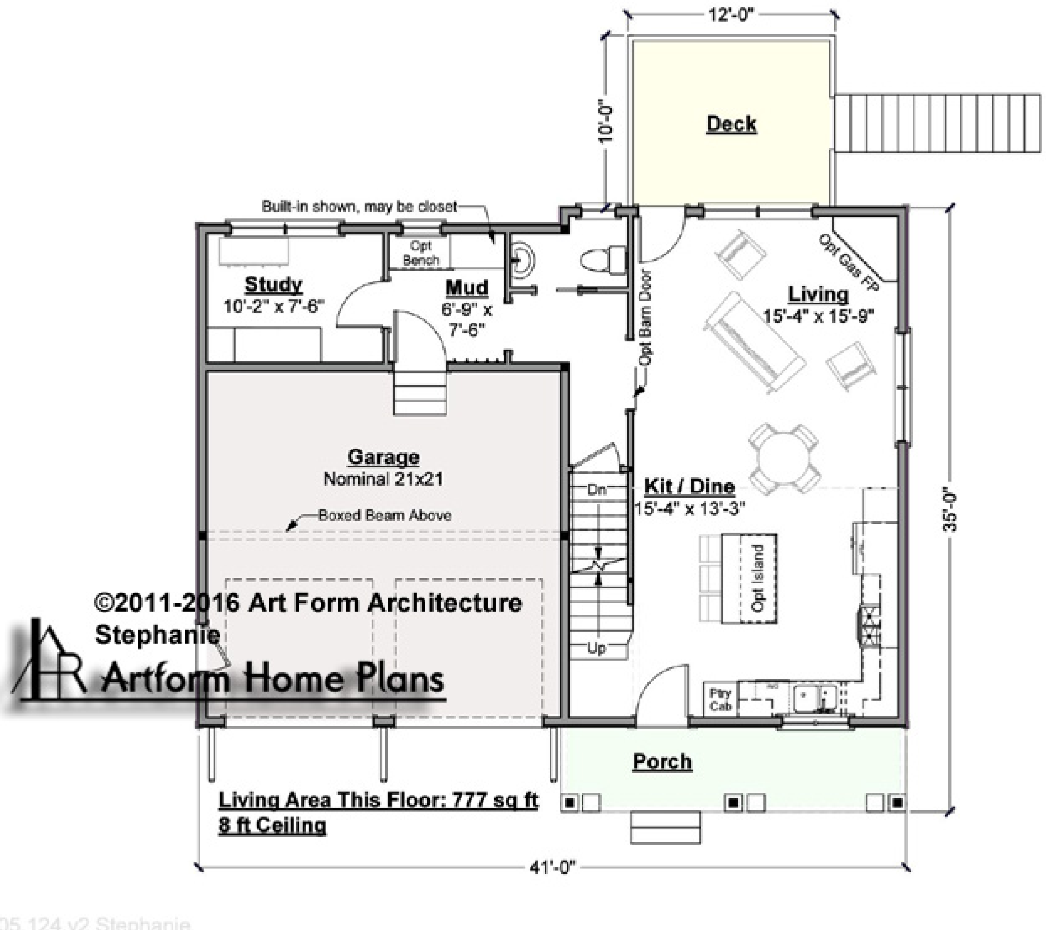
405.124.v2 KR Stephanie

First Floor

	Area	Beds	Baths
Main	777 SF	0	0.5
Future	0 SF	1	0
Apt	0 SF	0	0
Total	**777 SF**	**1**	**0.5**

	Ceiling Height
Shown	8'-0"
Possible*	8'-8"

* See Major Change information on plan page for cost



Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

405.124.v2 KR Stephanie

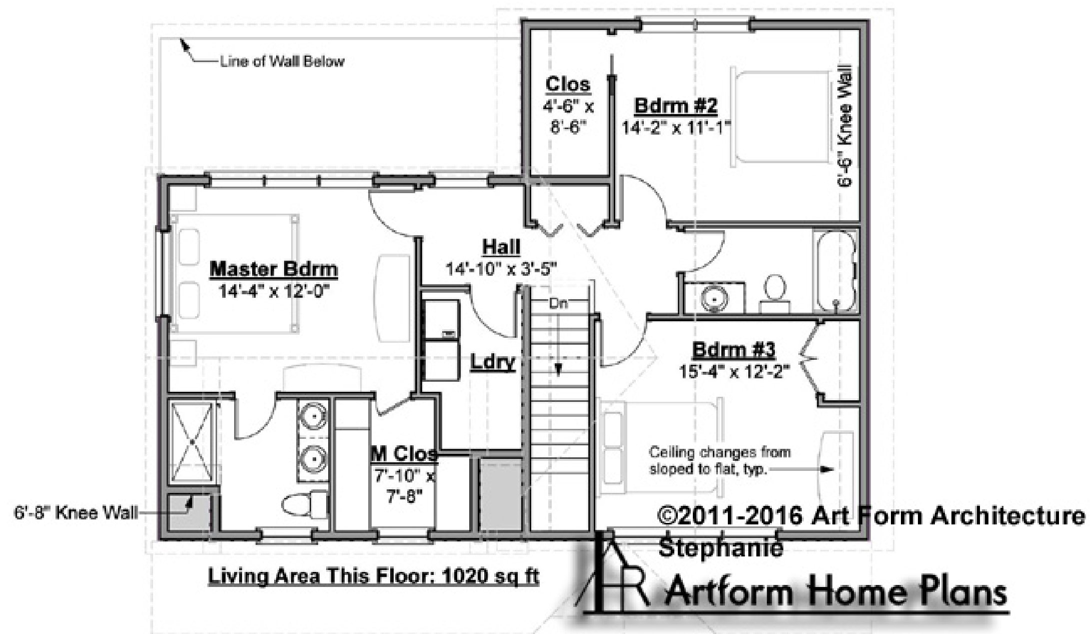
Artform Home Plans

Second Floor

	Area	Beds	Baths
Main	1020 SF	3	2
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1020 SF**	**3**	**2**

Ceiling Height	
Shown	8'-0"
Possible*	9'-0"

* See Major Change information on plan page for cost



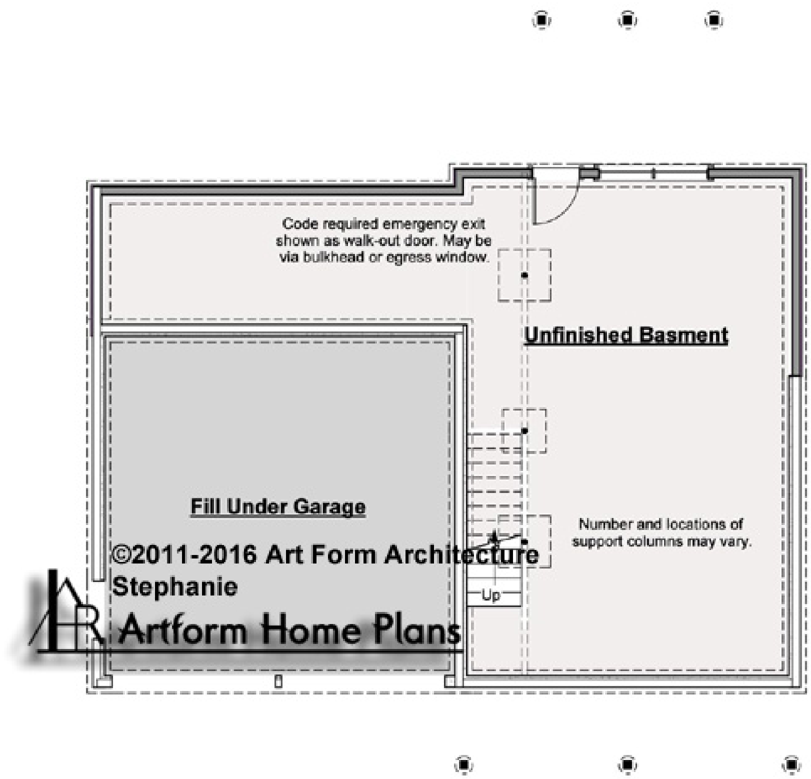
405.124.v2 KR Stephanie

Basement Floor

	Area	Beds	Baths
Main	0 SF	0	0
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**0 SF**	**0**	**0**

Ceiling Height	
Shown	7'-8"
Possible*	9'-0"

* See Major Change information on plan page for cost



WEB 405.124.v2 Stephanie

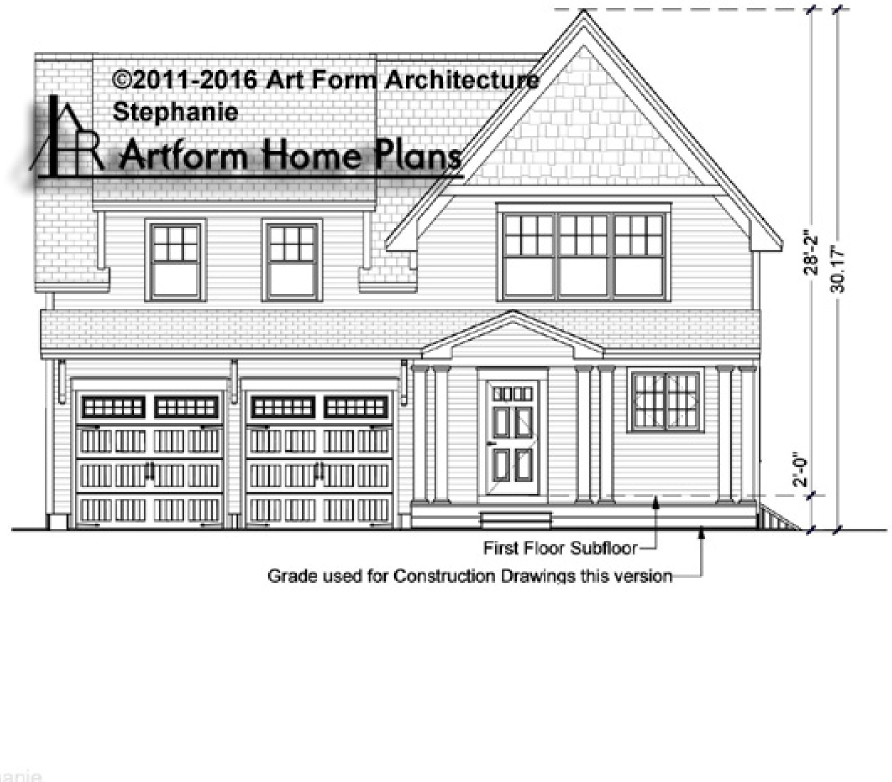
Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

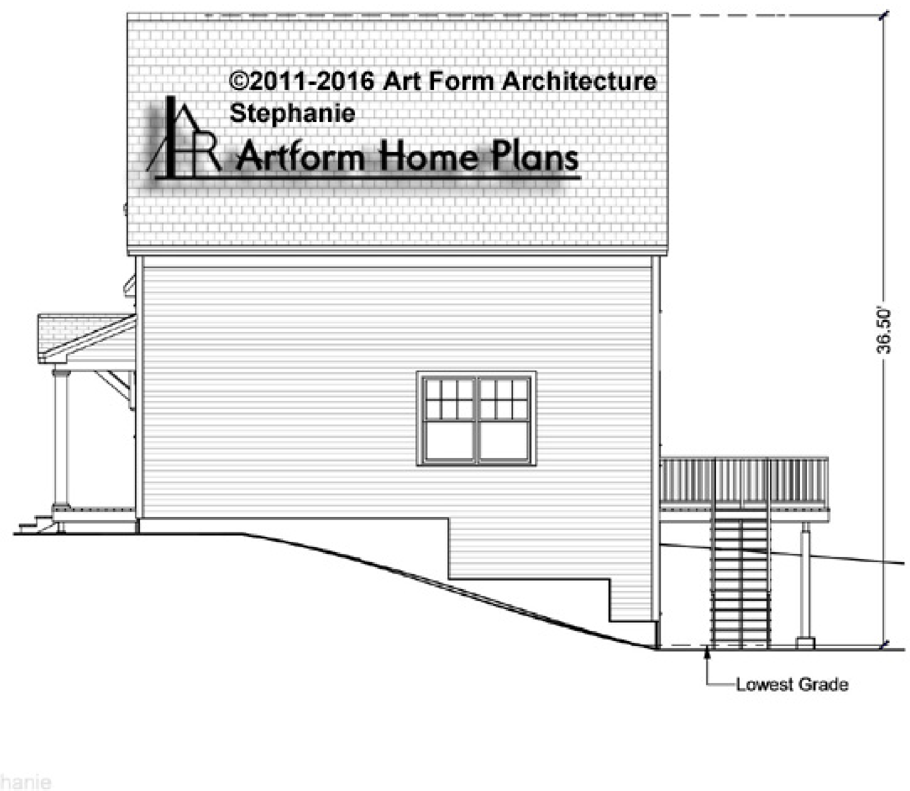
405.124.v2 KR Stephanie

Front Elevation



405.124.v2 KR Stephanie

Right Elevation



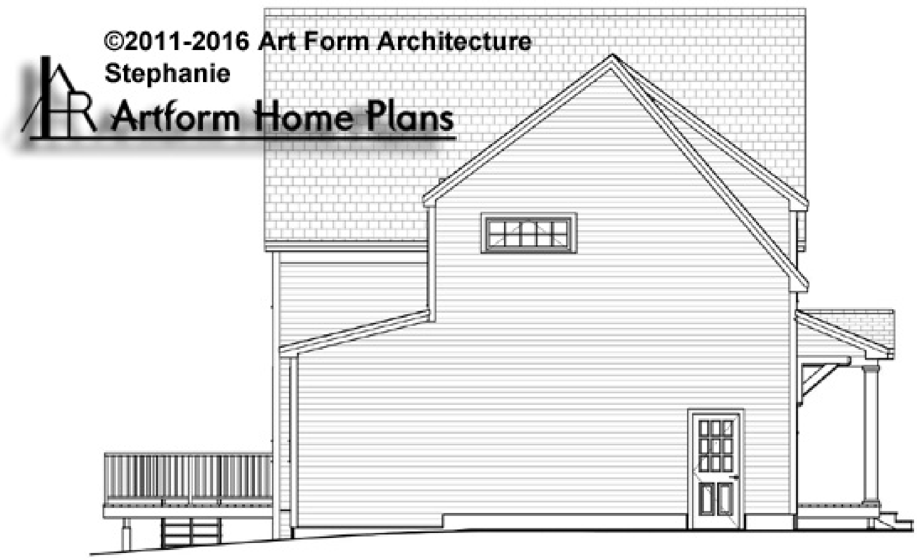
405.124.v2 KR Stephanie

Artform Home Plans

Rear Elevation

405.124.v2 KR Stephanie

Left Elevation



148.124.v6 KR Sweet Liberty

	Main	Future	Apt	Main + Future	Main + Apt	All
Living Area	2413 SF	0 SF	0 SF	2413 SF	2413 SF	2413 SF
Bedrooms	3	0	0	3	3	3
Baths	2.5	0.0	0.0	2.5	2.5	2.5

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

148.124.v6 KR Sweet Liberty

Artform Home Plans

First Floor

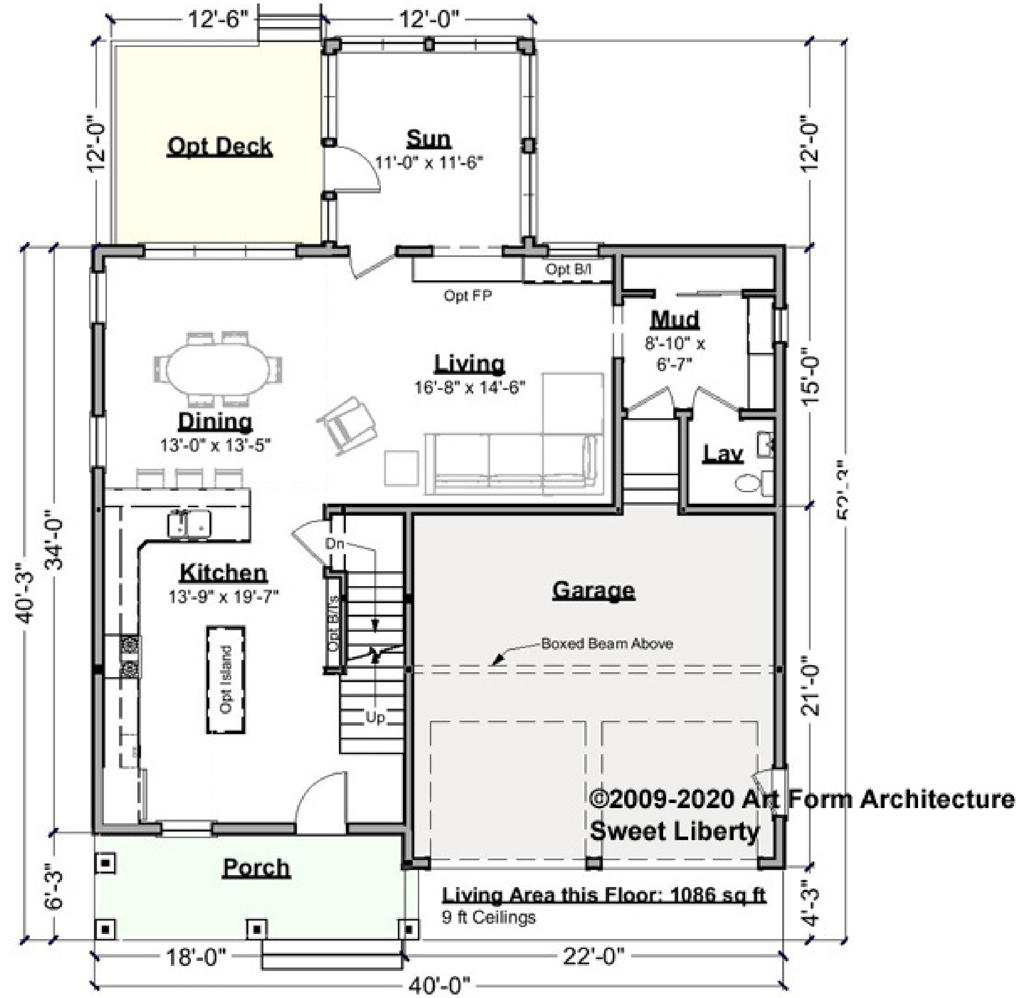
	Area	Beds	Baths
Main	1086 SF	0	0.5
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1086 SF**	**0**	**0.5**

	Ceiling Height
Shown	9'-0"
Possible*	8'-0"

* See Major Change information on plan page for cost

Notes This Design:

Side entry garage will require some structural redesign - a beam to transfer load from that post.



Use of this document is governed by our **Terms and Conditions**, found on our website: http://www.artformhomeplans.com/TermsConditions.a5w

Some features show are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

We are not responsible for typographical errors.

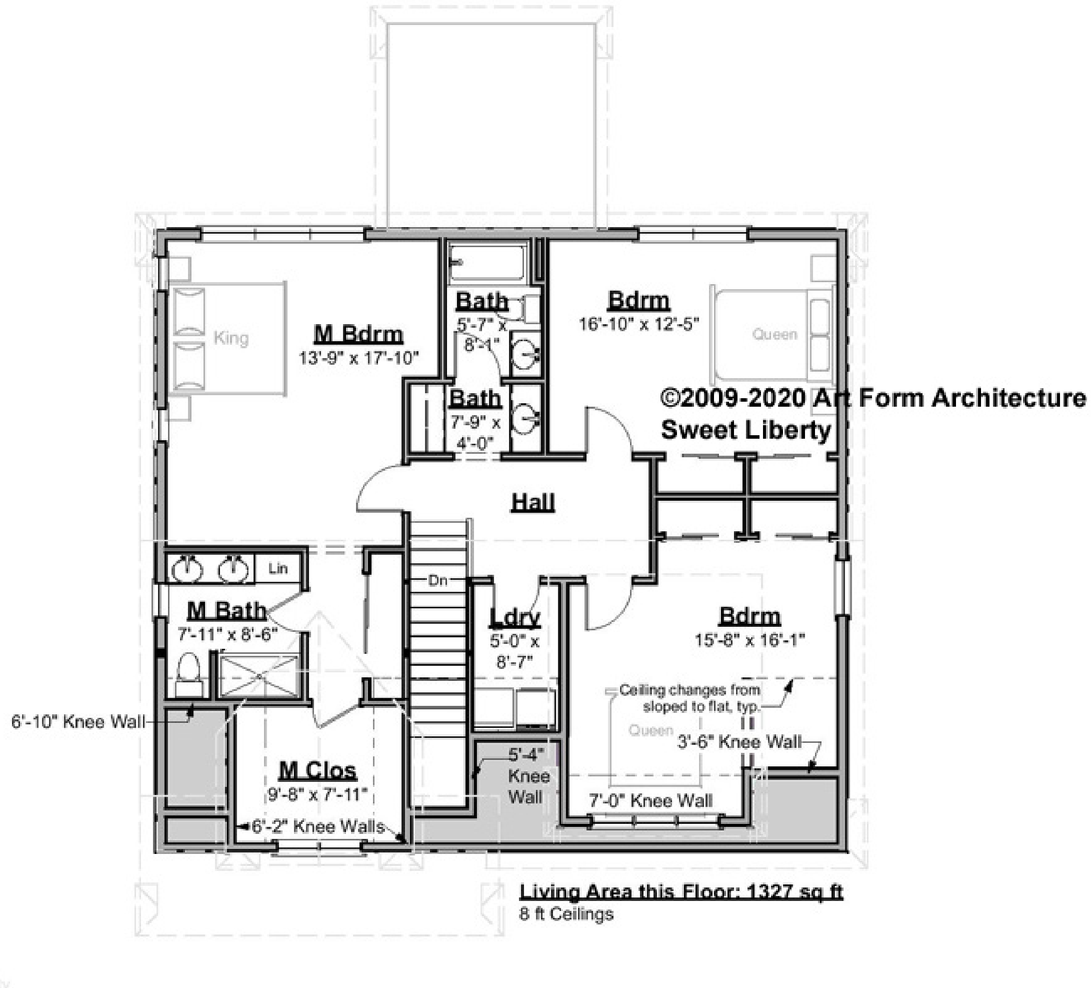
148.124.v6 KR Sweet Liberty

Second Floor

	Area	Beds	Baths
Main	1327 SF	3	2
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**1327 SF**	**3**	**2**

	Ceiling Height
Shown	8'-0"
Possible*	9'-0"

* See Major Change information on plan page for cost



148.124.v6 KR Sweet Liberty

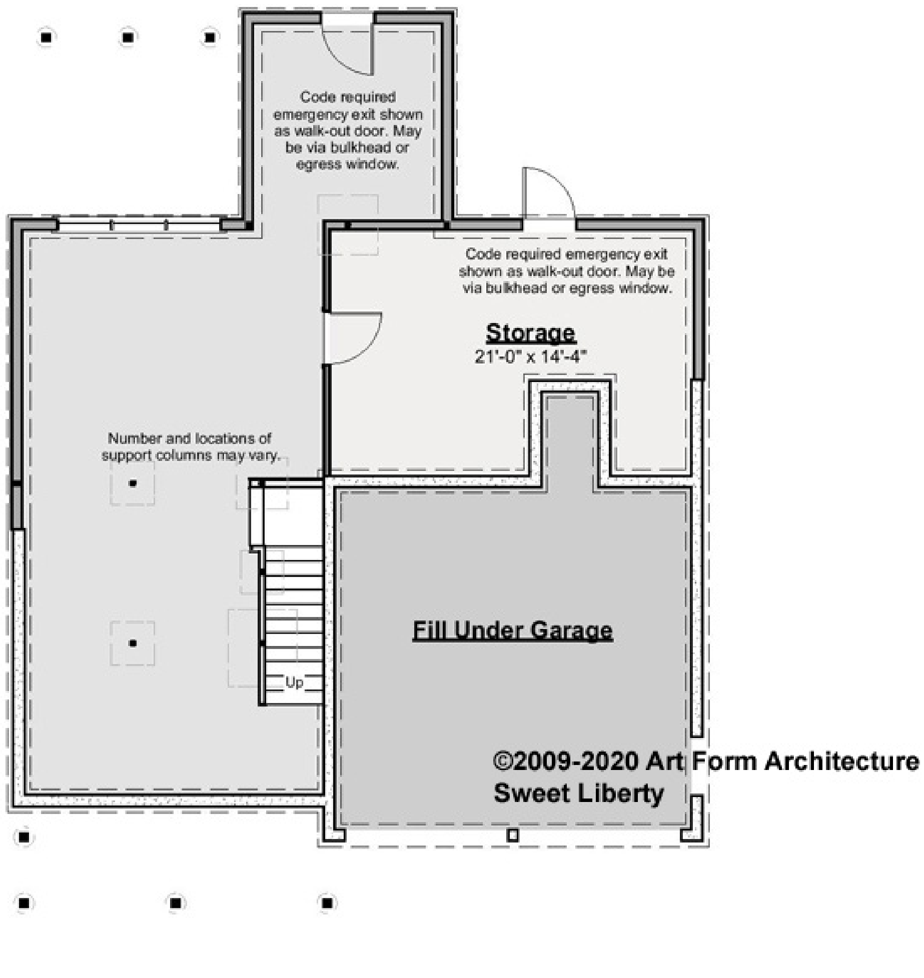
Artform Home Plans

Basement Floor

	Area	Beds	Baths
Main	0 SF	0	0
Future	0 SF	0	0
Apt	0 SF	0	0
Total	**0 SF**	**0**	**0**

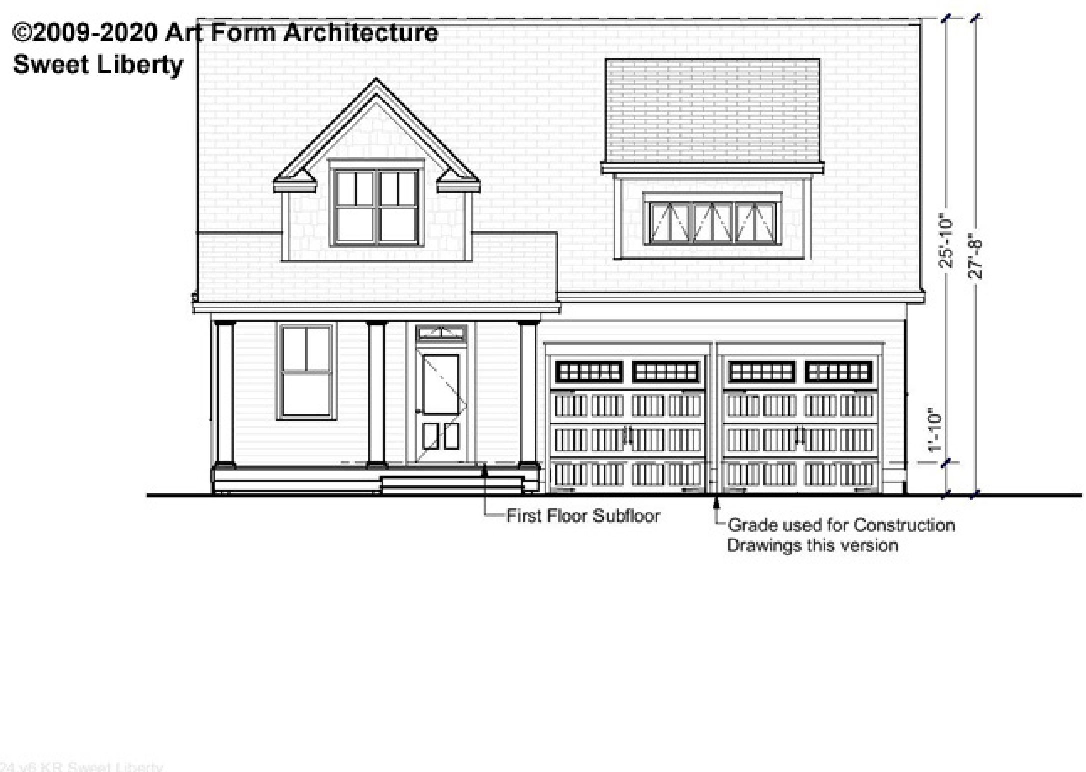
Ceiling Height	
Shown	7'-8"
Possible*	9'-0"

* See Major Change information on plan page for cost



148.124.v6 KR Sweet Liberty

Front Elevation



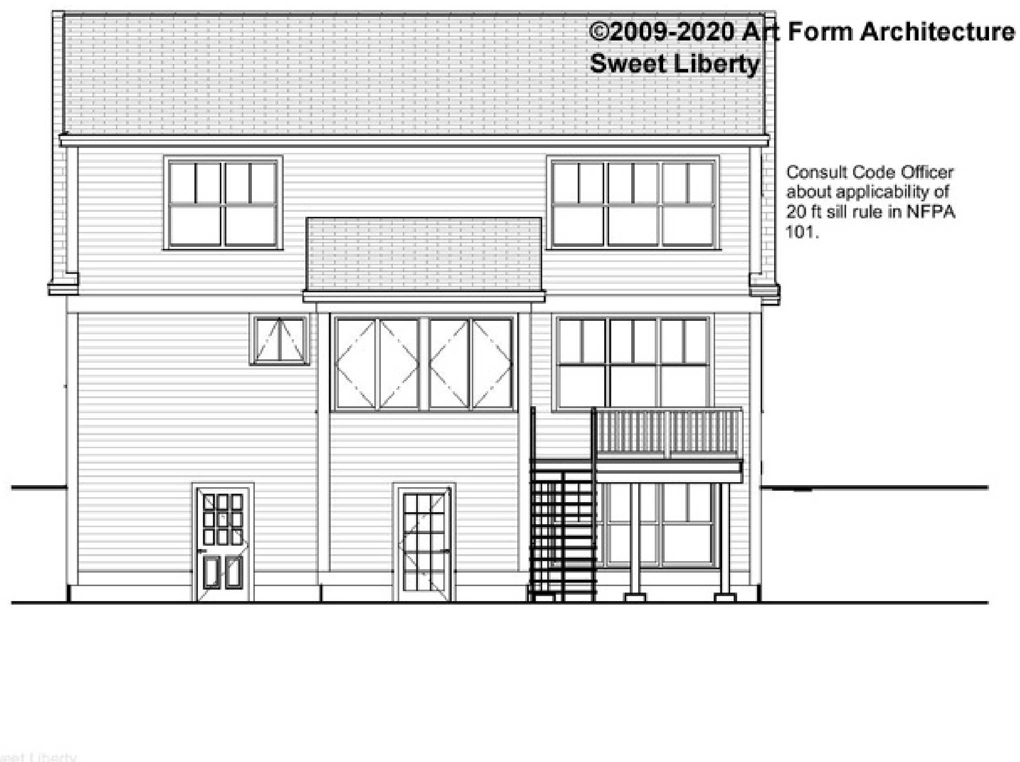
148.124.v6 KR Sweet Liberty

Right Elevation

148.124.v6 KR Sweet Liberty

Artform Home Plans

Rear Elevation



148.124.v6 KR Sweet Liberty

Left Elevation

Green & Company

Wall Types

Exterior walls 2x6 wood stud
Interior walls 2x4 wood stud, unless noted otherwise

Wall Keys

(2) 2x wood studs on the flat
(6) 2x6 wood stud wall, 16" oc
Note: 2x4 wood stud wall, 16" oc unless otherwise noted

Key Notes

A — 30" x 22" Minimum Attic Access Panel - Insulated (RO 34" x 26")
F — Field locate for plumbing or mechanical
V — Verify size of fixture or appliance. Adjust dimensions to accommodate
C — Center - Place door or window centered on wall

SD Smoke Detector — HD Heat Detector
CO Carbon Monoxide Detector

Dimensions

1. Dimensions are to face of stud, unless noted otherwise.
2. Closets are 24" clear inside, unless dimensioned otherwise.

Square Footages

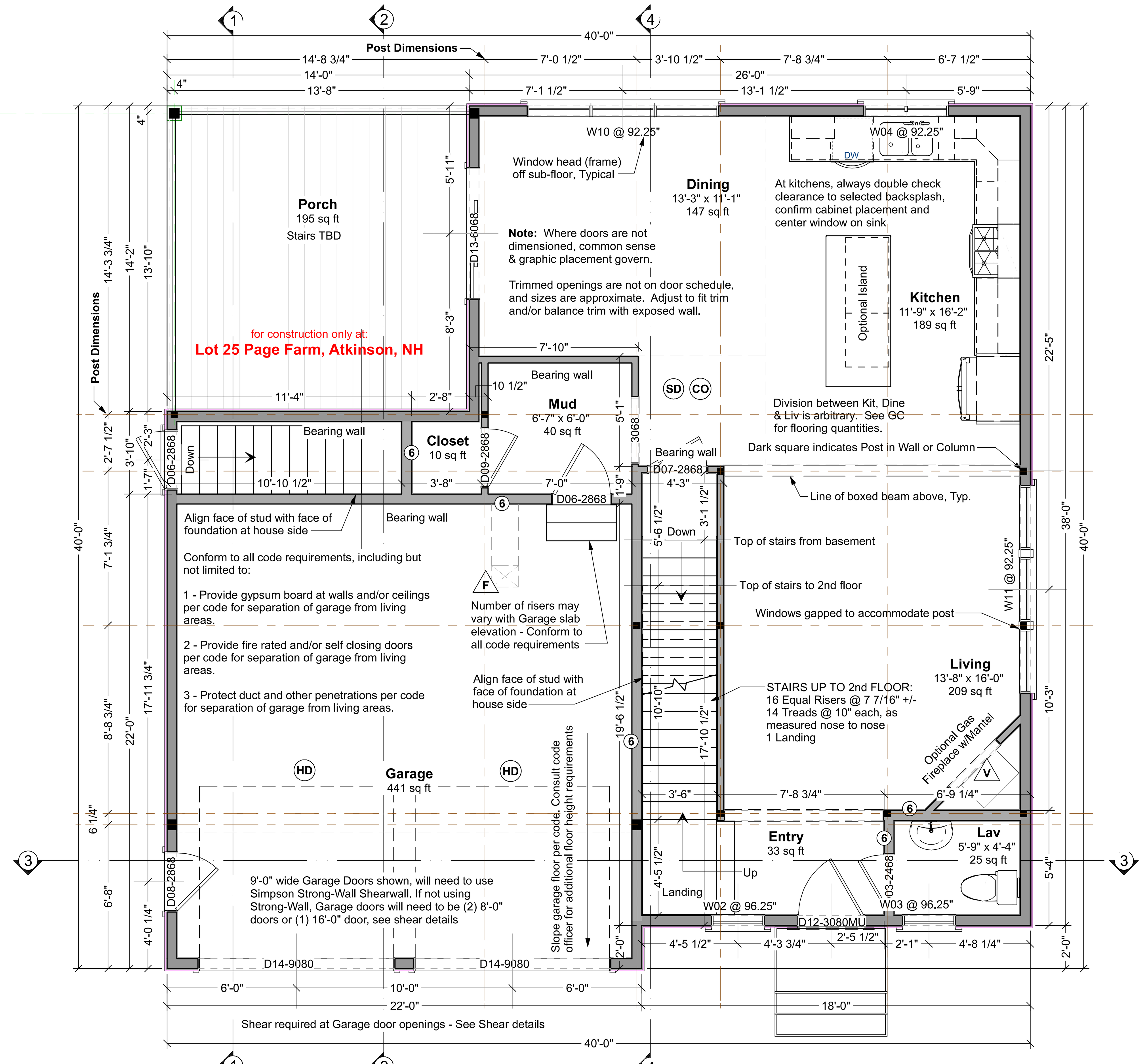
1. Sq ft numbers are interior to room for use in calculating finishes.
2. Cabinets and fixtures not subtracted.
3. Add for doorways when floor finishes run through.

Notes

1. Exterior walls 2x6 wood stud @ 16" oc. Provide insulation & vapor barrier conforming to state or local codes. Interior sheathing 1/2" gypsum board. Provide 1/2" exterior rated sheathing, house wrap with drainage plane and siding. Provide step flashing at walls adjacent to roof planes.
2. Interior walls 2x4 wood stud @ 16" oc, unless noted otherwise.
3. Roof - see structural for rafter sizes. Provide 5/8" exterior rated roof sheathing 15# roofing felt, ice & water shield at eaves and valleys, aluminum drip edge and asphalt shingles or metal roofing. Structure not calculated to support slate or tile. Flash all penetrations. Provide cricket at any added chimneys.
4. Provide roof and/or ceiling insulation per code. Provide soffit and ridge vents where required for insulation strategy. (Verify with code officer - closed cell spray foam or dense-pack cellulose installed at rafters and filling ridge and eaves generally contra-indicates venting, batt insulation always requires venting).
5. Provide smoke, carbon monoxide, and heat detectors where shown and where required by code and where required by local authorities.
6. Provide fire resistive materials where required by code, including but not limited to, firestopping at penetrations, 5/8" Type X drywall on walls and ceilings to separate garage (where garage present in design) from dwelling, and separation of dwellings (where more than one dwelling present in design), and protection of flammable insulation materials. See Table R306.6 IRC 2015.
7. Compliance with code requirements for room sizes and clearances, (hallway widths, room sizes, etc) assume 1/2" drywall on walls and 1/2" drywall on 3/4" strapping on ceilings. Adjust as required if materials differ.
8. Shear is only called out where Continuous Portal Frame will not suffice. See Section R602.10.4 (Pages 177 - 188) of the IRC 2015.

General Design Notes

1. Builder shall consult and follow the building code and other regulations in effect for the building site for all construction details not shown in these drawings. Requirements described here are specific to this design and/or are provided as reference. Additional building code or local requirements may apply.
2. Builder shall maintain a safe worksite, including but not limited to, provision of temporary supports where appropriate and adherence to applicable safety standards.
3. Design is based on the snow load listed on the framing plans, 100 mph basic wind speed, Exposure type B, soil bearing capacity of 2000 psf, and Seismic Category C, unless otherwise noted on the framing plans. Builder shall promptly inform Artform Home Plans of differing conditions.



NOTE TO HOMEOWNER:
These construction plans ARE NOT a part of your construction contract with your builder, unless your P&S agreement specifies that they are. Your P&S and it's attachments (like the builder's specifications or a review set of this design) describes what you and your builder agreed the builder would build for you. We here at Artform Home Plans do not have the authority to obligate your builder to provide you with amenities like fireplaces and spa tubs. The contract between you and your builder governs.

First Floor Plan

Living Area this Floor: 854 sq ft
9 ft Finished Ceiling Height

1 0 1 2 3 4

Door & Window Notes

1. **Rated Doors:** Provide fire rated and/or self-closing doors where required by local codes or local authorities
2. **Trimmed Openings:** Trimmed openings not shown on schedule. See Plan.
3. **Window Tempering:** Provide tempered windows where required by local codes or local authorities. Tempering column provided here for convenience. Windows have not been reviewed for tempering requirements.
4. **Window RO's:** 1/4" or 1/2" on each of 4 sides allowed for window RO's, typical. Review framing size vs RO size. Adjust per manufacturer's requirements and/or builder preference.
5. **Egress Windows:** Provide minimum one door or window meeting egress requirements in basement, in each sleeping room, in each potential sleeping room, and other locations required by local code, in sizes required by local code. Note that casement windows coded by manufacturer as meeting IRC 2015 egress requirements typically need to be ordered with specific hardware. Emergency Escape Window Sizes (Section R310.2.1, R310.2.2, R310.2.3 and R310.2.4). Will also comply with NFPA 101.
6. **Basement Windows:** Add basement windows as required to meet state or local code requirements, including but not limited to egress and light/ventilation.
7. **Skylights:** Skylights are not shown on this schedule, but may be required. Consult builder and/or see floor plan.
8. **Minimum window sill height:** IRC 2015 requires that floor window sills be 24" from floor. Confirm bottom of window opening relative to frame. Conform to IRC 2015 R312.1.

DOOR SCHEDULE

NUMBER	QTY	FLOOR	SIZE	WIDTH	HEIGHT	TYPE	COMMENTS
D01	1	2	2068 R IN	24 "	80 "	HINGED	
D02	1	2	2468 L	28 "	80 "	POCKET	
D03	1	1	2468 L IN	28 "	80 "	HINGED	
D04	3	2	2468 L IN	28 "	80 "	HINGED	
D05	3	2	2468 R IN	28 "	80 "	HINGED	
D06	2	1	2868 L EX	32 "	80 "	HINGED	
D07	1	1	2868 L IN	32 "	80 "	HINGED	
D08	1	1	2868 R EX	32 "	80 "	HINGED	
D09	1	1	2868 R IN	32 "	80 "	HINGED	
D10	3	2	2868 L IN	32 "	80 "	HINGED	
D11	2	2	2868 R IN	32 "	80 "	HINGED	
D12	1	1	3080	36 "	96 "	MULLED UNIT	HINGED W/TRANSOM
D13	1	1	6068 R EX	72 "	80 "	SLIDER	
D14	2	1	9080	108 "	96 "	GARAGE	

WINDOW SCHEDULE

NUMBER	QTY	WIDTH	HEIGHT	R/O	EGRESS	TEMPERED	DESCRIPTION	COMMENTS
W01	2	23 1/2 "	23 1/2 "	24"X24"			SINGLE AWNING	
W02	1	29 1/2 "	41 1/2 "	30"X42"		YES	SINGLE CASEMENT-HL	
W03	1	29 1/2 "	41 1/2 "	30"X42"			SINGLE CASEMENT-HR	
W04	1	47 "	47 1/2 "	47 1/2"X48"			DOUBLE CASEMENT-LHL/RHR	
W05	1	70 1/2 "	23 1/2 "	71"X24"			TRIPLE CASEMENT-LHL/RHR	
W06	1	106 1/2 "	47 1/2 "	107"X48"	YES		TRIPLE CASEMENT-LHL/RHR	
W07	1	23 1/2 "	35 1/2 "	24"X36"			DOUBLE HUNG	
W08	1	23 1/2 "	47 1/2 "	24"X48"		YES	DOUBLE HUNG	
W09	2	76 "	61 1/2 "	76 1/2"X62"	YES		2X DH	
W10	1	106 1/2 "	65 1/2 "	107"X66"			3X DH	
W11	1	115 1/2 "	65 1/2 "	116"X66"			3X DH	

Giselle 40x40

Dear Code Officer,

These are predesigned home plans, designed to bring good design and construction drawings to people at more affordable prices and faster time frames than traditional architecture. Where traditional "internet" home plans disclaim all responsibility, we split responsibility between us (Artform) and the owner. We encourage the future homeowners to use a quality builder who can assist them with this. They are responsible for thermal and moisture decisions and for meeting code in ways that a quality builder should know without an explicit detail. We are responsible for things that are directly related to the design and/or that a quality builder couldn't reasonably figure out on their own - specifically the following IRC 2015 code sections:

1 - Room sizes (Section R304)
2 - Ceiling Height (Section R305)
3 - Floor space & ceiling height at Toilet, Bath and Shower Spaces (Section R307)
4 - Hallway widths (Section R311.6)
5 - Door types & sizes (Section R311.2)
6 - Floor space in front of doors (Section R311.3)
7 - Stair width - The stairs in our designs will be a minimum of 36" wide measured wall surface to wall surface, allowing compliance with R311.7.1 with installation of correct handrail.
8 - Stairway headroom (Section R311.7.2)
9 - Stair treads and risers (Section R311.7.5)
10 - Landings for stairways (Section R311.7.6)
11 - Emergency Escape Window Sizes (Section R310.2.1, R310.2.2, R310.2.3 and R310.2.4). Casement windows may require manufacturer's emergency escape window hardware. Will also comply with NFPA 101.
12 - Structural Floor Framing (Section R502.3) Where dimensional lumber is shown, framing members will be sized according to this section of the code. Where engineered wood products are shown, those framing members will be size according to the manufacturer's tables for loads and spans, or sizes will have been calculating using manufacturer's published materials properties.
13 - See structural sheets for additional notes.

The builder can and should add information to this set, such as Rescheck, a hand markup of our generic thermal and moisture section, additional information about doors and windows (such as fire rating, tempering, etc), foundation drops relative to site grading, and sometimes their chosen method of basement egress. These drawings are not intended to be used without that additional information.

Where a construction address is shown on the drawings, it is for copyright control only. We have not inspected the site, adapted the design to state specific laws (except where it says so in the drawings) or site or region specific climate conditions. Homeowner and/or Builder shall be responsible for thermal and moisture control strategies, materials choices and compliance with applicable laws and ordinances.

Please do feel free to call us with any questions. We can and do update our drawings and standard notes to address specific concerns, especially in jurisdictions where our clients will be building again.

Dear Everybody,

With these drawings a copyright license is granted for a single construction only at Lot 25 Page Farm, Atkinson, NH by or for Green & Company. This is a License to Build, and does not include a License to Modify, except as required to conform to building code or fulfill builder's/owners responsibilities.

Permissible uses of these drawings:
1. All activities associated with construction at the listed address.
2. Pricing or preliminary discussions with zoning or code officials for construction at other addresses, with prior notification to Artform Home Plans - just use the Contact form on the web site – http://www.artformhomeplans.com/contact.a5w

Not Permitted:
1. Application for any permits or other approvals for construction at properties other than the listed address, including but not limited to construction, zoning, conservation, or design review.
2. Modification of the basic design.

Use of these drawings outside these parameters is a violation of federal copyright law, punishable by both civil action and criminal prosecution, as it is stealing or enabling theft of "intellectual property". Making modifications to plans, even significant ones, does not change this, under copyright law, that's considered "derivative works".

We can provide drawings suitable for use in obtaining design or zoning approvals without incurring the expense of a full set of construction drawings. Contact us for more information.

AFHP CD Commons 20.2 X11 - IRC 2015

These drawings are intended for use by an experienced professional builder in responsible charge of the entire project, including but not limited to mechanical, electrical and sitework. Any additional adaptation for these trades or other trades must be determined prior to start of construction. Contact Artform for any adjustments needed.

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans
AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

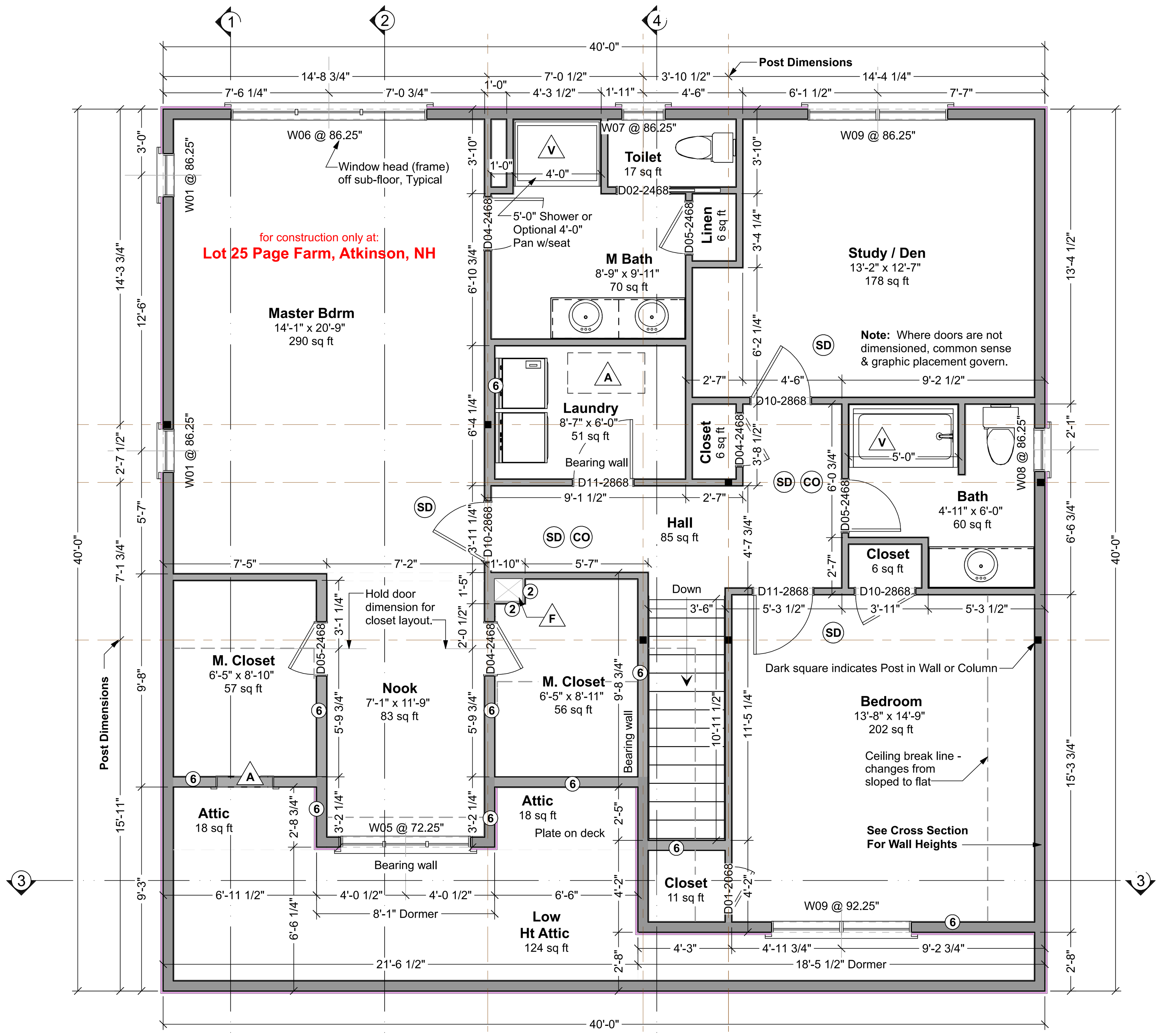
1

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

Issued for: Construction

...

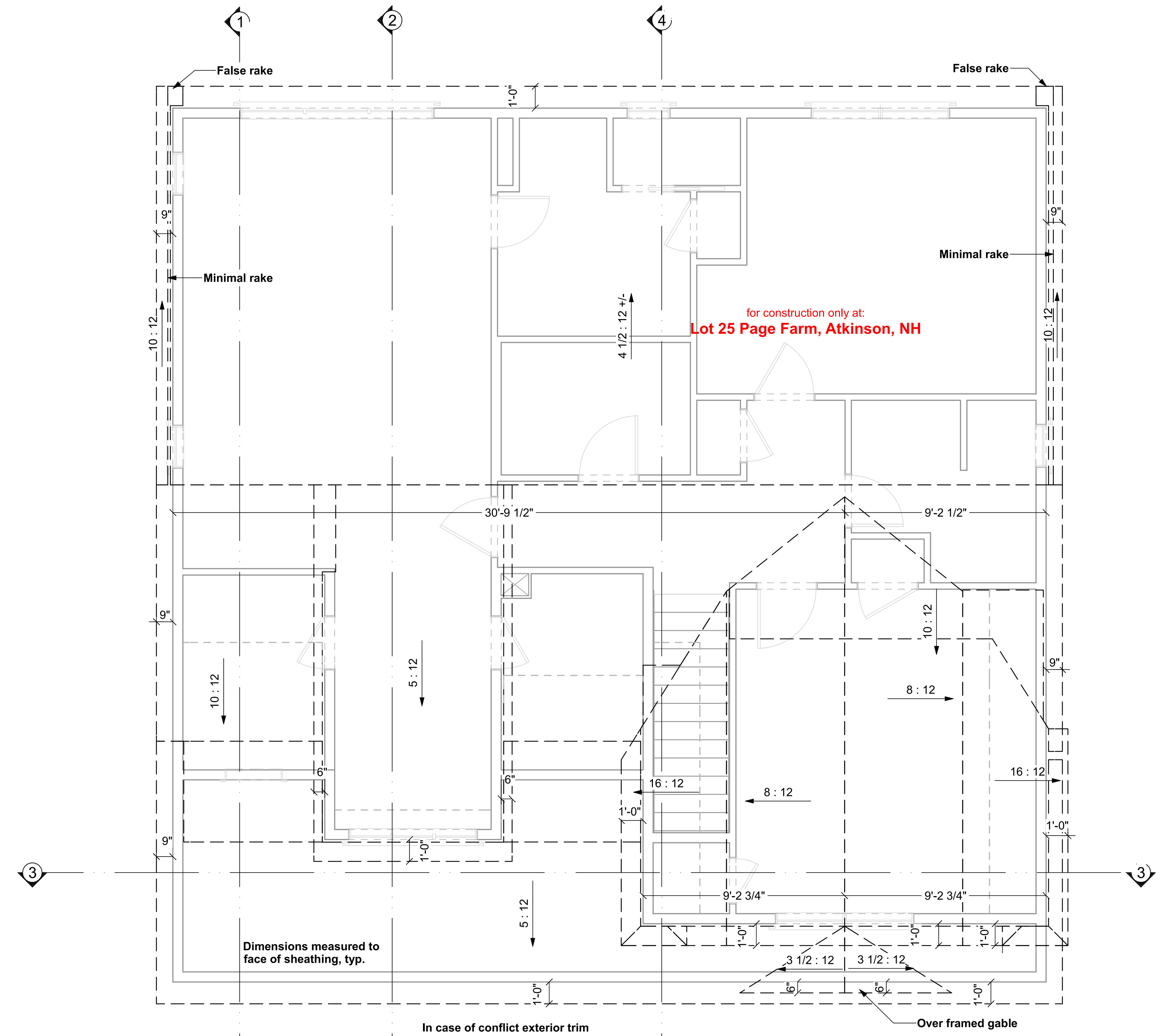
Green & Company



Second Floor Plan

Living Area this Floor: 1374 sq ft

8ft Finished Ceiling Height



In case of conflict exterior trim alignment takes precedence over overhang dimensions

Roof Plan

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 918.124.v3 GL

Giselle 40x40

Lot 25 Page Farm

Atkinson, NH

2

1/4"=1'-0" unless noted otherwise / Print @ 1:1

PDF created on: 4/23/2020, drawn by ACJ

Issued for: Construction

C:/Users/Fred/Desktop/CD 918.124.v3 GL 2909 Giselle 40x40 - 25 Page Farm.layout

4/23/2020 3:51:48 PM

Green & Company

C:/Users/Fred/Desktop/CD 918.124.v3 GL 2909 Giselle 40x40 - 25 Page Farm.layout

Foundations

1. No footing shall be poured on loose or unsuitable soils, in water or on frozen ground.

2. All exterior footings to conform to all applicable code requirements for frost protection.

3. All concrete shall have a minimum compressive strength of at least 3000 PSI at 28 days.

4. Foundation anchorage to comply with IRC 2015 Section R403.1.6, it shall consist of minimum size 1/2" diameter anchor bolts with 3/16" x 2" x 2" washers at a maximum of 72" oc for two stories or 48" oc for more than two stories, max of 12" from each corner, min of 2 bolts per wall. Anchor bolt shall extend 7" into concrete or grouted cells of concrete masonry units. Be aware that a garage under may be counted by your code officer as a story. Additional anchorage may be required at braced walls.

5. Foundation reinforcing steel is to be installed in accordance with all applicable provisions of IRC 2015 Section 404.1.3.2

TYPICAL PERIMETER FOUNDATION WALL:

- 8" poured concrete, 8 ft forms, min 7'-10" finished, with total of 3 rebar, as follows:
- (1) #4 rebar, 4" from top
- (1) #4 rebar @ vertical midpoint. Omit this rebar at walls 4 ft high or less.
- (1) #4 rebar, min 3" from bottom or per code
- Lap corners & splices of rebar per code.
- Secure sill to foundation with 1/2" diameter anchor bolts that extend 7" into concrete and tightened with a nut and washer @ 6' oc & max 12" from each corner & each end @ wood sill splices - if built-up sill, bolts must extend through all sill plates or straps must secure all sill plates.

TYPICAL PERIMETER FOOTING:

1. Use Footing chart(s) below to verify that depth of home matches chart. Depth is foundation dimension eave to eave. Contact Artform Home Plans if you believe the chart does not match the plan.
2. Select row for snow load shown on the structural plans.
3. Select a column for soil bearing pressure based on soil type and/or consultation with code officer.
4. The required footing size is at the intersection of the Snow Load and Soil PSF. Rebar is not required. Key or pin foundation wall to footing per code.

FAQ - Adding rebar to footings does not reduce the required width. Rebar affects performance with earth movement, like an earthquake and has near zero effect on bearing capacity.

Guide to Soil PSF

3,000	Sandy gravel and/or gravel (GW and GP)
2,000	Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)
1,500	Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)

8" wall - Footing Size for 28 Ft wide house

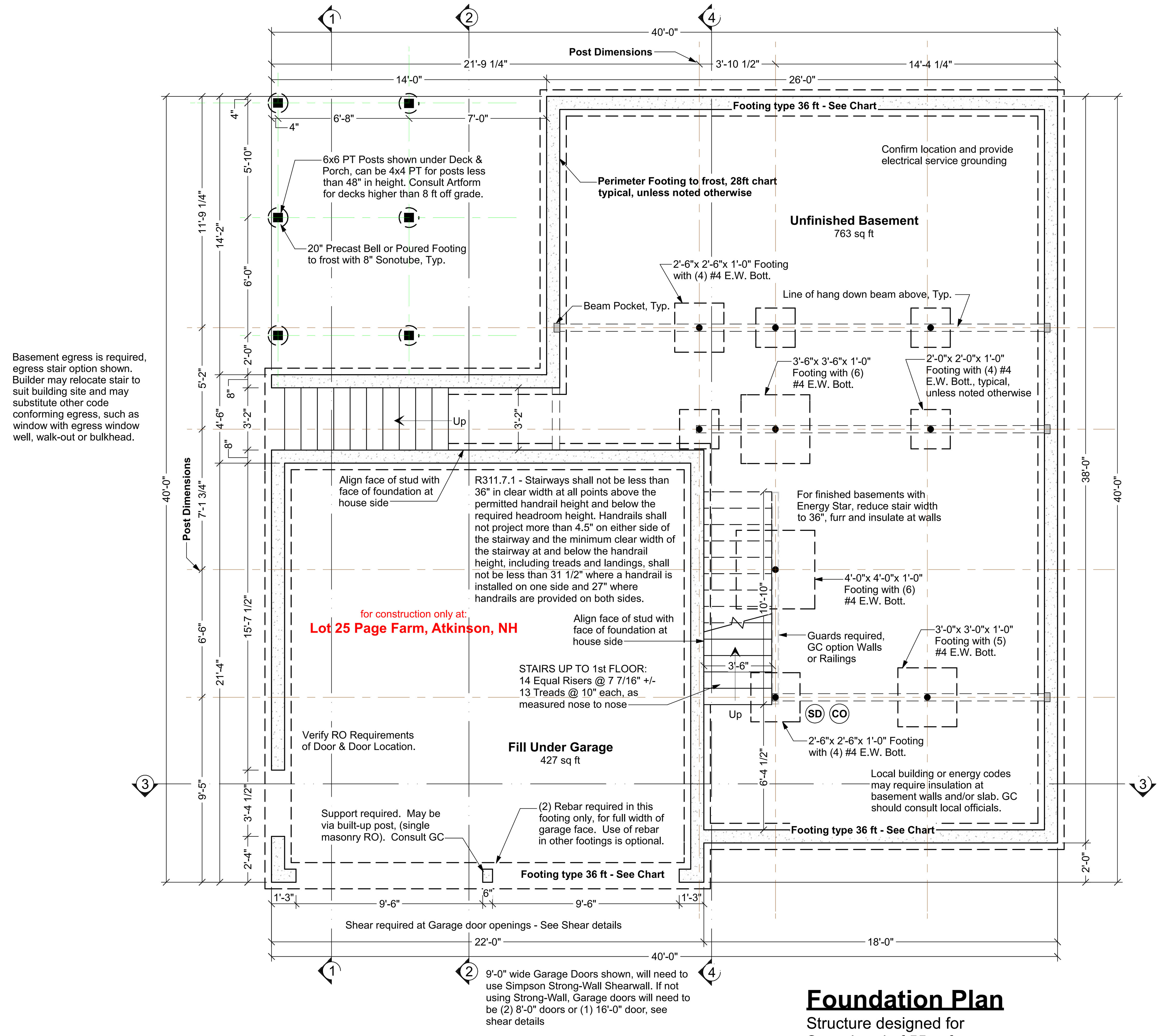
Snow Load	Story and type of structure	Load Bearing Value of Soil (PSF)		
		1500 PSF	2000 PSF	3000 PSF
50 PSF	2 Story – Plus Basement	23 x 7.5	17 x 6	12 x 6
55 PSF	2 Story – Plus Basement	23.5 x 7.75	17.25 x 6	12 x 6
60 PSF	2 Story – Plus Basement	24 x 8	17.5 x 6	12 x 6
65 PSF	2 Story – Plus Basement	24.5 x 8.25	17.75 x 6	12 x 6
70 PSF	2 Story – Plus Basement	25 x 8.5	18 x 6	12 x 6

8" wall - Footing Size for 32 Ft wide house

Snow Load	Story and type of structure	Load Bearing Value of Soil (PSF)		
		1500 PSF	2000 PSF	3000 PSF
50 PSF	2 Story – Plus Basement	25 x 8.5	19 x 6	12 x 6
55 PSF	2 Story – Plus Basement	25.5 x 8.75	19.25 x 6	12.5 x 6
60 PSF	2 Story – Plus Basement	26 x 9	19.5 x 6	13 x 6
65 PSF	2 Story – Plus Basement	26.5 x 9.25	19.75 x 6	13.5 x 6
70 PSF	2 Story – Plus Basement	27 x 9.5	20 x 6	14 x 6

8" wall - Footing Size for 36 Ft wide house

Snow Load	Story and type of structure	Load Bearing Value of Soil (PSF)		
		1500 PSF	2000 PSF	3000 PSF
50 PSF	2 Story – Plus Basement	27 x 9.5	21 x 7	14 x 7
55 PSF	2 Story – Plus Basement	27.5 x 9.75	21.25 x 7	14.5 x 7
60 PSF	2 Story – Plus Basement	28 x 10	21.5 x 7	15 x 7
65 PSF	2 Story – Plus Basement	28.5 x 10.25	21.75 x 7	15.5 x 7
70 PSF	2 Story – Plus Basement	29 x 10.5	22 x 7	16 x 7



Foundation Plan

Structure designed for
Snow Load of 55 psf
Ceiling Height may vary: 8 ft forms

Foundation Contractor Check List

Confirm or review the following prior to forming & pouring foundation

Initials Date Checked

____ ________ Confirmed soil bearing

____ ________ Checked w/GC for added foundation steps to suit grade

____ ________ Confirm sill plate thickness (foundation bolts to extend through all)

____ ________ Confirmed garage door size

____ ________ Checked w/GC for added basement windows

____ ________ Checked w/GC for added basement man doors

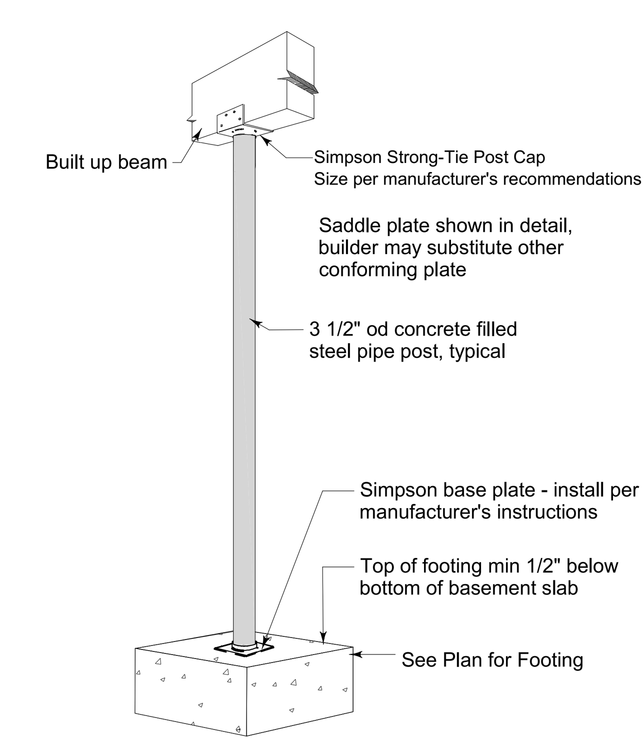
____ ________ Confirmed sizes & locations mech/plbg penetrations

____ ________ Confirmed sizes and locations of beams w/GC, added or adjusted beam pockets

____ ________ Confirmed location and installed electrical service grounding - See GC for location

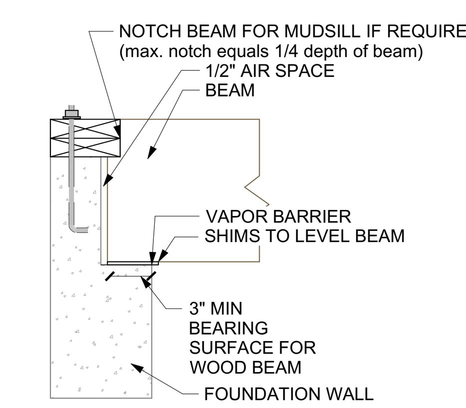
MINIMUM VERTICAL REINFORCEMENT FOR 8-INCH (203MM) NOMINAL FLAT CONCRETE BASEMENT WALL

MAXIMUM UNSUPPORTED WALL HEIGHT (feet)	MIAXIMUM UNBALANCED BACKFILL HEIGHT (feet)	MINIMUM VERTICAL REINFORCEMENT - BAR SIZE AND SPACING (inches)		
		Soil classes and design lateral soil (psf per foot of depth)		
		GW, GP, SW, SP 30	GM, GC, SM, SM-SC and ML 45	SC, ML-CL and inorganic CL 60
8	4	NR	NR	NR
	5	NR	NR	NR
	6	NR	NR	6 @ 37
	7	NR	6 @ 36	6 @ 35
	8	6 @ 41	6 @ 35	6 @ 26



Typical Basement Post

Not to Scale



Beam Pocket

Scale 1/2"=1'-0"

Artform Home Plans

AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

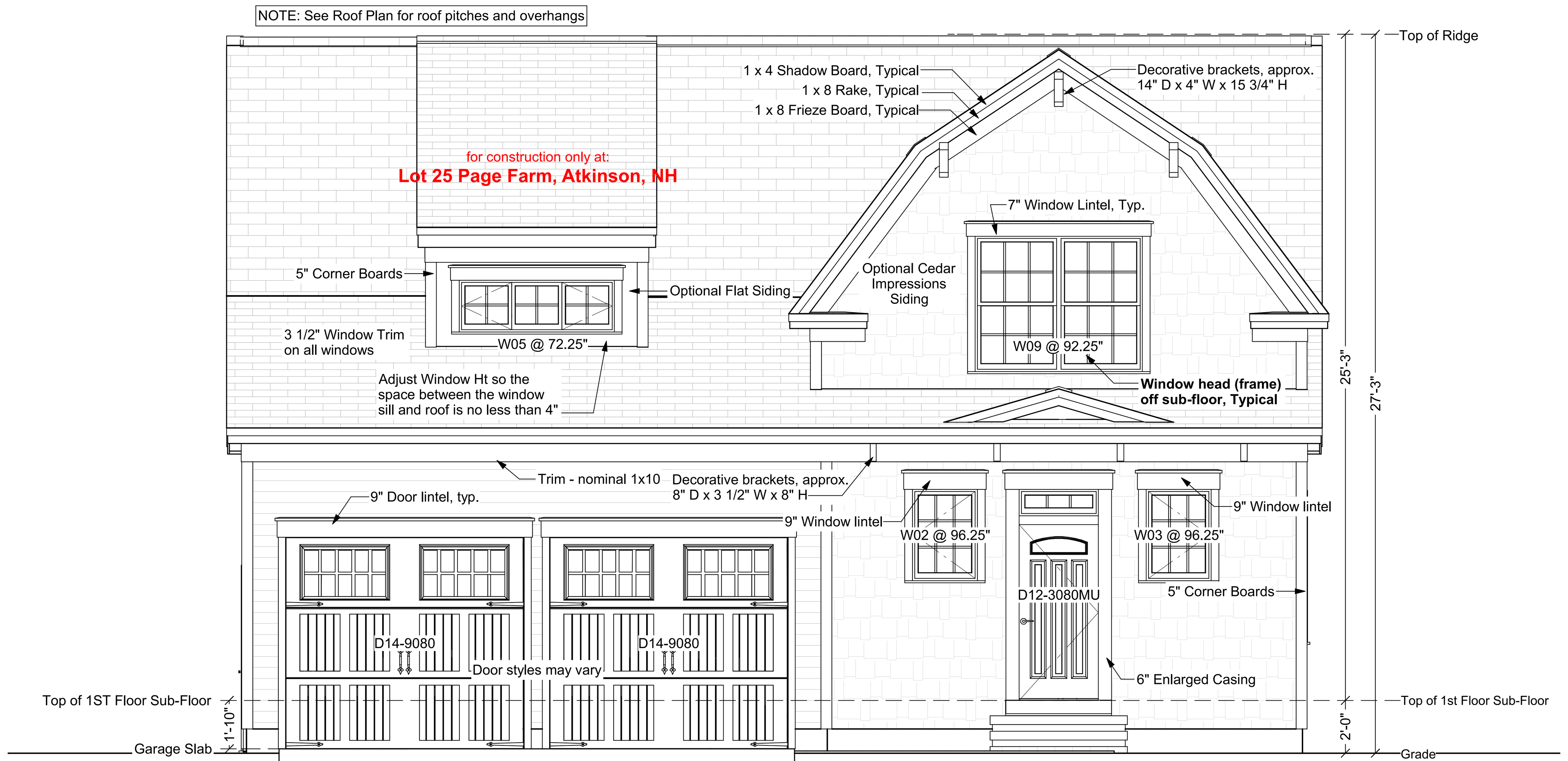
Issued for: Construction

...

4/23/2020 3:51:48 PM

Green & Company

NOTE: See Roof Plan for roof pitches and overhangs



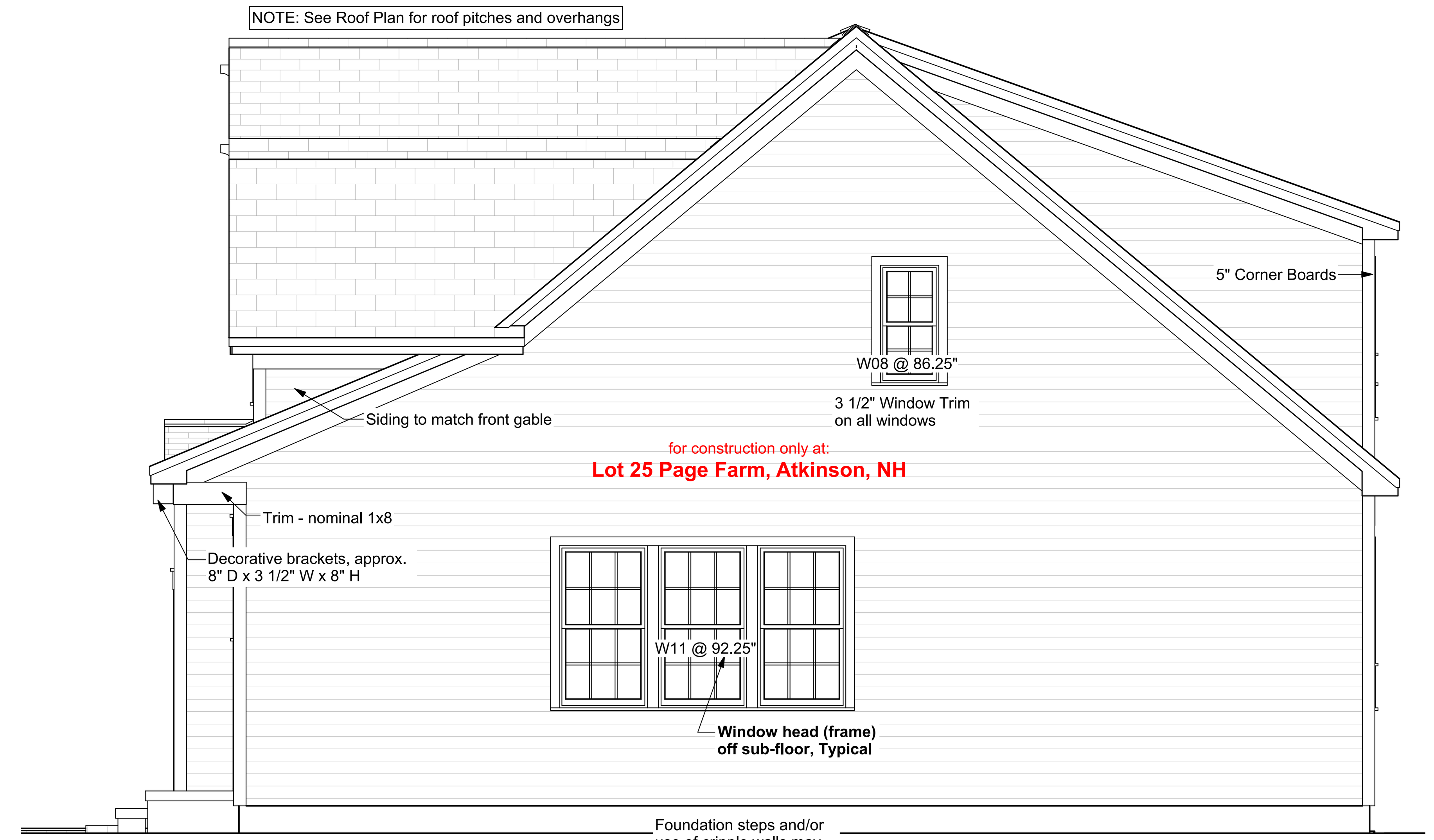
Not shown - number of steps may vary - handrail may be required per code.

Front Elevation

Garage slab height may vary. If garage slab height is lower than shown, consult Artform for aesthetic direction. Taller garage doors, transoms, lintels and/or additional frieze boards may be required to achieve desired look.

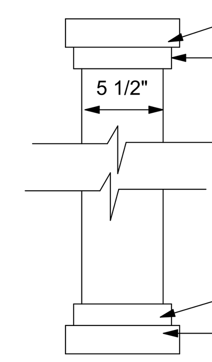
Note - Actual grade level may vary. Where zoning height restrictions apply, builder shall verify conformance. Manual markup of drawings to demonstrate compliance is recommended.

NOTE: See Roof Plan for roof pitches and overhangs

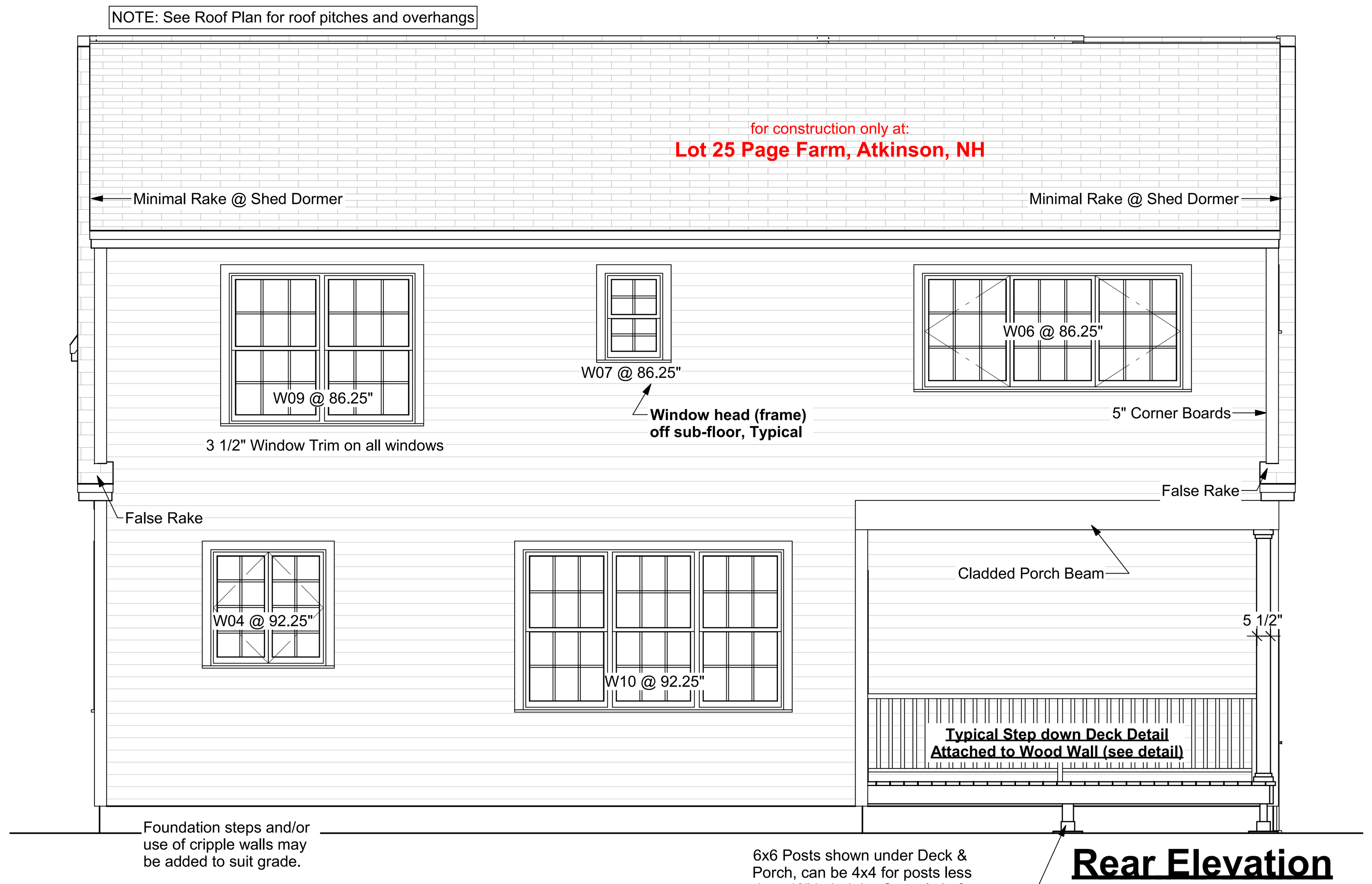


Foundation steps and/or use of cripple walls may be added to suit grade.

Right Elevation



NOTE: See Roof Plan for roof pitches and overhangs

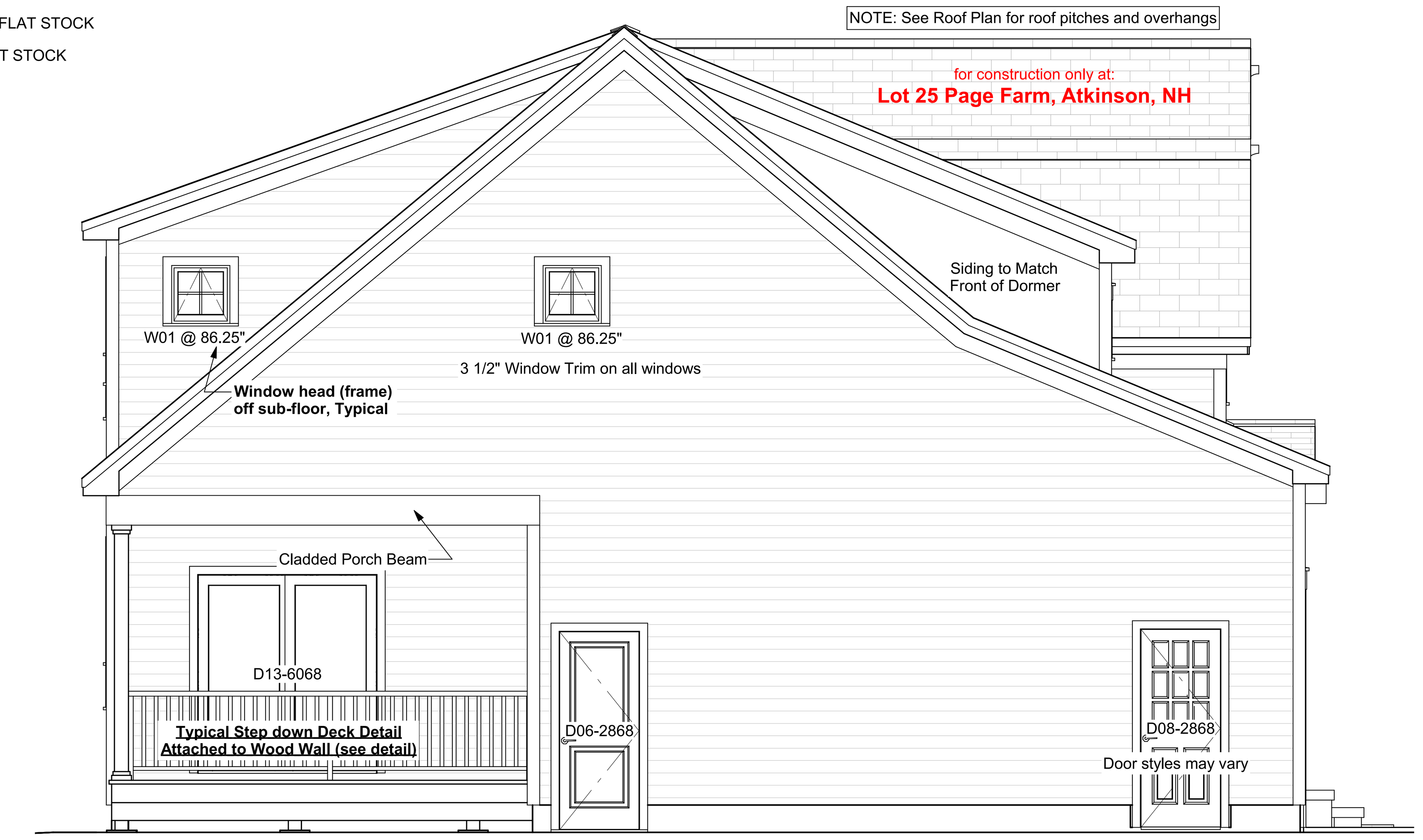


Foundation steps and/or use of cripple walls may be added to suit grade.

6x6 Posts shown under Deck & Porch, can be 4x4 for posts less than 48" in height. Consult Artform for decks higher than 8 ft off grade.

Rear Elevation

NOTE: See Roof Plan for roof pitches and overhangs



Foundation steps and/or use of cripple walls may be added to suit grade.

Basement egress is required, walk-out door option shown. Builder may relocate walk-out door to suit building site and may substitute other code conforming egress, such as window well or bulkhead.

Left Elevation

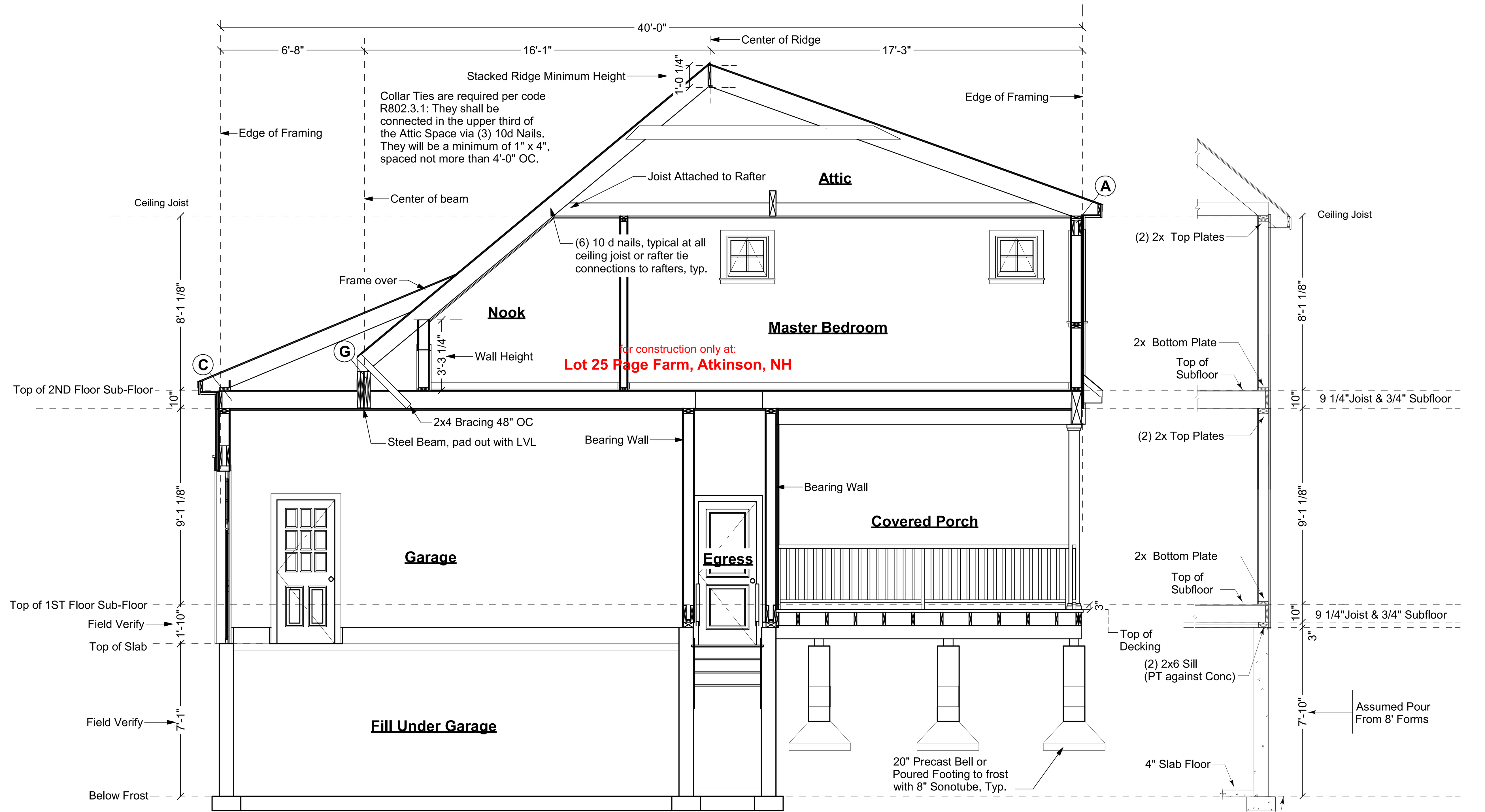
Artform Home Plans
AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

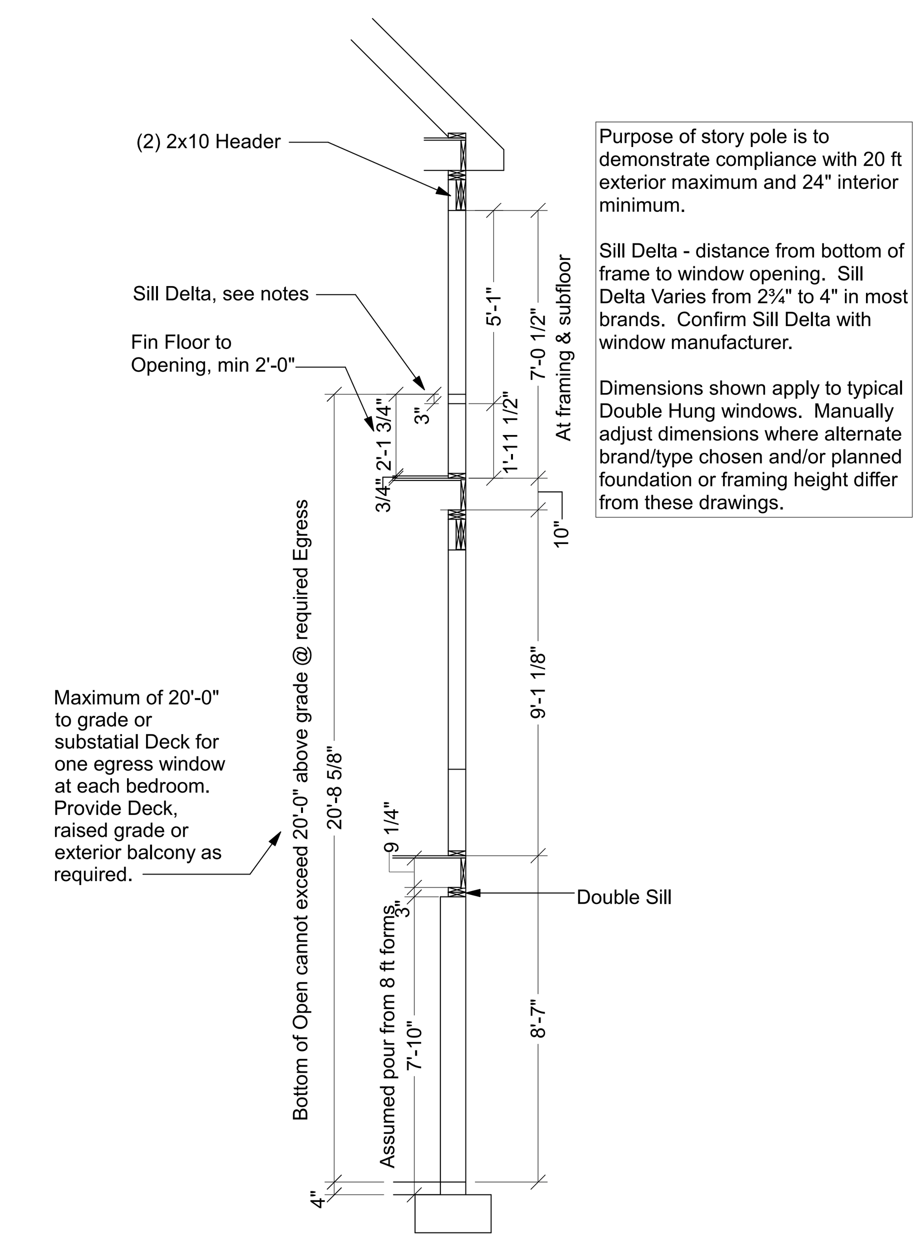
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

Issued for:
Construction

C:/Users/Fred/Desktop/CD 918.124.v3 GL 2909 Giselle 40x40 - 25 Page Farm.layout

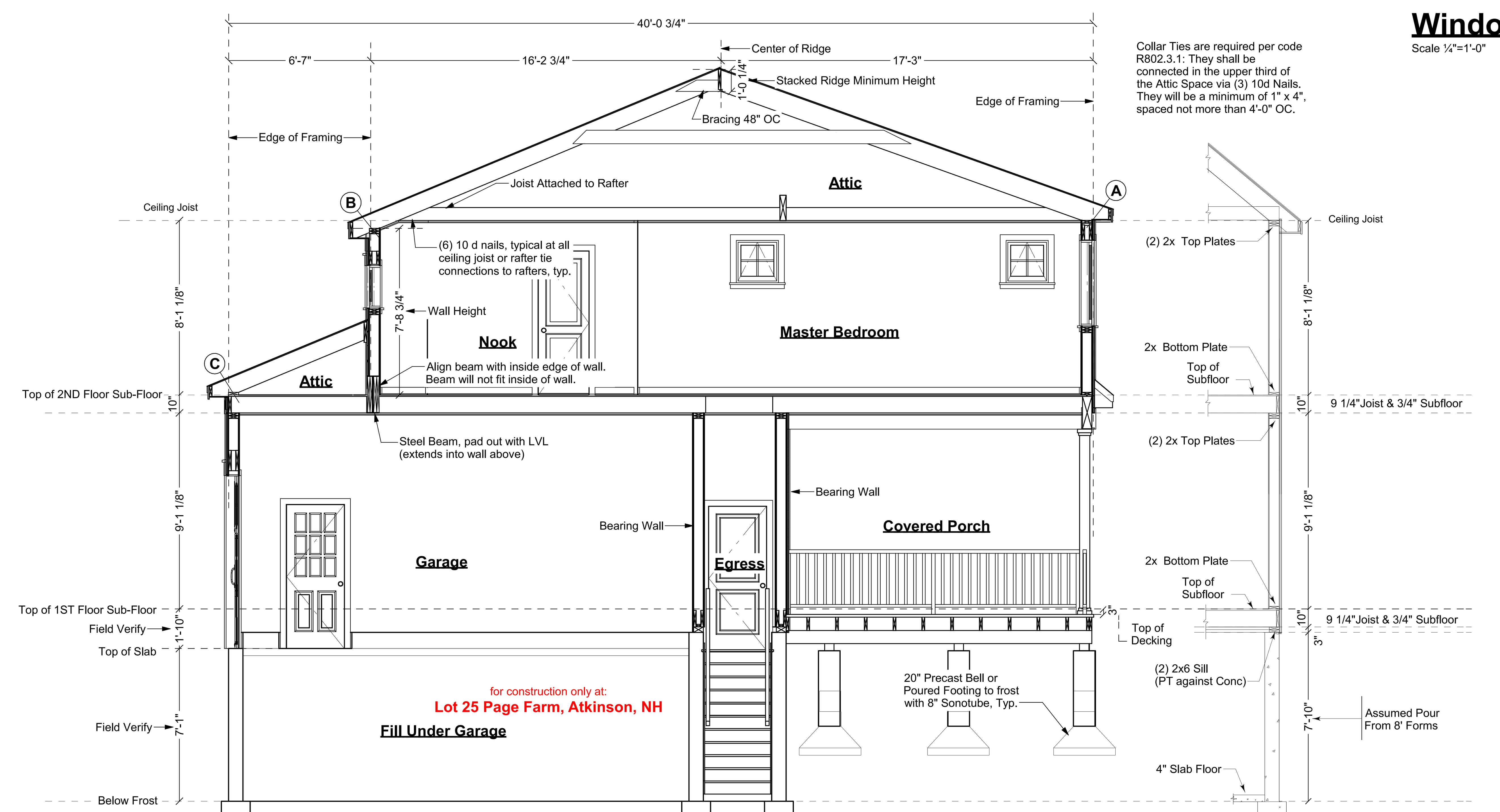


1 Cross Section @ Garage



Window Story Pole

Scale ¼"=1'-0"



2 Cross Section @ Garage Dormer

Artform Home Plans
AFHP Design # 918.124.v3 GL

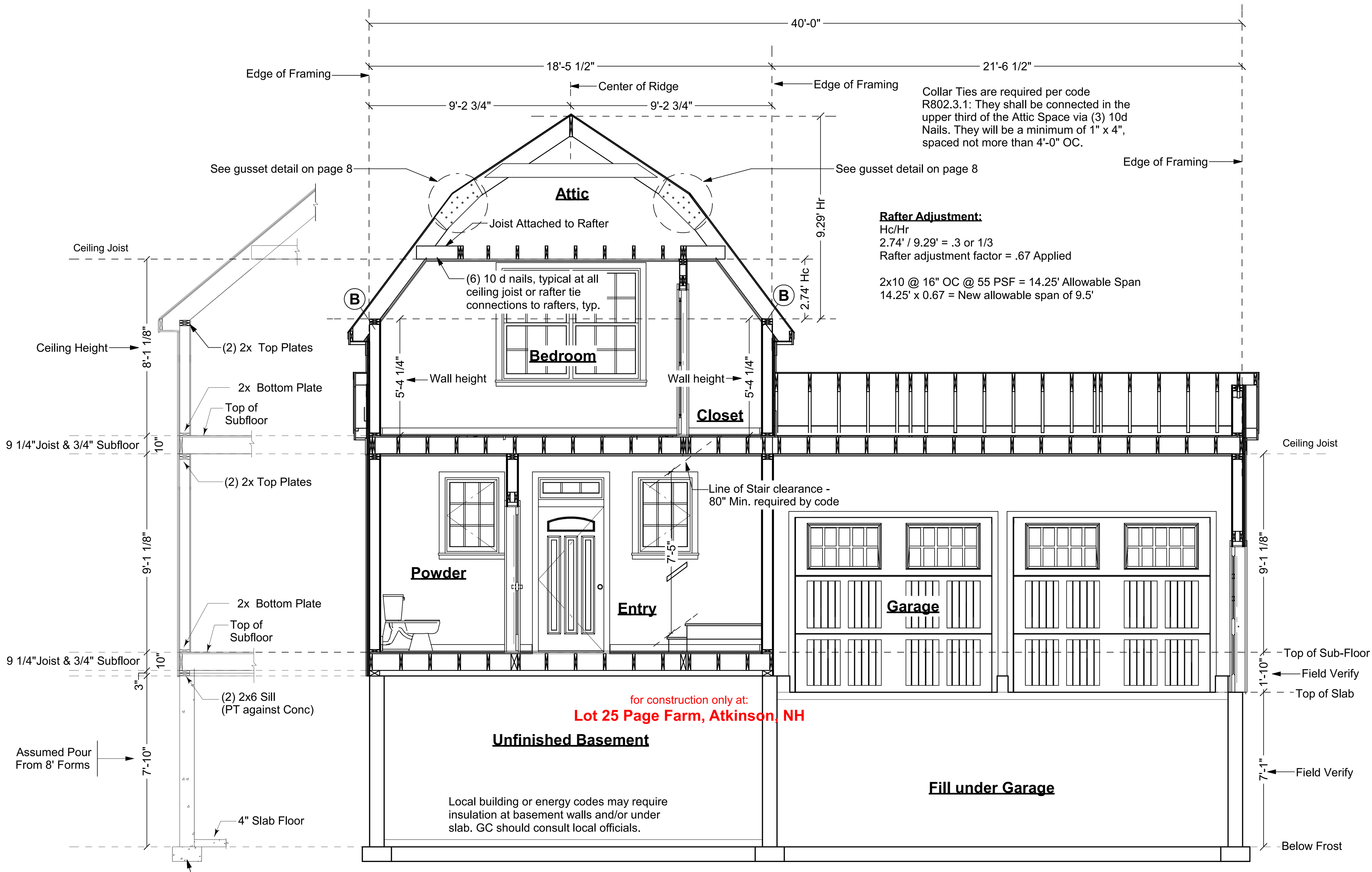
Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

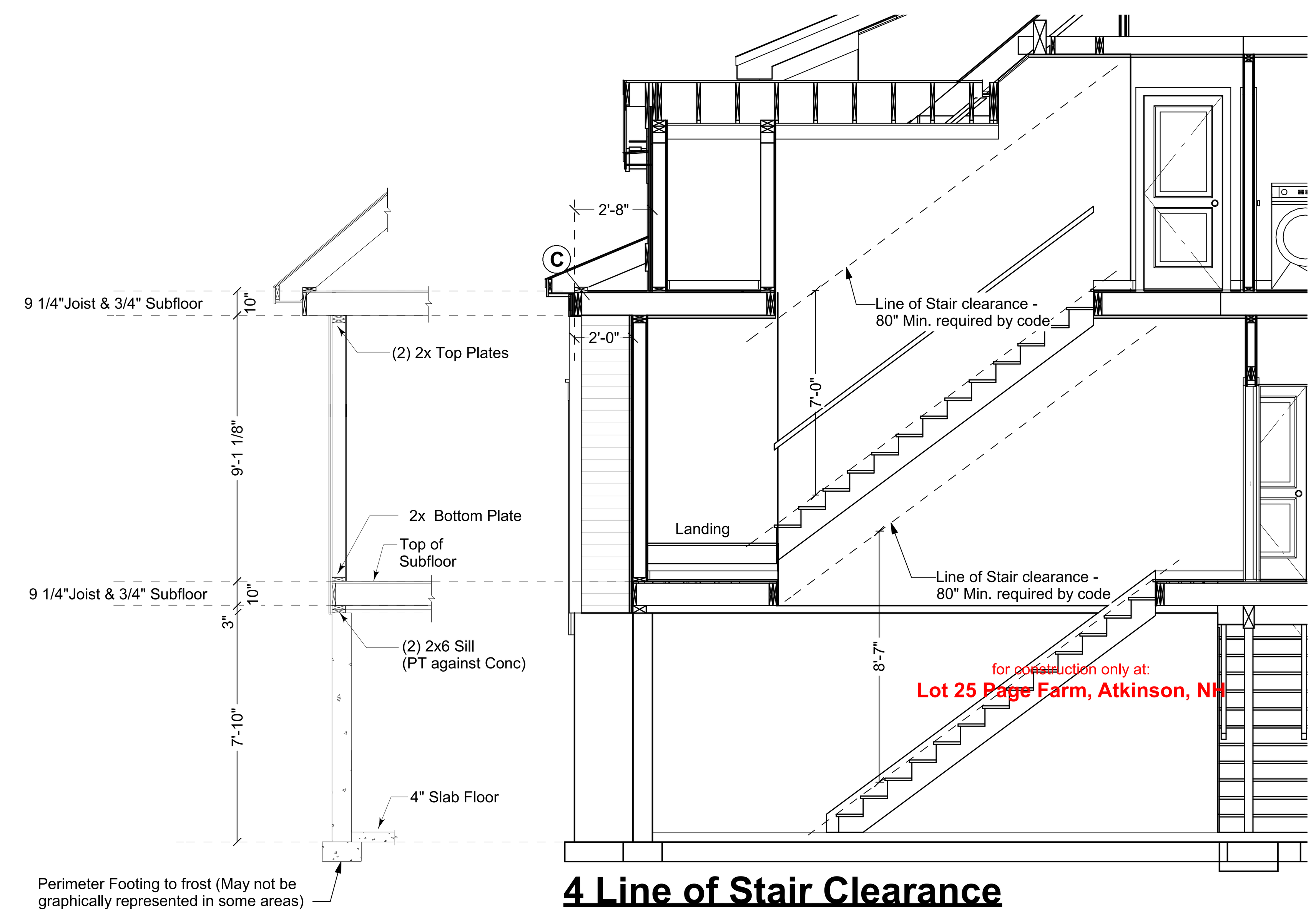
Issued for:
Construction

4/23/2020 3:51:48 PM

Green & Company

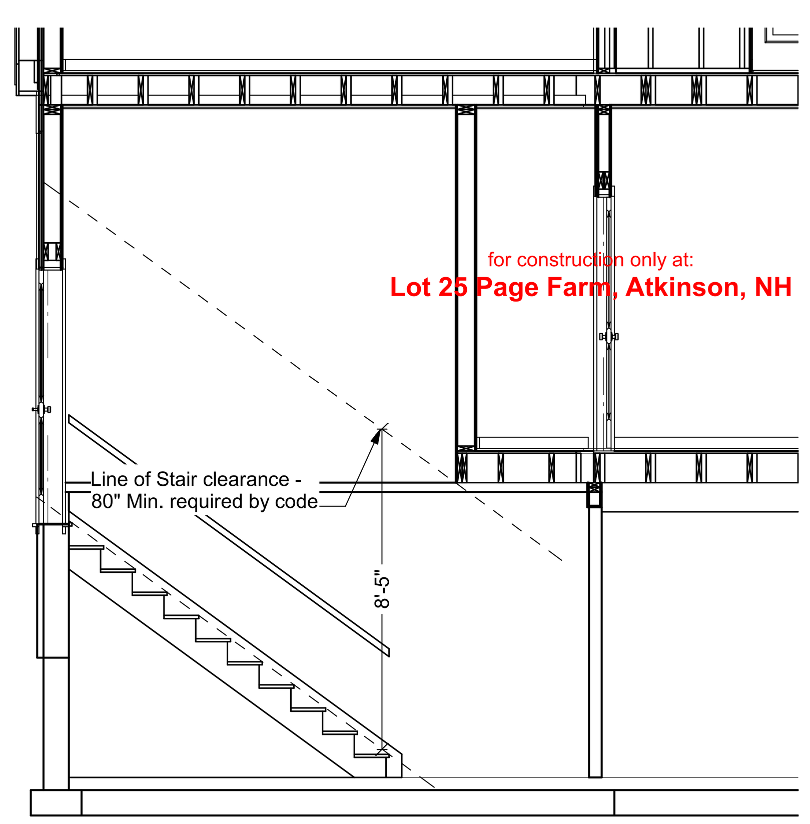


3 Cross Section @ Front Gable

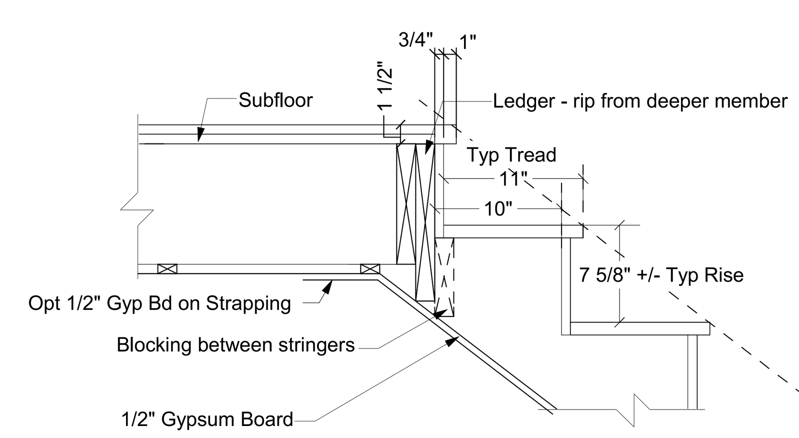


4 Line of Stair Clearance

Clearances shown do not assume insulation under the basement slab. If that insulation is added to meet local energy codes, adjust stairs as needed, see Detail T2 for framing adjustment to gain addition headroom.



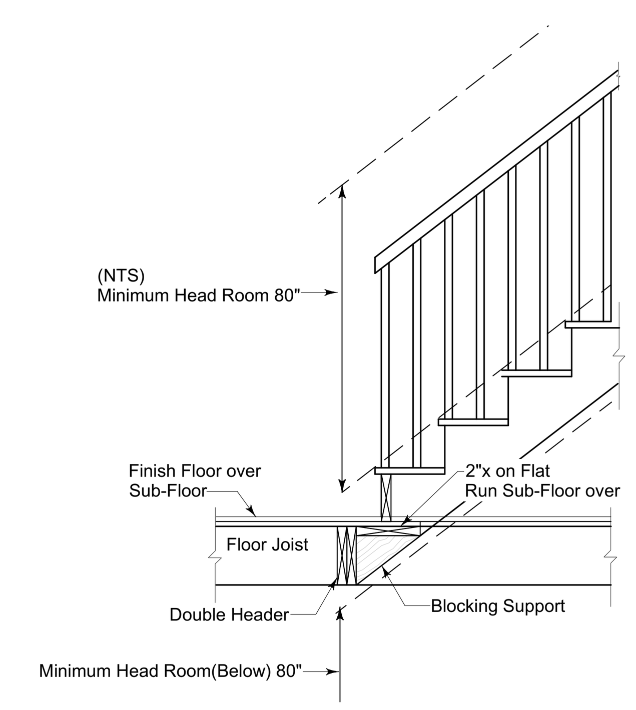
Line of Stair Clearance (Egress)



Detail shows assumptions used for framing plan RO
Framer may adjust to suit different head support methods

Top of Carriage (C)

Scale: 1" = 1'-0"



T2

1/2" = 1'

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site:
http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

6

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

Issued for:
Construction

C:/Users/Fred/Desktop/CD 918.124.v3 GL 2909 Giselle 40x40 - 25 Page Farm.layout

Method PFG: Portal frame at garage door openings shall be constructed in accordance with Figure R602.10.6.3. Note this method is allowed on either side of garage door openings.

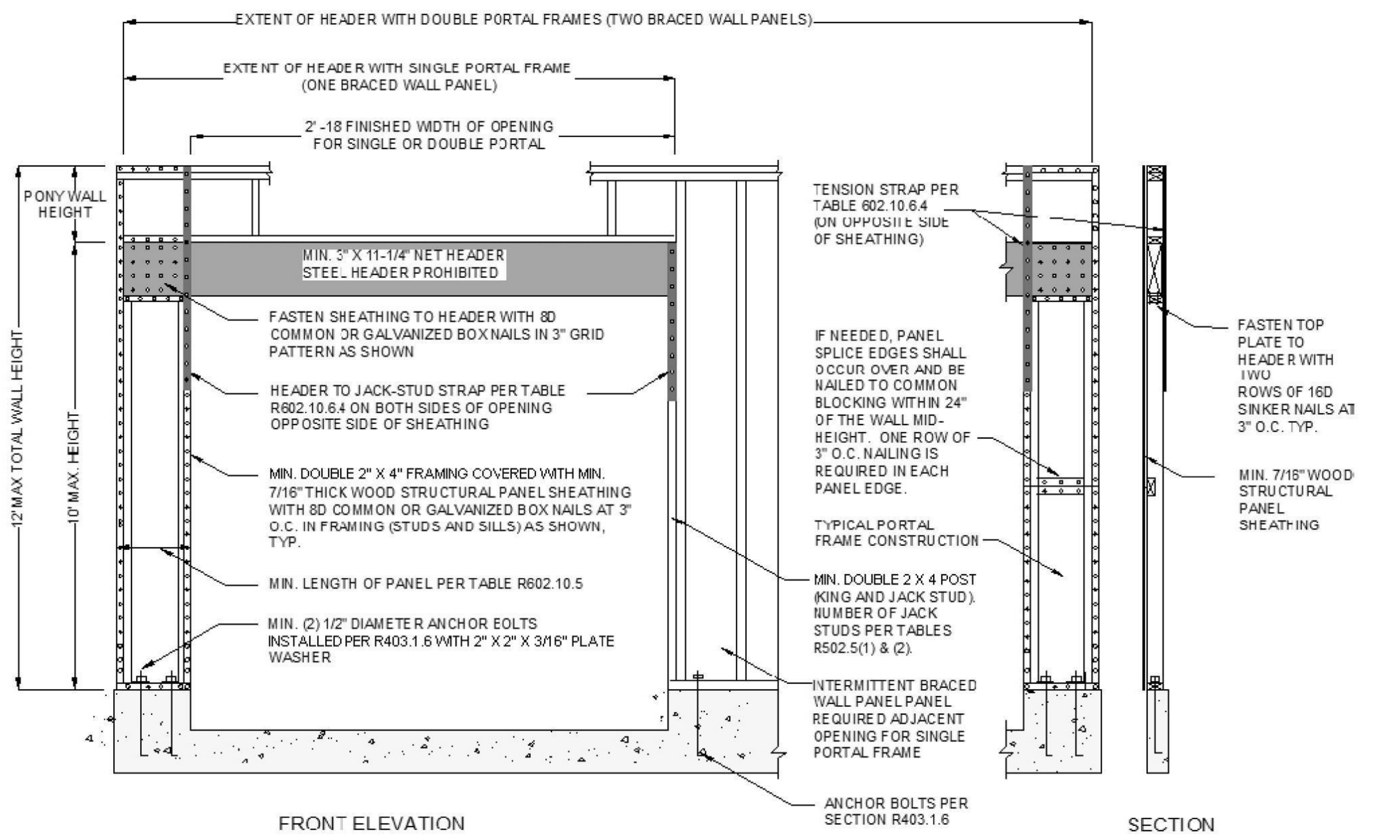


FIGURE R602.10.6.3
METHOD PFG—PORTAL FRAME AT GARAGE DOOR OPENINGS IN SEISMIC DESIGN CATEGORIES A, B AND C

TABLE R602.10.6.4

TENSION STRAP CAPACITY FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHODS PFH, PFG AND CS-PF BRACED WALL PANELS

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (feet)	MAXIMUM TOTAL WALL HEIGHT (feet)	MAXIMUM OPENING WIDTH (feet)	TENSION STRAP CAPACITY REQUIRED (pounds)[a, b]					
				Ultimate Design Wind Speed V_{ult} (mph)					
				110	115	130	110	115	130
				Exposure B			Exposure C		
2 × 4 No. 2 Grade	0	10	18	1,000	1,000	1,000	1,000	1,000	1,050
	1	10	9	1,000	1,000	1,000	1,000	1,000	1,750
			16	1,000	1,025	2,050	2,075	2,500	3,950
			18	1,000	1,275	2,375	2,400	2,850	DR
	2	10	9	1,000	1,000	1,475	1,500	1,875	3,125
			16	1,775	2,175	3,525	3,550	4,125	DR
			18	2,075	2,500	3,950	3,975	DR	DR
	2	12	9	1,150	1,500	2,650	2,675	3,175	DR
			16	2,875	3,375	DR	DR	DR	DR
			18	3,425	3,975	DR	DR	DR	DR
	4	12	9	2,275	2,750	DR	DR	DR	DR
			12	3,225	3,775	DR	DR	DR	DR
2 × 6 Stud Grade	2	12	9	1,000	1,000	1,700	1,700	2,025	3,050
			16	1,825	2,150	3,225	3,225	3,675	DR
			18	2,200	2,550	3,725	3,750	DR	DR
	4	12	9	1,450	1,750	2,700	2,725	3,125	DR
			16	2,050	2,400	DR	DR	DR	DR
			18	3,350	3,800	DR	DR	DR	DR

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

a. DR = Design Required.

b. Straps shall be installed in accordance with manufacturer's recommendations.

R602.10.4 Construction methods for braced wall panels

Intermittent and continuously sheathed braced wall panels shall be constructed in accordance with this section and the methods listed in Table R602.10.4.

TABLE 91.5.602.10.4

BRACING METHODS[f]

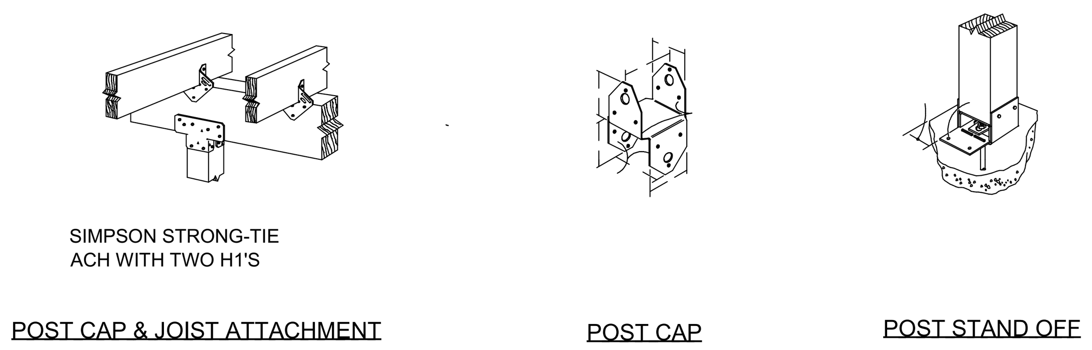
METHODS, MATERIAL		MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA[a]	
				Fasteners	Spacing
Intermittent Bracing Method	**PFG** Portal frame at garage	15/32"		See Section R602.10.6.3	See Section R602.10.6.3
Continuous Sheathing Methods	**CS-WSP** Continuously sheathed wood structural panel	15/32"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
				Interior sheathing per Table 91.5.602.3(1) or 91.5.602.3(2)	Varies by fastener

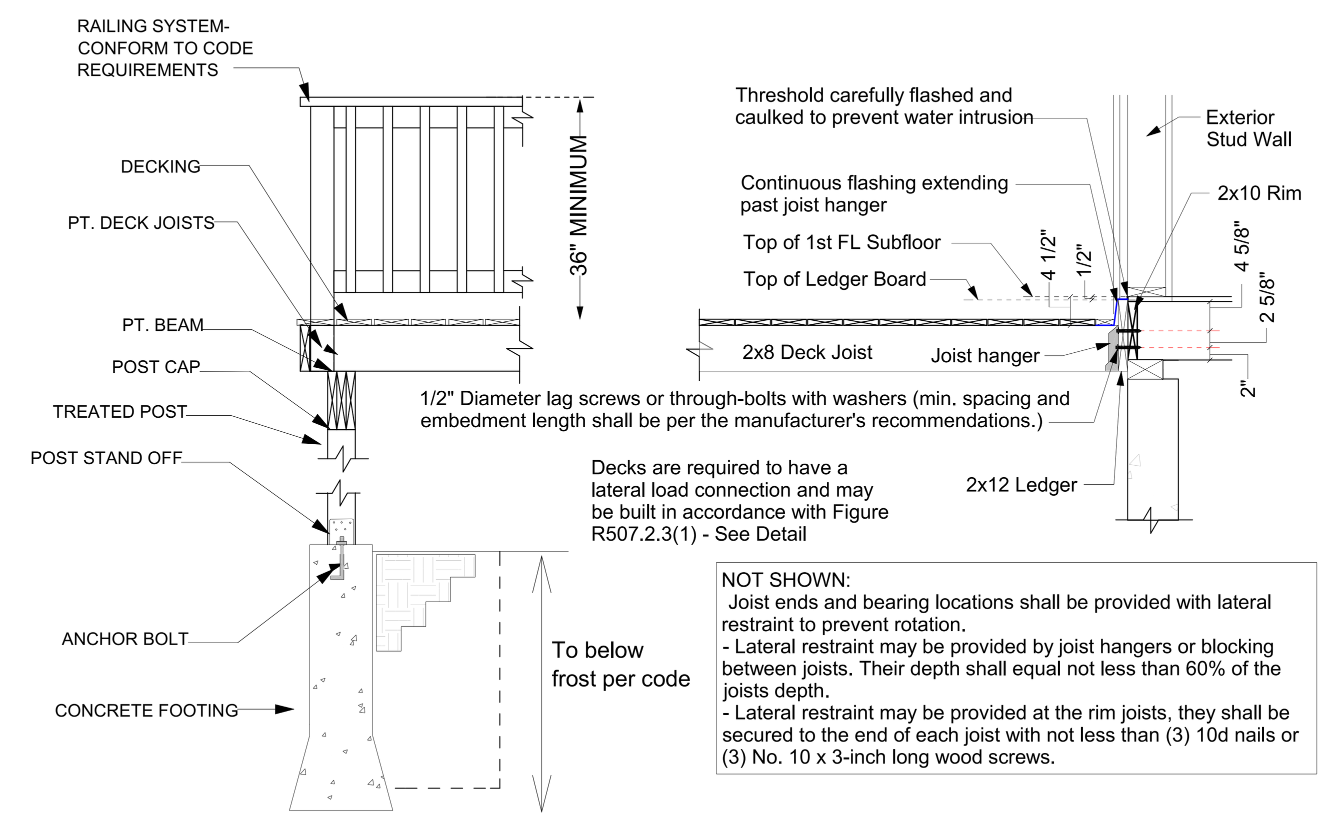
Shear Wall Details

Not to Scale

Notes:

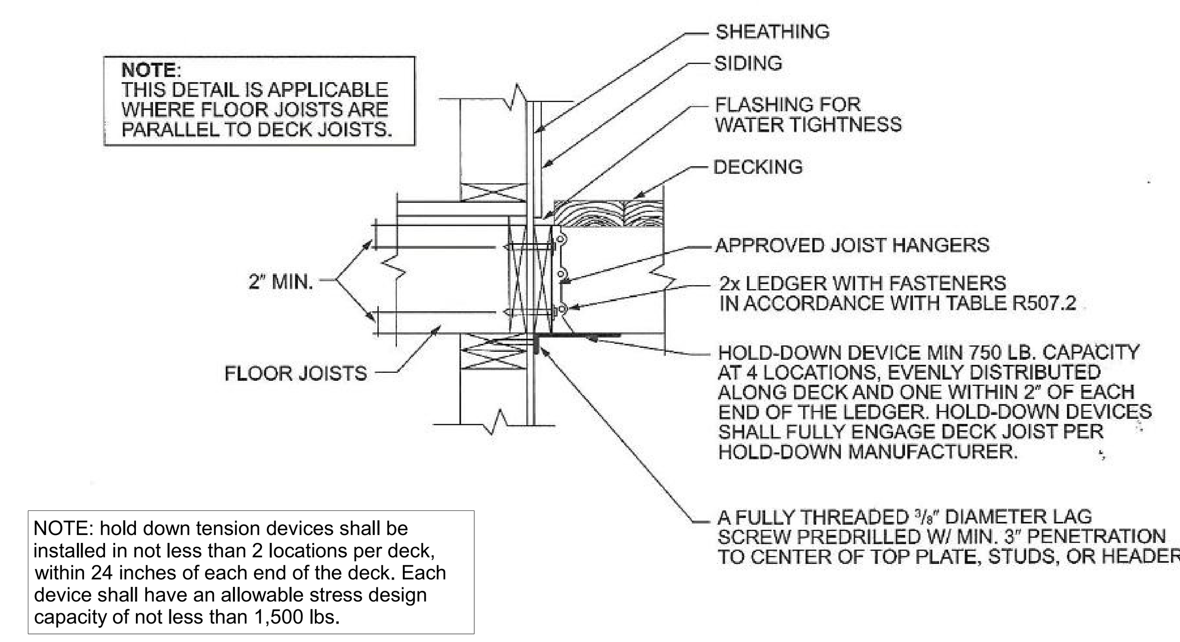
- See plans for locations where shear panels are required.
- Details shown here are for one method and for typical conditions. An alternate shear method allowed per code or approved by the code officer may be substituted.
- Note that if sheathing is to be used as wall bracing all vertical joints in required braced wall panels must be blocked. [2015 IRC section R602.10.10]





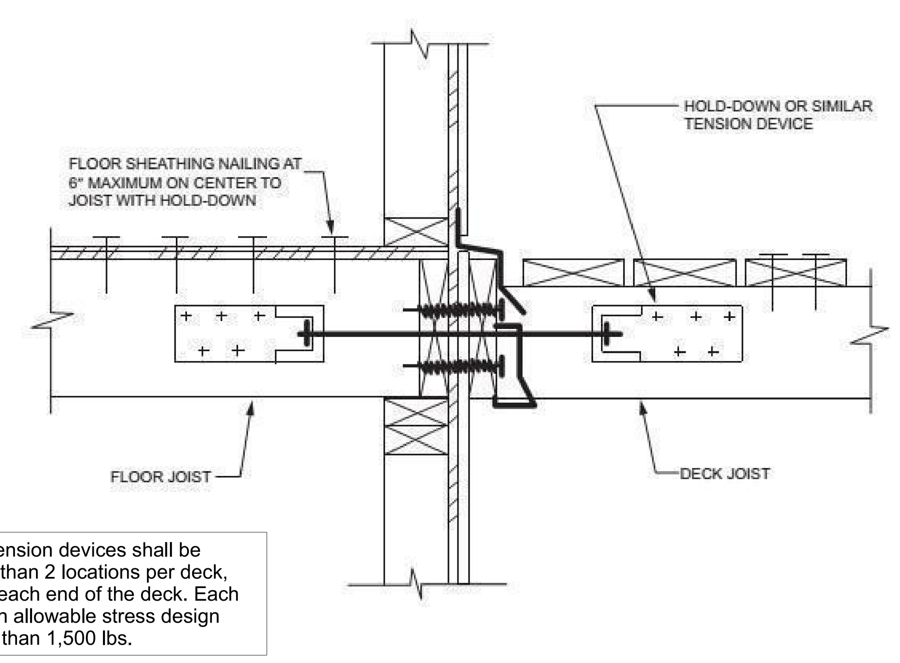
Deck Ledger Attachment Detail for Step Down

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



NOTE: hold down tension devices shall be installed in not less than 2 locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 lbs.

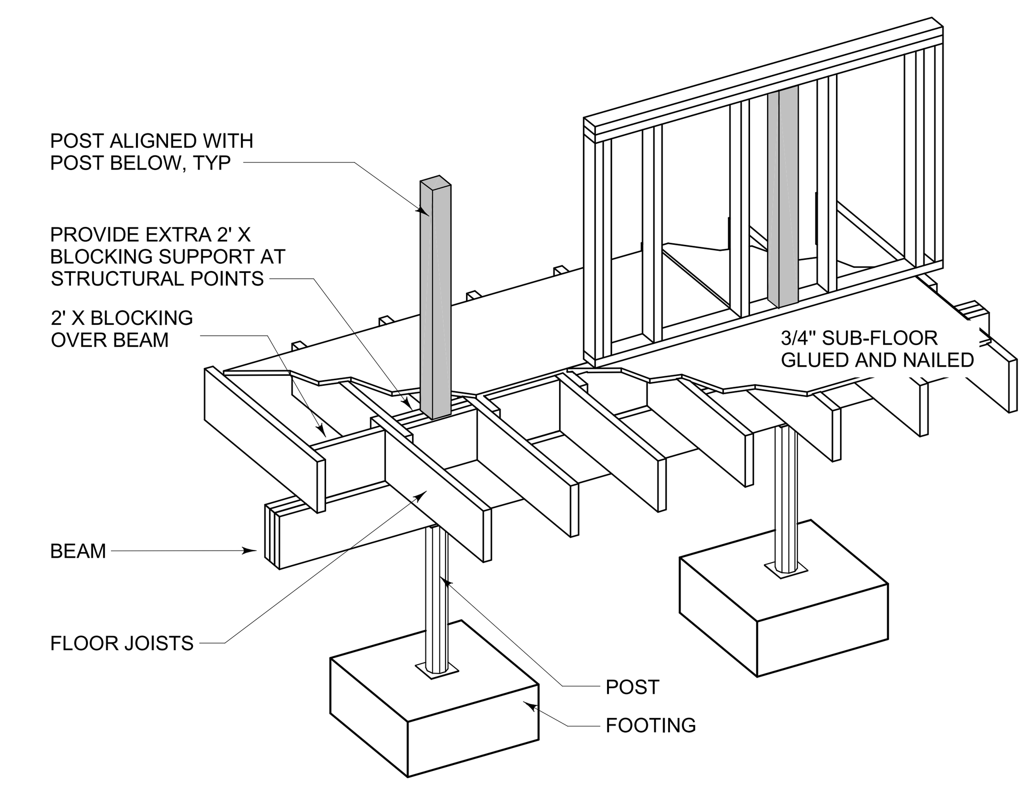
FIGURE R507.2.3(2)
DECK ATTACHMENT FOR LATERAL LOADS



NOTE: hold down tension devices shall be installed in not less than 2 locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 lbs.

FIGURE R507.2.3(1)
DECK ATTACHMENT FOR LATERAL LOADS

Follow manufacturer's instructions both for installation of joist hangers to joist and to beam. The illustration below, by Simpson Strong Tie, is provided as a courtesy. Consult their full manual for acceptable fastener sizes and other important instructions.



Artform Home Plans
AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

Issued for: Construction

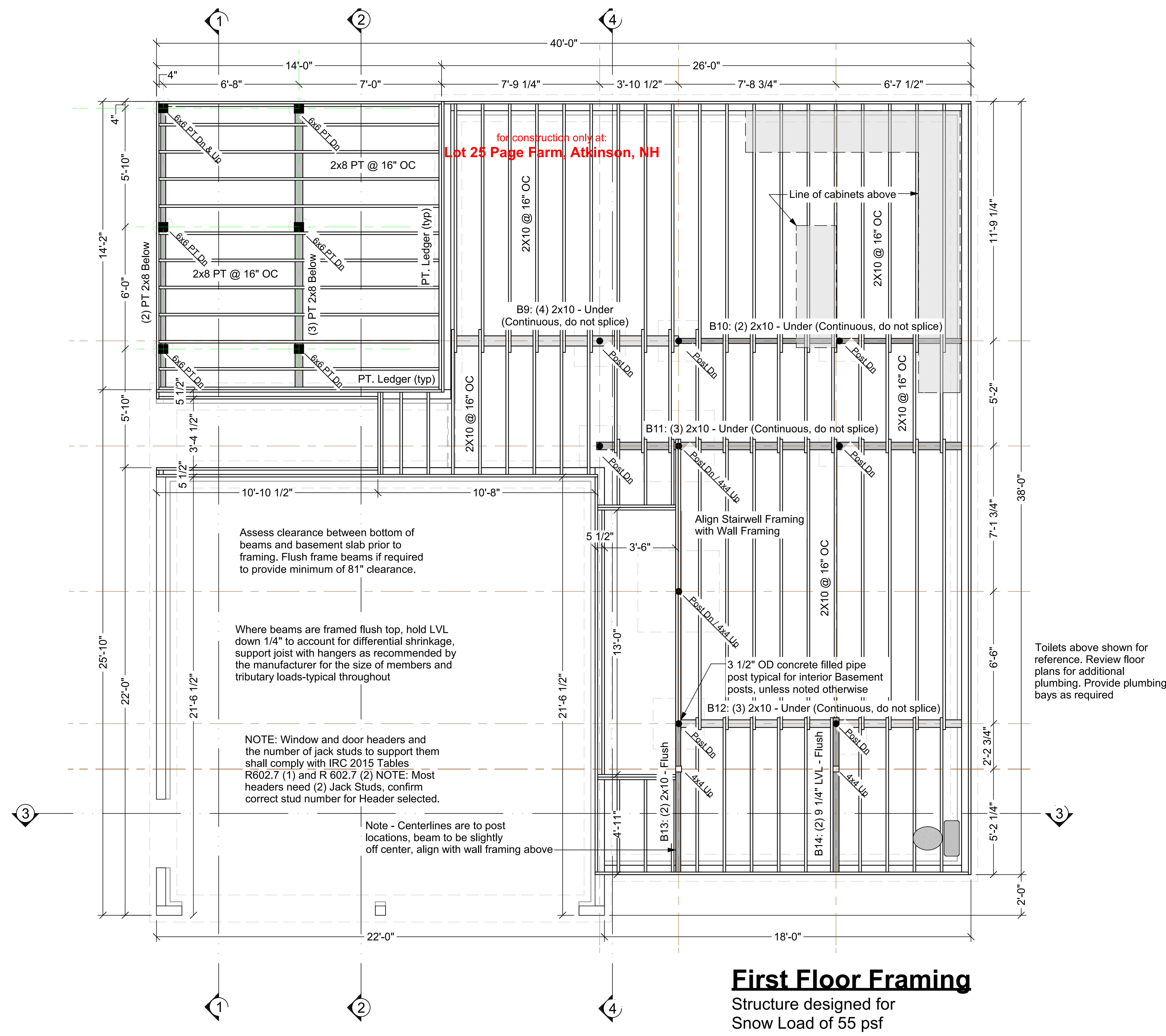
...

Wood Framing Notes:

1. All structural wood shall be identified by a grade mark or certificate of inspection by a recognized inspection agency.
2. Structural wood shall be Spruce-Pine-Fir (SPF) #2 or better.
3. When used, LVL or PSL indicate Laminated Veneer Lumber or Parallel Strand Lumber, respectively. Products used shall equal or exceed the strength properties for the size indicated as manufactured by TrusJoist.
4. When used, TJI indicates wood I-joists as manufactured by TrusJoist. Products of alternate manufacturers may be substituted provided they meet or exceed the strength properties for the member specified.
5. All floor joists shall have bridging installed at mid-span or at 8'-0" oc maximum.
6. Floor systems are designed for performance with subfloor glued and screwed.
7. Per code R502.6.1 Floor joists splicing over bearing walls allowed, shall lap a min 3" over walls and shall be nailed together with a minimum of (3) 10d face nails. Also permitted is a wood or metal splice with strength equal to or greater than that provided by the nailed lap.
8. Per code R802.3.2 Ceiling joists splicing over bearing walls is allowed, shall lap a min 3" or butted over bearing partitions or beams and toenailed to the bearing member. Where ceiling joists are used to provide resistance to rafter thrust, lapped joists shall be nailed together in accordance with Table R802.5.1(9), and butted joists shall be tied together in a manner to resist such thrust. Joists that do not resist thrust shall be permitted to be nailed together in accordance with Table R602.3(1).
9. Provide blocking in the floor at structural points. Blocking may be 2x's or solid, but must have grain of wood vertical.
10. All wood permanently exposed to the weather, in contact with concrete or in contact with the ground shall meet code requirements for wood in these environments.
11. Deck ledgers shall be securely attached to the structure and/or independently supported. Deck lateral load connection required see IRC 2015 Section R507.2.4
12. Wherever beams are noted as Flush framed, install joist hangers at all joists, sized appropriately for the members being connected.
13. Support the lower end of roof beams via minimum 2" horizontal bearing on a post, ledger or via an appropriately sized and configured hanger.
14. The ends of each joist, beam or girder shall have not less than 1.5" of bearing on wood or metal and not less then 3" on masonry or concrete except where supported on a 1" x 4" ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers.
15. Post caps where required are typically calculated by supplier using weights based on these framing plans. Contact Art Form if additional information is needed.
16. Hangers, post caps, post bases, ties and other connectors shall be as manufactured by Simpson Strong Tie, as designed to connect the members shown, and shall be installed per manufacturer's instructions.

Prefabricated Wood Trusses

1. Where trusses are indicated on the drawings, truss design shall be provided by truss manufacturer.
2. Trusses shall be designed in accordance with applicable provisions of the latest edition of the National Design Specifications for Wood Construction (NDS), American Forst and Paper Association (APA), and Design Specifications for Metal Plate Connected Wood Trusses (ANSI/TPI 1), Truss Plate Institute (TPI) and code of jurisdiction.
3. Manufacturer shall furnish design drawings bearing seal and registration number of a structural engineer licensed in the state where project will be built.



First Floor Framing

Structure designed for
Snow Load of 55 psf

1 0 1 2 3 4

Built-up Beams:
Unless otherwise noted, connect multiple 1 3/4" ply beams as follows:
3 ply & up, fasteners are per side

(2) 9 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 24" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 24" oc
- Framed under (2) rows 10d nails @ 24" oc

(2) 11 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(2) 16" LVL or greater:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 9 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 19.2" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 19.2" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 11 1/4" LVL:
- Flush framed
  - (2) rows 3 3/8" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 14" LVL:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(3) 16" LVL or greater:
- Flush framed
  - (3) rows 3 3/8" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x3 1/2 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(4) 9 1/4" LVL:
- Flush framed
  - (2) rows 5" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 24" oc

(4) 11 1/4" LVL:
- Flush framed
  - (2) rows 5" TrussLock @ 16" oc, or
  - (2) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 12" oc

(4) 16" LVL or greater:
- Flush framed
  - (3) rows 5" TrussLock @ 16" oc, or
  - (3) rows SDS 1/4x6 @ 16" oc
- Framed under (2) rows 10d nails @ 12" oc

Beam Substitutions:

(2) 9 1/4" LVL may replace a double or triple 2x10 beam. No other substitutions are allowed. Conventional lumber beams MAY NOT be substituted for LVL beams by any "rule of thumb". Substitutions must be calculated by either Artform or a structural engineer. If calculated by a structural engineer, provide stamped plans and/or calculations.

We specify LVL beams as built up members to allow framers to use existing stock. You may substitute single piece LVLs of equivalent overall size for built-up members, unless otherwise noted.

Built-up members MAY NOT replace single piece LVL's where specified.

Where a beam of 1 3/4" or less in width is specified as framed under, either brace at 48" or double member for lateral stability.

Notes: Beam & Joist Sizing

1. Our beams sizes often differ from prescriptive code, because our designs are rarely the old style box colonial or cape with a center bearing wall upon which prescriptive code is based. We size our beams via calculations for this specific design, which may carry those loads separately via second floor beams and/or roof transfer beams. Beam or joist sizes, types and/or spacing may not be reduced or alternates substituted without our express permission.
2. Walls intended to be bearing are labeled as such. This information is provided to aid code officer in understanding the framing. It does not indicate permission to add loads to those walls, or any other walls.
3. Framing is sized for normal residential conditions. Contact Artform if additional loads are anticipated, including but not limited to waterbeds, large fish tanks, indoor hot tubs, multiple framed soffits or coffers.
4. In states where the designer is a licensed architect, (NH, MA, ME, CT & NY as of the date of issue) we are happy to stamp our drawings at no additional charge. In other states we are happy to provide calculations. Administration fees apply with provision of calculations. Code officer is encouraged to call with any questions about our methodology.

Artform Home Plans
AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

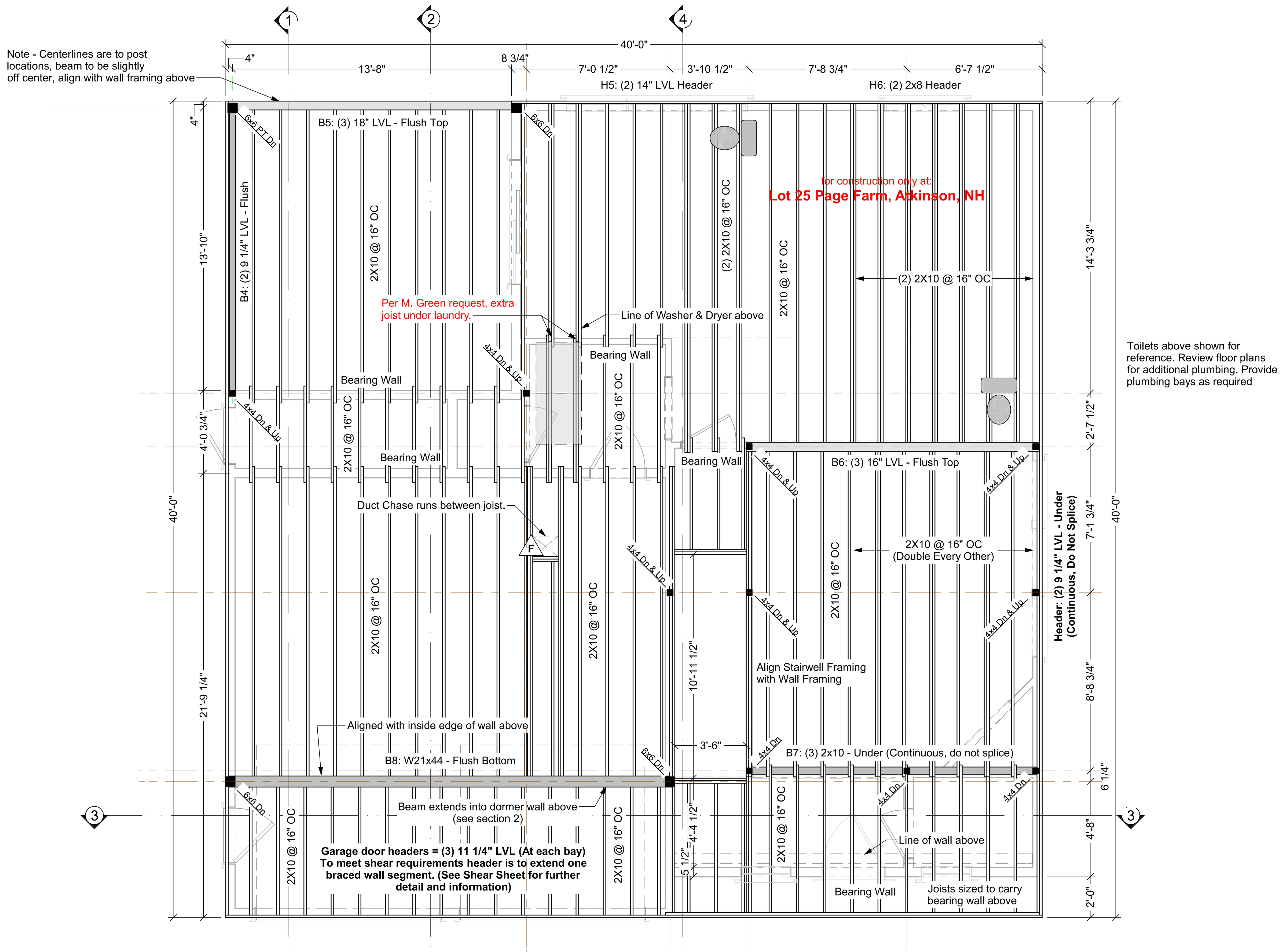
Issued for:
Construction

...

4/23/2020 3:51:50 PM

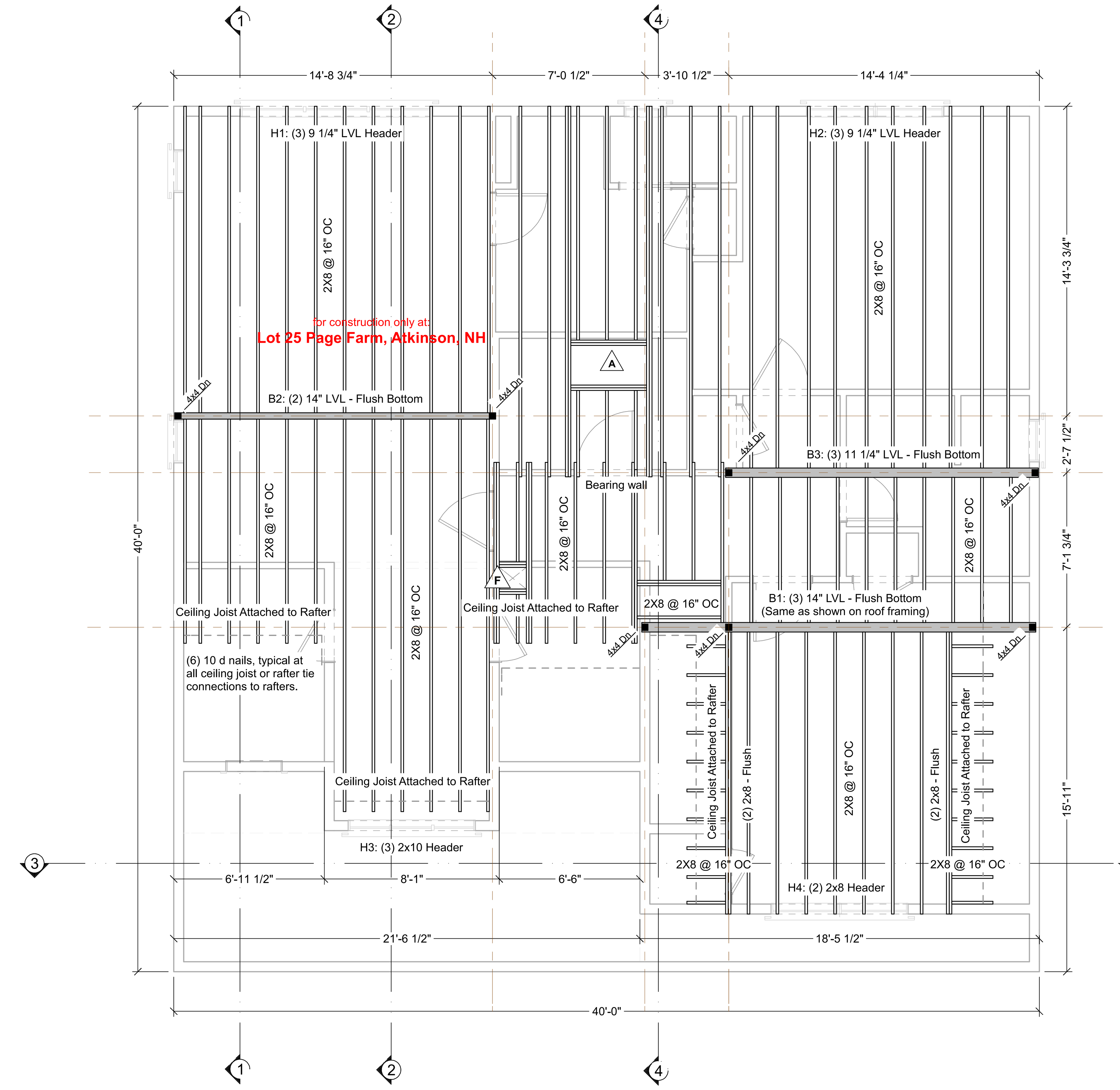
Green & Company

C:/Users/Fred/Desktop/CD 918.124.v3 GL 2909 Giselle 40x40 - 25 Page Farm.layout



Second Floor Framing

Structure designed for
Snow Load of 55 psf



Ceiling Framing

Structure designed for
Snow Load of 55 psf

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site:
http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

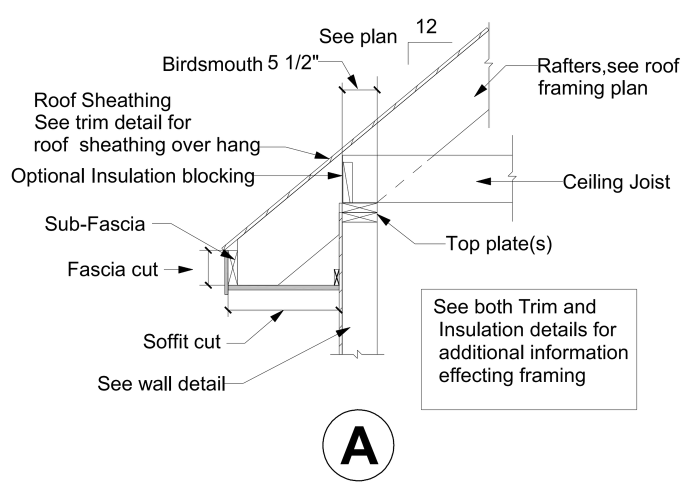
1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

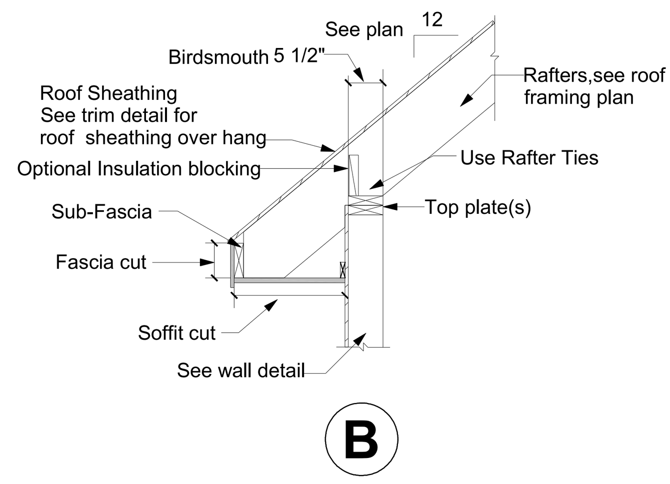
Issued for:
Construction

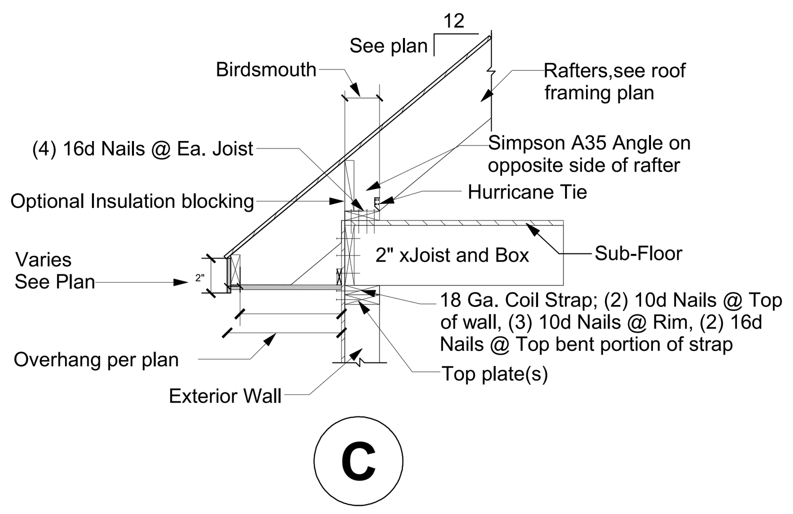
4/23/2020 3:51:51 PM

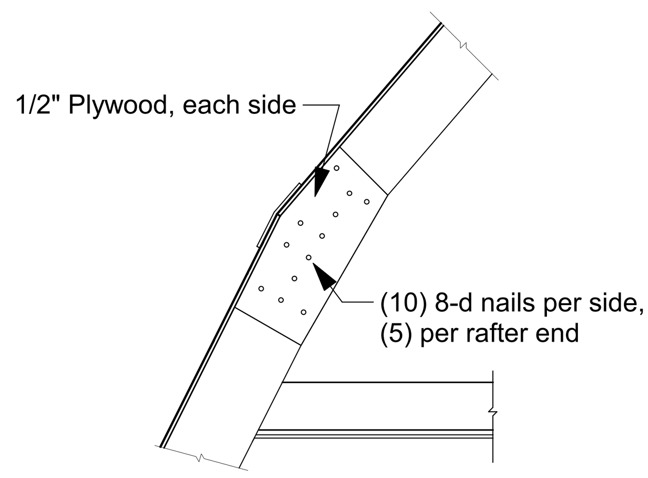
Green & Company

C:/Users/Fred/Desktop/CD 918.124.v3 GL 2909 Giselle 40x40 - 25 Page Farm.layout

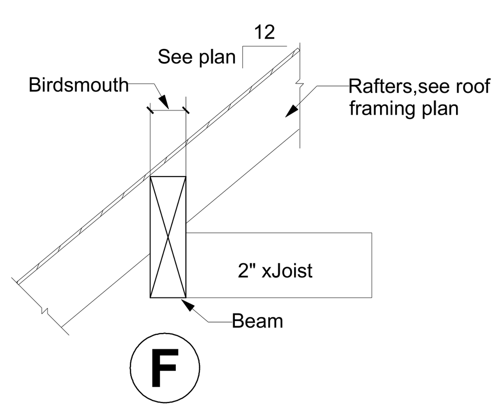


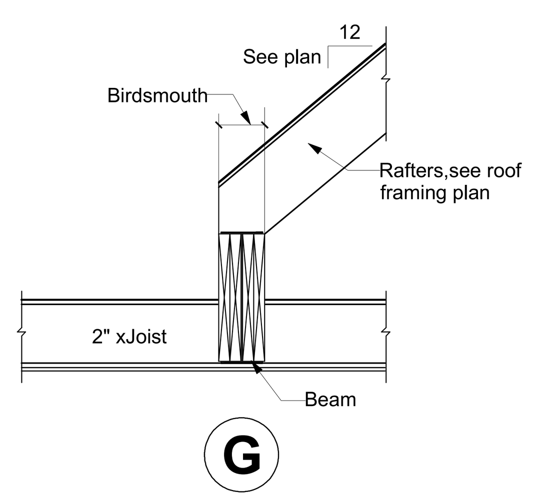


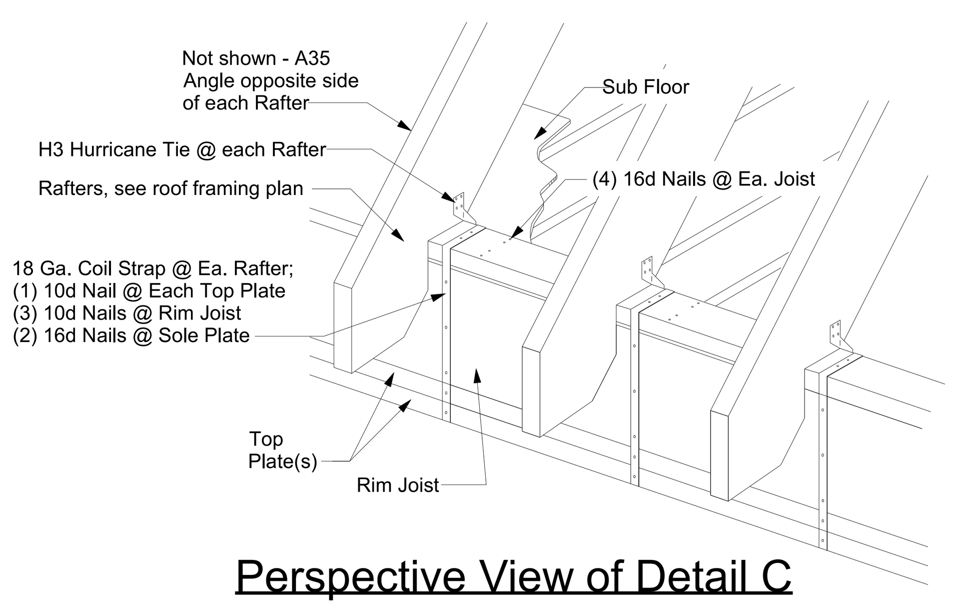




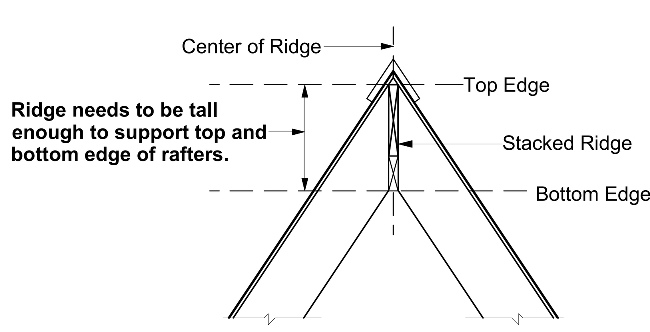
Gusset Detail





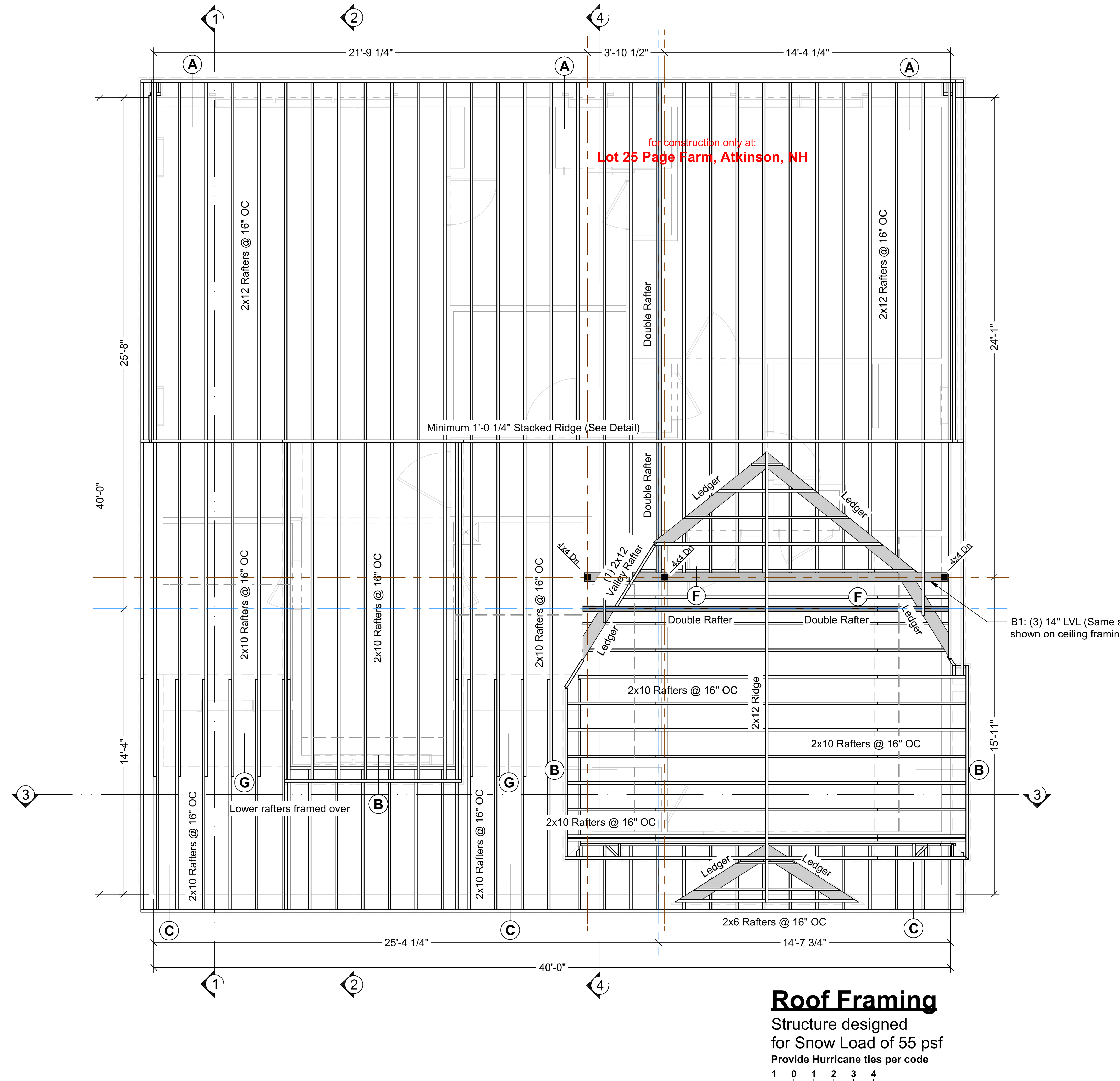


Perspective View of Detail C



Stacked Ridge Detail

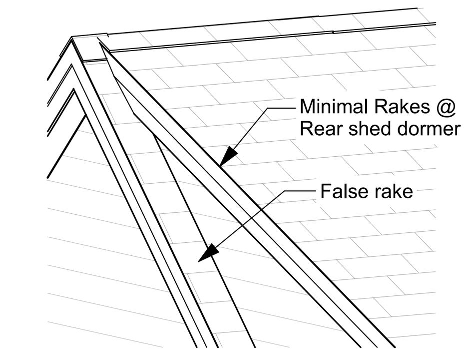
for construction only at:
Lot 25 Page Farm, Atkinson, NH



Roof Framing

Structure designed for Snow Load of 55 psf

Provide Hurricane ties per code



Alternate:
12" False Rake and a 6" Shed Dormer Rake

Your use of these drawings constitutes an acceptance of responsibility as outlined in "Dear Code Officer" on the first page of these drawings, and on our web site: http://www.artformhomeplans.com/TermsConditions.a5w

If you have any concerns or questions, please feel free to contact us. We are happy to clarify matters that fall within our scope, as listed on the first page. We can also often provide affordable support for issues that are your responsibility, such as energy design/calcs, or additional detailing.

Artform Home Plans

AFHP Design # 918.124.v3 GL

Giselle 40x40
Lot 25 Page Farm
Atkinson, NH

10

1/4"=1'-0" unless noted otherwise / Print @ 1:1
PDF created on: 4/23/2020, drawn by ACJ

Issued for:
Construction

PUD SITE DATA

DIMENSIONAL REQUIREMENTS (PROPOSED PUD USE)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
MINIMUM LOT SIZE	10 AC	100± AC
FRONTAGE	100 FT OR (2) @ 50'	665± FT
BASE RESIDENTIAL DENSITY:	74 RESIDENCES	56 RESIDENCES
MINIMUM INTERNAL SETBACKS:		
FRONT	20 FT	20 FT
SIDE	25 FT	TBD
REAR	25 FT	25 FT
BETWEEN BUILDINGS	30 FT	30 FT
MINIMUM OPEN SPACE	25%	83%
MINIMUM PERIMETER BUFFER:		
FRONT	100 FT	>100 FT
SIDE	50 FT	>50 FT
REAR	50 FT	>50 FT

BASE RESIDENTIAL DENSITY CALCULATIONS

REQUIRED BASE RESIDENTIAL DENSITY:

SRA:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 3,938,561 SF – 1,684,960 SF – 156,927 SF
= 2,096,674 SF

MINIMUM LOT AREA PER DWELLING = 1 AC = 43,560 SF

SRB:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 665,948 SF – 286,452 SF – 1,217 SF

MINIMUM LOT AREA PER DWELLING = 15,000 SF

TOTAL REQUIRED = DEVELOPABLE AREA / MINIMUM LOT AREA PER DWELLING
(SRA) 2,096,674 SF / 43,560 SF = 48.1 RESIDENCES
(SRB) 378,279 SF / 15,000 SF = 25.2 RESIDENCES
TOTAL = 74 RESIDENCES

ROADWAY LENGTH

TOTAL ROADWAY = 2,945 FT
TOTAL DEAD END ROADWAY = 2,945 FT

HOUSE LEGEND

LETTER	HOUSE TYPE
AB	ABBOTT
AU	AURELIA
B	BALMALCOLM
C	CARTER
G	GIARA
GS	GISELLE
SC	SINCLAIR
SP	SWEET CHEERY PIE
S	SUNROOM

*NO STRUCTURES PERMITTED IN EXTERNAL YARD SETBACKS. EXTERNAL YARDS SHALL BE LANDSCAPED AND SHALL NOT BE USED FOR VEHICULAR PARKING.

HORIZONTAL SCALE 1"=40'
40 20 0 40

REV.	DATE	DESCRIPTION	DR	CK
2	7/20/2021	REVISED PATH AND LANDSCAPING.	JSM	JJM
1	6/14/2021	REVISED PLAN TO SHOW NEW ROAD ALIGNMENT	JSM	JJM

SITE DEVELOPMENT PLAN

TAX MAP 242 LOT 4

OVERALL SITE LAYOUT COLOR PLAN

PEVERLY HILL ROAD CONDOMINIUMS

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

SCALE: 1" = 40' (30" X 48") **MAY 4, 2021**

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE 47388.11 DR JSM FB – CK JJM CADFILE C-1

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

THIS PLAN IS A PRELIMINARY CONCEPTUAL DESIGN FOR SITE LOCATION FEASIBILITY AND DISCUSSION PURPOSES ONLY. ADDITIONAL PERMITS, WAIVERS, AND VARIANCE MAY BE REQUIRED UPON FURTHER DESIGN, REVIEW, AND COORDINATION WITH THE TOWN.

Jul 20, 2021 - 11:25am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Hill Rd_Condo Project\Design\Concept\47388-11_PUD_Condo_TAC_3rd Submittal.dwg

LEGEND:

MAP 137 LOT 11	ASSESSORS MAP AND LOT NUMBER
CHB	CHORD BEARING
CHL	CHORD LENGTH
I	INDUSTRIAL ZONE
L	LENGTH
NRP	NATURAL RESOURCE PROTECTION ZONE
N/F	NOW OR FORMERLY
R	RADIUS
RU	RURAL ZONE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
Δ	CENTRAL ANGLE
S.F.	SQUARE FEET
SRA	SINGLE RESIDENCE A ZONE
SRB	SINGLE RESIDENCE B ZONE
TC	TRANSPORTATION CORRIDOR ZONE
	BOUNDARY LINE
	STONE WALL
	WIRE FENCE
	EDGE OF WETLAND
	WETLAND BUFFER
	WELL
	WETLANDS
	DEVELOPED LAND
	REMAINING LAND

PLAN REFERENCES:

1. "PLAN OF A LOT OF LAND BELONGING TO CHARLES H. HAYES PORTSMOUTH, N.H." BY A.C. HOYT SURVEYOR, DATED JULY 1896. RCRD PLAN #0171.
2. "PLAN OF LAND FOR JOHN & MAUD HETT PORTSMOUTH, N.H. SURVEY BY ME JENKINS, LEE, N.H.", DATED DEC. 1988. RCRD PLAN #C-19399.
3. "PROPERTY OF SWIFTWATER GIRL SCOUT COUNCIL CITY OF PORTSMOUTH N.H." SURVEYED BY JON MOORE, DATED AUGUST 1972. RCRD PLAN #D-3206.
4. "SUBDIVISION OF LAND FOR ROBERT E. DOWD IN PORTSMOUTH, N.H." BY BRUCE L. POHOPEK LAND SURVEYORS DOVER, N.H., DATED MAY 31, 1978, REVISED OCT 5, 78. RCRD PLAN #D-8312.
5. "SUBDIVISION PLAN OF LAND FOR THEODORE C. BURTT BANFIELD ROAD COUNTY OF ROCKINGHAM PORTSMOUTH, N.H." BY RICHARD P. MILLETTE AND ASSOCIATES, DATED DECEMBER 1981, WITH REVISION 2 DATED JANUARY, 1982. RCRD PLAN #D-10795.
6. "STANDARD BOUNDARY SURVEY MAP 242 – LOT 1 MAP 258 – LOT 54 MAP 263 – LOT 1-6 & 2 FOR THE NATURE CONSERVANCY N.H. ROUTE 33 GREENLAND ROAD COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED FEBRUARY 2006, WITH REVISION 1, DATED 4/13/06. RCRD PLAN #D-33859.
7. "LOT LINE RELOCATION PLAN MAP R-65 LOTS 2A & 2B FOR HAROLD & MARILYN ECKER AND ELIZABETH K. HURLEY 422 & 470 BANFIELD ROAD PORTSMOUTH, N.H. COUNTY OF ROCKINGHAM" BY AMBIT ENGINEERING, INC., DATED MAY 2000, WITH REVISION 0 DATED 5/26/00. RCRD PLAN #D-28209.

EASEMENTS AND RESTRICTIONS (E&R):

1. THE RIGHT TO USE SAID DRIVEWAY IN COMMON WITH PETER STOKEL AND HIS HEIRS FROM SAID GREENLAND ROAD, ALONG BY SAID CEMETERY, AND ALONG THE BOUNDARY BETWEEN THE LANDS OF SAID PETER AND STELLA TO SAID RAILROAD, AND SUBJECT TO SAID PETER'S RIGHT TO USE THE SAME IN COMMON. (SEE RCRD BK.#5066 PG.#1603).
2. RIGHTS OF PETER AND STELLA STOKEL AND THEIR RESPECTIVE HEIRS AND ASSIGNS SHALL HAVE EQUAL RIGHTS TO THE WATER OF SAID WELL, SAID PUMP, THE PIPES AND ANY OTHER EQUIPMENT USED NOW OR HEREAFTER IN COMMON, CHARGES OF CARE, UPKEEP, REPAIRS OR REPLACEMENT TO BE BORNE EQUALLY, WITH MUTUAL EASEMENTS TO ENTER ON THE LAND OF THE OTHER WHENEVER NECESSARY FOR ANY OF SAID PURPOSES. (SEE RCRD BK.#5066 PG.#1603).
3. 100' WIDE POWER LINE EASEMENT TO THE NEW HAMPSHIRE GAS & ELECTRIC COMPANY. (SEE RCRD BK.#1052 PG.#321).

LINE TABLE

LINE #	BEARING	DISTANCE
L1	N78°08'44"E	85.87'
L2	N51°37'18"E	544.02'
L3	N50°33'19"E	248.37'
L4	N38°55'51"E	136.50'
L5	N24°30'55"W	199.99'
L7	N69°17'23"E	56.05'
L8	N69°46'08"E	65.15'
L9	N70°28'21"E	57.22'
L10	N70°58'09"E	146.93'
L11	N69°38'29"E	122.30'
L12	N71°01'01"E	69.20'
L13	N70°36'35"E	73.15'
L14	N70°09'53"E	65.99'
L15	N68°45'39"E	56.30'
L16	N71°22'53"E	90.32'
L17	N69°46'51"E	792.39'
L18	N33°28'11"W	253.49'
L19	N30°43'03"W	25.87'
L20	N34°50'10"W	64.05'
L21	N32°23'37"W	59.65'
L22	N32°36'14"W	75.31'
L23	N32°30'33"W	44.57'
L24	N31°38'38"W	14.39'
L25	N33°17'28"W	36.28'
L26	N33°32'47"W	33.10'
L27	N32°28'55"W	58.19'
L28	S65°32'22"W	961.06'
L29	S69°39'32"W	39.37'
L30	S66°43'10"W	699.69'
L31	S61°50'59"W	21.03'
L32	S21°45'52"E	10.17'
L33	S20°39'30"E	392.22'
L34	S24°19'08"E	65.84'
L35	S22°34'53"E	52.86'
L36	S23°02'43"E	111.50'
L37	S22°45'01"E	171.93'
L38	S67°19'43"W	152.24'
L39	S69°35'00"W	360.76'
L40	S71°11'01"W	41.19'
L41	S69°52'05"W	74.38'
L42	S68°05'19"W	38.26'

LINE TABLE

LINE #	BEARING	DISTANCE
L43	S69°37'42"W	88.49'
L44	S69°05'04"W	85.94'
L45	S68°46'51"W	56.81'
L46	S67°27'31"W	81.81'
L47	S67°26'04"W	87.58'
L48	S68°24'11"W	247.91'
L49	S70°35'06"W	20.09'
L50	S02°20'46"W	96.94'
L51	S04°10'09"W	71.99'
L52	S02°55'30"W	60.89'
L53	S04°46'48"W	64.75'
L54	S04°06'17"W	73.30'
L55	S02°44'38"W	55.33'
L56	S30°51'45"W	36.06'
L57	S29°37'18"W	72.38'
L58	S30°17'36"W	108.68'
L59	S29°36'04"W	113.60'
L60	S29°36'07"W	62.04'
L61	S30°55'15"W	107.77'
L62	S27°41'10"W	68.75'
L63	S30°19'04"W	62.95'
L64	S28°10'44"W	90.88'
L65	S27°46'33"W	84.72'
L66	S28°09'12"W	63.04'
L67	S29°23'48"W	74.83'
L68	S29°32'16"W	94.54'
L69	S29°00'39"W	86.86'
L70	S28°38'51"W	79.24'
L71	S15°03'54"E	206.01'
L72	S15°34'48"E	56.79'
L73	S16°34'18"E	55.67'
L74	S14°35'44"E	35.23'
L75	S15°16'42"E	66.01'
L76	S16°55'11"E	94.64'
L77	S15°41'57"E	93.63'
L78	N62°33'20"E	210.79'
L79	N60°22'36"E	85.15'
L80	N60°02'43"E	125.36'
L81	N61°36'13"E	1100.89'
L82	S22°55'14"W	3930.00'

ABUTTERS ACROSS PEVERLY HILL ROAD:

MAP 232 LOT 92
N/F
DYANNA L. INNES
78 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
RCRD BK.#3754 PG.#0099

MAP 232 LOT 88
N/F
NATHAN M. & SHERRI M. TARLETON
74 LEAVITT AVENUE
PORTSMOUTH, NH 03801
RCRD BK.#5885 PG.#1471

MAP 232 LOT 93
N/F
KENNETH T. BLACK
82 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
RCRD BK.#3743 PG.#1942

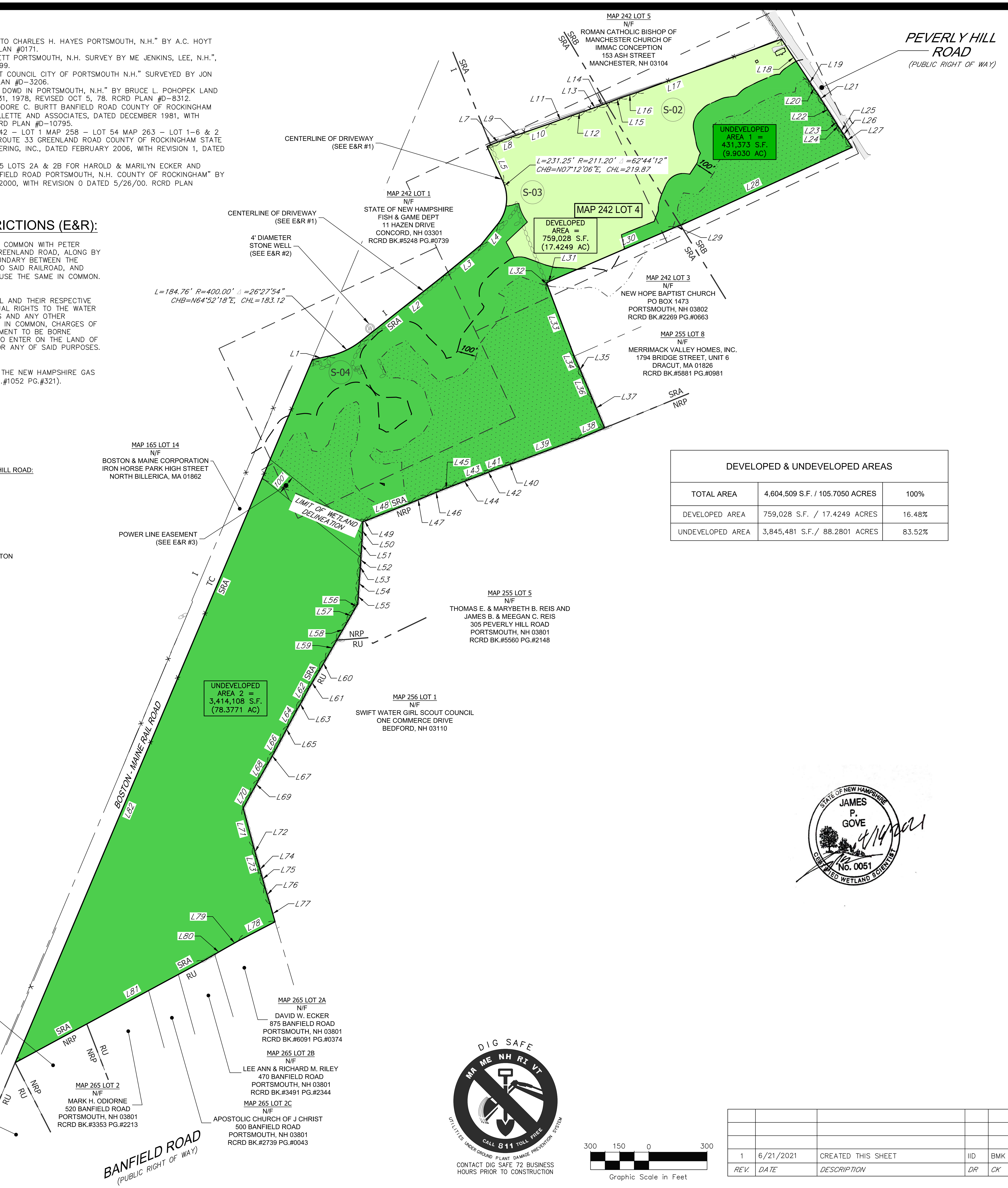
MAP 232 LOT 87
N/F
SUSAN L. DIXON
68 WIBIRD STREET
PORTSMOUTH, NH 03801
RCRD BK.#2504 PG.#0028

MAP 232 LOT 95
N/F
CITY OF PORTSMOUTH DPW
PO BOX 628
PORTSMOUTH, NH 03802
RCRD BK.#2247 PG.#0239

MAP 243 LOT 50
N/F
ASRT, LLC
266 MIDDLE STREET
PORTSMOUTH, NH 03801
RCRD BK.#6184 PG.#1176

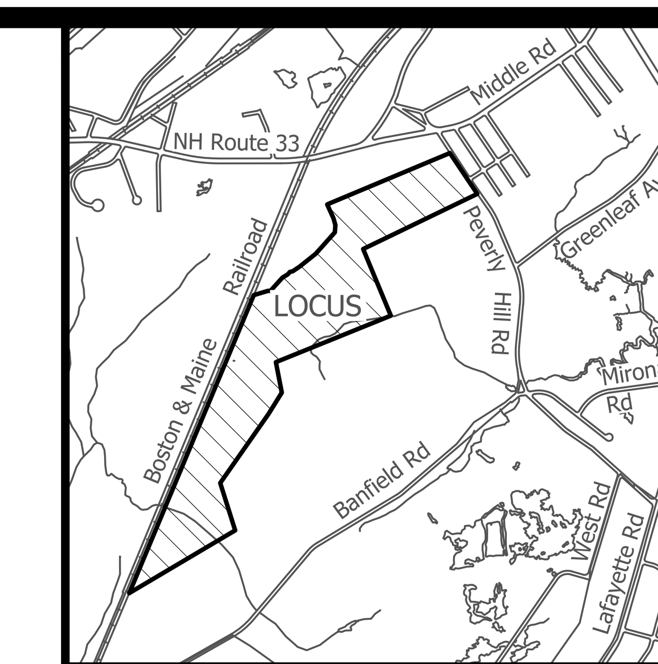
MAP 243 LOT 51
N/F
AJEI REAL ESTATE LLC
163 SPINNEY ROAD
PORTSMOUTH, NH 03801
RCRD BK.#5887 PG.#0463

MAP 243 LOT 52
N/F
CITY OF PORTSMOUTH DPW
PO BOX 628
PORTSMOUTH, NH 03802
RCRD BK.#2042 PG.#0498



DEVELOPED & UNDEVELOPED AREAS

TOTAL AREA	4,604,509 S.F. / 105.7050 ACRES	100%
DEVELOPED AREA	759,028 S.F. / 17.4249 ACRES	16.48%
UNDEVELOPED AREA	3,845,481 S.F./ 88.2801 ACRES	83.52%



LOCATION PLAN

NOTES:

1. THE PARCEL IS LOCATED IN THE SINGLE RESIDENCE A (SRA) & SINGLE RESIDENCE B (SRB) ZONING DISTRICTS.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 242 AS LOT 4.
3. THE PARCEL IS LOCATED IN ZONE X AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270F, MAP REVISED JANUARY 29, 2021.
4. DIMENSIONAL REQUIREMENTS:

	REQUIRED: SRA	REQUIRED: SRB
MINIMUM LOT AREA:	1 ACRE	15,000 SF
LOT AREA PER DWELLING UNIT:	1 ACRE	15,000 SF
CONTINUOUS STREET FRONTAGE:	150'	100'
LOT DEPTH:	200'	100'
MINIMUM YARD DIMENSIONS:		
FRONT:	30'	30'
SIDE:	20'	10'
REAR:	40'	30'
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT:		
SLOPED ROOF	35'	35'
FLAT ROOF	30'	30'
BUILDING COVERAGE:	10%	20%
MINIMUM OPEN SPACE:	50%	40%

PER THE CITY OF PORTSMOUTH ZONING ORDINANCE SECTION 10.520.

5. OWNER OF RECORD:
MAP 242 LOT 4:
STELLA B. STOKEL 1993 TRUST,
NANCY A. STOKEL 1993 TRUST & PHILIP J. STOKEL
83 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
RCRD BK.#5066 PG.#1603
6. PARCEL AREA:
MAP 242 LOT 4:
4,604,509 S.F.
(105.7050 ACRES)
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED DEVELOPED & UNDEVELOPED AREAS OF MAP 242 LOT 4.
9. FIELD SURVEY COMPLETED BY TCE, MVP & PJT IN APRIL-MAY 2020 USING A TOPCON DS103, TOPCON HIPER-SR, TOPCON HIPER-V AND A CARLSON RT4 DATA COLLECTOR.
10. HORIZONTAL DATUM IS NAD83 (2011) PER STATIC GPS OBSERVATIONS. THE VERTICAL DATUM IS NAVD88 (GEOID12B) PER STATIC GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 2 FEET.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.
13. WETLAND DELINEATION WAS COMPLETED BY GOVE ENVIRONMENTAL SERVICES ON FEBRUARY 18, 2020 AND REVISED ON MAY 14, 2020 IN ACCORDANCE WITH THE 1987 ARMY CORP OF ENGINEERS WETLAND MANUAL AND THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. FIELD LOCATED BY TFMORAN, INC.
14. THE ABANDONED CEMETERY SHOWN ON SHEET S-03 IS BELIEVED TO BE THE FORMER HAYES FAMILY CEMETERY. CURRENT OWNERS OF THE PROPERTY ACKNOWLEDGE THAT ALL BODIES HAVE BEEN EXHUMED FROM THIS LOCATION. NO GRAVESTONES EXIST AT THIS CEMETERY. THE 25' BUFFER TO THE CEMETERY IS SHOWN AS AN ABUNDANCE OF CAUTION.

TAX MAP 242 LOT 4

OVERALL PROPOSED DEVELOPED & REMAINING LAND

PEVERLY HILL ROAD

83 PEVERLY HILL ROAD

PORTSMOUTH, NEW HAMPSHIRE

COUNTY OF ROCKINGHAM

OWNED BY

STELLA B. STOKEL 1993 TRUST, NANCY A. STOKEL 1993 TRUST & PHILIP J. STOKEL

SCALE: 1" = 300' (22x34)
1" = 600' (11x17)

APRIL 19, 2021

DIG SAFE
CALL 811 TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

300 150 0 300
Graphic Scale in Feet

REV.	DATE	DESCRIPTION	DR	CK
1	6/21/2021	CREATED THIS SHEET	IID	BMK

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388-11	DR	MVP	FB	568	S-01
		CK	BMK	CADFILE		

Jun 21, 2021 - 12:03pm
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Carlson Survey\Dwgs\47388-11 Overall Proposed.dwg

CONVENTIONAL SUBDIVISION

DIMENSIONAL REQUIREMENTS (PROPOSED PUD USE)

	SRA REQUIRED:	SRA PROVIDED:	SRB REQUIRED:	SRB PROVIDED:
MINIMUM LOT DIMENSIONS:				
MINIMUM LOT SIZE	1 AC	1± AC	15,000 S.F.	15,000± S.F.
FRONTAGE	150 FT	150± FT	100 FT	100'± FT
BASE RESIDENTIAL DENSITY:	48 RESIDENCES	38 RESIDENCES	25 RESIDENCES	13 RESIDENCES
MINIMUM INTERNAL SETBACKS:				
FRONT	30 FT	30 FT	30 FT	30 FT
SIDE	20 FT	20 FT	10 FT	10 FT
REAR	40 FT	40 FT	30 FT	30 FT
BETWEEN BUILDINGS	40 FT	40 FT	20 FT	20 FT
MINIMUM OPEN SPACE	50%	TBD	40%	TBD

BASE RESIDENTIAL DENSITY CALCULATIONS

REQUIRED BASE RESIDENTIAL DENSITY:

SRA:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 3,938,561 SF – 1,684,960 SF – 156,927 SF
= 2,096,674 SF

MINIMUM LOT AREA PER DWELLING = 1 AC = 43,560 SF

SRB:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 665,948 SF – 286,452 SF – 1,217 SF

MINIMUM LOT AREA PER DWELLING = 15,000 SF

TOTAL REQUIRED = DEVELOPABLE AREA / MINIMUM LOT AREA PER DWELLING
(SRA) 2,096,674 SF / 43,560 SF = 48.1 RESIDENCES
(SRB) 378,279 SF / 15,000 SF = 25.2 RESIDENCES
TOTAL = 74 RESIDENCES

ROADWAY LENGTH

TOTAL ROADWAY = 7,332 FT
TOTAL DEAD END ROADWAY = 4,376 FT

CONCEPTUAL DESIGN

TAX MAP 242 LOT 4

CONCEPT - CONVENTIONAL SUBDIVISION PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

1"=200' (11X17")
SCALE: 1"=100' (22"X34")

JULY 19, 2021

THIS PLAN IS A PRELIMINARY CONCEPTUAL DESIGN FOR SITE LOCATION FEASIBILITY AND DISCUSSION PURPOSES ONLY. ADDITIONAL PERMITS, WAIVERS, AND VARIANCE MAY BE REQUIRED UPON FURTHER DESIGN, REVIEW, AND COORDINATION WITH THE TOWN.

HORIZONTAL SCALE 1"=100'
100 50 0 100

REV.	DATE	DESCRIPTION	DR	CK

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-01
		CK	JJM	CAD	47388-11 CONCEPT_CONVENTIONAL SUBDIVISION	

CONVENTIONAL SUBDIVISION

DIMENSIONAL REQUIREMENTS (PROPOSED PUD USE)

	SRA REQUIRED:	SRA PROVIDED:	SRB REQUIRED:	SRB PROVIDED:
MINIMUM LOT DIMENSIONS:				
MINIMUM LOT SIZE	1 AC	1± AC	15,000 S.F.	15,000± S.F.
FRONTAGE	150 FT	150± FT	100 FT	100'± FT
BASE RESIDENTIAL DENSITY:	48 RESIDENCES	38 RESIDENCES	25 RESIDENCES	13 RESIDENCES
MINIMUM INTERNAL SETBACKS:				
FRONT	30 FT	30 FT	30 FT	30 FT
SIDE	20 FT	20 FT	10 FT	10 FT
REAR	40 FT	40 FT	30 FT	30 FT
BETWEEN BUILDINGS	40 FT	40 FT	20 FT	20 FT
MINIMUM OPEN SPACE	50%	TBD	40%	TBD

BASE RESIDENTIAL DENSITY CALCULATIONS

REQUIRED BASE RESIDENTIAL DENSITY:

SRA:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 3,938,561 SF – 1,684,960 SF – 156,927 SF
= 2,096,674 SF

MINIMUM LOT AREA PER DWELLING = 1 AC = 43,560 SF

SRB:

DEVELOPABLE AREA = TOTAL AREA – WETLANDS – 15% SLOPES
= 665,948 SF – 286,452 SF – 1,217 SF

MINIMUM LOT AREA PER DWELLING = 15,000 SF

TOTAL REQUIRED = DEVELOPABLE AREA / MINIMUM LOT AREA PER DWELLING
(SRA) 2,096,674 SF / 43,560 SF = 48.1 RESIDENCES
(SRB) 378,279 SF / 15,000 SF = 25.2 RESIDENCES
TOTAL = 74 RESIDENCES

ROADWAY LENGTH

TOTAL ROADWAY = 7,332 FT
TOTAL DEAD END ROADWAY = 4,376 FT

THIS PLAN IS A PRELIMINARY CONCEPTUAL DESIGN FOR SITE LOCATION FEASIBILITY AND DISCUSSION PURPOSES ONLY. ADDITIONAL PERMITS, WAIVERS, AND VARIANCE MAY BE REQUIRED UPON FURTHER DESIGN, REVIEW, AND COORDINATION WITH THE TOWN.

HORIZONTAL SCALE 1"=100'
100 50 0 100

REV.	DATE	DESCRIPTION	DR	CK

CONCEPTUAL DESIGN

TAX MAP 242 LOT 4

CONCEPT - CONVENTIONAL SUBDIVISION PLAN

PROPOSED OPEN SPACE RESIDENTIAL PUD

83 PEVERLY HILL ROAD, PORTSMOUTH, NH

OWNED BY

STOKEL SB & NA TRUST, PHILIP J 25% INT

1"=200' (11X17")
SCALE: 1"=100' (22"X34")

JULY 19, 2021

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47388.11	DR	JSM	FB	–	C-02
		CK	JJM	CADFILE	47388-11 CONCEPT_A_ALTS	

Jul 19, 2021 - 8:42am
F:\MSC Projects\47388 - Peverly Hill Rd - Portsmouth\47388-11 Green and Co - 83 Peverly Rd_Condo Project\Design\Concepts\47388-11 Concept_A_Alts.dwg

August 25, 2021

TFM Project No: 47388.11

Juliet Walker, Planning Director
Portsmouth Planning Board
1 Junkins Avenue
Portsmouth, NH 03801

Re: Response to Comments Prior to and During the August 3, 2021 TAC Review Meeting for Condominium Development, 83 Peverly Hill Road, Tac Map 242, Lot 4

Dear Juliet,

On behalf of our client, Green & Company, TF Moran, Inc. (TFM) respectfully submits the following revised plans and letter in response to the comments made by the Technical Advisory Committee (TAC) prior to and at our August meeting.

Included within this Response to Comments are the following items:

- *Woods Condominium, 83 Peverly Hill Road, Portsmouth, New Hampshire Dated April 19, 2021, Last Revised August 25, 2021 (Electronic Copy)*
- *Drainage Letter conforming to Article 7 of the Site Plan Review Regulations, dated August 25, 2021 (Electronic Copy)*

To facilitate your review of the plans, we have provided the Technical Advisory Committee (TAC) and the staff comments along with our responses which are shown in ***bold blue italics.***

Comments Received from TAC on August 10, 2021

TAC voted to recommend approval to the Planning Board for consideration at the August 3, 2021 TAC meeting with a list of 13 written stipulations. TFM has reviewed these stipulations and provided responses to each as follows:

1) Applicant will construct a temporary shared use path to connect to the existing sidewalk network and install crossing equipment to cross Peverly Hill Road at Middle Rd.
Following a site walk with the DPW manager, a conceptual plan was decided upon and is shown on sheet C-68. This plan shows a sidewalk providing a connection from the intersection of Middle Rd and Peverly Hill Rd to the proposed residential development.

2) Applicant should provide detailed written confirmation that the application meets all of the requirements of Article 7 of the Site Plan Review regulations as these relate to stormwater management, specifically that the post-development flows all meet or decrease the pre-development stormwater flows.
Addressed. See Drainage Letter.

3) Update subdivision and site plan review checklists prior to submission to PB.
Revised checklists. See checklists provided.

4) Road profiles will show geometry, sewer manhole numbers, and inverts.
Revised profiles accordingly. See sheets C-12 – C-15.

5) Final calculations regarding both the gravity and force sewer systems will be provided.
Revised. See NHDES Sewer Submittal in Planning Board submittal.

6) Cross slope percentages will be added as details.
Detail of existing path for bicycle/pedestrian use added to plans. This detail shows the cross slopes. See sheet C-69.

7) Pavement will be used instead of pavers for areas of road that are widened at hydrant areas.
Pavers removed from widened road sections. See sheets C-06 – C-10.

8) Water main shall be cl 52 CLDI wrapped in polyethylene with continuity wedges as per City Standards and called on in detail.
Note added to plans. See sheets C-01 (Utility Note #11) and C-71 (Water Main Trench Detail).

9) Design of Irrigation systems for houses will use smart controls and noted on plan set.
Note added to plans. See sheets C-01 (Utility Note #13) and C-45 (Landscape Note #18).

10) NHDES Sewer extension permit will be obtained.
Noted. Pending – will provide when obtained.

11) Force main's entry into the gravity sewer will be detailed in plan set.
Detail added to plans. See sheet C-75.

12) Reroute water main at entrance to provide separation from sewer line.
Revised plans accordingly. See sheet C-27.

13) Show expanded tree clearing for City vehicle access.
Revised plans accordingly. See sheet C-24.

Additional Comments Addressed

Additional comments were received during the August 3, 2021 TAC meeting that were not included as stipulations on the written comments received from TAC prior to the TAC meeting. TFM has provided responses to each comment as follows:

14) Show the gas main at the centerline of the road.
Revised plans accordingly. See sheets C-27 – C-33.

15) Add note stating that construction and utility installation shall be overseen by a 3rd party reviewer.
Revised plans accordingly. See sheet C-01 (General Note #19).

16) Add note stating that signage shall be installed demarcating the 100' wetland buffer prior to commencement of earthwork.
Revised plans accordingly. See sheet C-01 (General Note #19).

We trust that the above responses satisfy the concerns expressed in the August meeting at the Technical Advisory Committee. Please contact me if there are any questions or concerns regarding the responses and/or plans submitted.

Respectfully,
TFMoran, Inc.

Jack McTigue, PE
Senior Project Manager

JJM/ jsd

cc: Rick Green, Michael Green and Jenna Green