### INTRODUCED: April 14, 2025

### AN ORDINANCE No. 2025-082

To authorize the special use of the property known as 3202 Monument Avenue for the purpose of a dwelling unit within an accessory building to a single-family detached dwelling, upon certain terms and conditions.

Patron – Mayor Avula (By Request)

Approved as to form and legality by the City Attorney

PUBLIC HEARING: MAY 12 2025 AT 6 P.M.

WHEREAS, the owner of the property known as 3202 Monument Avenue, which is situated in a R-6 Single-Family Attached Residential District, desires to use such property for the purpose of a dwelling unit within an accessory building to a single-family detached dwelling, which use, among other things, is not currently allowed by section 30-412.5, concerning yards, of the Code of the City of Richmond (2020), as amended; and

WHEREAS, in accordance with section 17.11 of the Charter of the City of Richmond (2020), as amended, it has been made to appear that, if granted subject to the terms and conditions set forth in this ordinance, the special use granted by this ordinance will not be detrimental to the safety, health, morals and general welfare of the community involved, will not tend to create

AYES:	8	NOES:	0	ABSTAIN:	
ADOPTED:	MAY 12 2025	REJECTED:		STRICKEN:	

congestion in streets, roads, alleys and other public ways and places in the area involved, will not create hazards from fire, panic or other dangers, will not tend to overcrowding of land and cause an undue concentration of population, will not adversely affect or interfere with public or private schools, parks, playgrounds, water supplies, sewage disposal, transportation or other public requirements, conveniences and improvements, and will not interfere with adequate light and air; and

WHEREAS, (i) the City Planning Commission has conducted a public hearing to investigate the circumstances and conditions upon which the Council is empowered to authorize such use, (ii) the City Planning Commission has reported to the Council the results of such public hearing and investigation and its recommendations with respect thereto, and (iii) the Council has conducted a public hearing on this ordinance at which the person in interest and all other persons have had an opportunity to be heard;

### NOW, THEREFORE,

### THE CITY OF RICHMOND HEREBY ORDAINS:

§ 1. Finding. Pursuant to section 30-1050.1 of the Code of the City of Richmond (2020), as amended, the Council hereby finds that the special use set forth in and subject to the terms and conditions of this ordinance will not (i) be detrimental to the safety, health, morals and general welfare of the community involved, (ii) tend to create congestion in streets, roads, alleys and other public ways and places in the area involved, (iii) create hazards from fire, panic or other dangers, (iv) tend to overcrowding of land and cause an undue concentration of population, (v) adversely affect or interfere with public or private schools, parks, playgrounds, water supplies, sewage disposal, transportation or other public requirements, conveniences and improvements, or (vi) interfere with adequate light and air.

### § 2. Grant of Special Use Permit.

(a) Subject to the terms and conditions set forth in this ordinance, the property known as 3202 Monument Avenue and identified as Tax Parcel No. W000-1476/019 in the 2025 records of the City Assessor, being more particularly shown on a survey entitled "Survey of Portions of Lot 21, 23 & Lot 22 Block E, Shepards Plan, Richmond, Virginia," prepared by A. G. Harocopos & Associates, P.C., and dated February 2, 2024, a copy of which is attached to and made a part of this ordinance, hereinafter referred to as "the Property," is hereby permitted to be used for the purpose of a dwelling unit within an accessory building to a single-family detached dwelling, hereinafter referred to as "the Special Use," substantially as shown on the plans entitled "3202 Monument Avenue," prepared by Obsidian, and dated May 23, 2024, hereinafter referred to as "the Plans," copies of which are attached to and made a part of this ordinance.

(b) The adoption of this ordinance shall constitute the issuance of a special use permit for the Property. The special use permit shall inure to the benefit of the owner or owners of the fee simple title to the Property as of the date on which this ordinance is adopted and their successors in fee simple title, all of which are hereinafter referred to as "the Owner." The conditions contained in this ordinance shall be binding on the Owner.

§ 3. **Special Terms and Conditions.** This special use permit is conditioned on the following special terms and conditions:

(a) The Special Use of the Property shall be as a dwelling unit within an accessory building to a single-family detached dwelling, substantially as shown on the Plans.

(b) The height of the accessory structure shall not exceed two stories, substantially as shown on the Plans.

(c) All building elevations and site improvements shall be substantially as shown on the Plans, and subject to the issuance of a Certificate of Appropriateness by the Commission of

Architectural Review.

(d) All mechanical equipment serving the Property shall be located or screened so as not to be visible from any public right-of-way.

§ 4. **Supplemental Terms and Conditions.** This special use permit is conditioned on the following supplemental terms and conditions:

(a) All required final grading and drainage plans, together with all easements made necessary by such plans, must be approved by the Director of Public Utilities prior to the issuance of the building permit.

(b) Storm or surface water shall not be allowed to accumulate on the land. The Owner, at its sole cost and expense, shall provide and maintain at all times adequate facilities for the drainage of storm or surface water from the Property so as not to adversely affect or damage any other property or public streets and the use thereof.

(c) Facilities for the collection of refuse shall be provided in accordance with the requirements of the Director of Public Works. Such facilities shall be located or screened so as not to be visible from adjacent properties and public streets.

(d) Any encroachments existing, proposed on the Plans or contemplated in the future shall require separate authorization and shall be subject to the applicable provisions of the Code of the City of Richmond (2020), as amended, and all future amendments to such laws.

(e) In all other respects, the use of the Property shall be in accordance with the applicable underlying zoning regulations.

§ 5. General Terms and Conditions. This special use permit is conditioned on the following general terms and conditions:

(a) No permit implementing this special use permit shall be approved until satisfactory evidence has been presented to the Zoning Administrator that any delinquent real estate taxes

applicable to the Property have been paid.

(b) The Owner shall be bound by, shall observe and shall comply with all other laws, ordinances, rules and regulations applicable to the Property, except as otherwise expressly provided in this ordinance.

(c) Words and phrases used in this ordinance shall be interpreted to have the meanings ascribed to them by section 30-1220 of the Code of the City of Richmond (2020), as amended, unless the context clearly indicates that a different meaning is intended.

(d) Notwithstanding any other provision of law, this special use permit is being approved due, in part, to the mitigating effects of each and every condition attached hereto; consequently, if any portion of this ordinance is determined to be invalid for any reason by a final, non-appealable order of any Virginia or federal court of competent jurisdiction, the invalidity shall cause the entire ordinance to be void and of no further effect from the effective date of such order.

(e) The privileges granted by this ordinance may be revoked pursuant to the provisions of sections 30-1050.7 through 30-1050.11 of the Code of the City of Richmond (2020), as amended, and all future amendments to such laws. Failure to comply with the terms and conditions of this ordinance shall constitute a violation of section 30-1080 of the Code of the City of Richmond (2020), as amended, and all future amendments to such law, or any other applicable laws or regulations.

(f) When the privileges granted by this ordinance terminate and the special use permit granted hereby becomes null and void, whether as a result of the Owner relinquishing this special use permit in a writing addressed to the Director of Planning and Development Review or otherwise, use of the Property shall be governed thereafter by the zoning regulations prescribed for the district in which the Property is then situated.

§ 6. Implementation. The Commissioner of Buildings is authorized to issue a building

permit substantially in accordance with the Plans for the Special Use subject to the terms and conditions set forth in this ordinance. An application for the building permit shall be made within 1,096 calendar days following the date on which this ordinance becomes effective. If either the application for the building permit is not made within the time period stated in the previous sentence or the building permit terminates under any provision of the Virginia Statewide Building Code, this ordinance and the special use permit granted hereby shall terminate and become null and void.

§ 7. Effective Date. This ordinance shall be in force and effect upon adoption.

A TRUE COPY: TESTE:

City Clerk



# City of Richmond

### **O&R** Transmittal

**DATE:** February 11, 2025

**TO:** The Honorable Members of City Council

THROUGH: The Honorable Dr. Danny Avula, Mayor (by request) (This is no way reflects a recommendation on behalf of the Mayor)THROUGH: Sabrina Joy-Hogg, Interim Chief Administrative Officer

THROUGH: Sharon L. Ebert, DCAO for Economic Development and Planning

**FROM:** Kevin J. Vonck, Director of Planning & Development Review

**RE:** To authorize the special use of the property known as 3202 Monument Avenue for the purpose of one dwelling unit within an accessory building to a single-family detached dwelling, upon certain terms and conditions.

ORD. OR RES. No.

**PURPOSE:** The applicant is requesting a Special Use Permit to authorize a single-family detached dwelling with an accessory structure containing a dwelling unit within the R-6 Single-Family Attached Residential District. This special use permit will allow a dwelling unit within an accessory structure. The applicant wishes to construct a second story above an existing accessory structure. While the use is permitted, the existing structure does not meet the requirements regarding side and rear setbacks as detailed in Sections 30-412.5 of the Code of the City of Richmond, as amended.

**BACKGROUND:** The property is in The Museum District neighborhood, on the northern side of Monument Avenue, between Tilden Street and Cleveland Street. The property is a ,750 square foot (.155 acre) parcel of land, improved with a single-family detached dwelling. The City's Richmond 300 Master Plan designates a future land use for the subject property as Neighborhood Mixed-Use, which is defined as "Existing or new highly walkable urban neighborhoods that are predominantly

residential with a small, but critical, percentage of parcels providing retail, office, personal service, and institutional uses." (Richmond 300, p. 82).

<u>Intensity</u>: Building heights are generally two to four stories. Buildings taller than four stories may be found along major streets (see Street Typologies Map). Parcels are generally between 1,500 and 5,000 sq. ft.

<u>Primary Uses</u>: Single-family houses, accessory dwelling units, duplexes, small multi-family buildings (typically 3-10 units), and open space.

<u>Secondary Uses</u>: Large multifamily buildings (10+units), retail/office/personal service, institutional, cultural, and government.

The current zoning for this property is R-6 Single-Family Attached Residential. It is also located within the Monument Avenue City Old and Historic District. The surrounding area is generally residential.

**COMMUNITY ENGAGEMENT:** The Museum District Association, the Fan Area Business Alliance, and the Historic Monument Avenue civic associations were notified of this request.

**STRATEGIC INITATIVES AND OTHER GOVERNMENTAL:** Richmond 300 Master Plan; Ordinance to be considered by the Planning Commission on February 18, 2024 (tentative)

**FISCAL IMPACT:** \$2,400 Application Fee

**DESIRED EFFECTIVE DATE:** Upon adoption

**REQUESTED INTRODUCTION DATE:** March 24, 2025

CITY COUNCIL PUBLIC HEARING DATE: April 21, 2025

**REQUESTED AGENDA:** Consent

**RECOMMENDED COUNCIL COMMITTEE:** Planning Commission, April 15, 2025 **AFFECTED AGENCIES:** Office of Chief Administrative Officer

Law Department (for review of draft ordinance)

RELATIONSHIP TO EXISTING ORD. OR RES.: None

**ATTACHMENTS:** Draft Ordinance, Application Form, Applicant's Report, Plans, Survey **STAFF:** Alyson Oliver, Planner, Land Use Administration (Room 511) 646-3709

STOF RICHMOR * * * * * * * * STOF RICHMOR * * * * * * * * STOF RICHMOR * * * * * * * * *		r SPECIAL USE PERMIT Planning and Development Review Land Use Administration Division 900 E. Broad Street, Room 511 Richmond, Virginia 23219 (804) 646-6304 http://www.richmondgov.com/
Application is hereby submitted for: (check one) Secial use permit, new special use permit, plan amendment special use permit, text only amendment		
Project Name/Location Property Address: 3202 Monument Ave. Parcel I.D. #:Fee: Total area of affected site in acres:		Date: <b>9, 2, 24</b>
(See <i>page 6</i> for fee schedule, please make check payable to the "C	ity of Richmond")	
Zoning Current Zoning: residential		
Richmond 300 Land Use Designation:		
Proposed Use (Please include a detailed description of the proposed use in the ref Second floor atop Carriage house in Existing Use: garage Is this property subject to any previous land use cases Yes No If Yes, please list the Ordinance Number	?	
Applicant/Contact Person: Caleb Valentine Company: Clean Square IIC Mailing Address: 2116 Clacke St		
City: <u>Henrico</u> Telephone: <u>(814)</u> 441 7645	State: <u>V4</u> Fax: _(	_ Zip Code: 23228
Email: Valentine kcje gmail		
Property Owner: <u>Steven Minyar</u> If Business Entity, name and title of authorized signee:		
(The person or persons executing or attesting the execution of this she has or have been duly authorized and empowered to so execute		he Company certifies that he or
Mailing Address: 3202 Monument Ave		
City: <u>Kichman</u> Telephone: (214) 883-7394	State: <u></u> Fax: (	Zip Code:

### Property Owner Signature:

Email:

danielis. cris

er @amail

The names, addresses, telephone numbers and signatures of all owners of the property are required. Please attach additional sheets as needed. If a legal representative signs for a property owner, please attach an executed power of attorney. Faxed or photocopied signatures will not be accepted.

com

NOTE: Please attach the required plans, checklist, and a check for the application fee (see Filing Procedures for special use permits)

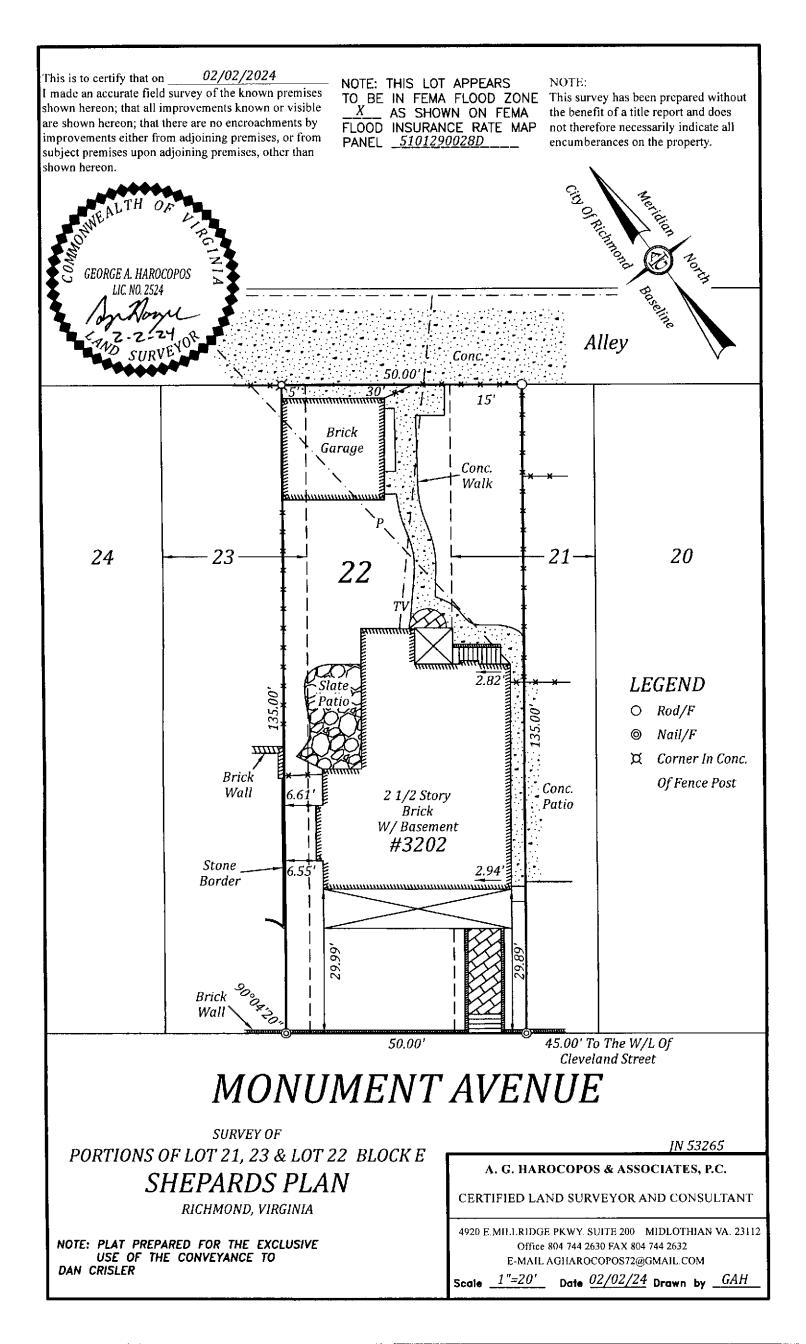
From:	Caleb Valentine
To:	<u>Oliver, Alyson E PDR</u>
Subject:	Re: Special Use Permit
Date:	Friday, February 14, 2025 2:51:52 PM
Attachments:	image002.png

CAUTION: This message is from an external sender - Do not open attachments or click links unless you recognize the sender's address and know the content is safe.

As requested:

The client contacted us to design and build additional living space above their carriage house "garage". The space will have a small terrace facing the main home and will contain a common area, and bathroom. Access will be via stairs inside the back yard, and all cosmetics will match original home in accordance with local architectural guidelines.

Thanks. Caleb



# 3202 Monument Avenue **Building Permit Plans**

## Owner

Steven Craig & Jeannie Denise Minyard 3202 Monument Ave. Richmond, VA, 23221

# Engineer

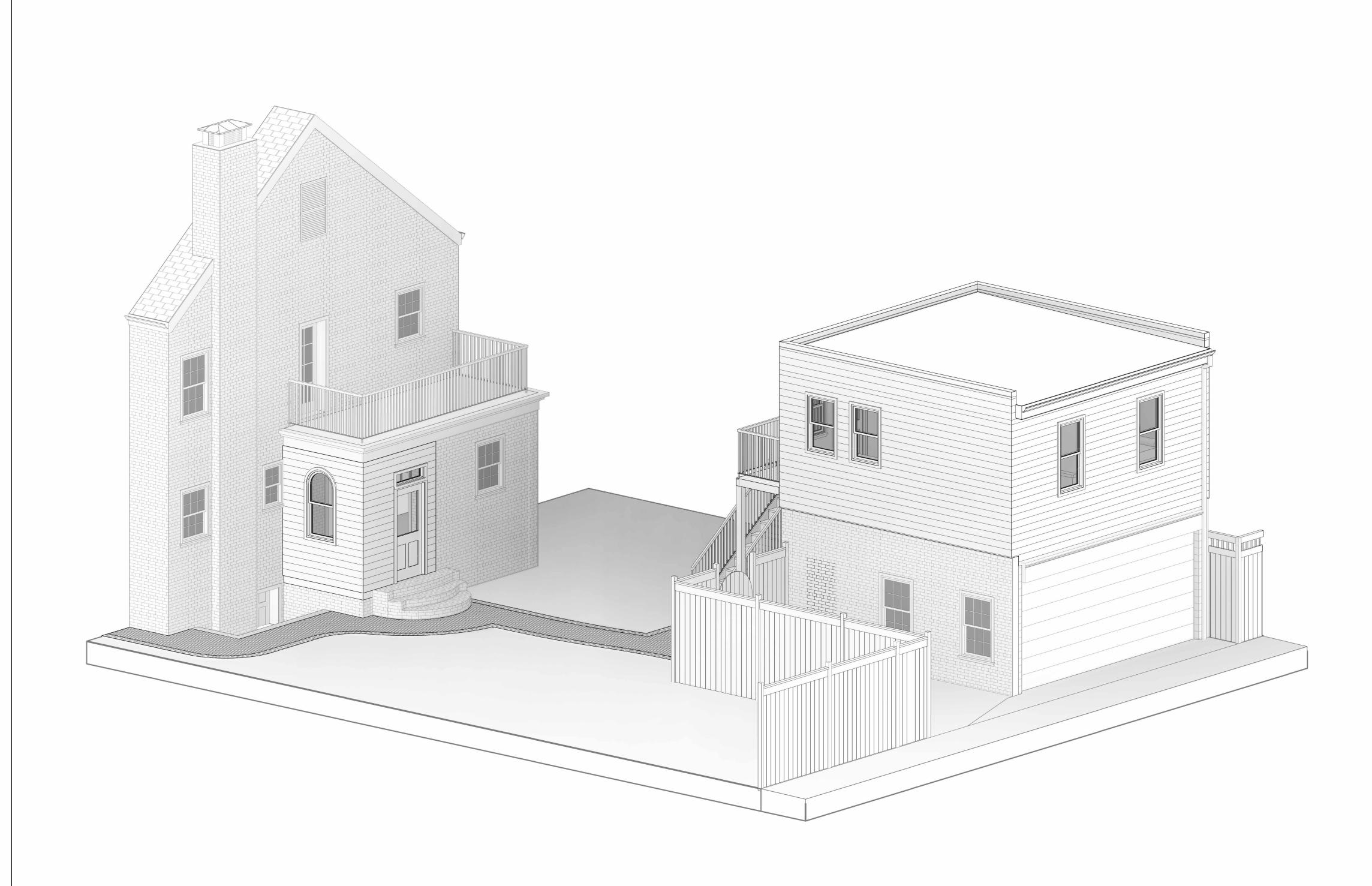
Obsidian, Inc. Charles R. Field, P.E. 417 North 22nd Street Richmond, VA 23223 804.647.1589

obsidianrva@gmail.com

# **Property Information**

Parcel ID Zoning Use **S**etbacks

W0001476019 **R**–6 Residential Front Yard = 15 feet Side Yard = 5 feet Rear Yard = 5 feet Lot Coverage < 55%



G0.1Cover SheetNameAreaG0.2NotesSecond FloorV1.1Site PlanKitchen/Living Area95 SFA1.1Floor PlanOffice88 SFA1.2Floor PlanBath69 SFA2.1ElevationsLinen9 SFA3.1SectionsCloset8 SFA5.1DetailsBedroom126 SFA9.1Exterior RenderingsGrand total395 SFS1.2BracingS7.1CalculationsS7.2CalculationsS7.2Calculations	nts	Room Area Tab	ulation
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A2.1ElevationsLinen9 SFA3.1SectionsCloset8 SFA5.1DetailsBedroom126 SFA5.2Details395 SFA9.1Exterior RenderingsGrand total395 SFS1.2Bracing57.1Calculations		Office	88 SF
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A5.1DetailsBedroom126 SFA5.2Details395 SFA9.1Exterior RenderingsGrand total395 SFS1.1Structure51.2Bracing57.1S7.1Calculations57.1Structure		Linen	9 SF
A5.2Details395 SFA9.1Exterior RenderingsGrand total395 SFS1.1Structure51.2BracingS7.1Calculations57.1Structure		Closet	8 SF
A9.1Exterior RenderingsGrand total395 SFS1.1StructureS1.2BracingS7.1Calculations		Bedroom	126 SF
S1.1 Structure S1.2 Bracing S7.1 Calculations			395 SF
S1.2 Bracing S7.1 Calculations	enderings	Grand total	395 SF
S7.1 Calculations			
S7.2 Calculations	าร		
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# NCS Sheet Identification Standards

Dis	cipline Designators	Sheet Type Designator	0.1
G	General –Sheet list, symbols, code summary	0 General: Symbol legend, abbreviations, general notes	
Н	Hazardous Materials Abatement, handling, etc.	1 Plans	
V	Survey / Mapping	2 Elevations	
В	Geotechnical	3 Sections	
С	Civil	4 Large Scale Drawings: plans, elevations, sections	
L	Landscape	5 Details	
S	Structural	6 Schedules and Diagrams	
Α	Architectural	7 User Defined (Calculations for Obsidian, Inc.)	
1	Interiors	8 User Defined	
Q	Equipment	9 3D drawings: isometric, perspective, photos	
F	Fire <sup>'</sup> Protection		
Р	Plumbing		
D	Process		
М	Mechanical	N-#.##	
Ε	Electrical		
W	Distributed Energy	Sheet Sequence Number	
Т	Telecommunications		
R	Resource Existing conditions / buildings	Sheet Type Designator	
X	Other Disciplines	Discipline Designator	
Ζ	Contractor / Shop Drawings		
0	Operations		

# Scope of Work

Scope of work will generally consist of building a single story ADU on top of existing brick garage, adding a single parking space adjacent to the existing garage, and changing the location of the man-door into the garage, in accordance with the Virginia Residential Code, 2018.

## **General Notes**

- 1. The structure will be constructed in accordance with the 2018 edition of the "Virginia Residential Code", the Virginia Statewide Uniform Building Code and the applicable City of Richmond ordinances.
- 2. The contractor is responsible for compliance with City, State and Federal job site safety requirements. 3. These plans are being provided without the benefit of external review by a third party. The client accepts responsibility for plans as drawn and will notify designer of any deficiencies that may be encountered during plan review or construction. If the contractor or contractors agent discovers missing or in complete details or conflicting items of work, they are obliged to call these items to the attention of the designer. Failure to do so may result in the designer disallowing any claims for cost incurred due to these deficiencies. 4. The contractor shall verify all dimensions and conditions prior to start of work, and any discrepancies will
- immediately be brought to the attention of the engineer.
- 5. Plans and specifications in some instances, do not contain specific instructions for installation or preparation methods. Contractor and their subs are responsible for following ASTM standards and applicable codes
- 6. All decorative elements and finishes are to be selected by owner and/or interior designer and contractor to verify with owner and/or interior designer pertaining to any special requirements for ordering and installation prior to ordering and installation.
- 7. Glazing in windows shall be tempered if the bottom edge is less than 18" above floor, in walls enclosing bathtub or showers, within 24" of arc of either vertical edge of a door, or less than 36" above the plane of stairways or landings. Glazing in all fixed and operable panels of swinging, sliding and bifold doors shall be tempered.
- 8. Carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages. The carbon monoxide detector shall comply with NFPA 720 and UL 2075. 9. Enclosed accessible space under stairs shall have walls, under-stair surface, and any soffits protected on the enclosed side with 1/2" gypsum board.
- 10. Bathrooms and water closet compartments shall be provided with not less than 3 sf of glazing area (onehalf must be operable) or an exhaust fan in compliance with Section M1507 of the code. 11. Provide a fire extinguisher (2-A:10-B:C) in the kitchen area if the home does not contain an approved
- sprinkler system. 12. Smoke alarms shall be installed in the following locations:
- In each sleeping room.
- Outside each separate sleeping area in the immediate vicinity of the bedrooms.
- On each additional story of the dwelling, including basements and habitable attics and not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper
- Smoke alarms shall be installed not less than 3 feet horizontally from the door or opening of a bathroom that contains a bathtub or shower.
- 13. The structure shall be protected from subterranean termites by one of the following methods or a combination of these methods:
  - Chemical termiticide treatment, as provided in Section R318.2.
  - Termite baiting system installed and maintained according to the label.
  - Pressure-preservative-treated wood in accordance with the provisions of Section R317.1.
  - Naturally durable termite-resistant wood.
  - Physical barriers as provided in Section R318.3 and used in locations as specified in Section R317.1.
- 14. Basements, habitable attics, and every sleeping room shall have at least one operable emergency escape and rescue opening. The sill height shall be not more than 44" to the bottom of the clear opening. Openings not on grade level shall have a min net clear opening of 5.7 sf. Openings on grade level or below shall have a min net clear opening of 5 sf. The min clear opening height shall be 24". The min clear opening width shall be 20".
- 15. Attic access shall be provide with a minimum size of 22" x 30"
- 16. All lumber unless otherwise noted is to be Southern Pine No. 2. 17. There will not be a fire sprinkler system.
- 18. There is no proposed fire detection system or alarm.
- 19. The occupancy is Residential Group R-3.
- 20. The construction type is V-B.
- 21. There are 2 stories.
- 22. The house is located in Climate Zone 4.
- 23. VRC 2018 minimum insulation and fenestration requirements: • Fenestration U-factor : 0.32
  - Skylight U-factor : 0.55
  - Ceiling R-value : 49
  - Wood frame wall R-value : 15 cavity or 13 + 1 continuous
  - Mass wall R-value : 8/13
  - Floor R-value : 19
  - Basement wall R-value : 10/13
  - Slab R-value & depth: 10, 2ft
- Crawlspace wall R-value : 10/13
- 24. Load criteria: • Bearing soil capacity = 1500 psf\*
  - Floor live load = 40 psf
  - Floor dead load = 10 psf
  - Roof live load = 20 psf
  - Roof dead load = 10 psf
  - Snow loads = 20 psf • Basic Wind speed = 115 mph
  - Seismic Category: B.
  - Exposure: B.

• In lieu of a complete geotechnical evaluation, the load-bearing values in Table R401.4.1 has been assumed.

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### **General Notes**

- 1. The general contractor and each trade contractor shall be required to check and be responsible for conformance of these plans with all requirements of the Virginia Uniform Statewide Building Code in force at the time of construction, local ordinances & construction requirements, and manufacturers recommendations prior to beginning work and during construction.
- 2. During construction the contractor may expose conditions that are unstable or unsafe. If the contractor finds such conditions, he shall take emergency action to stabilize the conditions and notify the owner and architect immediately.
- 3. The drawings are diagrammatic, intending to outline general design requirements only and are not intended to be complete in all details. specific implementation of the plans shall be the responsibility of the general
- contractor 4. The general contractor and each trade contractor shall protect theirs and others work from damage due to their operation and shall repair or replace,
- as required, all damaged work to the satisfaction of the owner. 5. Protect existing construction to remain. If existing construction to remain is damaged during construction, the contractor shall repair or replace damaged
- areas to match the original condition. 6. Measurements and working conditions for all work shall be taken at the site and coordinated with connecting work with each other trade contractor. All walls are drawn @ 4" width with dimension taken edge to edge. Adjust as
- needed for prefabricated tubs, stairs, and other appliances. 7. Each trade contractor shall verify these drawings before laying out or proceeding with work and shall be held responsible for any errors resulting from their failure to exercise such verification.
- 8. The general contractor is responsible for coordination of the design of the site, HVAC, plumbing, and electrical trade contractors. Any plumbing, HVAC, or electric diagrams included in this plan are only provided as a guide to placement, not necessarily the final placement.
- 9. Smoke detectors are required in each bedroom or sleeping space and in adjacent entry space and on each level of the dwelling.

### Exterior

- 1. Exterior details (eg: columns, shutters, decorative items, etc.) Are shown for illustrative purposes only. Window and door grill patterns are illustrative only and will be determined by the manufacturer of the window specified or by the general contractor. The general contractor and trade contractor will determine final placement and materials for all exterior details as well as requirements for exposure of siding reveal and other items that may be fastened to the exterior cladding or veneer.
- 2. Exterior detail may vary as predicted in elevation drawings. Field conditions and material variabilities or selections may affect final feature considerations and design.

### Framing

- 1. Sawn lumber shall be identified by a grade mark of an accredited lumber grading or inspection agency and have design values certified by an accreditation body that complies with DOC PS 20.
- 2. Glued-laminated timbers shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D 3737.
- 3. All framing lumber unless otherwise noted shall be SP #2 or better and have a minimum fb=1,200 psi, fv=90 ps, and e=1,400,000 PSI. All laminated veneer lumber shall have minimum fb=2,800 psi, fv=285 psi, and e=2,000,000 psi.
- 4. Wood structural panel sheathing shall conform to DOC PS 1, DOC PS 2 or, when manufactured in Canada, CSA O437 or CSA O325. Panels shall be identified for grade, bond classification, and performance category by a grade
- 5. Truss drawings on architectural plans are intended to be diagrammatic only. Sealed manufacturer's truss drawings are required to be submitted with these drawings
- 6. Braced wall panels to be placed in accordance with IRC §R602.10 or engineer design as indicated on plan. Where IRC proscriptive methods are used and indicated on plan minimum dimension of panel will govern placement of rough openings for openings in exterior and interior walls and may override center dimension of opening shown.
- Where access is provided to attic areas over two story homes where a future room may be constructed first floor walls to be framed in accordance with IRC §R603.2.1 and tables R602.3(5) and R602.3.1.
- Rafters framed to ridge members (ridge, hip, valley) labeled beam are
- required to be mechanically fastened with minimum Simpson A35 or equal. 9. Where applicable temporary truss bracing will be the responsibility of the general contractor and his agents and will follow recommendations of the truss plate institute's guide "BCSI 1-03 Guide to Good Practice for Handling, Installing, & Bracing of Metal Plate Connected Wood Trusses." 10. Exterior walls of woodframe construction shall be designed and constructed
- 11. accordance with the provisions of Chapter 6 and Figures R602.3(1) and R602.3(2), or in accordance with AWC NDS.
- 12. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4).
- 13. Wall sheathing shall be fastened directly to framing members and, where placed on the exterior side of an exterior wall, shall be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) and
- 14. shall conform to the requirements of Table R602.3(3). 15. Wall sheathing used only for exterior wall covering purposes shall comply with Section R703.
- 16. Studs shall be continuous from support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.
- Jack studs, trimmer studs and cripple studs at openings in walls that comply with Tables R602.7(1) and R602.7(2). 17. The size, height and spacing of studs shall be in accordance with Table
- 18. R602.3.(5).

studs

- 19. Studs shall be minimum Southern Pine No. 2 grade lumber
- 20. Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions.
- 21. End joints in top plates shall be offset not less than 24 inches. 22. Joints in plates need not occur over studs. Plates shall be not less than 2inches nominal thickness and have a width not less than the width of the
- 23. Studs shall have full bearing on a nominal 2-by or larger plate or sill having a width not less than to the width of the studs.

### Egress / Windows / Doors

- 1. All egress openings from bedrooms shall have a minimum net clear opening of 5.7 square feet, be not more than 44" from finished floor to sill height, and have a minimum net clear opening height of 24" and width of 20".
- 2. Contractor to verify height of window sill above grade and determine need for guard rail or other remedy if over 6' from finished grade at exterior.
- 3. All exterior openings shall be protected from water intrusion by generally accepted building practices and as required by the Virginia USBC.
- 4. Handrails shall be continuous, the full length of the stairs and ends shall be returned or terminated in newel posts. Handgrip portions shall not be more than 2-5/8" in cross sectional dimension or as approved by the building official.

### Footing

- 1. Since the house is not located in a shrink swell area, in lieu of a complete geotechnical evaluation, the load-bearing values shall be assumed to be 1500psi as per Table R401.4.1.
- 2. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:
- a. Extended below the frost line specified in Table R301.2.(1), 18".
- b. Constructed in accordance with Section R403.3. c. Constructed in accordance with ASCE 32.
- d. Erected on solid rock.
- 3. Exceptions:
- a. Protection of freestanding accessory structures with an area of 600 square feet (56 m2) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
- b. Protection of freestanding accessory structures with an area of 400 square feet (37 m2) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required. c. Decks not supported by a dwelling need not be provided with footings
- that extend below the frost line. 4. The footings shall be placed on clean undisturbed soil or compacted fill
- verified by an independent engineering firm. 5. The design does not allow for variation in bearing unless otherwise noted.
- 6. Concrete to be minimum compressive strength of 3000psi and shall comply with Section R608.5.1 concrete material requirements as referenced by IRC §R402.2 7. Concrete shall be placed with a slump of 4"
- 8. Concrete exposed to weather shall have 6% air entrainment.
- 9. Concrete shall be thoroughly compacted and vibrated during placement and around embedded items and into corners of forms.
- 10. All reinforcing bar placed in concrete shall have a minimum 3" cover to all
- 11. Reinforcing bars shall be deformed conforming to ASTM A-615, grade 60 (fy–60 ksi)
- 12. Do not backfill against walls retaining earth until masonry or concrete has cured for 28 days.
- 13. Backfill shall be placed in 8" loose layers and compacted to 95% of dry density in accordance with ASTM D698.
- 14. Footings shall be a minimum of 18" deep.

# Foundation

- 1. Grout collar joint solid in composite masonry foundation wall construction under all bearing points where indicated on plan. 2. In areas where columns or posts are shown on foundation plan the CMU
- cells shall be filled solid. 3. Brick columns supporting raised decks and porches shall be filled solid from
- footing to cap. 4. Foundation walls that retain earth and enclose interior spaces and floors below grade shall be dampproofed from the higher of (a) the top of the footing or (b) 6 inches below the top of the basement floor, to the finished grade. Masonry walls shall have not less than 3/8 inch Portland cement parging applied to the exterior of the wall. The parging shall be dampproofed in accordance with one of the following:
- a. Bituminous coating.
- b. Three pounds per square yard of acrylic modified cement. c. One-eighth-inch coat of surface-bonding cement complying with ASTM C 887.
- d. Any material permitted for waterproofing in Section R406.2. 5. All sills in contact with masonry to be pressure treated (PT) material. Fasteners in contact with PT material to be hot dipped galvanized
- conforming to ASTM A153 except foundation bolts greater than 1/2"dia. 6. Wood sill plates shall be anchored to the foundation with minimum 1/2-inch board or directly opposite from each other with a gusset plate as a tie. diameter anchor bolts spaced a maximum of 6 feet on center or *approved* Ridge board shall be not less than 1-inch nominal thickness and not less in anchors or anchor straps spaced as required to provide equivalent anchorage depth than the cut end of the rafter. to 1/2-inch-diameter (12.7 mm) anchor bolts. Bolts shall extend a minimum 8. At valleys and hips there shall be a valley or hip rafter not less than 2-inch of 7 inches into concrete or grouted cells of concrete masonry units. The nominal thickness and not less in depth than the cut end of the rafter. bolts shall be located in the middle third of the width of the plate. A nut Hip and valley rafters shall be supported at the ridge by a brace to a and washer shall be tightened on each anchor bolt. There shall be a minimum bearing partition or be designed to carry and distribute the specific load at of two bolts per plate section with one bolt located not more than 12 inches that point. or less than seven bolt diameters from each end of the plate section.

# Drainage

- 1. Foundation walls that retain earth and enclose interior spaces and floors below grade shall be dampproofed from the higher of (a) the top of the footing or (b) 6 inches below the top of the basement floor, to the finished grade. Masonry walls shall have not less than 3/8-inch Portland cement parging applied to the exterior of the wall. The parging shall be dampproofed in accordance with one of the following:
- Bituminous coating: three pounds per square yard (1.63 kg/m2) of acrylic modified cement. • One-eighth-inch coat of surface-bonding cement complying with ASTM
- C887.
- Other approved methods or materials. • Exception: Parging of unit masonry walls is not required where a
- material is approved for direct application to the masonry 2. Drains shall be provided around concrete or masonry foundations that retain earth and enclose habitable or usable spaces located below grade. Drainage tiles, gravel or crushed stone drains, perforated pipe or other approved systems or materials shall be installed at or below the top of the footing or below the bottom of the slab and shall discharge by gravity or mechanical means into an approved drainage system. Gravel or crushed stone drains shall extend not less than 1 foot beyond the outside edge of the footing and 6 inches above the top of the footing and be covered with an approved filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Except where otherwise recommended by the drain manufacturer, perforated drains shall be surrounded with an approved filter membrane or the filter membrane shall cover the washed gravel or crushed rock covering the drain. Drainage tiles or perforated pipe shall be placed on not less than 2 inches of washed gravel or crushed rock not less than one sieve size larger than the tile joint opening or perforation and covered with not less than 6 inches of the same material.
- 3. Window wells and bulkhead enclosures shall be designed for proper drainage by connecting to the building's foundation drainage system.
- 4. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches within the first 10 feet.

• **Exception:** Where *lot lines*, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be constructed to ensure drainage away from the structure. 5. Impervious surfaces within 10 feet of the building foundation shall be sloped

a minimum of 2 percent away from the building.

Print plans at 24" x 36", Arch D

# Ventilation

# Crawlspace

- 1. The under-floor space between the bottom of the floor joists and the earth under the building shall have ventilation openings through foundation walls or exterior walls. The minimum net area of ventilation openings shall be not less than 1 square foot for each 150 square feet of under-floor space area. One such ventilating opening shall be within 3 feet of each corner of the building.
- 2. Ventilation openings shall be covered for their height and width with any of the following materials provided that the least dimension of the covering shall not exceed 1/4 inch (6.4 mm):
- Perforated sheet metal plates not less than 0.070 inch thick.
- Expanded sheet metal plates not less than 0.047 inch thick. • Cast-iron grill or grating.
- Extruded load-bearing brick vents.
- Hardware cloth of 0.035 inch wire or heavier.
- Corrosion-resistant wire mesh, with the least dimension being 1/8 inch thick.

# Roof

- Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow.
- 2. Ventilation openings shall have a least dimension of 1/16 inch minimum and 1/4 inch maximum
- 3. Ventilation openings having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth or similar material with openings having a least dimension of 1/16 inch minimum and 1/4 inch maximum.
- 4. Required ventilation openings shall open directly to the outside air. 5. The minimum net free ventilating area shall be 1/150 of the area of the vented space.
- 6. Where eave or cornice vents are installed, insulation shall not block the free flow of air. Not less than a 1-inch space shall be provided between the insulation and the roof sheathing and at the location of the vent.
- 7. Ventilators shall be installed in accordance with manufacturer's instructions. 8. Installation of ventilators in roof systems shall be in accordance with the requirements of Section R903.
- 9. Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

# Roofing

- 1. The home shall have a controlled method of water disposal from roofs that will collect and discharge roof drainage to the ground surface not less than 5 feet (1524 mm) from foundation walls or to an *approved* drainage system. Ice and water shield shall be applied at the eaves to 24" inside the exterior
- wall line. All valley's to be lined with ice and water shield or equivalent. 3. Drip edge shall be installed on all roof edges. Install drip edge on eaves first with underlayment installed over the drip edge. Install drip edge on
- rakes after underlayment is installed, with the drip edge fastened over the 4. Underlayment. Joints in drip edge shall be lapped minimum 2 in with the upslope piece lapped over the down slope piece. Install fastener 8 in to 10 in on center, approximately 1-3/4 in (44 mm) from the outside edge of the drip
- 5. Rafters shall be framed not more than 11/2-inches offset from each other to

- 10. Where the roof pitch is less than three units vertical in 12 units horizontal (25-percent slope), structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams. 11. Where ceiling joists are not connected to the rafters at the top wall plate,
- joists connected higher in the *attic* shall be installed as rafter ties, or rafter ties shall be installed to provide a continuous tie. 12. Where ceiling joists are not parallel to rafters, rafter ties shall be installed.
- Rafter ties shall be not less than 2 inches by 4 inches (nominal), installed in accordance with the connection requirements in Table R802.5.1(9), or connections of equivalent capacities shall be provided.
- 13. Where ceiling joists or rafter ties are not provided, the ridge formed by these rafters shall be supported by a wall or girder designed in accordance with accepted engineering practice.
- 14. Collar ties or ridge straps to resist wind uplift shall be connected in the upper third of the attic space with 4-10d box (3" x 0.128"); or 3-10d common  $(3" \times 0.148")$ ; or 4-3"  $\times$  0.131" nails faced nailed to each rafter.
- 15. Collar ties shall be not less than 1 inch by 4 inches (nominal), spaced not more than 4 feet on center.
- 16. Ends of ceiling joists shall be lapped not less than 3 inches 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.
- 17. Joists that do not resist thrust shall be permitted to be nailed in accordance with Table R602.3(1).
- 18. Wood structural panels shall conform to DOC PS 1, DOC PS 2, CSA 0437 or CSA 0325, and shall be identified for grade, bond classification and performance category by a grade mark or certificate of inspection issued by an *approved* agency. Wood structural panels shall comply with the grades specified in Table R503.2.1.1(1).
- 19. Roofing material dead loads based on: 40 yr composite shingle: 3.0 lbs/sf 11 lbs/sf ouarried slate: concrete tile: 12.5 lbs/sf

# Decks

1. Decks to be constructed in accordance with the IRC Section R507 in force at the issuance of the building permit as illustrated by the American Forest and Paper Associations Guide for Prescriptive Residential Wood Deck Construction (https://awc.org/codes-standards/publications/dca6)

# Stairways

- 1. Width. Stairways shall be not less than 36 inches in clear width at all points above the permitted handrail height and below the required headroom height. The clear width of stairways at and below the handrail height, including treads and landings, shall be not less than 311/2 inches where a handrail is installed on one side and 27 inches where handrails are installed on both sides.
- 2. **Headroom**. The headroom in stairways shall be not less than 6 feet 8 inches measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway.
- 3. Vertical rise. A flight of stairs shall not have a vertical rise larger than 151 inches between floor levels or landings.
- 4. **Risers.** The riser height shall be not more than 8 1/4" inches. The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch. Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees from the vertical. At open risers, openings located more than 30 inches, as measured vertically, to the floor or grade below shall not permit the passage of a 4-inch-diameter sphere.
- 5. Treads. The tread depth shall be not less than 9 inches. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch.
- 6. Nosings. Nosings at treads, landings and floors of stairways shall have a radius of curvature at the nosing not greater than 9/16 inch (14 mm) or a bevel not greater than 1/2 inch (12.7 mm). A nosing projection not less than 3/4 inch (19 mm) and not more than 11/4 inches (32 mm) shall be provided on stairways. The greatest nosing projection shall not exceed the smallest nosing projection by more than 3/8 inch (9.5 mm) within a stairway.
- 7. Landings. There shall be a floor or landing at the top and bottom of each stairway. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).
- 8. Handrails. Handrails shall be provided on not less than one side of each flight of stairs with four or more risers. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches and not more than 38 inches. Handrails shall not project more than 41/2 inches on either side of the stairway. Handrails adjacent to a wall shall have a space of not less than 1 1/2" inches between the wall and the handrails. Handrails shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Required handrails shall be of one of the following types or provide equivalent graspability.
- a. Type I. Handrails with a circular cross section shall have an outside diameter of not less than 11/4 inches and not greater than 2 inches. If the handrail is not circular, it shall have a perimeter of not less than 4 inches and not greater than 61/4 inches and a cross section of not more than 21/4 inches
- b. Type II. Handrails with a perimeter greater than 61/4 inches shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within 3/4 inch measured vertically from the tallest portion of the profile and have a depth of not less than 5/16 inch within 7/8 inch below the widest portion of the profile. This required depth shall continue for not less than 3/8 inch to a level that is not less than 13/4 inches below the tallest portion of the profile. The width of the handrail above the recess shall be not less than 11/4 inches and not more than 23/4 inches.

# Glazing

- 1. Each pane of glazing installed in hazardous locations shall be provided with a manufacturer's designation specifying who applied the designation, the type of glass and the safety glazing standard with which it complies, and that is visible in the final installation.
- 2. Regular, float, wired or patterned glass in jalousies and louvered windows shall be not less than nominal 3/16 inch thick and not more than 48 inches in length. Exposed glass edges shall be smooth.
- 3. Glazing in fixed and operable panels of swinging, sliding and bifold doors shall be considered to be a hazardous location. 4. Glazing in an individual fixed or operable panel adjacent to a door shall be
- considered to be a hazardous location where the bottom exposed edge of the glazing is less than 60 inches above the floor or walking surface and it meets either of the following conditions:
- A. Where the glazing is within 24 inches of either side of the door in the plane of the door in a closed position.
- B. Where the glazing is on a wall less than 180 degrees from the plane of the door in a closed position and within 24 inches of the hinge side of an in-swinging door.
- 5. Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered to be a hazardous location:
- A. The exposed area of an individual pane is larger than 9 square feet. B. The bottom edge of the glazing is less than 18 inches above the floor. C. The top edge of the glazing is more than 36 inches above the floor.
- D. One or more walking surfaces are within 36 inches, measured horizontally and in a straight line, of the glazing.
- 6. Glazing in guards and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered to be a hazardous location.
- 7. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60 inches measured vertically above any standing or walking surface shall be considered to be a hazardous location. This shall apply to single glazing and each pane in multiple glazing. Exception: Glazing that is more than 60 inches, measured horizontally and in a straight line, from the water's edge of a bathtub, hot tub, spa, whirlpool or swimming pool or from the edge of a shower, sauna or steam room.
- 8. Glazing where the bottom exposed edge of the glazing is less than 36 inches above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps shall be considered to be a hazardous location.
- A. Exceptions: Where glazing is adjacent to a walking surface and a horizontal rail is installed at 34 to 38 inches above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot without contacting the glass and have a cross-sectional height of not less than 11/2 inches.
- B. Glazing 36 inches or more measured horizontally from the walking surface. 9. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within a 60-inch horizontal arc less than 180 degrees (3.14 rad) from the bottom tread nosing
- shall be considered to be a hazardous location. A. Exception: Where the glazing is protected by a *guard* complying with Section R312 and the plane of the glass is more than 18 inches (457 mm) from the guard.

### Smoke Alarms

- 1. Smoke alarms shall comply with NFPA 72
- 2. Smoke alarms shall be listed in accordance with UL 217. Combination smoke and carbon monoxide alarms shall be listed in accordance with UL 217 and UL 2034. 3. Smoke alarms shall be installed in the following locations:
- In each sleeping room.
- Outside each separate sleeping area in the immediate vicinity of the bedrooms. • On each additional story of the dwelling, including basements and habitable attics and not including crawl spaces and uninhabitable attics.
- 4. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.
- Smoke alarms shall be installed not less than 3 feet horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by this section.
- Where more than one smoke alarm is required to be installed within an individual dwelling unit the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. Combination smoke and carbon monoxide alarms shall be permitted to be used in lieu of smoke
- alarms. Smoke alarms shall receive their primary power from the building wiring where such wiring is served
- from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

### Carbon Monoxide Alarms

- Carbon monoxide alarms shall be listed in accordance with UL 2034. Combination carbon monoxide
- and smoke alarms shall be listed in accordance with UL 2034 and UL 217. Carbon monoxide alarms shall be provided in accordance with Sections R315.2.1 and R315.2.2
- Carbon monoxide alarms shall be provided in dwelling units where either or both of the following conditions exist.
- The dwelling unit contains a fuel-fired appliance.
- The dwelling unit has an attached garage with an opening that communicates with the dwelling unit.
- Carbon monoxide alarms in dwelling units shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms.
- Where a fuel-burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.
- Combination carbon monoxide and smoke alarms shall be permitted to be used in lieu of carbon monoxide alarms. Where more than one carbon monoxide alarm is required to be installed, the alarm devices shall be
- interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical interconnection of carbon monoxide alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.
- Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Exceptions: • Carbon monoxide alarms shall be permitted to be battery operated where installed in
- buildings without commercial power. • Carbon monoxide alarms installed in accordance with Section R315.2.2 shall be permitted to

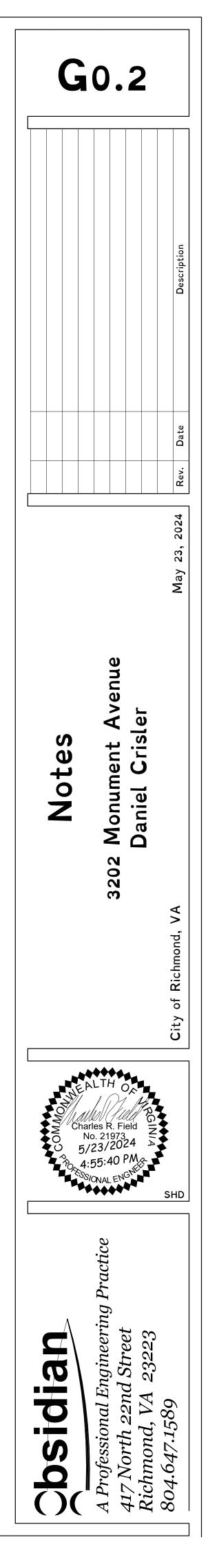
### Flashing

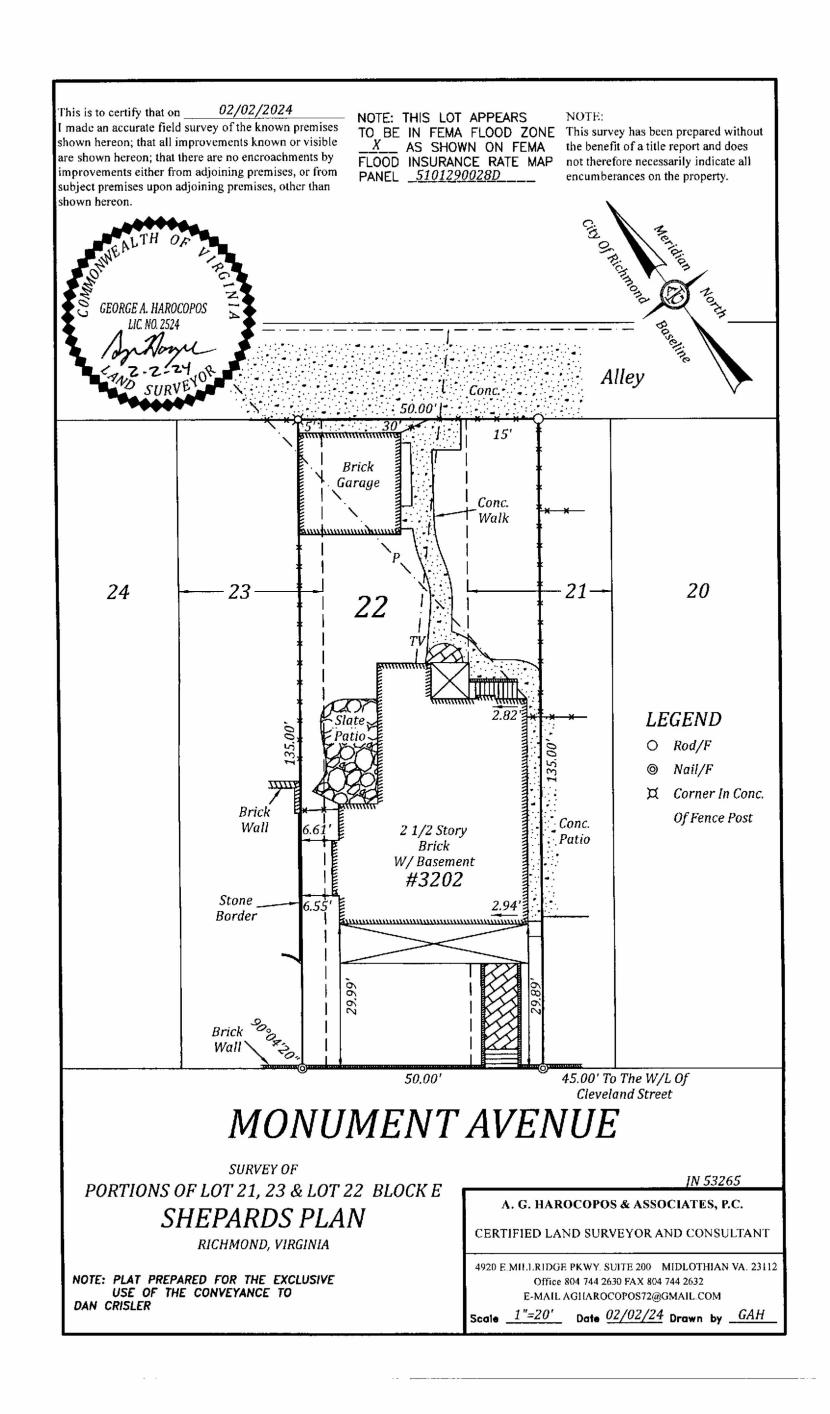
be battery powered.

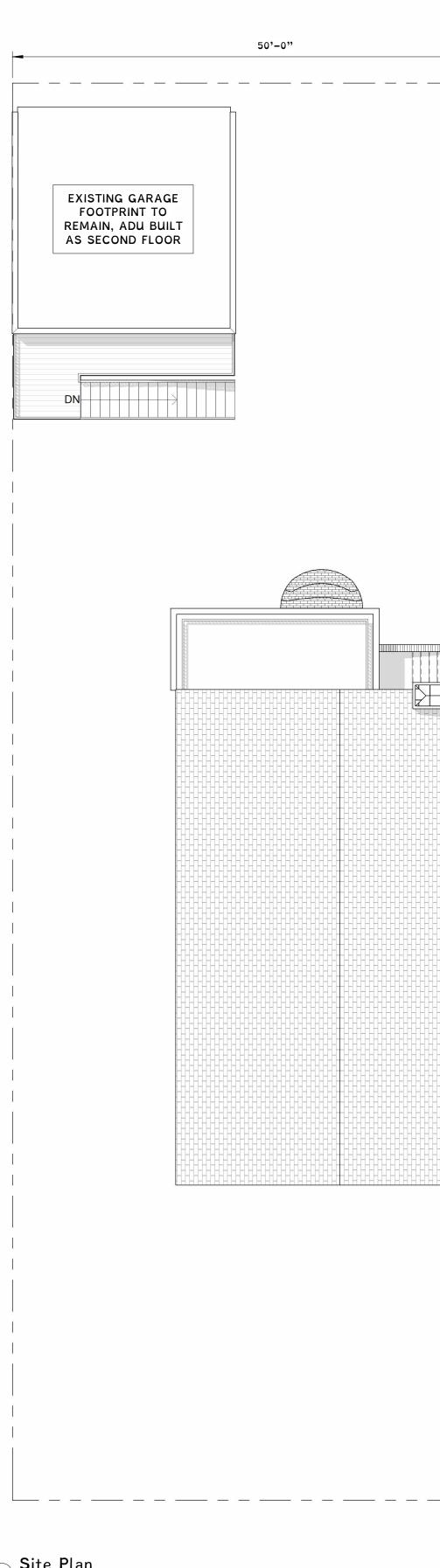
- Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at the following locations:
- A. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:
- a. The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the waterresistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides.
- b. In accordance with the flashing design or method of a registered design professional. c. In accordance with other approved methods.
- B. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
- C. Under and at the ends of masonry, wood or metal copings and sills.
- D. Continuously above all projecting wood trim. E. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame
- construction. F. At wall and roof intersections.
- **G**. At built-in gutters.

### Attic Access

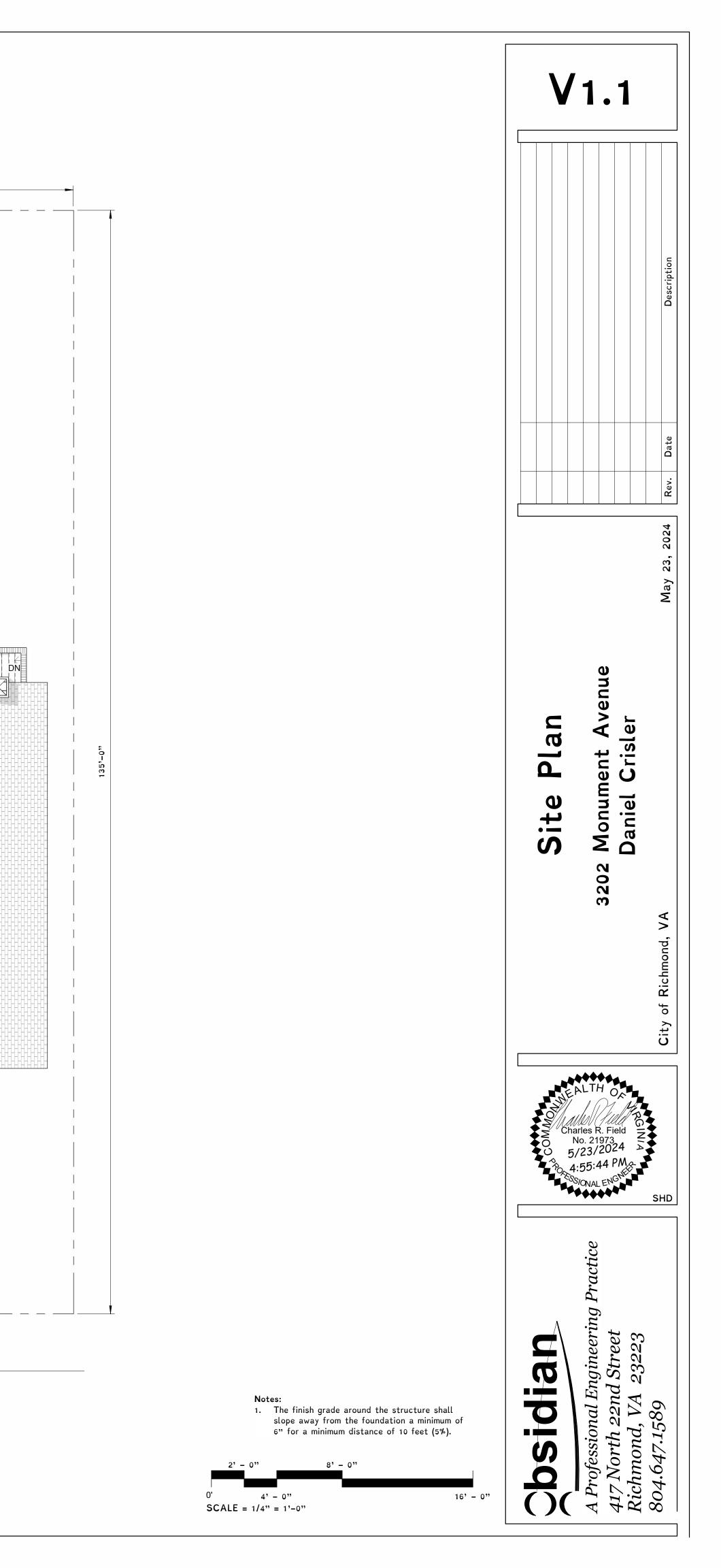
- 1. Buildings with combustible ceiling or roof construction shall have an attic access opening to attic areas that have a vertical height of 30 inches or greater over an area of not less than 30 square feet. The vertical height shall be measured from the top of the ceiling framing members to the underside of the roof framing members.
- 2. The rough-framed opening shall be not less than 22 inches by 30 inches (559 mm by 762 mm) and shall be located in a hallway or other location with ready access. Where located in a wall, the opening shall be not less than 22 inches wide by 30 inches high (559 mm wide by 762 mm high). Where the access is located in a ceiling, minimum unobstructed headroom in the attic space shall be 30 inches (762 mm) at some point above the access measured vertically from the bottom of ceiling framing members. See Section M1305.1.3 for access requirements where mechanical equipment is located in attics.

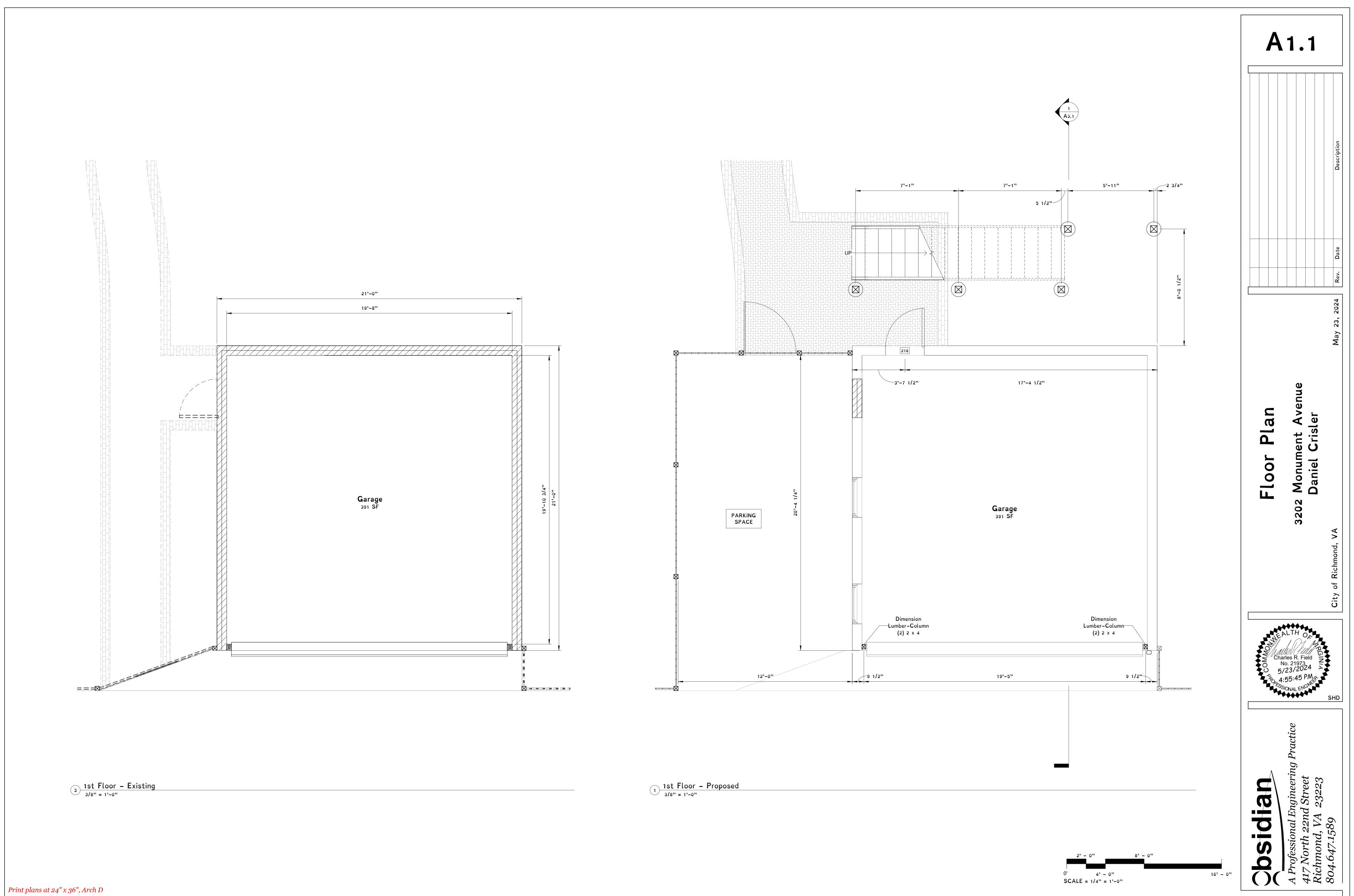


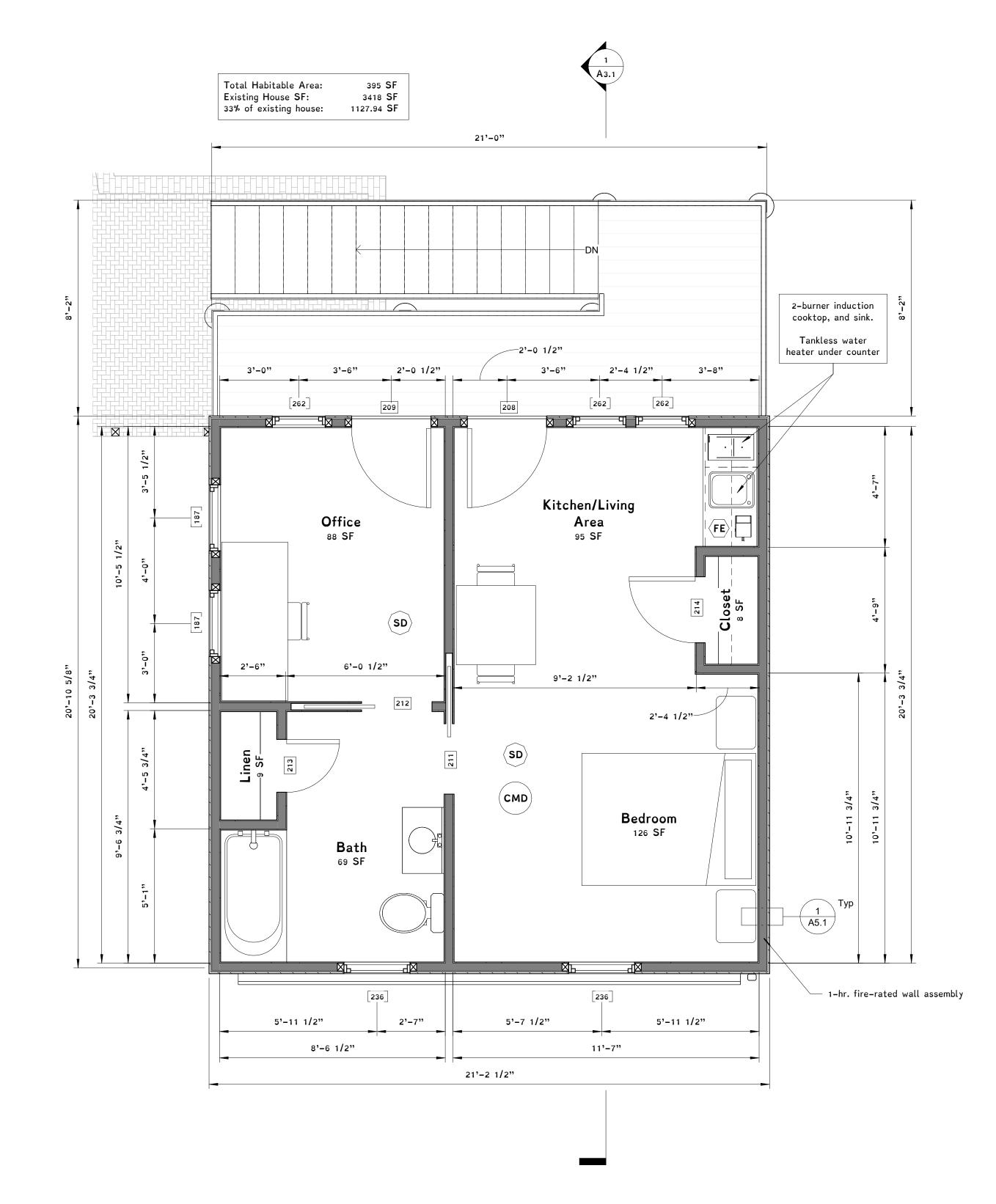




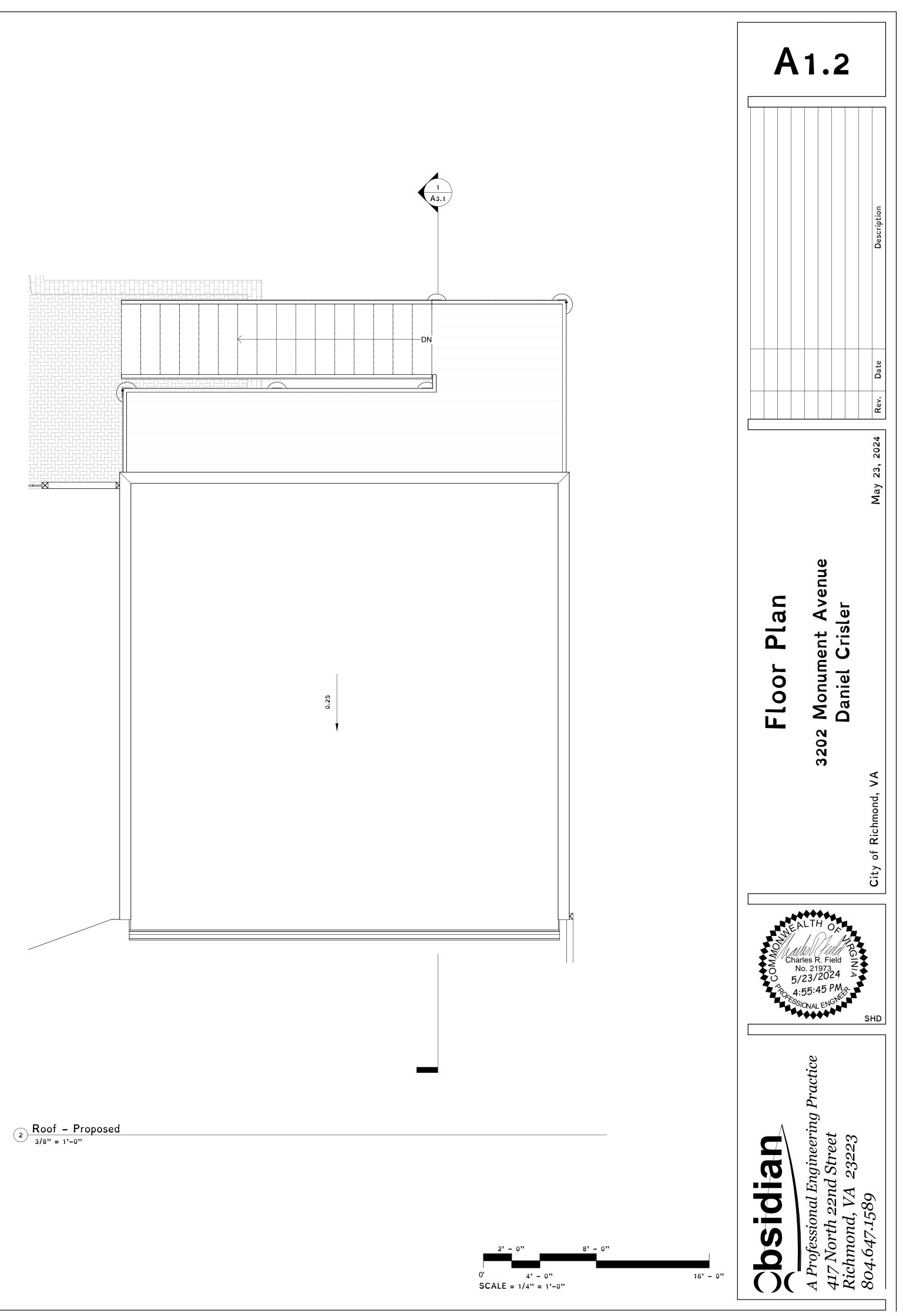
1 Site Plan 1/8" = 1'-0"





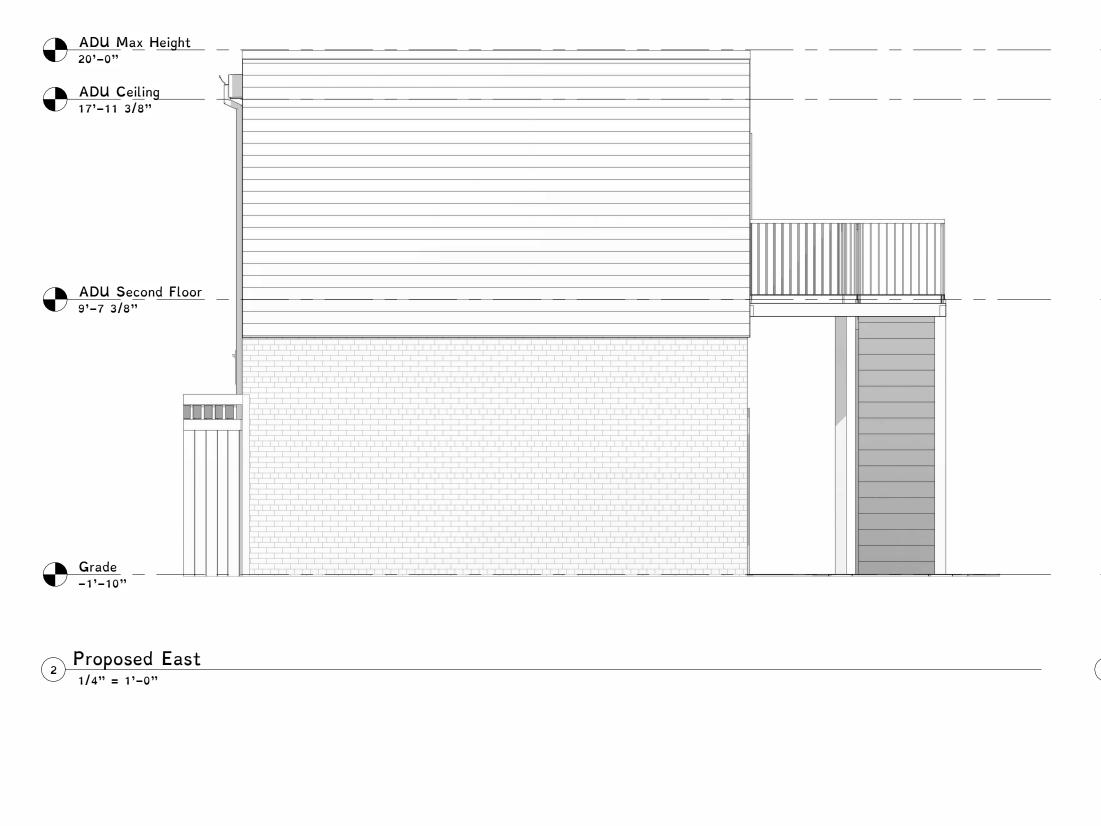


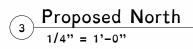
 $1 \frac{2nd \ Floor - Proposed}{3/8" = 1'-0"}$ 



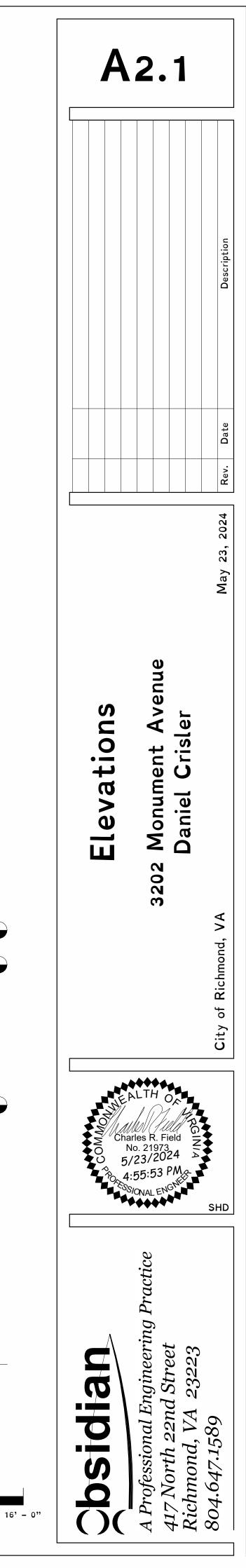


4 Proposed South 1/4" = 1'-0"

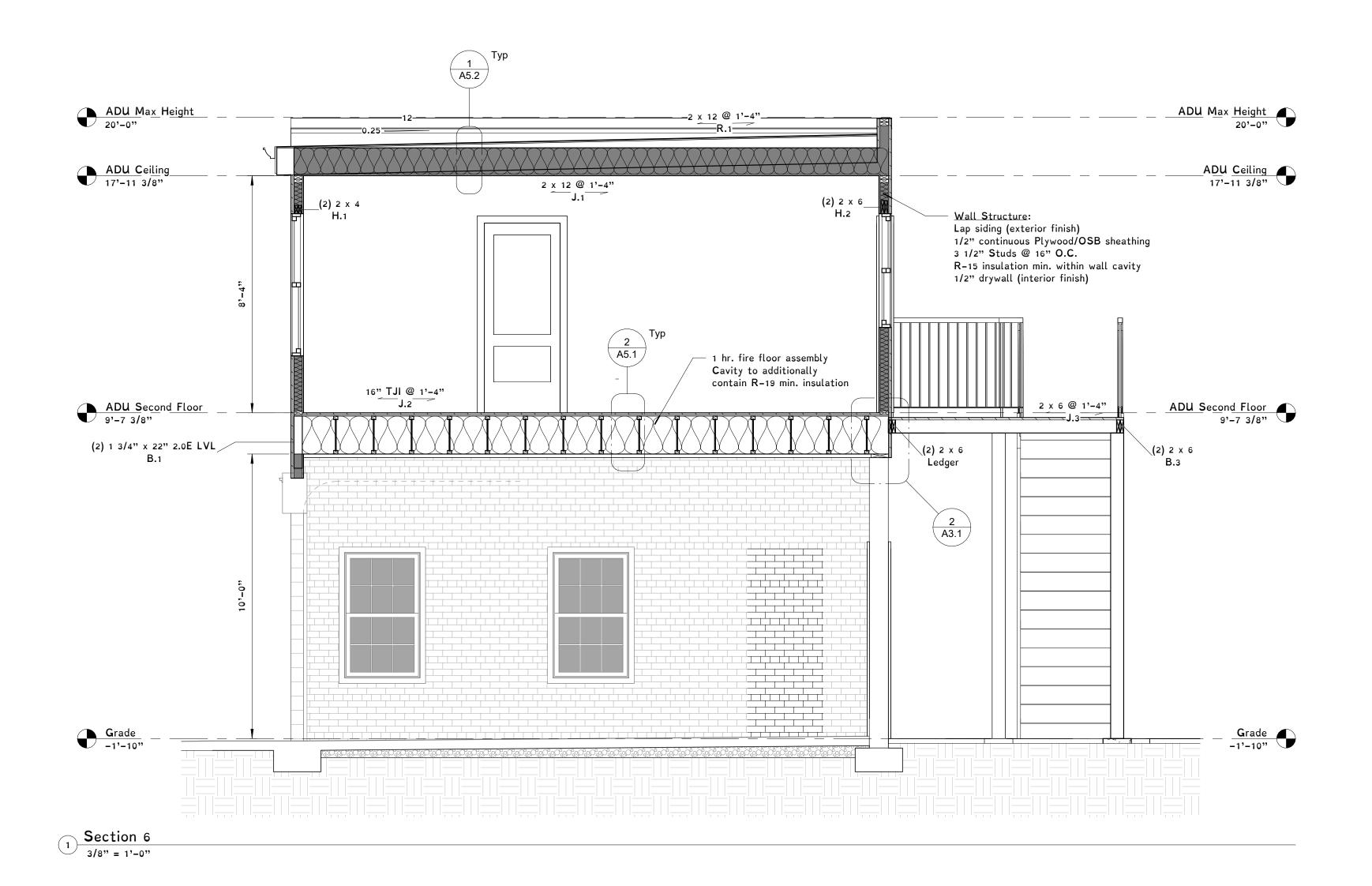








0' 4' - 0" SCALE = 1/4" = 1'-0"



Sill Height

2'-0"

2'-0"

3'-0"

3'-0"

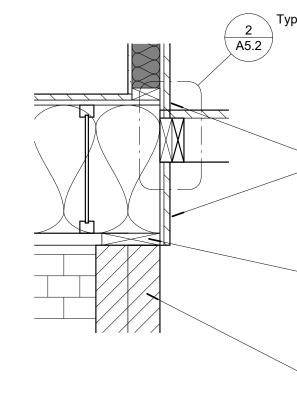
3'-0"

3'-0"

3'-0"

# Window Schedule

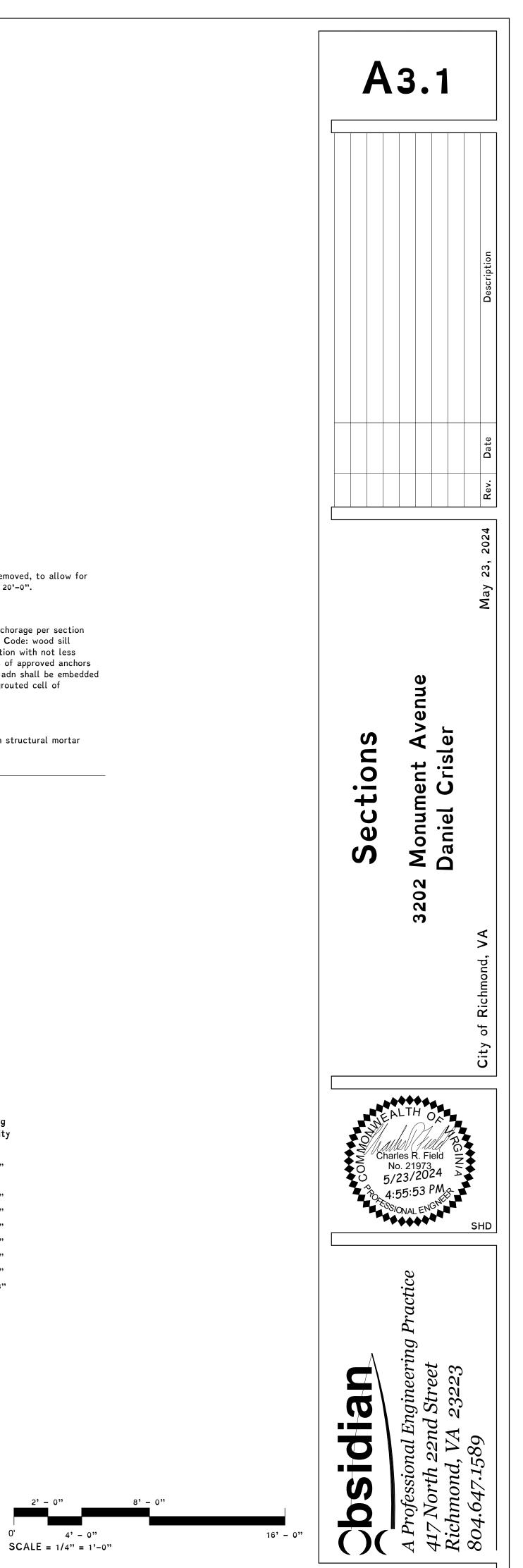
Type Mark	Family	Count	Width	Height
ADU Second Floor				
236	Window-Double-Hung	1	2'-6"	5'-0"
236	Window-Double-Hung	1	2'-6"	5'-0"
262	Window-Double-Hung	1	2'-0"	4'-0"
187	Window-Double-Hung	1	2'-6"	4'-0"
262	Window-Double-Hung	1	2'-0"	4'-0"
262	Window-Double-Hung	1	2'-0"	4'-0"
187	Window-Double-Hung	1	2'-6"	4'-0"



2 Section 6 - Callout 1 1" = 1'-0"

Door	Schedule
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Header	Casing Quantity	Sill Quantity	Mark	Family	Width	Height
			Grade			
H.1 (2) 2 x 4	12'-6"	3'-2"	218	Single- Exterior windowed door	2'-8"	6'-8"
H.1 (2) 2 x 4	12'-6"	3'-2"	ADU Second Floor			
H.2 (2) 2 x 6	10'-0"	2'-8"	208	Single- Exterior windowed door	3'-0"	6'-8"
H.1 (2) 2 x 4	10'-6"	3'-2"	209	Single- Exterior windowed door	3'-0"	6'-8"
H.1 (2) 2 x 4	10'-0"	2'-8"	211	Single Pocket Door	2'-8"	6'-8"
H.1 (2) 2 x 4	10'-0"	2'-8"	212	Single Pocket Door	2'-8"	6'-8"
H.1 (2) 2 x 4	10'-6"	3'-2"	213	Single–Panel 6	2'-0"	6'-8"
	76'-0"	20'-8"	214	Single–Panel 6	2'-6"	6'-8"



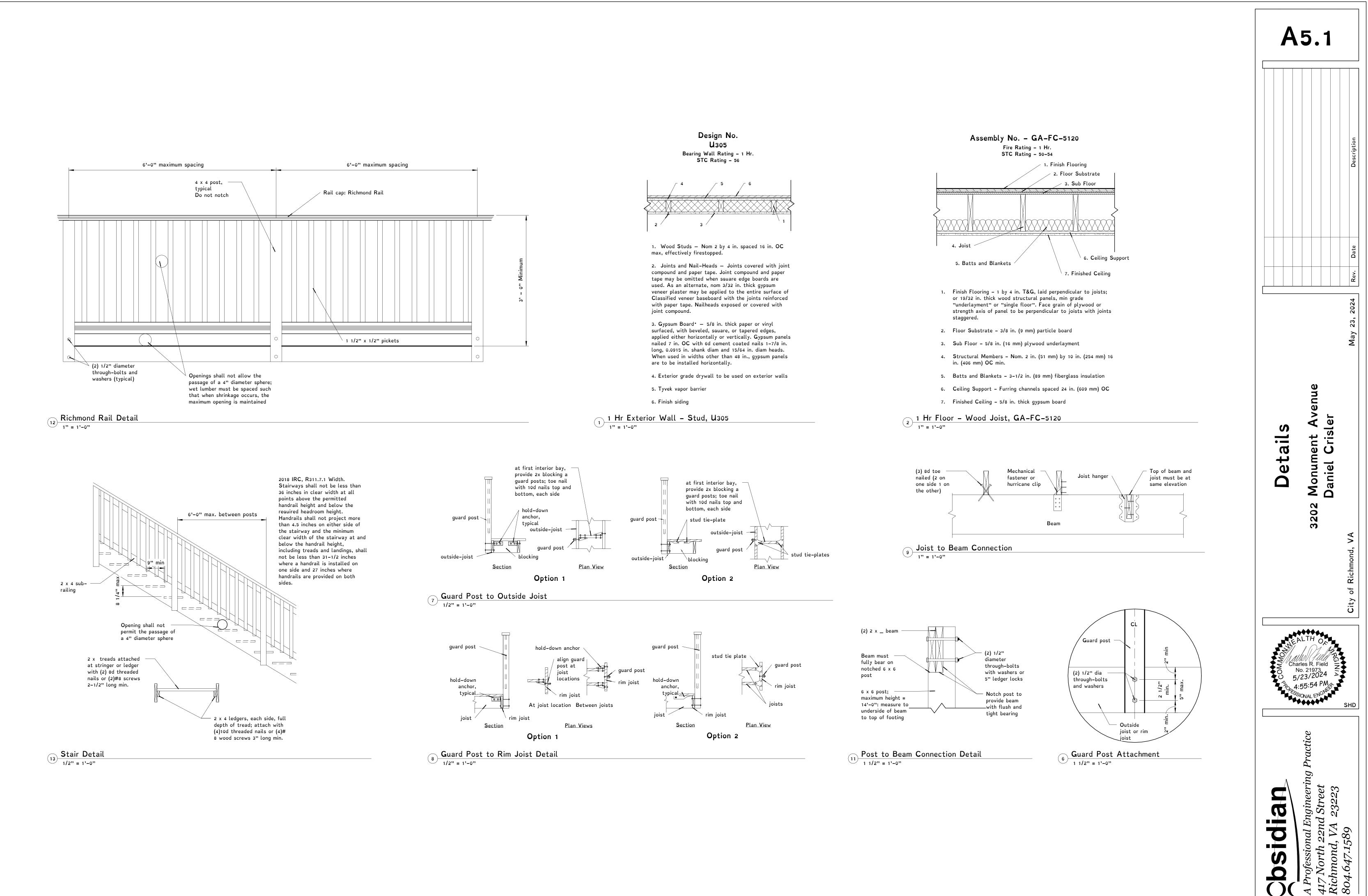
Portion of existing parapet to be removed, to allow for ADU to be within a max. height of 20'-0".

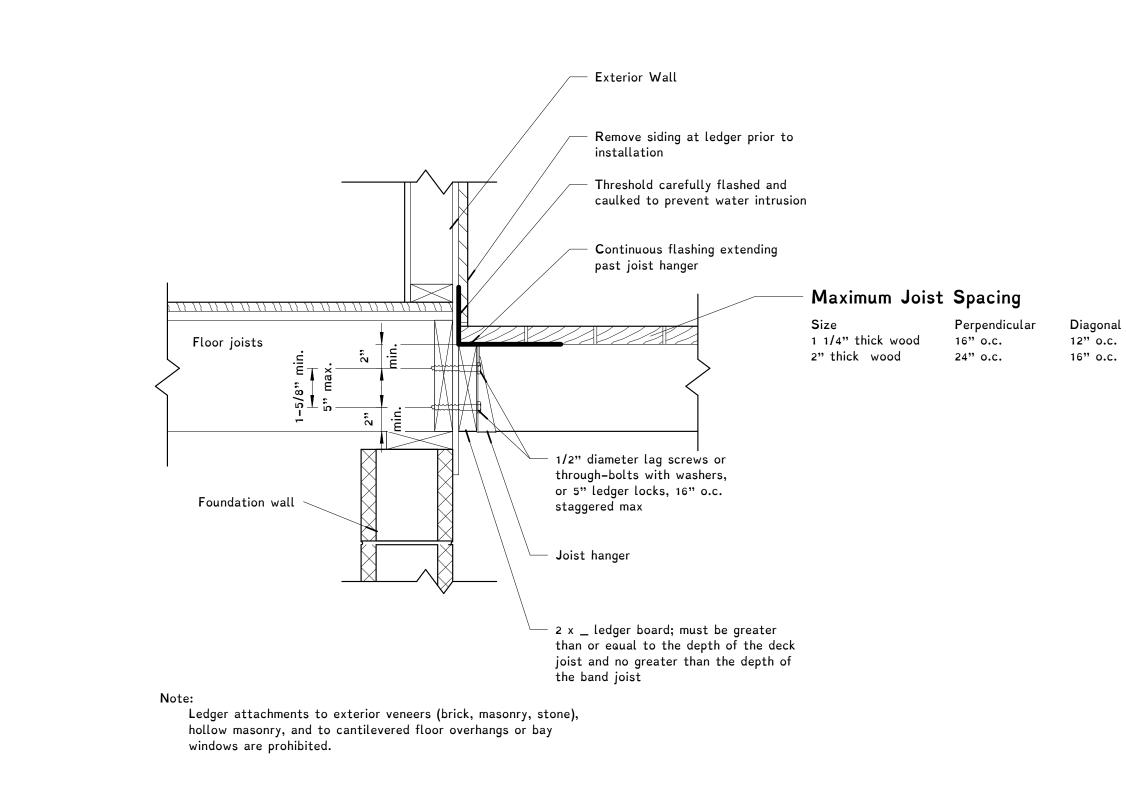
Pressure Treated 2x8 sill plate. Anchorage per section R403.1.6 in the Virginia Residential Code: wood sill plates shall be anchored to foundation with not less — than 1/2" min. diameter steel bolts of approved anchors spaced not more than 6' on center adn shall be embedded not less than 7" into concrete or grouted cell of concrete masonry units.

- Existing bricks to be repointed with structural mortar

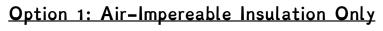
Casing Quantity Header (2)L 3 1/2" x 3 1/2" x 3/8" H.1 (2) 2 x 4 H.1 (2) 2 x 4 (2) 2 x 4 (2) 2 x 4 (2) 2 x 4 (2) 2 x 4

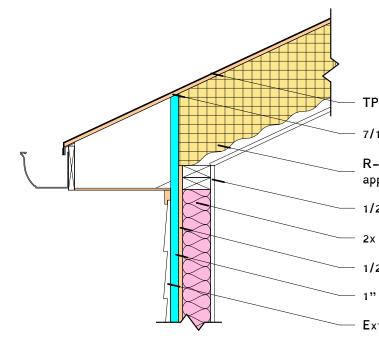
32'-0" 32'-8" 32'-8" 32'-0" 32'-0" 30'-8" 31'-8" 223'-8"

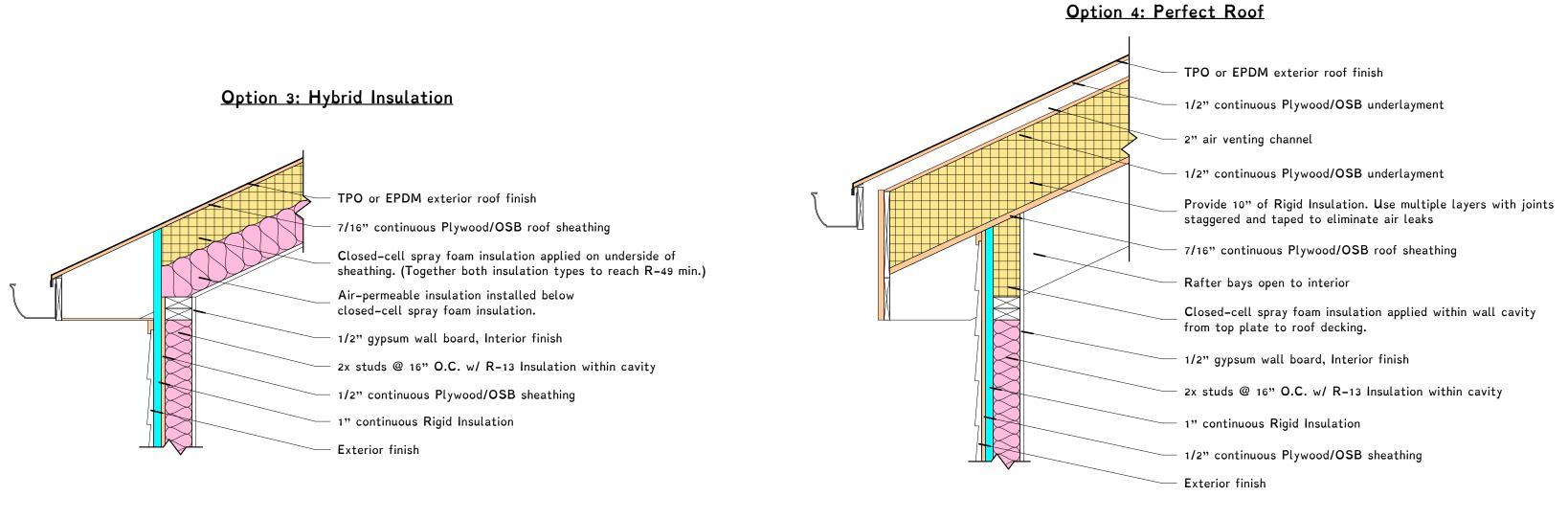




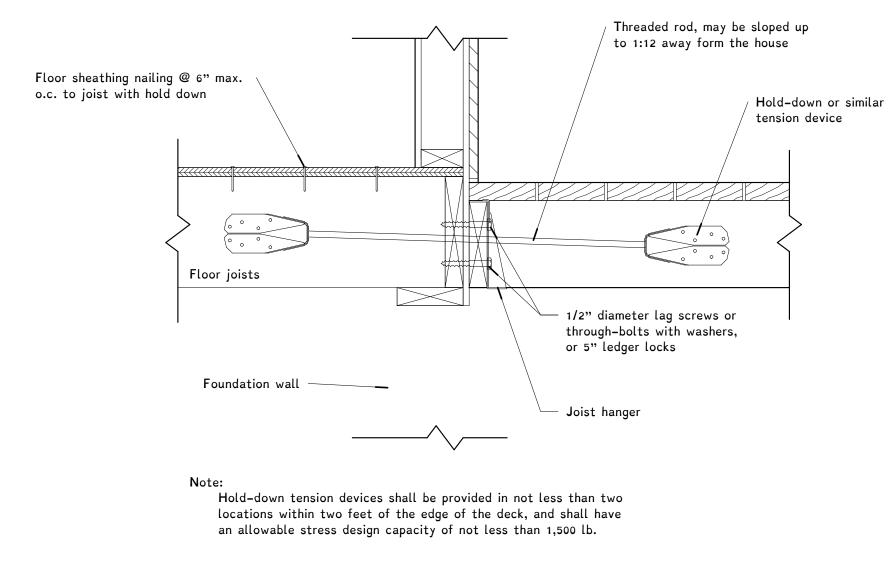
2 Ledger Attachment – deck to rim board 1 1/2" = 1'-0"







1 Unvented Roof Assembly Options

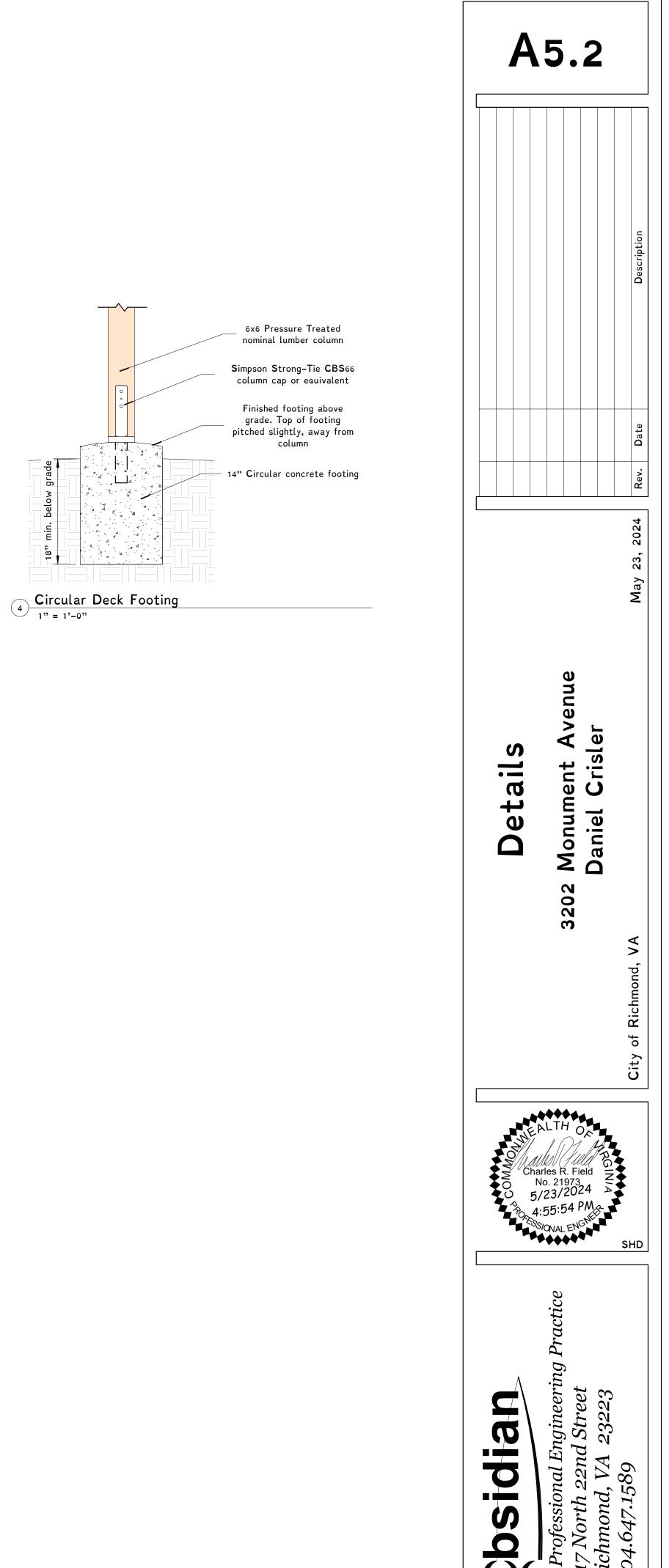


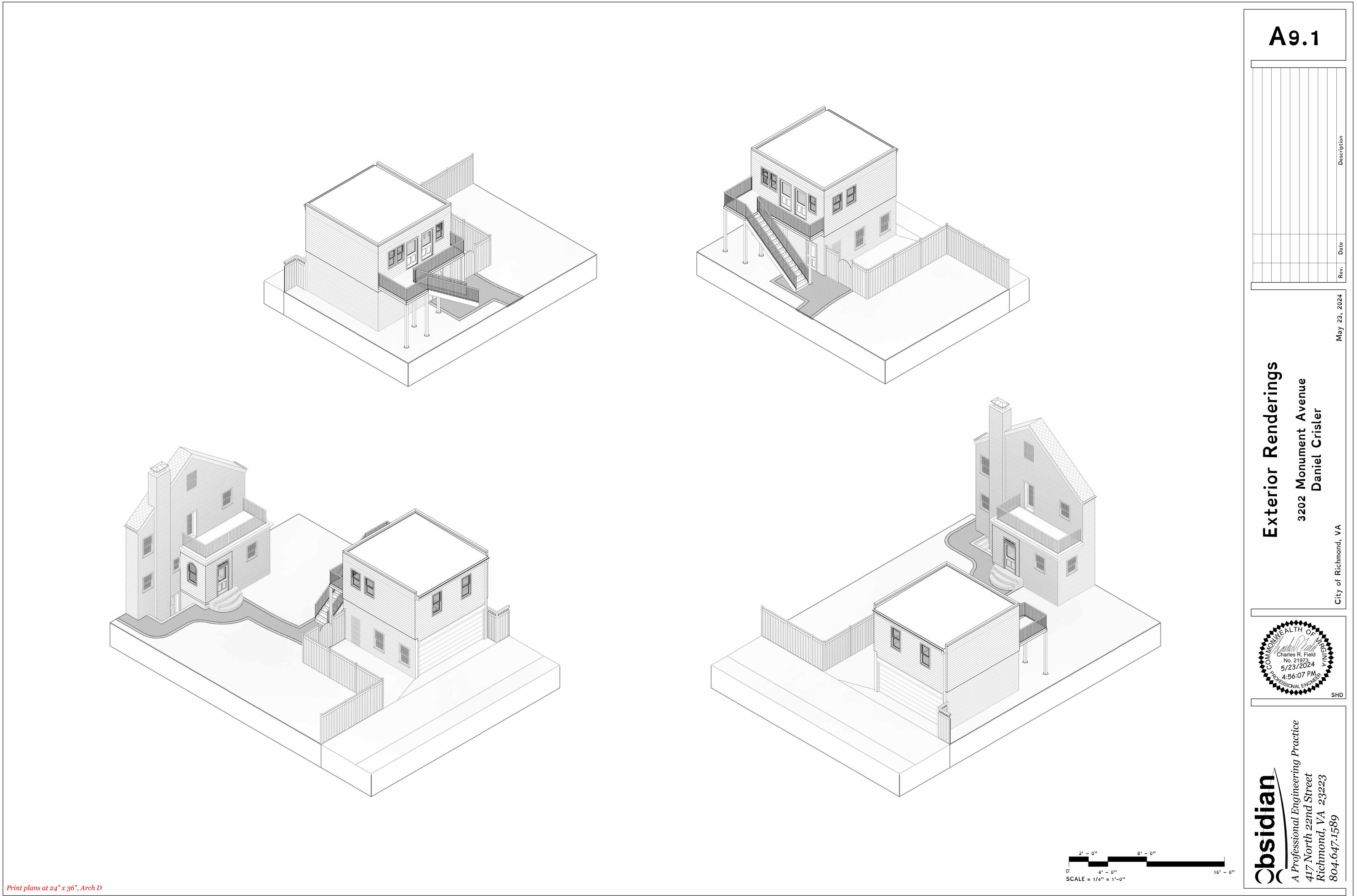


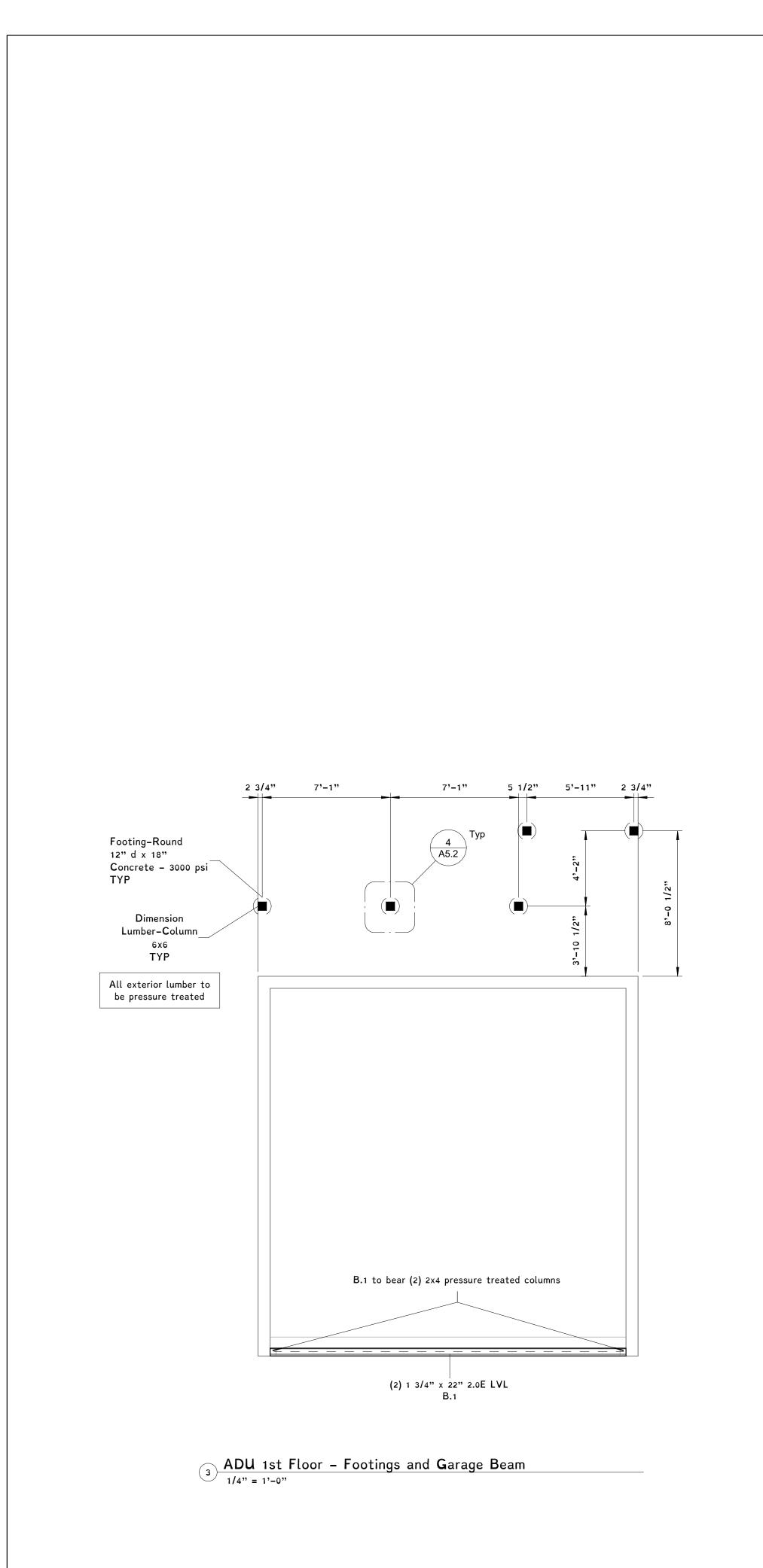
- TPO or EPDM exterior roof finish
- 7/16" continuous Plywood/OSB roof sheathing
- R-49 min. Closed-cell spray foam insulation applied on underside of sheathing
- 1/2" gypsum wall board, Interior finish
- 2x studs @ 16" O.C. w/ R-13 Insulation within cavity
- 1/2" continuous Plywood/OSB sheathing
- 1" continuous Rigid Insulation
- Exterior finish

# Option 2: Air–Permeable Cavity Insulation

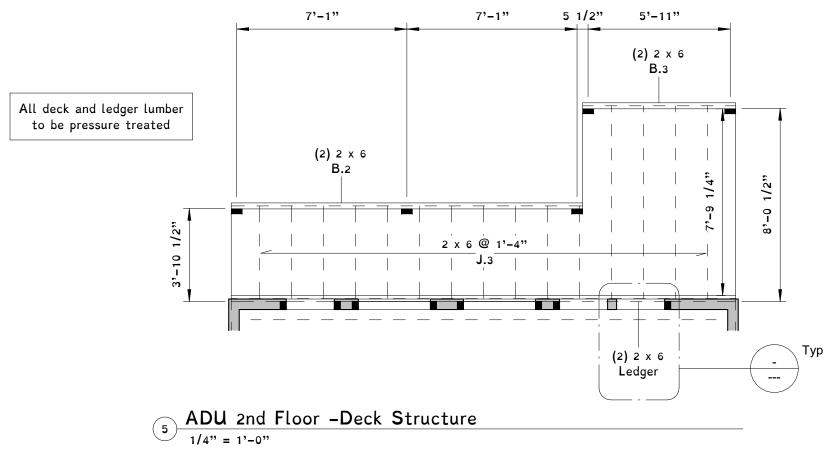
TPO or EPDM exterior roof finish 1/2" continuous Plywood/OSB underlayment Provide 3" of Rigid Insulation in Climate Zone 4A. Use multiple layers with joints staggered and taped to eliminate air leaks 7/16" continuous Plywood/OSB roof sheathing Closed-cell spray foam insulation applied on underside of sheathing. (Together both insulation types to reach R-49 min.) - 1/2" gypsum wall board, Interior finish - 2x studs @ 16" O.C. w/ R-13 Insulation within cavity - 1/2" continuous Plywood/OSB sheathing — 1" continuous Rigid Insulation - Exterior finish

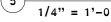


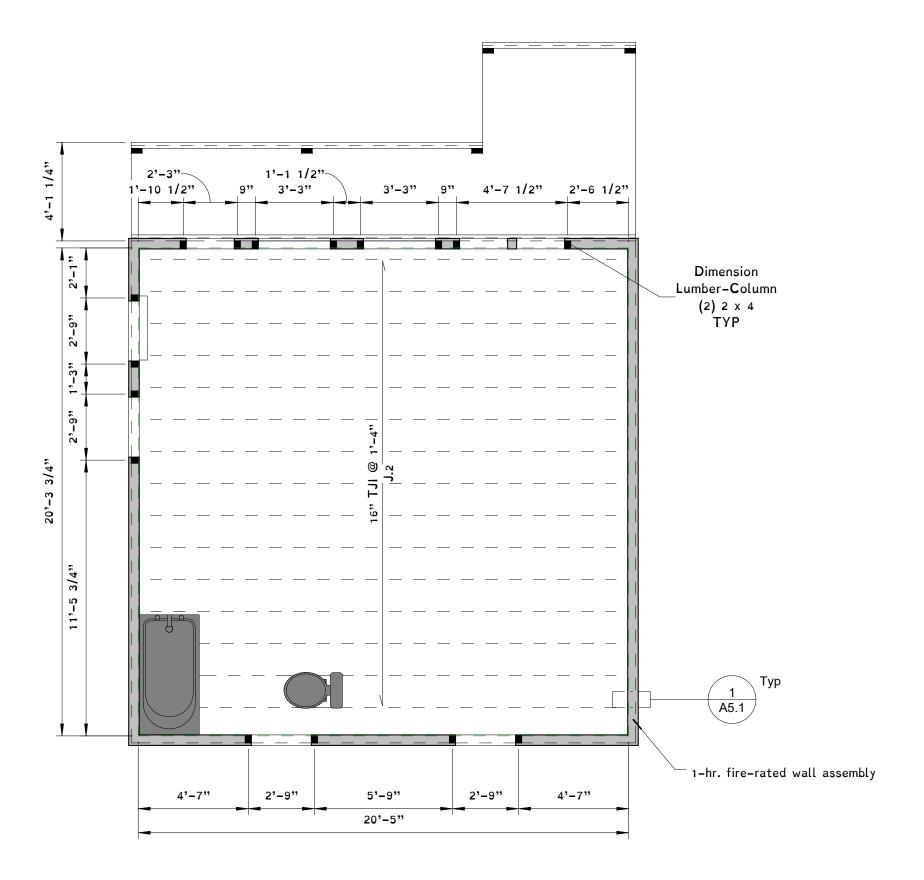




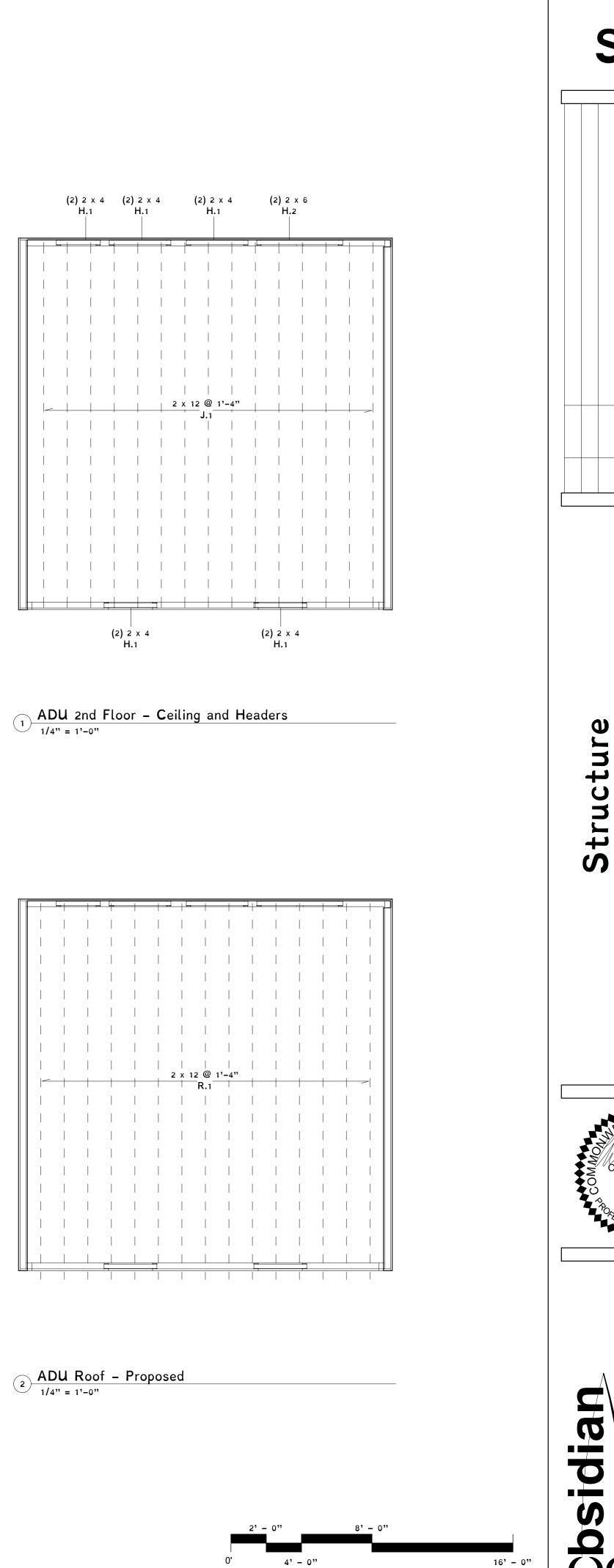
Print plans at 24" x 36", Arch D



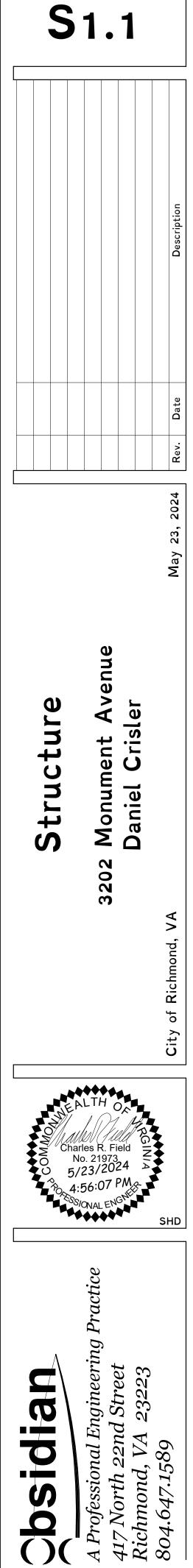


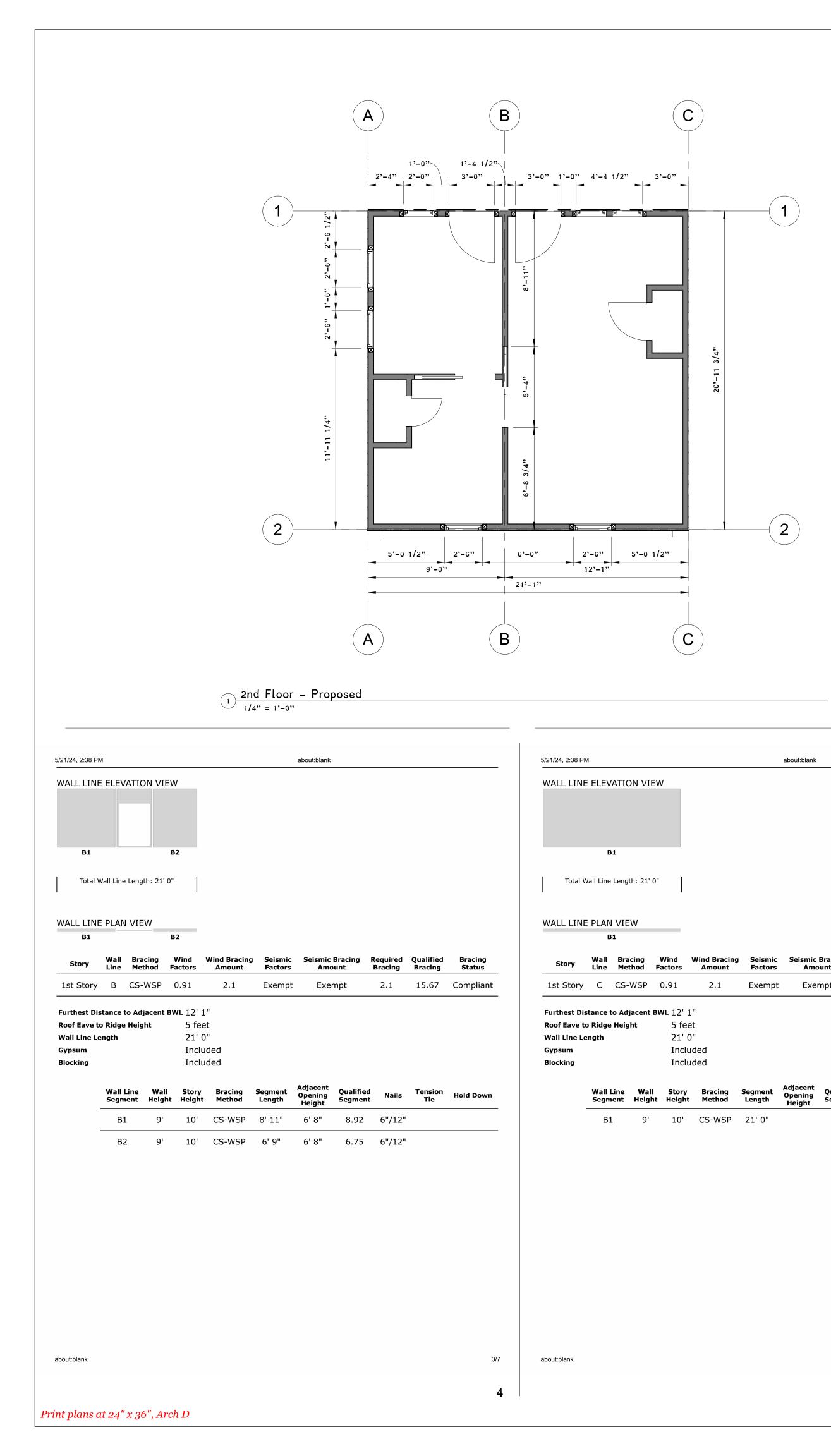


4 ADU 2nd Floor - Proposed



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





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			A										
			APA Wa	II Bra	cing C	alcula	ator Pro	oject R	eport				
			Builder/Desig	Iner				-	-				
			Home/Buildir Development Code		ne		BASE	D ON 2021 1	IRC				
			SDC (Seismic Wind Speed	Design Ca	ategory)		1-2 F/	AMILY A-C 15 mph					
			Wind Exposu Total Number				EXPO 1 STC	SURE B DRY					
			Cripple Wall Mean Roof H	eight less t	than 30 ft.		NO YES						
			Designer Ro	esponsib	ilities:								
			Confirm	n load pat	th to foun	dation pe	R301.2.2.6 r IRC sectior	n R403.1.6					
			• Design o	foundatio	ons per IR terior bra	RC section ced wall I	R403.1 R403.1		Section R	502.11			
			0	Redesigna	te as the	first story	and use the ion R602.10	e calculator .10.					
			A A	TORY 1 B	c	2							
			2			,							
			about:blank										1/
		1											2
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			WALL LINE	ELEVATI		N							
						-							
			B1 B2	B3	B4	B5							
			Total V	Vall Line Le	ngth: 21' 1	."							
						I							
			WALL LINE B1 B2	PLAN VI B3	EW B4	B5							
g Required Bracing	Qualified Bracing	Bracing Status	Story	Wall Br Line M		Wind Factors	Wind Bracing Amount	) Seismic Factors			Required Bracing	Qualified Bracing	Bracing Status
2.1	21	Compliant	1st Story	1 CS	S-WSP	0.7	2.52	Exempt	Exe	mpt	2.52	5.33	Compliant
			Furthest Dis Roof Eave to			<b>w∟</b> 21' 0 5 fee							
			Wall Line Le Gypsum		iyiit	21' 1 Inclue	u –						
			Blocking			Inclue							
ed Nails ent	Tension Tie	Hold Down		Wall Line Segment		Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nails	Tension Tie	Hold Down
6"/12"			-	B1	9'	10'	CS-WSP	2' 4"	4' 0"	2.33	6"/12"		
				B2	9'	10'	CS-WSP	1' 0"	6' 8"	0	6"/12"		
				B3	9'	10'	CS-WSP	1' 4"	6' 8"	0	6"/12"		
				B4	9'	10'	CS-WSP	1' 0"	6' 8"	0	6"/12"		

B5 9' 10' CS-WSP 3'0" 4'0" 3 6"/12"

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WALL LINE ELEVATION VIEW

B1 B2 B3

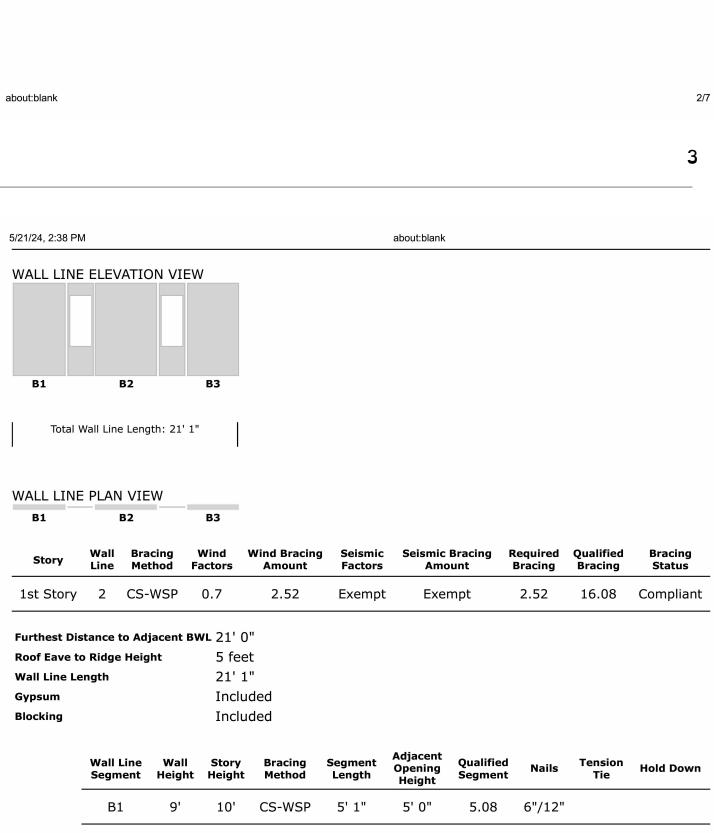
Total Wall Line Length: 21' 0"

**B3** 

## WALL LINE PLAN VIEW B1 B2

Story	Wall Line	Bracing Method		Vind Ictors	Wind Bracing Amount	g Seismic Factors	Seismic Amo	-	Required Bracing	Qualified Bracing	Bracing Status
1st Story	А	CS-WSP	, C	).91	1.68	Exempt	Exer	mpt	1.68	14.5	Compliant
Furthest Dis	stance to	o Adjacer	t BW	<b>/∟</b> 9' 0"	1						
Roof Eave to	o Ridge	Height		5 fee	et						
Wall Line Le	ength			21' (	)"						
Gypsum				Inclu	ıded						
Blocking				Inclu	ıded						
	Wall L Segme		all ght	Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nalis	Tension Tie	Hold Down
	B1	9	<b>'</b>	10'	CS-WSP	2' 7"	4' 0"	2.58	6"/12"		
,	B2	9	,	10'	CS-WSP	1' 6"	4' 0"	0	6"/12"		
	В3	9	,	10'	CS-WSP	11' 11"	4' 0"	11.92	6"/12"		

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DI	9	10	C3-W3P	51	50	5.08	0/12
B2	9'	10'	CS-WSP	6' 0"	5' 0"	6	6"/12"
В3	9'	10'	CS-WSP	5' 0"	5' 0"	5	6"/12"

# **S**1.2 **O** Ľ 0) U) acing S Monument Daniel Cris Ω 202 C Ū **\_\_\_** C,OMA Charles R. Field No. 21973 5/23/2024 4:56:16 PM SSIONAL ENGINE SHD actice P g A Professional Engineering 417 North 22nd Street Richmond, VA 23223 804.647.1589 dian

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FORTE		Monument Avenue, 3202	
ADU			
Member Name	Results (Max UTIL %)	Current Solution	Comments
R.1	Passed (86% M)	1 piece(s) 2 x 12 SP No.2 @ 16" OC	
J.1 Ceiling Joists	Passed (46% M)	1 piece(s) 2 x 12 SP No.2 @ 16" OC	
J.2 ADU 2nd Floor Joists	Passed (80% R)	1 piece(s) 16" TJI® 560 @ 24" OC	
J.3 Deck Joists	Passed (84% ΔL)	1 piece(s) 2 x 6 SP No.2 @ 16" OC	
H.1 ADU 2nd Floor Headers	Passed (86% M)	2 piece(s) 2 x 4 SP No.2	
H.2 ADU 2nd Floor Header (Double Window)	Passed (89% M)	2 piece(s) 2 x 6 SP No.2	
H.3 Mudroom Headers	Passed (51% M)	2 piece(s) 2 x 4 SP No.2	
B.1 Garage Header	Passed (64% R)	2 piece(s) 1 3/4" x 22" 2.0E Microllam® LVL	
B.2 Deck Beam	Passed (54% M)	2 piece(s) 2 x 6 SP No.2	
B.3 Deck Beam	Passed (71% M)	2 piece(s) 2 x 6 SP No.2	

					1	piece(	(s) 2	•
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	+ 0 —							
		<b>الم</b> ر 1						
Drawing is Conceptual. All loca	tions are	e measured	from the	e outs	ide face	of left	supp	c
Design Results	Ac	tual @ Loca	tion	A	llowed	Re	esult	
Member Reaction (lbs)		7 @ 21' 1 1		127	'1 (1.50		issed	
Shear (lbs)		433 @ 20' 2			2461		issed	
Moment (Ft-lbs)	2438 @ 10' 10 9/16"				2843		issed	
Live Load Defl. (in) Total Load Defl. (in)		22 @ 10' 10 37 @ 10' 10			0.682		issed issed	
<ul> <li>A 15% increase in the moment of Applicable calculations are based</li> </ul>			d to accor		repetitiv		er usag	
Supports		Total	Availat		Required	_	ad	i
Supports 1 - Stud wall - SYP		3.50"	3.50"		1.50"	-	18	
2 - Hanger on 11 1/4" SYP Ledger		3.50"	Hange		1.50"	2:		-
<ul> <li>Blocking Panels are assumed to c</li> <li>At hanger supports, the Total Bea</li> <li><sup>1</sup> See Connector grid below for ac</li> </ul>	aring dime dditional ir	nsion is equa nformation an	l to the w d/or requ	idth of	the mate its.	erial that		
Lateral Bracing		Bracing Inte			Comme	ents		
Top Edge (Lu) Bottom Edge (Lu) •Maximum allowable bracing interv Connector: Simpson St			c					
			Model		s	eat Len	gth	
2 - Face Mount Hanger			LRU28Z 1.94"					
Refer to manufacturer notes and	l instructio	ons for proper	installatio	on and	use of a	II connec	tors.	
Vertical Load	Location (Side) Sp		acing	cing (0.90				
			16" 15				Ì	
1 - Uniform (PSF)	0 to 21	4 3/4"	1	l6"		15.0		
Weyerhaeuser Notes								
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Weyerhaeuser Notes Weyerhaeuser warrants that the si related to the software. Use of this responsible to assure that this calc Weyerhaeuser facilities are third-pi and/or tested in accordance with a www.weyerhaeuser.com/woodproc	zing of its software ulation is arty certifi pplicable ducts/docu	products will is not intende compatible w dto sustaina ASTM standar ument-library. dimensions a	be in acc ed to circu th the ove able fores rds. For cu	ordanc imvent erall pr try star urrent o	the nee oject. Ac ndards. V code eva	eyerhaeu d for a do cessories Veyerhae luation re	esign p s (Rim euser E eports,	,

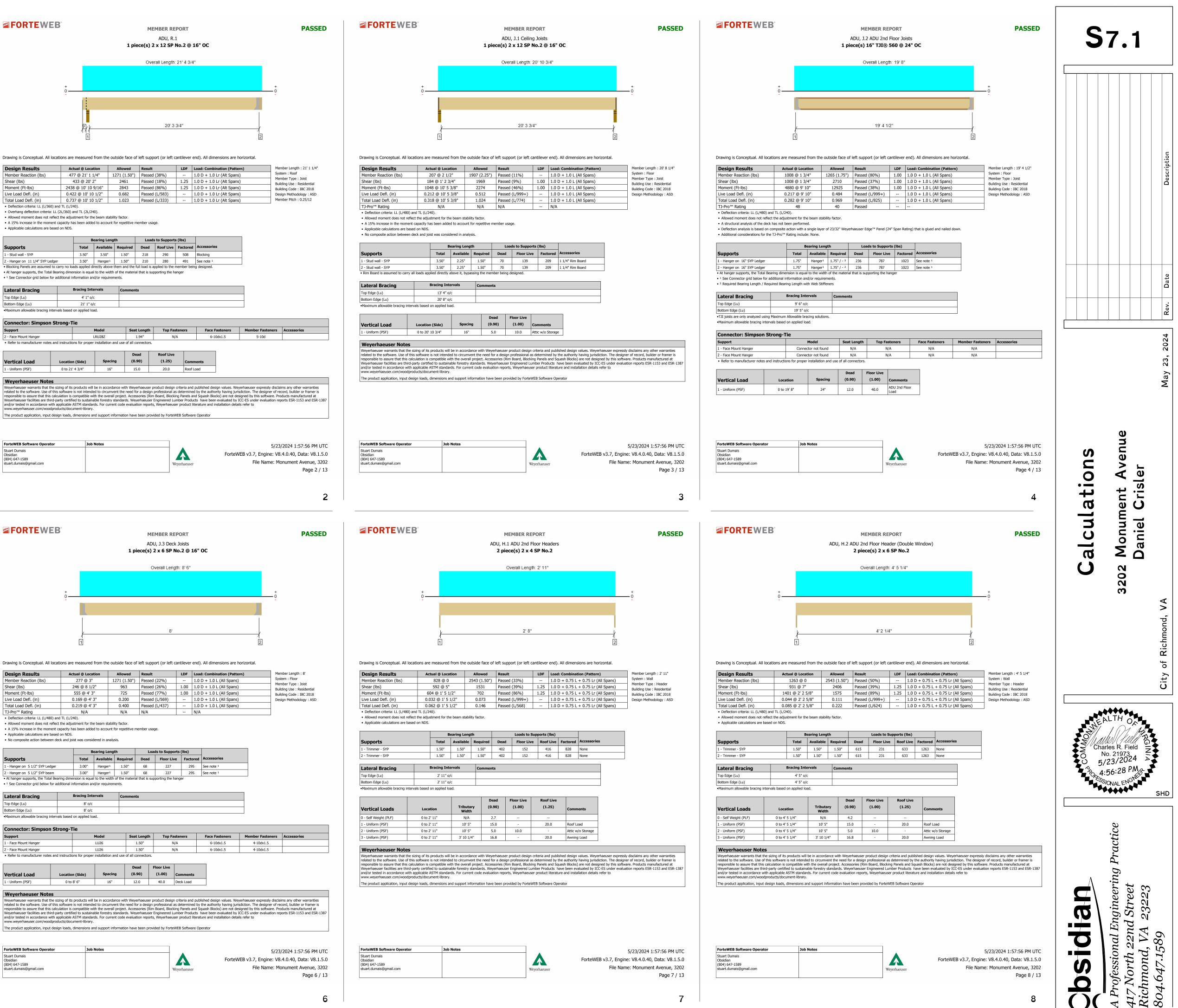
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					1	piec
	<u> </u>					
		,				
		1				
Prawing is Conceptual. All loca	itions ar	e measured	from the	outsi	ide face	of le
Design Results	A	ctual @ Loca	ition	A	llowed	I
Member Reaction (lbs)		277 @ 3"		127	'1 (1.50"	')
Shear (lbs)		246 @ 8 1/			963	
		FFF 0 41 5				
Moment (Ft-lbs)	_	555 @ 4' 3			725	
Moment (Ft-lbs) Live Load Defl. (in)		0.169 @ 4'	3"		0.200	
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment	nd TL (L/2 tt the adju capacity h	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the	3" 3" ne beam sta	bility i	0.200 0.400 N/A factor.	
Moment (Ft-lbs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec	nd TL (L/2 tt the adju capacity h d on NDS.	0.169 @ 4' 0.219 @ 4' N/A 240). Istment for the has been adde	3" 3" ne beam sta	bility 1 nt for	0.200 0.400 N/A factor. repetitive	
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base	nd TL (L/2 tt the adju capacity h d on NDS.	0.169 @ 4' 0.219 @ 4' N/A 240). Istment for the las been adde	3" 3" ne beam sta	bility f nt for alysis.	0.200 0.400 N/A factor. repetitive	
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base	nd TL (L/2 tt the adju capacity h d on NDS.	0.169 @ 4' 0.219 @ 4' N/A 240). Istment for the las been adde	3" 3" he beam sta ed to accour dered in and	bility for alysis.	0.200 0.400 N/A factor. repetitive	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between do	nd TL (L/2 tt the adju capacity h d on NDS.	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the has been adde orist was considered	3" 3" he beam sta ed to accour dered in ana Bearing Ler	bility for alysis. ngth e R	0.200 0.400 N/A factor. repetitive	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between do Supports 1 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP beam	nd TL (L/2 t the adju capacity h d on NDS eck and jo	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the as been added oist was considered <b>Total</b> 3.00'' 3.00''	3" 3" 3" a beam sta dered in ana Bearing Lee Availabl Hanger <sup>1</sup> Hanger <sup>1</sup>	bility for alysis. ngth e R	0.200 0.400 N/A factor. repetitive	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between de Supports 1 - Hanger on 5 1/2" SYP Ledger	aring dime	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the as been added	3" 3" 3" are beam sta ed to accour dered in ana Bearing Ler Availabl Hanger <sup>1</sup> Hanger <sup>1</sup>	bility f nt for alysis. e R	0.200 0.400 N/A factor. repetitive	e mem
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Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between do <b>Supports</b> 1 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP Ledger • At hanger supports, the Total Be • 1 See Connector grid below for a <b>Lateral Bracing</b> Top Edge (Lu)	aring dime	0.169 @ 4' 0.219 @ 4' N/A 40). ustment for the as been added output store and the <b>Total</b> 3.00" 3.00" astore and <b>Bracing Int</b> 8' o/c	3" 3 " 3 " 3 " 4 a beam sta a to account dered in ana bearing Lei Availabl Hanger Hanger a to the wic d/or requir tervals	bility f nt for alysis. e R	0.200 0.400 N/A factor. repetitive tequired 1.50" 1.50" the mater ts.	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between do Supports 1 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP beam • At hanger supports, the Total Bea • 3 See Connector grid below for a Lateral Bracing	aring dime	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the as been added output output twas considered <b>Total</b> 3.00" 3.00" as output as output <b>Bracing Int</b> 8' o/c 8' o/c	3" 3 " 3" 4 a beam sta a to account dered in ana a bearing Lei Availabl Hanger Hanger a to the wic d/or requir bervals	bility f nt for alysis. e R	0.200 0.400 N/A factor. repetitive tequired 1.50" 1.50" the mater ts.	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between dr <b>Supports</b> 1 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP beam • At hanger supports, the Total Bea • 1 See Connector grid below for a <b>Lateral Bracing</b> Top Edge (Lu) Bottom Edge (Lu) • Maximum allowable bracing interv	aring dime dditional i	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the as been added 	3" 3 " 3" 4 a beam sta a to account dered in ana a bearing Lei Availabl Hanger Hanger a to the wic d/or requir bervals	bility f nt for alysis. e R	0.200 0.400 N/A factor. repetitive tequired 1.50" 1.50" the mater ts.	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between do <b>Supports</b> 1 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP beam • At hanger supports, the Total Be • 1 See Connector grid below for a <b>Lateral Bracing</b> Top Edge (Lu) Bottom Edge (Lu)	aring dime dditional i	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the as been added 	3" 3 " 3" 4 a beam sta a to account dered in ana a bearing Lei Availabl Hanger Hanger a to the wic d/or requir bervals	bility f nt for alysis. e R	0.200 0.400 N/A factor. repetitive tequired 1.50" 1.50" the mater ts. Comme	e mem
Moment (Ft-Ibs) Live Load Defl. (in) Total Load Defl. (in) TJ-Pro™ Rating • Deflection criteria: LL (L/480) ar • Allowed moment does not reflec • A 15% increase in the moment • Applicable calculations are base • No composite action between de <b>Supports</b> 1 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP Ledger 2 - Hanger on 5 1/2" SYP beam • At hanger supports, the Total Be • 1 See Connector grid below for a <b>Lateral Bracing</b> Top Edge (Lu) Bottom Edge (Lu) Maximum allowable bracing interv	aring dime dditional i	0.169 @ 4' 0.219 @ 4' N/A 240). ustment for the as been added 	3" 3 " 3" 3 " 3" 3 " 3" 3 " 3" 4 3 4 4 4 4	bility f nt for alysis. e R	0.200 0.400 N/A factor. repetitive tequired 1.50" 1.50" the mater ts. Comme	e mem
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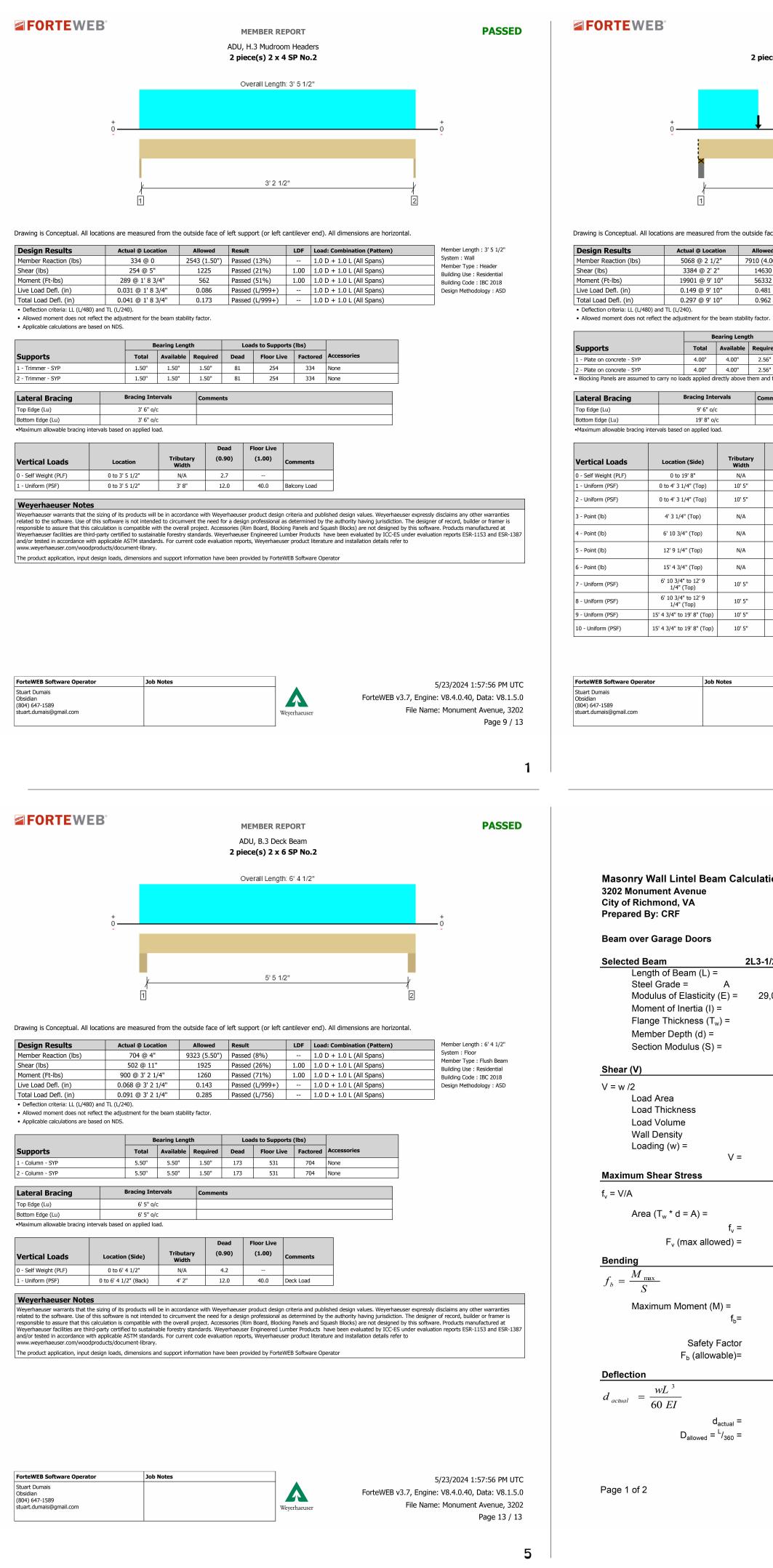
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The product application, input design loads, dimensions and support information have been provided by ForteW	EB Software Operator
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	File Name: Monument Avenue, 3202 Page 5 / 13
	rage 5 / 15
	_





stuart.dumais@gmail.com

Bearing Length

N/A

10' 5"

22.5

15.0

10' 5" 5.0

N/A 402

N/A 402

N/A 402

N/A 402

10' 5" 15.0

10' 5" 5.0

10' 5" 15.0

Bracing Intervals Comments

9' 6" o/c

19' 8" o/c

Location (Side)

0 to 19' 8"

0 to 4' 3 1/4" (Top)

4' 3 1/4" (Top)

6' 10 3/4" (Top)

12' 9 1/4" (Top)

15' 4 3/4" (Top)

6' 10 3/4" to 12' 9

6' 10 3/4" to 12' 9

1/4" (Top)

5' 4 3/4" to 19' 8" (Top)

15' 4 3/4" to 19' 8" (Top) 10' 5" 5.0

Job Notes

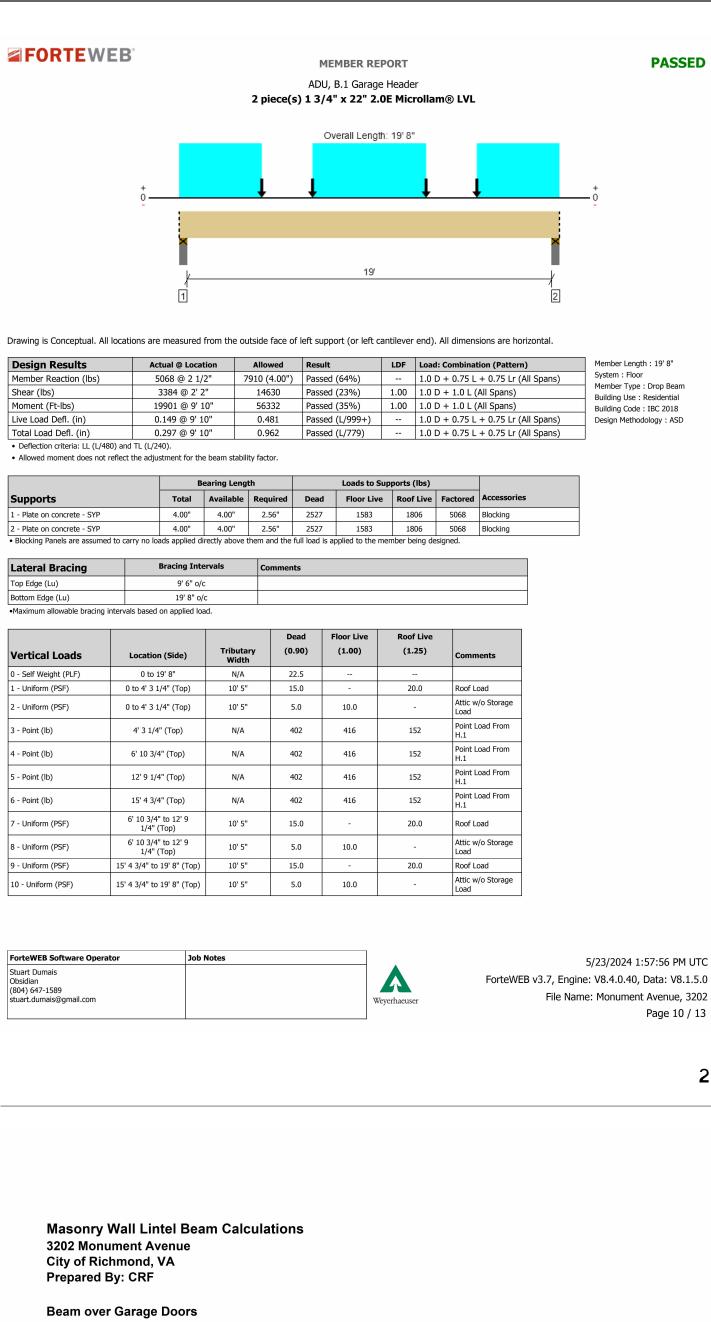
0 to 4' 3 1/4" (Top)

**Masonry Wall Lintel Beam Calculations** 3202 Monument Avenue City of Richmond, VA Prepared By: CRF

Beam over Garage Doors

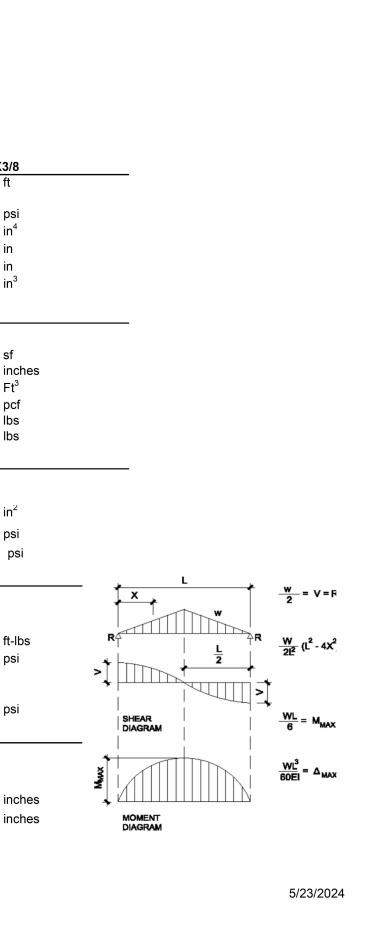
•	
Selected Beam	2L3-1/2X3-1/2X3
Length of Beam (L) =	2.67 f
Steel Grade = A	50
Modulus of Elasticity (E) =	29,000,000 p
Moment of Inertia (I) =	5.72 i
Flange Thickness $(T_w) =$	0.25 i
Member Depth (d) =	4 i
Section Modulus (S) =	2.05 i
Shear (V)	
V = w /2	
Load Area	1.78 s
Load Thickness	8 i
Load Volume	1 F
Wall Density	150 p
Loading (w) =	178 I
V =	89 I
Maximum Shear Stress	
$f_v = V/A$	
Area (T <sub>w</sub> * d = A) =	1.0 i
f <sub>v</sub> =	89.0 p
$F_v$ (max allowed) =	20,000
	20,000
Bending	
$f_b = \frac{M_{\text{max}}}{S}$	
Maximum Moment (M) =	79 f
f <sub>b</sub> =	464 p
Safety Factor	0.66
$F_{b}$ (allowable)=	33000 p
	33000 μ
Deflection	
$d_{actual} = \frac{wL^3}{C_0 EL}$	
60 EI	
d <sub>actual</sub> =	0.001 i
$D_{\text{allowed}} = \frac{L}{360} =$	0.089 i
- allowed , 360	0.000 1

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