DESIGN LOADS

The following are design loads for Harnett County, NC. For all other locations refer to the building code and any applicable local requirements.

1. Building Codes
   - 1.1 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina Amendments)
   - 1.2 Minimum Design Loads for Building and Other Structures, ASCE 7-98.

2	Roof Dead Load	15 PSF
3	Roof Live Load	20 PSF
4	Typical Floor Dead Load	10 PSF
5	Floor Live Loads	
	5.1 Rooms other than sleeping rooms	40 PSF
	5.2 Sleeping Rooms	30 PSF
	5.3 Stairs	40 PSF
	5.4 Decks	40 PSF
	5.5 Exterior Balconies	60 PSF
6	Wind Loads / Data	
	6.1 Ultimate Design Wind Speeds	120 MPH
	6.2 Wind Importance Factor, IW	1.00
	6.3 Exposure	B
	6.4 Walls (Component and Cladding)	25 PSF
	6.5 Roofs (Component and Cladding)	
	6.5.1 Roof Slopes 2.25/12 to 7/12	34.8 PSF
	6.5.2 Roof Slopes 7/12 to 12/12	21 PSF
7	Seismic Loads/ Data	
	7.1 Seismic Use Group	0.075
	7.2 Spectral Response Coefficient, SDS	0.17g< and <0.33g
	7.3 Site Class	D
	7.4 Seismic Importance Factor, IS	1.00
	7.5 Seismic Design Category	B

FOUNDATIONS & CRAWL SPACES

1. Foundations shall conform to the requirements of the North Carolina Residential Building Code, Chapter 4. Should a conflict occur between these drawings and the aforementioned building code references the more stringent shall govern.
2. The architect has not received a subsurface investigation. The foundation is based upon an assumed soil bearing capacity of 2000 psf net bearing. Verification of this assumed value is the responsibility of the owner or contractor should any adverse soil condition be encountered the architect must be contacted before proceeding.
3. Foundations shall extend not less than 12 inches below the finished natural grade and in no case less than the frost line depth. Foundation walls are assumed to restrain earth pressures of 30 pcf or less, unbalanced fill and foundation wall construction shall conform to tables 404.1 of the North Carolina Residential Building Code. Site topography has not been provided to TightLines Designs. Report any unusual site conditions to TightLines Designs before construction.
4. Any fill shall be placed under the direction or recommendation of a licensed professional engineer. The resulting soil shall be compacted to a minimum of 95 percent maximum dry density.
5. Excavation for footings shall be lined temporarily with a 6 mil polyethylene if placement of concrete does not occur within 24 hours of excavation.
6. No concrete shall be poured against any subgrade containing water, ice, frost, or loose material.
7. Enlarged perimeter footings are to be poured monolithically with wall footings. Reinforcement for wall footings, if any, shall run continuously through column footings.
8. Crawl space vents to be 8"x16" w/ min. 50% free air, and shall be located within 3' of each corner unless closed crawl space. Crawl space door may serve as vent.
9. Install 6 mil. vapor barrier below all slabs and on ground area within all crawlspaces.
10. Provide min. 18x24 access panel or larger as required by the NC Mechanical Code when mechanical equipment is located in the crawlspace.
11. Remove earth as required to achieve a minimum clearance from ground to underside of floor joists of 18".
12. Provide foundation drains at all foundation walls. Coordinate location to daylight with owner.

CONCRETE

1. Concrete shall have normal weight aggregate and a minimum compressive strength (fc) at 28 days as listed below.
   - 1.1. Footings 3000 psi
   - 1.2. Slabs-on-grade 4000 psi
   - 1.3. Elevated Slabs 3500 psi
2. Concrete shall be proportioned, mixed, and placed in accordance with ACI 318 latest edition "Building Code Requirements for Reinforced Concrete" and ACI 301 latest edition "Specifications for Structural Concrete for Building"
3. Entrained air must be used in all concrete that will be exposed to freezing and thawing and deicing chemicals. Amount of air entrainment (percent) shall be in accordance with the following schedule with a range of -1 to +2 percentage points of the target value:
   - 3.1. Footings 5%
   - 3.2. Interior Slabs 0% see note below
   - 3.3. Exterior Slabs 5%
   - 3.4. Note: It is recommended that interior slabs to be given a smooth, dense, hard-troweled finish not contain entrained air since blistering or delamination may occur. If slab will be exposed to deicing or other aggressive chemicals contact TightLines Designs for proper air entrainment requirements.
4. No admixtures shall be added to any structural concrete without written permission of the architect.

CONCRETE SLABS ON GRADE

1. Concrete slabs on grade shall be constructed in accordance with ACI 302.1r-96 "guide for concrete slab and slab construction".
2. The architect is not responsible for differential settlement, slab cracking or other future defects resulting from unreported conditions.
3. Control joints shall be spaced in slabs on grade at a maximum of 20'-0" O.C. Unless noted otherwise.
4. Control joints shall be produced using conventional processes within 4 to 12 hours after the slab has been finished.
5. Reinforcing steel shall not extend through the control joint.
6. All welded wire fabric for concrete slab on grade shall be supplied in flat sheets
7. All welded wire fabric for concrete slab on grade shall be placed 2" from top of slab. The WWF shall be securely supported during the concrete pour.

FOUNDATION & FLOOR FRAMING NOTES

1. All dimensions stretched from the outside face of the foundation wall or the center line of piers.
2. Typical pier is 16"x16" w/ 24"x24"x10" footing, U.N.O.
3. Typical wall footing is 16"W x 8"D, U.N.O.
4. All girders and joists to be SPF, U.N.O.
5. Typical floor joists to be 2x10s @ 16" o.c., U.N.O.
6. See sheet A1.1 & A3.1 for additional foundation & framing notes.

FLOOR FRAMING NOTES

1. Floors shall be constructed in accordance with the requirements listed in the North Carolina Residential Building Code Chapter 5.
2. Floors are designed for the uniformly distributed loads shown in the general structural notes. Special loading conditions must be reported to TightLines Designs; TightLines Designs is not responsible for floor defects resulting from unreported conditions.
3. P denotes a point load from above. Provide solid blocking to foundation w/ the same number of studs as above.
4. Install double joists or see truss manf. dwgs. for support under parallel non load bearing partitions above typ.
5. Floor sheathing shall be APA rated sheathing exposure 1 or 2, 3/4" T&G glued and attached to its supporting framing with 1-8d CC nail at 6" O.C. At panels edges and at 12" O.C. in panel field unless otherwise noted on the plans. Sheathing shall be applied perpendicular to framing. Panel end joints shall occur over framing.
6. Joists framing into the side of a girder shall be supported by a 2x2 ledger or by manuf. recommended hangers.

FLOOR PLAN NOTES:

1. All interior walls drawn @ 5 1/2" wide & exterior walls drawn w/sheathing @ 4" wide. All dimensions are drawn to face of stud on interior walls and to exterior sheathing on exterior walls.
2. All windows to have screens.
3. Provide plastic coated wire shelving w/clothes rod in coat closet & bedroom closets, one (1) shelf in laundry closet & four (4) shelves in pantry.
4. See above for additional framing notes.

Julia II Modified

1370 TOTAL HEATED SF
207 SF FRONT PORCH

GENERAL STRUCTURAL NOTES:

1. This structure is only stable in its completed form. The contractor shall provide all required temporary bracing during construction to stabilize the structure.
2. The architect is not responsible for construction sequences, methods, or techniques in connection with the construction of this structure. The architect will not be held responsible for the contractor's failure to conform to the construction documents, should any non-conformities occur.
3. Verification of assumed field conditions is not the responsibility of the architect. The contractor shall verify the field conditions for accuracy and report any discrepancies to TightLines Designs before construction begins.
4. This structure and all construction shall conform to all applicable sections of the North Carolina residential code and any local laws where the structure is to be constructed.

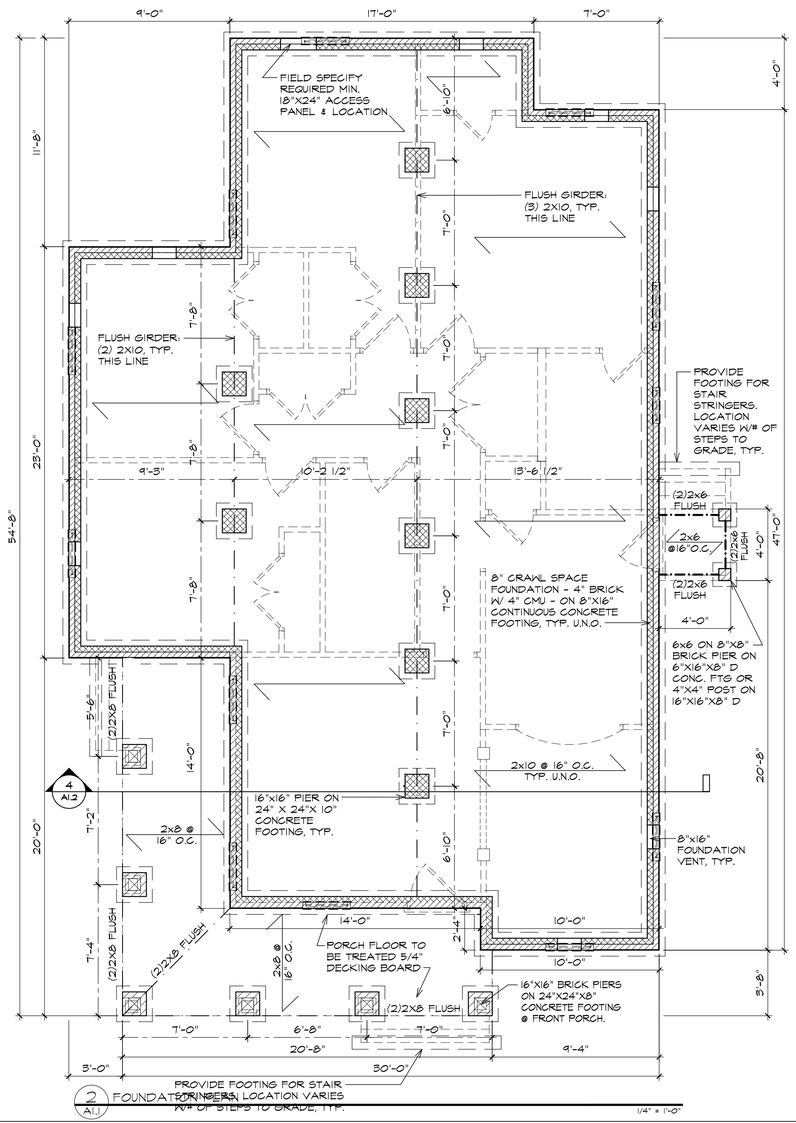
FIELD SPECIFY REQUIRED ACCESS PANEL & LOCATION - SEE NOTES ON A1.1 FOR ADDITIONAL CRAWL SPACE DETAILS

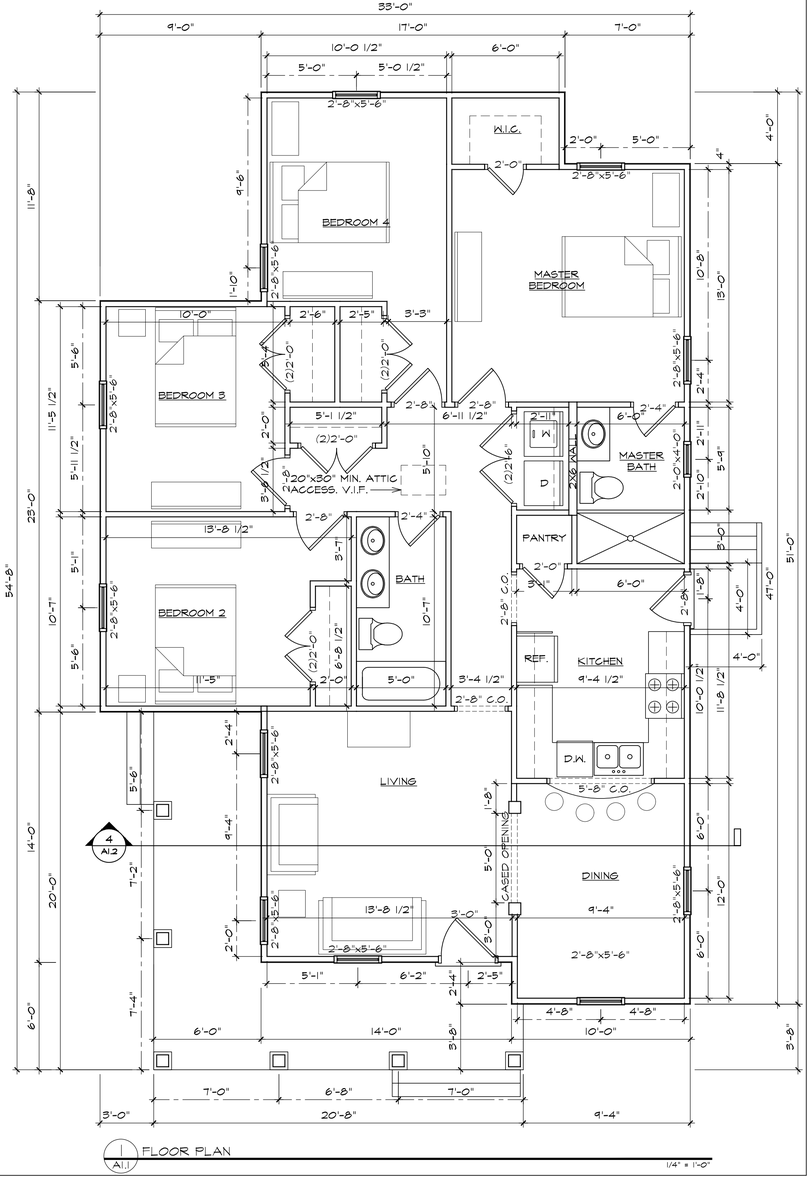
CRAWL SPACE VENT CALCS:
CRAWL SPACE W/ VAPOR BARRIER REQUIRES 1 SF VENT AREA PER 1500 SF CRAWL SPACE AREA

1370 SF CRAWL SPACE/1500 SF = .91 SF VENT AREA
.91 SF x 144 Sq.in/SF = 132 Sq.in.

8"x16" VENTS W/50% FREE AIR SPACE = 64 Sq.in. FREE AIR PER VENT

132 Sq.in./64 Sq.in. = 3 VENTS REQUIRED
9 VENTS PROVIDED





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Julia II Modified

TightLines Designs, Inc. 51726 North Carolina Raleigh, NC

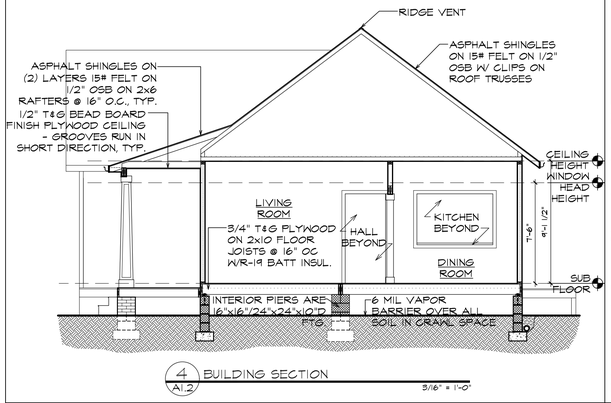
DAVID SCOTT MAURER REGISTERED ARCHITECT 5131 NORTH CAROLINA RALEIGH, NC

04.12.19

date	04.12.19
drafter	C.L.B.
checked by	D.S.M.
proj. no.	T-19035.1
revisions	date

Floorplan, Foundation Plan, Notes

A1.1



4 A1.2 BUILDING SECTION

3/16" = 1'-0"

TABLE N1102.1
(2012 EDITION NC RESIDENTIAL CODE)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT a

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Glazed Fenestration SHGC b,e	Ceiling R-Value	Wood Frame Wall R-Value d	Mass Wall R-Value i	Floor R-Value	Basement c, h Wall R-Value	Slab e, j R-Value & Depth	Crawl Space c, h Wall R-Value
3	0.35	0.60	0.30	30	13	5/10	19	10/13	0	5/13
4	0.35	0.60	0.30	38 or 30 cont.	15 or 13 + 2.5 c	5/10	19	10/13	10 c	10/13
5	0.35	0.60	NR	38 or 30 cont.	15, 13 + 5, or 19 + 3 c	13/17	30 c	10/13	10 c	10/13

a. R-values are minimums. U-factors and SHGC are maximums.
b. The fenestration U-factor column excludes skylights. The solar heat gain coefficient (SHGC) column applies to all glazed fenestration.
c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall or crawl space wall.
d. For nonsolid log walls, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 18 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. R-5 shall be added to the required slab edge R-values for heated slabs.
e. R-19 fiberglass batts compressed and installed in a nominal 2x6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall is not deemed to comply.
f. Basement wall insulation is not required in warm-humid locations as defined by table N1101.2.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. "15+5" means R-15 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers more than 25 percent of exterior, insulated sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2. "15+2.5" means R-15 cavity insulation plus R-2.5 sheathing.
i. For Mass Walls, the second R-value applies when more than half the insulation is on the interior of the mass wall.
j. R-10 shall be deemed to satisfy the slab edge insulation requirement wherever the full height of uncompressed R-10 insulation extends over the wall top plate at the eaves. Otherwise R-15 insulation is required where adequate clearance exists or insulation must extend to either the insulation baffle or within 1" of the attic roof deck.
k. Table value required except for roof edge where the space is limited by the pitch of the roof, there the insulation must fill the space up to the air baffle.

NOTE:
FOR ALL PROJECTS OUTSIDE NORTH CAROLINA, CONFIRM INSULATION REQUIREMENTS WITH ALL APPLICABLE CODES.

TABLE N1102.2
(2012 EDITION NC RESIDENTIAL CODE)
NORTH CAROLINA CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY COUNTY

KEY: A - Moist, B - Dry, C - Marine.
Absence of moisture designation indicates moisture regime is irrelevant. Asterisk, (*) indicates warm-humid location.

4A Alamance	4A Franklin	5A Pamlico
4A Alexander	5A Gaston	5A Pasquotank
5A Alleghany	4A Gates	5A Pender*
5A Anson	4A Graham	5A Perquimans
5A Ashe	4A Granville	4A Person
5A Avery	5A Greene	5A Pitt
5A Beaufort	4A Guilford	4A Polk
4A Bertie	4A Halifax	5A Randolph
5A Bladen	4A Harnett	5A Richmond
5A Brunswick*	4A Haywood	5A Robeson
4A Buncombe	4A Henderson	4A Rockingham
4A Burke	4A Hertford	5A Rowan
5A Cabarrus	5A Hoke	4A Rutherford
4A Caldwell	5A Hyde	5A Sampson
5A Camden	4A Iredell	5A Scotland
5A Carteret*	4A Jackson	5A Stanly
4A Caswell	5A Johnston	4A Stokes
4A Catawba	5A Jones	4A Surry
4A Chatham	4A Lee	4A Swain
4A Cherokee	5A Lenoir	4A Transylvania
5A Chowan	4A Lincoln	5A Tyrrell
4A Clay	4A Macon	5A Union
4A Cleveland	4A Madison	4A Vance
5A Columbus*	5A Martin	4A Wake
5A Craven	4A McDowell	4A Warren
5A Cumberland	5A Mecklenburg	5A Washington
5A Currituck	5A Mitchell	5A Watauga
5A Dare	5A Montgomery	5A Wayne
5A Davidson	5A Moore	4A Wilkes
4A Davie	4A Nash	5A Wilson
5A Duplin	5A New Hanover*	4A Yadkin
4A Durham	4A Northampton	5A Yancey
5A Edgecombe	5A Onslow*	
4A Forsyth	4A Orange	

TIMBER

1. Solid sawn wood framing shall conform to the specifications as listed in the National Forest Products Association "National Design Specification for Wood Construction" latest edition (NDS). The framing shall be of the species and grade as listed below:
   1.1. Joists, Rafters, and Wood Girders and Beams: Spruce Pine Fir No. 2
   1.2. Studs: Spruce Pine Fir No. 3 or Stud Grade
2. LVL or PSL shall the following minimum design stresses:
   2.1. E = 1.9 x 10E6
   2.2. Fb = 2600 PSI
   2.3. Fv = 285 PSI
   2.4. Fc = 700 PSI
3. Lumber in contact with concrete, masonry, or earth shall be pressure treated in accordance with AWPA standard C-15. All other exposed timber shall be treated in accordance with AWPA standard C-2.
4. Nails shall be common wire nails unless otherwise noted.
5. Lag screws shall conform to ANSI / ASME standard B18.2.1-1981. Lead holes for lag screws shall be in accordance with NDS specifications.
6. Beams containing multiple plies of lumber shall have each ply attached to its adjacent ply with 3 10d CC nails @ 12" O.C.
7. Flitch plate beams shall be attached w/ 1/2" through bolts at 24" O.C. staggered w/ (2) bolts 6" from each End.

HANGER SCHEDULE

SIZE	SST HANGER	SIZE	SST HANGER
2x8	LUS26	(2) 1.75 x 9.25 LVL	HU411(Max)
(2) 2x6	LUS26-2	(3) 1.75 x 9.25 LVL	HHUS6.50/10
(3) 2x6	LUS26-3	(2) 1.75 x 11.29 LVL or (2) 1.75 x 11.875 LVL	HU412 (Max)
2x8	LUS28	(3) 1.75 x 11.29 LVL or (3) 1.75 x 11.875 LVL	HHUS8.50/10
(2) 2x8	LUS28-2	(2) 1.75 x 14 LVL	HU414 (Max)
(3) 2x8	LUS28-3	(3) 1.75 x 14 LVL	HHUS8.50/10
2x10	LUS210	(2) 1.75 x 16 LVL	HUS412
(2) 2x10	HUS210-2	(3) 1.75 x 16 LVL	HHUS8.50/10
(3) 2x10	LUS210-3	(2) 1.75 x 18 LVL	HUS414
(4) 2x10	HHUS210-4	(3) 1.75 x 18 LVL	HHUS8.50/14
2x12	LUS212	NOTES: 1. SST Denotes Simpson Strong Tie. Use hanger per schedule above (or equivalent metal hanger) unless hanger is noted on plans. 2. Install Hangers per mant. Specifications	
(2) 2x12	HUS212-2		
(3) 2x12	HUS212-3 (Max)		

WALL FRAMING NOTES

1. Unless otherwise noted on the plans, all framing is assumed to be standard wood framing. Framing shall comply with the requirements of the North Carolina State Residential Code, Chapter 6. Should a conflict occur between these drawings and the aforementioned code references the more stringent shall govern.
2. Studs for wall framing shall consist of 2x nominal framing and be constructed in accordance with the requirements listed below. Studs listed in the following schedule shall have a maximum height of 10'-0":

Location	Stud Size	Grade	Spacing
2.1 Interior non-bearing walls	2x4	Stud	24" O.C.
2.2 Interior bearing walls	2x4	Stud	16" O.C.
2.3 Exterior walls	2x4 spf	no.2	16" O.C.

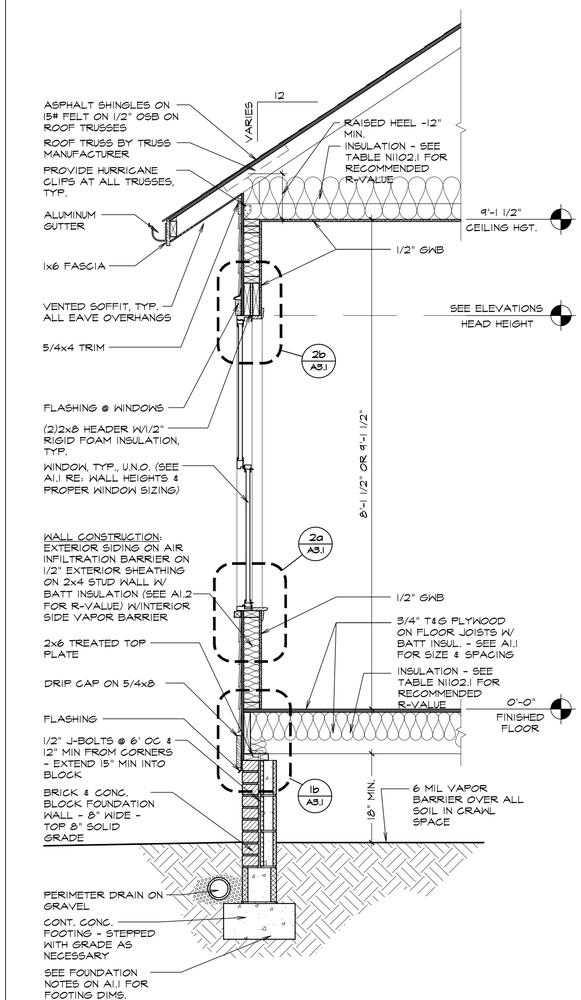
3. Studs shall be continuous from the sole plate to the double top plate at the ceiling or roof. Studs shall only be discontinuous at beams / headers for window or door openings. King studs shall be continuous with the same requirement as stud walls.
4. All headers at ext. openings and at bearing walls shall be (2) 2x8 (unless noted otherwise). Provide continuous king studs on each side of the jack studs. Unless otherwise noted on the drawings provide jack studs in accordance with the following schedule:

Opening	No. of Jack Studs
4.1. less than 4'-0"	1 ea. End
4.2. 4'-1" to 6'-0"	2 ea. End
4.3. 6'-1" to 12'-0"	3 ea. End
4.4. over 12'-0"	4 ea. End, or see plans

5. All beam bearing on timber framing shall have full bearing for the width of the beam and supported by a minimum of three studs. Where beams bear onto a wall parallel to the beam the beam shall have a minimum bearing length of 4-1/2".
6. Individual studs forming a column shall be attached together with one 10d CC nail @ 6" O.C. staggered. The stud column shall be continuous to the foundation or beam. The column shall be properly blocked at all floor levels to ensure proper load transfer.
7. All exterior walls shall be sheathed per section R602.10.3 of the North Carolina State Residential Code. Wall sheathing shall be APA rated structural 1 sheathing. Wall sheathing shall be attached to its supporting wall framing with 1-8d CC nail at 6" O.C. At panels edges and @ 12" O.C. In panel Field unless otherwise noted on the plans. Sheathing shall have a span rating constant with the framing spacing. Apply air infiltration barrier over the sheathing as required by the North Carolina Residential Code.

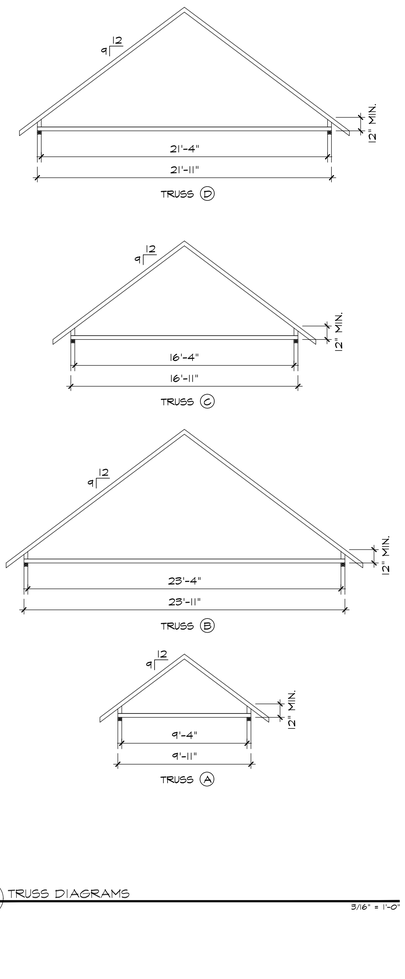
ROOF FRAMING NOTES

1. Unless otherwise noted on the plans, all framing is assumed to be standard wood framing. Framing shall comply with the requirements of the North Carolina State Residential Code, Chapter 8.
2. Roofs are designed for the uniformly distributed loads shown in the general structural notes. Special loading conditions must be reported to TightLines Designs; TightLines Designs is not responsible for defects resulting from unreported conditions.
3. Roofs shall be framed with roof trusses at 24" O.C. unless noted otherwise. Trusses shall be designed and/or reviewed by a licensed structural engineer.
4. At rafter and joist framing, a 2x4 collar tie (beam) shall be provided every third set of rafters. Ties shall be placed in the upper third of the roof and attached to each rafter with 4-12d CC nails.
5. Proper roof drainage shall be maintained at all roof conditions.
6. Roofs shall be sheathed with 15/32 APA rated structural sheathing exposure 1 or 2. Roof sheathing shall be continuous over two supports and attached to its supporting roof framing with 1-8d CC nail at 6" O.C. At panels edges and @ 12" O.C. In panel Field unless otherwise noted on the plans. Sheathing shall be applied perpendicular to framing. Sheathing shall have a span rating constant with the framing spacing. Use suitable edge support by use of plywood clips or lumber blocking unless otherwise noted. Panel end joints shall occur over framing. Sheathing shall have a 1/8" gap at panel ends and edges as recommended in accordance with the APA.
7. Apply building felt over the sheathing as required by the North Carolina Residential Code, with two layers for slopes 2/12 to 4/12 and one layer for slopes >4/12.
8. Attach a Simpson H2.5A Hurricane Tie at every connection between trusses and top plates.



3 A1.2 TYPICAL WALL SECTION

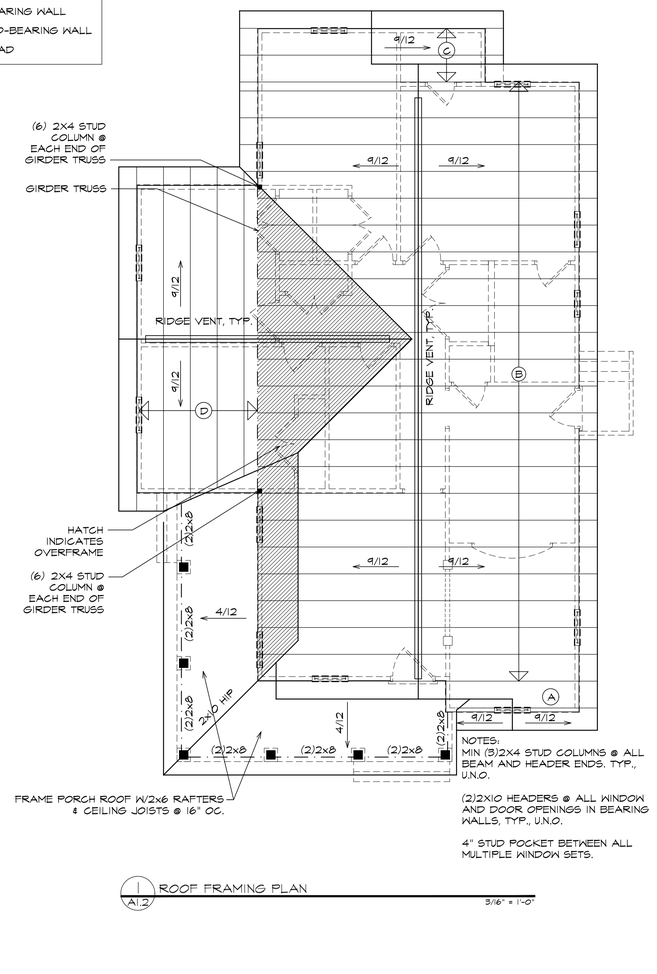
3/4" = 1'-0"



2 A1.2 TRUSS DIAGRAMS

3/16" = 1'-0"

WALL LEGEND
- LOAD-BEARING WALL
- NON LOAD-BEARING WALL
- POINT LOAD



NOTES:
MIN (3)2X4 STUD COLUMNS @ ALL BEAM AND HEADER ENDS, TYP., U.N.O.

(2)2X10 HEADERS @ ALL WINDOW AND DOOR OPENINGS IN BEARING WALLS, TYP., U.N.O.

4" STUD POCKET BETWEEN ALL MULTIPLE WINDOW SETS.

1 A1.2 ROOF FRAMING PLAN

3/16" = 1'-0"

ROOF FRAMING NOTES:
1) ROOF PLAN AND PITCHES ARE INDICATED IN ROOF PLAN. REFER TO ENGINEERED TRUSS DRAWINGS FOR FINAL ROOF CONSTRUCTION.
- SEE SHEET A1.2 FOR ADDITIONAL ROOF FRAMING NOTES.
2) PROVIDE TWO LAYERS 15# FELT UNDERLAYMENT FOR ROOFS 2:12 TO 4:12 AND ONE LAYER FOR ROOFS >4:12.

TRUSS NOTES:
1) DIMENSIONS ARE OUTSIDE TO OUTSIDE OF STUDS.
2) THESE ARE DIAGRAMATIC TRUSS CONFIGURATIONS. REFER TO ENGINEERED TRUSS DRAWINGS FOR ALL FINAL TRUSS DIMENSIONS, LAYOUTS AND CONSTRUCTION NOTES.
3) ROOF TRUSSES TO BE DESIGNED & ENGINEERED BY A NC LICENSED ENGINEER.
4) ALL TRUSS LOADS TO BEAR ON OUTSIDE WALLS ONLY U.N.O.
5) COORDINATE TRUSS LAYOUT TO PROVIDE 20"x30" MIN ATTIC ACCESS PANEL OR PULL DOWN STAIR AT LOCATION INDICATED ON 1/A1.1

OVERHANG NOTES:
1) RECOMMENDED RAKE OVERHANG: 1'-0"
2) RECOMMENDED EAVE OVERHANG 1'-4"

ROOF VENT CALCULATIONS:
1370 SF ROOF AREA/300 = 5 SF VENT REQUIRED
5 x 50% = 3 SF VENT REQ'D IN UPPER ROOF AREA

61 LF HORIZ. RIDGE VENT x .08 SF/LF = 5 SF VENT PROVIDED IN UPPER ROOF AREA

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Julia II Modified

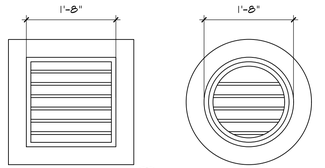
TightLines Designs, Inc. 51726 North Carolina Registered Corporation Raleigh, NC

DAVID SCOTT MAHER 5131 REGISTERED ARCHITECT NORTH CAROLINA RALEIGH, NC 06.13.19

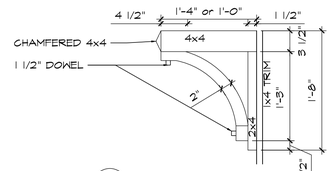
date	06.13.19
drafter	G.P.L.
checked by	C.L.B.
proj. no.	T-19035.1
revisions	date

Floor & Roof Framing, Trusses, Sections, & Insulation Notes

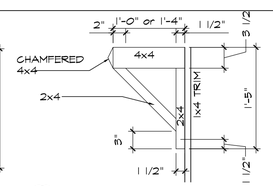
A1.2



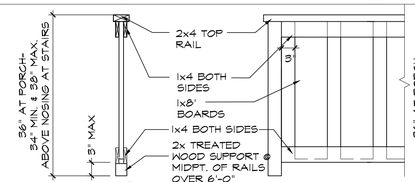
9 A2.1 VENT DETAILS 3/4" = 1'-0"



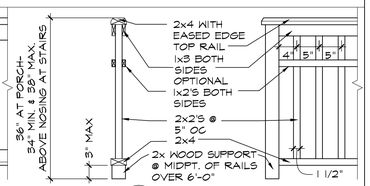
8b A2.1 CURVED BRACKET 1" = 1'-0"



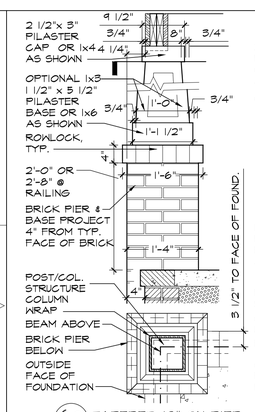
8a A2.1 ANGLED BRACKET 1" = 1'-0"



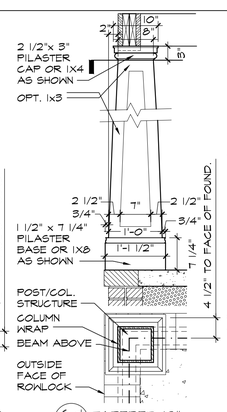
7b A2.1 RAILING DETAIL 3/4" = 1'-0"



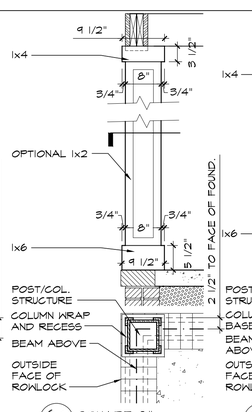
7a A2.1 RAILING DETAIL 3/4" = 1'-0"



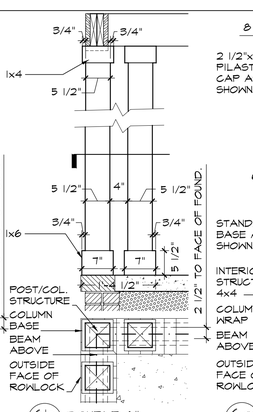
6e A2.1 TAPERED 12" ON PIER 3/4" = 1'-0"



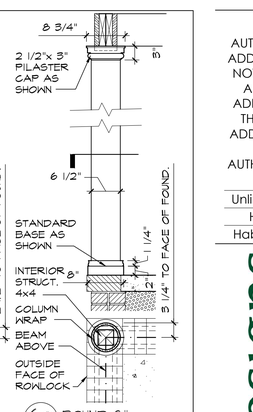
6d A2.1 TAPERED 12" 3/4" = 1'-0"



6c A2.1 SQUARE 8" 3/4" = 1'-0"



6b A2.1 DOUBLE 6" 3/4" = 1'-0"



6a A2.1 ROUND 8" 3/4" = 1'-0"

GUARDRAIL AND HANDRAILS:
1) INSTALL HANDRAILS AND GUARDS PER 2018 RESIDENTIAL BUILDING CODE SECTIONS R311.7.2 THROUGH R312. PORCHES, BALCONIES, RAMPS OR RAISED FLOOR SURFACES LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW SHALL HAVE GUARDS NOT LESS THAN 36" IN HEIGHT. OPEN SIDES OF STAIRS WITH A TOTAL RISE OF MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW SHALL HAVE GUARDS NOT LESS THAN 34" IN HEIGHT MEASURED VERTICALLY FROM THE NOSING OF THE TREADS. REQUIRED GUARDS ON OPEN SIDES OF STAIRWAYS, RAISED FLOOR AREAS, BALCONIES AND PORCHES SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL CLOSURES WHICH DO NOT ALLOW PASSAGE OF AN OBJECT 4" OR MORE IN DIAMETER. HORIZONTAL SPACING BETWEEN THE VERTICAL MEMBERS IN REQUIRED GUARDRAILS SHALL BE A MAXIMUM OF 4" AT THE NEAREST POINT BETWEEN MEMBERS.
2) INSTALL HANDRAILS PER 2018 RESIDENTIAL BUILDING CODE SECTION R311.5.6 AT ALL PORCH STAIRS WITH MORE THAN 4 RISERS. HANDRAIL HEIGHT, MEASURED VERTICALLY FROM THE SLOPED PLANE ADJOINING THE TREAD NOSING, OR FINISH SURFACE OF RAMP SLOPE, SHALL NOT BE LESS THAN 34" AND NOT MORE THAN 38".

4 A2.1 LEFT ELEVATION 1/4" = 1'-0"

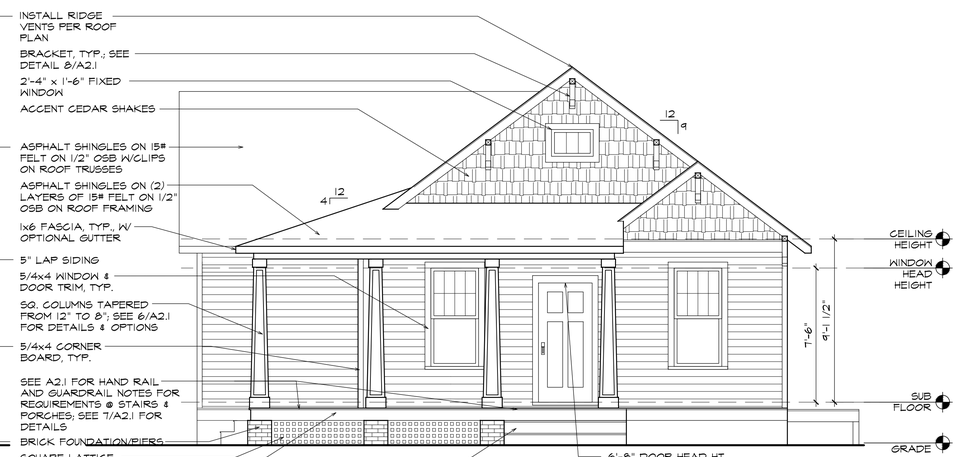
3 A2.1 REAR ELEVATION 1/4" = 1'-0"

GLADDING VALUES
PROVIDE POS. AND NEG. WALL & ROOF CLADDING DESIGN VALUES. PLANS MAY STATE THAT WALL CLADDING IS DESIGNED FOR 24.1 LBS/SF OR GREATER POS. OR NEG.PRESSURE FOR HOUSES W/ MEAN ROOF HGT. OF 30 FT. OR LESS. ROOF VALUES, BOTH POS. & NEG., SHALL BE DESIGNED AS FOLLOWS:
- 45.4 LBS/SF FOR ROOF PITCHES OF 0/12 TO 2.25/12
- 24.8 LBS/SF FOR ROOF PITCHES OF 2.25/12 TO 7/12
- 21 LBS/SF FOR ROOF PITCHES OF 7/12 TO 12/12
VALUES STATED ARE FOR ROOFS WITH A MEAN HGT. OF 30 FT. OR LESS. ROOFS W/ MEAN HGTS. GREATER THAN 30 FT. MUST SHOW SPECIFIC INFORMATION FOR CLADDING.

MEAN ROOF HEIGHT: 16'-2"

5 A2.1 NOTES

2 A2.1 RIGHT ELEVATION 1/4" = 1'-0"



1 A2.1 FRONT ELEVATION 1/4" = 1'-0"

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Julia II Modified

TightLines Designs, Inc. 51726 Raleigh, NC North Carolina Registered Corporation

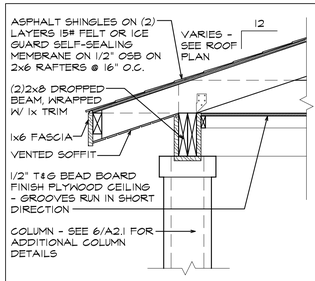
DAVID SCOTT MARRER REGISTERED ARCHITECT 5131 NORTH CAROLINA RALEIGH, NC 06.13.19

date	06.13.19
drafter	G.P.L.
checked by	C.L.B.
proj. no.	T-19035.1
revisions	date

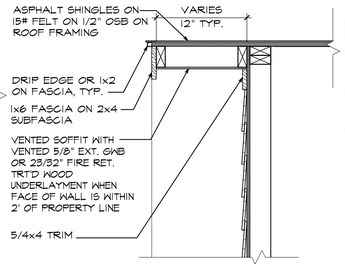
Elevations, Details, & Notes

A2.1

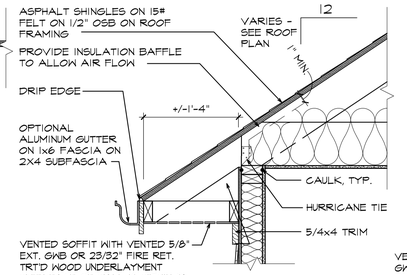
RAKE & EAVE DETAILS



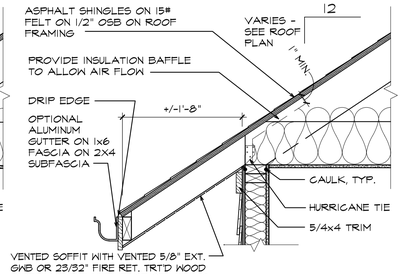
6 PORCH EAVE DETAIL (A3.1) 1" = 1'-0"



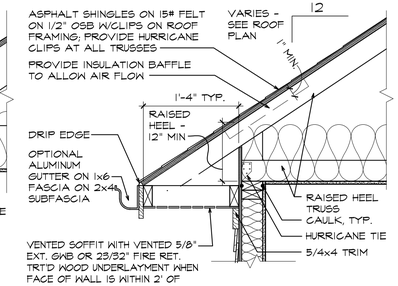
5 TYPICAL RAKE DETAIL (A3.1) 1" = 1'-0"



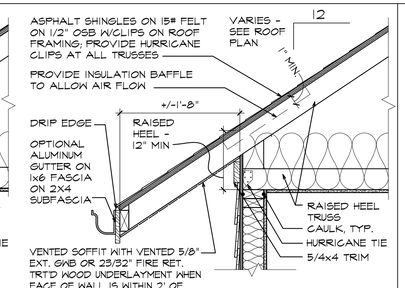
4a BOXED EAVE DETAIL (A3.1) 1" = 1'-0"



4c SLOPED EAVE DETAIL (A3.1) 1" = 1'-0"

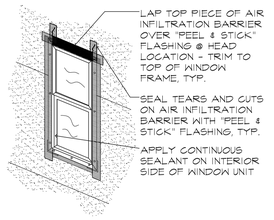


4b BOXED EAVE DETAIL W/ TRUSS (A3.1) 1" = 1'-0"

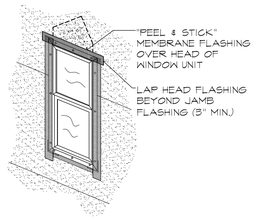


4a SLOPED EAVE DETAIL W/ TRUSS (A3.1) 1" = 1'-0"

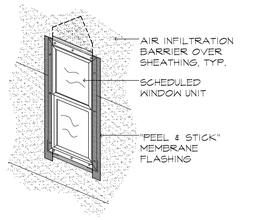
WINDOW INSTALLATION



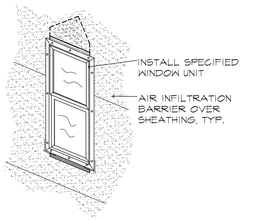
7 FINISHING
a) LAP TOP PIECE OF AIR INFILTRATION BARRIER OVER "PEEL & STICK" FLASHING @ HEAD LOCATION - TRIM TO TOP OF WINDOW FRAME, TYP.
b) INSTALL A CONTINUOUS BEAD OF POLYURETHANE SEALANT WHERE INTERIOR OF WINDOW UNIT MEETS R.O.



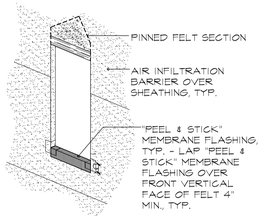
6 HEAD FLASHING
INSTALL "PEEL & STICK" MEMBRANE FLASHING OVER NAILING FLANGE OF WINDOW UNIT AT HEAD LOCATIONS.



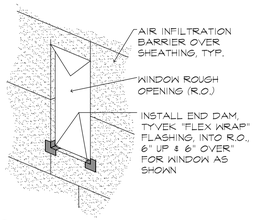
5 JAMB FLASHING
INSTALL "PEEL & STICK" MEMBRANE FLASHING OVER NAILING FLANGE OF WINDOW UNIT AT JAMB LOCATIONS.



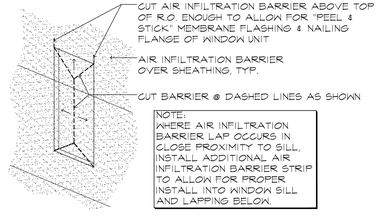
4 WINDOW INSTALLATION
INSTALL SPECIFIED WINDOW UNIT - SEE MFGR. RECOMMENDATIONS FOR INSTALLATION



3 SILL FLASHING
INSTALL "PEEL & STICK" FLASHING AT SILL LOCATION BY ADHERING TO INSIDE SILL R.O. AND EXTENDING DOWN OVER AIR INFILTRATION BARRIER



2 END DAM FLASHING
INSTALL END DAM FLASHING IN ROUGH OPENING FOR WINDOW



1 INSTALL AIR INFILTRATION BARRIER/CUT WINDOW R.O.
a) INSTALL AIR INFILTRATION BARRIER ON SHEATHING & OVER R.O. FOR WINDOW.
b) CUT AIR INFILTRATION BARRIER @ ALL R.O. LOCATIONS AS SHOWN.
c) PULL HEAD SECTION OF BARRIER UP AND TEMPORARILY PIN TO SHEATHING - FOLD THE JAMB SECTIONS OF THE BARRIER INTO THE R.O.

FRAMING DETAILS

4 INT. WALL AT ATTIC (A3.1) 1-1/2" = 1'-0"

3c CORNER DETAIL (A3.1) NOT TO SCALE

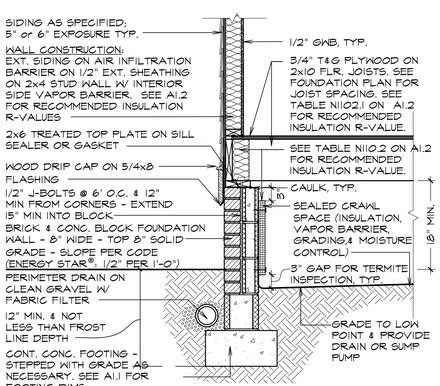
3b EXT. INSULATED T-WALL (A3.1) NOT TO SCALE

3a INTERIOR T-WALL DETAIL (A3.1) 1-1/2" = 1'-0"

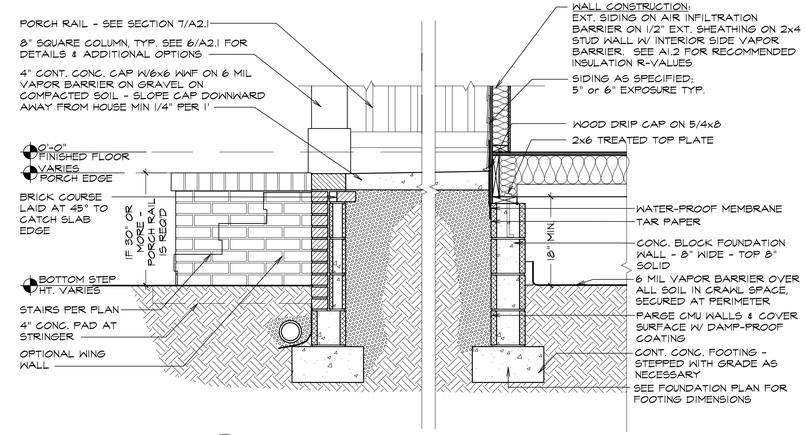
2b WINDOW AT HEAD (A3.1) 1-1/2" = 1'-0"

2a WINDOW AT SILL (A3.1) 1-1/2" = 1'-0"

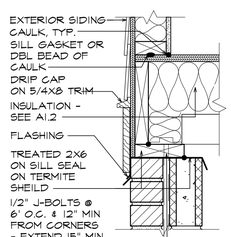
FOUNDATION DETAILS



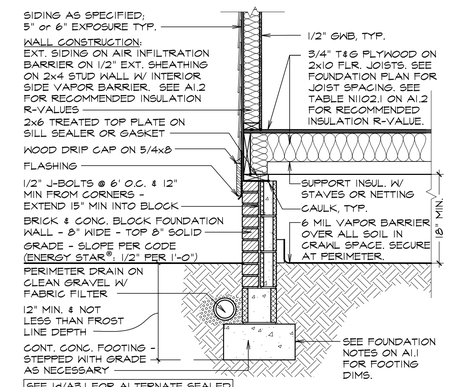
1d ALTERNATE SEALED CRAWL SPACE FOUNDATION (A3.1) 3/4" = 1'-0"



1c PORCH FOUNDATION (A3.1) 3/4" = 1'-0"



1b CRAWL SPACE (A3.1) 1-1/2" = 1'-0"



1a TYPICAL CRAWL SPACE FOUNDATION (A3.1) 3/4" = 1'-0"

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Construction Details

TightLines Designs, Inc. 51726 North Carolina Registered Architecture Raleigh, NC

DAVID SCOTT MADRAK 5131 REGISTERED ARCHITECT NORTH CAROLINA RALEIGH, NC

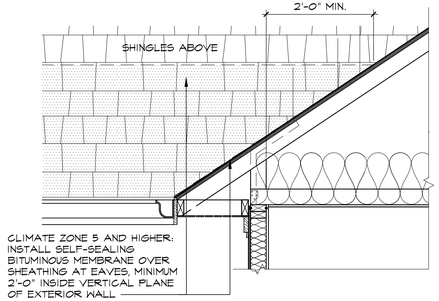
06.13.19

date	06.13.19
drafter	G.P.L.
checked by	C.L.B.
proj. no.	T-19035.1

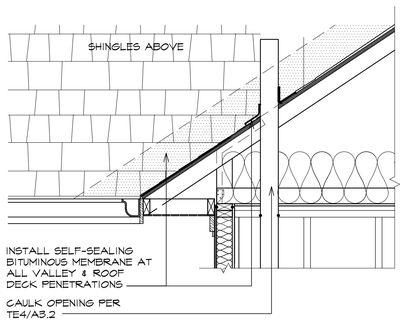
Foundation, Wall & Roof Framing Details

A3.1

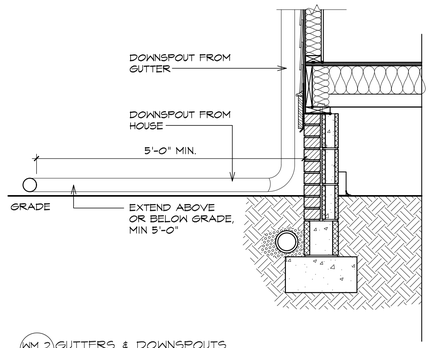
WATER MANAGEMENT



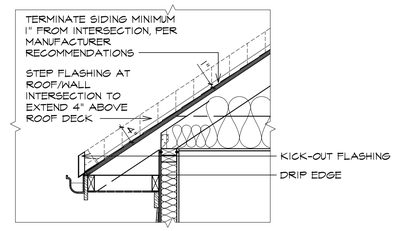
WM 4 / A3.2 BITMINUOUS MEMBRANE AT EAVES
SEE A3.1 FOR TYPICAL RAKE & EAVE DETAILS 3/4" = 1'-0"



WM 3 / A3.2 ROOF DECK PENETRATIONS
SEE A3.1 FOR TYPICAL RAKE & EAVE DETAILS 3/4" = 1'-0"

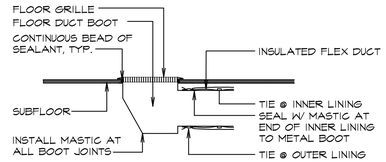


WM 2 / A3.2 GUTTERS & DOWNSPOUTS
SEE A3.1 FOR TYPICAL FOUNDATION DETAILS 3/4" = 1'-0"

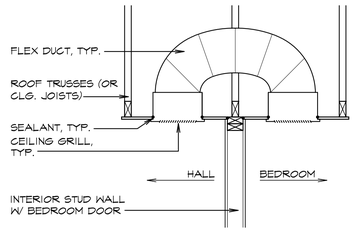


WM 1 / A3.2 KICK-OUT FLASHING AT ROOF/WALL INTERSECTION
SEE A3.1 FOR TYPICAL RAKE & EAVE DETAILS 3/4" = 1'-0"

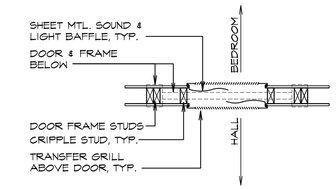
HVAC QUALITY



HC 1 / A3.2 TYPICAL DUCT BOOT SEAL
3/4" = 1'-0"

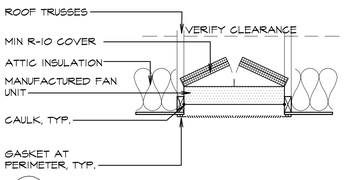


HC 2 / A3.2 BEDROOM PRESSURE BALANCE: JUMPER DUCT
3/4" = 1'-0"

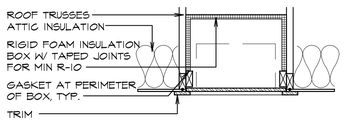


HC 1 / A3.2 BEDROOM PRESSURE BALANCE: TRANSFER GRILL
3/4" = 1'-0"

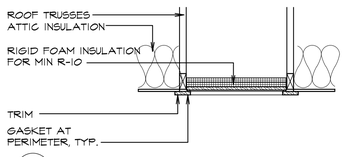
THERMAL ENCLOSURE



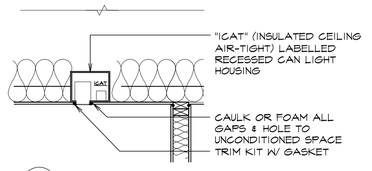
TE 9 / A3.2 TYPICAL WHOLE HOUSE FANS
3/4" = 1'-0"



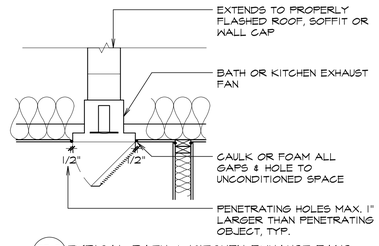
TE 8 / A3.2 TYPICAL ATTIC PULL-DOWN STAIRS
3/4" = 1'-0"



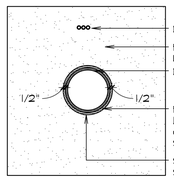
TE 7 / A3.2 TYPICAL ATTIC ACCESS PANEL
3/4" = 1'-0"



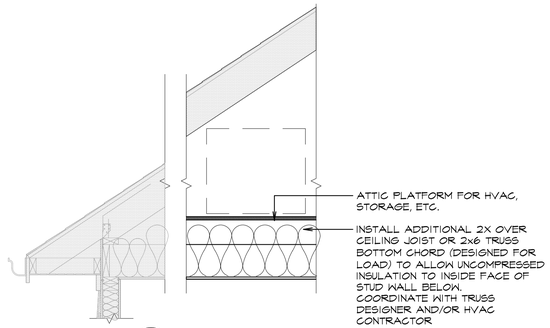
TE 6 / A3.2 TYPICAL ICAT RECESSED LIGHTING FIXTURES
3/4" = 1'-0"



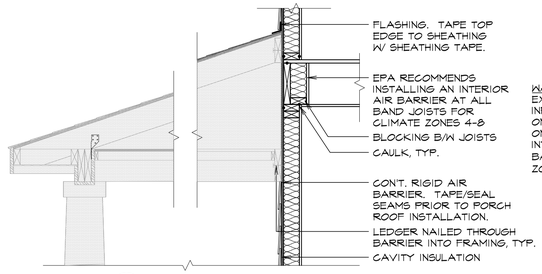
TE 5 / A3.2 TYPICAL BATH & KITCHEN EXHAUST FANS
3/4" = 1'-0"



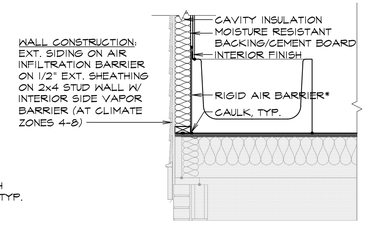
TE 4 / A3.2 TYPICAL PENETRATIONS TO UNCONDITIONED SPACE
3/4" = 1'-0"



TE 3 / A3.2 TYPICAL INSULATION AT ATTIC PLATFORM
3/4" = 1'-0"



TE 2 / A3.2 TYPICAL WALL ADJOINING PORCH ROOF
3/4" = 1'-0"



TE 1 / A3.2 TYPICAL TUB/SHOWER AT EXTERIOR WALL
*RIGID AIR BARRIER MAY BE GYPSUM BOARD, PLYWOOD, OSB, OR RIGID FOAM BOARD
3/4" = 1'-0"

THIS PAGE CONTAINS ILLUSTRATED DETAILS THAT ARE REQUIRED FOR ENERGY STAR ® CERTIFICATION AND ARE RECOMMENDED FOR THE CONSTRUCTION OF ANY TIGHTLINES HOUSE. THIS SHEET IS NOT A COMPREHENSIVE CHECKLIST FOR ANY CERTIFICATION PROCESS.

TightLines Designs®
creating great places to live
115.5 E. Hargett St. Suite 300, Raleigh, NC 27601
919-834-3600 • www.tightlinesdesigns.com

ENERGY STAR® Details

TightLines Designs, Inc. Licensed Professional Engineering Corporation 51726 North Carolina Raleigh, NC

DAVID SCOTT MAUER REGISTERED ARCHITECT 5131 NORTH CAROLINA RALEIGH, NC 06.13.19

date	06.13.19
drafter	G.P.L.
checked by	C.L.B.
proj. no.	T-19035.1
revisions	date
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ENERGY STAR® Details

A3.2

Green Opportunities

Green Opportunities is a collection of ideas for achieving more sustainable construction habits and a greener home. *The italic text elaborates about the intent and its relationship to TightLines Designs.* We highly recommend participation in a green certification program to ensure that your home conserves energy, natural resources, and maintains optimal indoor air quality. Take a look at the resources below to get started finding a certification program that is right for you.

Green Certification Programs

Program	Intent	Website
National Association of Home Builders	National Rating System for Energy, Resources, & Indoor Air Quality	http://www.nahbgreen.org/Guidelines/anasistandard.aspx
LEED for Homes	National Rating System for Energy, Resources, & Indoor Air Quality	http://www.greenhomeguide.org/
Enterprise Green Communities	Framework for developers to pursue green building in affordable multi- and single-family developments	http://www.greencommunitiesonline.org/
Earthcraft	Southeast Rating System for Energy, Resources, & Indoor Air Quality	http://www.earthcrafthouse.com/
Greenbuilt North Carolina	Statewide Rating System for Energy, Resources, & Indoor Air Quality	http://www.greenbuilt.org/

LOCATION

Site Selection • Built above 100-year floodplain • Not built on habitat for threatened or endangered species • Not built within 100 ft of water, including wetlands • Not built on land that was public parkland prior to acquisition • Not built on land with prime soils, unique soils, or soils of state significance	*Selecting an appropriate site is the first step in building a green home. The intent is to minimize the home's impact on the environment and to preserve significant species, open space, soil, or community amenities.*
Preferred Locations • Edge Development • Infill • Previously Developed • Greyfield/Brownfield Site	
Infrastructure • Existing Infrastructure	*Minimize site disturbance on- and off-site.*
Community Resources/Transit • Community Resources/Transit	*Reduce the use of fossil fuels by building near shopping centers, parks/greenways, and mass transit systems.*

SUSTAINABLE SITES

Site Stewardship

Erosion Controls During Construction • Stockpile and protect topsoil from erosion • Control the path and velocity of runoff with silt fencing or equivalent • Protect sewer inlets, streams, and lakes with straw bales, silt fencing, etc. • Provide swales to divert surface water from hillsides • Use tiers, erosion blankets, compost blankets, etc. on sloped areas	*Preventing erosion aids in maintaining soil quality and prevents soil runoff that pollutes lakes and streams.*
Minimize Disturbed Area of Site • Develop tree/plant preservation plan with "no-disturbance" zones • Rehabilitate lot; undo soil compaction and remove invasive plants • Maximize number of units per acre or build on smaller lot	

Landscaping

Basic Landscaping Design • Use drought tolerant turf • Do not use turf in densely shaded areas • Do not use turf in areas with slope of 25% • Add mulch or soil amendments as appropriate • Till compacted soil to at least 6 inches	*Using water responsibly includes limiting the use of potable water for irrigation. This can be done by selecting drought- tolerant plants, limiting turf, and mulching.*
Limit Conventional Turf	
Drought-Tolerant Plants	
Reduce Overall Irrigation Demand	
Group plants with similar water needs (hydrozoning)	

Reduce Local Heat Island Effects

Reduce Local Heat Island Effects • Locate trees/plantings to provide shade for hardscapes • Install light colored hardscapes • Do not use turf in areas with slope of 25%	*The heat island effect occurs when areas experience unnaturally elevated temperatures that are caused by increased heat retention in man-made materials such as dark roofs or asphalt. Heat islands affect human comfort and wildlife patterns. Heat islands can be avoided by selecting light colored building materials or shading heat retaining materials.*

Storm Water Management

Maximize Permeable Area of Lot • Vegetative landscape • Permeable paving • Impermeable surfaces directed to infiltration features	*Runoff from hard surfaces washes pollutants directly into water systems that are used to yield food or drinking water to residents. Also, it is important that soils retain rainwater to naturally irrigate landscapes.*
Permanent Erosion Control Options • For portions of lot on steep slope, use terracing and retaining walls • Plant trees, shrubs or groundcover	
Management of Runoff From Roof • Install permanent storm water controls to manage runoff from the home • Install vegetated roof	

Nontoxic Pest Control

Pest Control Alternatives • Keep all wood at least 12" above soil • Seal external cracks, joints etc. with caulking and install pest-proof screens • Include no wood-to-concrete connections, or separate connections with dividers • Install landscaping so mature plants are 24" from home	

WATER EFFICIENCY

Water Reuse

Rainwater Harvesting System	*Rain barrels are a simple and inexpensive way to collect rainwater from your home's roof for irrigation use.*
Graywater Reuse System	*For example: flushing your toilet or irrigating your lawn with bathtub, lavatory, or laundry water.*
Use of Municipal Recycled Water System	*For example: using non-potable water for car washing or irrigation.*

Irrigation System

High-Efficiency Irrigation System • Irrigation system designed by EPA Water Sense certified professional • Irrigation system with head-to-head coverage • Install central shut-off valve • Install sub-meter for the irrigation system • Use drip irrigation for planting beds • Create separate zones for each type of bedding • Install timer or controller for each watering zone • Install pressure-regulating devices • High-efficiency nozzles with distribution uniformity of at least0.70 • Check valves in heads • Install moisture sensor or rain delay controller	*If irrigation is desired, installing an efficient system is the responsible solution.*
Reduce Overall Irrigation Demand	

Indoor Water Use

High-Efficiency Fixtures and Fittings • Average flow rate of lavatory faucets is ≤ 2.0 gpm • Average flow rate for all showers is ≤ 2.0 gpm per stall • Average flow rate for all toilets is ≤ 1.3 gpf; or toilets are dual flush or toilets must meet the EPA Water Sense specification	*Availability of drinking water is becoming a growing concern for communities across the United States. Do your part to reduce wasteful water use and ensure ample resources for future generations.*

ENERGY & ATMOSPHERE

Optimize Energy Performance

Performance of ENERGY STAR® for Homes	*See sheet A3.2 for* ENERGY STAR® *Details.*
Exceptional Energy Performance	*Contact a Certified Energy Rater to learn more about the opportunities to increase energy performance. Often energy performance is an excellent investment due to a short pay-back period. Find a Certified Energy Rater at* http://www.resnet.us/

Water Heating

Efficient Hot Water Distribution System options • Structured plumbing system • Central manifold distribution system • Compact design of conventional system	
Pipe Insulation	

Residential Refrigerant Management

Refrigerant Charge Test	
Appropriate HVAC Refrigerant Options • Use no refrigerants • Use non-HCFC refrigerants • Use refrigerants that complies with global warming potential equation	

MATERIALS & RESOURCES

Material Efficient Framing

Framing Efficiency Options • Precut framing packages • Open-web floor trusses • Structural insulated panel walls • Structural insulated panel roof • Structural insulated panel floors • Stud spacing greater than 16" on center • Ceiling joist spacing greater than 16" on center • Floor joist spacing greater than 16" on center • Roof rafter spacing greater than 16" on center • Size headers for loads; ladder blocking; drywall clips; 2-stud corners	*Framing Efficiency refers to efficient use of materials and the ability to insulate properly to allow for energy efficiency within the home.* *TightLines Designs feature open web floor trusses (2-story homes) and roof trusses (all homes excluding 1.5-story). See sheet A3.1 for ladder blocking, drywall clips, and 2-stud corner diagrams.*
Off-site Fabrication Options • Panelized construction • Modular, prefabricated construction	

Environmentally Preferable Products

Wood Products • Use non-tropical wood • Use reclaimed wood • FSC (Forest Stewardship Council) Certified Tropical Wood	
Environmentally Preferable Products • Low emission • Produced locally	

Waste Management

Construction Waste Management Planning • Determine where waste can be diverted for reuse or recycling • Identify vendor that can sort and divert waste from landfill	
Construction Waste Reduction • Document amount of waste diverted from landfill	
Designated cutting area	*Having a designated cutting area discourages wasteful practices. Example: if blocking is needed, blocking can be gathered from the scraps in the cutting area, rather than cutting a long board into small pieces.*
On-site recycling	*On-site recycling for plastic and aluminum drink bottles keeps the project green throughout the construction phase.*

INDOOR ENVIRONMENTAL QUALITY

ENERGY STAR with Indoor Air Plus

ENERGY STAR with Indoor Air Plus	*Simple steps to ensure healthy indoor air can make a tremendous difference in the health of your family. Visit* http://epa.gov/indoorairplus/ *for more information.*

Combustion Venting

Basic Combustion Venting Measures • No unvented combustion appliances • Carbon monoxide monitors on each floor • No fireplace installed • Space, water heating equipment designed with closed combustion, power-vented exhaust, or located in open-air facility	*Properly venting and monitoring combustion devices ensures the safety of homeowners from fire and carbon monoxide poisoning.*

Moisture Control

Moisture Load Control Options • Additional dehumidification system • Central HVAC system equipped with additional dehumidification mode	

Outdoor Air Ventilation

• Outdoor Air Ventilation	*Provide additional fresh air into the home with enhanced outdoor air ventilation.*

Local Exhaust

Basic Local Exhaust • Bathroom and kitchen exhaust meets ASHRAE Std. 62.2 air flow requirement • Fans and ducts designed and installed to ASHRAE Std. 62.2 • Air exhausted to outdoors • ENERGY STAR labeled bathroom exhaust fans	*Amply exhausting damp kitchen and bath air from the home prevents the opportunity for mold and mildew growth.*
Enhanced Local Exhaust Options • Occupancy sensor • Automatic humidstat controller • Automatic timer tied to switch • Continuously operating exhaust fan	

Distribution of Space Heating and Cooling

Room-by-Room Load Calculations	
Return Air Flow/Room-by-Room Controls Options Forced Air Systems • Return air opening of 1 sq. inch per cfm of supply • Limited pressure differential between closed room and adjacent spaces Nonducted HVAC Systems • Flow control valves on every radiator	
Third Party Performance Test/Multiple Zones Forced Air Systems • Have supply air flow rates in each room tested and confirmed Nonducted HVAC Systems • Install at least two distinct zones with independent thermostat control	

Air Filtering

Higher Quality Air Filters	*A simple option to remove dust and pollutants from indoor air.*

Contaminant Control

Indoor Contaminant Control during Construction	*Prevent dust from settling in ductwork.*
Indoor Contaminant Control • Design and install permanent walk-off mats at each entry • Design shoe removal and storage space near primary entryway • Install central vacuum system with exhaust to outdoors	
Pre-occupancy Flush	

Radon Protection

Radon-Resistant Construction	
Radon Testing	

Garage Pollutant Protection

No HVAC in Garage	
Minimize Pollutants from Garage • Seal all penetrations and connecting floor and ceiling joist bays • Paint walls and ceilings of shared walls, including garage • Weather-strip all doors leading into home • Carbon monoxide detectors in rooms that share a door with garage • Seal all penetrations and cracks at the base of walls	
Exhaust Fan in Garage • Fan runs continuously • Fan designed with automatic timer control	
Detached Garage or No Garage	*With a TightLines Design, you can often receive green certification points for not having a garage.*

AWARENESS & EDUCATION

Education of the Homeowner or Tenant

Basic Operations Training • Operations and training manual • One-hour walkthrough with occupant(s)	
Public Awareness • Open House • Website about features and benefits of green homes • Newspaper article on the project • Display signage on exterior of home designating green accolades	

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"Green" Opportunities

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