



206.409.6690  
dan@brobstdesignworks.com

COVER SHEET

**MERLINO RESIDENCE**  
4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED

1.20.2021

4.21.2021

1/4"=1'-0"

SCALE

11.10.2020

DATE

MERCER ISLAND

COMPUTER FILE NAME

COVER

SHEET NUMBER

# NFPA 13d FIRE SPRINKLER SYSTEM REQUIRED

## MERLINO RESIDENCE

4225 89TH AVE SE MERCER ISLAND, WA 98040

### ABBREVIATION KEY

B.E.W. = BOTTOM EACH WAY  
DBL. = DOUBLE  
DISP = GARBAGE DISPOSAL  
DW = DISH WASHER  
FT = FEET  
O.C. = ON CENTER  
PL. = POINT LOAD  
R&S = ROD AND SHELF  
SG = SAFETY GLASS  
SIM. = SIMILAR  
TB = TOWEL BAR  
TP = TOILET PAPER HANGER  
TR = TOWEL RING  
TYP. = TYPICAL  
U.N.O. = UNLESS NOTED OTHERWISE  
VB = VAPOR BARRIER  
VTOS = VENT TO OUT SIDE  
WH = WATER HEATER

### PLAN DESCRIPTION

<b>FLOOR AREA:</b>	
MAIN LEVEL:	2463 S.F.
UPPER LEVEL:	1302 S.F.
TOTAL HEATED AREA:	3765 S.F.
<b>GARAGE:</b> 754 S.F.	
ENTRY PORCH:	192 S.F.
REAR PATIO:	360 S.F.
COVERED BALCONY:	206 S.F.

<b>FLOOR AREA RATIO:</b>	
MAXIMUM ALLOWED:	5245 S.F. 40%
TOTAL LIVING:	3765 S.F.
GARAGE:	754 S.F.
COVERED BALCONY:	206 S.F.
GREAT ROOM TALL CEILING: (460 S.F. x .5)	230 S.F.
FOYER TALL CEILING: (70 S.F. x .1)	70 S.F.
STAIRWELL CEILING: (103 S.F. x 1)	103 S.F.
PROPOSED F.A.R.	5128 S.F.
5128 S.F. / 13,113 S.F. = 39.11%	

SINGLE FAMILY RESIDENCE  
WOOD FRAME STRUCTURE  
STEM WALL / CRAWL SPACE FOUNDATION  
DETACHED RESIDENCE  
WITH ATTACHED 3 CAR GARAGE

### BUILDING CODE / ENERGY COMPLIANCE

2015 INTERNATIONAL RESIDENTIAL CODE W/ WA. STATE AMMENDMENTS  
2015 INTERNATIONAL BUILDING CODE W/ WA. STATE AMMENDMENTS  
2015 INTERNATIONAL MECHANICAL CODE W/ WA. STATE AMMENDMENTS  
2015 WASHINGTON STATE ENERGY  
2015 UNIFORM PLUMBING CODE

### BUILDING ZONE R-9.6

### DESIGNER

### BROBST DESIGN WORKS

CONTACT:  
DAN BROBST  
206.409.6690  
dan@brobstdesignworks.com

### STRUCTURAL ENGINEER

### RB ENGINEERS, INC.

1312 2nd Street, Kirkland, WA 98033  
Tel: (425) 822-3009, Fax: (425) 822-2679  
Email: RBE1992@GMAIL.COM

### ENERGY CREDIT INFORMATION

SELECTED	STANDARD AMERICAN CLASSIC SELECTED CREDITS	3.5 REQUIRED
OPTION	DESCRIPTION	CREDIT(S)
1A	EFFICIENT BUILDING ENVELOPE 1A: PRESCRIPTIVE COMPLIANCE IS BASED ON TABLE R402.1.1 WITH THE FOLLOWING MODIFICATIONS: VERTICAL FENESTRATION U=0.28 FLOOR R-38 SLAB ON GRAD R-10 PERIMETER AND UNDER ENTIRE SLAB BELOW GRADE SLAB R-10 PERIMETER AND UNDER ENTIRE SLAB	.5
3A	HIGH EFFICIENCY HVAC EQUIPMENT 3A: GAS, PROPANE OR OIL-FIRED FURNACE WITH MINIMUM AFUE OF 94% OR GAS, PROPANE OR OIL-FIRED BOILER WITH MINIMUM AFUE OF 92% TO QUALIFY TO CLAIM THIS CREDIT, THE BUILDING PERMIT DRAWINGS SHALL SPECIFY THE OPTION BEING SELECTED AND SHALL SPECIFY THE HEATING EQUIPMENT TYPE AND THE MINIMUM EQUIPMENT EFFICIENCY. FURNACE MODEL: TRANE XR-95 (95% EFFICIENCY)	1.0
5A	EFFICIENT WATER HEATING 5A: ALL SHOWERED AND KITCHEN SINK FAUCETS INSTALLED IN THE HOUSE SHALL BE RATED AT 1.75 GPM OR LESS. ALL OTHER LAVATORY FAUCETS SHALL BE RATED AT 1.0 GPM OR LESS TO QUALIFY TO CLAIM THIS CREDIT, THE BUILDING PERMIT DRAWINGS SHALL SPECIFY THE OPTION BEING SELECTED AND SHALL SPECIFY THE MAXIMUM FLOW RATES FOR ALL SHOWER HEADS, KITCHEN SINK FAUCETS, AND OTHER LAVATORY FAUCETS.	.5
5C	EFFICIENT WATER HEATING 5C: WATER HEATING SYSTEMS SHALL INCLUDE ONE OF THE FOLLOWING: GAS, PROPANE OR OIL WATER HEATER WITH MINIMUM EF OF 0.91 OR SOLAR WATER HEATING SUPPLEMENTING A MINIMUM STANDARD WATER HEATER. SOLAR WATER HEATING WILL PROVIDE A RATED MINIMUM SAVINGS OF 85 THERMS OR 2000 kWh BASED ON THE SOLAR RATING AND CERTIFICATION CORPORATION (SRCC) ANNUAL PERFORMANCE OF 0G-300 CERTIFIED SOLAR WATER HEATING SYSTEMS. OR ELECTRIC HEAT PUMP WATER HEATER WITH A MINIMUM EF OF 2.0 AND MEETING THE STANDARDS OF NEEA'S NORTHERN CLIMATE SPECIFICATIONS FOR HEAT PUMP WATER HEATERS. TO QUALIFY TO CLAIM THIS CREDIT, THE BUILDING PERMIT DRAWINGS SHALL SPECIFY THE OPTION BEING SELECTED AND SHALL SPECIFY THE WATER HEATER EQUIPMENT TYPE AND THE MINIMUM EQUIPMENT EFFICIENCY AND, FOR SOLAR WATER HEATING SYSTEMS, THE CALCULATIONS OF THE MINIMUM ENERGY SAVINGS. TANKLESS WATER HEATER MODEL: RINNAI RU 98i (95% EFFICIENCY)	1.5

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### CURRENT DATE

4.21.2021  
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11.10.2020



**LEGAL DESCRIPTION:**  
 THE SOUTH 25 FEET OF LOT 3 AND ALL OF LOT 4, BLOCK 4, LUCAS HEIGHTS,  
 ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 17 OF PLATS,  
 PAGES 5, IN KING COUNTY, WASHINGTON  
 TOGETHER WILL THE LAST HALF OF VACATED ALLEY ADJOINING

**CRITICAL SITE INFORMATION:**  
 THIS LOT DOES NOT CONTAIN ANY WETLANDS, WATERCOURSE, STEEP SLOPE  
 OR ANY CRITICAL AREAS OR BUFFERS

Category	Grove	≥ 24" DBH	Tree No.	DBH (in)	Tree Common Name & Species	Dripline (ft)	Health	Structure	Comments on Condition	Tree Type
Large	NO	✓	1	25"	Douglas-fir, Pseudotsuga menziesii	16'	Excellent	Good	No visible defects	Conifer
Shrub	N/A		2		Photinia fraseri	20'	Good	Fair	Multiple leaders covered in ivy, old age	Broadleaf evergreen
Shrub	N/A		3	18"	Leyland cypress, Cupressus xleylandii	16'	Excellent	Fair	Multiple leaders covered in ivy	Conifer
Shrub	N/A		4	22"	Leyland cypress, Cupressus xleylandii	16'	Excellent	Fair	Multiple leaders covered in ivy	Conifer
Shrub	N/A		5	39"	Leyland cypress, Cupressus xleylandii	17'	Excellent	Fair	Multiple leaders covered in ivy	Conifer
Exceptional	NO	✓	6	32"	Douglas-fir, Pseudotsuga menziesii	*14'	Excellent	Good	No visible defects	Conifer
Small	NO		7	5"	Douglas-fir, Pseudotsuga menziesii	8'	Excellent	Good	Suppressed by larger trees	Conifer
Small	N/A		8	5"	Douglas-fir, Pseudotsuga menziesii	8'	Excellent	Good	Suppressed by larger trees	Conifer
Shrub	N/A		9		Stranvaesia	12'	Good	Good	Multiple leaders (the largest of this shrub I have ever seen)	Broadleaf evergreen

\* Dripline overhanging property line

DEVELOPMENT PROPOSALS FOR A NEW SINGLE-FAMILY HOME SHALL REMOVE JAPANESE KNOTWEED (POLYGONUM CUSPIDATUM) AND REGULATED CLASS A, REGULATED CLASS B, AND REGULATED CLASS C WEEDS IDENTIFIED ON THE KING COUNTY NOXIOUS WEED LIST, AS AMENDED, FROM REQUIRED LANDSCAPING AREAS ESTABLISHED PURSUANT TO SUBSECTION 19.02.020(F)(3)(A). NEW LANDSCAPING ASSOCIATED WITH NEW SINGLE FAMILY HOME SHALL NOT INCORPORATE ANY WEED LIST, AS AMENDED. PROVIDED, THAT REMOVAL SHALL NOT BE REQUIRED IF THE REMOVAL WILL RESULT IN INCREASED SLOPE INSTABILITY OR RISK OF LANDSLIDE OR EROSION.

AVERAGE BUILDING ELEVATION (ABE)			
	WALL	EXIST. MIDPT. ELEV.	WALL SEGMENT x ELEV.
A	44.0'	354.25	15587
B	15.0'	355.0	5325
C	2.0'	355.05	710.1
D	36.0'	355.25	12789
E	4.0'	355.5	1422
F	10.0'	355.55	3555.5
G	4.0'	355.60	1422.4
H	12.0'	355.75	4269
I	46.0'	355.0	16330
J	20'	354.25	7085
K	10'	354.35	3543.5
L	21.0'	354.45	7443.45
M	17.0'	354.25	6022.25
N	17.0'	353.90	6016.3
O	7.0'	353.90	2477.3
P	15.0'	353.85	5307.75
TOTAL	280.0'	5675.9	99,305.55

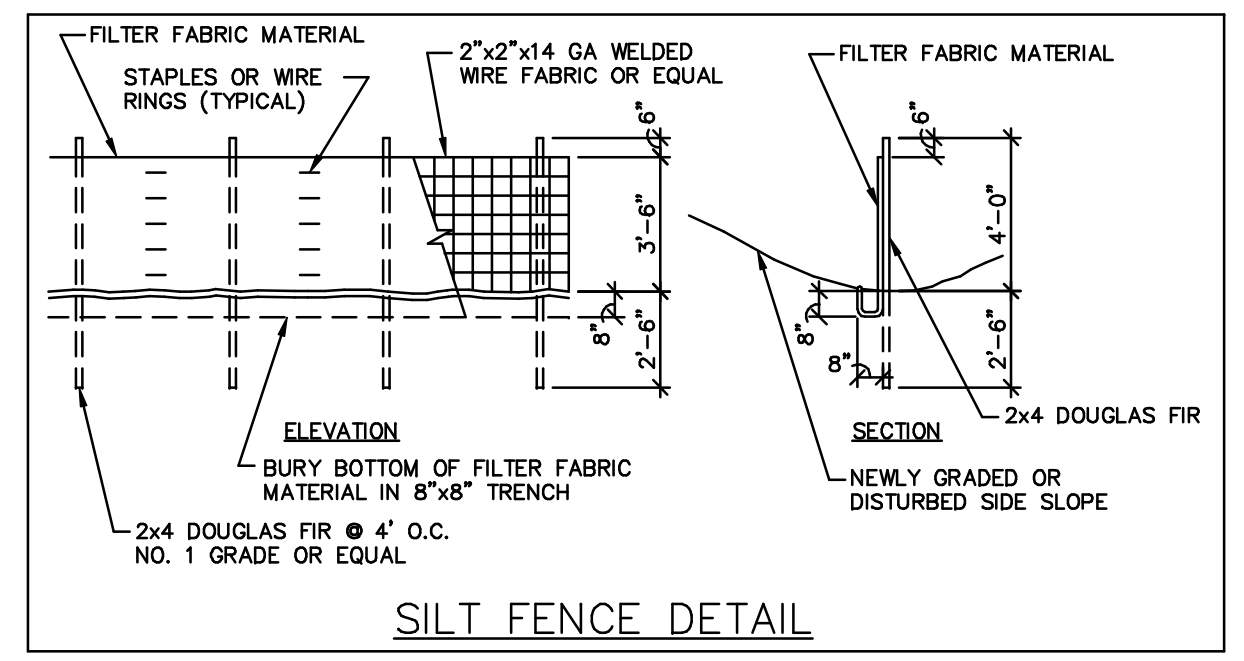
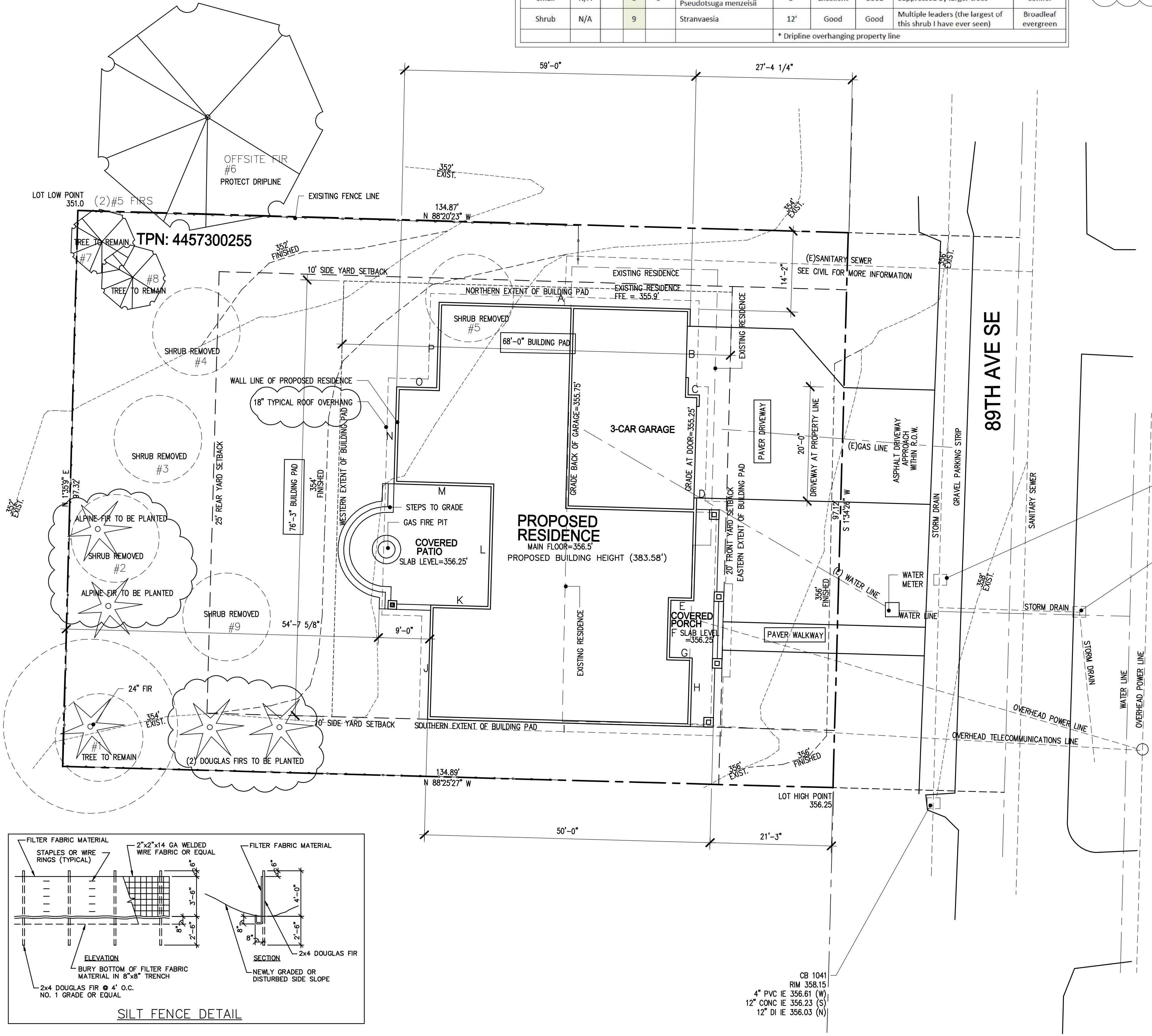
AVERAGE BUILDING ELEVATION = 99,305.55 / 280.0' = 354.66'  
 MAXIMUM BUILDING HEIGHT = 354.66' + 30' = 384.66'  
 PROPOSED BUILDING HEIGHT (383.58')

**LOT SLOPE**  
 356.25' - 351 = 5.25'  
 HORIZONTAL DISTANCE = 165.75'  
 5.25 / 165.75' = .0317  
 .0316 x 100 = 3.17%

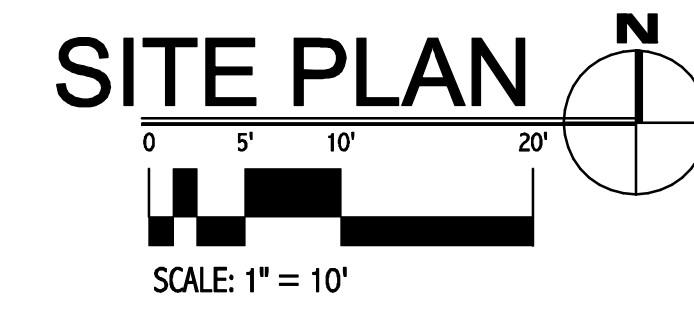
**NOTE:**  
 SILT FENCES TO BE PROVIDED AT ALL  
 DOWNSTREAM AREAS - NO EXCEPTIONS

**NOTE:**  
 (DS) DENOTES DOWNSPOUT LOCATIONS  
 CONNECT TO APPROVED DRAINAGE  
 SYSTEM AS REQUIRED

**TREE NOTE:**  
 NO TREES TO BE REMOVED WITHOUT  
 PRIOR APPROVAL



NO RETAINING WALLS ARE REQUIRED	
<b>LOT COVERAGE:</b>	
LOT AREA:	13,113 S.F.
PROPOSED ROOF:	4589 S.F.
PAVER DRIVEWAY:	630 S.F.
TOTAL AREA:	5219 S.F.
TOTAL %:	39.54% S.F.
MAX. ALLOWED %:	40.0% S.F.
FRONT WALK BEYOND COVER:	86 S.F.
REAR PATIO BEYOND COVER:	79 S.F.
TOTAL HARDSCAPE:	165 S.F.
TOTAL %:	1.26% S.F.
MAX. ALLOWED %:	6% S.F.
<b>FLOOR AREA RATIO:</b>	
MAXIMUM ALLOWED:	5245 S.F. 40%
TOTAL LIVING:	3765 S.F.
GARAGE:	754 S.F.
COVERED BALCONY:	206 S.F.
GREAT ROOM TALL CEILING:	230 S.F.
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STAIRWELL CEILING:	103 S.F.
PROPOSED F.A.R.	5128 S.F.
	5128 S.F. / 13,113 S.F. = 39.11%
<b>BUILDING PAD AREA:</b>	5185 S.F.



**BROBST DESIGN WORKS**  
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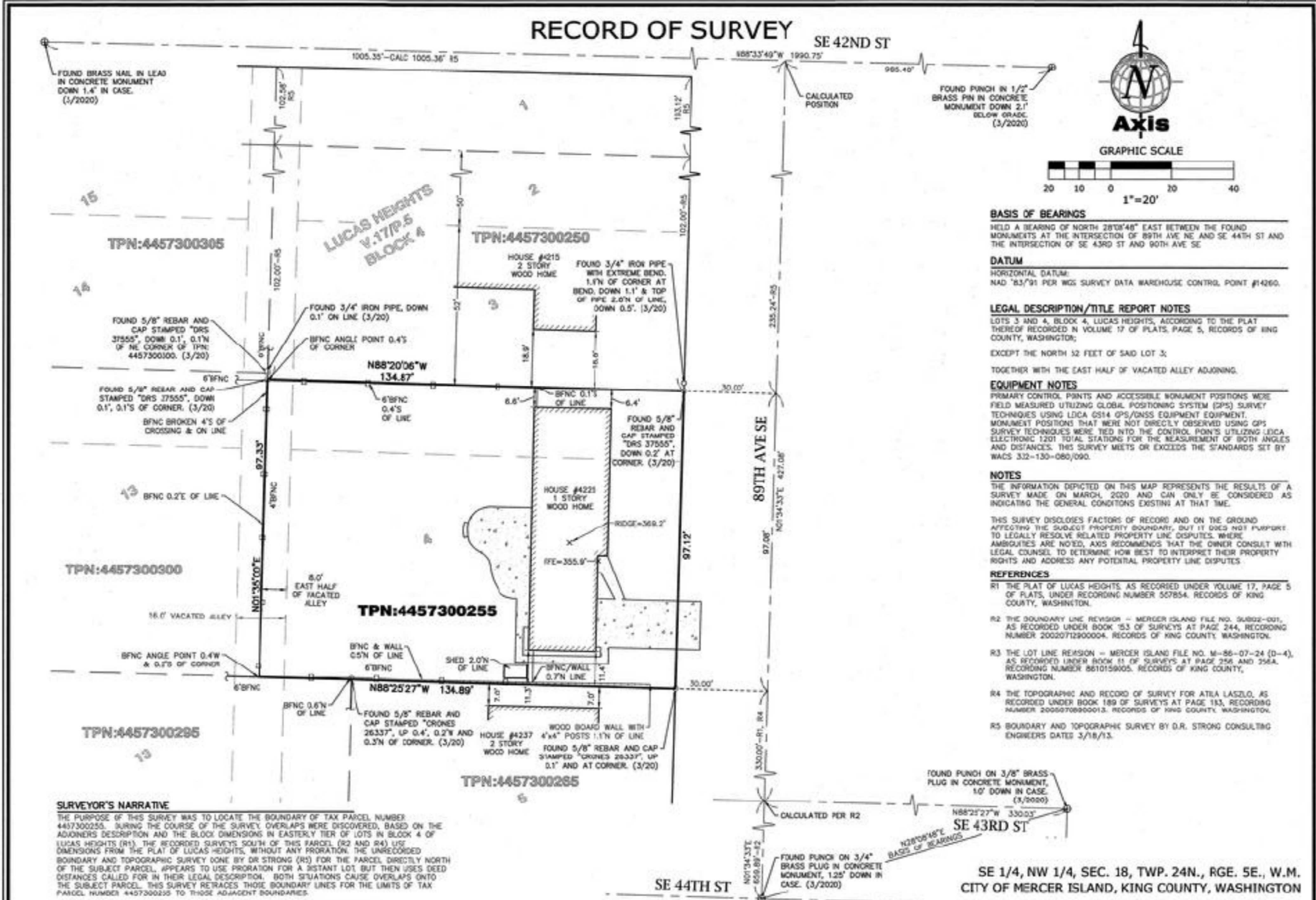
**SITE PLAN**  
 4225 89TH AVE SE  
 MERCER ISLAND WA 98040  
 TAX PARCEL: 4457300255

**MERLINO RESIDENCE**  
 4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED 1.11.2021  
 1.20.2021 4.21.2021  
 1"=10'-0"  
 SCALE  
 8.20.2020  
 DATE  
 MERLINO  
 COMPUTER FILE NAME  
**SITE**  
 SHEET NUMBER



425/201



**BASIS OF BEARINGS**

FIELD A BEARING OF NORTH 28°08'48" EAST BETWEEN THE FOUND MONUMENTS AT THE INTERSECTION OF 89TH AVE NE AND SE 44TH ST AND THE INTERSECTION OF SE 43RD ST AND 90TH AVE SE

**DATUM**

HORIZONTAL DATUM:  
 NAD '83/'91 PER WGS SURVEY DATA WAREHOUSE CONTROL POINT #14260.

**LEGAL DESCRIPTION/TITLE REPORT NOTES**

LOTS 3 AND 4, BLOCK 4, LUCAS HEIGHTS, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 17 OF PLATS, PAGE 5, RECORDS OF KING COUNTY, WASHINGTON;

EXCEPT THE NORTH 32 FEET OF SAID LOT 3;  
 TOGETHER WITH THE EAST HALF OF VACATED ALLEY ADJOINING.

**EQUIPMENT NOTES**

PRIMARY CONTROL POINTS AND ACCESSIBLE MONUMENT POSITIONS WERE FIELD MEASURED UTILIZING GLOBAL POSITIONING SYSTEM (GPS) SURVEY TECHNIQUES USING LEICA GS14 GPS/GNSS EQUIPMENT. MONUMENT POSITIONS THAT WERE NOT DIRECTLY OBSERVED USING GPS SURVEY TECHNIQUES WERE TIED INTO THE CONTROL POINTS UTILIZING LEICA ELECTRONIC TOTAL STATIONS FOR THE RE-MEASUREMENT OF BOTH ANGLES AND DISTANCES. THIS SURVEY MEETS OR EXCEEDS THE STANDARDS SET BY WACS 332-130-080/090.

**NOTES**

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE ON MARCH, 2020 AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.

THIS SURVEY DISCLOSES FACTORS OF RECORD AND ON THE GROUND AFFECTING THE SUBJECT PROPERTY BOUNDARY, BUT IT DOES NOT PURPORT TO LEGALLY RESOLVE RELATED PROPERTY LINE DISPUTES, WHERE AMBIGUITIES ARE NOTED, AXIS RECOMMENDS THAT THE OWNER CONSULT WITH LEGAL COUNSEL TO DETERMINE HOW BEST TO INTERPRET THEIR PROPERTY RIGHTS AND ADDRESS ANY POTENTIAL PROPERTY LINE DISPUTES.

**REFERENCES**

- R1 THE PLAT OF LUCAS HEIGHTS, AS RECORDED UNDER VOLUME 17, PAGE 5 OF PLATS, UNDER RECORDING NUMBER 507854, RECORDS OF KING COUNTY, WASHINGTON.
- R2 THE BOUNDARY LINE REVISION - MERGER ISLAND FILE NO. 36802-001, AS RECORDED UNDER BOOK 153 OF SURVEYS AT PAGE 244, RECORDING NUMBER 20020712900004, RECORDS OF KING COUNTY, WASHINGTON.
- R3 THE LOT LINE REVISION - MERGER ISLAND FILE NO. M-86-07-24 (D-4), AS RECORDED UNDER BOOK 51 OF SURVEYS AT PAGE 256 AND 256A, RECORDING NUMBER 8610159005, RECORDS OF KING COUNTY, WASHINGTON.
- R4 THE TOPOGRAPHIC AND RECORD OF SURVEY FOR ATELA LASZLO, AS RECORDED UNDER BOOK 189 OF SURVEYS AT PAGE 183, RECORDING NUMBER 20050708900013, RECORDS OF KING COUNTY, WASHINGTON.
- R5 BOUNDARY AND TOPOGRAPHIC SURVEY BY D.R. STRONG CONSULTING ENGINEERS DATES 3/18/13.

**SURVEYOR'S NARRATIVE**  
 THE PURPOSE OF THIS SURVEY WAS TO LOCATE THE BOUNDARY OF TAX PARCEL NUMBER 4457300255. DURING THE COURSE OF THE SURVEY OVERLAPS WERE DISCOVERED, BASED ON THE ADJOINER'S DESCRIPTION AND THE BLOCK DIMENSIONS IN EASTERLY TIER OF LOTS IN BLOCK 4 OF LUCAS HEIGHTS (R1). THE RECORDED SURVEYS SOUTH OF THIS PARCEL (R2 AND R4) USE DIMENSIONS FROM THE PLAT OF LUCAS HEIGHTS, WITHOUT ANY PRORATION. THE UNRECORDED BOUNDARY AND TOPOGRAPHIC SURVEY DONE BY DR STRONG (R5) FOR THE PARCEL DIRECTLY NORTH OF THE SUBJECT PARCEL, APPEARS TO USE PRORATION FOR A INSTANT LOT, BUT THEN USES DEED DISTANCES CALLED FOR IN THEIR LEGAL DESCRIPTION. BOTH SITUATIONS CAUSE OVERLAPS ONTO THE SUBJECT PARCEL. THIS SURVEY RETRACES THOSE BOUNDARY LINES FOR THE LIMITS OF TAX PARCEL NUMBER 4457300255 TO THOSE ADJACENT BOUNDARIES.

20200618900004 Vol:425 Page:201  
 SURVEY  
 6/18/2020 10:10 AM  
 KING COUNTY, WA

**RECORDER'S CERTIFICATE:** NO. 10210  
 FILED FOR RECORD THIS 19 DAY OF JUNE, 2020 AT 8 AM  
 IN BOOK 425 OF SURVEYS, PAGE 201 AT THE REQUEST OF AXIS  
 SURVEYING AND MAPPING INC.  
 DIVISION OF RECORDS AND ELECTIONS  
 MANAGER: [Signature]  
 SUPT. OF RECORDS: [Signature]

**SURVEYOR'S CERTIFICATE**  
 THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT AT THE REQUEST OF JOHN MERLINO IN MAY 2020  
 W. Travis Bradley  
 CERTIFICATE NO. 48372  
 DATE: 06/12/2020



**JOHN MERLINO**  
 4225 89TH AVE SE  
 MERCER ISLAND, WA 98040

**Axis**  
 Survey & Mapping  
 15241 NE 90TH ST  
 REDMOND, WA 98052  
 TEL 425.823-5300  
 FAX 425.823-6700  
 www.axismap.com

JOB NO.	DATE
20-060	06/12/2020
DRAWN BY	CHECKED BY
JM	WTB
SCALE	SHEET
1"=20'	1 OF 1



PROPOSED INFILTRATION LOCATIONS  
TO BE PROTECTED FROM  
COMPACTION DURING CONSTRUCTION

PROPOSED INFILTRATION LOCATIONS  
TO BE PROTECTED FROM  
COMPACTION DURING CONSTRUCTION

NO STAGING OR STORAGE  
WITHIN RIGHT-OF-WAY  
ALL STAGING AND STORAGE  
TO TAKE PLACE WITHIN  
LIMITS OF WORK

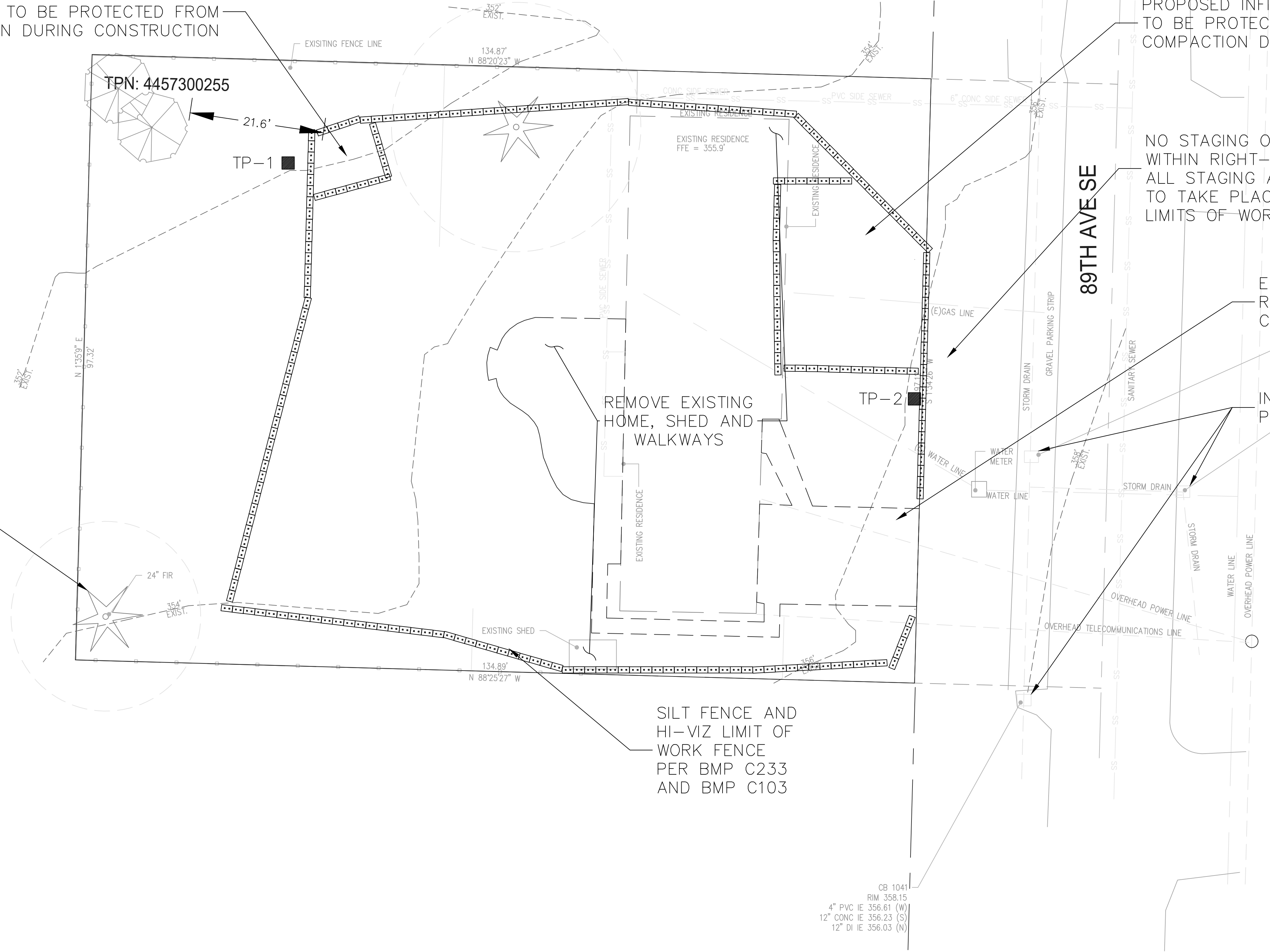
EXISTING DRIVEWAY TO BE  
RETAINED AND UTILIZED FOR  
CONSTRUCTION ENTRANCE

INSTALL STORM DRAIN INLET  
PROTECTION PER BMP C200

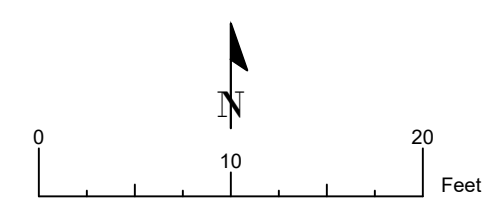
PROTECT TREE  
BEYOND LIMITS  
OF WORK (TYP.)

REMOVE EXISTING  
HOME, SHED AND  
WALKWAYS

SILT FENCE AND  
HI-VIZ LIMIT OF  
WORK FENCE  
PER BMP C233  
AND BMP C103



SEE C2 FOR DRAINAGE SITE PLAN



**Merlino Residence**  
 Site Address: 4225 89th Ave SE  
 Jurisdiction: Mercer Island  
 Parcel No.: 445730-0255  
 Applicant: John Merlino  
 Permit No.:  
 Interlaken Project No.: SEA-20-041

**Interlaken Engineering and Design, PLLC**  
 Seattle, WA | (206) 470-9572  
 www.interlakenengineering.com

Revisions:
2021-04-27: Updated for City of Mercer Island comments

**C1**  
 TESC/ Demo/ CSWPPP  
 Scale: 1" = 10'



THE LAWN AND LANDSCAPE AREAS ARE REQUIRED TO PROVIDE POST-CONSTRUCTION SOIL QUALITY AND DEPTH IN ACCORDANCE WITH BMP T5.13. THE PROJECT CIVIL ENGINEER MUST PROVIDE A LETTER OF CERTIFICATION TO ENSURE THAT THE LAWN AND LANDSCAPE AREAS ARE MEETING THE POST-CONSTRUCTION SOIL QUALITY AND DEPTH REQUIREMENTS SPECIFIED ON THE APPROVED PLAN SET PRIOR TO FINAL INSPECTION ON THE PROJECT.

ALL AREAS SUBJECT TO CLEARING AND GRADING THAT HAVE NOT BEEN COVERED BY IMPERVIOUS SURFACE, INCORPORATED INTO A DRAINAGE FACILITY OR ENGINEERED AS STRUCTURAL FILL OR SLOPE SHALL, AT PROJECT COMPLETION, DEMONSTRATE THE FOLLOWING:

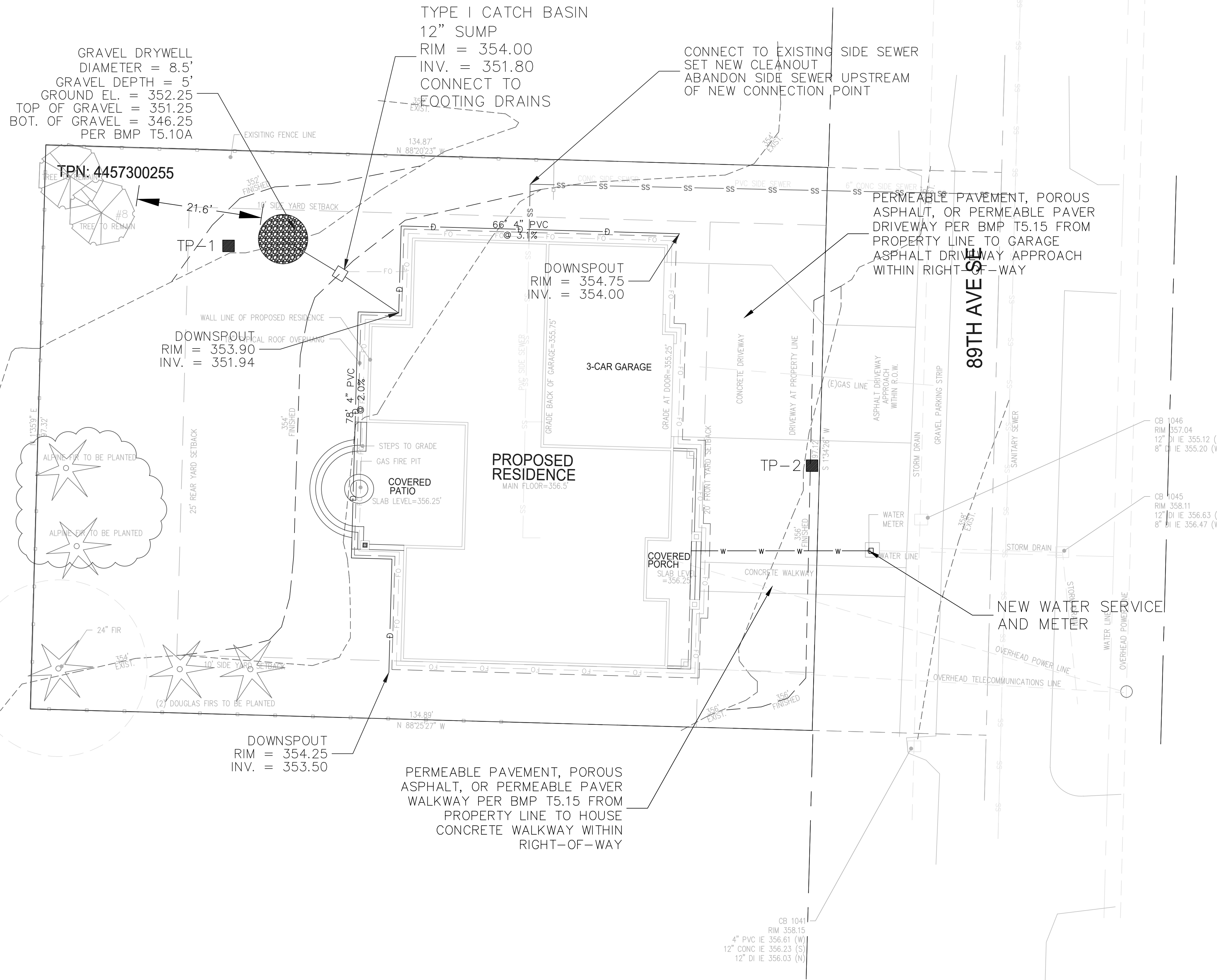
1. A TOPSOIL LAYER WITH A MINIMUM ORGANIC MATTER CONTENT OF 10% DRY WEIGHT IN PLANTING BEDS, AND 5% ORGANIC MATTER CONTENT IN TURF AREAS, AND A PH FROM 6.0 TO 8.0 OR MATCHING THE PH OF THE UNDISTURBED SOIL. THE TOPSOIL LAYER SHALL HAVE A MINIMUM DEPTH OF EIGHT INCHES EXCEPT WHERE TREE ROOTS LIMIT THE DEPTH OF INCORPORATION OF AMENDMENTS NEEDED TO MEET THE CRITERIA. SUBSOILS BELOW THE TOPSOIL LAYER SHOULD BE SCARIFIED AT LEAST 4 INCHES WITH SOME INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS, WHERE FEASIBLE.
2. MULCH PLANTING BEDS WITH 2 INCHES OF ORGANIC MATERIAL.
3. USE COMPOST AND OTHER MATERIALS THAT MEET THESE ORGANIC CONTENT REQUIREMENTS:
  - A. THE ORGANIC CONTENT FOR "PRE-APPROVED" AMENDMENT RATES CAN BE MET ONLY USING COMPOST MEETING THE COMPOST SPECIFICATION FOR BIORETENTION (BMP T7.30), WITH THE EXCEPTION THAT THE COMPOST MAY HAVE UP TO 35% BIOSOLIDS OR MANURE. THE COMPOST MUST ALSO HAVE AN ORGANIC MATTER CONTENT OF 40% TO 65%, AND A CARBON TO NITROGEN RATIO BELOW 25:1. THE CARBON TO NITROGEN RATIO MAY BE AS HIGH AS 35:1 FOR PLANTINGS COMPOSED ENTIRELY OF PLANTS NATIVE TO THE PUGET SOUND LOWLANDS REGION.
  - B. CALCULATED AMENDMENT RATES MAY BE MET THROUGH USE OF COMPOSTED MATERIAL MEETING (A) ABOVE; OR OTHER ORGANIC MATERIALS AMENDED TO MEET THE CARBON TO NITROGEN RATIO REQUIREMENTS, AND NOT EXCEEDING THE CONTAMINANT LIMITS IDENTIFIED IN TABLE 220-B, TESTING PARAMETERS, IN WAC 173-350-220.

THE RESULTING SOIL SHOULD BE CONDUCTIVE TO THE TYPE OF VEGETATION TO BE ESTABLISHED.

IMPLEMENTATION OPTIONS: THE SOIL QUALITY DESIGN GUIDELINES LISTED ABOVE CAN BE MET BY USING ONE OF THE METHODS LISTED BELOW:

1. LEAVE UNDISTURBED NATIVE VEGETATION AND SOIL, AND PROTECT FROM COMPACTION DURING CONSTRUCTION.
2. AMEND EXISTING SITE TOPSOIL OR SUBSOIL EITHER AT DEFAULT "PRE-APPROVED" RATES, OR AT CUSTOM CALCULATED RATES BASED ON TESTS OF THE SOIL AND AMENDMENT.
3. STOCKPILE EXISTING TOPSOIL DURING GRADING, AND REPLACE IT PRIOR TO PLANTING. STOCKPILED TOPSOIL MUST ALSO BE AMENDED IF NEEDED TO MEET THE ORGANIC MATTER OR DEPTH REQUIREMENTS, EITHER AT A DEFAULT "PRE-APPROVED" RATE OR AT A CUSTOM CALCULATED RATE.
4. IMPORT TOPSOIL MIX OF SUFFICIENT ORGANIC CONTENT AND DEPTH TO MEET THE REQUIREMENTS. MORE THAN ONE METHOD MAY BE USED ON DIFFERENT PORTIONS OF THE SAME SITE. SOIL THAT ALREADY MEETS THE DEPTH AND ORGANIC MATTER QUALITY STANDARDS, AND IS NOT COMPACTED, DOES NOT NEED TO BE AMENDED.

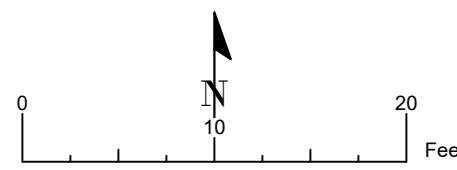
PRE-APPROVED AMENDMENT METHOD:  
TURF: 3111 SF x 5.4 CY / 1,000 SF = 17 CY  
TOTAL QUANTITY = 17 CY



Hard Surface Data	
Existing Hard Surface	3038 sf
Existing Vegetation	10192 sf
New Roof	4589 sf
New Driveway (North)	635 sf
New Walkway (South)	85 sf
New Patio (West)	80 sf
Total Proposed	5389 sf
Proposed Vegetation	7841 sf
Replaced Hard Surface	2708 sf
Total New Hard Surface	2681 sf
Removed Hard Surface	330 sf
Total New + Replaced	5389 sf

SEE C1 FOR TESC/ DEMO CSWPPP  
SEE C3 FOR DRAINAGE DETAILS

**LEGAL DESCRIPTION**  
THE SOUTH 23 FEET OF LOT 3 AND ALL OF LOT 4, BLOCK 4, LUCAS HEIGHTS,  
ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 17 OF PLATS,  
PAGES 5, RECORDS OF KING COUNTY WASHINGTON.  
TOGETHER WITH THE EAST HALF OF VACATED ALLEY ADJOINING.



**Merlino Residence**  
Site Address: 4225 89th Ave SE  
Jurisdiction: Mercer Island  
Parcel No.: 445730-0255  
Applicant: John Merlino  
Permit No.:  
Interlaken Project No.: SEA-20-041

Interlaken Engineering and Design, PLLC  
Seattle, WA | (206) 470-9572  
www.interlakenengineering.com

Revisions:

2021-04-27: Updated for City of Mercer Island comments	

**C2**  
Drainage Site Plan  
Scale: 1" = 10'



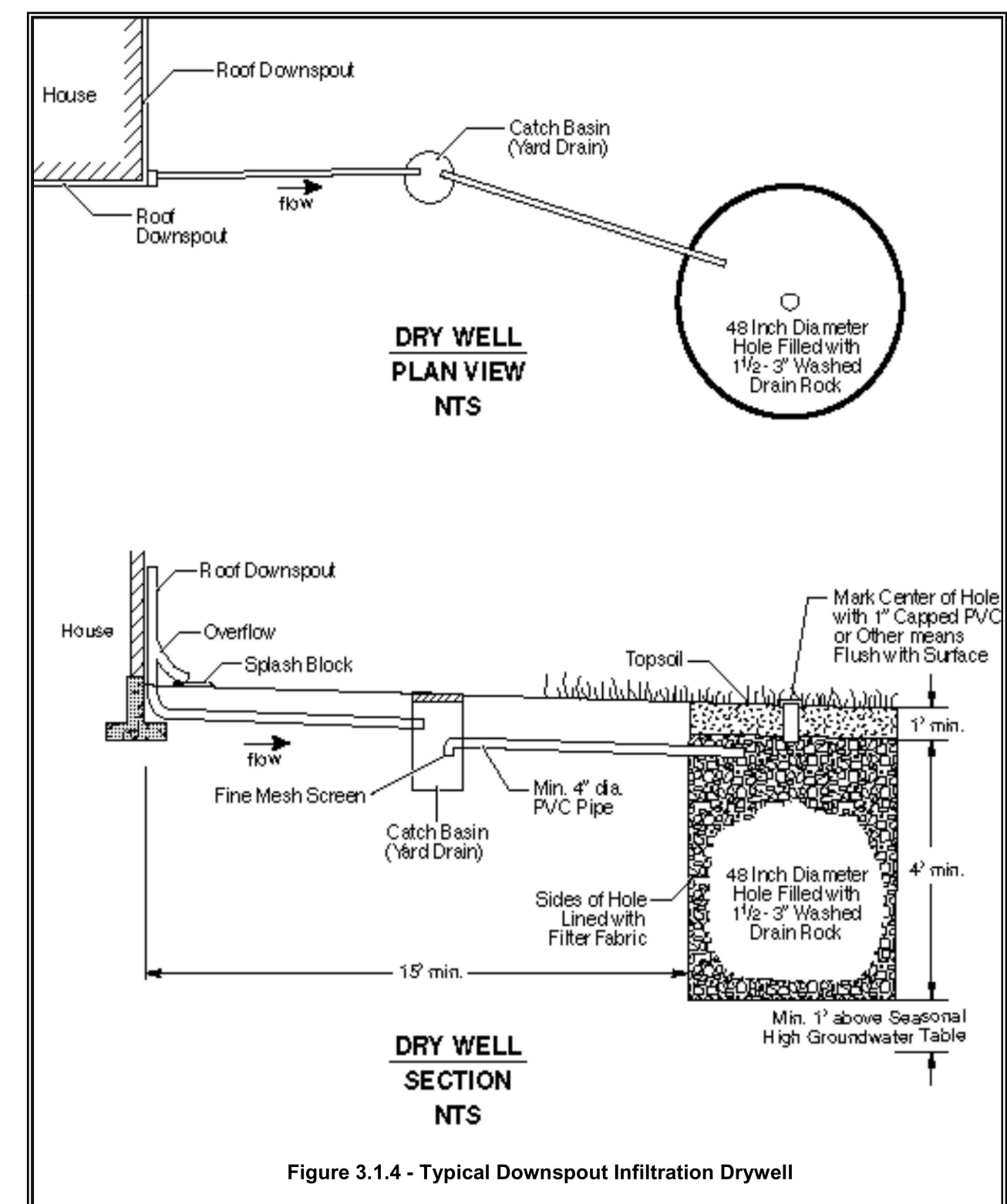


Figure 3.1.4 - Typical Downspout Infiltration Drywell

Source: King County

### CITY OF MERCER ISLAND

Community Planning and Development  
9611 SE 36TH STREET | MERCER ISLAND, WA 98040  
PHONE: 206.275.7605 | [www.mercer.gov.org](http://www.mercer.gov.org)  
Inspection Requests: Online: [www.MyBuildingPermit.com](http://www.MyBuildingPermit.com) VM: 206.275.7730



#### PERMEABLE PAVER BLOCK DESIGN GUIDELINES (Single-Family Residential Projects)

##### Permeable Pavers

The City of Mercer Island allows the use of permeable pavers in limited situations as a material exempted from impervious surface lot coverage for certain applications. Refer to MICC 19.02.020(D)(2) for specific exemptions.

Not all concrete pavers are considered permeable. The following list of paver materials meets the definition of "pavers" according to MICC 19.16.010(P) when installed properly.

- Uni-Group USA ([www.uni-groupusa.org](http://www.uni-groupusa.org))
- Eco-Stone
- Ecoloc
- Eco Optiloc
- Eco Piora
- SF Concrete Technologies ([www.sfconcrete.com](http://www.sfconcrete.com))
- SF Rima
- SF Matoro
- VSS Eco
- VSS Drain
- Advanced Pavement Technologies ([www.advancedpavement.com](http://www.advancedpavement.com))
- Eco Bric
- Aqua Bric
- Aqua Bric Type 4
- Aqua Loc
- Aqua Bricoloc

**Note:** There may be other paver systems that meet the definition of "paver". In general, the paver system should be pre-manufactured, interlocking, have an effective open/permeable surface area of at least 12% and conform to the cross-section shown on page 3. Manufacturer's specifications for paver systems not listed above must be submitted for compliance review prior to issuance of a permit. The use of non-permeable pavers (e.g. flagstone, stepping stones, architectural slabs, dimensional stone, etc.) in a permeable manner is described below in the following section.

##### Other Pavers and Stones

Other pavers and stone material may be considered permeable when installed in a manner that provides equivalent performance function to permeable interlocking concrete pavers. The installation will require sufficient aggregate material beneath and in between the pavers/stones to allow the free flow of surface water runoff between and below the pavers/stones. The effective open/permeable surface area ("gap")

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between the pavers/stones shall be a minimum of 12 percent. See below for paver dimensions and the corresponding minimum gap required

PAVER/STONE SIZE	MINIMUM REQUIRED GAP SURROUNDING EACH INDIVIDUAL PAVER
12" x 12" (144 square inches)	1"
24" x 24" (576 square inches)	2"
24" x 36" (864 square inches)	3"
30" x 30" (900 square inches)	4"

*Note: Sites not specified above, or oddly shaped pavers/stones require submittal of additional performance and specific review of proposed material and design confirming a 12 percent minimum gap.*

##### Additional requirements include the following:

- Gap between pavers shall be filled with stone fill (ASTM No. 8) or other free draining material.
- Gap cannot be planted if using topsoil or other planting media that impedes the free flow of water between the pavers unless approved by the City Engineer.
- Pavers shall be underlain by at least 6" reservoir course (ASTM No. 57) and 2" leveling course stone fill (ASTM No. 8) in accordance with the typical cross-section for Pervious Concrete Block or "Paver" Systems.
- Refer also to the design and construction criteria below.

##### Design and Construction Criteria for Paver Blocks

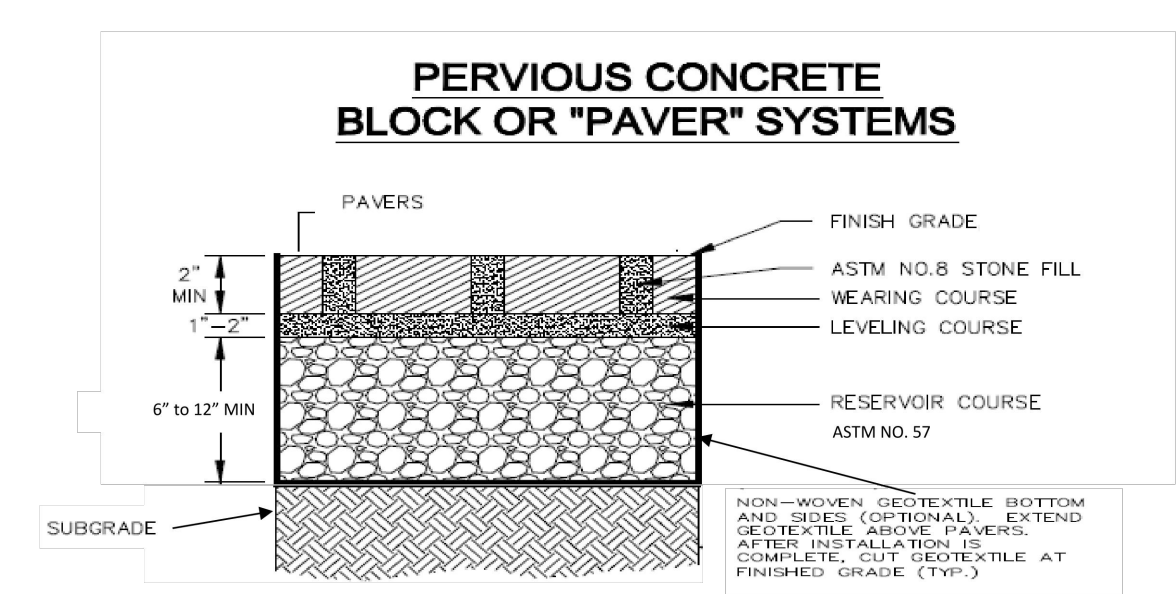
The following notes (as a minimum) shall be included on the construction drawings for single-family residential projects intended to use permeable pavers:

1. **General:** Installation must be in accordance with the manufacturer's requirements and specifications.
2. **Subgrade:** Compact the subgrade to the minimum necessary for structural stability. Use static dual wheel small mechanical rollers or plate vibration machines for compaction. Do not allow heavy compaction due to heavy equipment operation. The subgrade should not be subject to truck traffic.
3. **Geotextile:** Geotextile fabric shall be placed beneath the reservoir layer in areas where soil remains saturated part of the year, where there is soil freeze and thaw, or over clay and moist silty subgrade soils. The geotextile fabric should pass water at a greater rate than the subgrade soils.
4. **Underdrain:** Provide an underdrain pipe when subgrade soils are poorly draining, or soils remain saturated part of the year.
5. **Aggregate Materials (stone fill, leveling course, and base/sub-base reservoir layer):** Use crushed aggregate. Clean and washed. No fines. "Open graded" rock containing only a small percentage of aggregate in the small range. Do not use round rock.
  - a. **Stone Fill/Leveling Course** - ASTM No. 8 crushed aggregate. Minimum 1" to 2" thickness.
  - b. **Reservoir Course** - ASTM No. 57 crushed aggregate. Minimum 6" to 12" thickness depending on permeability of the subgrade soils.
6. **Limitations:** The design shall have no surface drainage onto the pavers from other surfaces. If surface drainage comes from minor or incidental pervious areas, those areas must be fully stabilized. Slope adjacent impervious surfaces away from the permeable pavement to the maximum extent practicable. The maximum installed slope is generally 5%.
7. **Protection:** After work is complete, the contractor shall be responsible for protecting work from sediment deposition and damage due to subsequent construction activity on the site.
8. **Improper Installation:** May result in loss of impervious surface exemption or may require reconstruction of the paving system.

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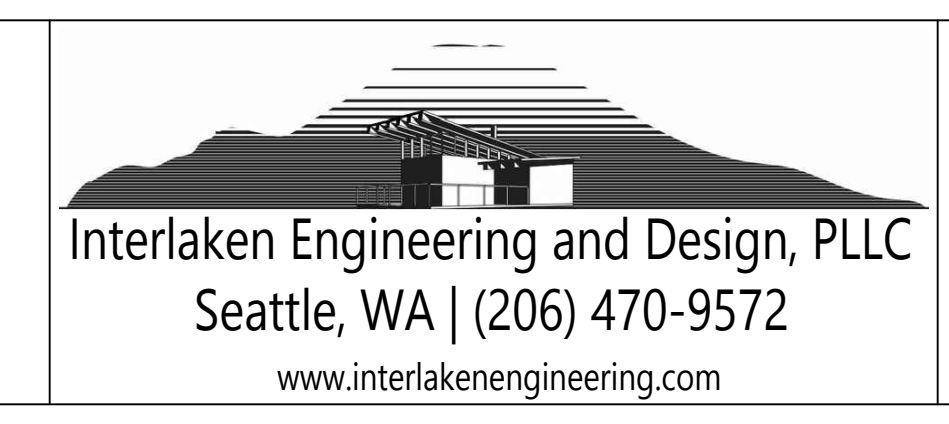
9. **Inspections:** The contractor shall call for inspection of the subgrade preparation prior to placement of base material and for a subsequent inspection of the base material placement prior to installation of blocks.
10. **Maintenance:** Homeowners must adequately maintain their permeable block pavements. Over time, the space between the pavers will tend to clog. Conduct periodic visual inspections to determine if surfaces are clogged with vegetation or fine grain soils. Clogged surfaces should be corrected immediately. Surfaces should be swept with a high-efficiency or vacuum sweeper twice per year; preferably, once in the autumn after leaf fall, and again in early spring. As long as annual infiltration rate testing demonstrates that a rate of 5 inches per hour or greater is being maintained, the sweeping frequency can be reduced to once per year.

##### PERVIOUS CONCRETE BLOCK OR "PAVER" SYSTEMS



SEE C2 FOR DRAINAGE SITE PLAN

Merlino Residence  
Site Address: 4225 89th Ave SE  
Jurisdiction: Mercer Island  
Parcel No.: 445730-0255  
Applicant: John Merlino  
Permit No.:  
Interlaken Project No.: SEA-20-041



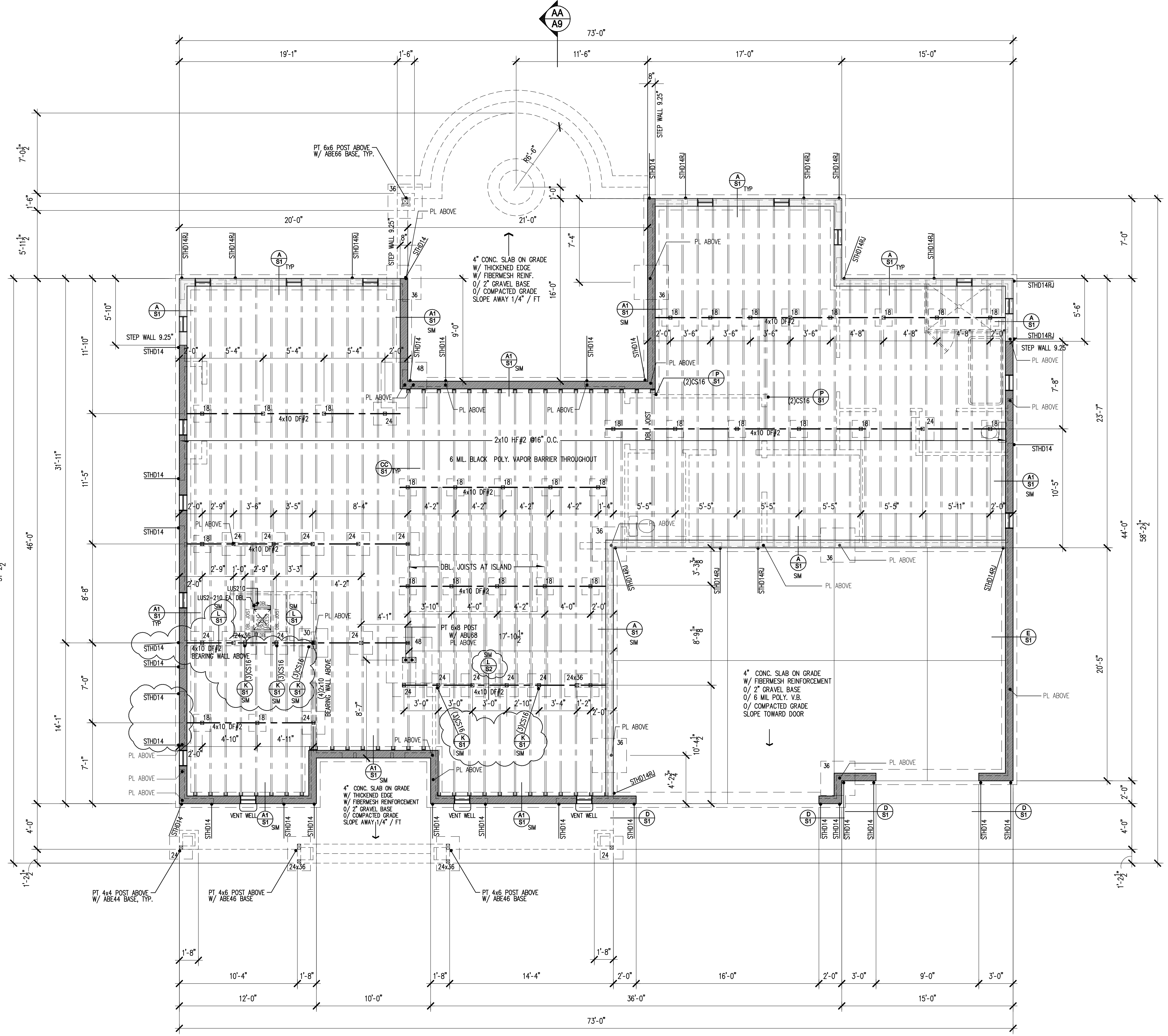
Revisions:

**C3**  
Drainage Details  
Scale: As Noted



**MAIN LEVEL FLOOR FRAMING  
& FOUNDATION PLAN**

**MERLINO RESIDENCE**  
4225 89TH AVE SE MERCER ISLAND, WA 98040

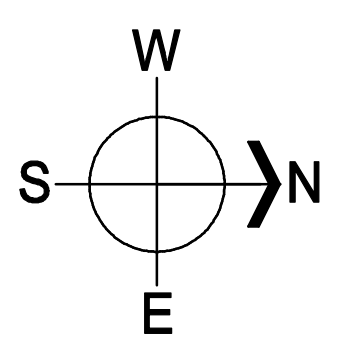


**FOOTING SCHEDULE:**

18"	1'-6"x1'-6"x8" DEEP CONC. FOOTING W/ (3)#4 EACH WAY, TYP.
24"	2'-0"x2'-0"x8" DEEP CONC. FOOTING W/ (3)#4 EACH WAY, TYP.
30"	2'-6"x2'-6"x8" DEEP CONC. FOOTING W/ (4)#4 EACH WAY, TYP.
36"	3'-0"x3'-0"x12" DEEP CONC. FOOTING W/ (5)#4 EACH WAY, TYP.
48"	4'-0"x4'-0"x14" DEEP CONC. FOOTING W/ #5 @ 6" o.c. EACH WAY TOP AND BOTTOM, TYP.

**VENTILATION:** R408.2 WITH WA. STATE AMENDMENT  
 PROVIDE 1 SQFT. VENTILATION PER 300 SQFT. UNDER FLOOR AREA  
 2463 SQFT UNDER FLOOR AREA / 300 = 8.21 SQFT. VENTILATION REQUIRED  
 8.21 SQ FT VENTING REQUIRED / .50 SQ FT PER VENT = 16.42 TOTAL NUMBER OF 16"x8" PLASTIC VENTS REQUIRED  
 PROVIDE A MINIMUM OF (17) 16"x8" FND VENTS  
 (NET VENTING AREA = 73 SQ IN OR .50 SQFT)

**POINT LOAD NOTE:**  
 "PL" DESIGNATES POINT LOAD FROM ABOVE ON THE FOUNDATION PLAN. PROVIDE SOLID BLOCKING UNDER ALL LOCATIONS AND NO VENTS ARE ALLOWED BELOW PL.

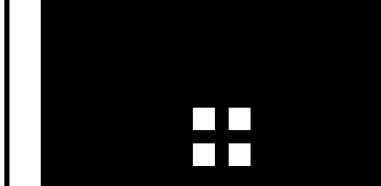






EXPIRES 2/1/2022

**DR. BROBST**  
DESIGN WORKS



dan@brobstdesignworks.com  
206.409.6690

**MAIN LEVEL FLOOR PLAN**

**MERLINO RESIDENCE**  
4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED  
4.21.2021

1/4"=1'-0"

SCALE  
11.10.2020  
DATE

COMPUTER FILE NAME

**A2**  
SHEET NUMBER

**FIRE BLOCKING NOTE**

PROVIDE FIRE BLOCKING AT THE FOLLOWING LOCATIONS:

- AT ALL INTERCONNECTIONS BETWEEN CONCEALED VERTICAL AND HORIZONTAL SPACES
- IN CONCEALED SPACES OF STUD WALLS AND PARTITIONS INCLUDING FURRED SPACES AT THE CEILING AND FLOOR LEVELS AND AT 10 FT. INTERVALS BOTH VERTICAL AND HORIZONTAL
- IN CONCEALED SPACES BETWEEN STAIR STRINGERS AT THE TOP AND BOTTOM OF THE RUN AND BETWEEN STUDS ALONG AND IN LINE WITH THE RUN OF STAIRS IF THE WALLS UNDER THE STAIRS ARE UNFINISHED
- IN OPENINGS AROUND VENTS, PIPES, DUCTS, CHIMNEYS, FIREPLACES AND SIMILAR OPENINGS THAT AFFORD PASSAGE FOR FIRE AT CEILING AND FLOOR LEVELS, WITH NONCOMBUSTIBLE MATERIALS.
- AT OPENINGS BETWEEN ATTIC SPACES AND CHIMNEY CHASES FOR FACTORY BUILT CHIMNEYS.

**FRAMING & ROUGH OPENING NOTES:**

(VERIFY W/ CONTRACTOR)

- EXTERIOR HINGED DOORS: FURF. BOTTOM WITH 3-1/2" x WIDTH x 7/16" OSB
- SINGLE DOOR: WIDTH + 2" x 83"
- DOUBLE DOOR SET: WIDTH + 3" x 83"
- INTERIOR HINGED DOORS: UPPER LEVEL SINGLE DOOR: WIDTH + 2" x 82-1/2"
- DBL. DOOR SET: WIDTH + 2" x 82-1/2"
- BYPASS DOORS: WIDTH - 1" x 83"
- INTERIOR HINGED DOORS: MAIN LEVEL SINGLE DOOR: WIDTH + 2" x 99"
- DBL. DOOR SET: WIDTH + 3" x 100"
- SLIDING GLASS DOOR: WIDTH + 0" x 82-1/2"
- PLACE NEVASTROL PLASTIC UNDER DOOR WITH CAULKING UNDER AND OVER NEVASTROL.

PROVIDE 2x BLOCKING AT THE FOLLOWING LOCATIONS:

- KITCHEN CABINET BACKING @ 8'-10" CENTER LINE
- HANDRAIL BACKING @ 32" CENTERLINE
- TOWEL BAR BACKING @ 52" CENTERLINE
- TOILET PAPER BACKING @ 26"x26"

**PLUMBING NOTES:**

- ALL PLUMBING SHALL BE RAT-PROOFED PER SECTION 313.12 UPC
- STRAINER PLATES ON DRAIN INLETS SHALL BE DESIGNED AND INSTALLED SO THAT NO OPENING IS GREATER THAN 1/2" IN THE LEAST DIMENSION. SECTION 313.12.1
- METER BOXES SHALL BE CONSTRUCTED IN SUCH A MANNER THAT RATS CAN NOT ENTER A BUILDING BY FOLLOWING THE SERVICE PIPES FROM THE BOX INTO THE BUILDING. SECTION 313.12.2
- IN OR ON BUILDINGS WHERE OPENINGS HAVE BEEN MADE IN WALLS, FLOORS, CEILINGS FOR THE PASSAGE OF PIPES - SUCH OPENINGS SHALL BE CLOSED & PROTECTED BY THE INSTALLATION OF APPROVED METAL COLLARS SECURELY FASTENED TO THE ADJOINING STRUCTURE. SECTION 313.12.3
- TUB WASTE OPENINGS IN FRAMED CONSTRUCTION TO CRAWL SPACES AT OR BELOW THE FIRST FLOOR SHALL BE PROTECTED BY THE INSTALLATION OF APPROVED METAL COLLARS OR METAL SCREEN SECURELY FASTENED TO THE ADJOINING STRUCTURE WITH NO OPENING GREATER THAN 1/2" IN THE LEAST DIMENSION. SECTION 313.12.3

**SAFETY GLASS NOTE:**

(SG) DENOTES SAFETY TEMPERED GLASS

**BUNDLED STUD NOTE:**

SEE FLOOR FRAMING FOR BUNDLED STUD / POST LOCATIONS

**ENGINEERING NOTE**

REFERENCE "S" PAGES FOR POST & GANG STUD LOCATIONS, SHEARWALL LOCATIONS AND OTHER STRUCTURAL INFORMATION / REQUIREMENTS, TYP.

**DOOR TRIMMER NOTE:**

PROVIDE (3) TRIMMERS EACH SIDE OF ALL DOORS, TYP.

(F) DENOTES MIN. 50 CFM EXHAUST FAN, UNO  
ALL FANS MUST VENT TO THE OUTSIDE

(110v) DENOTES SMOKE DETECTOR LOCATION  
ALL SMOKE DETECTORS TO BE 110V  
INTERCONNECTED WITH BATTERY BACK-UP

(CO) CARBON MONOXIDE DETECTOR TO BE 110V  
WITH BATTERY BACK-UP, REQUIRED ON EACH LEVEL  
AND ADJACENT TO ALL SLEEPING AREAS

**GAS APPLIANCE NOTE:**

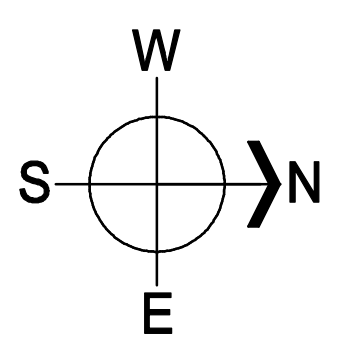
GAS BURNING APPLIANCES SHALL BE ANCHORED TO RESIST SEISMIC HORIZONTAL DISPLACEMENT PER IRC M1307.2, THE ELEVATION OF THE IGNITION SOURCE TO BE 18" MIN. ABOVE THE FLOOR LEVEL PER IRC M1307.3

**FLOOR AREA:**

MAIN LEVEL:	2463 S.F.
UPPER LEVEL:	1302 S.F.
<b>TOTAL HEATED AREA:</b>	<b>3765 S.F.</b>
GARAGE:	754 S.F.
ENTRY PORCH:	192 S.F.
REAR PATIO:	360 S.F.
COVERED BALCONY:	206 S.F.

**FLOOR AREA RATIO:**

MAXIMUM ALLOWED:	5245 S.F.	40%
TOTAL LIVING:	3765 S.F.	
GARAGE:	754 S.F.	
COVERED BALCONY:	206 S.F.	
GREAT ROOM TALL CEILING:	(460 S.F. x .5)	230 S.F.
FOYER TALL CEILING:	(70 S.F. x 1)	70 S.F.
STAIRWELL CEILING:	(103 S.F. x 1)	103 S.F.
PROPOSED F.A.R.	5128 S.F.	
	5128 S.F. / 13,113 S.F. =	39.11%



**DOOR NOTE:**

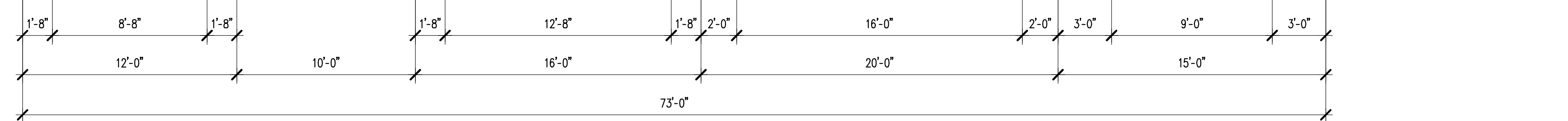
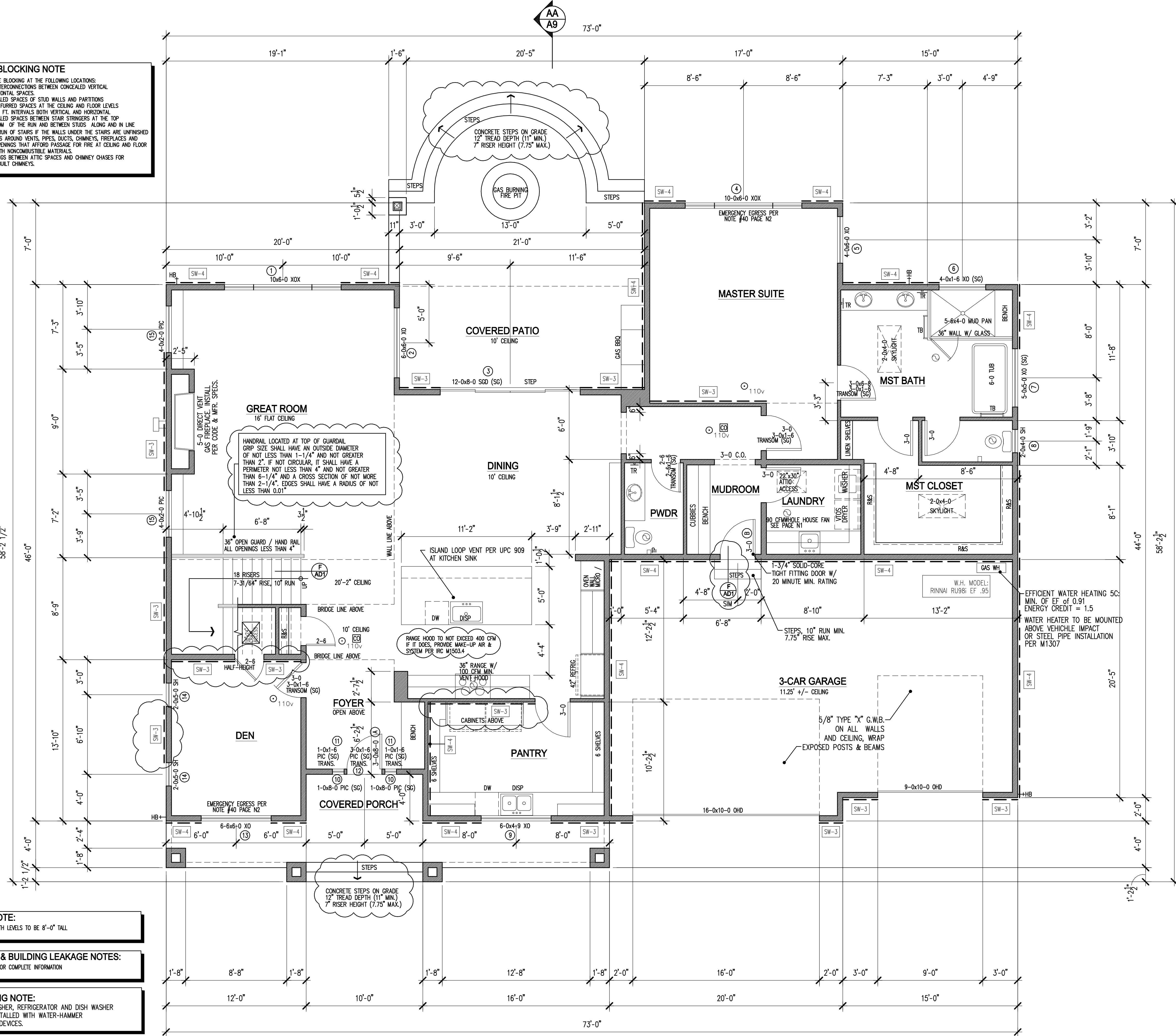
ALL DOORS, BOTH LEVELS TO BE 8'-0" TALL

**ENERGY & BUILDING LEAKAGE NOTES:**

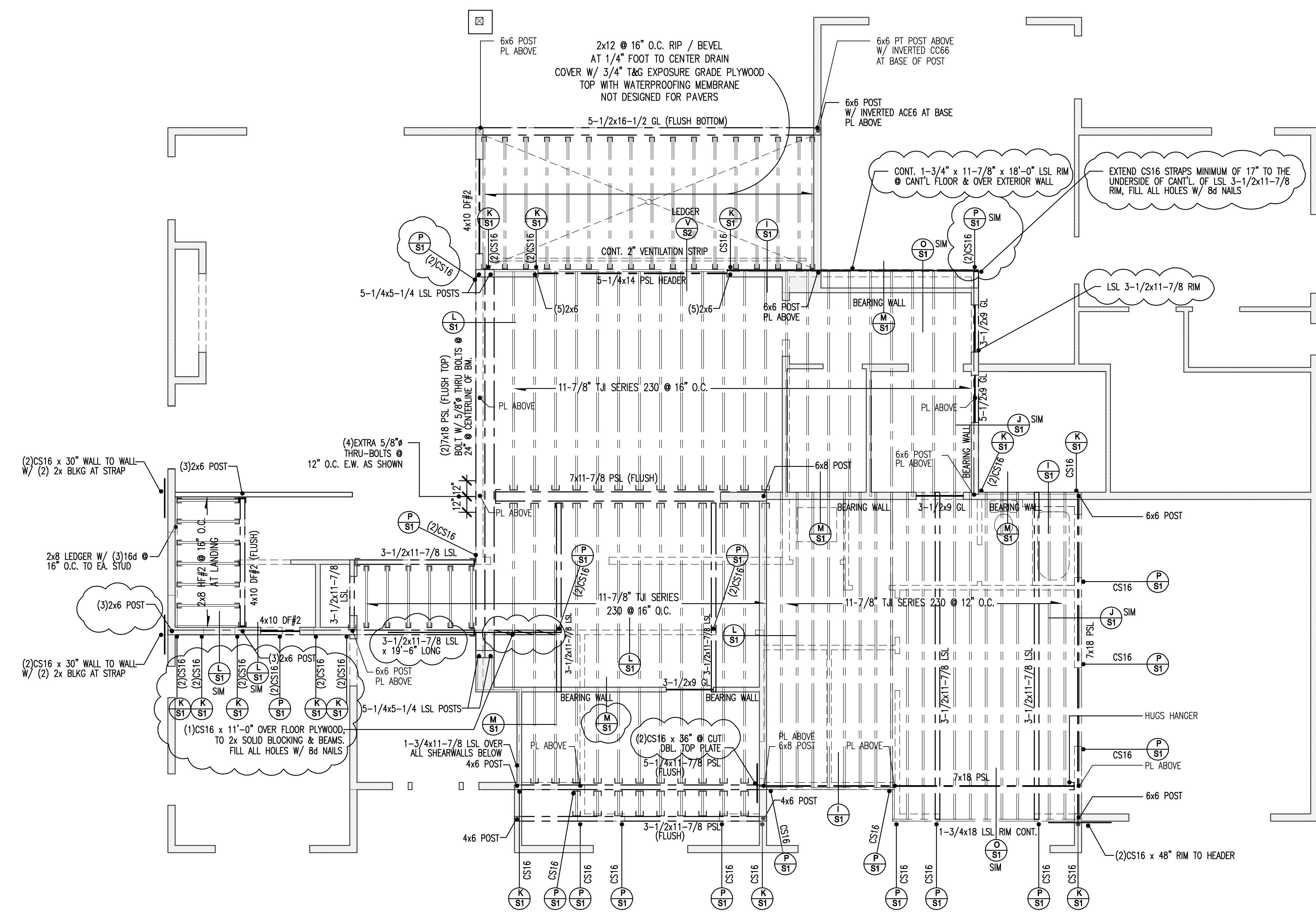
SEE PAGE N1 FOR COMPLETE INFORMATION

**PLUMBING NOTE:**

CLOTHES WASHER, REFRIGERATOR AND DISH WASHER MUST BE INSTALLED WITH WATER-HAMMER PREVENTION DEVICES.



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A9

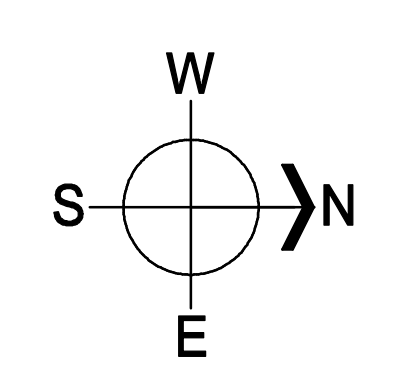


EXPIRES 2/1/2022  
**DR. BROBST**  
 DESIGN WORKS  
 dan@brobstdesignworks.com  
 206.409.6690

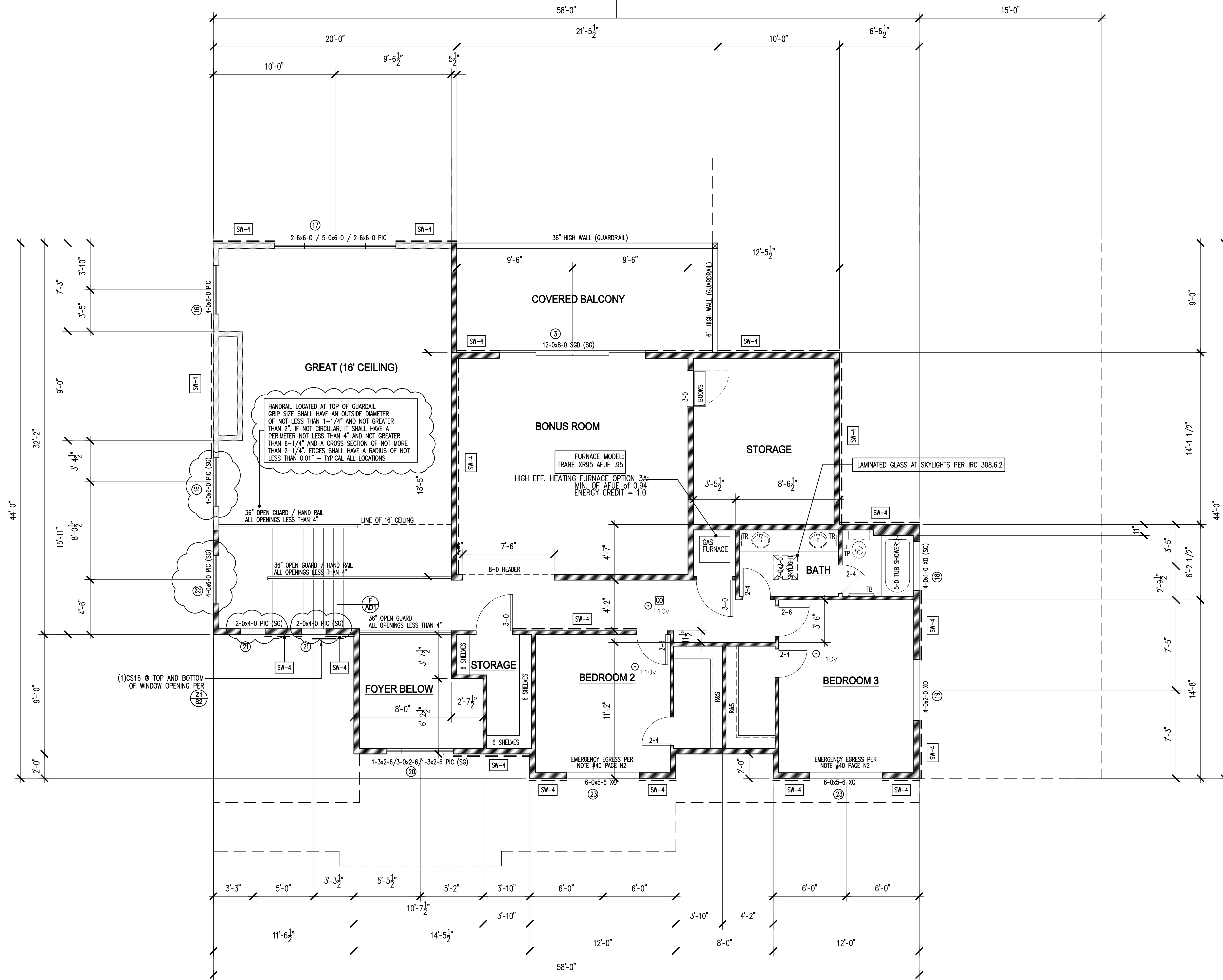
**UPPER LEVEL FLOOR FRAMING**

**MERLINO RESIDENCE**  
 4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED  
 4.21.2021  
 1/4" = 1'-0"  
 SCALE  
 11.10.2020  
 DATE  
 COMPUTER FILE NAME  
**A3**  
 SHEET NUMBER

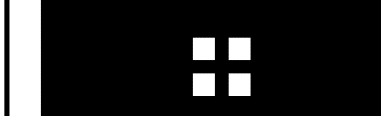






EXPIRES 2/1/2022

**DR. BROBST**  
DESIGN WORKS



dan@brobstdesignworks.com  
206.409.6690

**UPPER LEVEL FLOOR PLAN**

**MERLINO RESIDENCE**  
4225 89TH AVE SE MERCER ISLAND, WA 98040

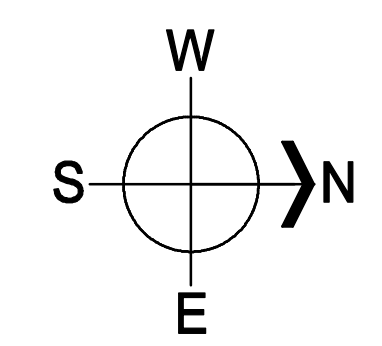
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4.21.2021

1/4" = 1'-0"  
SCALE

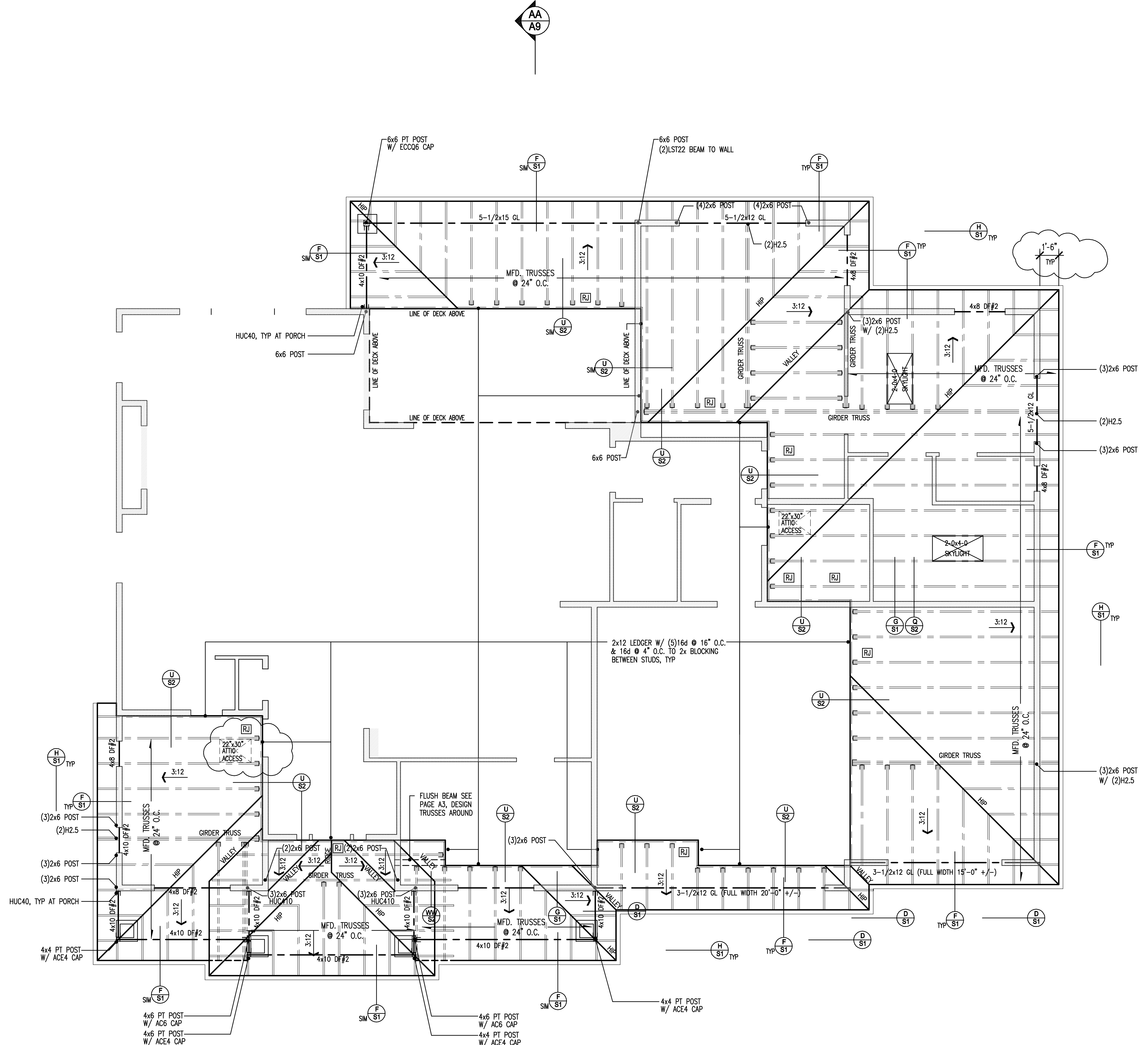
11.10.2020  
DATE

COMPUTER FILE NAME

**A4**  
SHEET NUMBER







**ATTIC VENTILATION:**  
 MINIMUM ATTIC VENTILATION SHALL BE 1/300 OF THE ATTIC PLAN AREA.  
 UPPER VENTING SHALL BE PROVIDED BY 4\"/>

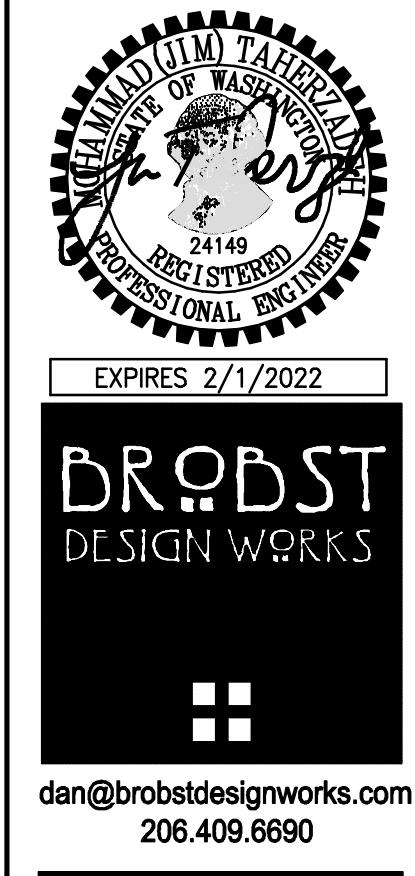
**REAR PATIO, MASTER, NORTH GARAGE ROOF:**  
 1170.0 SQ. FT ATTIC AREA / 300 = 3.9 SQFT. VENT'G REQ'D  
 1.95 SQFT. OF VENT'G TO BE PROVIDED ABOVE THE HALF-WAY POINT AND 1.95 SQFT. OF VENT'G TO BE PROVIDED BELOW THE HALF-WAY POINT.  
 UPPER VENTING: 1.95 SQ. FT. / .34 PER VENT = 5.74 : PROVIDE (6) ROOF JACKS  
 LOWER VENTING: 1.95 SQ. FT. / .049 PER VENT = 39.7 : PROVIDE A MIN. OF (40) EAVE BLOCKS

**GARAGE LOW FRONT ROOF / PATIO NORTH:**  
 140.0 SQ. FT ATTIC AREA / 300 = .48 SQFT. VENT'G REQ'D  
 .24 SQFT. OF VENT'G TO BE PROVIDED ABOVE THE HALF-WAY POINT AND .24 SQFT. OF VENT'G TO BE PROVIDED BELOW THE HALF-WAY POINT.  
 UPPER VENTING: .24 SQ. FT. / .34 PER VENT = .71 : PROVIDE (1) ROOF JACKS  
 LOWER VENTING: .24 SQ. FT. / .049 PER VENT = 4.89 : PROVIDE A MIN. OF (5) EAVE BLOCKS

**RAISED FRONT PORCH ROOF AT ENTRY DOOR:**  
 116.0 SQ. FT ATTIC AREA / 300 = .40 SQFT. VENT'G REQ'D  
 .20 SQFT. OF VENT'G TO BE PROVIDED ABOVE THE HALF-WAY POINT AND .20 SQFT. OF VENT'G TO BE PROVIDED BELOW THE HALF-WAY POINT.  
 UPPER VENTING: .20 SQ. FT. / .34 PER VENT = .59 : PROVIDE (1) ROOF JACKS  
 LOWER VENTING: .20 SQ. FT. / .049 PER VENT = 4.08 : PROVIDE A MIN. OF (5) EAVE BLOCKS

**DEN LOW FRONT ROOF / PATIO SOUTH:**  
 195.0 SQ. FT ATTIC AREA / 300 = .65 SQFT. VENT'G REQ'D  
 .24 SQFT. OF VENT'G TO BE PROVIDED ABOVE THE HALF-WAY POINT AND .24 SQFT. OF VENT'G TO BE PROVIDED BELOW THE HALF-WAY POINT.  
 UPPER VENTING: .24 SQ. FT. / .34 PER VENT = .71 : PROVIDE (1) ROOF JACKS  
 LOWER VENTING: .24 SQ. FT. / .049 PER VENT = 4.89 : PROVIDE A MIN. OF (5) EAVE BLOCKS

[RJ] ROOF JACK LOCATIONS



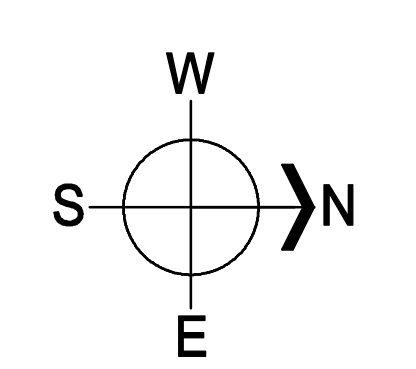
**LOWER ROOF FRAMING PLAN**

**MERLINO RESIDENCE**  
 4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED 4.21.2021

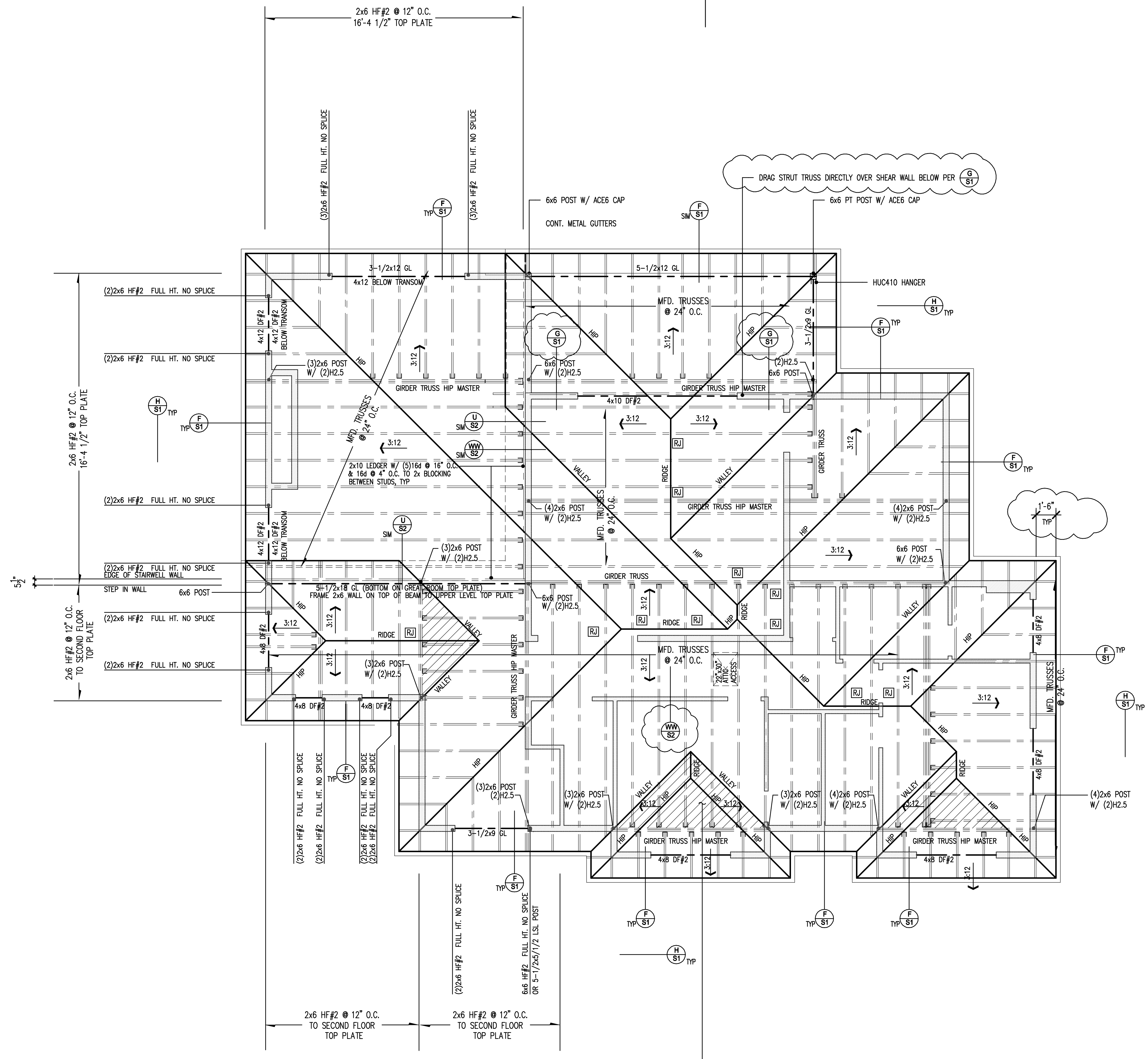
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 11.10.2020  
 DATE

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**A5**  
 SHEET NUMBER





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OVERFRAMING NOTE:  
ALL OVERFRAMING MEMBERS SHALL BE 2x6 H F#2 @ 24" O.C. MAX.  
ALL MEMBERS SHALL BE BRACED DOWN TO TRUSSES @ 48" O.C.  
EACH WAY W/ MIN. 2x4 BRACE, TYPICAL ALL OVERFRAMING

**ATTIC VENTILATION:**  
MINIMUM ATTIC VENTILATION SHALL BE 1/300 OF THE ATTIC PLAN AREA.  
UPPER VENTING SHALL BE PROVIDED BY AT-50 ROOF JACKS LOCATED WITHIN 3' OF THE RIDGE OF THE ROOF EACH JACK VENT PROVIDES .34 SF OF VENTING PER JACK  
LOWER VENTING SHALL BE PROVIDED BY LOWER VENTING SHALL BE EAVE VENT BLOCKS W/ (3) 2" DIA SCREENED HOLES PROVIDING A NET VENT AREA OF 7.068 SQIN. =0.0492 SQ FT AND IF REQUIRED AT-50 ROOF JACKS LOCATED BELOW THE MIDPOINT OF THE ROOF EACH JACK VENT PROVIDES .34 SF OF VENTING PER JACK  
SEE DETAIL S/AD1 FOR VENTING AT EAVE DIAGRAM

**UPPER ROOF:**  
2130.0 SQ. FT ATTIC AREA / 300 = 7.1 SQFT. VENT'G REQ'D  
3.55 SQFT. OF VENT'G TO BE PROVIDED ABOVE THE HALF-WAY POINT AND 3.55 SQFT. OF VENT'G TO BE PROVIDED BELOW THE HALF-WAY POINT.  
UPPER VENTING:  
3.55 SQ. FT. / .34 PER VENT = 10.4 : PROVIDE (11) ROOF JACKS  
LOWER VENTING:  
3.55 SQ. FT. / .049 PER VENT = 72.44 : PROVIDE A MIN. OF (73) EAVE BLOCKS

[RJ] ROOF JACK LOCATIONS

EXPIRES 2/1/2022

**DROBST**  
DESIGN WORKS

dan@brobstdesignworks.com  
206.409.6690

**UPPER ROOF FRAMING PLAN**

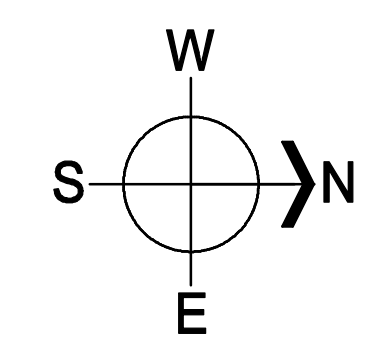
**MERLINO RESIDENCE**  
4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED  
4.21.2021

1/4"=1'-0"  
SCALE

11.10.2020  
DATE

COMPUTER FILE NAME  
**A6**  
SHEET NUMBER





MAXIMUM ALLOWED BUILDING HEIGHT (384.66')

PROPOSED BUILDING HEIGHT (383.58')



FRONT (EAST) ELEVATION

AVERAGE BUILDING ELEVATION (354.66')

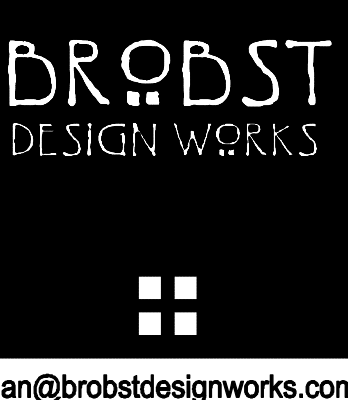
GARAGE SLAB AT DOOR (355.25')

MAXIMUM ALLOWED BUILDING HEIGHT (384.66')



LEFT (SOUTH) ELEVATION

AVERAGE BUILDING ELEVATION (354.66')



dan@brobstdesignworks.com  
206.409.6690

ELEVATIONS

MERLINO RESIDENCE

4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED  
4.21.2021

SCALE  
1/4"=1'-0"

DATE  
11.10.2020

MERCER ISLAND  
COMPUTER FILE NAME

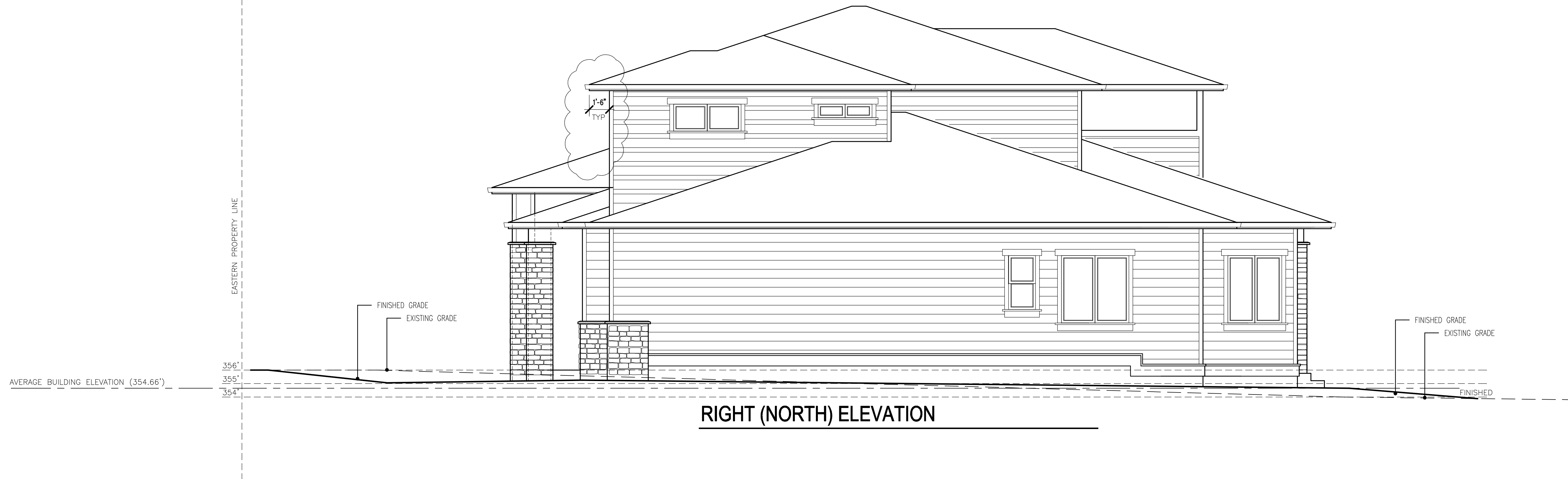
A7  
SHEET NUMBER

MAXIMUM ALLOWED BUILDING HEIGHT (384.66')



**REAR (WEST) ELEVATION**

MAXIMUM ALLOWED BUILDING HEIGHT (384.66')



**RIGHT (NORTH) ELEVATION**

**DRÖBST**  
DESIGN WORKS

dan@brobstdesignworks.com  
206.409.6690

**ELEVATIONS**

**MERLINO RESIDENCE**

4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISED  
4.21.2021

1/4"=1'-0"

SCALE

11.10.2020

DATE

MERCER ISLAND

COMPUTER FILE NAME

**A8**

SHEET NUMBER



**ROOF CONSTRUCTION**

COMPOSITION ROOF ON DBL. LAYER 30# FELT o/  
7/16" OSB  
2X RAFTERS OR PRE-MANUFACTURED TRUSSES o/  
R-49 INSULATION (R-38 IN RAFTER AREAS) o/  
1/2" G.W.B.

**FLOOR CONSTRUCTION**

FINISH FLOOR o/  
3/4" T & G PLYWOOD o/  
JOISTS PER PLAN o/  
R-38 INSULATION ABOVE NON-HEATED AREAS

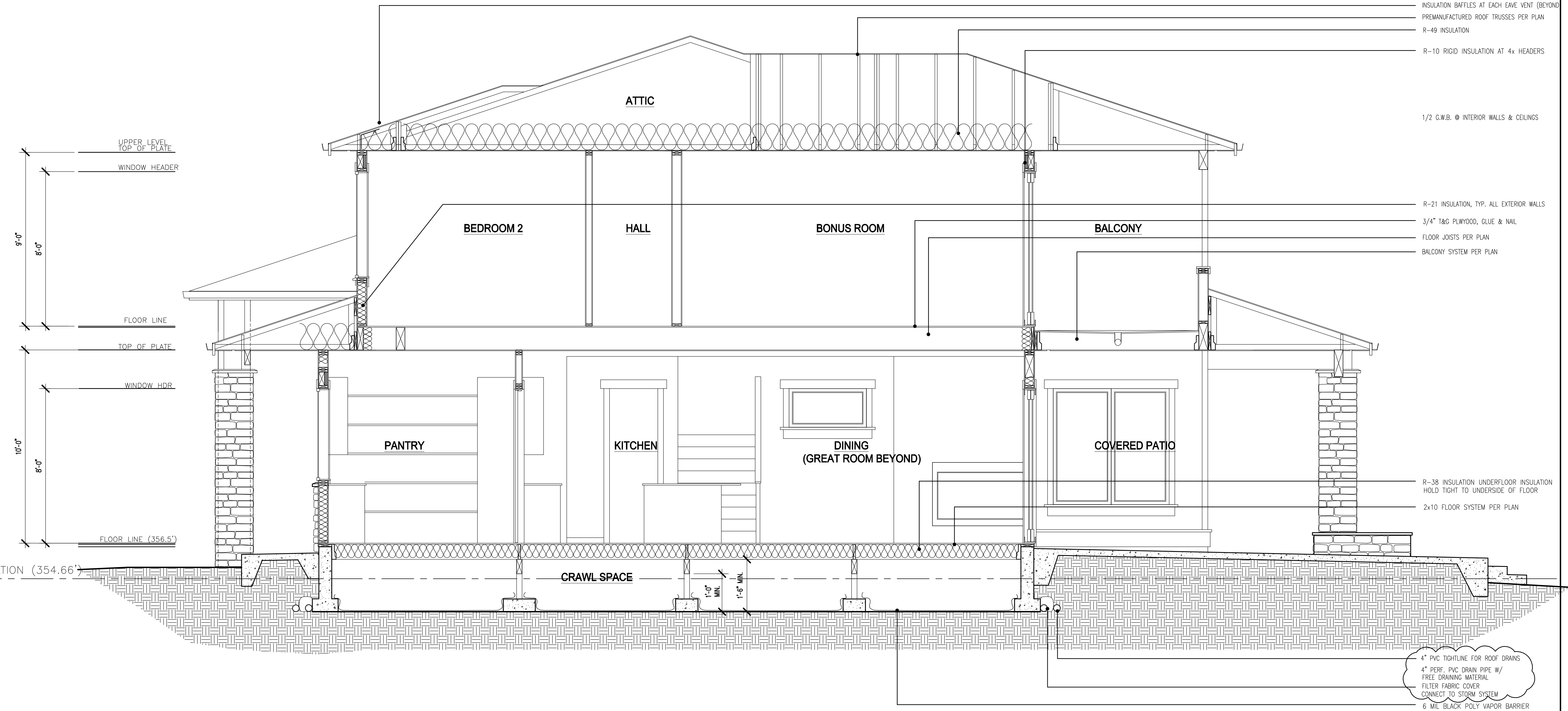
**STAIR CONSTRUCTION**

2x12 STRINGERS  
1-1/8" PLYWOOD TREADS  
1/2" G.W.B. @ USEABLE  
SPACE UNDER STAIRS  
FIREBLOCK BETWEEN STUDS  
ALONG RUN AND @ MID POINT  
BETWEEN STRINGERS

**EXTERIOR WALL CONSTRUCTION**

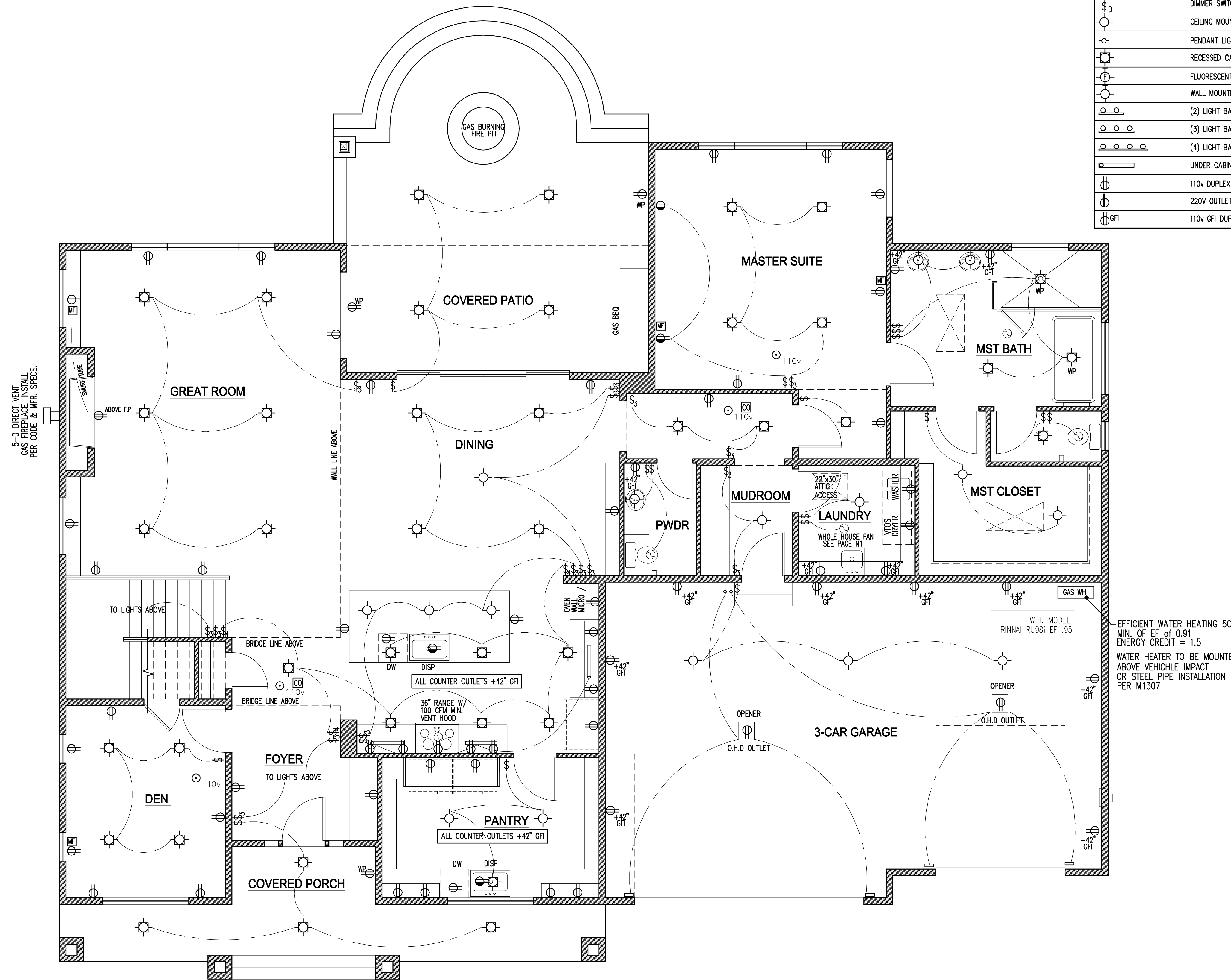
SIDING o/  
7 1/2# FELT o/  
1/2" RATED OSB o/  
2x6 STUDS PER PLAN  
R-21.0 INSULATION w/ V.B. o/  
1/2" G.W.B.

MAXIMUM ALLOWED BUILDING HEIGHT (384.66')



AVERAGE BUILDING ELEVATION (354.66')

**SECTION AA**



ELECTRICAL LEGEND			
\$	STANDARD SWITCH	⊕	HALF-HOT DUPLEX OUTLET
\$3	TWO-WAY SWITCH	⊕ WP	WEATHER-PROOF DUPLEX OUTLET
\$D	DIMMER SWITCH	⊕	CARBON MONOXIDE DETECTOR
⊙	CEILING MOUNT FIXTURE	⊙	SPECIAL PURPOSE CONNECTION
⊕	PENDANT LIGHT FIXTURE	⊙	EXHAUST FAN (MIN 50 CFM.)
⊕	RECESSED CAN		
⊕	FLUORESCENT WALL MOUNTED FIXTURE	MF	MULTI-FUNCTION (TV, PHONE, DATA)
⊕	WALL MOUNTED FIXTURE	N	NETWORK JACK
⊕	(2) LIGHT BAR LIGHT	↑	REMOTE BUTTON
⊕	(3) LIGHT BAR LIGHT	⊕	THERMOSTAT
⊕	(4) LIGHT BAR LIGHT	⊕	DOOR BELL RINGER
⊕	UNDER CABINET LIGHTS	⊕	PHOTO-EYE AT GARAGE DOOR
⊕	110v DUPLEX OUTLET	⊕ 110v SD	SMOKE DETECTOR W/ BATTERY BACK-UP
⊕	220V OUTLET	COMBO	FAN / LIGHT COMBINATION
⊕ GFI	110v GFI DUPLEX OUTLET		

⊕ DENOTES MIN. 50 CFM EXHAUST FAN, UNO ALL FANS MUST VENT TO THE OUTSIDE

⊕ 110v DENOTES SMOKE DETECTOR LOCATION ALL SMOKE DETECTORS TO BE 110V. INTERCONNECTED WITH BATTERY BACK-UP

⊕ CARBON MONOXIDE DETECTOR TO BE 110V WITH BATTERY BACK-UP. REQUIRED ON EACH LEVEL AND ADJACENT TO ALL SLEEPING AREAS

**NOTE:**  
ANY RECESSED LIGHT FIXTURE IS TO HAVE PROPER PROTECTION SO THAT THE FIXTURE WILL NOT BECOME OVERHEATED

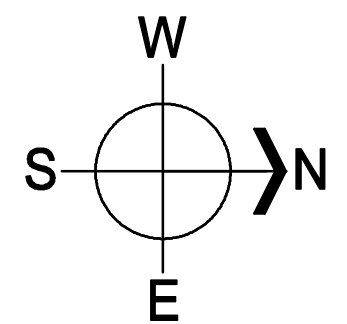
**ENERGY NOTES:**  
(SEE PAGE N1 AND N2 FOR ADD'L INFORMATION)  
- HVAC CONTROLS WITH PROGRAMMABLE SCHEDULE PER WSEC 403.1.1  
- 75% OF ALL LIGHTING FIXTURES SHALL BE HIGH-EFFICACY EQUIPPED PER WSEC 404.1

EFFICIENT WATER HEATING 5C:  
MIN. OF EF OF 0.91  
ENERGY CREDIT = 1.5  
WATER HEATER TO BE MOUNTED ABOVE VEHICLE IMPACT OR STEEL PIPE INSTALLATION PER M1307

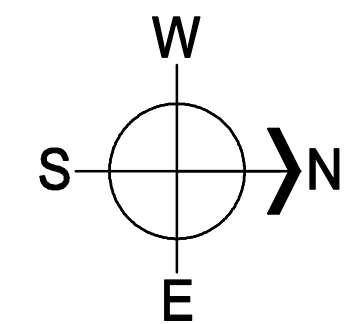
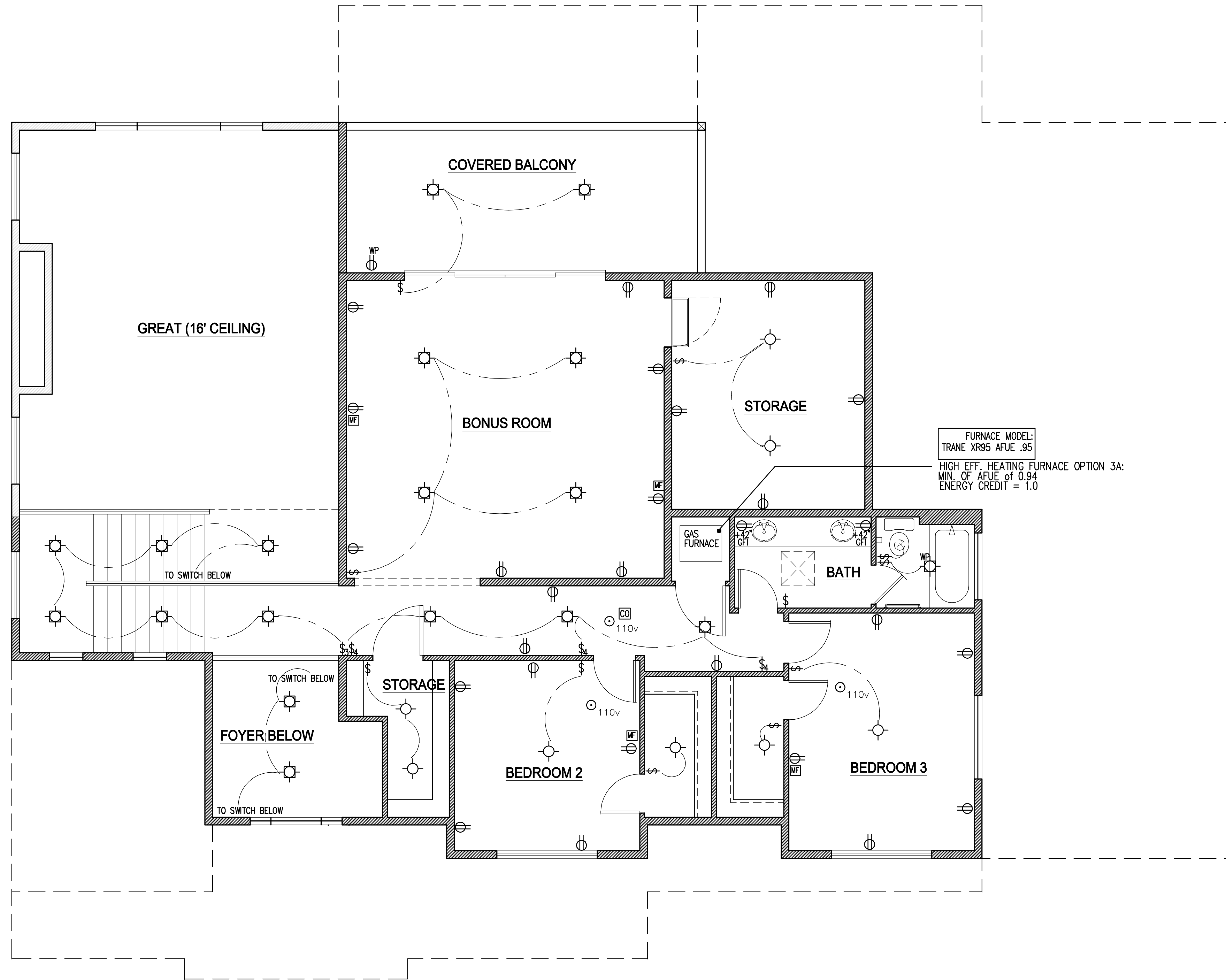
REVISED

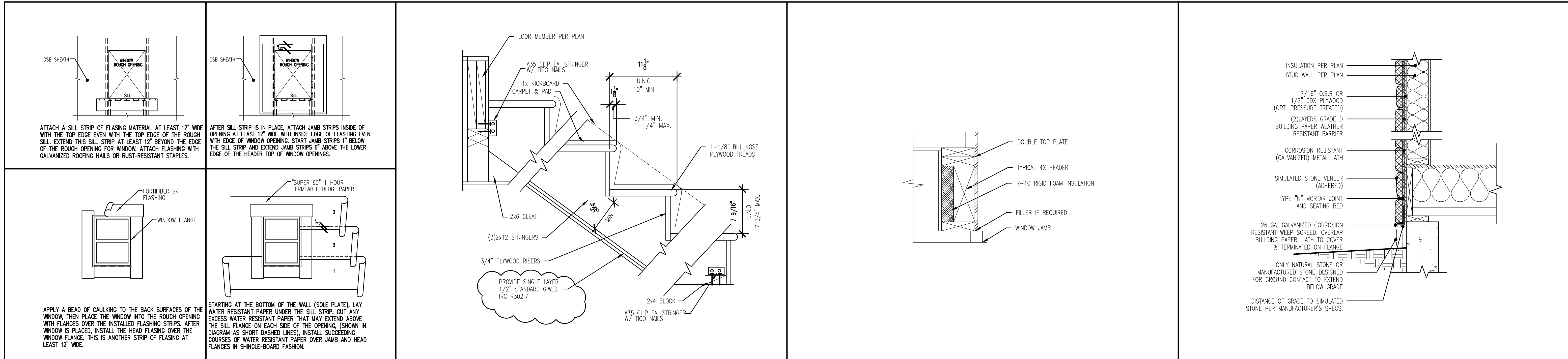
1/4"=1'-0"  
SCALE  
11.10.2020  
DATE

COMPUTER FILE NAME  
**E1**  
SHEET NUMBER

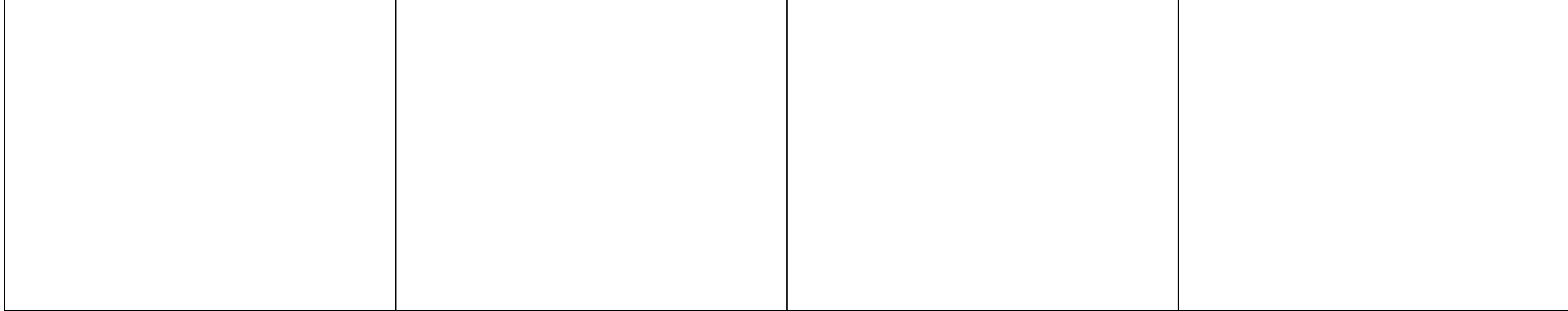




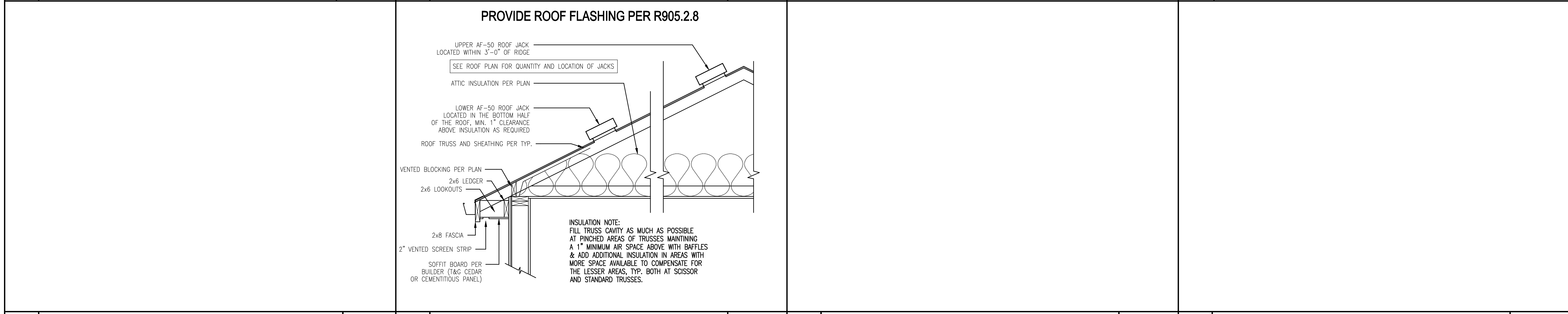




**A WINDOW FLASHING DETAIL** NONE **F TYPICAL STAIR DETAIL** 3/4" = 1' **K INSULATED HEADER** NTS **M ADHERED STONE VENEER DETAIL** 1"=1'-0"

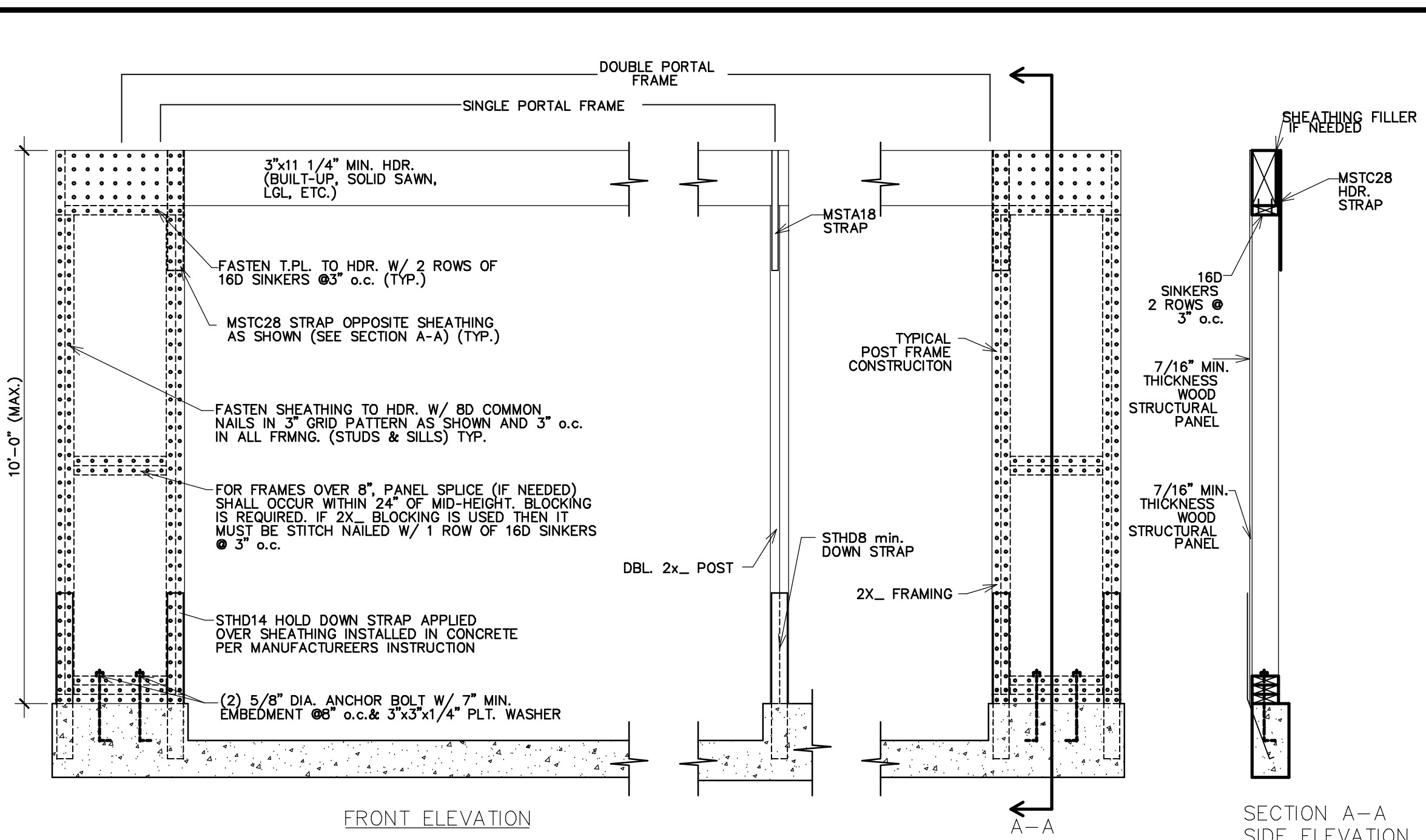
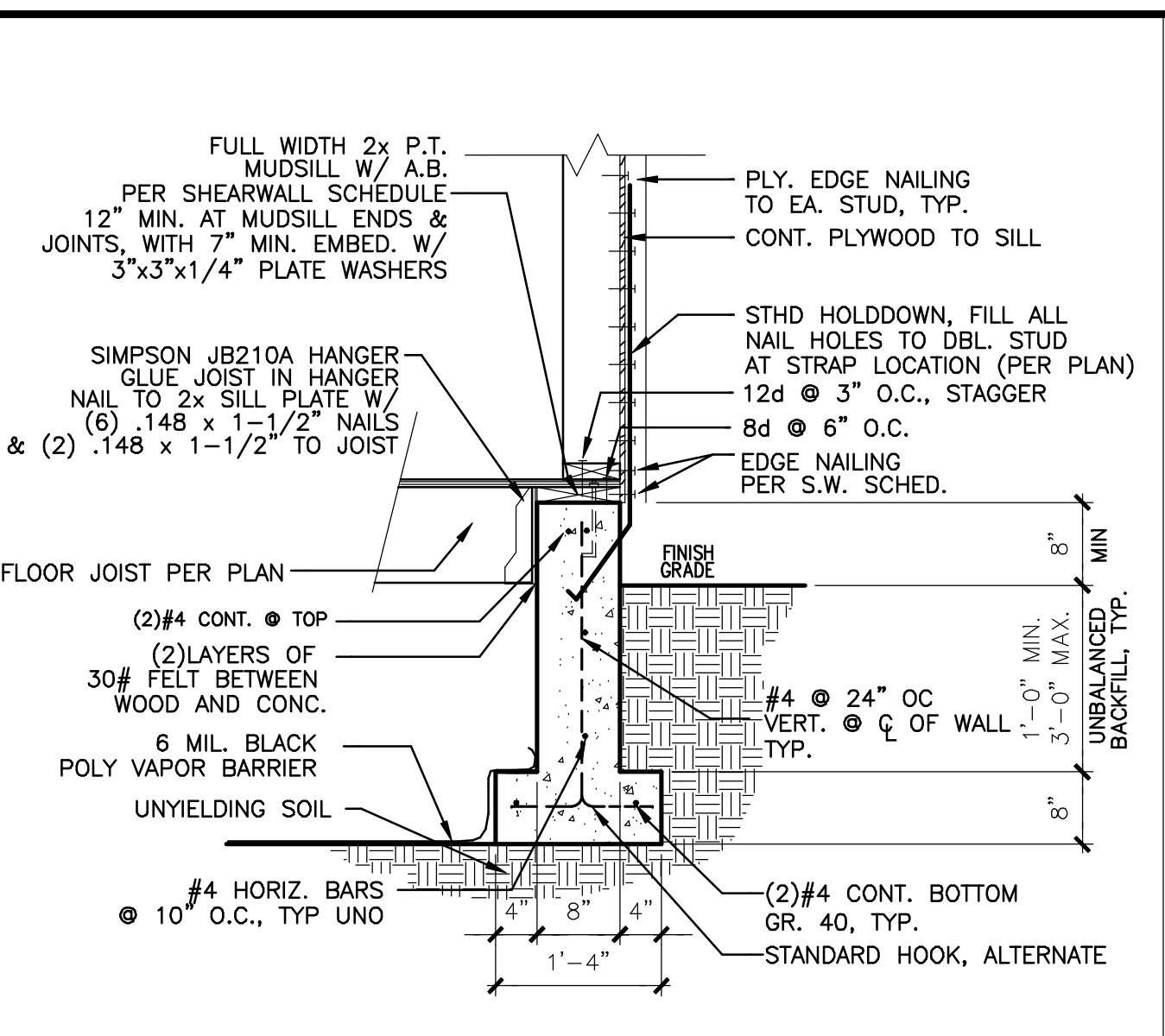
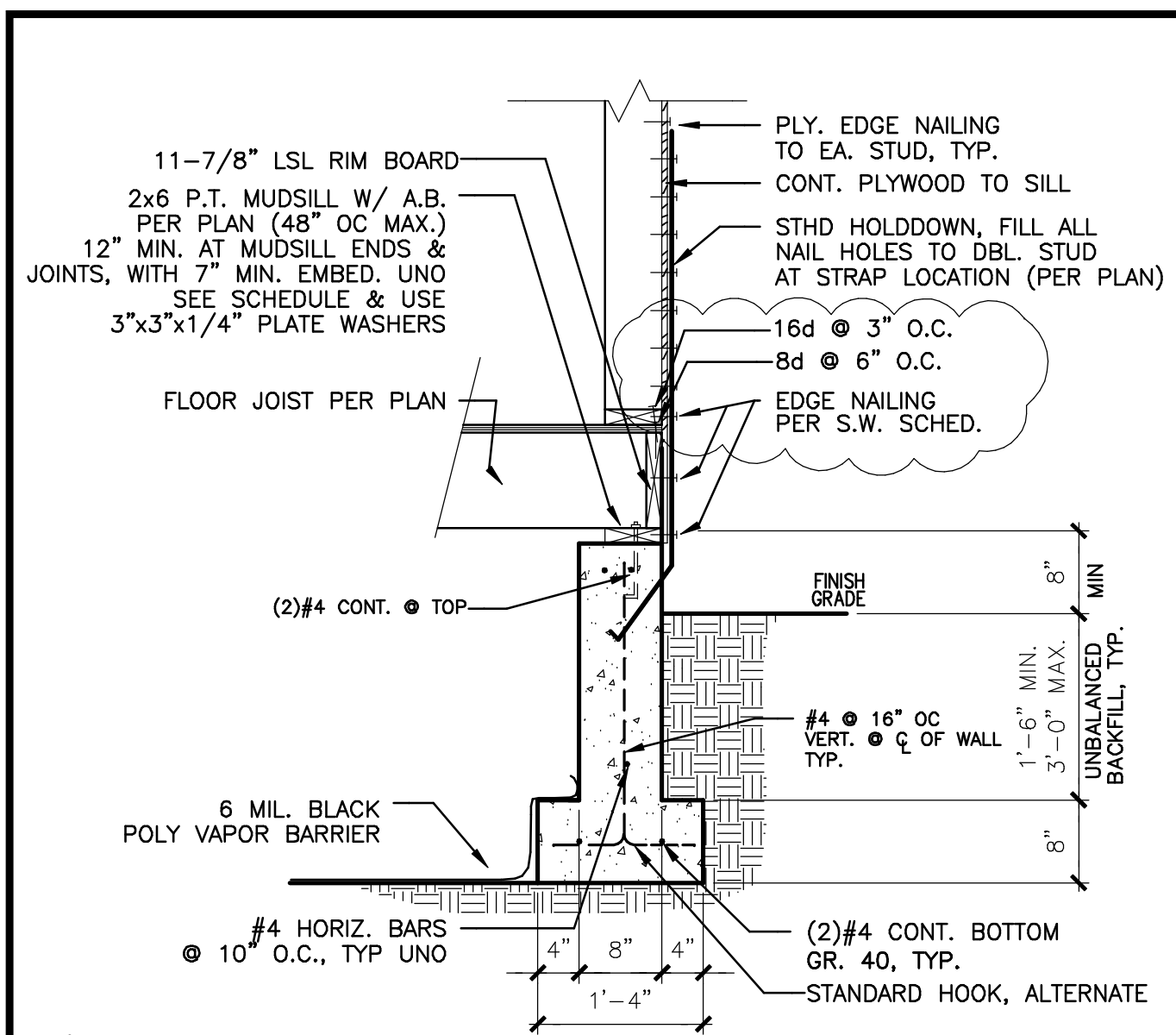


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**S ROOF VENT DIAGRAM** 3/4" = 1'



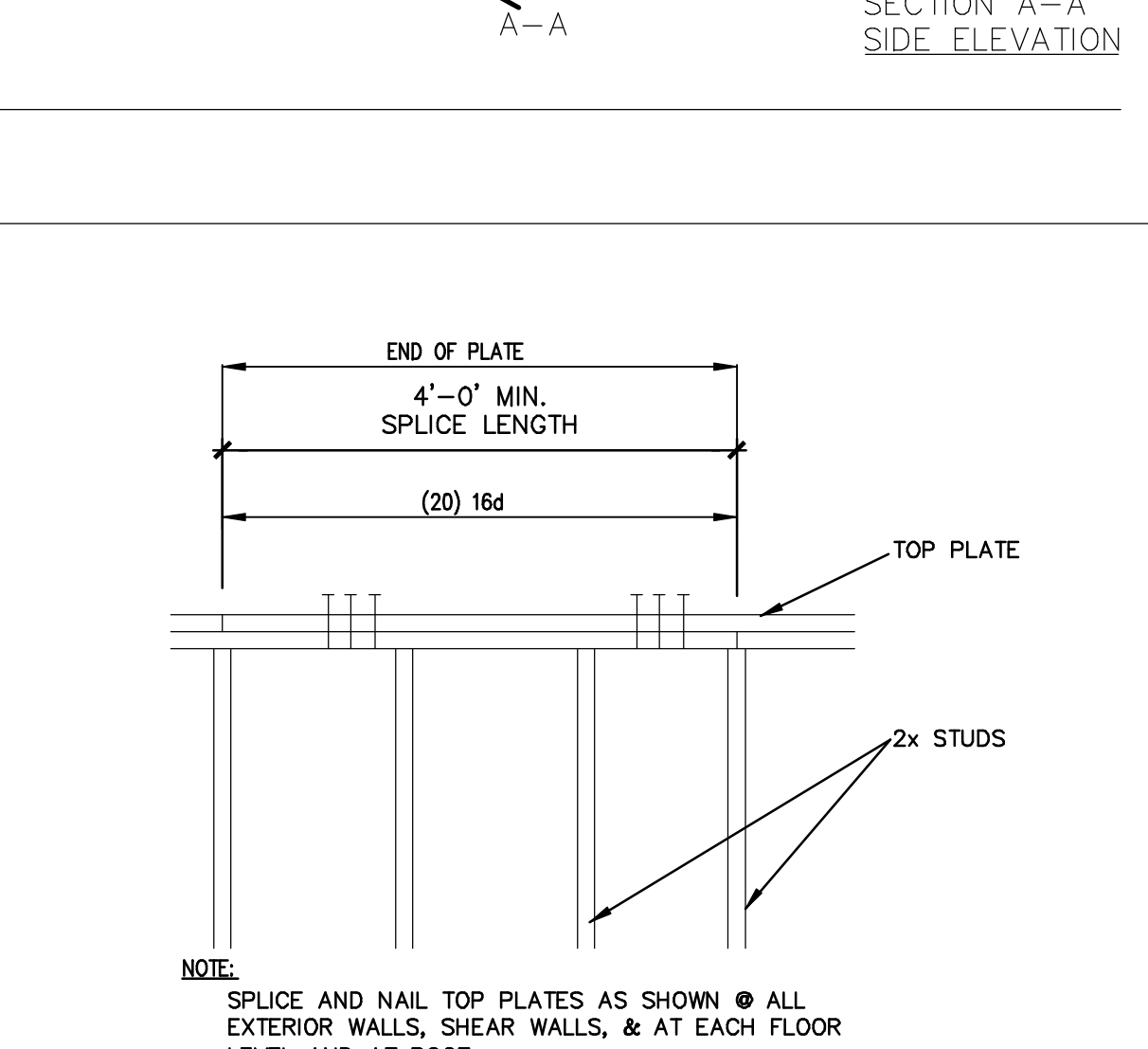
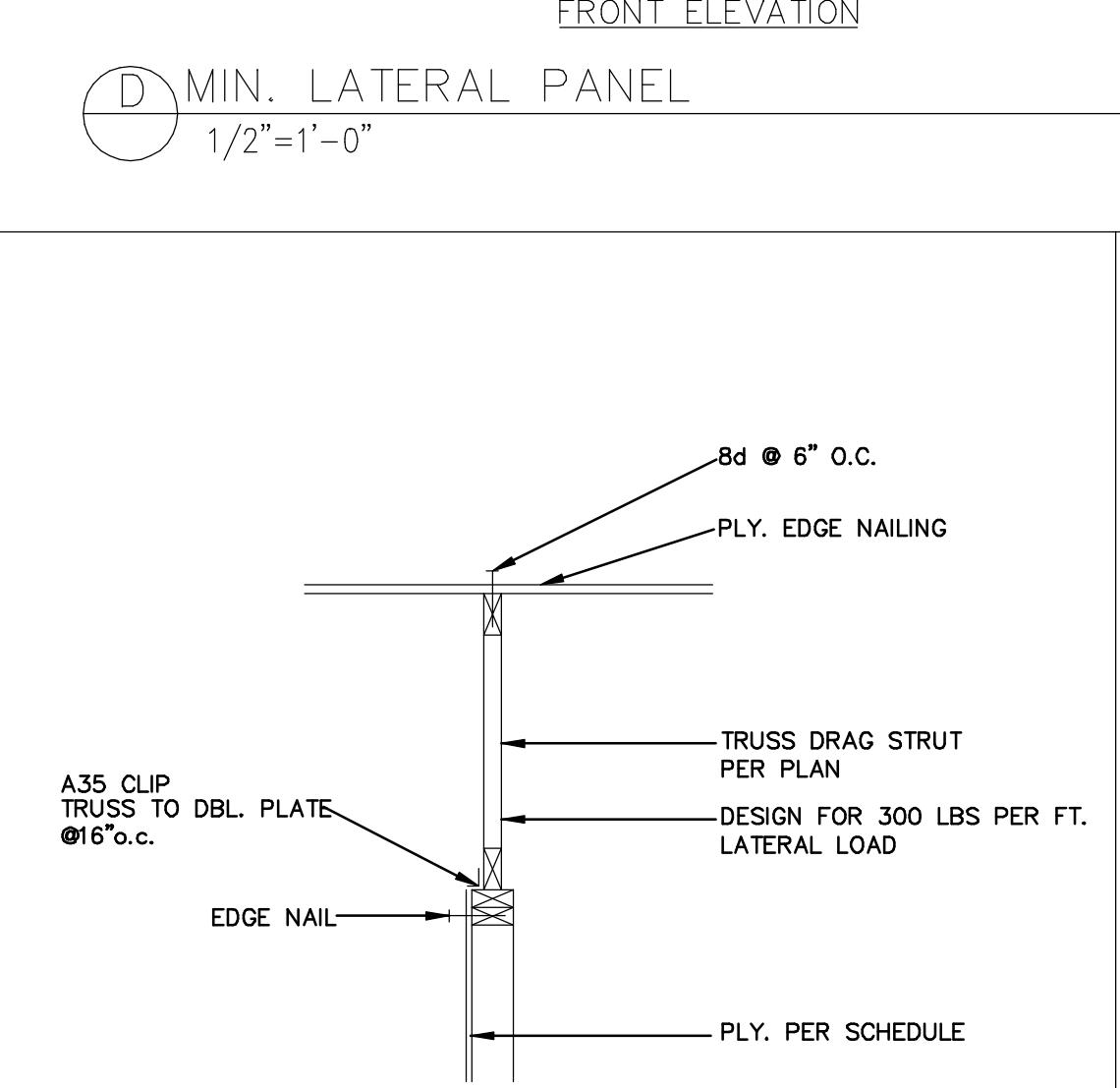
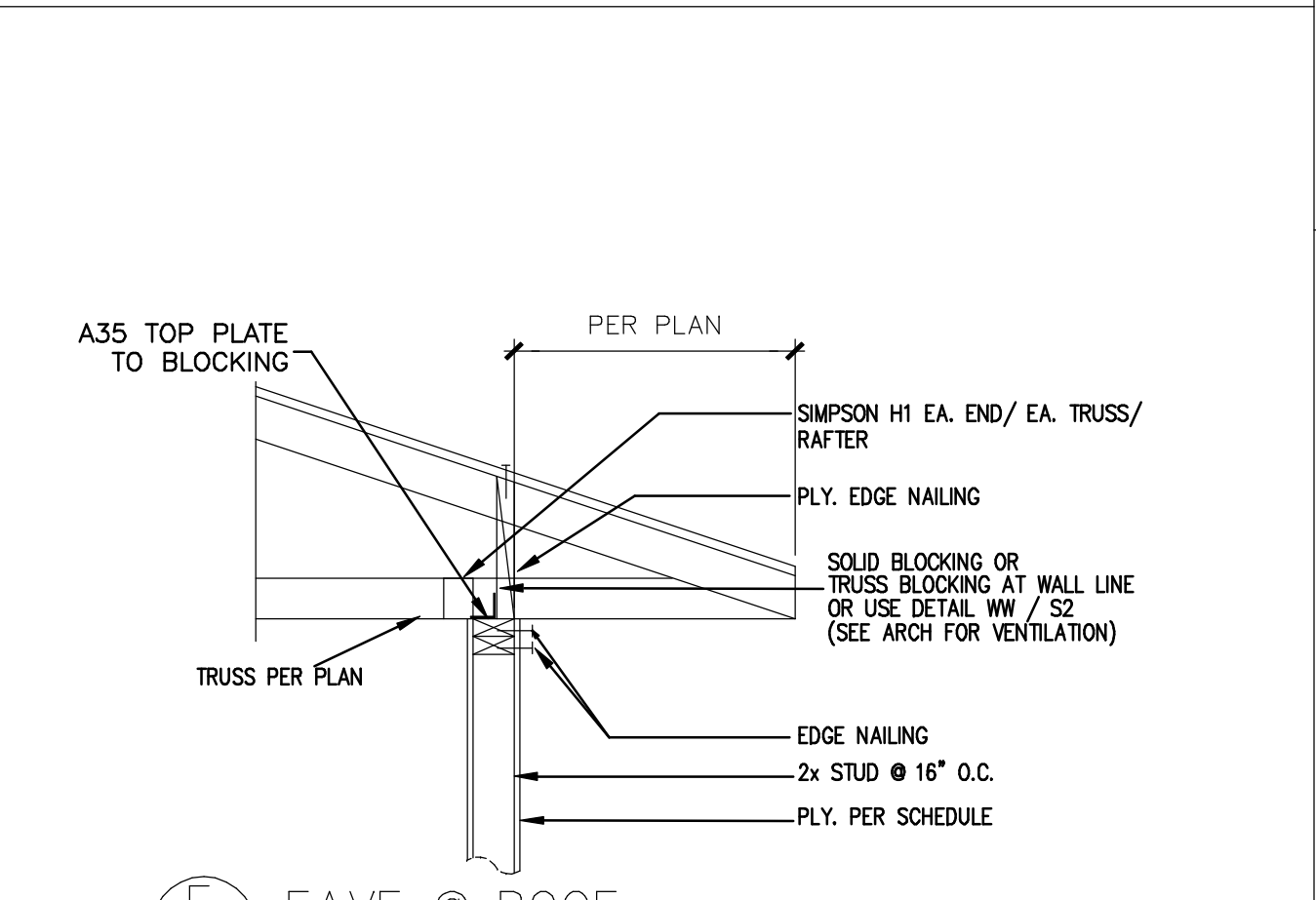
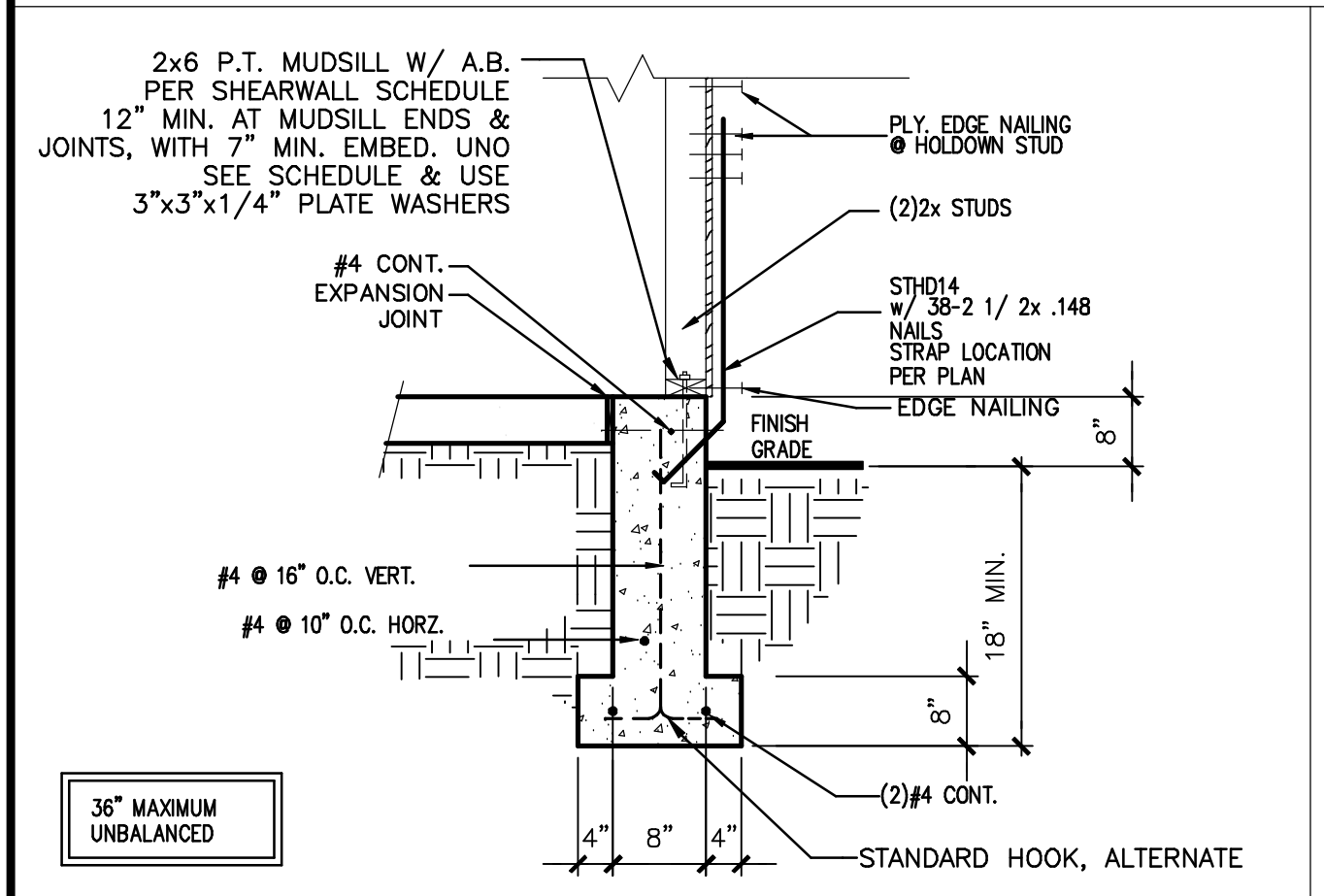


- TYP. EXT. WALL CONSTRUCTION**
- SW-6**  
INDICATES SHEARWALL w/ PLYWOOD ONE SIDE.
1. SHEATHING: 1/2\"/>
  2. BOLT SILL PLATE TO CONCRETE w/ 5/8\"/>
  3. NAIL BOTTOM PLATE TO FRAMING BELOW w/ 16d @ 4\"/>
  4. FASTEN DOUBLE PLATE TO JOIST OR BLOCKING ABOVE PER DETAILS ON S1 & S2 (CAPACITY: 240 LB/FT)
- SHEARWALL SCHEDULE**
- SW-4**  
INDICATES SHEARWALL w/ PLYWOOD ONE SIDE.
1. SHEATHING: 1/2\"/>
  2. BOLT SILL PLATE TO CONCRETE w/ 5/8\"/>
  3. NAIL BOTTOM PLATE TO FRAMING BELOW w/ 16d @ 3-1/2\"/>
  4. FASTEN DOUBLE PLATE TO JOIST OR BLOCKING ABOVE PER DETAILS ON S1 & S2 (CAPACITY: 350 LB/FT)
- SW-3**  
INDICATES SHEARWALL w/ PLYWOOD ONE SIDE.
1. SHEATHING: 1/2\"/>
  2. a. BOLT (3) 2x SILL PLATE TO CONCRETE w/ 5/8\"/>
  3. NAIL BOTTOM PLATE TO FRAMING BELOW w/ 16d @ 3-1/2\"/>
  4. FASTEN DOUBLE PLATE TO JOIST OR BLOCKING ABOVE PER DTL.S. ON S1 & S2.
  5. USE (2) 2x STUDS @ 16\"/>

**A** EXTERIOR SHEARWALL @ CRAWL SPACE  
3/4\"=1'-0\" JOISTS ON TOP OF STEM WALL

**A1** EXTERIOR SHEARWALL @ CRAWL SPACE  
3/4\"=1'-0\" JOISTS HUNG FROM TOP OF STEM WALL

**D** MIN. LATERAL PANEL  
1/2\"=1'-0\"



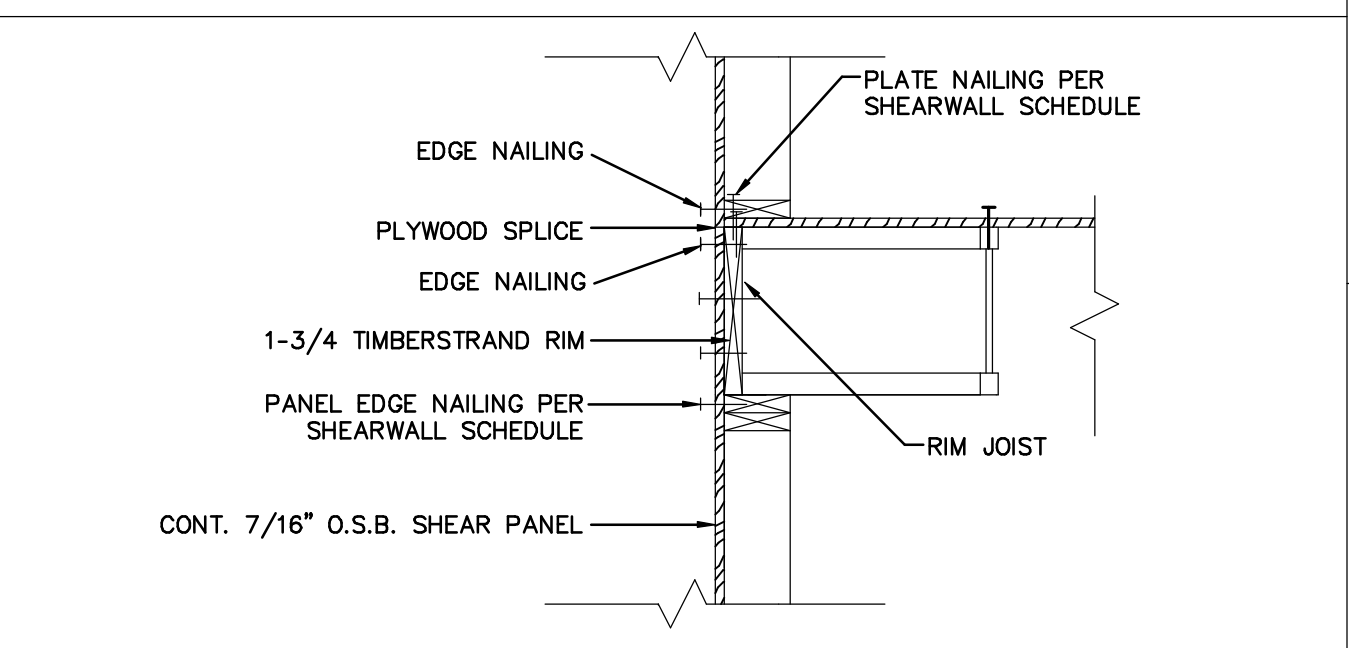
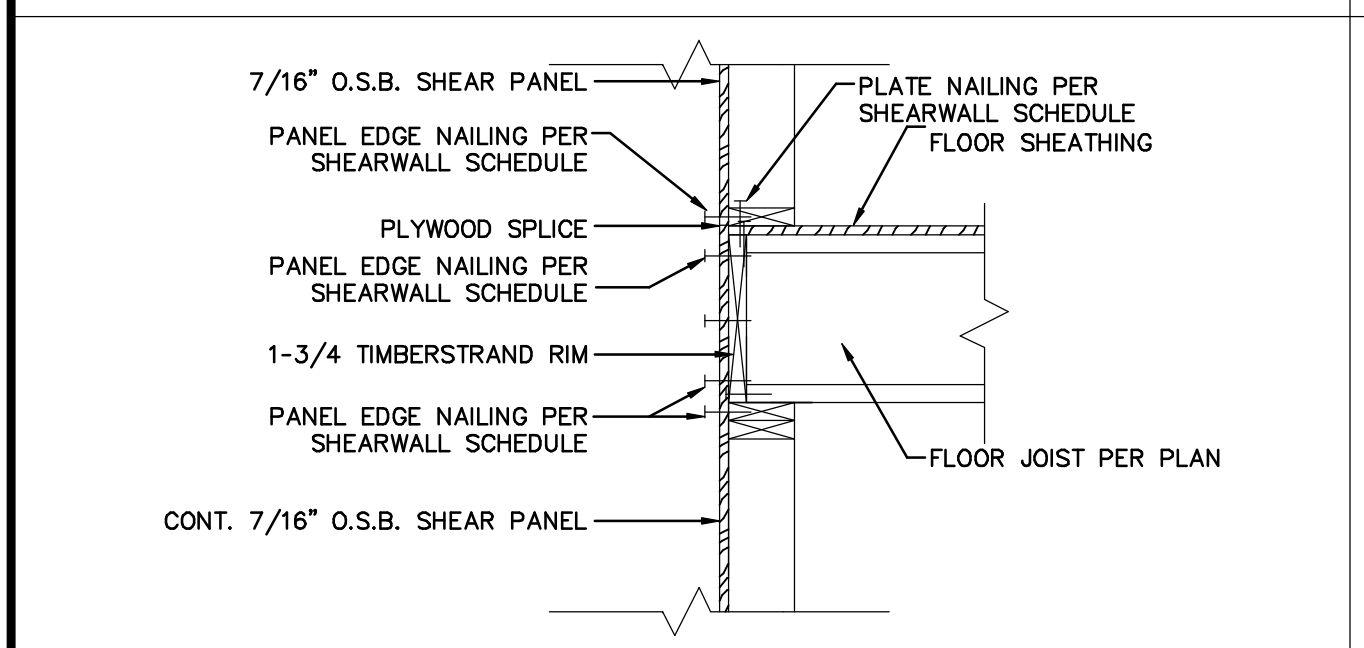
**E** EXT. SHEARWALL @ SLAB  
3/4\"=1'-0\"

**F** EAVE @ ROOF  
3/4\"=1'-0\"

**G** DRAG STRUT TRUSS  
3/4\"=1'-0\"

**H** DBL. TOP PLATE SPLICE  
3/4\"=1'-0\"

- TYPICAL ROOF SHEATHING**
- 7/16\"/>
- DIAPHRAM BOUNDARY, OVER SHEARWALLS & DRAG STRUTS**
- ALL SUPPORTED EDGES 8d @ 6\"/>
- FIELD 8d @ 12\"/>
- TYPICAL FLOOR SHEATHING**
- 3/4\"/>
- DIAPHRAM BOUNDARY AND OVER EXTERIOR WALLS, SHEARWALLS & DRAG STRUTS.**
- ALL SUPPORTED EDGES 8d @ 6\"/>
- FIELD 8d @ 10\"/>
- OPTION: USE #6 SCREWS @ 16\"/>
- NOTES:**
1. USE 3\"/>
  2. THE PLATE WASHER SHALL EXTEND TO WITHIN 1/2\"/>
  3. EXPANSION BOLTS MAY BE USED IN LIEU OF ANCHOR BOLTS W/ SAME SPACING & 4-1/2\"/>
  4. ALL POWDER DRIVEN NAILS SHALL BE 2-3/4\"/>
  5. USE 20d NAILS @ 3x FRAMING MEMBERS
  6. a. 8d NAILS SHALL BE .131 x 2-1/2\"/>
  - b. 10d NAILS SHALL BE .148 x 3\"/>
  - c. 16d NAILS SHALL BE .162 x 3-1/2\"/>
  - d. 20d NAILS SHALL BE .192 x 4\"/>

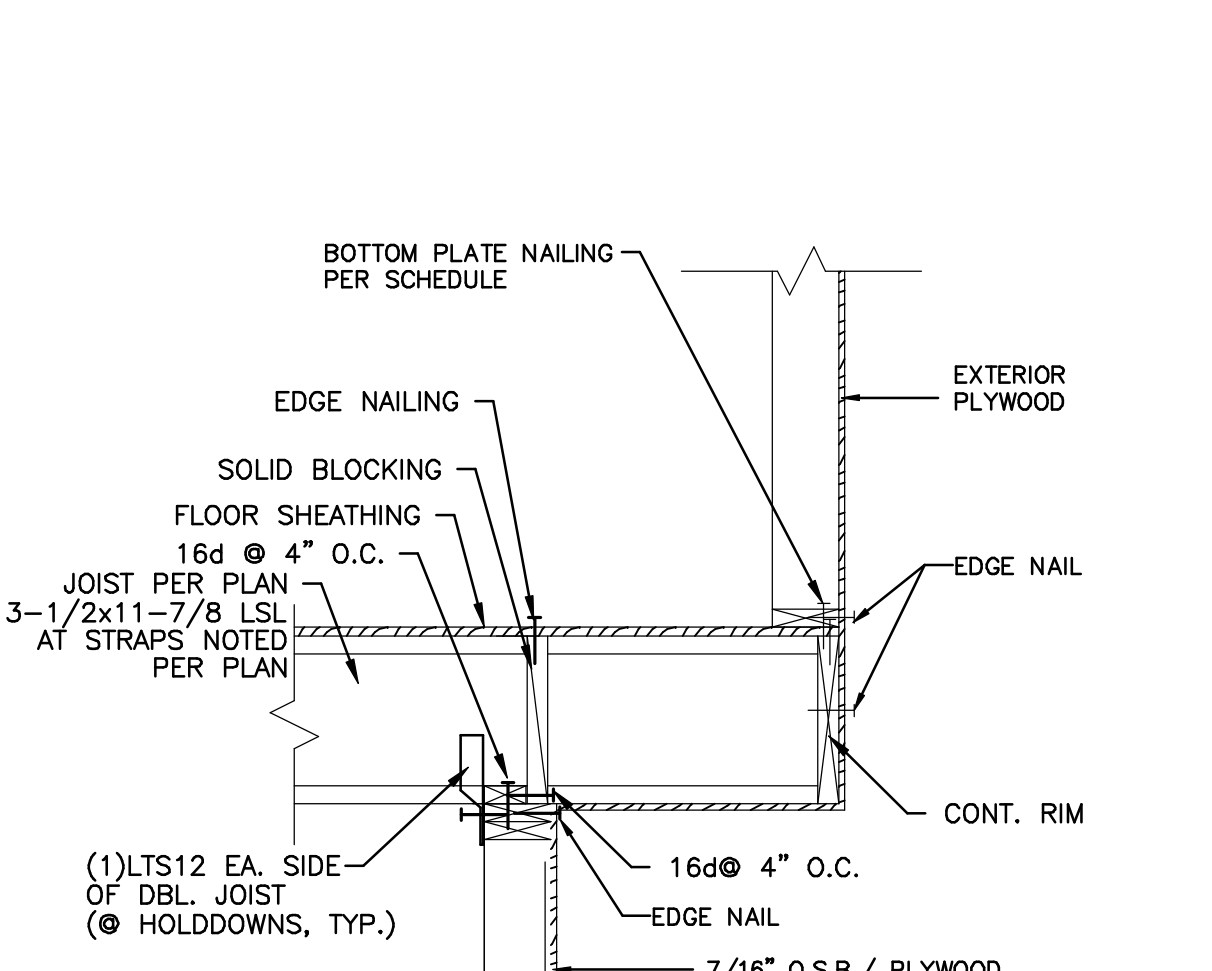
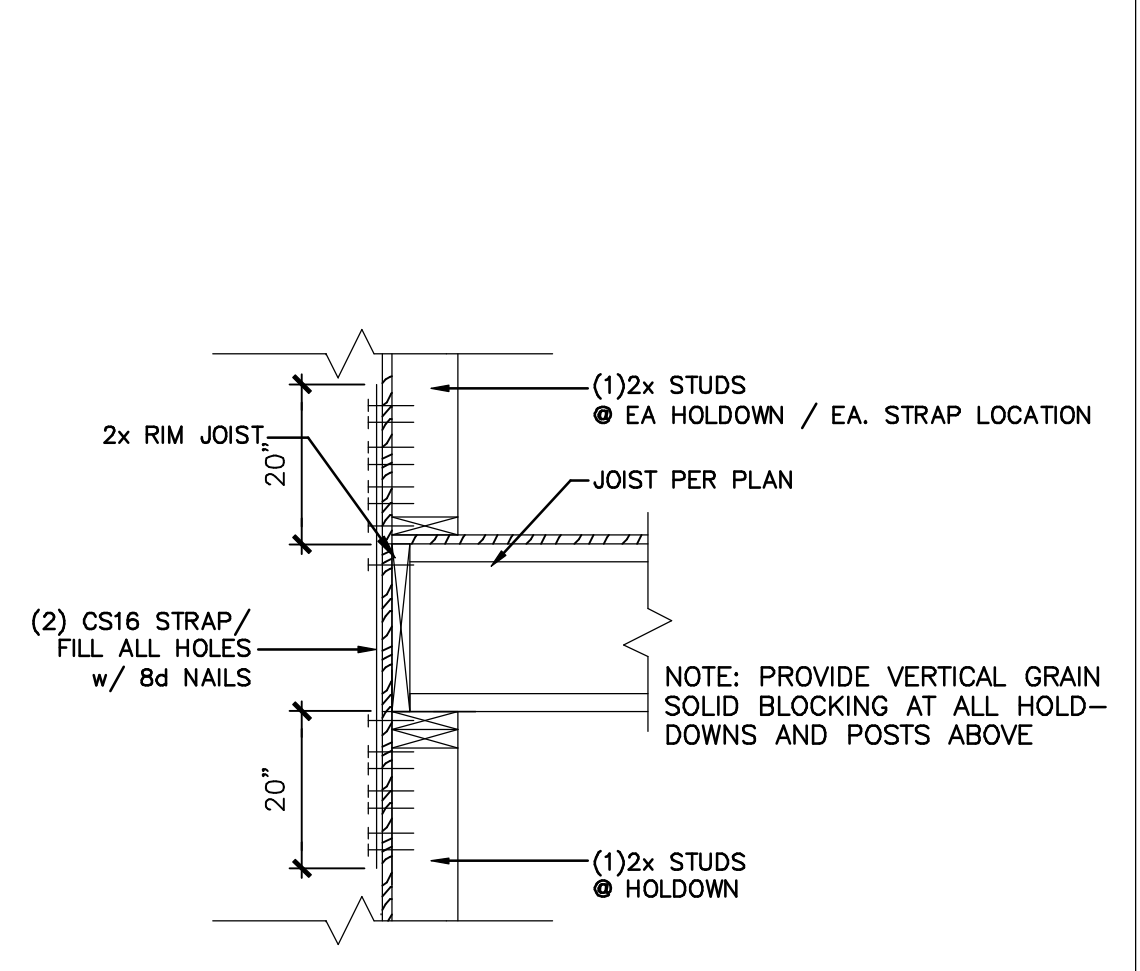
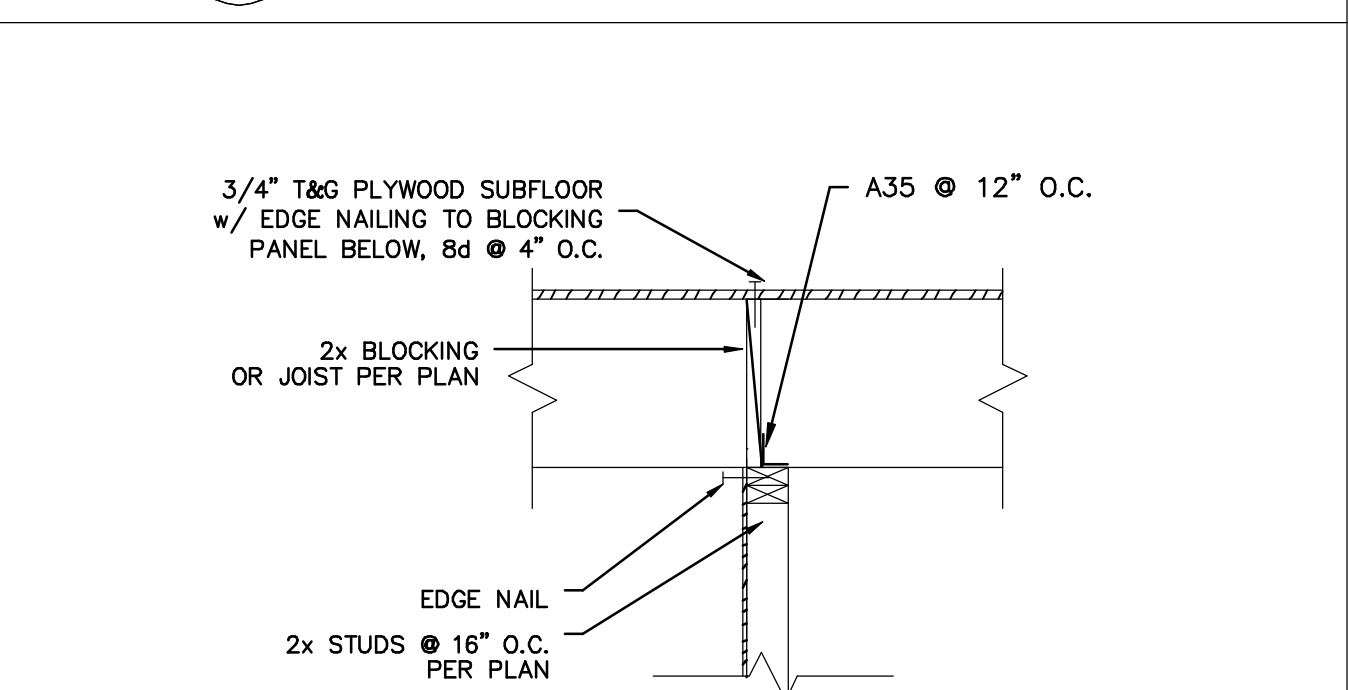
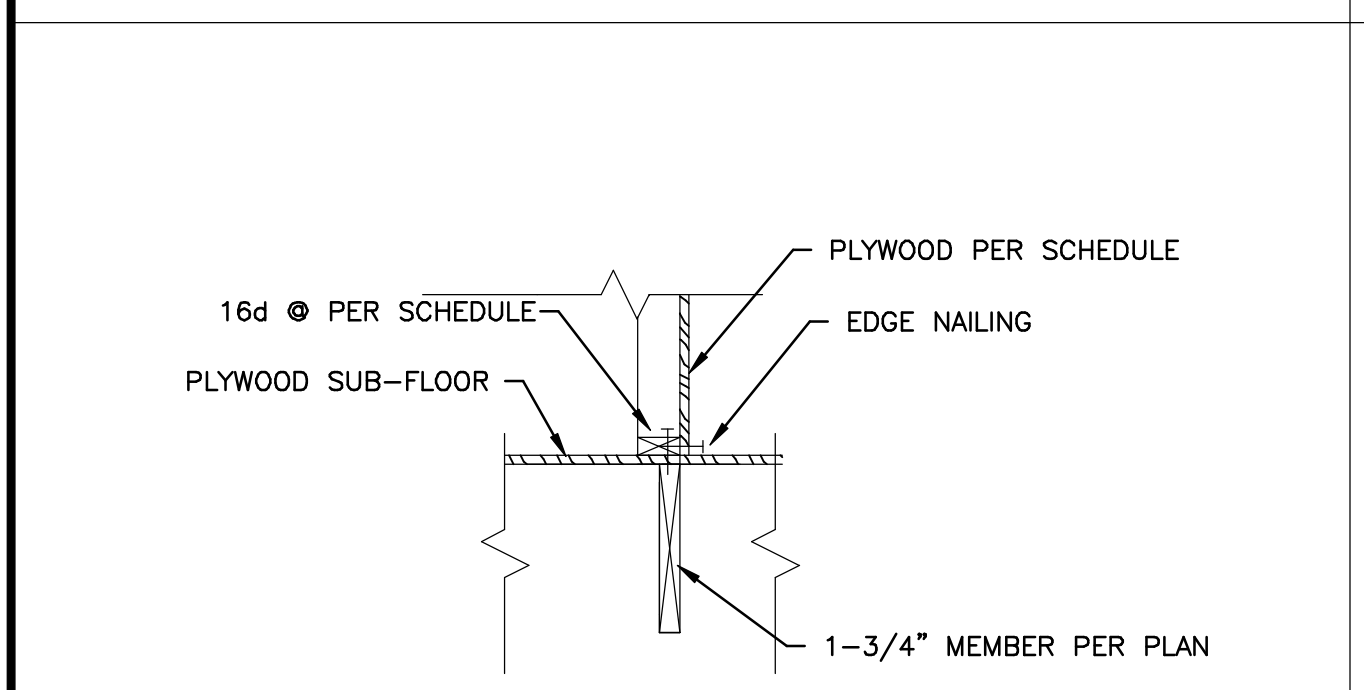


**G** DRAG STRUT TRUSS  
3/4\"=1'-0\"

**H** DBL. TOP PLATE SPLICE  
3/4\"=1'-0\"

**I** JOIST PERPENDICULAR TO EXT. WALL  
3/4\"=1'-0\"

**J** JOIST PARALLEL TO EXTERIOR WALL  
3/4\"=1'-0\"

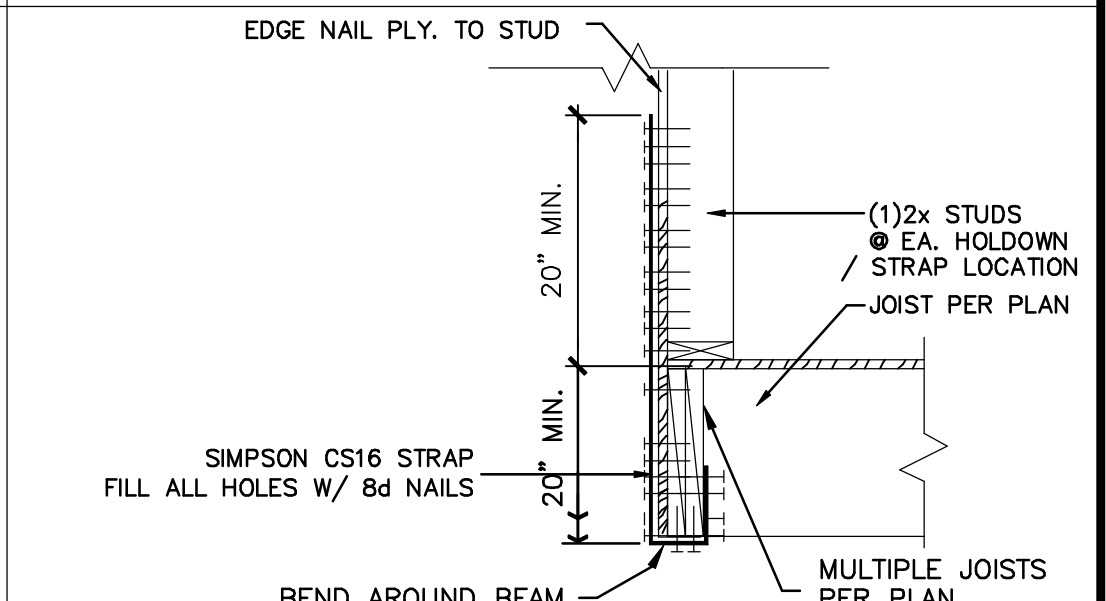


**L** INTERIOR SHEARWALL TO FLOOR  
3/4\"=1'-0\"

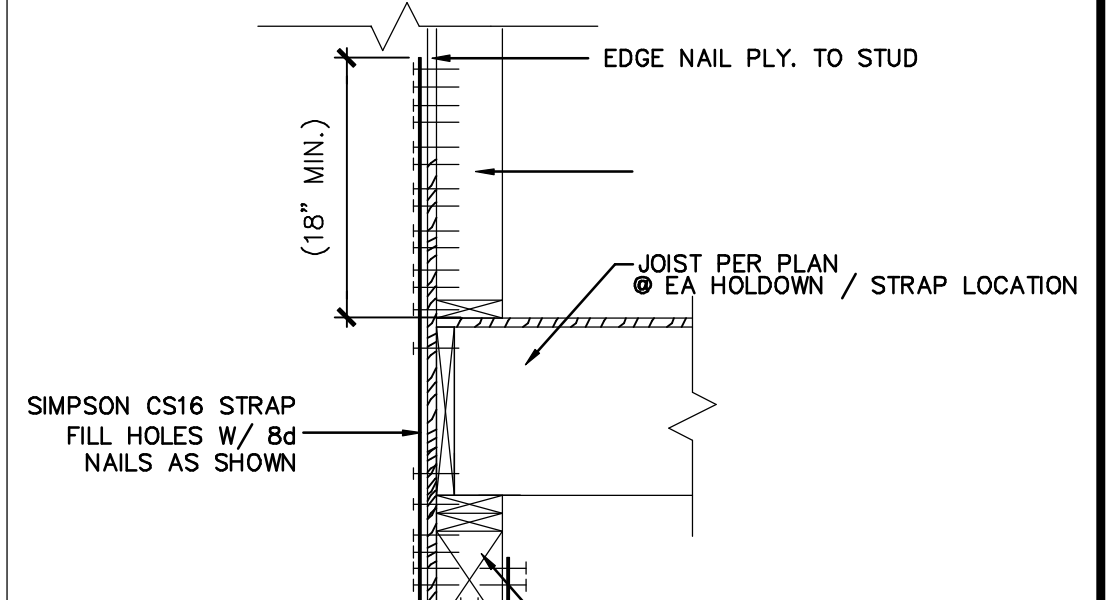
**M** INT. SHEARWALL TO FLOOR ABV.  
3/4\"=1'-0\"

**K** STRAP HOLDDOWN AT FLOOR  
3/4\"=1'-0\" SEE PLANS FOR # OF HOLD-DOWNS

**O** CANT. FLOOR JOISTS  
3/4\"=1'-0\"



**P** STRAP HOLDDOWN AT HDR  
3/4\"=1'-0\" SEE PLANS FOR # OF HOLD-DOWNS



**P1** STRAP HOLDDOWN AT HDR  
3/4\"=1'-0\"

**RB ENGINEERS, INC.**  
1312 2nd Street, Kirkland, WA 98033  
Tel: (425) 822-3009, Fax: (425) 822-2679  
Email: RBE1992@GMAIL.COM

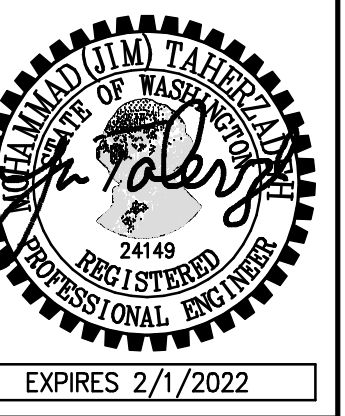
**MERLINO RESIDENCE**  
STRUCTURAL DETAILS



Project	
FILE NUMBER	
DRAWN BY	
Date	4.21.2021

Sheet  
**S1**

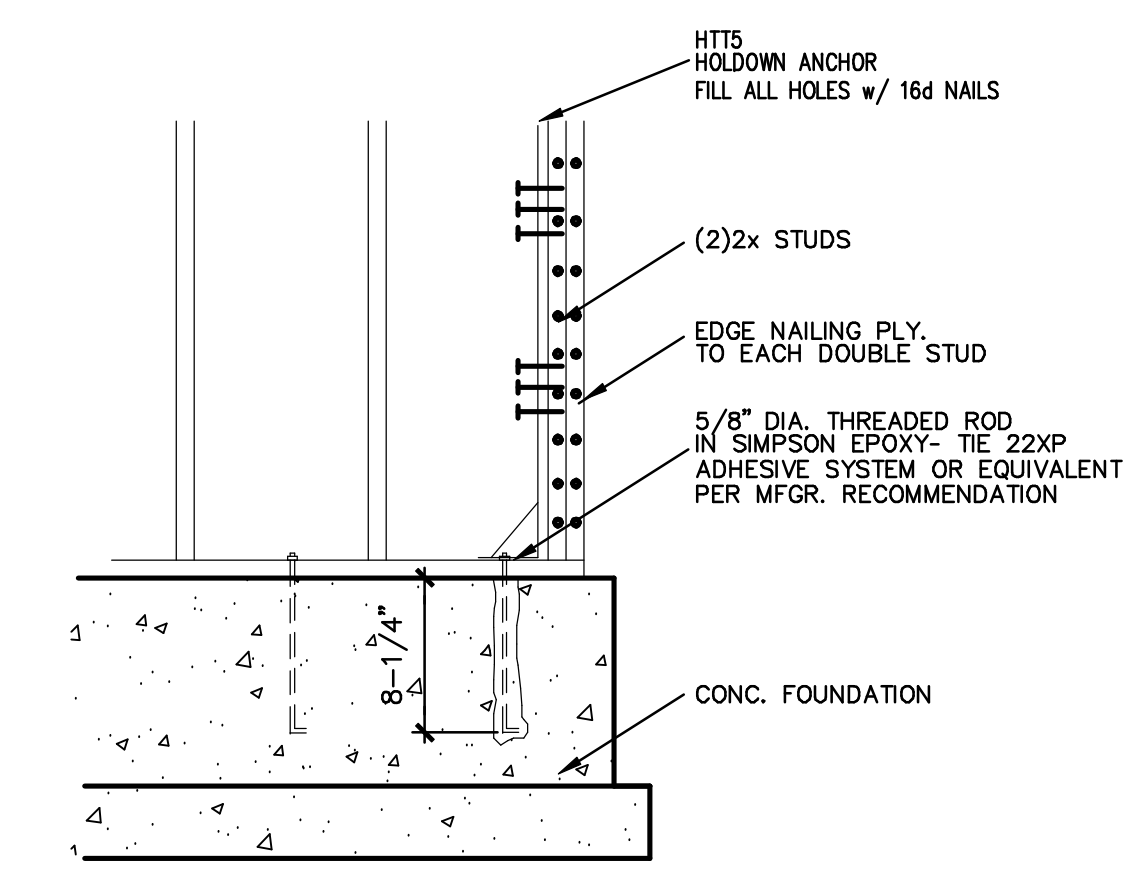
**MERLINO RESIDENCE**  
 STRUCTURAL DETAILS



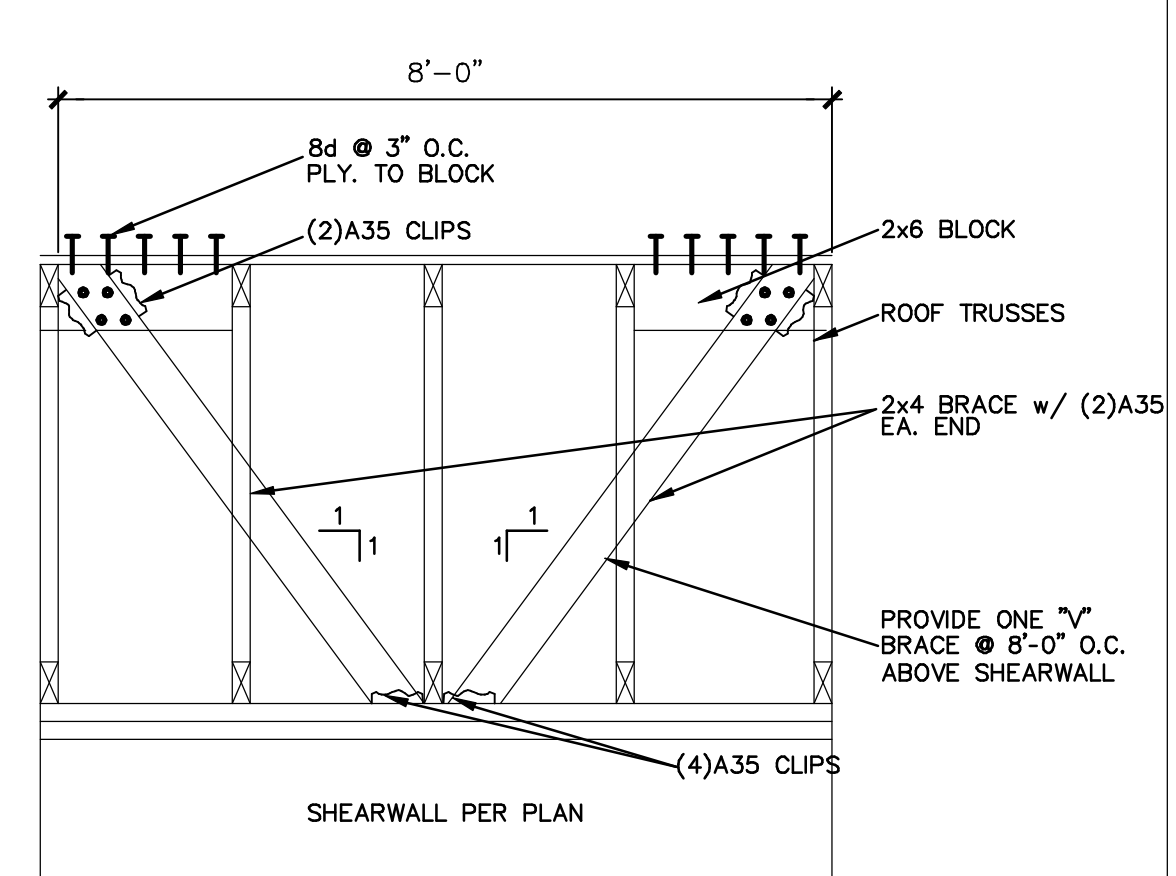
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 FILE NUMBER  
 DRAWN BY  
 Date  
 4.21.2021

Sheet  
**S2**

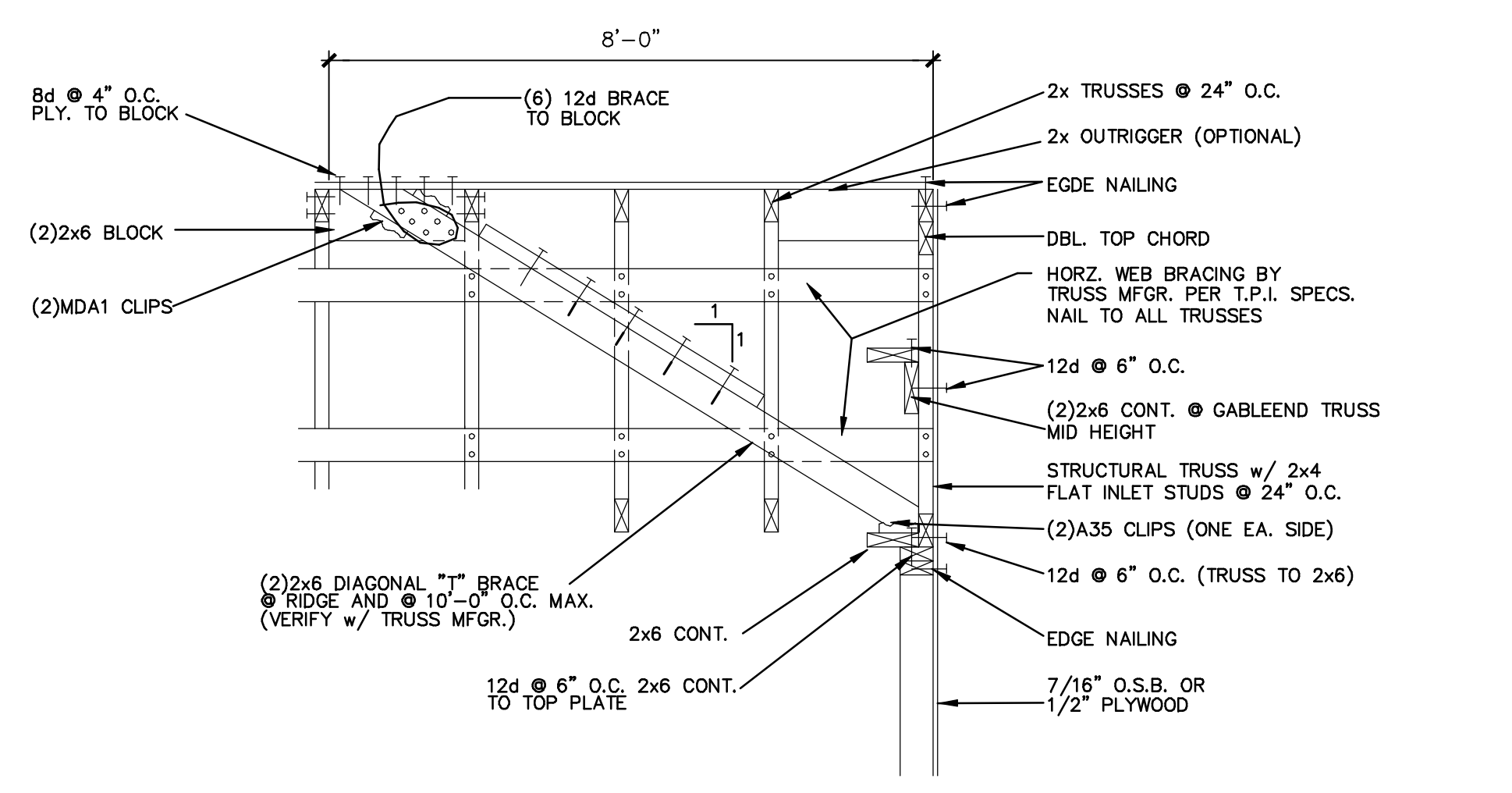
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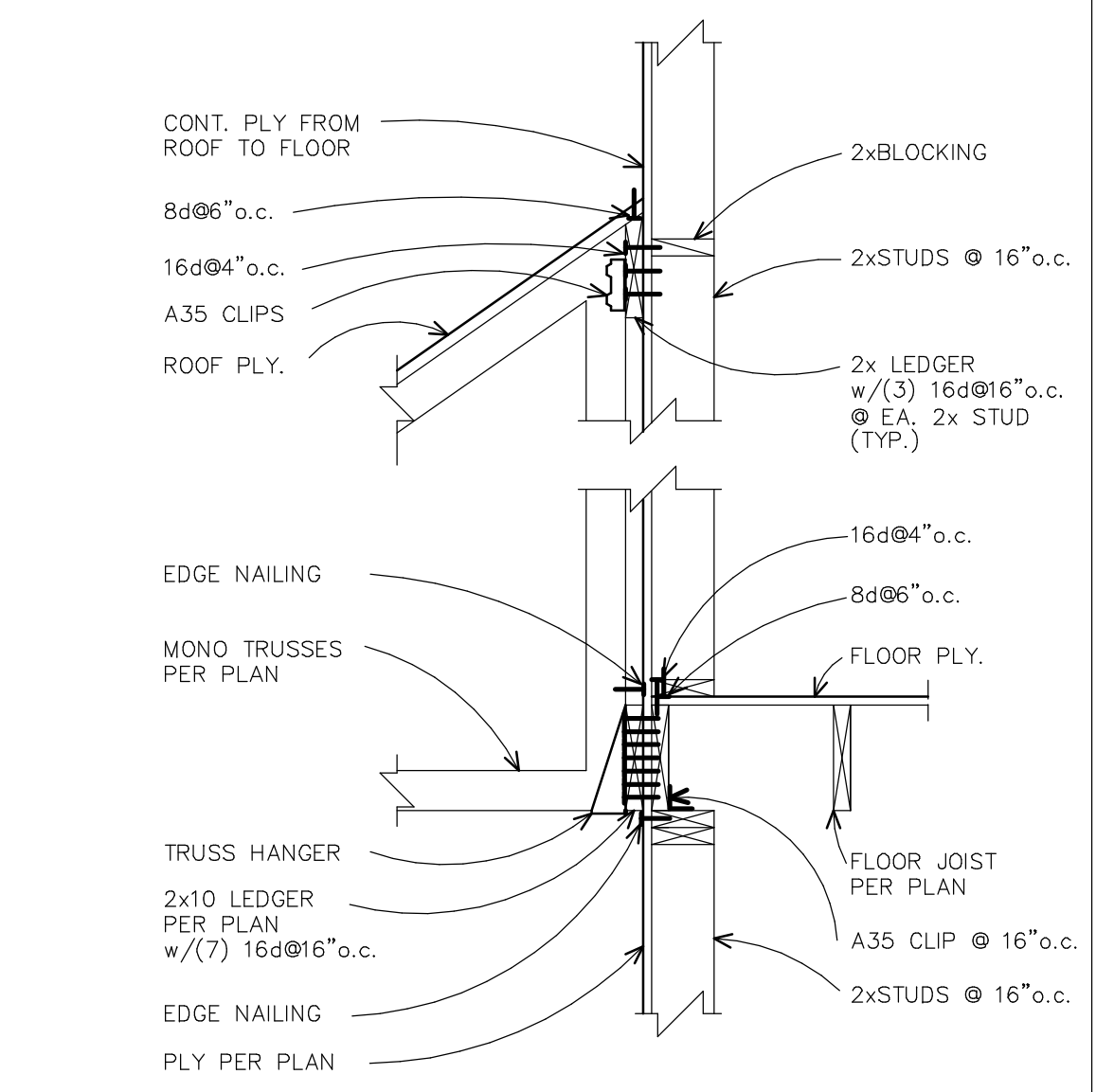
**R** TYP. HOLDOWN TO EXISTING FOOTING  
 3/4"=1'-0"  
 ONLY TO BE USED IN REPLACEMENT OF MISPLACED HOLD-DOWN  
 SPECIAL INSPECTION MAY BE REQUIRED



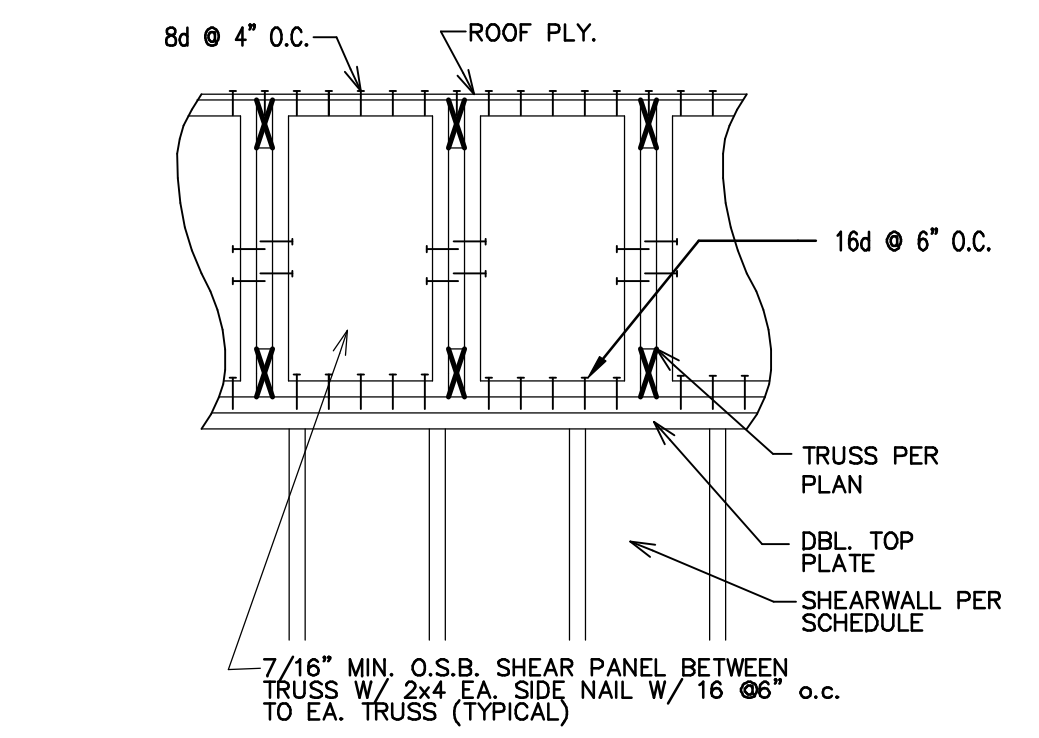
**S** SHEARWALL PERPENDICULAR  
 3/4"=1'-0" TO ROOF TRUSSES



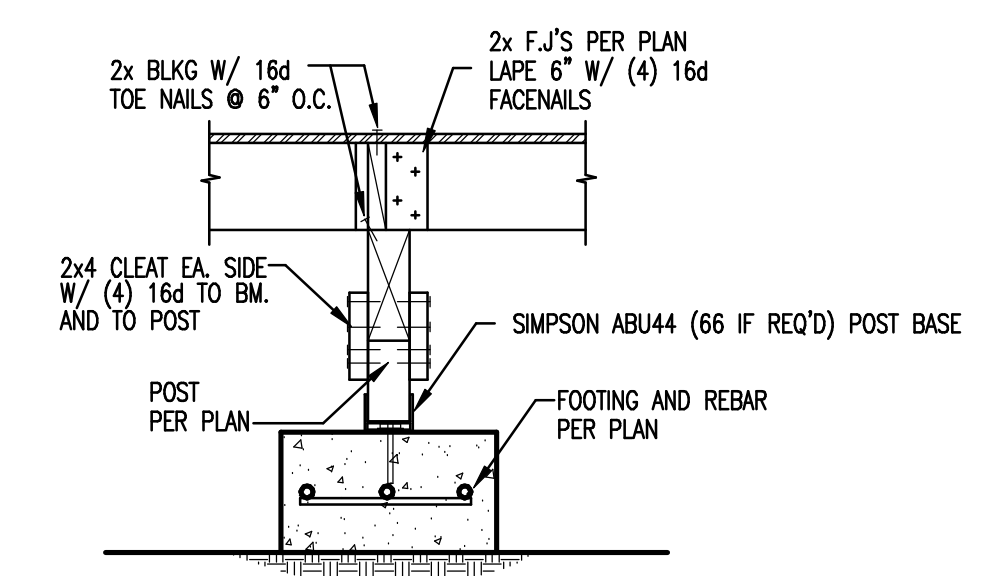
**T** TYP. GABLE TRUSS DETAIL  
 3/4"=1'-0"



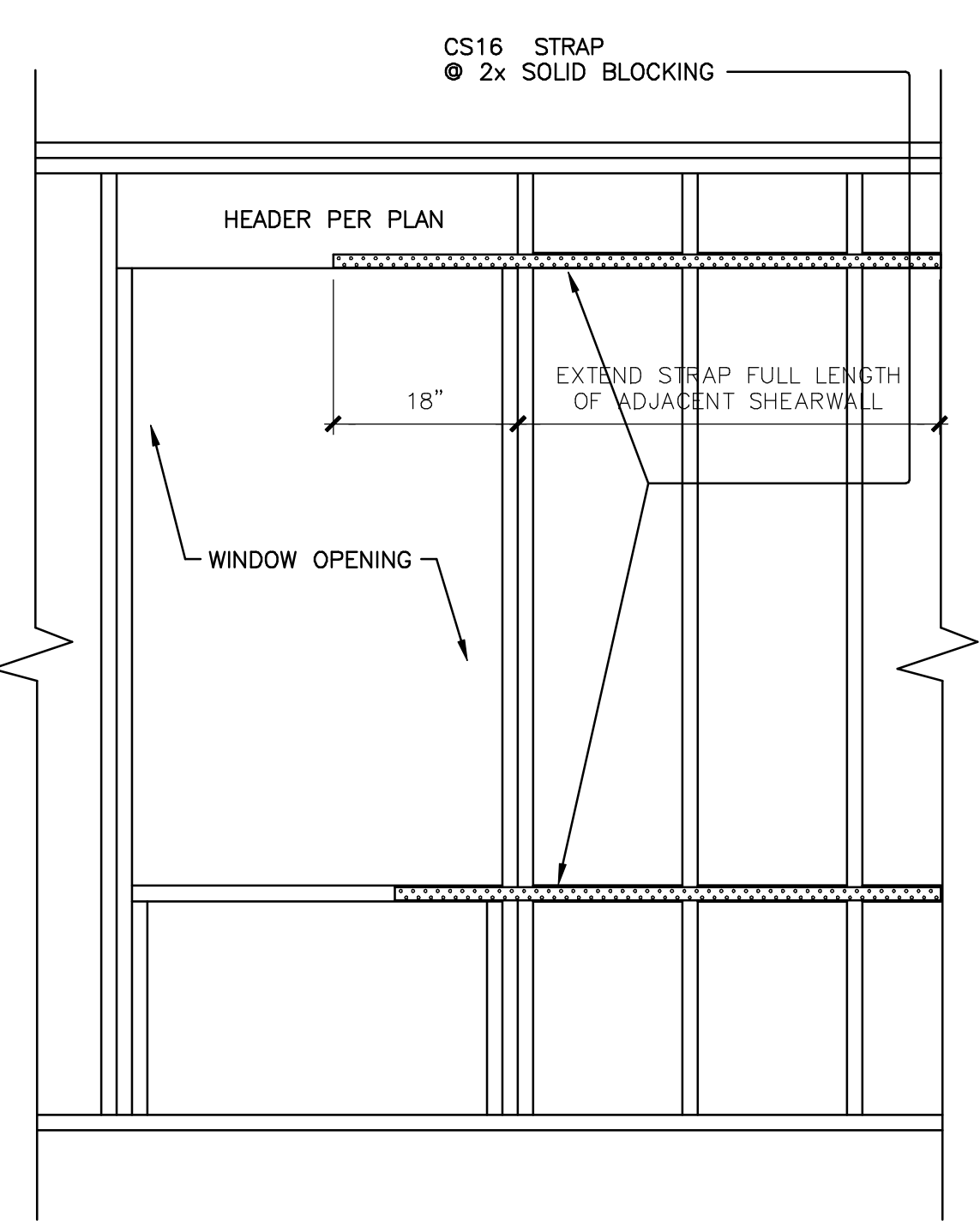
**U** TRUSS TO WALL CONNECTION



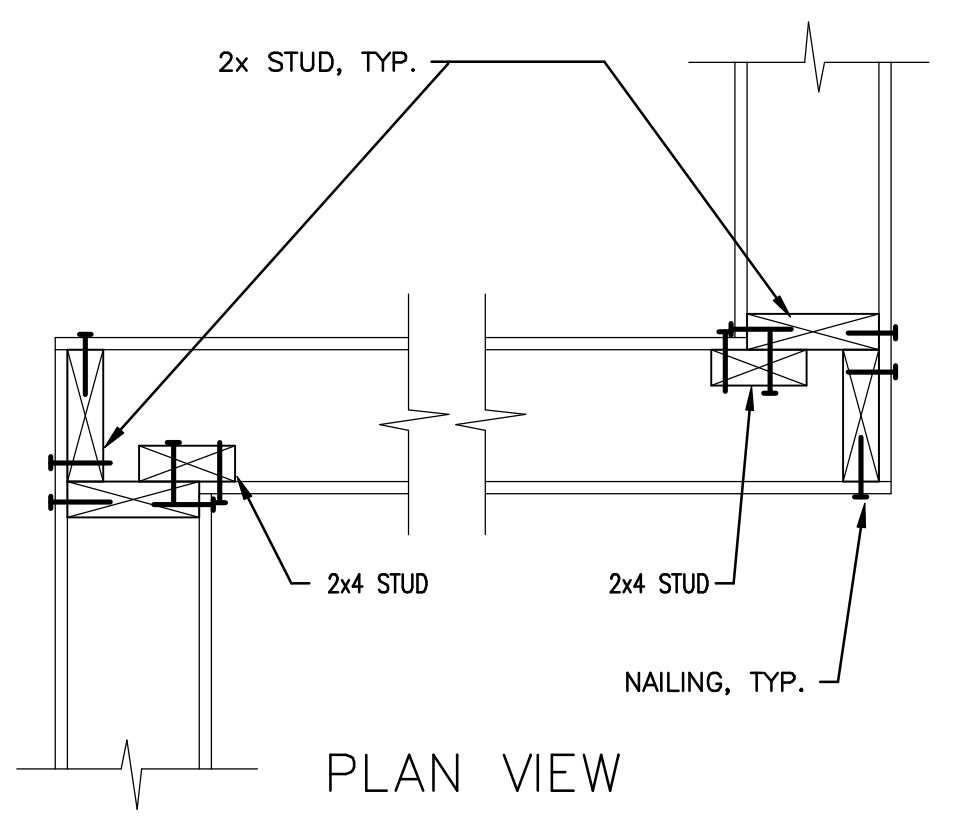
**WW** SHEAR PANEL @ SHEARWALLS  
 NOTE: TRUSS BLOCKING MAY BE SUBSTITUTED FOR SHEAR PANELS W/ (2)1TP4 @ 12" O.C.



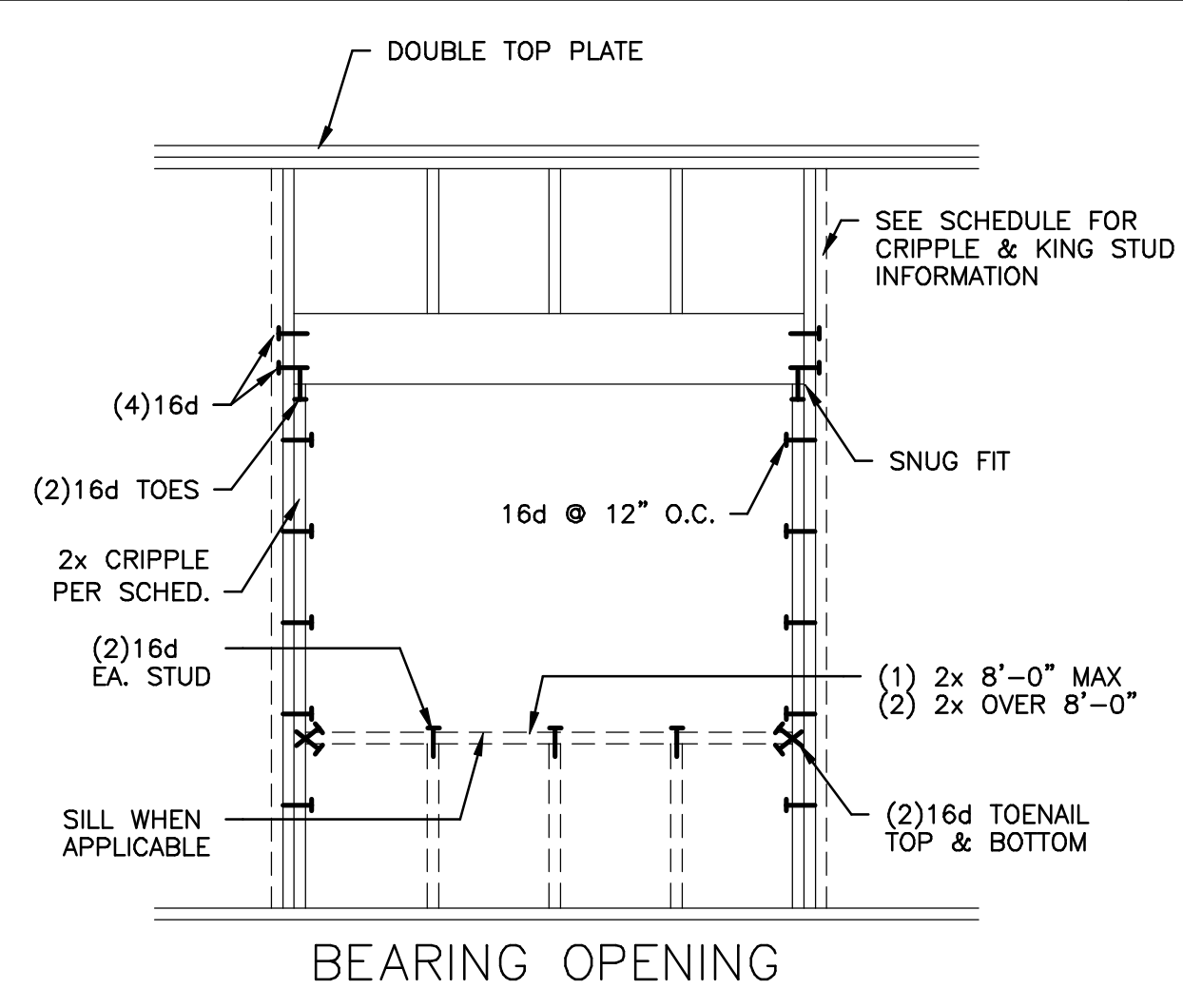
**CC** POST / PAD CONNECTION  
 3/4"=1'-0"



**Z1** WINDOW STRAP DETAIL  
 3/4"=1'-0"



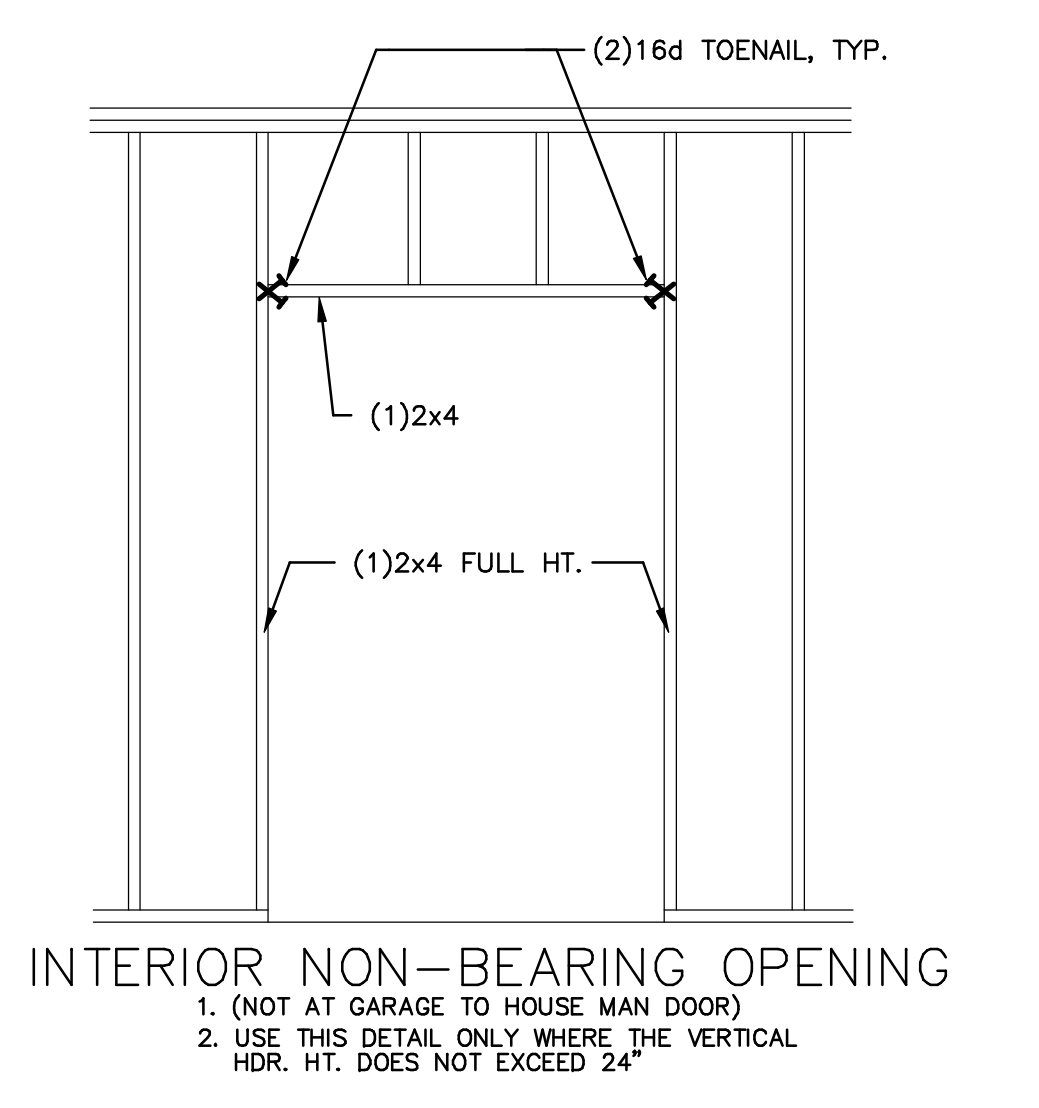
**XX** CORNER DETAIL



**WALL OPENING FRAMING SCHEDULE (UNO ON PLAN)**

WIDTH OF OPENING	CRIPPLES	KINGS	COMMENTS	SILL
0 - 4'-0" MAX.	1	1	(4)16d EA. KING STUD TO HDR.	
4'-1" - 5'-6" MAX.	2	1	(4)16d EA. KING STUD TO HDR.	
5'-7" - 8'-0" MAX.	2	2	(4)16d EA. KING STUD TO HDR. & (1)1TP4 HDR TO EA. KING STUD	
8'-1" & OVER	SEE PLANS	SEE PLANS	SEE PLANS	

**ZZ** WALL OPENING DETAIL



**NOTES:**  
 1. ALL HEADERS PER PLAN  
 2. PROVIDE (2)2x6 HDR. @ BEARING OPENINGS & BELOW STRUCTURAL GIRDER END TRUSSES  
 3. SEE PLANS FOR INFORMATION NOT NOTES

**ZZ** INTERIOR NON-BEARING OPENING



**GENERAL STRUCTURAL NOTES**

( The following applies unless shown otherwise on the plans.)

- ALL MATERIALS AND WORKMANSHIP DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE DRAWING SPECIFICATIONS, THE INTERNATIONAL BUILDING CODE, (2015 EDITION).
  - DESIGN CRITERIA
 

ROOF LIVE LOAD.....	25 PSF
FLOOR LIVE LOAD (RESIDENTIAL)	40 PSF
FLOOR LIVE LOAD (DECK)	60 PSF
STAIR & CORRIDOR LIVE LOAD	100 PSF
MECHANICAL UNITS	WEIGHTS FURNISHED BY MFR.
WIND	110 MPH, EXPOSURE "B" <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Kzt = 1.3</span>
EARTHQUAKE	S <sub>c</sub> =1.55 ; S =.55 (CLASS "D")
ALLOWABLE SOIL PRESSURE SEE PLANS FOR ADD. LOADING CRITERIA.	2000 PSF (NATURAL SOILS OR COMPACTED) PER SOILS REPORT
  - STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS FOR BIDDING CONSTRUCTION. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS FOR COMPATIBILITY AND SHALL NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER, OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION SO HE MAY MAKE PROPER REVISIONS TO THE WORK.
  - CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS, MEMBER SIZES, AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS ARE INTENDED AS GUIDELINES ONLY AND MUST BE VERIFIED.
  - CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND SHORING FOR THE STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES REQUIRED TO PERFORM HIS WORK.
  - CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT.
  - DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER.
  - ALL STRUCTURAL SYSTEMS WHICH ARE TO BE COMPOSED OF COMPONENTS TO BE FIELD ERRECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.
  - SHOP DRAWINGS FOR STRUCTURAL STEEL, GLUED LAMINATED MEMBERS, OPEN WEB WOOD TRUSSES, AND PLYWOOD WEB JOISTS SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW TWO WEEKS PRIOR TO FABRICATION OF THESE ITEMS.
  - SHOP DRAWINGS REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD, AND THEREFORE MUST BE VERIFIED BY THE CONTRACTOR. CONTRACTOR SHALL REVIEW AND STAMP DRAWINGS PRIOR TO REVIEW BY ENGINEER OF RECORD. SUBMISSIONS SHALL INCLUDE A REPRODUCIBLE AND ONE COPY; REPRODUCIBLE WILL BE MARKED AND RETURNED.
- SHOP DRAWINGS SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT, THAT HE DEMONSTRATES HIS UNDERSTANDING BY INDICATING WHICH MATERIAL HE INTENDS TO FURNISH AND INSTALL AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS HE INTENDS TO USE. IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED.
- SHOP DRAWINGS OF DESIGN BUILD COMPONENTS INCLUDING STAIRS, AND EXTERIOR CLADDING SHALL INCLUDE THE DESIGNING PROFESSIONAL ENGINEER'S STAMP, STATE OF WASHINGTON, AND SHALL BE APPROVED BY THE COMPONENT DESIGNER PRIOR TO CURSORY REVIEW BY THE ENGINEER OF RECORD FOR LOADS IMPOSED ON THE BASIC STRUCTURE. THE COMPONENT DESIGNER IS RESPONSIBLE FOR CODE CONFORMANCE AN ALL NECESSARY CONNECTIONS NOT SPECIFICALLY CALLED OUT ON ARCHITECTURAL OR STRUCTURAL DRAWINGS. SHOP DRAWINGS SHALL INDICATE MAGNITUDE AND DIRECTION OF ALL LOADS IMPOSED ON BASIC STRUCTURE. DESIGN CALCULATIONS SHALL BE MADE AVAILABLE UPON REQUEST.

**GEOTECHNICAL**

- FOUNDATION NOTES: SUBGRADE PREPARATION INCLUDING DRAINAGE, EXCAVATION, COMPACTION, AND FILLING REQUIREMENTS, SHALL CONFORM STRICTLY WITH RECOMMENDATIONS GIVEN IN THE SOILS REPORT OR AS DIRECTED BY THE SOILS ENGINEER. FOOTINGS SHALL BEAR ON SOLID UNDISTURBED EARTH (CONTROLLED, COMPACTED STRUCTURAL FILL OR BOTH) AT LEAST 18" BELOW LOWEST ADJACENT FINISHED GRADE. FOOTING DEPTHS/ELEVATIONS SHOWN ON PLANS (OR IN DETAILS) ARE MINIMUM AND FOR GUIDANCE ONLY; THE ACTUAL ELEVATIONS OF FOOTINGS MUST BE ESTABLISHED BY THE CONTRACTOR IN THE FIELD
- FOLLOW RECOMMENDATIONS OF THE SOIL REPORT #ES7526 BY EARTH SOLUTIONS LLC DATED NOVEMBER 2, 2020

**CONCRETE**

- CONCRETE SHALL ATTAIN A 28 DAY STRENGTH OF f<sub>c</sub>= 2500 PSI AND MIX SHALL CONTAIN NOT LESS THAN 5 SACKS OF CEMENT PER CUBIC YARD AND NO MORE THAN 6 GALLONS OF WATER PER SACK OF CEMENT.
- ALL CONCRETE EXPOSED TO WEATHER SHALL BE AIR-ENTRAINED WITH AN AIR -ENTRAINING AGENT CONFORMING TO I.B.C. THE AMOUNT SHALL BE 4% + 1% BY VOLUME. f<sub>c</sub> 3000
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, (INCLUDING SUPPLEMENT S1) GRADE 40, f<sub>y</sub>= 40,000 PSI. EXCEPTION: COLUMN TIES, BEAM STIRRUPS, BARS TO BE FIELD BENT, BARS TO BE WELDED AND ANY OTHER BARS SPECIFICALLY SO NOTED ON THE DRAWINGS SHALL BE GRADE 40 f<sub>y</sub>= 40,000 PSI REINFORCING COMPLYING WITH ASTM A706 (S1) MAY BE WELDED ONLY IF MATERIAL PROPERTY REPORTS INDICATING CONFORMANCE WITH WELDING PROCEDURES SPECIFIED IN A.W.S. D1.4 ARE SUBMITTED. NO REINFORCING SHALL BE WETSET UNLESS SPECIFICALLY SO DETAILED.
- WELDED WIRE MESH SHALL CONFORM TO ASTM A-185.
- REINFORCING STEEL SHALL BE DETAILED (INCLUDING HOOKS AND BENDS ) IN ACCORDANCE WITH ACI 315-04 AND 318-05. LAP ALL CONTINUOUS REINFORCEMENT 58 BAR DIAMETERS (2'-6" MIN.). PROVIDE CORNER BARS AT ALL WALL INTERSECTIONS. LAP CORNER BARS 30 BAR DIAMETERS (2'-6" MIN.). LAP ADJACENT MATS OF WELDED WIRE FABRIC TWO SQUARES (MIN. OF 12") AT SIDES AND ENDS.
- NO BARS PARTIALLY EMBEDDED IN HARDENED CONCRETE SHALL BE FIELD BENT UNLESS SPECIFICALLY SO DETAILED OR APPROVED BY THE STRUCTURAL ENGINEER.

- CONCRETE PROTECTION (COVER) FOR REINFORCING STEEL SHALL BE AS FOLLOWS:
 

FOOTINGS AND OTHER UNFORMED SURFACES, EARTH FACE.....	3"
FORMED SURFACES EXPOSED TO EARTH (i.e. WALLS BELOW GROUND) OR WEATHER (#6 BARS OR LARGER).....	2"
(#5 BARS OR SMALLER).....	1 1/2"
COLUMN TIES OR SPIRAL AND BEAM STIRRUPS.....	1 1/2"
SLABS AND WALLS (INTERIOR FACE).....	3/4"

CAST-IN-PLACE CONCRETE: SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND DIMENSIONS OF DOOR AND WINDOW OPENINGS IN ALL CONCRETE WALLS. SEE MECHANICAL DRAWINGS FOR SIZE AND LOCATION OF MISCELLANEOUS MECHANICAL OPENINGS THROUGH CONCRETE WALLS. SEE ARCHITECTURAL DRAWINGS FOR ALL GROOVES, NOTCHES, CHAMFERS, FEATURE STRIPS, COLOR, TEXTURE, AND OTHER FINISH DETAILS AT ALL EXPOSED CONCRETE SURFACES, BOTH CAST-IN-PLACE AND PRECAST.
  - NON-SHRINK GROUT SHALL BE FURNISHED BY AN APPROVED MANUFACTURER AND SHALL BE MIXED AND PLACED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS.
- STEEL
- STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE A.I.S.C. "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL BUILDINGS", LATEST EDITION, PLUS ALL REFERENCES CODES.
  - STRUCTURAL STEEL INCLUDING PLATES, AND ROLLED SHAPES, SHALL CONFORM TO ASTM A36, F<sub>y</sub>= 36 KSI STEEL PIPE SHALL CONFORM TO ASTM A-53, TYPE E, OR S, GRADE B, F<sub>y</sub>= 35 KSI STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, F<sub>y</sub>= 46 KSI BOLTS SHALL CONFORM TO ASTM A307 EXPANSION SHALL BE "PARABOLT" OR APPROVED EQUAL INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATION. EXPANSION BOLTS SHALL ALSO BE SIMPSON STRONG BOLT (ICC-ESR1) INSTALLED PER ICC-ESR REQUIREMENTS
  - ALL WELDING SHALL BE IN CONFORMANCE WITH A.I.S.C. AND A.W.S. STANDARDS AND SHALL BE PERFORMED BY W.A.B.O. CERTIFIED WELDERS USING E70XX ELECTRODES. ONLY PREQUALIFIED WELDS (AS DEFINED BY A.W.S.) SHALL BE USED. WELDING OF GRADE 40 REINFORCING BARS (IF REQUIRED) SHALL BE PERFORMED USING E70XX ELECTRODES & PER ASTM A706. WELDING WITHIN 4" OF COLD BENDS IN REINFORCING STEEL IS NOT PERMITTED. SEE REINFORCING NOTE FOR MATERIAL REQUIREMENTS OF WELDED BARS.
- WOOD
- |  |   |
|--|---|
| JOISTS (2x MEMBERS)                    | HEM FIRS NO.2                                   |
| BEAMS AND STRINGERS                    | DOUGLAS FIR NO.2                                |
| POSTS AND TIMBERS                      | DOUGLAS FIR NO.1                                |
| STUDS, PLATES AND MISC. LIGHT FRAMING  | DOUGLAS FIR NO.1 OR HEM FIR STAND. GRADE.       |
| TOP AND BOTTOM PLATES AT BEARING WALLS | DOUGLAS FIR NO.1 OR HEM FIR CONSTRUCTION GRADE. |
| BOLTED STUDS, LEDGERS AND PLATES       | DOUGLAS FIR STANDARD GRADE.                     |
| 2x6 STUDS AND PLATES                   | DOUGLAS FIR OR HEM FIR NO.3 (STUD GRADE).       |
- FRAMING LUMBER SHALL BE KILN DRIED OR MC-15, AND GRADED AND MARKED IN CONFORMANCE WITH W.C.L.B. STANDARD GRADING RULES FOR WEST COAST LUMBER NO. 16, LATEST EDITION. FURNISH TO THE FOLLOWING MINIMUM STANDARDS:
 

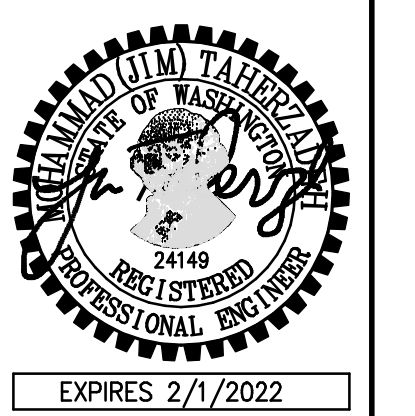
GLUE-LAMINATED MEMBERS SHALL BEAR AN AITC IDENTIFICATION MARK AND SHALL BE ACCOMPANIED BY AN AITC CERTIFICATION OF CONFORMANCE. ALL SIMPLE SPAN BEAMS SHALL BE DOUGLAS FIR COMBINATION 24F-V4, F <sub>b</sub> = 2400 PSI, F <sub>v</sub> = 240 PSI. ALL CONTINUOUS & CANTILEVER BEAMS SHALL BE DOUGLAS FIR COMBINATION 24F-V8, F <sub>b</sub> = 2400 PSI, F <sub>v</sub> = 240 PSI.
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  - LAMINATED VENEER LUMBER SHALL BE FABRICATED IN CONFORMANCE WITH REPORT NO. NER-126. EACH MEMBER SHALL BEAR AN IDENTIFICATION MARK. ALL BEAMS SHALL BE WESTERN SPECIES, GRADE 1.8E, F<sub>b</sub>= 2600 PSI, F<sub>v</sub>= 285 PSI.
  - PARALLEL STRAND LUMBER SHALL BE FABRICATED IN CONFORMANCE WITH REPORT NO. NER-292. EACH MEMBER SHALL BEAR AN IDENTIFICATION MARK. ALL BEAMS SHALL BE DOUGLAS FIR, GRADE 2.0E, F<sub>b</sub>= 2900 PSI, F<sub>v</sub>= 290 PSI
  - PLYWOOD WEB WOOD JOISTS (TJI'S) SHALL BE DESIGNED BY THE MANUFACTURER FOR THE SPANS AND CONDITIONS SHOWN ON THE PLANS AND SHALL BE FURNISHED AND INSTALLED IN CONFORMANCE WITH THE MANUFACTURER'S PUBLISHED SPECIFICATIONS. ALL NECESSARY BRACING, BRIDGING, BLOCKING, PRE-NOTCHED PLATES ETC., SHALL BE THE DETAILED AND FURNISHED BY THE MANUFACTURER.
- SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS (COMPLETE WITH STRESS DIAGRAMS) TO THE ARCHITECT AND THE STRUCTURAL ENGINEER FOR REVIEW TWO WEEKS PRIOR TO FABRICATION.
- DESIGN SUBMITTALS SHALL BEAR THE STAMP OF A REGISTERED PROFESSIONAL ENGINEER, STATE OF WASHINGTON.
- PERMANENT AND TEMPORARY BRIDGING AND BRACING SHALL BE INSTALLED IN CONFORMANCE WITH MANUFACTURER'S SPECIFICATIONS.
- PLYWOOD SHEATHING SHALL BE GRADE C-D EXTERIOR GLUE OR STRUCTURAL II, EXTERIOR GLUE ORIENTED STRAND BOARD OF EQUIVALENT THICKNESS, EXPOSURE 1 RATING AND PANEL INDEX MAY BE USED IN LIEU OF PLYWOOD. SEE PLANS FOR THICKNESS, PANEL IDENTIFICATION INDEX AND NAILING REQUIREMENTS. STRUCTURAL WOOD SHEATHING PANELS SHALL HAVE APA GRADE TRADEMARK OF THE AMERICAN PLYWOOD ASSOCIATION
  - ALL WOOD PLATES AND BLOCKING IN DIRECT CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-TREATED WITH AN A.W.P.A. APPROVED PRESERVATIVE. PROVIDE 2 LAYERS OF ASPHALT IMPREGNATED BUILDING PAPER BETWEEN UNTREATED LEDGERS, BLOCKING, ETC., AND CONCRETE OR MASONRY.

- TIMBER CONNECTORS CALLED OUT BY LETTERS AND NUMBERS SHALL BE BY SIMPSON COMPANY, AS SPECIFIED IN THEIR CATALOG. EQUIVALENT DEVICES BY OTHER MANUFACTURERS MAY BE SUBSTITUTED, PROVIDED THEY HAVE ICC APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. PROVIDE NUMBER AND SIZE OF FASTENERS AS SPECIFIED BY MANUFACTURER. CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE CONNECTORS STRAPS CONNECT TWO MEMBERS, PLACE ON HALF OF THE NAILS OR BOLTS IN EACH MEMBER. ALL BOLTS IN WOOD MEMBERS SHALL CONFORM TO ASTM A307. PROVIDE WASHERS UNDER THE HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS BEARING ON WOOD UNLESS NOTED OTHERWISE. ALL NAILS SHALL BE COMMON. ALL SHIMS SHALL BE SEASONED AND DRIED AND THE SAME GRADE (MINIMUM) AS MEMBERS CONNECTED. ALL JOISTS SHALL BE CONNECTED TO FLUSH BEAMS WITH "U" SERIES HANGERS. ALL DOUBLE JOIST BEAMS SHALL BE CONNECTED TO FLUSH BEAMS WITH "U" SERIES HANGERS. ALL TRIPLE JOIST BEAMS SHALL BE CONNECTED TO FLUSH BEAMS WITH "U" SERIES HANGERS. TJI JOIST HANGERS PER MANUFACTURER / TJI SHOP DRAWINGS (U.N.O.)
  - PROTECTION OF CONNECTORS IN CONTACT WITH PRESSURE TREATED WOOD ALL BOLTS, NAILS, JOIST HANGERS AND ANY OTHER CONNECTORS SHALL BE HOT DIPPED GALVANIZED FASTENERS RECOMMENDED TO CONFORM WITH ASTM STANDARD A-153 AND HOT DIPPED GALVANIZED CONNECTORS SHOULD CONFORM TO ASTM A165, CLASS G-1B3. STAINLESS STEEL FASTENERS AND CONNECTORS SHOULD BE TYPE 304 OF 316 SIMPSON PRODUCT FINISHES CORRESPONDING TO THESE REQUIREMENTS ARE ZMAX 9158 (HOT DIPPED GALVANIZED) AND SST3000 (STAINLESS STEEL)
  - ALL WOOD FRAMING DETAILS - THE FOLLOWING APPLY UNLESS OTHERWISE SHOWN ON THE PLANS.
    - MINIMUM NAILING REQUIREMENTS: UNLESS OTHERWISE NOTED, MINIMUM NAILING SHALL BE IN ACCORDANCE WITH TABLE 2304.10.1 OF THE INTERNATIONAL BUILDING CODE.
    - NOTE REMOVED
    - PROVIDE DOUBLE JOIST UNDER ALL PARALLEL PARTITIONS THAT EXTEND MORE THAN HALF THE JOIST LENGTH AND DOUBLE JOIST HEADERS AND DOUBLE JOISTS EACH SIDE OF ALL OPENINGS IN FLOORS AND ROOFS UNLESS DETAILED OTHERWISE. COORDINATE SIZE AND LOCATION OF ALL OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
    - PROVIDE TWO 2x10 HEADERS OVER AND DOUBLE STUDS EACH SIDE OF ALL OPENINGS IN STUD BEARING WALLS NOT DETAILED OTHERWISE.
    - PROVIDE SOLID BLOCKING FOR WOOD COLUMNS AND MULTIPLE STUD POSTS THROUGH FLOORS TO SUPPORTS BELOW.
    - PROVIDE CONTINUOUS SOLID BLOCKING AT MID OF ALL STUDS OVER 10' IN HEIGHT.
    - TOENAIL JOISTS TO SUPPORTS WITH 2-16d NAILS. ATTACH ALL BEAMS AT THE ROOF EXCEEDING 8'-0" IN LENGTH TO SUPPORTS WITH ST22 STRAP EACH END.
    - ATTACH TIMBER JOISTS TO FLUSH HEADERS AND BEAMS WITH "U" SERIES METAL JOIST HANGERS TO SUIT THE JOIST SIZE.
    - WALL FRAMING ALL STUD WALL SHOWN AND NOT OTHERWISE NOTED SHALL BE 2x4 STUDS @ 16" o.c. AT INTERIOR WALLS AND 2x6 STUDS @ 16" o.c. AT EXTERIOR WALLS
    - NOTATIONS ON DRAWINGS RELATING TO FRAMING CLIPS, JOIST HANGERS, AND OTHER CONNECTING DEVICES REFER TO CATALOG NUMBERS OF CONNECTORS MANUFACTURED BY SIMPSON CONNECTORS, A GIBRALTAR COMPANY, LIVERMORE, CALIFORNIA. EQUIVALENT DEVICES BY OTHER MANUFACTURERS MAY BE SUBSTITUTED, PROVIDED THEY HAVE ICGO APPROVAL FOR EQUAL LOAD CAPACITIES.
    - INDIVIDUAL MEMBERS OF BUILT-UP POSTS AND BEAMS SHALL EACH BE ATTACHED WITH 16d NAILS @ 6" o.c. STAGGERED.
    - ALL WOOD STUDS WALLS SHALL HAVE LOWER WOOD PLATE ATTACHED TO WOOD FRAMING BELOW WITH 16d NAILS @ 6" o.c. STAGGERED UNLESS SHOWN OTHERWISE.
    - ALL WOOD FRAMING DETAILS NOT SHOWN OTHERWISE SHALL BE CONSTRUCTED TO MINIMUM STANDARDS OF THE INTERNATIONAL BUILDING CODE AND AS NOTED IN THE NOTE 30-A ABOVE.
    - PLYWOOD ROOF SHEATHING AND FLOOR SHEATHING UNLESS OTHERWISE NOTED ON PLANS SHALL BE LAID UP WITH FACE GRAIN PERPENDICULAR TO SUPPORTS AND NAILED WITH 8d nails @ 6" o.c. TO FRAMED PANEL EDGES AND OVER STUD WALLS SHOWN ON PLANS AND @ 12" o.c. (10" o.c. AT FLOORS TO INTERMEDIATE SUPPORTS. PROVIDE APPROVED EDGE CLIPS @ 24" o.c. AT UNBLOCKED ROOF SHEATHING EDGES. PROVIDE SOLD BLOCKING AT LINES OF SUPPORT AT FLOORS. TOENAIL BLOCKING TO SUPPORTS WITH 16d NAILS @ 12" o.c. UNLESS OTHERWISE NOTED IN THE SHEARWALL SCHEDULE.
    - PROVIDE 2- 2x10 HEADERS OVER AND DOUBLE STUDS EACH SIDE OF ALL OPENINGS IN STUD WALLS NOT DETAILED OTHERWISE. ATTACH WITH AC OR PC POST CAPS OR EQUAL.
    - PLYWOOD WALL SHEATHING SHALL HAVE SOLID BLOCKING AT ALL EDGES.
    - ALL WOOD STUD WALLS SHALL HAVE LOWER WOOD PLATE ATTACHED TO WOOD FRAMING BELOW WITH 16d NAILS AT 6" o.c. STAGGERED OR BOLTED TO CONCRETE WITH 5/8" DIAMETER ANCHOR BOLTS @ 4'-0" o.c. UNLESS SHOWN OTHERWISE.
    - PLYWOOD NAILING: (USE UNLESS GREATER NAILING IS DETAILED OR SPECIFIED)
 

8d @ 6" o.c.	AT SHEET EDGES
8d @ 12" o.c.	AT INTERMEDIATE BEARING POINTS
- PROVIDE ABU POST BASE @ ISOLATED POSTS TO CONCRETE CONNECTION
    - PROVIDE (2)A35 CLIPS @ TOP & BOTTOM OF ALL POST TO OTHER FRAMING MEMBERS
    - PROVIDE AC OR ACE POST CAP @ ISOLATED POSTS TO BEAM CONNECTIONS
    - PROVIDE MIN. (2)A35 CLIPS @ POST TO BEAM CONNECTION (U.N.O.)

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**MERLINO RESIDENCE**  
**STRUCTURAL NOTES**



Project  
 FILE NUMBER  
 DRAWN BY  
 Date  
 4.21.2021

Sheet  
**S3**



REVISED

1/4"=1'-0"

SCALE

11.10.2020

DATE

MERCER ISLAND

COMPUTER FILE NAME

**N1**

SHEET NUMBER

**BUILDING LEAKAGE / TESTING NOTE:**

402.4.1.2 Building Air Leakage Testing: Building envelope air leakage control shall be considered acceptable when tested to have an air leakage maximum of 3 air changes per hour when tested with a blower door at a press of 50 Pascals (0.2 inch w.g.). Testing shall occur at any time after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances and sealing thereof. When required by the building official, testing shall be done by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed.
2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;
3. Interior doors connecting conditioned spaces shall be open; access hatches to conditioned crawl spaces and conditioned attics shall be open; doors connecting to unconditioned spaces shall be closed but not sealed;
4. Exterior openings for continuous operation ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s) shall be turned off;
6. HVAC ducts supply and return registers shall not

Also reference WSEC Chapter 4 for general building design requirements using the prescriptive path

**ENERGY NOTES:**

- DUCT TESTING REQUIRED PER WSEC R403.3.3

- BUILDING AIR LEAKAGE TESTING REQUIRED PER WSEC R402.4.1.2 (SEE NOTE THIS PAGE)

- HVAC CONTROLS WITH PROGRAMMABLE SCHEDULE PER WSEC R403.1.1

- A MINIMUM OF 75% OF PERMANENTLY INSTALLED LIGHTING FIXTURES SHALL BE HIGH-EFFICACY PER R404.1

- INSULATION MARKERS SHALL BE PLACED EVERY 300 S.F. IN THE ATTIC AND FACE TOWARD THE ATTIC ACCESS

PER WSEC R401.3.

A CERTIFICATE IS TO BE POSTED IN SPACE THE SPACE WHERE THE FURNACE IS LOCATED, UTILITY ROOM OR ON AN APPROVED LOCATION INSIDE THE BUILDING. WHEN LOCATED ON THE ELEC. PANEL, THE CERTIFICATE SHALL NOT COVER OR OBSTRUCT THE VISIBILITY OF THE

1. R-VALUES OF ALL INSULATION INSTALLED (ATTIC, FLOOR, WALLS, DUCT WORK OUTSIDE OF CONDITIONED SPACE, ETC.)
2. U-FACTORS AND SOLAR HEAT GAIN COEFFICIENT (SHGC) OF FENESTRATION
3. TYPE OF HEATING
4. TYPE OF COOLING (IF ANY)
5. TYPE OF WATER HEATING EQUIPMENT.
6. DUCT LEAKAGE RATES - INCLUDING TEST CONDITIONS & AIR LEAKAGE RESULTS IF A BLOWER DOOR TEST WAS CONDUCTED.

A COPY OF THE WSEC 2015 CERTIFICATE CAN BE FOUND AT: <http://www.energy.wsu.edu/BuildingEfficiency/EnergyCode.aspx>

ALL HEADER MEMBERS ARE TO BE INSULATED WITH R-10 RIGID INSULATION UNLESS THE HEADER MEMBER IS 5-1/2" IN WIDTH

ALL STUD WALL INTERSECTIONS ARE TO BE FRAMED PER DETAIL XX/52 AND ARE TO BE FULLY INSULATED WITH NO VOIDS

MECHANICAL SYSTEMS

Electrical

60. Electrical Connections. Equipment electrical connection shall be regulated in accordance with the adopted state electrical code.

Exceptions:

1. Means of disconnect. Independent means of disconnect for the electrical supply to each piece of equipment shall be provided in sight of the equipment served when the supply voltage exceeds 50 volts.
2. Service Receptacle. A 120-volt service receptacle shall be located within 25 feet of, and on the same level as, the equipment.
3. Illumination. Permanent switch controlled lighting shall be installed for maintenance of equipment. The lighting shall provide sufficient illumination to safely approach the equipment and perform maintenance. Control of the lighting shall be provided at the access entrance.
61. Mechanical Equipment.. Equipment shall be approved by the building official for safe use or comply with applicable nationally recognized standards as evidenced by the listing and label of an approved agency. Listed appliances. The installer shall leave the manufacturer's installation and operating instructions attached to the appliance. Clearances of listed appliances from combustible materials shall be as specified in the listing or on the rating plate.

62. Water Heaters. Fuel burning water heaters shall not be installed in bathrooms or in a closet with access only through a bedroom or bathroom.

Exceptions:

1. Water heaters installed having direct vent systems.
2. Water heaters installed in a closet that has a weather-stripped solid door with an approved door closing device, and designed exclusively for the water heater and where all air for combustion and ventilation is supplied from the outdoors.
3. Water heaters of the automatic storage type installed as a replacement in a bathroom, when specifically approved, properly vented and supplied with adequate combustion air.

Heating system

64. Listing Required. All furnaces shall be listed and labeled by an approved agency and installed to listed specifications.

Location

65. Installation Per Listing. Equipment shall be located as required in Section M1307 & M1308, IRC, specific requirements elsewhere in the IRC and the conditions of the equipment's approval.

66. Prohibited Location. Fuel-burning equipment shall not be installed in a closet, bathroom or a room readily usable as a bedroom, or in a room, compartment or alcove opening directly into any of these, except direct vent equipment, electric heat furnaces and other conditions noted in

In areas subject to flooding, equipment which would be damaged or create hazardous conditions if subjected to inundation shall not be installed at or below grade unless suitably protected by elevation or other approved means.

67. Liquefied petroleum gas burning appliances shall not be installed in a pit, an underfloor space, below grade or similar location where vapors or fuel might unsafely collect unless an approved method for the safe collection, removal and containment or disposal of the vapors or fuel is provided.

68. Clearances. Furnaces within compartments or alcoves shall have a minimum working space clearance of 3 inches along the sides, back and top with a total width of the enclosing space being at least 12 inches wider than the furnace. Section M1305, IRC.

69. Access and Service Space. Equipment requiring routine inspection or maintenance shall be provided with sufficient access to allow inspection, maintenance and replacement without removing permanent construction or other equipment or disabling the function of required fire-resistant construction. Section M1305, IRC. Furnace installations in attics or crawl spaces shall comply with Section M1305.1.3, IRC

70. Support. Appliances designed to be in a fixed position shall be securely fastened in place. Supports for appliances shall be designed and constructed to sustain vertical and horizontal loads within the stress limitations in the building code. Section M1307.2, IRC.

71. Mechanical System in Garage.

A. Protection from damage. Equipment shall not be installed in a location where it is subject to mechanical damage unless protected by approved, substantial barriers. Section M1307.3.1.

B. Elevation of ignition source. Heating or cooling equipment located in a garage and which generates a glow, spark, or flame capable of igniting flammable vapors shall be installed with the pilots and burners or heating elements and switches at least 18 inches above the floor level. Section M1307.3

72. Fire dampers. Fire dampers need not be installed in air ducts passing through the wall, floor, or ceiling separating a residence (Group R, Division 3 Occupancy) from a garage (Group U, Division 1 Occupancy), provided such ducts within the garage are constructed of steel having a thickness not less than 0.019 inch (No. 26 galvanized sheet gauge) and have no openings into the garage.

Venting and Combustion Air

73. All fuel burning equipment shall be provided with combustion air. Appliances located within the building envelope shall obtain combustion air from outdoors. Heating equipment located within the Building Envelope shall be thermally isolated from the heated area. Chapter 17 IRC

74. Every appliance designed to be vented shall be connected to a venting system complying with Chapter 18, IRC.

75. Every factory-built chimney, Type L vent, Type B gas vent, or Type BW gas vent shall be installed in accordance with the terms of its listing, manufacturer's instructions, and the applicable provisions of Chapter 18, IRC.

76. Vent connectors shall be installed within the space or area in which the appliance is located and shall be connected to a chimney or vent in

and Table M1306.2 IRC. and Figure M1306.1 IRC

77. Type B or BW. Type B or BW gas vent shall terminate per M1804 IRC such a manner as to maintain the clearance to combustibles per Section M1803.3.4 Duct work

78. Duct systems shall be of metal as set forth in Table M1601.1.1(2) IRC factory made air ducts complying with Chapter 16, IRC.

Joints and seams shall be substantially airtight by means of tapes, mastics, gaskets or other means.

2015 WASHINGTON STATE ENERGY CODE,

E1. Access Hatches and Doors. Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer must be provided when loose fill insulation is installed. Section R402.2.4. WSEC INSULATION: All insulation materials, including facings such as vapor barriers or breather papers, installed within floor/ceiling assemblies, roof/ceiling assemblies, walls, crawl spaces, or attics shall have a flame-spread rating not to exceed 25 and a smoke density not to exceed 450

Exceptions:

1. Foam plastic insulation shall comply with Section R316, IRC.

2. When such materials are installed in concealed spaces, the flame spread and smoke-developed limitations do not apply to the facing, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor, or wall finish.

3. Cellulose insulation shall comply with Section R316 IRC

E2. Insulation Clearances. Where required, insulation shall be installed with clearances according to manufacturer's specifications. Insulation shall be installed so that required ventilation is unobstructed. For blown or poured loose fill, clearances shall be maintained through installation of a permanent retainer.

E3. Roofs/Ceilings. Open blown or poured loose fill insulation may be used where the slope of the ceiling is not more than 3:12 and there is more than 30 inches from the top of the ceiling framing to the underside of the roof sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation. Baffles shall be rigid material, resistant to wind driven moisture. Section R402.2.3 WSEC Refer to Section R806 IRC for additional information.

E4. Walls. Insulation installed in exterior walls shall comply with the provisions of this section. All wall insulation shall fill the entire framed cavity. Exterior wall cavities isolated during framing shall be fully insulated to the levels of surrounding walls. All faced insulation shall be face stapled to avoid compression. Table R402.4.1.1 WSEC

E5. Floors. Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is no more than 24 inches on center. Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation. Section R402.2.7 WSEC

E6. Slabs. Perimeter insulation installed on the inside of the foundation wall shall extend downward from the top of the slab for a minimum of 24 inches. Insulation installed on the outside of the slab shall extend downward from the top to the bottom of the footing. Thermal breaks shall be placed in the slab between conditioned and unconditioned spaces. The entire area of a radiant slab shall be thermally isolated from the soil, with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use. Section R402.2.9 WSEC Radiant Slabs. The entire area of a radiant slab shall be thermally isolated from the soil with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use.

E7. Below Grade Walls. Below grade exterior wall insulation (cold side of the wall) shall extend from the top of the below grade wall to the top of the footing and shall be approved for below-grade use. Above grade insulation shall be protected. Insulation used on the interior (warm side of the wall) shall extend from the top of the below-grade wall to the below-grade floor level. Section R402.2.8 WSEC Moisture Control. Section Table R402.4.1.1 WSEC - Vapor retarders shall be installed on the warm side (in winter) of the insulation

E8. Roof/Ceiling assemblies where the ventilation space above the insulation is less than an average of 12 inches shall be provided with a vapor retarder. Faced batt insulation where used as a vapor retarder shall be face stapled. Single rafter joist vaulted ceiling cavities shall be of sufficient depth to allow a minimum one inch vented air space above the insulation. Vapor retarders are not required where the ventilation space above the insulation averages 12 inches or greater or where the insulation is installed between the roof membrane and the structural roof deck.

E9. Walls separating conditioned space shall have a vapor retarder installed. Faced batt insulation shall be face stapled.

E10. Floors separating conditioned space from unconditioned space shall have a vapor retarder installed with a one perm dry cup (4 ml.) rating or less.

E11. Ground cover of six mil (0.006" thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped 12" minimum at the joints and shall extend to the foundation wall.

Exception: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with minimum thickness of 3-1/2 inches.

E12. Air Leakage Control. Seal all exterior openings

A. Exterior doors and windows shall be designed to limit air leakage into or from the building envelope, except for assemblies that are required to be of fire-resistive construction.

B. Exterior joints around windows and door frames, openings between walls and foundation, between roof and wall panels; openings at penetrations of utility services through wall, floors and roofs; and all other openings in the building envelope shall be sealed, caulked, gasketed, or weather stripped. All other openings shall be sealed, caulked, gasketed or weather-stripped to limit air leakage.

C. Site constructed doors and windows are not required to be tested, but shall be made tight fitting. Fixed lights shall be stopped with saient all around. Operating sash shall have weather-stripping working against overlapping trim, and a latch which will hold the sash closed.

D. Recessed Light Fixtures. When installed in the building envelope, recessed lighting fixtures shall meet one of the following requirements :

1. Type IC rated, manufactured with no penetrations between the inside of the recessed fixture and the ceiling cavity, and sealed or gasketed to prevent air leakage into the unconditioned space.
2. Type IC, installed inside a sealed box constructed from a min. 1/2 inch thick gypsum wall board, or constructed from a preformed polymeric vapor barrier, or other air tight assembly manufactured for this purpose.
3. Type IC rated, certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 75 Pascals or 1.57 lbs/ft2 pressure difference and have a label attached, showing compliance. Section R402.4.4 WSEC

E14. Duct Construction. All duct work shall be constructed in accordance with standards RS-15, RS-16, RS-17, RS-18, RS-19, or RS-20, as applicable, and the International Mechanical Code. Section R403.2 WSEC

E15. Zoning for Temperature Control. Readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each zone. Section R403.1.1WSEC

E16. Thermostat Control. Each system shall be provided with at least one adjustable thermostat for the regulation of temperature. Each shall be capable of being set by adjustment or selection of sensors as follows:

- a. Heating 55 - 75 degrees F.
- b. Cooling 75 - 85 degrees F.
- c. For heating and cooling 55-85 degrees and shall be capable of operating the system heating and cooling sequence.

E17. Pipe Insulation. All piping shall be thermally insulated in accordance with Section R403.4 WSEC

**DUCT NOTE:**  
**DUCTS ARE REQUIRED TO BE INSULATED TO A MINIMUM OF R-8, R403.3.1**

**MECHANICAL SYSTEM PIPING IS REQUIRED TO BE INSULATED TO A MINIMUM OF R-6 R403.4**

**HOT WATER PIPES ARE REQUIRED TO BE INSULATED TO A MINIMUM OF R-3, R403.5.3**

**MECHANICAL DUCTS ARE REQUIRED TO BE SEALED PER R403.3.2 AND TESTED IN ACCORDANCE WITH R403.3.3. TESTING TO COMPLY WITH WSU RS-33**



**Window, Skylight and Door Schedule**

**Project Information**  
 Merlino Residence  
 Mercer Island, Wa

**Contact Information**  
 Dan Brobst  
 Brobst Design Works  
 206.409.6690 dan@brobstdesignworks.com

Ref.	U-factor	Qt.	Width Feet	Height Feet	Area	UA
Exempt Swinging Door (24 sq. ft. max.)					0.0	0.00
Exempt Glazed Fenestration (15 sq. ft. max.)					0.0	0.00

**Vertical Fenestration (Windows and doors)**

Component Description	Ref.	U-factor	Qt.	Width Feet	Height Feet	Area	UA
Vinyl Window	1	0.28	1	10	6	60.0	16.80
Vinyl Window	2	0.28	1	6	6	36.0	10.08
Vinyl Sliding glass door	3	0.28	2	12	8	192.0	53.76
Vinyl Window	4	0.28	1	10	6	60.0	16.80
Vinyl Window	5	0.28	1	4	6	24.0	6.72
Vinyl Window	6	0.28	1	4	1	4.0	1.12
Vinyl Window	7	0.28	1	5	5	25.0	7.00
Vinyl Window	8	0.28	1	2	4	8.0	2.24
Vinyl Window	9	0.28	1	6	4	24.0	6.72
Vinyl Window	10	0.28	2	1	8	16.0	4.48
Vinyl Window	11	0.28	2	1	1	3.0	0.84
Vinyl Window	12	0.28	1	3	1	4.5	1.26
Vinyl Window	13	0.28	1	6	6	36.0	10.08
Vinyl Window	14	0.28	2	2	5	20.0	5.60
Vinyl Window	15	0.28	2	4	2	16.0	4.48
Vinyl Window	16	0.28	2	4	6	48.0	13.44
Vinyl Window	17	0.28	1	10	6	60.0	16.80
Vinyl Window	18	0.28	1	4	2	8.0	2.24
Vinyl Window	19	0.28	1	4	2	8.0	2.24
Vinyl Window	20	0.28	1	5	2	13.8	3.85
Vinyl Window	21	0.28	2	2	4	16.0	4.48
Vinyl Window	22	0.28	1	4	6	24.0	6.72
Vinyl Window	23	0.28	2	6	5	66.0	18.48
Entry door to house	A	0.28	1	3	8	24.0	6.72
Garage door to house	B	0.28	1	3	8	24.0	6.72
					0.0	0.00	

Sum of Vertical Fenestration Area and UA: 824.8 230.93  
 Vertical Fenestration Area Weighted U = UA/Area: 0.28

**Overhead Glazing (Skylights)**

Component Description	Ref.	U-factor	Qt.	Width Feet	Height Feet	Area	UA
Master Bath Skylight (aluminum)	s1	0.28	1	2	2	4.0	1.12
Master Bath Skylight (aluminum)	s2	0.28	1	2	4	8.0	2.24
						0.0	0.00
						0.0	0.00
						0.0	0.00
						0.0	0.00

Sum of Overhead Glazing Area and UA: 12.0 3.36  
 Overhead Glazing Area Weighted U = UA/Area: 0.28

**Total Sum of Fenestration Area and UA (for heating system sizing calculations)**: 836.8 234.29

**Simple Heating System Size: Washington State**  
 This heating system sizing calculator is based on the Prescriptive Requirements of the 2015 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This calculator will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Please fill out all of the green drop-downs and boxes that are applicable to your project. As you make selections in the drop-downs for each section, some values will be calculated for you. If you do not see the selection you need in the drop-down options, please call the WSU Energy Extension Program at (360) 956-2042 for assistance.

**Project Information**  
 Merlino Residence  
 Mercer Island, WA

**Contact Information**

**Heating System Type:**  All Other Systems  Heat Pump

To see detailed instructions for each section, place your cursor on the word "Instructions".

**Design Temperature**  
 Instructions: Mercer Island Design Temperature Difference (ΔT) 45  
 ΔT = Indoor (70 degrees) - Outdoor Design Temp

**Area of Building**  
 Conditioned Floor Area: 3,785 sq ft

**Average Ceiling Height**  
 Instructions: Average Ceiling Height (ft) 9.5 Conditioned Volume 35,768

**Glazing and Doors**  
 Instructions: U-Factor X Area = UA  
 U-Factor: 0.28 Area: 825 UA: 231.00

**Skylights**  
 Instructions: U-Factor X Area = UA  
 U-Factor: 0.50 Area: 12 UA: 6.00

**Insulation**  
 Attic: Instructions: R-49 U-Factor X Area = UA  
 U-Factor: 0.026 Area: 2,857 UA: 74.28

**Single Rafter or Joist Vaulted Ceilings**  
 Instructions: Select R-Value No selection UA: ---

**Above Grade Walls (see Figure 1)**  
 Instructions: R-21 Intermediate U-Factor X Area = UA  
 U-Factor: 0.056 Area: 5,289 UA: 296.18

**Floors**  
 Instructions: R-38 U-Factor X Area = UA  
 U-Factor: 0.025 Area: 2,857 UA: 71.43

**Below Grade Walls (see Figure 1)**  
 Instructions: Select R-value No selection UA: ---

**Slab Below Grade (see Figure 1)**  
 Instructions: Select conditioning No selection UA: ---

**Slab on Grade (see Figure 1)**  
 Instructions: Select R-Value No selection UA: ---

**Location of Ducts**  
 Instructions: Unconditioned Space Duct Leakage Coefficient 1.10

**Figure 1:**

**Summary:**  
 Sum of UA: 678.89  
 Envelope Heat Load: 30,550 Btu / Hour  
 Air Leakage Heat Load: 17,383 Btu / Hour  
 Building Design Heat Load: 47,933 Btu / Hour  
 Building and Duct Heat Load: 52,726 Btu / Hour  
 Maximum Heat Equipment Output: 73,817 Btu / Hour

**Prescriptive Energy Code Compliance for All Climate Zones in Washington**

**Project Information**  
 Merlino Residence  
 Mercer Island, WA

**Contact Information**  
 Dan Brobst  
 Brobst Design Works  
 dan@brobstdesignworks.com

This project will use the requirements of the Prescriptive Path below and incorporate the minimum values listed. In addition, based on the size of the structure, the appropriate number of additional credits are checked as chosen by the permit applicant.

Authorized Representative \_\_\_\_\_ Date \_\_\_\_\_

**All Climate Zones**

Fenestration U-Factor <sup>a</sup>	R-Value <sup>a</sup>	U-Factor <sup>a</sup>
Fenestration U-Factor <sup>a</sup>	n/a	0.30
Skylight U-Factor	n/a	0.50
Glazed Fenestration SHGC <sup>b,c</sup>	n/a	n/a
Ceiling <sup>d</sup>	49 <sup>d</sup>	0.026
Wood Frame Wall <sup>e,m,n</sup>	21 int	0.056
Mass Wall R-Value <sup>e</sup>	21/21 <sup>n</sup>	0.056
Floor	30 <sup>o</sup>	0.029
Below Grade Wall <sup>o,m</sup>	10/15/21 int + TB	0.042
Slab <sup>o</sup> R-Value & Depth	10, 2 ft	n/a

\*Table R402.1.1 and Table R402.1.3 Footnotes included on Page 2.

Each dwelling unit in a residential building shall comply with sufficient options from Table R406.2 so as to achieve the following minimum number of credits:

- Small Dwelling Unit: 1.5 credits  
 Dwelling units less than 1500 square feet in conditioned floor area with less than 300 square feet of fenestration area. Additions to existing building that are greater than 500 square feet of heated floor area but less than 1500 square feet.
- Medium Dwelling Unit: 3.5 credits  
 All dwelling units that are not included in #1 or #3. Exception: Dwelling units serving R-2 occupancies shall require 2.5 credits.
- Large Dwelling Unit: 4.5 credits  
 Dwelling units exceeding 5000 square feet of conditioned floor area.
- Additions less than 500 square feet: .5 credits

**Table R406.2 Summary**

Option	Description	Credit(s)	
1a	Efficient Building Envelope 1a	0.5	<input checked="" type="checkbox"/>
1b	Efficient Building Envelope 1b	1.0	<input type="checkbox"/>
1c	Efficient Building Envelope 1c	2.0	<input type="checkbox"/>
1d	Efficient Building Envelope 1d	0.5	<input type="checkbox"/>
2a	Air Leakage Control and Efficient Ventilation 2a	0.5	<input type="checkbox"/>
2b	Air Leakage Control and Efficient Ventilation 2b	1.0	<input type="checkbox"/>
2c	Air Leakage Control and Efficient Ventilation 2c	1.5	<input type="checkbox"/>
3a	High Efficiency HVAC 3a	1.0	<input checked="" type="checkbox"/>
3b	High Efficiency HVAC 3b	1.0	<input type="checkbox"/>
3c	High Efficiency HVAC 3c	1.5	<input type="checkbox"/>
3d	High Efficiency HVAC 3d	1.0	<input type="checkbox"/>
4	High Efficiency HVAC Distribution System	1.0	<input type="checkbox"/>
5a	Efficient Water Heating 5a	0.5	<input checked="" type="checkbox"/>
5b	Efficient Water Heating 5b	1.0	<input type="checkbox"/>
5c	Efficient Water Heating 5c	1.5	<input type="checkbox"/>
5d	Efficient Water Heating 5d	0.5	<input type="checkbox"/>
6	Renewable Electric Energy	0.5	<input type="checkbox"/>

**Total Credits**: 3.50  
 \*1200 kWh  
 \*Please refer to Table R406.2 for complete option descriptions

FRESH AIR IN HABITABLE ROOMS SHALL BE PROVIDED THROUGH WINDOWS, DOORS, SKYLIGHTS, LOUVERS OR OTHER APPROVED OPENINGS TO THE OUTDOOR AIR. SUCH OPENINGS SHALL BE PROVIDED WITH READY ACCESS OR SHALL OTHERWISE BE READILY CONTROLLABLE BY THE BUILDING OCCUPANTS. THE OPENABLE AREA TO THE OUTDOORS SHALL NOT BE LESS THAN 4% OF THE FLOOR AREA BEING VENTILATED. R303.1

M1507.3.4.4: EACH HABITABLE SPACE SHALL BE PROVIDED WITH VENTILATION OPENINGS WITH AN OPENABLE AREA NOT LESS THAN 4% OF THE FLOOR AREA NOR LESS THAN 5 SQ. FT. WHERE OUTDOOR AIR SUPPLIES HABITABLE SPACES ARE SEPARATED FROM EXHAUST POINTS BY DOORS, PROVISIONS SHALL BE MADE TO ENSURE AIR FLOW BY INSTALLATION OF DISTRIBUTION DUCTS, UNDERCUTTING DOORS, INSTALLATION OF GRILLES, TRANSOM OR SIMILAR MEANS. DOORS SHALL BE UNDERCUT TO A MINIMUM OF 1/2" ABOVE THE SURFACE FOR THE FINISHED FLOOR COVERING

EXCEPTION: VENTILATION OPENINGS MAY BE PROVIDED TO EACH HABITABLE SPACE BY INDIVIDUAL OUTDOOR AIR INLETS. INDIVIDUAL ROOM OUTDOOR AIR INLETS SHALL:  
 1. HAVE CONTROLLABLE AND SECURE OPENINGS  
 2. BE SLEEVED OR OTHERWISE DESIGNED SO AS NOT TO COMPROMISE THE THERMAL PROPERTIES OF THE WALL OR WINDOW IN WHICH THEY ARE PLACED  
 3. PROVIDE NOT LESS THAN 4 SQ. IN. OF NET FREE AREA OF OPENING FOR EACH HABITABLE SPACE. ANY INLET OR COMBINATION OF INLETS WHICH PROVIDE 10 CFM AT 10 PASCALS ARE DEEMED EQUIVALENT TO 4 SQ. IN OF NET FREE AREA.

VENTILATION OPENINGS SHALL BE SCREENED OR OTHERWISE PROTECTED FROM ENTRY BY LEAVES OR OTHER MATERIAL, AND SHALL BE LOCATED SO AS NOT TO TAKE AIR FROM THE FOLLOWING AREAS:  
 1. CLOSER THAN 10 FEET FROM AN APPLIANCE VENT OUTLET, UNLESS SUCH VENT OUTLET IS 3 FEET ABOVE THE OUTDOOR AIR INLET.  
 2. WHERE IT WILL PICK UP OBJECTIONABLE ODORS, FUMES OR FLAMMABLE VAPORS.  
 3. A HAZARDOUS OR UNSANITARY LOCATION  
 4. A ROOM OR SPACE HAVING ANY FUEL-BURNING APPLIANCES THEREIN.  
 5. CLOSER THAN 10 FEET FROM A VENT OPENING OF A PLUMBING DRAINAGE SYSTEM UNLESS THE VENT OPENING IS AT LEAST 3 FEET ABOVE THE AIR INLET.  
 6. ATTIC, CRAWL SPACES OR GARAGES

**2015 IRC WHOLE HOUSE VENTILATION INFORMATION**  
 WHOLE HOUSE VENTILATION SYSTEM (CHECK ONE)

OPTION 1 - IRC M1507.3.4 WHOLE HOUSE VENTING USING EXHAUST FANS  
 OPTION 2 - IRC M1507.3.5 WHOLE HOUSE VENTILATION USING INTEGRATED WITH CENTRAL HEATING  
 OPTION 3 - IRC M1507.3.6 WHOLE HOUSE VENTILATION DUCTED FROM SUPPLY FAN  
 OPTION 7 - IRC M1507.3.7 WHOLE HOUSE VENTILATION HEAT RECOVERY VENTILATION SYSTEM

WHOLE HOUSE VENTILATION RATE: 90 CFM FROM TABLE M1507.3.3(1) FOR OPTION 1  
 CONTINUOUS OPERATION

**KEY REQUIREMENTS OF EACH SYSTEM:**

**IRC M1507.3.4 WHOLE HOUSE VENTING USING EXHAUST FANS**  
 - WHOLE HOUSE FANS LOCATED 4 FEET OR LESS FROM THE INTERIOR GRILL SHALL HAVE A SONE RATING OF 1.0 OR LESS.  
 - ALL EXHAUST DUCTS SHALL TERMINATE OUTSIDE THE BUILDING.  
 - OUTDOOR AIR SHALL BE DISTRIBUTED TO EACH HABITABLE ROOM.

**ALL SYSTEMS IRC M1507.3.2:**  
 THE WHOLE HOUSE VENTILATION FAN SHALL BE CONTROLLED BY A 24-HOUR CLOCK TIMER WITH THE CAPABILITY OF CONTINUOUS OPERATION, MANUAL AND AUTOMATIC CONTROL. SET TO OPERATE 8 HOURS A DAY & LABELED.

NOTE: THE ABOVE NOTES ARE EXCERPTS FROM THE CODE. FOR COMPLETE DETAILS, YOU MUST REFER TO THE CODE SECTIONS FOR TOTAL COMPLIANCE.

**TABLE M1507.4**  
 MINIMUM REQUIRED EXHAUST RATES FOR ONE AND TWO FAMILY DWELLINGS

AREA TO BE VENTILATED	VENTILATION RATES
KITCHENS	100 CFM INTERMEDIATE OR 25 CFM CONTINUOUS
BATHROOMS - TOILET ROOMS	MECHANICAL EXHAUST CAPACITY OF 50 CFM INTERMITTENT OR 20 CFM CONTINUOUS

**TABLE M1507.3.3(1)**  
 MINIMUM VENTILATION RATES (CONTINUOUSLY OPERATING SYSTEMS)

(FT.)	BEDROOMS (1)				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

(1) VENTILATION RATES IN TABLE ARE MINIMUM OUTDOOR AIRFLOW RATES MEASURED IN CFM.

**Table R402.1.1 Footnotes**

For SI: 1 foot = 304.8 mm, ci = continuous insulation, int = intermediate framing.

<sup>a</sup> R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the compressed R-value of the insulation from Appendix Table A101.4 shall not be less than the R-value specified in the table.

<sup>b</sup> The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

<sup>c</sup> "10/15/21+TB" means R-10 continuous insulation on the exterior of the wall, or R-15 on the continuous insulation on the interior of the wall, or R-21 cavity insulation plus a thermal break between the slab and the basement wall at the interior of the basement wall. "10/15/21+TB" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the wall. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall. "TB" means thermal break between floor slab and basement wall.

<sup>d</sup> R-10 continuous insulation is required under heated slab on grade floors. See R402.2.9.1.

<sup>e</sup> There are no SHGC requirements in the Marine Zone.

<sup>f</sup> Reserved.

<sup>g</sup> Reserved.

<sup>h</sup> Reserved.

<sup>i</sup> The second R-value applies when more than half the insulation is on the interior of the mass wall.

<sup>j</sup> Reserved.

<sup>k</sup> For single rafter- or joist-vaulted ceilings, the insulation may be reduced to R-38.

<sup>l</sup> Reserved.

<sup>m</sup> Int. (intermediate framing) denotes standard framing 16 inches on center with headers insulated with a minimum R-value.

**Table R402.1.3 Footnote**  
<sup>n</sup> Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source or as specified.

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**MERLINO RESIDENCE ENERGY / VIAQ NOTES**  
 2015 CODE VERSION

**MERLINO RESIDENCE**  
 4225 89TH AVE SE MERCER ISLAND, WA 98040

REVISIONS

1/4" = 1'-0"  
 SCALE

11.10.2020  
 DATE

MERCER ISLAND  
 COMPUTER FILE NAME

**N1.1**  
 SHEET NUMBER





REVISED

1/4"=1'-0"

SCALE

11.10.2020

DATE

MERCER ISLAND

COMPUTER FILE NAME

**N2**

SHEET NUMBER

GROUP R-3 OCCUPANCY  
Wind and Snow load factors may vary based on geographical location.

GENERAL

DEFINITION: Habitable Space (room) is space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space and similar areas, are not considered habitable space. Section R202.

1. Ceiling Heights. R305.1  
Habitable rooms, hallways, corridors, bathrooms, toilet rooms, laundry rooms and basements shall have a ceiling height of not less than 7 feet. The required height shall be measured from the finished floor to the lowest projection from the ceiling.  
Exceptions:  
1. Beams and girders spaced not less than 4 feet on center may project not more than 6 inches below the required ceiling height.  
2. Ceilings in basements without habitable spaces may project to within 6"-8" of the finished floor, and beams, girders, ducts or other obstructions may project to within 6"-4" of the finished floor.  
3. Not more than 50% of the required floor area of a room or space is permitted to have a sloped ceiling less than 7 feet in height, with no portion of the required floor area less than 5 feet in height.  
4. Bathrooms shall have a min. ceiling height of 6'-8" over the fixture and at the front clearance area for fixtures. A shower or tub equipped with a showerhead shall have a min. ceiling height of 6'-8" above a min. area 30"x30" at the showerhead.

LIGHT, VENTILATION AND SANITATION

1. All habitable rooms shall be provided with aggregate glazing area of not less than 8% of the floor area of such rooms. Natural ventilation shall be through windows, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the occupants. Section R303.1  
Exceptions provided per Section R303.1

2. Ventilation. Group R Occupancies shall be provided with ventilation systems which comply with Section 303  
The point of discharge for mechanical ventilating systems shall be at least 3 feet from any opening which allows air entry into occupied portions of the building. M1506.3

Refer to additional exhaust ventilation requirements in Section R303.3 for bathrooms and water closets. See Chapter 15 for kitchens & laundry room requirements.

3. Range & Dryer Vents. Ducts used for domestic kitchen range ventilation and clothes dryers exhaust shall be of metal and have smooth interior surfaces. Ducts shall be substantially airtight and shall comply with the provisions of Chapter 15. Exhaust ducts shall terminate outside the building and be equipped with back draft dampers. Sections M1501, M1502 & M1503

4. Moisture Exhaust Ducts. Moisture exhaust ducts for domestic clothes dryers shall terminate on the outside of the building and shall be equipped with a back-draft damper. Screens shall not be installed at the duct termination. Ducts for exhausting clothes dryers shall not be connected or installed with sheet metal screws or other fasteners which will obstruct the flow. Clothes dryer moisture exhaust ducts shall not be connected to a gas vent connector, gas vent or chimney. Clothes-dryer moisture exhaust ducts shall not extend into or through ducts or plenums. Length Limitation. Unless otherwise permitted or required by the dryer manufacturer's installation instructions and approved by the building official, domestic dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical length of 35 feet, with reductions for elbows per TABLE M1502.4.5.1

5. Water Closet Space Requirements. The water closet stool in all occupancies shall be located in a clear space not less than 30 inches in width, with a clear space in front of the stool of not less than 24"

6. Tub & Shower Walls. When gypsum is used as a base for tile or wall panels for tub, shower or water closet compartment walls, water-resistant gypsum backing board shall be used. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas

Water-resistant gypsum board shall not be used in the following locations:

- a) Over a vapor retarder.
- b) In areas subject to continuous high humidity, such as saunas, steam rooms or gang shower rooms.
- c) On ceilings where frame spacing exceeds 12 inches on center.

FOUNDATIONS

7. Slope Limits. Cut slopes for permanent excavations shall be not steeper than 2 horizontal to 1 vertical and slopes for permanent fills shall be not steeper than 2 horizontal to 1 vertical unless substantiating data justifying steeper slopes are submitted. Deviation from the foregoing limitations for slopes shall be permitted only upon the presentation of a soil investigation report acceptable to the building official.

8. Setbacks from Slopes. Foundation setbacks from ascending and descending slopes shall comply with Figure R403.1.7.1

9. Stepped Foundations. Foundations for all buildings where the surface of the ground slopes more than 1 foot vertical in 10 feet horizontal shall be level or shall be stepped so that both top and bottom of such foundation are level. Section R403.1.5

10. Pier Footings. Individual concrete pier footings shall project minimum of 8 inches above exposed ground unless the columns or posts are of approved wood of natural resistance to decay or of treated wood. Exterior concrete piers shall be 12" minimum below grad or to bearing soil whichever is greater

11. Column and Posts Supports. Columns and posts located on concrete or masonry floors or decks exposed to the weather or to water splash or in basements and which support permanent structures shall be supported by concrete piers or metal pedestals projecting above floors unless approved wood of natural resistance to decay or treated wood is used. The pedestals shall project at least 6 inches above exposed earth and at least 1 inch above such floors.

12. Under-floor Clearance & Access. When wood joists or the bottom of wood structural floors without joists are located closer than 18 inches or wood girders are located closer than 12 inches to exposed ground in crawl spaces or unexcavated areas located within the periphery of the building foundation, the floor assembly, including posts, girders, joists and subfloor, shall be approved wood of natural resistance to decay as listed in Section R317.1 or treated wood.

When the above under-floor clearances are required, the under-floor area shall be accessible. Accessible under-floor areas shall be provided with a minimum 18 inch-by-24 inch opening unobstructed by pipes, ducts and similar construction. All under-floor access openings shall be effectively screened or covered. Pipes, ducts and other construction shall not interfere with the accessibility to or within under-floor areas. Section R408.4

13. Under-floor Ventilation. Under-floor ventilation, minimum net area of 1 square foot for each 150 square feet of under floor area, one opening shall be located within 3' of each corner of the building and shall provide cross ventilation. The openings shall be covered with one-quarter inch corrosion resistant wire mesh. Section R408.2

FRAMING

14. Quality & Identification. All lumber, wood structural panels, particleboard, structural glued-laminated timber, end-jointed lumber, fiberboard sheathing (when used structurally), hardboard siding (when used structurally), piles and poles regulated by this chapter shall conform to the applicable standards and grading rules specified in the IRC and shall be so identified by the grade mark or a certificate of inspection issued by an approved agency.  
All preservative treated wood required to be treated under Section R317 shall be identified by the quality mark of an approved inspection.

15. Foundation Cripple Walls. Foundation cripple walls shall be framed of studs not less in size than the studs above with a minimum length of 14 inches, or shall be framed of solid blocking. When exceeding 4 feet in height, such walls shall be framed of studs having the size requirements for an additional story. Solid blocking or wood structural panels may be used to brace cripple walls having a stud height of 14 inches or less. Cripple walls having a stud height exceeding 14 inches shall be braced in accordance with Section R602.9.

16. BEARING: the ends of each floor joist shall have not less than 1-1/2 inches of bearing on wood or metal, nor less than 3 inches on masonry except where supported on a 1 x 4 ribbon strip nailed to adjoining stud. Section R502.6.

17. Supporting Bearing Partitions. Supporting bearing partitions perpendicular to floor joists shall not be offset from supporting girders, walls, or partitions more than floor joist depth. Floor joists under and parallel to bearing partitions shall be doubled.

18. Cutting, Notching and Boring.  
A. Notches on ends of rafters and ceiling joists shall not exceed one-fourth of the depth. Holes bored in rafters or ceiling joists shall not be within 2 inches of the top or bottom, and their diameter shall not exceed one-third the depth of the member. Notches in the top or bottom of the rafter or ceiling joist shall not exceed one-sixth the depth and shall not be located in the middle third of the span. Sections R602.6, IRC.  
B. In exterior walls and bearing partitions, any wood stud may be cut or notched to a depth not exceeding 25% of its width. Cutting or notching of studs to a depth of 40% of the stud width is permitted in non-bearing partitions. Section R602.6  
C. Notches in sawn lumber beams shall not exceed one-sixth the beam depth of the member and shall not be located in the middle third of the span. Notches at the ends shall not exceed one-fourth the beam depth. The tension side of sawn lumber beams of 3-1/2 inches or greater thickness shall not be notched except at the ends.  
D. Manufactured glue laminated beams may not be notched, cut or bored without submission and approval of substantiating calculations from a licensed Structural Engineer.

Cutting, Drilling, Notching Structural members shall not be cut, bored or notched in excess of the limitations specified in Sections: R502.8.1, R602.6, R802.7

19. Bridging and Blocking  
Wall Framing. Bridging. Unless covered by interior or exterior wall covering or sheathing meeting the minimum requirements of this code, all stud partitions or walls with studs having a height-to-least thickness ratio exceeding 50 shall have bridging not less than 2 inches in thickness and of the same width of the studs fitted snugly and nailed thereto to provide adequate lateral support.  
Floor Joists. Blocking. Floor joists shall be blocked when required by the provisions R502.7.1  
Roof Framing. Blocking. Roof rafters and ceiling joists shall be supported laterally to prevent rotation and lateral displacement. R802.10.3

20. Post-Beam Connections. Where post and beam or girder construction is used, the design shall be in accordance with the provisions of this code. Positive connection shall be provided to ensure against uplift and lateral displacement.

21. Manufactured Roof Trusses --Sections R802.10.1.  
A. Trusses. Stress analysis and drawings/details shall be stamped by an approved State of Washington Registered Engineer.  
Drawings/details shall be on job site for framing inspection.  
Pre-manufactured trusses shall be identified by manufacturer's stamp.  
Girder and field identification of light metal plate connected trusses is required.  
Information branded, marked, or otherwise permanently affixed to each truss shall contain the following:  
1) identification of the truss manufacturing company;  
2) the design load; and  
3) the truss spacing.  
Engineering data and details shall be approved by the building official before any field cuts or truss alterations.  
All roof trusses shall be so framed and tied into the framework and supporting walls so as to form an integral part of the whole building.  
Roof trusses shall have joints well fitted and shall have all tension members well tightened before any load is placed upon the truss. Diagonal and sway bracing shall be used to brace all roof trusses.  
B. Girder and Field Assembled Truss. Engineered stress analysis and details shall be submitted to building division for approval.  
C. Use approved/applicable truss support hangers.

22. Wood Exposed to Weather. All wood exposed to weather, such as wood used for deck framing including decking, railings, joists, beams, and posts shall be pressure treated or of wood with natural resistance to decay. Section R317

23. Guardrails. When decks, landings, stairs, ramps or porches are more than 30 inches above grade or floor below, the building shall be protected by a guardrail not less than 36 inches high with intermediate members spaced such that a sphere 4 inches in diameter cannot pass through. Section R312

24. Decks. Decks 30 inches or more above grade require a permit. All decks must be designed and constructed in accordance with Section R507 IRC  
Solid Sheathed Decks and Roofs. Solid sheathed decks and roofs shall be sloped a minimum 1/4 " per foot. When decks or roofs are not sloped to drain over deck or roof edges, roof drains in combination with overflow drain(s) and/or scupper(s) shall be installed. R903.4, R903.4.1

25. Roofs. Application of roof covering materials shall be in accordance with Section R903

26. Roof Ventilation. The net free ventilating area of enclosed rafter or attic spaces shall be not less than 1/150 of the area of each space to be ventilated, except that the area may be 1/300, provided that 50% of the required ventilating area is located at least 3 feet above eave or cornice vents with the balance being provided by the eave or cornice vents, or if a vapor retarder not exceeding a 1 perm rating is installed on the warm side of the attic insulation. The openings shall be covered with corrosion-resistant metal mesh with mesh openings of 1/4 inch max. & 1/16 inch min. Section R806.

27. Flashing & Counter-flashing. At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided per the roofing manufacturer's instructions and , when of metal, shall not be less than 0.019- inch (No. 26 ga. galvanized steel) corrosion-resistant metal. Section R903.2, R903.2.1, R903.2.2

28. Attic Space Access Opening. Attic spaces with 30 inches or more in vertical height and an area of 30 square feet or greater, shall be provided with an access opening 22 inches by 30 inches. The opening shall be located in a corridor, hallway or other readily accessible location and have at least 30 inches head room. Section R807.1

EXTERIOR WALLS

29. Exterior Wall Coverings. Exterior wood stud walls shall be covered on the outside with materials and in the manner specified in Section R703,

30. All weather-exposed surfaces shall have a weather-resistant barrier to protect the interior wall covering. Section R703.1 IRC

31. Anchored veneer shall comply with the provisions of Section R703.8, and Table R703.8(1) & (2), Figure R703.8

32. Veneer support shall conform to all standards in Section R703.8.2

GARAGE / CARPORT (occupancy separation)

33. The garage shall be separated from the residence and its attic area by not less than 1/2" type "X" gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8" Type X gypsum board or equivalent. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than 1/2" gypsum board or equivalent.

34. Doors between the garage and residence shall be equipped with solid wood doors not less than 1-3/8" in thickness, solid or honeycomb core steel doors not less than 1-3/8" thick, or 20-minute fire-rated door.

35. In areas where motor vehicles are stored or operated, floor surfaces shall be of noncombustible materials & slope to move liquid away.

36. An occupancy separation need not be provided between residence and a carport having no enclosed uses above, provided the carport is entirely open on two or more sides.

MEANS OF EGRESS

DEFINITIONS: A means of egress is an exit system that provides a continuous, unobstructed and unadorned path of exit travel from any occupied point in a building or structure to a public way. Such means of egress system consists of three separate and distinct elements: 1.) The exit access, 2.) The exit, and 3.) The exit discharge.  
Public way is any street, alley, or similar parcel of land essentially unobstructed from the ground to the sky that is deeded, dedicated or otherwise permanently appropriated to the public for public use and having a clear width of not less than 10 feet.

37. Exterior Exit Door. Buildings or structures used for human occupancy shall have at least one exterior exit door with dimensions of 3 feet by 6 feet, 8 inches. Sections R311.2, IRC.

38. Hallways. Width. Hallways shall not be less than 36 inches wide. Section R311.6, IRC.

39. Door Landing. A floor or landing is required on each side of an exterior door. The door may open at a landing that is not more than 7-3/4" inches lower than the floor level, provided the door does not swing over the landing. The landing shall be 36 inches in length minimum. Section R311.3

40. WINDOW EGRESS

R310.1: Emergency escape and rescue required:  
Basements, habitable attics and every sleeping room shall have at least one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with IRC Section R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way.

Exception: Basements used only to house mechanical equipment or storm shelters and not exceeding total floor area of 200 square feet

- 2015 IRC R310.2.1: Minimum opening area. All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet.

Exception: Grade floor openings shall have a minimum net clear opening of 5 s.f.

- R310.2.1: Minimum opening height. The minimum net clear openings height shall be 24 inches.

- R310.2.1: Minimum opening width. The minimum net clear opening width shall be 20 inches.

2015 IRC R310.1.1: Operational constraints. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools or special knowledge.

MISCELLANEOUS

41-A. Smoke Detection Location. A smoke detector shall be installed in each sleeping room and outside each separate sleeping area in the immediate vicinity of each bedroom. When the dwelling unit has more than one story and in dwellings with basements, a detector shall be installed on each story and in the basement. Smoke alarms shall be installed not less than 3' horiz. from the door opening to a bathroom with a shower or tub unless this would prevent placement required by R314.3. See Section R314.3.1 for placement of smoke alarms near cooking appliances. Not less than 20' for ionization type, not less than 10' ionization with an alarm-silencing switch or not less than 6' for a photoelectric type.

41-B. Carbon Monoxide Alarms. A Carbon monoxide alarm 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 it's attached bathroom, a carbon monoxide alarm shall be installed within the bedroom. R315.3

Alarms shall be listed as complying with UL 2034 and installed per manufacturer's listing. R315.2 WAC, R315.1, R315.4 WA. State ammendment

FACTORY BUILT FIREPLACES

Factory built fireplaces shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Factory-built fireplaces shall be tested in accordance with UL 127. R1004.1  
Fireplaces shall comply with all provisions of section R1004

42. Installation of vented gas fireplaces (decorative appliances) shall be in accordance with the manufacturer's installation instructions. And shall comply with all standards of Section G2434 (604) IRC

43. Gas Fire Log Lighters. Approved gas fire log lighters shall be installed in accordance with manufacturer's installation instructions. Section G2433.1

STAIRWAYS

44. Usable space under stairs shall have walls and soffits (on the enclosed side) protected as required for 1-hour fire resistive construction.

45. Fireblock Stairs. Between stair stringers at top and bottom and along and in line with the run of the stairs between studs.

46. Stairways. Section R311.7 IRC  
Maximum rise 7-3/4" inches; minimum run 10 inches; headroom minimum 6 feet 8 inches; minimum width 36 inches.

Handrails to have ends returned and placed minimum 34 inches, maximum 38 inches above tread nosing. Unless designated for the disabled, the handgrip portion of handrails shall be not less than 1-1/4 inches nor more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface.

The handgrip portion of handrails shall have a smooth surface with no sharp corners. Handrails projecting from a wall shall have a space of not less than 1-1/2 inches between the wall and the handrail.

Exit Facilities. Stairs and exit balconies shall be positively anchored to the primary structure at 8 feet on center max. or be designed for lateral forces. Such attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

GLAZING

47. Safety Glazing. Safety glass must comply with Section R308 IRC