Steinborn Residence

OWNERS:
Susan and Dan Steinborn
2011 19th Ave. E.
Seattle, WA 98112
PROJECT ADDRESS:
8435 SE 47th Pl.
Mercer Island, WA 98040
TAX PARCEL NUMBER:
3317500040
LEGAL DESCRIPTION:
LOT 4, HILL HIGH ESTATES AS RECORDED IN VOLUME 68 OF PLATS, PAGE 28, RECORDS OF KING COUNTY, WASHINGTON.
SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

PERMIT NUMBER:
Pre-App: PRE21-009
Building Permit: 2202-225
CAR2 : CAO22-006
Accessory Dwelling Unit: ADU22-005
PROJECT DESCRIPTION:
Clear and grade existing vacant lot. Provide protection for trees to remain as required.
Phase permanent nail shoring to enable hillside stability.
Build a new single family residence and related site work.

GOVERNING AUTHORITY:
City of Mercer Island, Development Services Group.
ZONING CODE INFORMATION:
Zone: R 9.6
Critical Area Review - 2 : See A1.3 and attached report
Lot Slope: 30% see sheet A1.1
Allowed Lot Coverage: 30% of lot area x 19,360sf =5,808sf
Proposed Lot Coverage: 5,360sf (27.7% of lot area) see Sht. A1.2 for calculation
Side Yard Calculation: see Sht. A1.1
Allowed Height 30' above ABE
Allowed height limit: 305.2' See A1.2 for ABE Calculations & A3.1, A3.2, A3.3 A4.1 for representation
Allowed GFA: 40% x 19,360.24sf = 7744sf
Proposed GFA: 4554sf (23.5% of lot area) see Shts. A2.0, A2.1, A2.2 for GFA detail
Allowed Hardscape: 9% of lot area x 26,673sf = 2,400.6 sf
Proposed Hardscape: 593sf (3% of lot area). see Sht A1.2

BUILDING CODE INFORMATION:
Building Code: IRC 2018; WSBC Chptr. 51-51 WAC
Occupancy: Group R-3 - Single Family Residence & Group U Garage
Construction Type: V - Wood Frame (VB)
Fire Code Alternate: Approved FCA on file - NFPA 13R PLUS

ENERGY CODE INFORMATION: 2018 WSEC & IRC VENTILATION
Energy Conservation: Component Performance per WSEC Table R402.1.1:
A2.0,A2.1, A2.2, A3.1, A3.2, A3.3, A4.1, A5.1, A9.0, A9.1, E2.0, E2.1, E2.2
Energy Credits - 6.0: Outlined below.
Fuel Normalization option 2: Heat pump air to water radiant system. (A1.0, A2.0) 1.0 credit
EC 1.4) Building Envelope: Vertical Fenestration U=.25 (sht. A9.0/9.1); Wall R-21 plus R-4ci; Floor R-38; Basement wall R-21 int plus R-5 ci; Slab on grade R-10 perimeter and under entire slab. 1.0 credit (shts. A3.1-3.3, A4.1, A5.1)
C 2.2 - Air leakage control 2.0 ach + HRV system with an efficiency of .65 (shts. A2.0, E2.0, E2.1, E2.2) 1.0 credit
EC4.2 - Efficient heating distribution system (hydronic piping) is 100% in conditioned space. (shts. A2.0, A2.1, A2.2, A3.2, A3.3, A4.1, A5.1) 1.0 credit
EC5.5 - Efficient water heating - Electric heat pump water heater. (sht. A2.0) 2.0 credits
Whole House Ventilation: Prescriptive Intermittent Whole House Ventilation per IRC M1507.3 with a Whole-House Ventilation Rate of 150 cfm each of (3) fans (see sheets E2.0, E2.1 & E2.2).

PROJECT DIRECTORY:

Architect: **Ectypos Architecture**
Contact: Lucia Pirzio-Biroli, Architect
4212 W. Mercer Way — Phone: (206) 232-9147
Mercer Island, WA 98040 — Fax: (206) 275-0312

Surveyor: **Terrane**
Contact: Dana Hall
10801 Main Street, Ste. 102 — Phone: (425) 458-4488
Bellevue, WA 98004

Geotechnical Engineer: **Geotech Consultants, Inc.**
Contact: Marc McGinnes
2401 10th Ave. E. — Phone: (425) 747-5618
Seattle, WA 98199

Civil Engineer **WR Consulting**
Contact: John W. Rundall
3611 45th Ave. W. — Phone: (206) 285-1593
Seattle, WA 98199 — Fax: (206) 264-7769

Structural Engineer: **Bykonen Carter Quinn**
Contact: Nick Carter
2033 6th Ave, Suite 995
Seattle, WA 98121 — Phone: (206) 264-7784

Shoring Engineer: **Ground Support PLLC**
Contact: Chris Wolschlag
16932 Woodinville-Redmond Rd NE, Ste. #210
Woodinville, WA 98072 — Phone: (425) 922-1501

Arborist: **Arborist NW LLC.**
Contact: Neil Baker
1710 SW 318 Pl. 44D — Phone: (206) 779-2579
Federal Way, WA 98023

General Contractor: **Mercer Builders**
Contact: Jeff Wenzel
3860 76th Ave SE — Phone: (206) 275-1234
Mercer Island, WA 98040

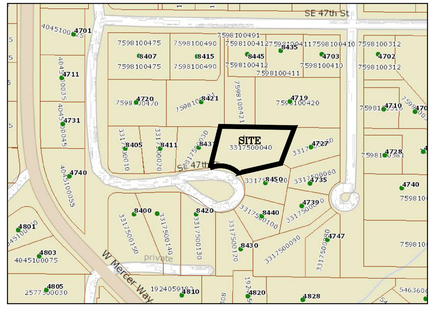
DOCUMENT LIST :
City of Mercer Island Coversheet

Drawing schedule:

Reports, Memos and City Forms:
Permit Application
Site Development Information (revised)
CAR 2 Report (revised)
WSEC Energy Code Compliance form
Fire Area Square Footage Calculation
Fire Code Alternate Request memo
Transportation Concurrency Application
Residential Water Meter Sizing Worksheet
ADU Application form
ADU Affidavit
Critical Area Disclosure - Notice on Title
Large lot - Real Covenant Limiting further Subdivision

Geotechnical Engineering Study and Critical Area Study / Plan Review Letter
Nail Shoring Design Calculations
Arborist Report and tree inventory/replacement form (revised)
Civil Engineer Drainage Report (revised)
Structural Calculations / Supplemental Calculations
Memo: Project 2202-225 Sub2 Ancillary Comments

VICINITY MAP



SYMBOLS:

&	and
@	at
℄	centerline
X	by
ø	diameter
#	pound/number
##	degree
±	plus or minus
1	revisions / window designation
1	door designation
X / Y	material designation
El.	finish floor elevation

ABBREVIATIONS:

AB	anchor bolt
ADJ	adjustable
AFF	above finish floor
ARCH	architect/ural
BLDG	building
BM	beam
B.O.	bottom of
B.O.F.	bottom of footing
BTWN	between
CB	catch basin
CIP	cast in place
CJ	control joint
CLG	ceiling
CMU	concrete masonry unit
CO/SD	combined carbon monoxide/
COL	column
CONC	concrete
CONT	continuous
DIA	diameter
DIM	dimension
DN	down
DR(S)	door(s)
DS	downspout
DWG	drawing
EA	each
EL	elevation
ELEC	electrical
ELEV	elevations
EQ	equal
EXIST	existing
EXH	exhaust
EXT	exterior
FB	flat bar
FD	floor drain
FDC	Fire Department Connection
FDN	foundation
FE	fire extinguisher
FIN	finish
FOC	face of conc.
FOS	face of stud
FLR	floor
FOIC	furnished by owner installed
FPHB	frost proof hose bib
FRT	fire retardant treated
FS	full size
FT	foot
FTNG	footing
GA	gauge
GALV	galvanized
GL	glass
GWB	gypsum wallboard
HB	hose bib
HC	hollow core
HM	hollow metal
HOR	horizontal
HP	high point
HR	hour/handrail
HT	height
ID	inside diameter
IN	inch/inches
INSUL	insulation
INT	interior
JNT	joint
KD	kiln dried
LNDSPG	landscaping
LP	low point
LT	light
MAX	maximum
MDF	medium density fiberboard
MDO	medium density overlay
MECH	mechanical
MFGR	manufacturer
MISC	miscellaneous
MIN	minimum
MTL	metal
NIC	not in contract
NO	number
NOM	nominal
NTS	not to scale
OA	overall
OC	on center
OD	outside diameter
OFD	overflow drain
OPNG	opening
OS	overflow scupper
OVR	over
PAV	pavers, paving
PLYWD	plywood
PR	pair
PT	paint/point
RAD	radius
RB	reinforcing bar
RD	roof drain
REQ'D	required
RES	resilient
RL	rain leader
RO	rough opening
SCHED	schedule(s)
SD	smoke detector
SF	square feet
SHT	sheet
SIM	similar
SPEC	specification
SQ	square
SS	stainless steel
ST	stone
STL	steel
SAF	self adhering flashing
TG	tempered glass
T&G	tongue and groove
THK	thick
T.O.	top of
TYP	typical
V	variable
VERT	vertical
VG	vertical grain
VIN	vinyl
VTR	vent through roof
W/	with
WP	waterproof
W/O	without
WWF	welded wire fabric

GENERAL NOTES:

1. **Contractor shall verify all dimensions and conditions shown on drawings at the job site and shall notify the Architect of any omissions, discrepancies and/or conflicts before proceeding with the work.**
2. General Contractor to coordinate pre-construction site meeting w/ Owner, Architect, Structural Engineer, Civil Engineer, Geotechnical Engineer and City of Mercer Island Building Inspector
3. Plumbing, mechanical and electrical work shall be under separate permits according to prevailing codes. Contractor shall obtain such permits.
4. Special Inspections that are required by the City of Mercer Island Development Services shall be coordinated by Contractor.
5. Contractor shall verify existing grade conditions and height limits with Architect and surveyor on site prior to beginning work and shall notify Architect of any discrepancy in the site survey.
6. **Do not scale drawings, dimensions govern.** Large scale dimensions govern over small scale dimensions. Notify Architect of discrepancies in dimensions prior to proceeding with work.
7. Construction dimensions shown are to face of stud (F.O.S.) on exterior walls, top of (t.o.) slab or sub-floor at floor levels.
8. **Per approved Fire Code Alternate** an NFPA "Chapter 29" Fire Alarm System shall be installed per City of Mercer Island standards. UL Listings: Devices - UL 268; Control Panel - UL 985; CO Detectors: UL 2075. **FIRE DEPARTMENT REQUIREMENTS** outlined below in notes 9-11. A separate permit is required and may be deferred and obtained by Contractor.
9. **DWELLING/GARAGE SEPARATION** shall meet the requirements of IRC R302.6. All habitable rooms shall be separated on the garage side by not less than ⅝" Type "X" gwb or equivalent.
DWELLING/GARAGE OPENING/PENETRATION PROTECTION shall meet the requirements of IRC R302.5. Doors shall be minimum 20 minute fire rated doors equipped with a self-closing device.
10. **FIREBLOCKING** shall meet the requirements of IRC R302.11.
DRAFTSTOPPING shall meet the requirements of IRC R302.12
UNDER STAIR PROTECTION Enclosed under-stair space accessible by a door or panel shall be protected by a minimum of ½" type "x" gypsum wall board per IRC R302.7 and as indicated in approved Fire Code Alternate.
SOLID CORE DOORS Throughout interior spaces except at closets.
1 HOUR TYPE "X" GWB throughout interior spaces as indicated in approved Fire Code Alternate
11. **SMOKE ALARMS & HEAT DETECTION** See note 8 above, shall comply with IRC R314/WBC R314. Smoke alarms shall be listed and labeled in accordance with UL268. Combined smoke and carbon monoxide detectors shall be listed in accordance with UL268 AND UL 2075. Smoke alarms shall be located as follows: each sleeping room; outside each separate sleeping area in the immediate vicinity of the bedrooms; on each floor of the dwelling; stairs leading from the basement near the entry to the stair. **Combination smoke alarms and carbon monoxide alarms** shall be permitted in lieu of smoke alarms where carbon monoxide alarms are also required.
CARBON MONOXIDE ALARMS shall meet the requirements of IRC R315. Carbon monoxide alarms shall be installed outside each separate sleeping area in the immediate vicinity of the bedrooms, on each floor level of the dwelling.
HEAT ALARM/DETECTION shall be installed in garage per WAC R314.2.1
12. **EMERGENCY EGRESS WINDOWS** shall meet the requirements of IRC R310. Each sleeping room shall have an operable rescue opening. **Emergency Escape minimum dimension** shall meet IRC R310.2 The sill height shall not be more than 44" from the finished floor to the bottom of the opening. Minimum net clear opening shall be 5.7 square feet; minimum clear width 20"; minimum clear height 24".
13. **STAIRWAYS** shall meet the requirements of IRC R311.7. Stairways shall have a minimum clear width of 36" above handrail, and be not less than 31½" in width below handrail. Minimum headroom shall not be less than 6'-8". Maximum riser 7¾" / minimum tread 10". Handrails shall be not less than 34" or more than 38" above the slope of the plane of the stairs and shall be continuous for the full run of the flight and shall have a minimum space of 1½" between wall and railing.
14. See specifications for required shop drawings. Contractor shall prepare and submit shop drawings to governing authority and Architect in a timely manner.
15. Provide mounting blocks at exterior walls behind all light fixtures, hose-bibs, structural steel connectors, guardrails and any other exterior mounted accessories. Verify type of mounting block with Architect prior to installation.
16. Provide damp-proofing on all below grade foundation walls per IRC R406. Provide all accessories required for a completely watertight installation, including but not necessarily limited to: flashing, counter-flashing, sealant, and caulking at all roof and wall penetrations; interlocking weather-stripping at all doors and windows; water-stops and other concrete inserts at below grade cold joints.
17. When a ventilated roof is required: Provide notching/ drilled holes according to Structural Engineer's recommendations or run roof furring strips perpendicular to roof joists to allow cross-ventilation of roof joist spaces. Maintain 1" minimum clear from top of insulation to bottom of decking where occurs.
18. Pressure treated lumber typical at all exterior applications and concrete surfaces.
19. Pursuant to MICC 19.02.020(F)(3)(d) all Japanese Knotweed and regulated Class A, B & C weeds identified on the King County Noxious Weed List as amended, shall be removed from the property. New landscaping associated with New Single Family Home shall not included any weeds identified on the KC Noxious Weed List.
20. Any excavation or foundation work performed between October 1st and April 1st shall be subject to wet season moratorium requirements per MICC 19.07.060(D)(4)
21. Per **IRC R312** guards shall be installed on all open sided walking surfaces including stairs, ramps, landings, that are located more than 30 inches measured vertically to the floor or grade below. Guards shall have openings small enough that a 4"ø ball cannot pass. All guards shall have a minimum overturn resistance 200 lb. per **IRC Table 301.5**. See **R311.7.8** for stair railing requirements.
22. At moist locations provide water resistant gypsum wall board (green board) on walls and ceiling. Rating and thickness shall match gwb throughout rest of structure.

ECTYPOS
ARCHITECTURE
4212 W. Mercer Way
Mercer Island, WA 98040
t. (206) 232-9147
f. (206) 275-0312

7785 REGISTERED ARCHITECT
LUCIA PIRZIO-BIROLI
STATE OF WASHINGTON

STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date: **3/15/2021 Pre-App**
2/14/2022 Permit Submittal
8/25/2022 Sub2-2202-225

Scale:

Sheet:
Project Information
A0.1

TOPOGRAPHIC & BOUNDARY SURVEY

LEGAL DESCRIPTION

LOT 4, HILL HIGH ESTATES AS RECORDED IN VOLUME 68 OF PLATS, PAGE 28, RECORDS OF KING COUNTY, WASHINGTON.

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

BASIS OF BEARINGS

A BEARING OF N 74°41'28" W CALCULATED PER R1 BETWEEN MONUMENTS SHOWN HEREON

REFERENCES

R1. HILL HIGH ESTATES, VOL. 68, PG. 28, RECORDS OF KING COUNTY, WASHINGTON.

VERTICAL DATUM

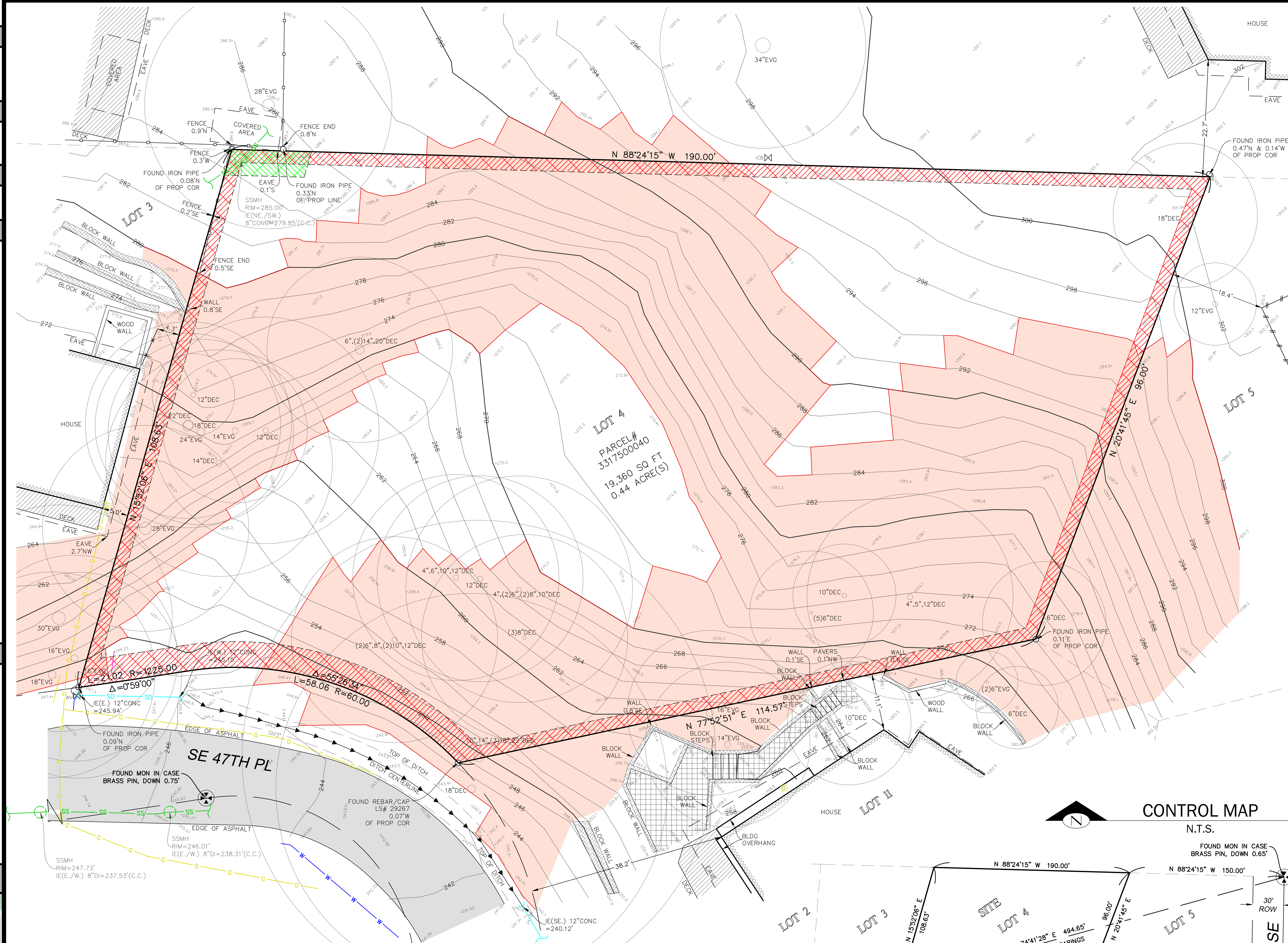
NAVD88 PER GPS OBSERVATIONS

SURVEYOR'S NOTES

1. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS PERFORMED IN FEBRUARY OF 2021. THE FIELD DATA WAS COLLECTED AND RECORDED ON MAGNETIC MEDIA THROUGH AN ELECTRONIC THEODOLITE. THE DATA FILE IS ARCHIVED ON DISC OR CD. WRITTEN FIELD NOTES MAY NOT EXIST. CONTOURS ARE SHOWN FOR CONVENIENCE ONLY. DESIGN SHOULD RELY ON SPOT ELEVATIONS.
2. ALL MONUMENTS SHOWN HEREON WERE LOCATED DURING THE COURSE OF THIS SURVEY UNLESS OTHERWISE NOTED.
3. THE TYPES AND LOCATIONS OF ANY UTILITIES SHOWN ON THIS DRAWING ARE BASED ON INFORMATION PROVIDED TO US, BY OTHERS OR GENERAL INFORMATION READILY AVAILABLE IN THE PUBLIC DOMAIN INCLUDING, AS APPLICABLE, IDENTIFYING MARKINGS PLACED BY UTILITY LOCATE SERVICES AND OBSERVED BY TERRANE IN THE FIELD. AS SUCH, THE UTILITY INFORMATION SHOWN ON THESE DRAWINGS ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE RELIED ON FOR DESIGN OR CONSTRUCTION PURPOSES; TERRANE IS NOT RESPONSIBLE OR LIABLE FOR THE ACCURACY OR COMPLETENESS OF THIS UTILITY INFORMATION. FOR THE ACCURATE LOCATION AND TYPE OF UTILITIES NECESSARY FOR DESIGN AND CONSTRUCTION, PLEASE CONTACT THE SITE OWNER AND THE LOCAL UTILITY LOCATE SERVICE (800-424-5555).
4. SUBJECT PROPERTY TAX PARCEL NO. 3317500040.
5. SUBJECT PROPERTY AREA PER THIS SURVEY IS 19,360± S.F. (0.44 ACRES)
6. THE PROPERTY DESCRIBED HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN CHICAGO TITLE COMPANY OF WASHINGTON, COMMITMENT NO. 0164787-ETU, WITH AN EFFECTIVE DATE OF FEBRUARY 4, 2021 AND THAT ALL EASEMENTS, COVENANTS, AND RESTRICTIONS REFERENCED IN SAID TITLE COMMITMENT OR APPARENT FROM A PHYSICAL INSPECTION OF THE PROPERTY OR OTHERWISE KNOWN TO ME HAVE BEEN PLOTTED HEREON OR OTHERWISE NOTED AS TO THEIR EFFECT ON THE PROPERTY.
7. FIELD DATA FOR THIS SURVEY WAS OBTAINED BY DIRECT FIELD MEASUREMENTS WITH A CALIBRATED ELECTRONIC 5-SECOND TOTAL STATION AND/OR SURVEY GRADE GPS OBSERVATIONS. ALL ANGULAR AND LINEAR RELATIONSHIPS ARE ACCURATE AND MEET THE STANDARDS SET BY WAC 332-130-090.

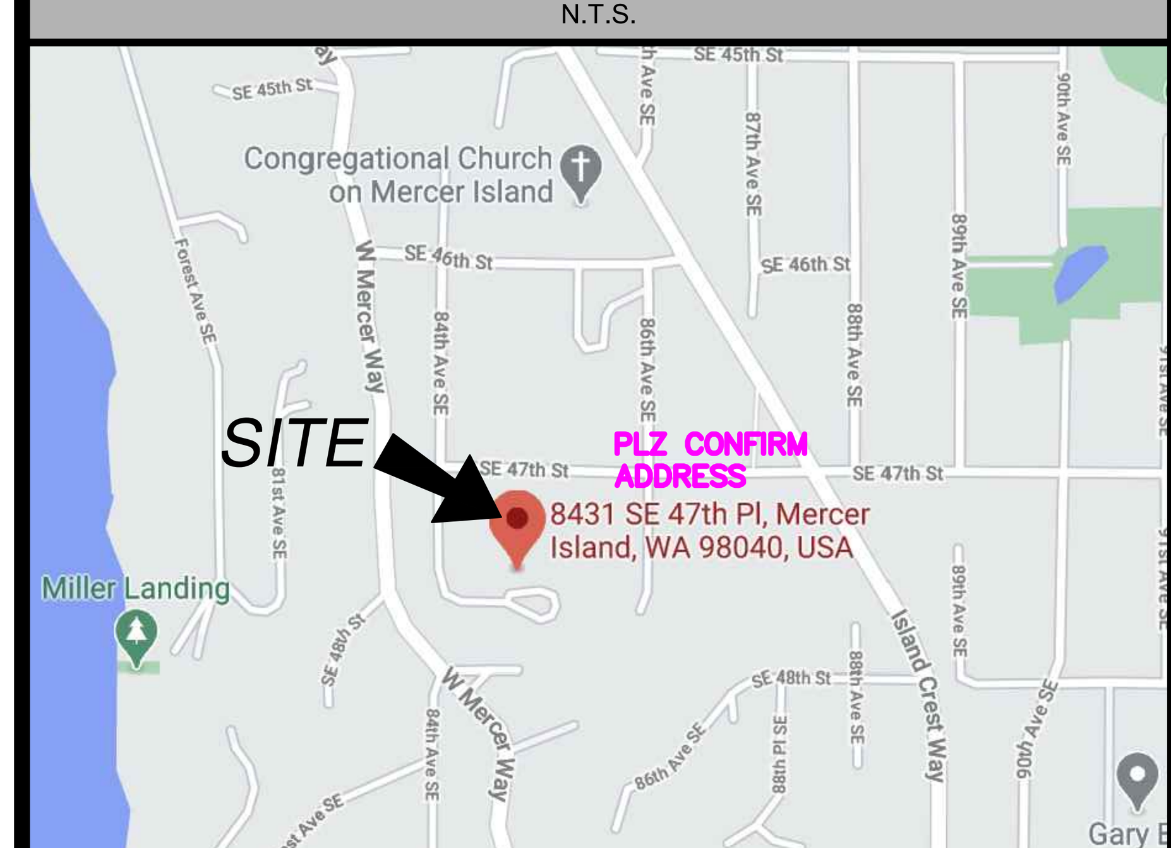
LEGEND

- ASPHALT SURFACE
- BUILDING
- CENTERLINE ROW
- CULVERT PIPE
- CONCRETE SURFACE
- RETAINING WALL
- DECK
- DITCH (FLOWLINE)
- FENCE LINE (WIRE)
- FENCE LINE (IRON)
- FENCE LINE (WOOD)
- GAS LINE
- IRON PIPE (FOUND)
- MONUMENT IN CASE (FOUND)
- PAVER SURFACE
- REBAR AS NOTED (FOUND)
- SEWER LINE
- SEWER MANHOLE
- STORM DRAIN LINE
- TREE (AS NOTED)
- UTILITY LINE
- WATER LINE
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- IRRIGATION CONTROL BOX
- GAS METER
- STEEP SLOPE AREA 40% OR GREATER



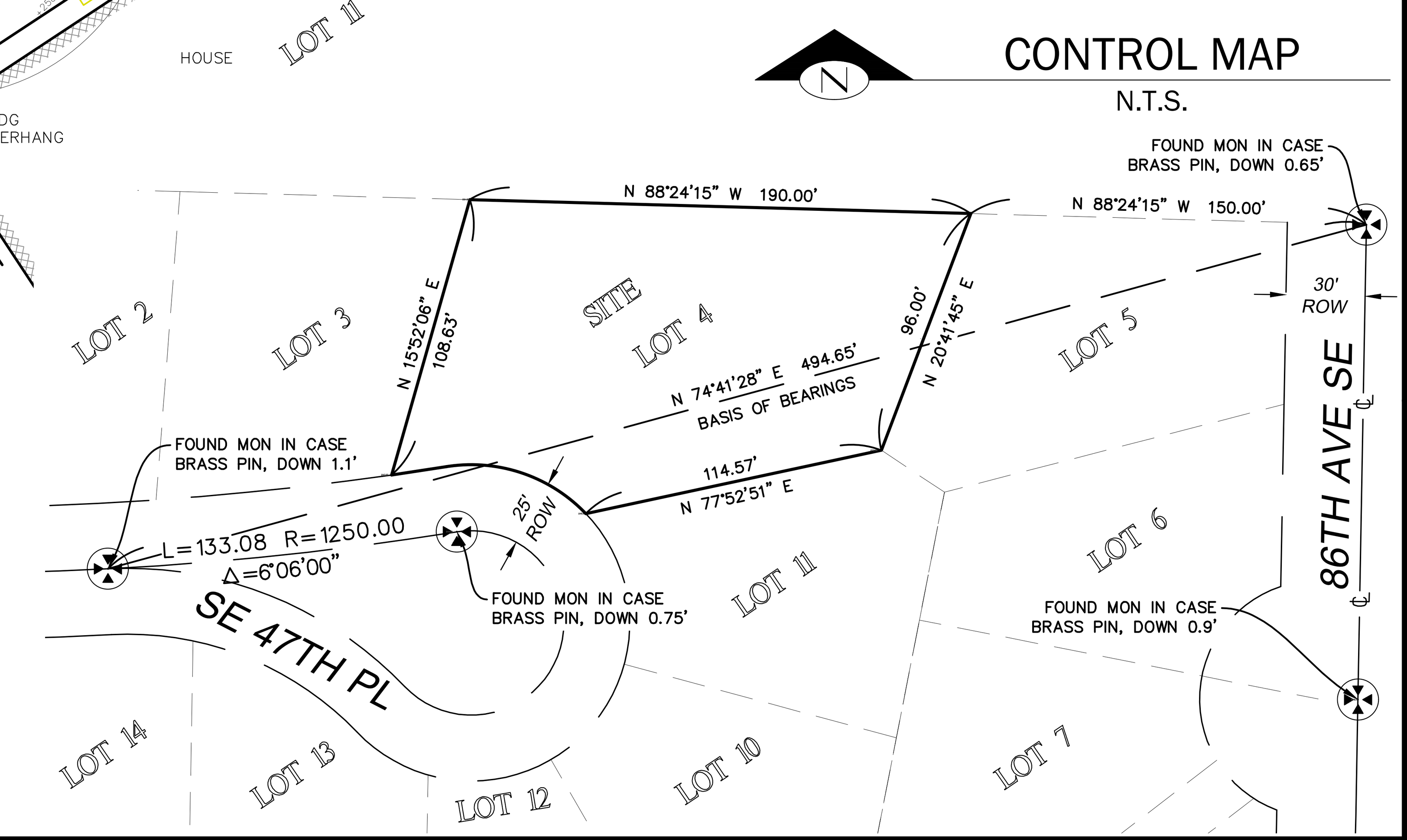
VICINITY MAP

N.T.S.



CONTROL MAP

N.T.S.



STEEP SLOPE/BUFFER DISCLAIMER:
THE LOCATION AND EXTENT OF STEEP SLOPES SHOWN ON THIS DRAWING ARE FOR INFORMATIONAL PURPOSES ONLY AND CANNOT BE RELIED ON FOR DESIGN AND/OR CONSTRUCTION. THE PITCH, LOCATION, AND EXTENT ARE BASED SOLELY ON OUR GENERAL OBSERVATIONS ON SITE AND OUR CURSORY REVIEW OF READILY AVAILABLE PUBLIC DOCUMENTS; AS SUCH, TERRANE CANNOT BE LIABLE OR RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY STEEP SLOPE INFORMATION. ULTIMATELY, THE LIMITS AND EXTENT OF ANY STEEP SLOPES ASSOCIATED WITH ANY SETBACKS OR OTHER DESIGN OR CONSTRUCTION PARAMETERS MUST BE DISCUSSED AND APPROVED BY THE REVIEWING AGENCY BEFORE ANY CONSTRUCTION CAN OCCUR.

SCHEDULE B ITEMS

- ITEM NO. 2 – SEWER EASEMENT, REC. NO. 5783155
- ITEM NO. 3 – ELECTRIC & TELEPHONE EASEMENT, REC. NO. 5918268

(IN FEET)
1 INCH = 10 FT.

INDEXING INFORMATION

SW 1/4 SW 1/4
SECTION: 18
TOWNSHIP: 24N
RANGE: 5E, W.M.
COUNTY: KING

TOPOGRAPHIC & BOUNDARY SURVEY
PARCEL NO. 3317500040

STEINBORN PROPERTY

84XX SE 47TH PL
MERCER ISLAND, WA 98040

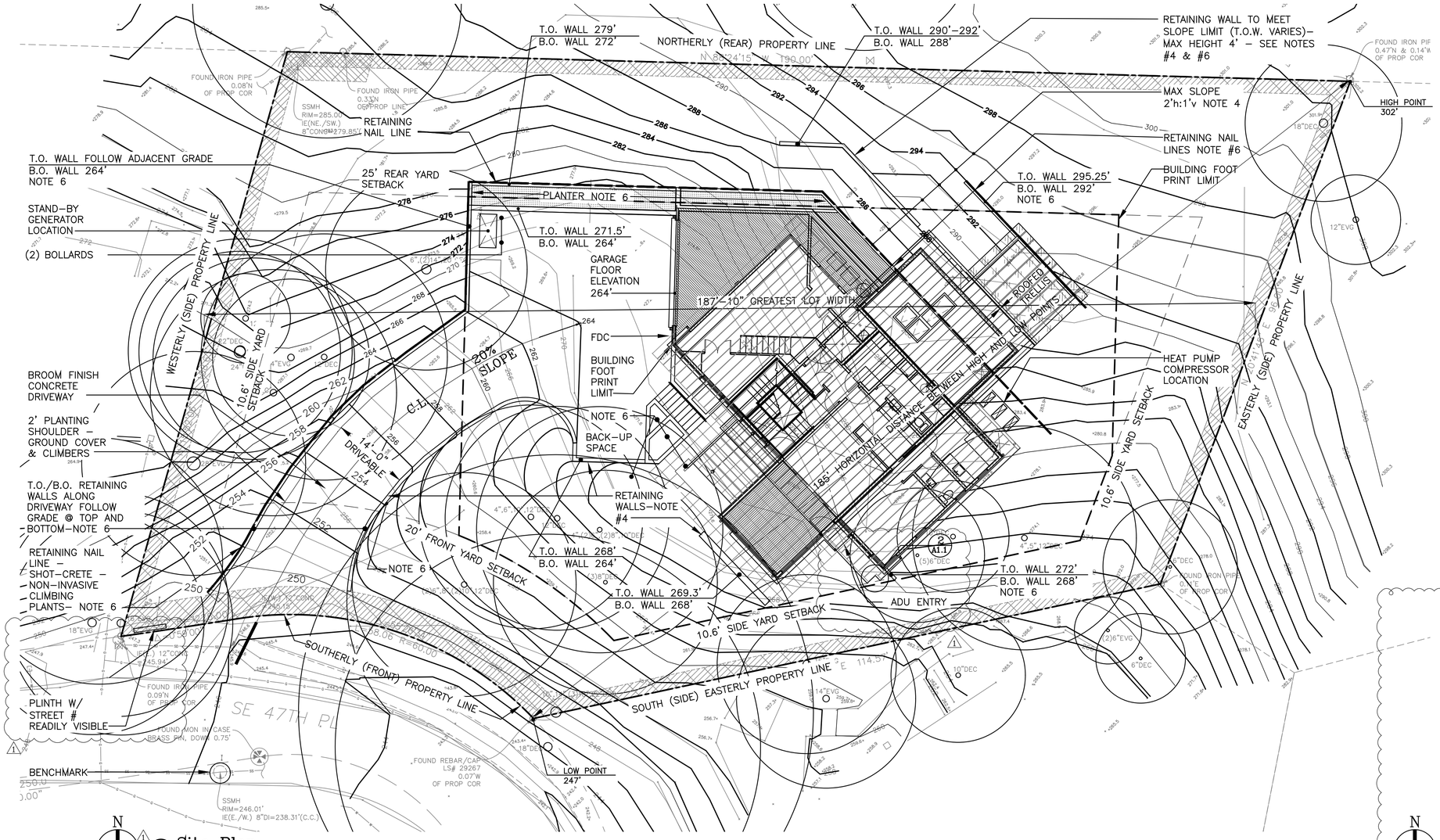
measure success

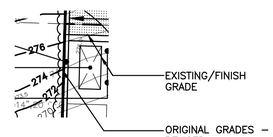
Terrane
10801 Main Street, Suite 102, Bellevue, WA 98004
phone 425.458.4488 support@terrane.net
www.terrane.net

JOB NUMBER:	210291
DATE:	02/21/2021
DRAFTED BY:	RSN
CHECKED BY:	EJG/TMM
SCALE:	1" = 10'

REVISION HISTORY

SHEET NUMBER
1 OF 1





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ARCHITECTURE

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7785 REGISTERED ARCHITECT
LUCIA PIRZIO-BIROLI
STATE OF WASHINGTON

1 Site Plan
scale: 1"=10'

Site Plan Notes
1. See sheet AR1 (Tree Plan) for all tree information
2. See sheet A1.4 (Grading Plan) for pre-foundation grading.
3. T.O./B.O. retaining walls noted on this drawing are to address planning requirements. For permanent nail shoring retaining see sheet SH3.0.
4. See12/S3.0 for Retaining Wall Schedule
5. All graded slopes shall be protected during construction and heavily planted at completion there of.
6. All planters/behind retaining walls shall be densely planted with no access as walking surfaces unless explicitly indicated. No guard required.
7. See attached memo: Project 2202-225 Sub2 Ancillary Comments

Grade Legend

Side Yard Calculation
REQUIRED SIDE YARD WIDTH SUM: 17% OF LOT WIDTH
LOT WIDTH: 187'-10"
SIDE YARD TOTAL WIDTH: 187'-10"x17% = 31'-11"
(3) SIDE YARDS: 31'-11"/3 = 10.6'

Lot Slope
HIGH POINT: 302'
LOW POINT: 247'
DIFFERENCE: 56'
HORIZONTAL DIFFERENCE: 185'
LOT SLOPE:30%
ALLOWED LOT COVERAGE: 30%

SEE SHEET A1.2 FOR LOT COVERAGE CALCULATIONS AND ABE CALCULATION

2 Roof Cut @ Sideyard Setback
scale: 1/2"=1'-0"

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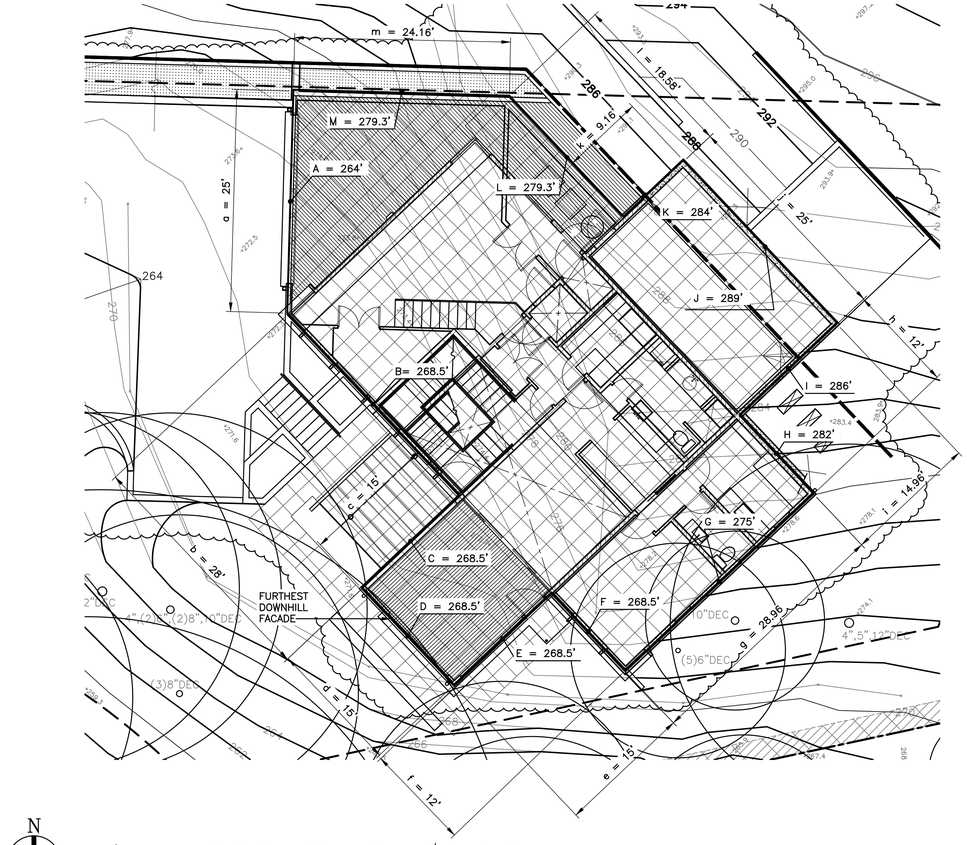
Scale:

Sheet:

Site
Plan
A1.1



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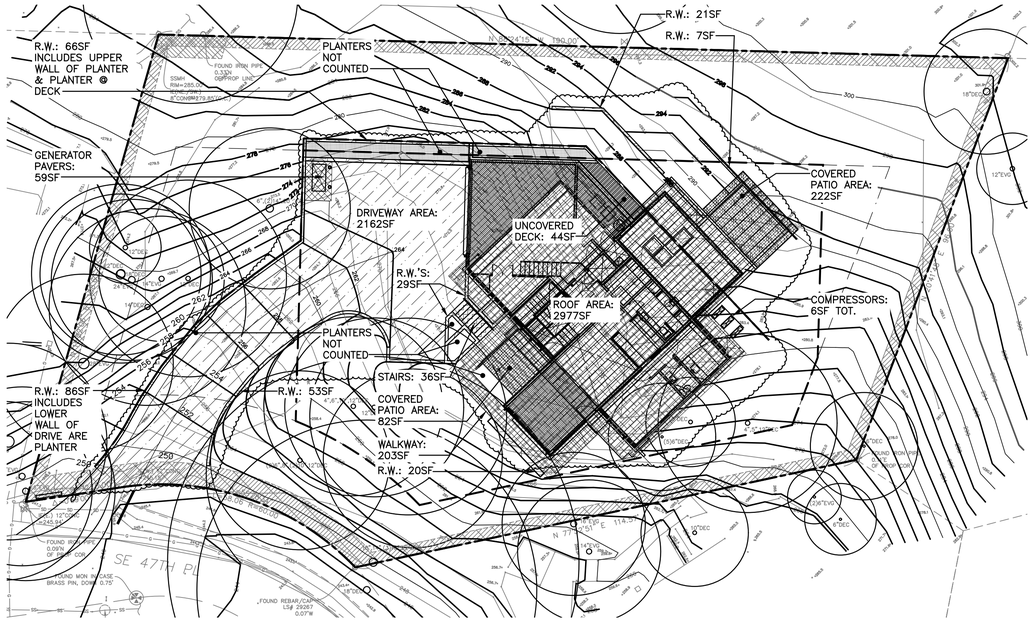
1 Average Building Elevation Calculation
scale: 1/8"=1'-0"

AVERAGE BUILDING ELEVATION								
Mid-point Elev.				Wall Segment Length				Elev x Length
A=	264	ft	*	a=	25.0	ft	=	6600.0
B=	268.5	ft	*	b=	28.0	ft	=	7518.0
C=	268.5	ft	*	c=	15.0	ft	=	4027.5
D=	268.5	ft	*	d=	15.0	ft	=	4027.5
E=	268.5	ft	*	e=	15.0	ft	=	4027.5
F=	268.5	ft	*	f=	12.0	ft	=	3222.0
G=	275	ft	*	g=	29.0	ft	=	7964.0
H=	282	ft	*	h=	12.0	ft	=	3384.0
I=	286	ft	*	i=	15.0	ft	=	4278.6
J=	289	ft	*	j=	25.0	ft	=	7225.0
K=	284	ft	*	k=	9.2	ft	=	2601.4
L=	279.3	ft	*	l=	18.6	ft	=	5189.4
M=	279.3	ft	*	m=	24.2	ft	=	6747.9
					total=			total=
					242.8	ft.		66812.8
Avg. Building Elevation =					275.2	ft.		
Allowed Building Height =					305.2	ft.		

INDICATES FOOTPRINT OF FOUNDATION PERIMETER



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3 Lot Coverage & Hardscape Calculations
scale: 1"=16'

Lot Coverage Calculation

GROSS/NET LOT AREA:	19360.24 SF
ALLOWED LOT COVERAGE:	5808 SF / 30%
EXISTING LOT COVERAGE: 0 SF	
PROPOSED DRIVEWAY:	2118 SF
PROPOSED MAIN STRUCTURE ROOF AREA:	2977 SF
COVERED PATIOS AND DECKS:	304 SF
TOTAL LOT COVERAGE:	5228 SF
PROPOSED LOT COVERAGE AREA: 27%	

Hardscape Calculation

GROSS/NET LOT AREA:	19360.24 SF
ALLOWED HARDSCAPE:	1742 SF / 9%
EXISTING LOT COVERAGE: 0 SF	
WALKWAYS:	262 SF
STAIRS:	36 SF
RETAINING WALLS (R.W.):	282 SF
UNCOVERED DECKS:	44 SF
TOTAL HARDSCAPE:	624 SF
PROPOSED LOT COVERAGE AREA: 3%	

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7785 REGISTERED ARCHITECT
LUCIA PIRZIO-BIROLI
STATE OF WASHINGTON

STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

1 MODESTLY REVISED

Date: 3/15/2021 Pre-App
2/14/2022 Permit Submittal
1 8/25/2022 Sub2-2202-225

Scale:

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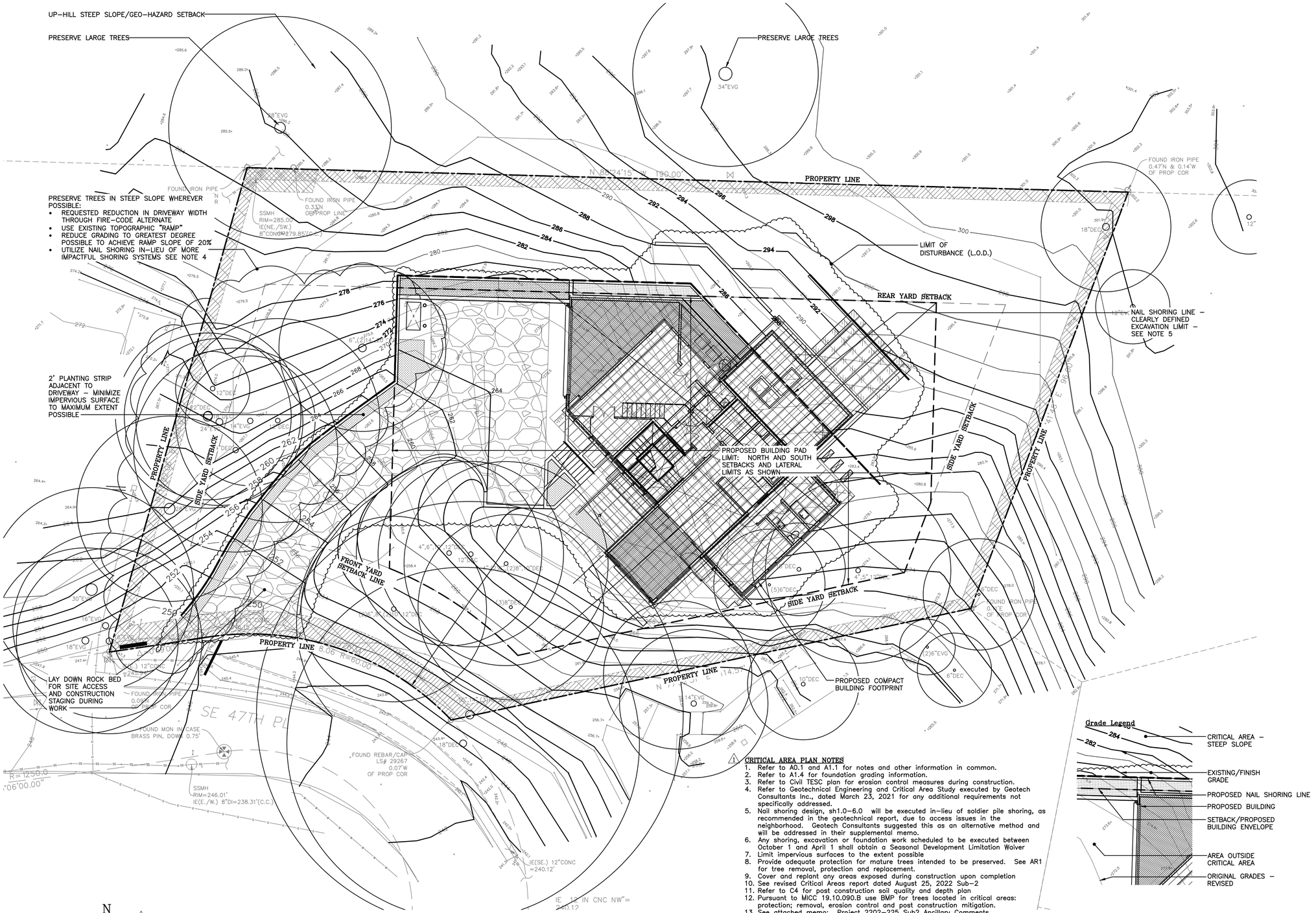
Site Calculations
A1.2



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1 Critical Area Review 2 Plan
scale: 1"=10'

CRITICAL AREA PLAN NOTES

1. Refer to A0.1 and A1.1 for notes and other information in common.
2. Refer to A1.4 for foundation grading information.
3. Refer to Civil TESC plan for erosion control measures during construction.
4. Refer to Geotechnical Engineering and Critical Area Study executed by Geotech Consultants Inc., dated March 23, 2021 for any additional requirements not specifically addressed.
5. Nail shoring design, sh1.0-6.0 will be executed in-lieu of soldier pile shoring, as recommended in the geotechnical report, due to access issues in the neighborhood. Geotech Consultants suggested this as an alternative method and will be addressed in their supplemental memo.
6. Any shoring, excavation or foundation work scheduled to be executed between October 1 and April 1 shall obtain a Seasonal Development Limitation Waiver
7. Limit impervious surfaces to the extent possible
8. Provide adequate protection for mature trees intended to be preserved. See AR1 for tree removal, protection and replacement.
9. Cover and replant any areas exposed during construction upon completion
10. See revised Critical Areas report dated August 25, 2022 Sub-2
11. Refer to C4 for post construction soil quality and depth plan
12. Pursuant to MICC 19.10.090.B use BMP for trees located in critical areas: protection; removal, erosion control and post construction mitigation.
13. See attached memo: Project 2202-225 Sub2 Ancillary Comments

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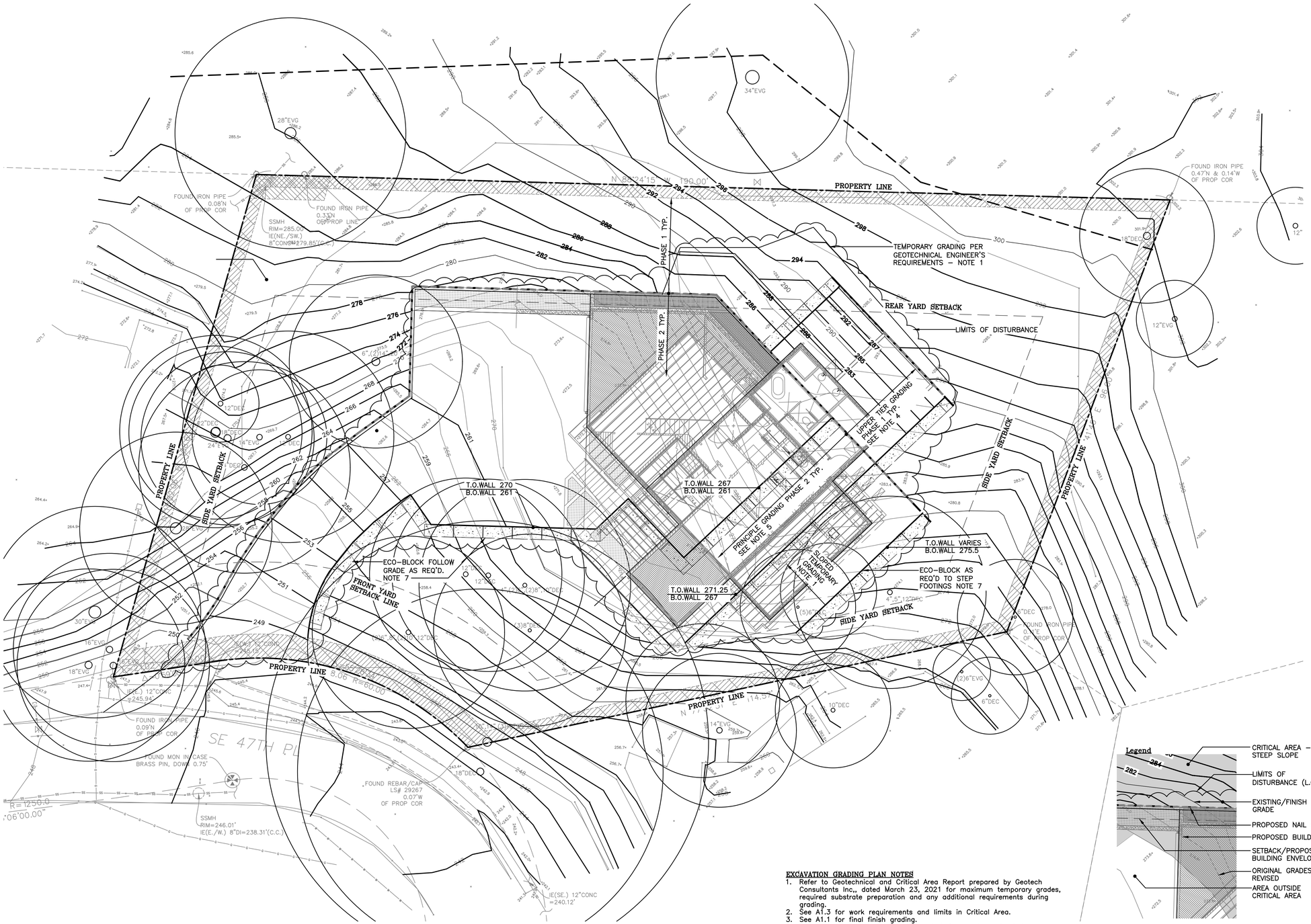
CAR 2
Plan
A1.3

1 NEW NUMBER - REVISED LOCATION IN SET



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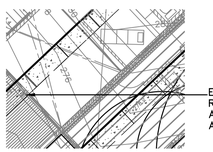
1 Excavation Grading Plan
scale: 1"=10'

EXCAVATION GRADING PLAN NOTES

1. Refer to Geotechnical and Critical Area Report prepared by Geotech Consultants Inc,, dated March 23, 2021 for maximum temporary grades, required substrate preparation and any additional requirements during grading.
2. See A1.3 for work requirements and limits in Critical Area.
3. See A1.1 for final finish grading.
4. Refer to Nail Shoring design (SH series) for requirements during execution of shoring.
5. Phase 1: Complete nail shoring, excavation, foundation work and final grading work at Upper Tier prior to start of phase 2
6. Phase 2: Begin work AFTER completion of Phase 1, including final grading. No heavy equipment above Phase 2 after phase 1 is complete.
7. Install Eco-Blocks as required for temporary shoring for foundation work. Blocks may remain in place if completely buried during final grading.
8. Any shoring, excavation or foundation work scheduled to be executed between October 1 and April 1 shall obtain a Seasonal Development Limitation Waiver
9. See attached memo: Project 2202-225 Sub2 Ancillary Comments



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1 NEW DRAWING

Excavation Grading Plan
A1.4

DAN AND SUSAN STEINBORN

8435 SE 47TH PLACE

MERCER ISLAND, WASHINGTON

PERMANENT SOIL NAIL RETAINING WALL PLANS

SHEET NUMBER	SHEET TITLE
SH1.0-1.1	COVER SHEET AND NOTES
SH2.0	WALL PLAN
SH3.0	WALL ELEVATION
SH4.0	CROSS-SECTIONS
SH5.0-5.1	DETAILS
SH6.0	SOIL NAILING SEQUENCE
SH7.0-7.1	SPECIFICATIONS

VICINITY MAP

GENERAL:

THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING DIMENSIONS AND SITE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS AND THOSE UTILITIES OR UNDERGROUND OBSTRUCTIONS NOT SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL ABANDONED UTILITIES, OR OTHER UNDERGROUND OBSTRUCTIONS THAT INTERFERE WITH THE NEW CONSTRUCTION.

THE CONTRACTOR AND SUBCONTRACTORS ARE RESPONSIBLE FOR THE CONSTRUCTION PROCESS AND THE SAFETY OF THE WORKERS. THIS INCLUDES BUT IS NOT LIMITED TO, THE CONSTRUCTION SEQUENCE, TEMPORARY HANDRAILS, EXCAVATION ACCESS, AND BARRIERS. IT ALSO INCLUDES LIFTING OF MATERIALS AND CONSTRUCTION EQUIPMENT INTO AND OUT OF THE EXCAVATION, TEMPORARY BRACING OF SINGLE-SIDED FORMWORK, TEMPORARY SHORING OF EXCAVATIONS, AND STABILITY OF ALL TEMPORARY CUT SLOPES.

REFERENCE DATA:

THE EXISTING SITE, TOPOGRAPHICAL, AND UTILITY DATA; THE PROPOSED GRADES, TOP AND BOTTOM OF WALL, AND THE WALL LOCATIONS, ARE ALL BASED ON THE FOLLOWING:

- THE AUTOCAD DRAWING FILES NAMED: "LOWER-LEVEL-PERMIT.DWG", DATED JULY 19, 2022, "SITEPLAN-PERMIT.DWG", DATED AUGUST 9, 2022, AND "ELEVATIONS-PERMIT-PANEL.DWG", DATED AUGUST 9, 2022, ALL PREPARED BY ECTYPOS ARCHITECTURE.

BUILDING CODES, DESIGN MANUALS, AND SPECIFICATIONS:

2018 INTERNATIONAL BUILDING CODE

PUBLICATION NO. FHWA-IF-03-017, GEOTECHNICAL ENGINEERING CIRCULAR NO. 7, SOIL NAIL WALLS

DESIGN LIVE LOADS:

FOR ALL THE WALLS, A UNIFORM SURCHARGE OF 250 PSF WAS CONSIDERED ON THE SLOPES BEHIND THE WALLS, EVEN THOUGH SURCHARGE IS UNLIKELY THERE. THE EXCEPTION IS IN NAIL SCHEDULE D (SEE WALL ELEVATION) WHERE A 500 PSF SURCHARGE WAS CONSIDERED TO ACCOUNT FOR THE FOOTING LOADS FROM THE STRUCTURE BEARING BEHIND THE WALL.

SEISMIC LOADING CONSIDERATIONS:

FOR THE PERMANENT SOIL NAIL WALLS, SEISMIC SLOPE STABILITY ANALYSES WERE PERFORMED FOR THE FINAL CONFIGURATION, BY CONSIDERING A PSEUDO-STATIC ACCELERATION OF 0.36 (CORRESPONDING TO AN MCE OF 0.67SS). SEISMIC LOADING WAS FOUND TO BE MORE CRITICAL TO THE DESIGN THAN THE PERMANENT STATIC LOADING CONDITION FOR THE DETERMINATION OF UPPER ROW NAIL LENGTHS ONLY. BUT NAIL BAR SIZES AND FACING LOADS WERE GOVERNED BY STATIC LOADING.

WALL TYPES/SCOPE:

ALL OF THE SOIL NAILS ARE PERMANENT, AND AS SUCH, EPOXY-COATED. ALL OF THE SHOTCRETE FACING IS ALSO PERMANENT, BEING 7" THICK, AND CONNECTED TO THE NAILS. SOME FACING AREAS RECEIVE A SPECIAL FLOAT FINISH AND WILL BE VISIBLE; WHILE OTHERS ARE NOT GOING TO BE VISIBLE AND THE FINISH CAN BE LESS SMOOTH.

DESIGN CALCULATIONS:

THE PERMANENT RETAINING WALL DESIGN CALCULATIONS ARE CONTAINED IN THE REPORT TITLED: "PERMANENT RETAINING WALL DESIGN CALCULATIONS AND PLANS, 8435 SE 47TH PLACE, MERCER ISLAND, WA", PREPARED BY GROUND SUPPORT PLLC FOR DAN AND SUSAN STEINBORN, DATED AUGUST 25, 2022.

SUBSURFACE DESIGN PARAMETERS:

THE SUBSURFACE CHARACTERIZATION USED TO DESIGN THE RETAINING WALLS IS BASED ON THE REPORT TITLED: "GEOTECHNICAL ENGINEERING STUDY, PROPOSED STEINBORN RESIDENCE, VACANT LOT EAST OF 8431 SE 47TH PLACE, PARCEL #3311500040, MERCER ISLAND, WASHINGTON", PREPARED BY GEOTECH CONSULTANTS, INC., DATED MARCH 23, 2021. THE FOLLOWING SOIL PROPERTIES WERE USED TO DESIGN THE SOIL NAIL RETAINING WALLS:

SUBSURFACE UNIT	UNIT WEIGHT (PCF)	SOIL FRICTION (DEG)	SOIL COHESION (PSF)	SERVICE NAIL PULLOUT (K/FT)
FILL	125	32	50	1.5
GLACIAL SOILS	135	40	100	3.5

FOR THE PURPOSES OF DESIGN OF THE RETAINING WALLS, THE WATER TABLE HAS BEEN ASSUMED TO OCCUR AT OR BENEATH THE BASE OF THE EXCAVATION, IN ACCORDANCE WITH THE FINDINGS FROM THE GEOTECHNICAL INVESTIGATION.

HOWEVER, SIGNIFICANT LOCALIZED WET ZONES AND/OR PERCHED POCKETS AND STRINGERS OF WATER-BEARING SOILS MAY BE ENCOUNTERED. THESE AREAS WILL REQUIRE SPECIAL ATTENTION TO DEWATERING USING METHODS SUCH AS INCREASED DRAIN BOARD COVERAGE, ADDITIONAL WEEP AND HEADER PIPES THROUGH THE SHOTCRETE WALL, AND SUMP PUMPS AS REQUIRED TO PREVENT THE WATER FROM CAUSING FACE INSTABILITY OR WATER PRESSURES FROM DEVELOPING BEHIND THE SHOTCRETE WALL DURING CONSTRUCTION.

RETAINING WALL STABILITY ANALYSES:

IN ACCORDANCE WITH THE REFERENCED FHWA PUBLICATION, THE FOLLOWING PARTIAL FACTORS OF SAFETY WERE USED IN THE ANALYSIS OF INTERNAL AND EXTERNAL RETAINING WALL STABILITY:

DESIGN COMPONENT	PARTIAL F.O.S. (TEMP)	PARTIAL F.O.S. (PERM)	PARTIAL F.O.S. (SEISMIC)
SOIL FRICTION	1.35	1.50	1.10
SOIL COHESION	1.35	1.50	1.10
SOIL-GROUT ADHESION	2.00	2.00	1.50
NAIL BAR YIELD	1.82	1.82	1.35
FACING CAPACITY	1.50	1.50	1.10

FOR THE INTERIM CONSTRUCTION CONDITIONS WHERE EXCAVATION FOR A LIFT HAS OCCURRED YET THE CORRESPONDING NAIL ROW HAS NOT BEEN INSTALLED, THE REQUIRED PARTIAL FACTORS OF SAFETY FOR SOIL FRICTION AND SOIL COHESION ARE REDUCED TO 1.20 IN ACCORDANCE WITH THE REFERENCED FHWA PUBLICATION.

SOIL NAIL THREADED BARS AND GROUT:

SOIL NAIL THREADED BARS SHALL CONFORM TO EITHER ASTM A615 / AASHTO M31, GRADE 75 OR ASTM A722 / AASHTO M275, GRADE 150, AS INDICATED ON THE PLANS.

SOIL NAIL GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI, AND A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 1500 PSI. SOIL NAIL GROUT MAY BE NEAT-CEMENT GROUT OR READY-MIX SAND-CEMENT GROUT, TYPE I/II PORTLAND CEMENT CONFORMING TO ASTM C150 / AASHTO M85 SHALL BE USED.

SHOTCRETE:

ALL SHOTCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI, AND A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 2000 PSI. SEE THE SPECIFICATIONS PLAN SHEETS FOR SPECIFIC REQUIREMENTS.

TYPE I/II PORTLAND CEMENT CONFORMING TO ASTM C150 / AASHTO M85 SHALL BE USED FOR SHOTCRETE. SUBMIT MIX DESIGNS IN ACCORDANCE WITH THE SPECIFICATIONS.

TEMPORARY SHOTCRETE MAY BE LEFT WITH A SCREEDED FINISH. PERMANENT SHOTCRETE SHALL RECEIVE A SMOOTH FLOAT FINISH.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 / AASHTO M31, GRADE 60 FOR DEFORMED BARS, AND ASTM A185 / AASHTO M55 FOR WELDED WIRE FABRIC. ALL REINFORCING DETAILS IN ACCORDANCE WITH ACI 315 MANUAL OF STANDARD PRACTICE.

WELDED WIRE FABRIC (WWF) LAPS SHALL BE 2 SQUARES. ALL DEFORMED REINFORCING BAR LAPS SHALL BE CLASS B, IN ACCORDANCE WITH THE 2018 INTERNATIONAL BUILDING CODE, OR AS SUMMARIZED IN THE FOLLOWING TABLE:

BAR SIZE	TENSILE DEVELOP LENGTH (IN)	LAP SPLICE LENGTH (IN)
#4	12	16
#5	15	20
#6	22	28
#7	36	48
#8	48	62

STRUCTURAL STEEL:

ALL STRUCTURAL STEEL WIDE FLANGE AND OTHER ROLLED SHAPES SHALL CONFORM TO ASTM A572 / AASHTO M270, GRADE 50; ALL STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A36 / AASHTO M270, GRADE 36; ALL RECTANGULAR STEEL TUBE MALERS SHALL CONFORM TO ASTM A500, GRADE B; AND ALL PIPES SHALL CONFORM TO ASTM A53 GRADE B, UNLESS SHOWN OTHERWISE ON THE PLANS, OR APPROVED OTHERWISE BY THE ENGINEER.

STRUCTURAL WELDING:

MINIMUM WELD SIZE 1/4" CONTINUOUS FILLET. MINIMUM WELD LENGTH 2 INCHES. ALL WELDING TO BE PERFORMED BY WABO-CERTIFIED WELDERS PER AWS STANDARD SPECIFICATIONS. USE E70XX ELECTRODES.

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8/25/22

STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

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Cover Sheet and Notes

SH1.0

HEADED STUDS:

ALL HEADED STUDS SHALL CONFORM TO ASTM A108 UNO. HEADED STUDS SHALL BE "NELSON STUDS" BY NELSON DIVISION OF TRW, INC. OR AN APPROVED EQUAL, AUTOMATICALLY END WELDED.

GEOCOMPOSITE WALL DRAINAGE BOARD:

ALL GEOCOMPOSITE WALL DRAINAGE BOARD SHALL BE AMERDRAIN 500, MIRAFI 6100, OR AN APPROVED EQUAL.

SPECIAL INSPECTION OF THE SHORING WALLS:

IN ACCORDANCE WITH SECTION 1704 OF IBC (2018), SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING SHORING ITEMS OR PROCESSES: SOIL NAIL INSTALLATION; SOIL NAIL TESTING; AND SHOTCRETE FACING/LAGGING MATERIALS TESTING AND PLACEMENT.

SHORING MONITORING:

SURVEY MONITORING OF THE SHORING WALLS, SHALL BE PERFORMED TO DETERMINE THE VERTICAL AND HORIZONTAL MOVEMENT OF THE MONITORING POINTS. THE MEASURING SYSTEM SHALL HAVE AN ACCURACY OF AT LEAST 0.01 FEET.

THE MONITORING PROGRAM SHALL BE DETERMINED BY THE GEOTECHNICAL SPECIAL INSPECTOR BUT, AT A MINIMUM, SHALL INCLUDE THE FOLLOWING:

- MONITORING POINTS SHALL CONSIST OF RODS OR BOLTS EMBEDDED INTO THE OBJECT OF INTEREST OR CROSS-HAIRS INSCRIBED ONTO A PLATE THAT IS ATTACHED TO THE OBJECT OF INTEREST.

- MONITORING POINTS SHALL BE ESTABLISHED: (1) A MAXIMUM OF 25 FEET ON CENTER AT THE TOP OF THE SHOTCRETE WALLS, (2) A MAXIMUM OF 25 FEET ON CENTER A DISTANCE OF 5 FEET BEHIND THE SHORING WALLS WHERE THERE ARE NO ADJACENT BUILDINGS, (3) A MAXIMUM OF 25 FEET ON CENTER A DISTANCE BEHIND THE SHORING WALLS WHERE THERE ARE NO ADJACENT BUILDINGS EQUAL TO THE EXCAVATION HEIGHT OF THE WALL, AND (4) ON ANY ADJACENT STRUCTURES THAT ARE LOCATED WITHIN A HORIZONTAL DISTANCE EQUAL TO THE WALL HEIGHT ALONG THE SHORING WALLS.

- READINGS SHALL BE TAKEN AND REPORTED AT LEAST TWICE A WEEK, ONE TIME OF WHICH MUST BE BY A LICENSED SURVEYOR.

MONITORING DATA SHALL BE DISTRIBUTED TO THE GEOTECHNICAL ENGINEER, THE SHORING DESIGN ENGINEER, AND THE GENERAL CONTRACTOR FOR REVIEW.

THE EXPECTED LATERAL SHORING WALL MOVEMENT IS ON THE ORDER OF 1/2". IF MOVEMENTS EXCEED 1/2", THE EXCAVATION SHALL BE HALTED UNTIL FURTHER REVIEW BY GROUND SUPPORT PLLC.

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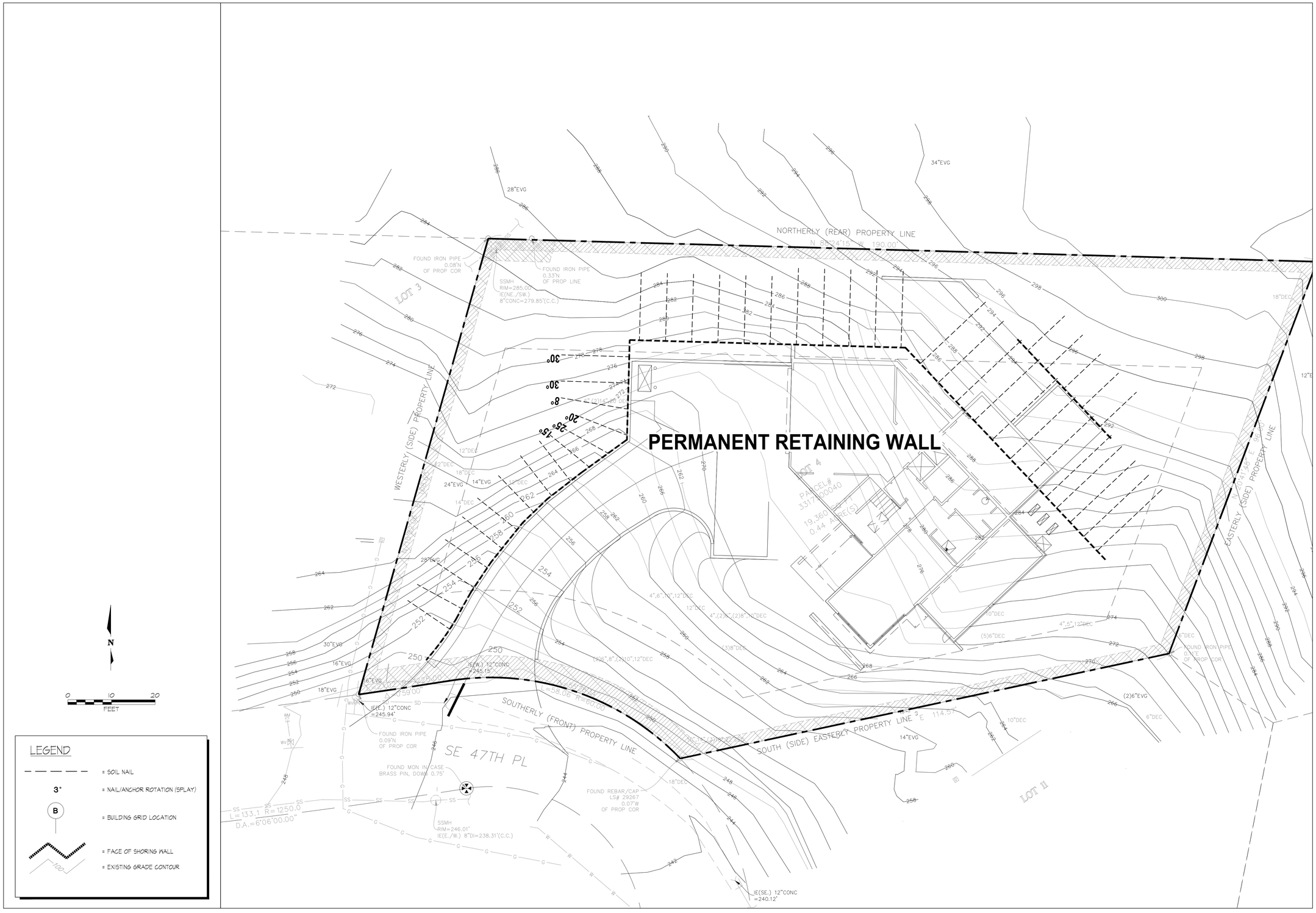
Notes

SH1.1



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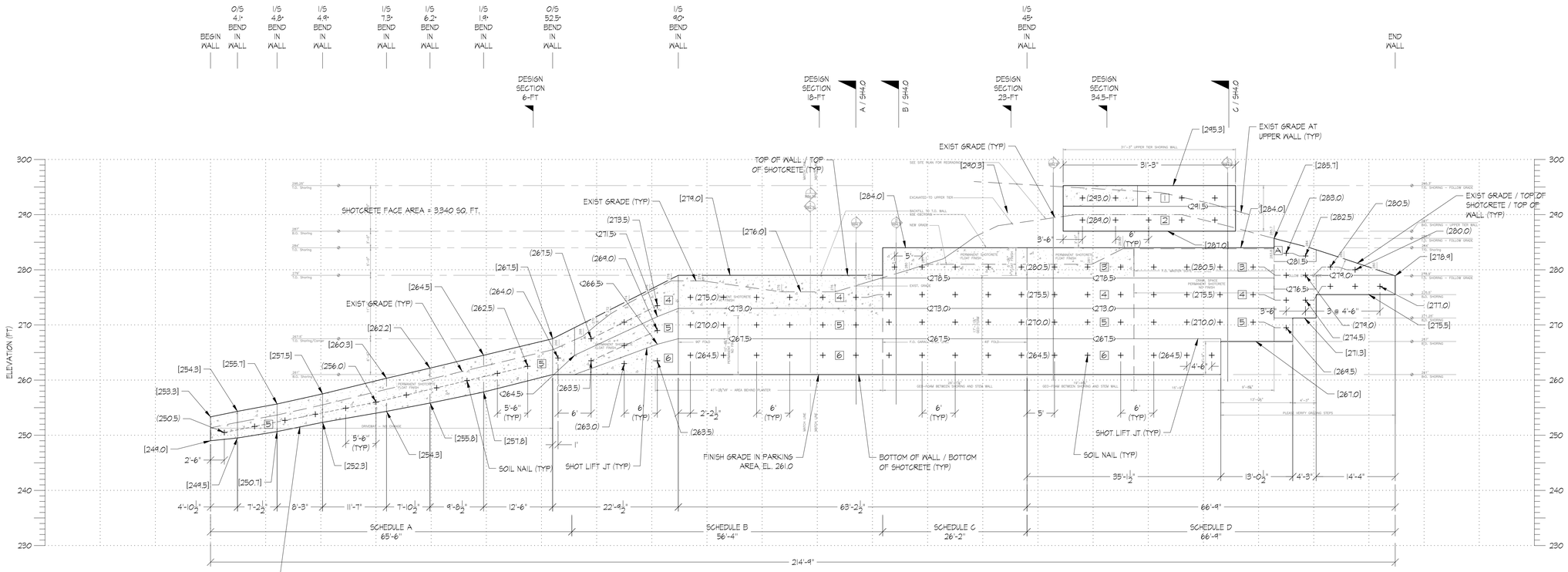
Wall Plan

SH2.0



PERMANENT SOIL NAIL WALL

SCHEDULE A

ROW	BAR	GRADE	L (UNO)	α (UNO)	Q_D	FACING
5	#8	75	12	15	3.5	F40

PERMANENT SOIL NAIL WALL

SCHEDULE B

ROW	BAR	GRADE	L (UNO)	α (UNO)	Q_D	FACING
4	#8	75	16	15	3.5	F40
5	#8	75	16	15	3.5	F40
6	#8	75	12	15	3.5	F40

PERMANENT SOIL NAIL WALL

SCHEDULE C

ROW	BAR	GRADE	L (UNO)	α (UNO)	Q_D	FACING
3	#8	75	18	15	3.5	F40
4	#8	75	18	15	3.5	F40
5	#8	75	18	15	3.5	F40
6	#8	75	12	15	3.5	F40

PERMANENT SOIL NAIL WALL

SCHEDULE D

ROW	BAR	GRADE	L (UNO)	α (UNO)	Q_D	FACING
1	#8	75	12	15	3.5	F40
2	#8	75	12	15	3.5	F40
A	#8	75	18	15	3.5	F40
3	#8	75	21	15	3.5	F40
4	#8	75	21	15	3.5	F40
5	#8	75	18	15	3.5	F40
6	#8	75	12	15	3.5	F40

LEGEND

[3]	NAIL ROW	BAR	SIZE OF NAIL BAR
+	NAIL	GRADE	STEEL GRADE OF NAIL BAR
[27.0]	GRADE ELEVATION	L	MIN DRILLED LENGTH (FT)
(42.5)	NAIL ROW ELEVATION	α	NAIL DECLINATION ANGLE FROM HORIZONTAL (DEGREES)
‹38.0›	SHOTCRETE JOINT ELEVATION	Q_D	DESIGN NAIL PULLOUT RESISTANCE (K/FT)
20°	SPECIFIC NAIL DECLINATION	N1	ANALYSIS SECTION LOCATION AND IDENTIFICATION
A / SH4.0	CROSS SECTION LOCATION AND IDENTIFICATION		

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FEET

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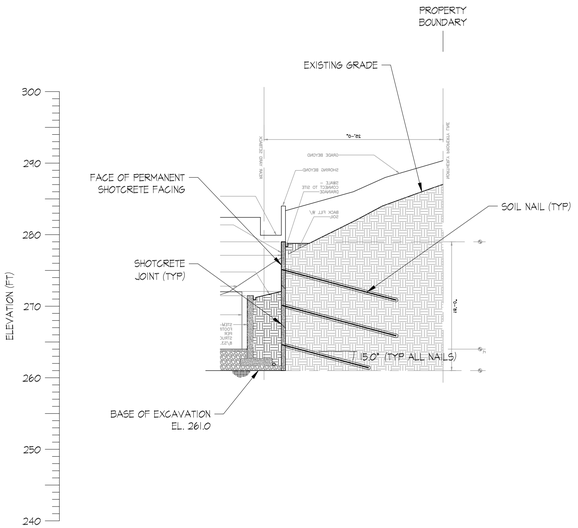
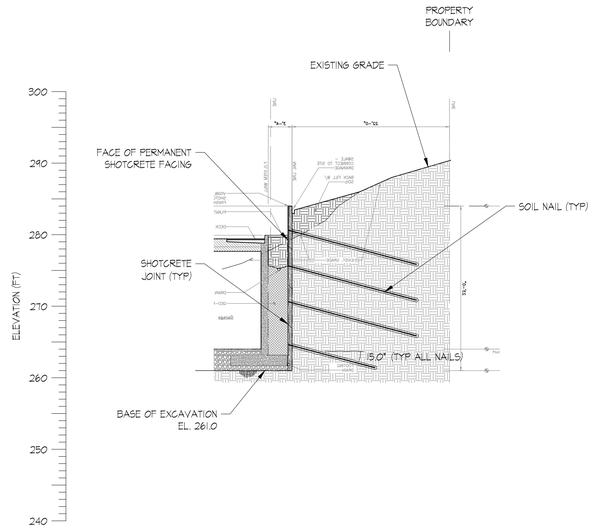
Wall Elevation
SH3.0



A SH4.0 CROSS-SECTION

0 10 FEET



B SH4.0 CROSS-SECTION

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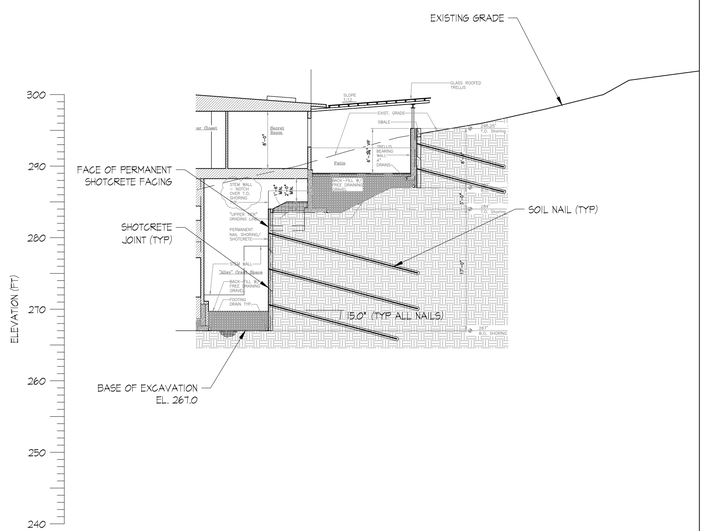

C SH4.0 CROSS-SECTION

0 10 FEET

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Cross-Sections
SH4.0

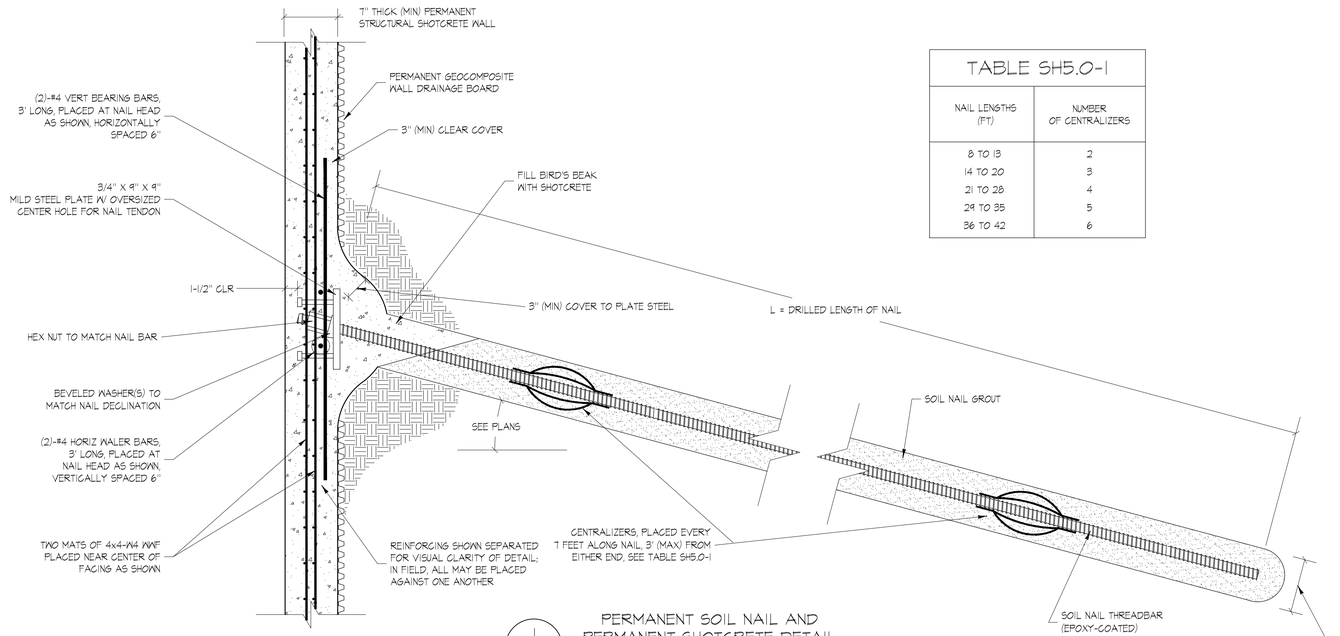
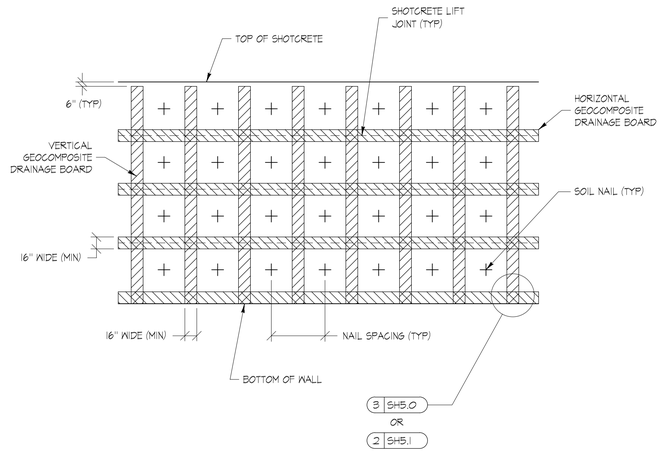


TABLE SH5.0-1	
NAIL LENGTHS (FT)	NUMBER OF CENTRALIZERS
8 TO 13	2
14 TO 20	3
21 TO 28	4
29 TO 35	5
36 TO 42	6

1 / SH5.0 PERMANENT SOIL NAIL AND PERMANENT SHOTCRETE DETAIL
NOT TO SCALE



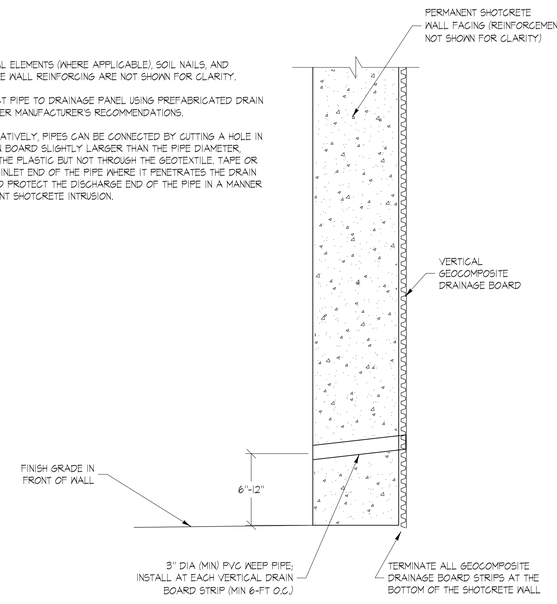
2 / SH5.0 WALL FACE DRAINAGE DETAIL
NOT TO SCALE

NOTES:

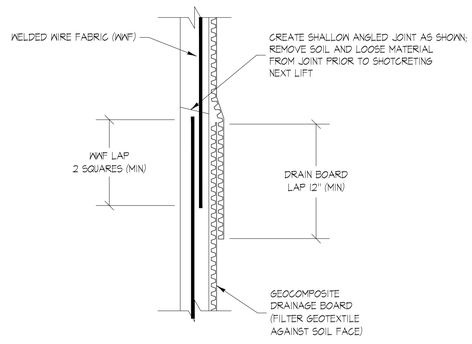
1. VERTICAL ELEMENTS (WHERE APPLICABLE), SOIL NAILS, AND SHOTCRETE WALL REINFORCING ARE NOT SHOWN FOR CLARITY.

2. CONNECT PIPE TO DRAINAGE PANEL USING PREFABRICATED DRAIN GRATES PER MANUFACTURER'S RECOMMENDATIONS.

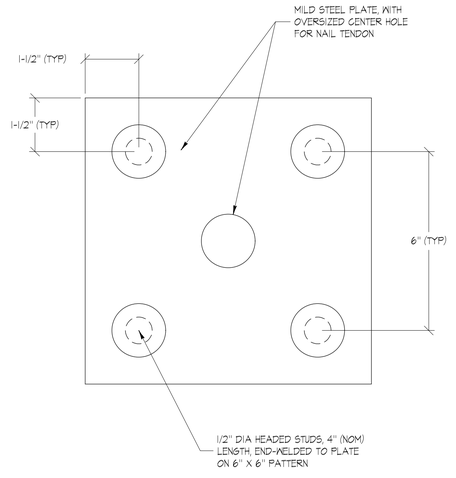
3. ALTERNATIVELY, PIPES CAN BE CONNECTED BY CUTTING A HOLE IN THE DRAIN BOARD SLIGHTLY LARGER THAN THE PIPE DIAMETER THROUGH THE PLASTIC BUT NOT THROUGH THE GEOTEXTILE. TAPE OR SEAL THE INLET END OF THE PIPE WHERE IT PENETRATES THE DRAIN STRIP, AND PROTECT THE DISCHARGE END OF THE PIPE IN A MANNER TO PREVENT SHOTCRETE INTRUSION.



3 / SH5.0 BOTTOM OF WALL DETAIL (WHERE WEEPS ARE EXPOSED)
NOT TO SCALE



4 / SH5.0 WALL FACING JOINT AND LAP DETAIL
NOT TO SCALE



5 / SH5.0 HEADED STUD AND BEARING PLATE DETAIL
NOT TO SCALE

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Details
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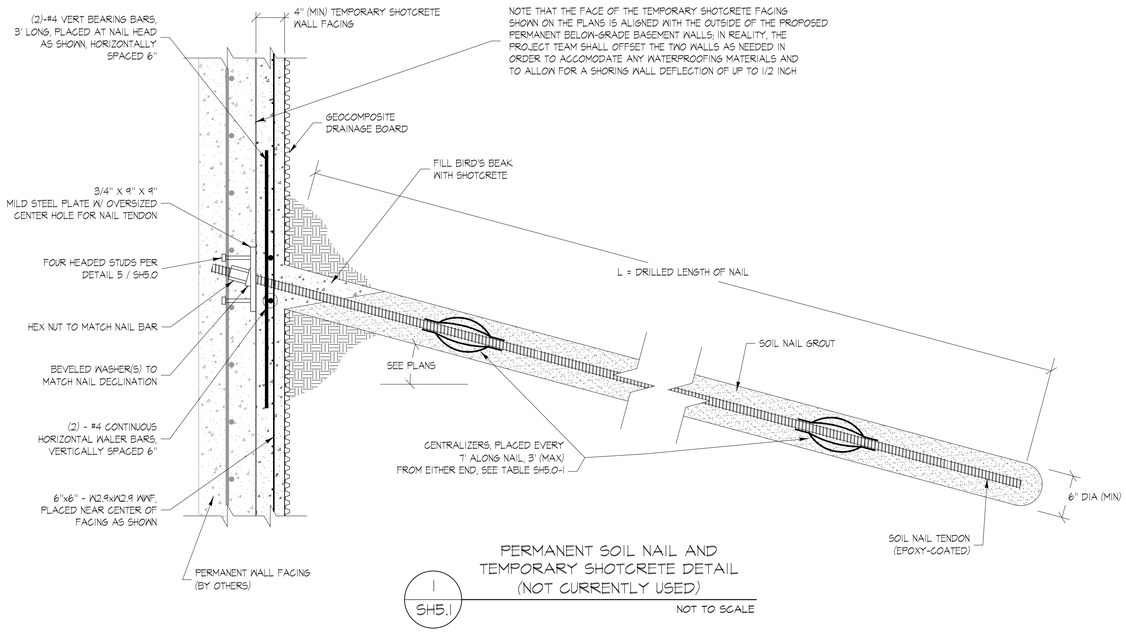


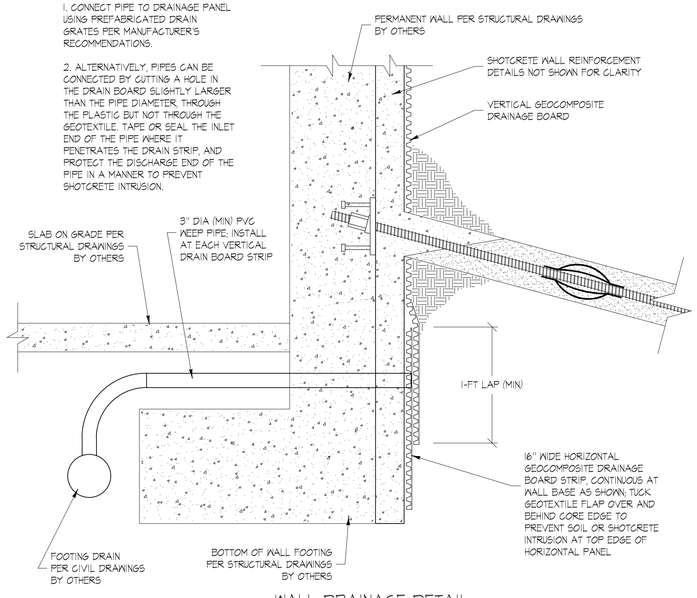
1 / SH5.1 — PERMANENT SOIL NAIL AND TEMPORARY SHOTCRETE DETAIL (NOT CURRENTLY USED)

NOT TO SCALE

NOTES:

1. CONNECT PIPE TO DRAINAGE PANEL USING PREFABRICATED DRAIN GRATES PER MANUFACTURER'S RECOMMENDATIONS.

2. ALTERNATIVELY, PIPES CAN BE CONNECTED BY CUTTING A HOLE IN THE DRAIN BOARD SLIGHTLY LARGER THAN THE PIPE DIAMETER, THROUGH THE PLASTIC BUT NOT THROUGH THE GEOTEXTILE. TAPE OR SEAL THE INLET END OF THE PIPE WHERE IT PENETRATES THE DRAIN STRIP, AND PROTECT THE DISCHARGE END OF THE PIPE IN A MANNER TO PREVENT SHOTCRETE INTRUSION.



2 / SH5.1 — WALL DRAINAGE DETAIL (WHERE WEEPS BELOW SLAB)

NOT TO SCALE

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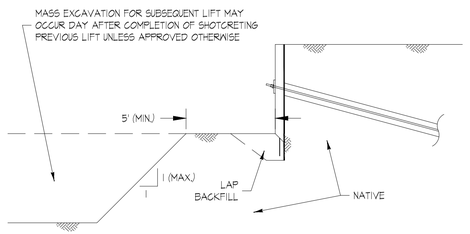
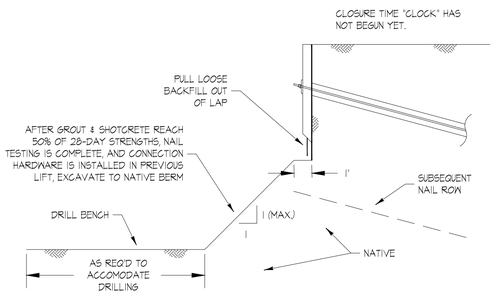
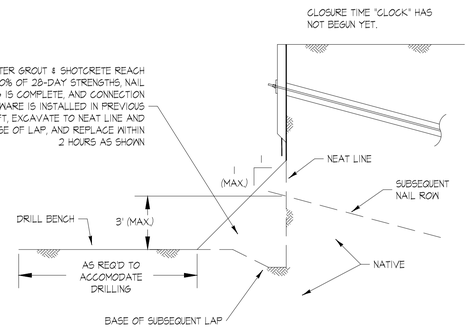
SH5.1



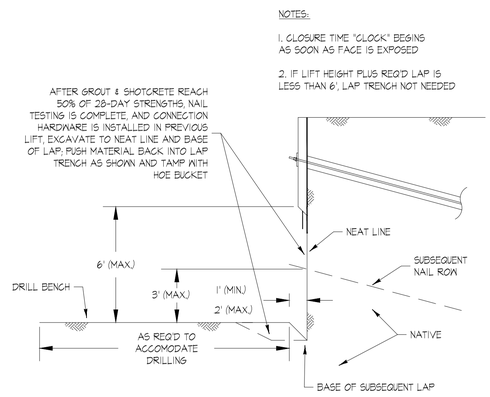
1 SH6.0 STEP 1
MASS EXCAVATION FOR SUBSEQUENT LIFT
NOT TO SCALE



2-A SH6.0 STEP 2
EXCAVATION FOR DRILL BENCH AND BERM
METHOD A - NATIVE BERM
NOT TO SCALE



2-B SH6.0 STEP 2
EXCAVATION FOR DRILL BENCH AND BERM
METHOD B - SOFT/FILL BERM
NOT TO SCALE

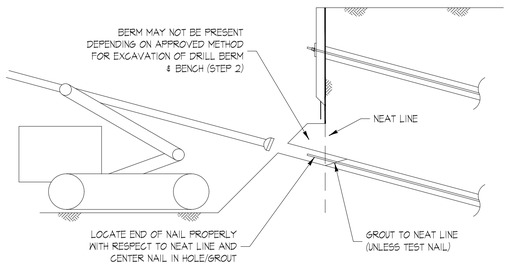


2-C SH6.0 STEP 2
EXCAVATION FOR DRILL BENCH AND BERM
METHOD C - NEAT CUT
NOT TO SCALE

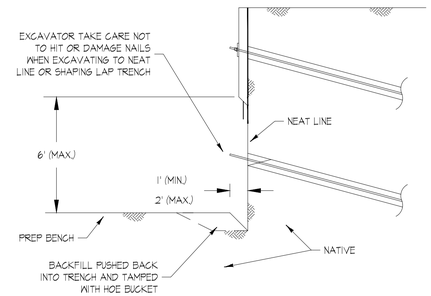
NOTES:

1. CLOSURE TIME "CLOCK" BEGINS AS SOON AS BERM IS REMOVED (IF APPLICABLE)

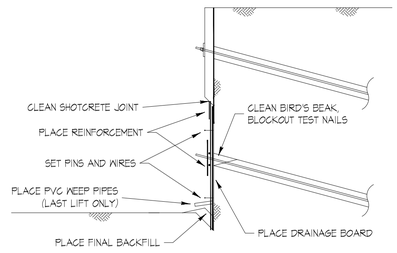
2. IF LIFT HEIGHT PLUS REQ'D LAP IS LESS THAN 6', LAP TRENCH IS NOT NEEDED



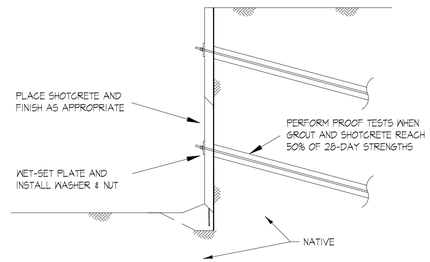
3 SH6.0 STEP 3
DRILL AND GROUT NAILS
NOT TO SCALE



4 SH6.0 STEP 4
EXCAVATE NEAT LINE AND PREP BENCH
NOT TO SCALE



5 SH6.0 STEP 5
PREPARE WALL FACING COMPONENTS
NOT TO SCALE



6 SH6.0 STEP 6
SHOTCRETE, WET SET CONNECTION, TEST NAILS
NOT TO SCALE

CONSTRUCTION NOTES:

BASED ON THE REFERENCED GEOTECHNICAL REPORT, THE SUBSURFACE CONDITIONS AT THE PROJECT SITE GENERALLY CONSIST OF A THIN VENEER OF FILL LESS THAN ABOUT 5-FT THICK, UNDERLAIN BY VERY DENSE GLACIAL TILL.

FOR STEP 2, IF LESS COMPETENT SOILS ARE ENCOUNTERED, ONLY METHOD A IS APPROVED BY THE ENGINEER.

FOR STEP 2, FOR THE UPPERMOST LIFT ALONG ANY WALL, WHEN VERY DENSE NATIVE SOIL IS ENCOUNTERED, METHOD B IS APPROVED BY THE ENGINEER.

FOR STEP 2, FOR LIFTS OTHER THAN THE UPPERMOST LIFT ALONG ANY WALL, WHEN VERY DENSE NATIVE SOIL IS ENCOUNTERED, METHOD C IS APPROVED BY THE ENGINEER, BUT METHOD B IS HIGHLY RECOMMENDED.

IF AT ANY TIME DURING CONSTRUCTION, THE SOIL FACE APPEARS TO BE DISTRESSED IN SUCH A WAY AS TO CAUSE POTENTIAL FOR SLOUGHING, FALLOUT, OR LARGE OVERBREAKS, THEN EITHER METHOD A OR B WILL BE REQUIRED BY THE OWNER'S REPRESENTATIVE AS NECESSARY TO LIMIT SOIL DISTURBANCE AT THE FACE.

CLOSURE TIME, DEFINED AS THE TIME DURATION BETWEEN EXCAVATION OF THE NEAT CUT FACE AND PLACEMENT OF SHOTCRETE, SHALL BE NO GREATER THAN A SINGLE WORKSHIFT UNLESS APPROVED OTHERWISE BY THE ENGINEER OR THE OWNER'S REPRESENTATIVE.

METHODS OF CONSTRUCTION AND CLOSURE TIMES THAT ARE APPROVED BY THE ENGINEER OR THE OWNER'S REPRESENTATIVE DO NOT RELIEVE THE CONTRACTOR OF ALL RESPONSIBILITY FOR STABILITY OF THE TEMPORARY CUT FACE UNTIL IT IS CLOSED WITH HARDENED SHOTCRETE AND THE NAIL CONNECTION IS COMPLETELY INSTALLED.

SEE THE SOIL NAIL SHORING WALL SPECIFICATION SHEETS FOR SPECIFIC REQUIREMENTS FOR MATERIALS AND CONSTRUCTION.

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Soil Nailing Sequence
SH6.0

SECTION 02350 - SOIL NAIL WALLS

TABLE OF CONTENTS

1. GENERAL

1.1 DESCRIPTION

A. THE GENERAL CONTRACTOR AND SUBCONTRACTORS (HEREAFTER REFERRED TO COLLECTIVELY AS THE CONTRACTOR UNLESS INDICATED OTHERWISE) ARE RESPONSIBLE FOR THE CONSTRUCTION MEANS AND METHODS AND CONTROL THE PROCESS OF THE WORK. THIS INCLUDES THE CONSTRUCTION SEQUENCE, THE SAFETY OF THE WORKERS, TEMPORARY HANDRAILS, EXCAVATION ACCESS, BARRIERS, LIFTING OF MATERIALS AND CONSTRUCTION EQUIPMENT INTO AND OUT OF THE EXCAVATION, TEMPORARY BRACING OF FORMWORK, AND THE STABILITY OF ALL TEMPORARY CUT SLOPES.

B. THE SOIL NAIL SHORING WALL IS A SYSTEM OF SHORING DESIGNED TO SUPPORT THE EXCAVATION SIDEWALLS ONCE THE COMPONENTS OF THE SOIL NAILS AND FACING SYSTEM ARE COMPLETELY INSTALLED FOR ALL LIFTS UP TO AND INCLUDING THE CURRENT EXCAVATION LIFT. THE STABILITY OF INTERIM TEMPORARY FACE CUTS THAT EXIST PRIOR TO INSTALLATION OF THE WALL FACING IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

C. THE WORK SHALL CONSIST OF INSTALLING SOIL NAILS, WALL DRAINAGE, AND WALL FACING AS SPECIFIED HEREIN AND SHOWN ON THE PLANS. THE WORK SHALL ALSO INCLUDE EXCAVATING IN ACCORDANCE WITH THE STAGED LIFTS SHOWN ON THE PLANS, INSTALLING SOIL NAILS TO THE SPECIFIED MINIMUM LENGTH AND ORIENTATION INDICATED ON THE PLANS, PLACING THE WALL DRAINAGE ELEMENTS AND FACING, AND PERFORMING SOIL NAIL PULLOUT TESTING. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED FOR COMPLETING THE WORK.

1.2 PRECONSTRUCTION MEETING

A. A PRECONSTRUCTION MEETING SHALL BE HELD PRIOR TO THE START OF THE WORK AND SHALL BE ATTENDED BY THE OWNER'S REPRESENTATIVES, THE ENGINEER, THE GENERAL CONTRACTOR, THE EXCAVATION SUBCONTRACTOR, AND THE SOIL NAIL SPECIALTY SUBCONTRACTOR. THE PRECONSTRUCTION MEETING SHALL BE CONDUCTED TO CLARIFY THE REQUIREMENTS FOR THE WORK, TO COORDINATE THE CONSTRUCTION ACTIVITIES, AND TO IDENTIFY CONTRACTUAL RELATIONSHIPS AND RESPONSIBILITIES.

1.3 EXISTING SITE CONDITIONS, UTILITIES, AND UNDERGROUND OBSTRUCTIONS

A. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO ANY CONSTRUCTION ACTIVITIES FOR THE PURPOSE OF OBSERVING AND DOCUMENTING THE PRECONSTRUCTION CONDITION OF ALL STRUCTURES, INFRASTRUCTURE, SIDEWALKS, ROADWAYS, AND ALL OTHER FACILITIES ADJACENT TO THE SITE. DURING CONSTRUCTION, THE CONTRACTOR SHALL OBSERVE THE CONDITIONS ABOVE THE SOIL NAIL WALL ON A DAILY BASIS FOR SIGNS OF GROUND OR BUILDING MOVEMENTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE AND THE ENGINEER IF SIGNS OF MOVEMENT SUCH AS NEW CRACKS, INCREASED SIZE OF OLD CRACKS OR SEPARATION OF JOINTS IN STRUCTURES, FOUNDATIONS, STREETS OR PAVED AND UNPAVED SURFACES ARE OBSERVED. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WRITTEN DOCUMENTATION OF THE OBSERVED CONDITIONS WITHIN 24 HOURS OF INITIAL OBSERVATION.

B. THE CONTRACTOR MUST VERIFY ALL EXISTING DIMENSIONS AND SITE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS AND THOSE UTILITIES OR UNDERGROUND OBSTRUCTIONS NOT SHOWN ON THE PLANS, THAT MAY IMPACT OR CONFLICT WITH THE SOIL NAIL WALL.

C. BASED ON THE AS-BUILT LOCATIONS OF SIDE SEWERS, WATER SERVICE AND GAS OR POWER SERVICE LINES, THE CONTRACTOR SHALL SEEK APPROVAL OF THE ENGINEER TO SHIFT NAIL LOCATIONS TO AVOID CONFLICTS WITH THESE UTILITIES.

D. THE CONTRACTOR IS RESPONSIBLE FOR ANY REMOVAL OF ABANDONED UTILITIES, OR OTHER UNDERGROUND OBSTRUCTIONS THAT INTERFERE WITH THE SOIL NAIL WALL.

1.4 SPECIAL INSPECTION

A. IN ACCORDANCE WITH THE LOCAL BUILDING CODE, SPECIAL INSPECTION SHALL BE PROVIDED BY THE OWNER FOR ALL SOIL NAIL INSTALLATION AND TESTING AND FOR ALL SHOTCRETE WORK. SUCH INSPECTION SHALL INCLUDE OBSERVATION AND TESTING OF TEST PANELS AND PLACEMENT OF REINFORCING STEEL AND SHOTCRETE.

B. THE OWNER'S REPRESENTATIVE PROVIDING THE SPECIAL INSPECTION SHALL BE A QUALIFIED GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE WITH EXPERIENCE MONITORING SOIL NAIL WALL CONSTRUCTION. ACCURATE RECORDS DOCUMENTING THE SOIL NAIL WALL CONSTRUCTION SHALL BE MAINTAINED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL ASSIST THE OWNER'S REPRESENTATIVE AS NECESSARY TO OBTAIN THE AS-BUILT NAIL LOCATIONS, TOP OF WALL ELEVATIONS, AND ALL OTHER INFORMATION AS REQUIRED BY THE OWNER AND ENGINEER. SPECIAL INSPECTION AND TESTING OF THE SHOTCRETE WORK SHALL BE PROVIDED BY A QUALIFIED MATERIALS TESTING AGENCY APPROVED BY THE ENGINEER.

C. ALL SHOTCRETE AND SOIL NAIL GROUT SHALL BE TESTED, AND SOIL NAIL DESIGN ADHESIONS VERIFIED, IN ACCORDANCE WITH THESE SPECIFICATIONS.

2. CONSTRUCTION SITE DRAINAGE

A. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING CONSTRUCTION SITE DRAINAGE, BOTH BEHIND AND IN FRONT OF THE SOIL NAIL WALL, THAT IS INDEPENDENT OF THE WALL DRAINAGE SYSTEM.

B. AT LEAST 15 DAYS PRIOR TO INITIATING THE WORK, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SITE DRAINAGE PLAN ADDRESSING ALL ELEMENTS NECESSARY TO DIVERT, CONTROL, AND DISPOSE OF SURFACE WATER. AMONG OTHER MEANS, CONTROL OF SURFACE WATER FROM BEHIND THE WALL MAY BE ACCOMPLISHED BY GRADING AWAY FROM THE WALL, TRENCHES AND SUMPS, OR A SHOTCRETED GUTTER SYSTEM. IN ADDITION, THE EXCAVATION SHOULD BE GRADED SO AS TO DIRECT SURFACE WATER AWAY FROM THE TOE OF THE SOIL NAIL WALL AND TO PREVENT THE PONDING OF WATER.

C. EXISTING SUBSURFACE DRAINAGE FEATURES ENCOUNTERED DURING THE EXCAVATION SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNER'S REPRESENTATIVE. WORK IN THESE AREAS SHALL BE SUSPENDED UNTIL REMEDIAL MEASURES MEETING THE APPROVAL OF THE OWNER'S REPRESENTATIVE ARE IMPLEMENTED BY THE CONTRACTOR. REMEDIAL MEASURES FOR EXISTING SUBSURFACE DRAINAGE FEATURES ENCOUNTERED DURING THE WORK, WHICH WERE NOT IDENTIFIED ON THE PLANS, WILL BE PAID FOR AS EXTRA WORK PER THE CONTRACT DOCUMENTS.

D. THE CONTRACTOR IS RESPONSIBLE FOR THE CONDITION AND MAINTENANCE OF ANY PIPE OR CONDUIT USED TO CONTROL SURFACE WATER DURING CONSTRUCTION. UPON SUBSTANTIAL COMPLETION OF THE WORK, SURFACE WATER CONTROL PIPES OR CONDUITS SHALL BE REMOVED FROM THE SITE. ALTERNATIVELY, PIPES OR CONDUITS THAT ARE LEFT IN PLACE WITH THE APPROVAL OF THE OWNER'S REPRESENTATIVE SHALL BE FULLY GROUTED (ABANDONED) OR LEFT IN A MANNER THAT PROTECTS THE STRUCTURE AND ALL ADJACENT FACILITIES FROM GROUND LOSS ASSOCIATED WITH MIGRATION OF FINES THROUGH THE PIPE OR CONDUIT.

3. CONSTRUCTION METHODS AND SEQUENCE

A. AT LEAST 15 DAYS PRIOR TO INITIATING THE WORK, THE CONTRACTOR SHALL SUBMIT THE PROPOSED CONSTRUCTION METHODS AND SEQUENCE TO THE ENGINEER FOR REVIEW AND APPROVAL.

B. THE CONSTRUCTION SEQUENCE SHALL BE AS SHOWN ON THE PLANS, OR IN ACCORDANCE WITH THE APPROVED SUBMITTAL, UNLESS APPROVED OTHERWISE BY THE ENGINEER. NO EXCAVATIONS STEEPER OR HIGHER THAN THOSE SPECIFIED HEREIN OR ON THE PLANS SHALL BE MADE ABOVE OR BELOW THE SOIL NAIL WALL WITHOUT WRITTEN APPROVAL OF THE ENGINEER.

C. TENTATIVELY APPROVED CONSTRUCTION METHODS, SEQUENCE, AND FACE CLOSURE TIMES ARE INDICATED ON THE PLANS. HOWEVER, CONSTRUCTION METHODS, SEQUENCE OR CLOSURE TIMES THAT ARE EITHER INDICATED ON THE PLANS OR APPROVED OTHERWISE BY THE ENGINEER DO NOT RELIEVE THE CONTRACTOR OF ALL RESPONSIBILITY FOR STABILITY OF THE TEMPORARY CUT FACE UNTIL IT IS CLOSED AND STABILIZED WITH HARDENED SHOTCRETE AND THE NAIL HEAD CONNECTION IS COMPLETELY INSTALLED.

D. WHERE THE CONTRACTOR'S CONSTRUCTION SEQUENCING RESULTS IN A DISCONTINUOUS LIFT ALONG ANY NAIL ROW, THE ENDS OF THE LIFT SHALL EXTEND BEYOND THE ENDS OF THE NEXT LOWER LIFT BY AT LEAST 10 FEET. A SOIL BERM SHALL BE CONSTRUCTED IMMEDIATELY BENEATH THESE STEPPED LIFTS TO PREVENT SLOUGHING OR FAILURE THAT WOULD RESULT IN LOSS OF GROUND AT THE FACE.

4. EXCAVATION

A. AT LEAST 15 DAYS PRIOR TO INITIATING THE WORK, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL EXCAVATION EQUIPMENT TYPES AND METHODS OF EXCAVATING TO THE STAGED LIFTS INDICATED ON THE PLANS.

B. FOR DISTANCES AWAY FROM THE SHOTCRETE WALL FACE GREATER THAN THE CURRENT SHOTCRETE WALL HEIGHT OR 10 FEET, WHICHEVER IS MORE, MASS EXCAVATION MAY OCCUR AT ANY TIME, BUT WITH SLOPES NO STEEPER THAN 1H:1V, UNLESS APPROVED OTHERWISE BY THE ENGINEER.

C. MASS EXCAVATION OF THE DRILL BENCH FOR THE NEXT ROW OF SOIL NAILS MAY OCCUR ANY TIME THE DAY AFTER SHOTCRETING THE PRECEDING LIFT, PROVIDED SUCH EXCAVATION OCCURS NO CLOSER THAN 5 FEET FROM THE FACE OF THE SHOTCRETE.

D. MASS EXCAVATION BENEATH A PRECEDING SHOTCRETE LIFT, CLOSER THAN 5 FEET FROM THE SHOTCRETE WALL FACE, SHALL NOT OCCUR UNTIL: (1) NAIL GROUT AND SHOTCRETE ON THE PRECEDING LIFT SHALL HAVE REACHED 50% OF THEIR SPECIFIED 28-DAY COMPRESSIVE STRENGTHS; AND (2) INSTALLATION OF CONNECTION HARDWARE AND NAIL TESTING FOR THE PRECEDING LIFT ARE COMPLETE AND ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. MASS EXCAVATION CLOSER THAN 5 FEET TO THE SHOTCRETE FACE MUST BE IN ACCORDANCE WITH THE DRILL BERM REQUIREMENTS DESCRIBED BELOW AND SHOWN ON THE PLANS, UNLESS APPROVED OTHERWISE BY THE ENGINEER.

E. DURING MASS EXCAVATION OF THE DRILL BENCH FOR THE NEXT ROW OF SOIL NAILS, THE CONTRACTOR SHALL MAINTAIN A BENCH OF MATERIAL TO SERVE AS A PLATFORM FOR THE DRILLING EQUIPMENT AND AS A STABILIZING BERM FOR THE WALL EXCAVATION FACE (NEAT LINE). IN ACCORDANCE WITH THE PLANS OR AS APPROVED BY THE ENGINEER, THE STABILIZING BERM MAY BE EITHER (1) A NATIVE BERM, (2) A FILL BERM, OR (3) NEAT CUT. IN ALL THREE CASES, THE DRILL BENCH SHALL BE ESTABLISHED NOT MORE THAN 3-1/2 FEET BELOW THE ROW OF NAILS TO BE INSTALLED AND SHALL EXTEND OUT FROM THE WALL FACE A MINIMUM DISTANCE NECESSARY TO PROVIDE A SAFE WORKING BENCH FOR THE DRILL EQUIPMENT AND WORKERS.

F. EXCAVATION TO THE NEAT LINE SHALL BE DONE USING PROCEDURES THAT PREVENT OVEREXCAVATION OR LOOSENING, MINIMIZE DEGRADATION OF THE SOIL BEARING SUPPORT BELOW THE OVERLYING PORTIONS OF THE SOIL NAIL WALL AND BELOW THE SOIL NAILS CURRENTLY BEING INSTALLED, MINIMIZE LOSS OF SOIL MOISTURE, AND PREVENT GROUND FREEZING.

G. THE DURATION OF TIME BETWEEN FINAL EXCAVATION TO THE NEAT LINE AND THE APPLICATION OF SHOTCRETE IS REFERRED TO AS THE CLOSURE TIME. THE CLOSURE TIME FOR ALL WALL EXCAVATION FACES SHALL BE LESS THAN A SINGLE WORK SHIFT, UNLESS SHOWN OTHERWISE ON THE PLANS OR APPROVED OTHERWISE BY THE ENGINEER.

H. EXTENSION OF THE CLOSURE TIME SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. NO EXTENSION OF CLOSURE TIME SHALL BE APPROVED UNTIL A TEST CUT IS CONSTRUCTED AND THE CONTRACTOR DEMONSTRATES FOR EACH MATERIAL TYPE THAT THE CUT FACE WILL BE STABLE OVER THE PROPOSED CLOSURE TIME. EXTENSIONS TO THE CLOSURE TIME MAY BE REVOKED BY THE ENGINEER AT ANY TIME DEPENDING ON THE PERFORMANCE OF THE CUT FACE.

I. METHODS OF REMOVAL OF FACE PROTRUSIONS (E.G. COBBLES, BOULDERS, RUBBLE, OR OTHER OBJECTS) TO ACCOMPLISH THE CONSTRUCTION SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE PROPOSED METHOD FOR MITIGATION OF FACE PROTRUSIONS PRIOR TO INITIATION OF THE WORK. SHOULD THE REMOVAL OF FACE PROTRUSIONS RESULT IN VOIDS BEYOND THE NEAT LINE, THE CONTRACTOR SHALL DETERMINE THE APPROPRIATE METHOD OF BACKFILLING AND SHALL SUBMIT TO THE ENGINEER SUCH METHOD(S) PRIOR TO INITIATING THE WORK.

5. TEMPORARY AND PERMANENT SOIL NAILS

5.1 GENERAL

A. AT LEAST 15 DAYS PRIOR TO INITIATING THE WORK, THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER FOR REVIEW AND APPROVAL:

1. DRILLING METHODS AND EQUIPMENT INCLUDING DRILL RIG TYPE, USE OF CASED OR OPEN-HOLE METHODS, PROPOSED DRILLHOLE DIAMETER, AND METHOD OF CUTTINGS REMOVAL TO ACHIEVE THE SPECIFIED PULLOUT RESISTANCE.
2. NAIL GROUT MIX DESIGN INCLUDING: BRAND AND TYPE OF PORTLAND CEMENT; SOURCE, GRADATION, AND QUALITY OF ALL AGGREGATES; PROPORTIONS OF MIX BY WEIGHT AND WATER-CEMENT RATIO; MANUFACTURER AND BRAND NAME OF ALL ADMIXTURES; AND COMPRESSIVE STRENGTH TEST RESULTS (PER ASTM C109 / AASHTO T106) VERIFYING THE SPECIFIED MINIMUM 3 AND 28 DAY GROUT STRENGTHS.
3. NAIL GROUT PLACEMENT PROCEDURES AND EQUIPMENT.
4. NAIL TESTING METHODS AND EQUIPMENT INCLUDING DETAILS OF THE JACKING FRAME AND APPURTENANT BRACING, METHODS OF ISOLATING TEST NAILS DURING SHOTCRETE APPLICATION, AND METHODS OF GROUTING THE UNBONDED LENGTH OF TEST NAILS AFTER TESTING.
5. IDENTIFICATION NUMBERS AND CERTIFIED CALIBRATION RECORDS FOR EACH TEST JACK AND PRESSURE GAUGE PAIR TO BE USED. CALIBRATION RECORDS SHALL INCLUDE THE DATE TESTED, DEVICE IDENTIFICATION NUMBER, AND THE CALIBRATION TEST RESULTS AND SHALL BE CERTIFIED FOR AN ACCURACY OF AT LEAST 2 PERCENT OF THE APPLIED CERTIFICATION LOADS BY A QUALIFIED INDEPENDENT TESTING LABORATORY WITHIN 90 DAYS PRIOR TO SUBMITTAL.
6. ONCE AVAILABLE, CERTIFIED MILL TEST RESULTS FOR NAIL BARS FROM EACH HEAT SPECIFYING THE ULTIMATE STRENGTH, YIELD STRENGTH, ELONGATION AND COMPOSITION.
7. MANUFACTURER CERTIFICATIONS FOR THE SOIL NAIL CENTRALIZERS AND SOIL NAIL BAR COUPLERS.

5.2 MATERIALS

A. MATERIALS FOR CONSTRUCTION OF SOIL NAIL WALLS SHALL BE FURNISHED NEW AND WITHOUT DEFECTS. DEFECTIVE MATERIALS REJECTED BY THE OWNER'S REPRESENTATIVE SHALL BE REMOVED BY THE CONTRACTOR. THE MATERIALS SHALL CONSIST OF THE FOLLOWING:

1. CENTRALIZERS SHALL BE CONSTRUCTED OF SCHEDULE 40 PVC, SHALL BE SECURELY ATTACHED TO THE NAIL BAR, SIZED TO POSITION THE NAIL BAR WITHIN 1 INCH OF THE CENTER OF THE DRILLHOLE, SIZED TO ALLOW TREMIE PIPE INSERTION TO THE BOTTOM OF THE DRILLHOLE, AND SIZED TO ALLOW GROUT TO FLOW FREELY UP THE DRILLHOLE.
2. NAIL GROUT SHALL BE A NEAT CEMENT OR SAND-CEMENT MIXTURE WITH A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 1500 PSI AND A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI PER ASTM C109 / AASHTO T106.
3. CEMENT SHALL CONFORM TO ASTM C150 / AASHTO M85, TYPE 1.
4. FINE AGGREGATE SHALL CONFORM TO ASTM C33 / AASHTO M6.
5. NAIL BARS SHALL CONFORM TO ASTM A615 / AASHTO M31, GRADE 60 OR 75 OR ASTM A722 / AASHTO M275, GRADE 150.
6. BAR COUPLERS SHALL DEVELOP THE ULTIMATE TENSILE STRENGTH OF THE BAR AS CERTIFIED BY THE MANUFACTURER.

B. CEMENT SHALL BE ADEQUATELY STORED TO PREVENT MOISTURE DEGRADATION AND PARTIAL HYDRATION. CEMENT THAT HAS BECOME CAKED OR LUMPY SHALL NOT BE USED.

C. ALL NAIL BARS SHALL BE CAREFULLY HANDLED AND SHALL BE STORED ON SUPPORTS TO KEEP THE STEEL FROM CONTACT WITH THE GROUND. STEEL BARS SHALL BE PICKED UP IN SUCH A WAY AS TO PREVENT OVERSTRESSING. DAMAGE TO THE NAIL STEEL AS A RESULT OF OVERSTRESSING, ABRASION, CUTS, NICKS, WELDS, AND WELD SPLATTER SHALL BE CAUSE FOR REJECTION BY THE OWNER'S REPRESENTATIVE. GROUNDING OF WELDING LEADS TO THE NAIL STEEL SHALL NOT BE ALLOWED. NAIL STEEL SHALL BE PROTECTED FROM AND SUFFICIENTLY FREE OF DIRT, RUST, AND OTHER DELETERIOUS SUBSTANCES PRIOR TO INSTALLATION. HEAVY CORROSION OR PITTING OF NAILS SHALL BE CAUSE FOR REJECTION BY THE OWNER'S REPRESENTATIVE. LIGHT RUST THAT HAS NOT RESULTED IN PITTING IS ACCEPTABLE.

5.3 NAIL INSTALLATION

A. FOR EACH DIFFERENT METHOD OF NAIL INSTALLATION, TWO SUCCESSFUL VERIFICATION TESTS SHALL BE PERFORMED IN EACH SOIL UNIT IDENTIFIED ON THE PLANS, PRIOR TO STARTING INSTALLATION OF PRODUCTION NAILS IN THE VARIOUS SOIL UNITS. THE VERIFICATION TEST LOCATIONS ARE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE OWNER'S REPRESENTATIVE.

B. NAILS SHALL BE INSTALLED AT THE LOCATIONS AND TO THE LENGTHS INDICATED ON THE PLANS. THE ENGINEER MAY ADD, ELIMINATE, OR RELOCATE NAILS TO ACCOMMODATE ACTUAL FIELD CONDITIONS.

C. THE CONTRACTOR SHALL SELECT THE DRILLING EQUIPMENT AND METHODS SUITABLE FOR THE GROUND CONDITIONS DESCRIBED IN THE GEOTECHNICAL REPORT. THE DRILLHOLE DIAMETER SHALL BE SELECTED TO PROVIDE THE MINIMUM SPECIFIED GROUT COVER OVER THE NAIL BAR AND TO DEVELOP THE SPECIFIED PULLOUT RESISTANCE. WATER, DRILLING MUDS, OR OTHER FLUIDS USED TO ASSIST IN CUTTING REMOVAL SHALL NOT BE ALLOWED FOR UNCASED DRILLHOLES. UNCASED DRILLHOLES SHALL BE OBSERVED FOR CLEANLINESS PRIOR TO INSERTION OF THE NAIL BAR. IN CAVING GROUND, THE CONTRACTOR SHALL USE CASED OR AUGERCAST DRILLING METHODS TO SUPPORT THE SIDES OF THE DRILLHOLE.

D. THE CONTRACTOR SHALL IMMEDIATELY SUSPEND DRILLING OPERATIONS IF GROUND SUBSIDENCE IS OBSERVED, IF THE SOIL NAIL WALL IS ADVERSELY AFFECTED, OR IF ADJACENT STRUCTURES ARE DAMAGED AS A RESULT OF THE DRILLING OPERATION. THE ADVERSE CONDITIONS SHALL BE STABILIZED IMMEDIATELY AND THE ENGINEER SHALL BE NOTIFIED OF SUCH CONDITIONS WITHIN 24 HOURS.

E. NAIL BARS SHALL BE INSERTED INTO THE DRILLHOLE TO THE REQUIRED LENGTH WITHOUT DIFFICULTY AND IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE DRILLHOLE. NAIL BARS THAT CANNOT BE FULLY INSERTED TO THE DESIGN DEPTH SHALL BE REMOVED FROM THE DRILLHOLE AND THE DRILLHOLE SHALL BE CLEANED SUFFICIENTLY TO ALLOW UNOBSTRUCTED INSTALLATION OF THE BAR.

F. IF THE NAIL BAR IS INSTALLED USING CASED OR AUGERCAST METHODS, CENTRALIZERS ARE NOT REQUIRED PROVIDED THE INSTALLATION METHOD ENSURES THAT THE BAR WILL REMAIN IN THE CENTRAL PORTION OF THE GROUT. IN SUCH SITUATIONS, SLUMP SHALL NOT EXCEED 8 INCHES.

5.4 NAIL GROUTING

A. GROUT EQUIPMENT SHALL PRODUCE A UNIFORMLY MIXED GROUT FREE OF LUMPY AND UNDISPERSED CEMENT. A POSITIVE DISPLACEMENT GROUT PUMP SHALL BE USED. THE PUMP SHALL BE EQUIPPED WITH A PRESSURE GAUGE THAT CAN MEASURE AT LEAST TWICE BUT NO MORE THAN THREE TIMES THE INTENDED GROUT PRESSURE. THE GROUTING EQUIPMENT SHALL BE SIZED TO ENABLE THE ENTIRE NAIL TO BE GROUTED IN ONE CONTINUOUS OPERATION. THE MIXER SHALL BE CAPABLE OF CONTINUOUSLY AGITATING THE GROUT DURING USAGE.

B. UNCASED DRILLHOLES SHALL BE GROUTED AFTER INSTALLATION OF THE NAIL BAR. GROUTING PRIOR TO INSERTION OF THE NAIL BAR MAY BE ALLOWED PROVIDED NEAT CEMENT GROUT IS USED AND THE NAIL BAR IS IMMEDIATELY INSERTED THROUGH THE GROUT TO THE SPECIFIED LENGTH WITHOUT DIFFICULTY. NO PORTION OF THE NAIL HOLE SHALL BE LEFT OPEN FOR MORE THAN 1 HOUR PRIOR TO GROUTING UNLESS APPROVED OTHERWISE BY THE ENGINEER. THE GROUT SHALL BE INJECTED AT THE LOWEST POINT OF EACH DRILLHOLE THROUGH A TREMIE PIPE, HOLLOW-STEM AUGER, OR DRILL RODS WITH THE DRILLHOLE FILLED IN ONE CONTINUOUS OPERATION. COLD JOINTS IN THE GROUT PLACEMENT ARE ALLOWED FOR CONSTRUCTION OF TEST NAILS. THE CONDUIT DELIVERING THE GROUT SHALL BE KEPT BELOW THE SURFACE OF THE GROUT AS THE CONDUIT IS WITHDRAWN. THE GROUTING CONDUIT SHALL BE WITHDRAWN AS THE NAIL HOLE IS FILLED IN A MANNER WHICH PREVENTS THE CREATION OF VOIDS. THE QUANTITY OF GROUT AND THE GROUTING PRESSURES SHALL BE RECORDED FOR EACH SOIL NAIL. GROUT PRESSURES SHALL BE CONTROLLED TO PREVENT EXCESSIVE GROUND HEAVE OR FRACTURING.

C. DURING CASING REMOVAL FOR DRILLHOLES ADVANCED BY EITHER CASED OR AUGERCAST METHODS, THE GROUT SURFACE WITHIN THE CASING SHALL BE CONTINUALLY MONITORED FOR MAINTENANCE OF "HEAD" SUFFICIENT TO OFFSET THE EXTERNAL GROUNDWATER/SOIL PRESSURE.

D. NAIL GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI IN 3 DAYS AND 3000 PSI IN 28 DAYS. NAIL GROUT SHALL BE TESTED BY A TESTING AGENCY UNDER CONTRACT WITH THE OWNER IN ACCORDANCE WITH ASTM C109 / AASHTO T106 AT A FREQUENCY OF NO LESS THAN ONE TEST FOR EVERY 50 CUBIC YARDS OF GROUT PLACED OR ONCE PER WEEK, WHICHEVER IS FIRST.

E. TEMPORARY UNBONDED LENGTHS SHALL BE PROVIDED FOR EACH TEST NAIL. THE TEST NAIL BAR SHALL BE ISOLATED FROM THE WALL FACING AND THE REACTION FRAME DURING TESTING. SATISFACTORY TEST NAILS MAY BE INCORPORATED IN THE WORK PROVIDED THE TEMPORARY TEST UNBONDED LENGTH IS FULLY GROUTED SUBSEQUENT TO TESTING.

5.5 NAIL TOLERANCES

A. THE SOIL NAILS SHALL NOT EXTEND BEYOND THE RIGHT-OF-WAY OR EASEMENT LIMITS SHOWN ON THE PLANS, UNLESS APPROVED OTHERWISE. BARS SHALL BE CENTERED WITHIN 1 INCH OF THE CENTER OF THE DRILLHOLE. INDIVIDUAL NAILS SHALL BE POSITIONED PLUS OR MINUS 1 FOOT FROM THE DESIGN LOCATIONS SHOWN IN THE PLANS. LOCATION TOLERANCES SHALL BE CONSIDERED APPLICABLE TO ONLY ONE NAIL AND NOT CUMULATIVE OVER LARGE WALL AREAS. THE NAIL INCLINATION SHALL BE PLUS OR MINUS 3 DEGREES OF THAT SHOWN IN THE PLANS. NAIL SPLAY ANGLE SHALL BE WITHIN PLUS OR MINUS 3 DEGREES. NAILS THAT ENCOUNTER UNANTICIPATED OBSTRUCTIONS DURING DRILLING SHALL BE RELOCATED BY THE CONTRACTOR WITH THE APPROVAL OF THE ENGINEER.

5.6 NAIL TESTING

5.6.1 GENERAL

A. VERIFICATION TESTS SHALL BE PERFORMED AT THE LOCATIONS SELECTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. PROOF TESTS SHALL BE PERFORMED AT THE LOCATIONS SELECTED BY THE OWNER'S REPRESENTATIVE. ALL TEST DATA SHALL BE RECORDED BY THE OWNER'S REPRESENTATIVE, UNLESS APPROVED OTHERWISE. PULLOUT TESTING OF NAILS SHALL NOT BE PERFORMED UNTIL THE NAIL GROUT AND WALL FACING HAVE ATTAINED AT LEAST 50 PERCENT OF THEIR SPECIFIED 28-DAY COMPRESSIVE STRENGTHS.

B. WHERE TEMPORARY CASING OF THE UNBONDED LENGTH OF TEST NAILS IS PROVIDED, THE CASING SHALL BE INSTALLED TO PREVENT ANY REACTION BETWEEN THE CASING AND THE GROUTED BOND LENGTH OF THE NAIL AND/OR THE STRESSING APPARATUS.

C. TESTING EQUIPMENT SHALL INCLUDE TWO DIAL GAUGES, A DIAL GAUGE SUPPORT, JACK AND PRESSURE GAUGE, A PUMP, AND A REACTION FRAME.

D. A MINIMUM OF TWO DIAL GAUGES CAPABLE OF MEASURING TO 0.001-INCH SHALL BE AVAILABLE AT THE SITE TO MEASURE THE NAIL MOVEMENT. THE DIAL GAUGES SHALL BE ALIGNED WITHIN 5 DEGREES OF THE AXIS OF THE NAIL AND SHALL BE SUPPORTED INDEPENDENT OF THE JACKING SETUP AND THE WALL. A HYDRAULIC JACK, PRESSURE GAUGE, AND PUMP SHALL BE USED TO APPLY AND MEASURE THE TEST LOAD.

E. THE JACK AND PRESSURE GAUGE SHALL BE CALIBRATED BY AN INDEPENDENT TESTING LABORATORY AS A UNIT. THE PRESSURE GAUGE SHALL BE GRADUATED IN 100 PSI INCREMENTS OR LESS AND SHALL HAVE A RANGE NOT EXCEEDING TWICE THE ANTICIPATED MAXIMUM PRESSURE DURING TESTING UNLESS APPROVED OTHERWISE BY THE ENGINEER. THE RAM TRAVEL OF THE JACK SHALL BE SUFFICIENT TO ENABLE THE TEST TO BE PERFORMED WITHOUT RESETTING THE JACK.

F. THE JACK SHALL BE INDEPENDENTLY SUPPORTED AND CENTERED OVER THE NAIL SO THAT THE NAIL DOES NOT CARRY THE WEIGHT OF THE JACK. THE STRESSING EQUIPMENT SHALL BE PLACED OVER THE NAIL IN SUCH A MANNER THAT THE JACK, BEARING PLATES, AND STRESSING ANCHORAGE ARE IN ALIGNMENT. THE JACK SHALL BE POSITIONED AT THE BEGINNING OF THE TEST SUCH THAT UNLOADING AND REPOSITIONING OF THE JACK DURING THE TEST WILL NOT BE REQUIRED.

G. THE TEST REACTION FRAME SHALL BE SUFFICIENTLY RIGID AND OF ADEQUATE DIMENSION SUCH THAT EXCESSIVE DEFORMATION OF THE TEST APPARATUS REQUIRING REPOSITIONING OF ANY COMPONENTS DOES NOT OCCUR DURING TESTING. WHERE THE REACTION FRAME BEARS DIRECTLY ON THE WALL, THE REACTION FRAME SHALL BE DESIGNED TO PREVENT DAMAGE OR CRACKING OF THE WALL FACING.

5.6.2 VERIFICATION TESTING OF SACRIFICIAL NAILS

A. VERIFICATION TESTING IN EACH SOIL UNIT SHALL BE PERFORMED IN THAT UNIT TO VERIFY THE CONTRACTOR'S INSTALLATION METHODS, NAIL PULLOUT CAPACITY, AND DESIGN ASSUMPTIONS. THE NAILS USED FOR THE VERIFICATION TESTS MAY BE INCORPORATED AS PRODUCTION NAILS. PAYMENT FOR ADDITIONAL VERIFICATION TEST NAILS REQUIRED DUE TO DIFFERING SITE CONDITIONS, AS DETERMINED BY THE ENGINEER, SHALL BE PER THE CONTRACT UNIT PRICE.

B. TEST NAILS SHALL BE CONSTRUCTED USING THE SAME EQUIPMENT, METHODS, AND HOLE DIAMETER AS PLANNED FOR THE PRODUCTION NAILS. CHANGES IN THE DRILLING OR INSTALLATION METHOD MAY REQUIRE ADDITIONAL NAIL TESTING AS DETERMINED BY THE ENGINEER.

C. THE UNBONDED LENGTH OF TEST NAILS SHALL BE AT LEAST 3 FEET UNLESS APPROVED OTHERWISE BY THE ENGINEER. THE BOND LENGTH OF TEST NAILS SHALL BE DETERMINED BY THE OWNER'S REPRESENTATIVE SUCH THAT THE ALLOWABLE BAR LOAD IS NOT EXCEEDED BUT SHALL NOT BE LESS THAN 10 FEET. THE BAR LOAD DURING TESTING SHALL NOT EXCEED 80% OF THE STEEL ULTIMATE STRENGTH FOR GRADE 150 BARS OR 90% OF THE STEEL YIELD STRENGTH FOR GRADE 60 AND GRADE 75 BARS.

D. THE DESIGN TEST LOAD (DTL) DURING TESTING SHALL BE DETERMINED BY MULTIPLYING THE BOND LENGTH OF THE NAIL TIMES THE DESIGN PULLOUT RESISTANCE. VERIFICATION TEST NAILS SHALL BE INCREMENTALLY LOADED AND UNLOADED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

LOAD	HOLD TIME
AL	1 MINUTE
0.25DL	10 MINUTES
0.50DL	10 MINUTES
0.75DL	10 MINUTES
1.00DL	10 MINUTES
1.25DL	10 MINUTES
1.50DL	60 MINUTES
1.75DL	10 MINUTES
2.00DL	10 MINUTES

E. THE ALIGNMENT LOAD (AL) SHOULD BE THE MINIMUM LOAD REQUIRED TO ALIGN THE TESTING APPARATUS AND SHOULD NOT EXCEED 0.05DTL. DIAL GAUGES SHOULD BE ZEROED AFTER THE ALIGNMENT LOAD IS APPLIED.

F. EACH LOAD INCREMENT SHALL BE HELD FOR AT LEAST 10 MINUTES. THE VERIFICATION TEST NAIL SHALL BE MONITORED FOR CREEP FOR 60 MINUTES AT THE 1.50 DTL LOAD INCREMENT. NAIL MOVEMENTS DURING THE CREEP PORTION OF THE TEST SHALL BE MEASURED AND RECORDED AT 1, 2, 3, 5, 6, 10, 20, 30, 50, AND 60 MINUTES.

5.6.3 PROOF TESTING OF PRODUCTION NAILS

A. PROOF TESTING SHALL BE PERFORMED ON APPROXIMATELY 5 PERCENT OF THE PRODUCTION NAILS AS DETERMINED BY THE OWNER'S REPRESENTATIVE. IF NAIL INSTALLATION METHODS ARE SUBSTANDARD ON ANY PARTICULAR NAIL OR SERIES OF NAILS, ADDITIONAL TESTS MAY BE REQUIRED.

B. THE UNBONDED LENGTH OF TEST NAILS SHALL BE AT LEAST 3 FEET UNLESS APPROVED OTHERWISE BY THE ENGINEER. THE BOND LENGTH OF TEST NAILS SHALL BE DETERMINED BY THE OWNER'S REPRESENTATIVE SUCH THAT THE ALLOWABLE BAR LOAD IS NOT EXCEEDED BUT SHALL NOT BE LESS THAN 10 FEET. THE BAR LOAD DURING TESTING SHALL NOT EXCEED 80% OF THE STEEL ULTIMATE STRENGTH FOR GRADE 150 BARS OR 90% OF THE STEEL YIELD STRENGTH FOR GRADE 60 AND GRADE 75 BARS.

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2/14/2022 Permit Submittal
2202-225-SUB2 August 25th, 2022

Scale:

Sheet:

Specifications

SH7.0

C. PROOF TEST NAILS SHALL BE INCREMENTALLY LOADED IN 0.25DTL INCREMENTS TO A MAXIMUM LOAD OF 1.50DTL IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

AL	1.00DL
0.25DL	1.25DL
0.50DL	1.50DL
0.75DL	

D. THE ALIGNMENT LOAD (AL) SHOULD BE THE MINIMUM LOAD REQUIRED TO ALIGN THE TESTING APPARATUS AND SHOULD NOT EXCEED 0.05DTL. DIAL GAUGES SHOULD BE ZEROED AFTER THE ALIGNMENT LOAD IS APPLIED.

E. DEPENDING ON PERFORMANCE, EITHER A 10 MINUTE OR 60 MINUTE CREEP TEST SHALL BE PERFORMED AT 1.50DTL. NAIL MOVEMENT SHALL BE MEASURED AND RECORDED AT 1, 2, 3, 5, 6, AND 10 MINUTES. WHERE THE NAIL MOVEMENT BETWEEN 1 MINUTE AND 10 MINUTES EXCEEDS 0.04 INCHES, THE MAXIMUM TEST LOAD SHALL BE MAINTAINED AN ADDITIONAL 50 MINUTES AND MOVEMENTS SHALL BE RECORDED AT 20, 30, 50, AND 60 MINUTES.

5.6.4 TEST NAIL ACCEPTANCE

A. A TEST NAIL SHALL BE CONSIDERED ACCEPTABLE WHEN:

1. FOR VERIFICATION TESTS, A CREEP RATE LESS THAN 0.08 INCHES PER LOG CYCLE OF TIME BETWEEN THE 6 AND 60 MINUTE READINGS IS OBSERVED DURING CREEP TESTING, AND THE RATE IS LINEAR OR DECREASING THROUGHOUT THE CREEP TEST LOAD HOLD PERIOD.
2. FOR PROOF TESTS, A CREEP RATE LESS THAN 0.04 INCHES PER LOG CYCLE OF TIME BETWEEN THE 1 AND 10 MINUTE READINGS IS OBSERVED OR A CREEP RATE LESS THAN 0.08 INCHES PER LOG CYCLE OF TIME BETWEEN THE 6 AND 60 MINUTE READINGS, AND THE CREEP RATE IS LINEAR OR DECREASING THROUGHOUT THE CREEP TEST LOAD HOLD PERIOD.
3. THE TOTAL MOVEMENT AT THE MAXIMUM TEST LOAD EXCEEDS 80% OF THE THEORETICAL ELASTIC ELONGATION OF THE UNBONDED LENGTH.
4. A PULLOUT FAILURE DOES NOT OCCUR DURING TESTING. PULLOUT FAILURE IS DEFINED AS THE LOAD AT WHICH ATTEMPTS TO INCREASE THE TEST LOAD SIMPLY RESULT IN CONTINUED PULLOUT MOVEMENT OF THE TEST NAIL.

B. AT THE CONTRACTOR'S OPTION, SUCCESSFUL PROOF TEST NAILS MEETING THE ABOVE TEST ACCEPTANCE CRITERIA MAY BE INCORPORATED AS PRODUCTION NAILS PROVIDED THAT (1) THE UNBONDED TEST LENGTH OF THE NAIL HOLE HAS NOT COLLAPSED DURING TESTING, (2) THE MINIMUM REQUIRED HOLE DIAMETER HAS BEEN MAINTAINED, AND (3) THE TEST NAIL LENGTH AND BAR SIZE ARE EQUAL TO OR GREATER THAN THE SCHEDULED PRODUCTION NAIL LENGTH AND BAR SIZE. TEST NAILS MEETING THESE REQUIREMENTS SHALL BE COMPLETED BY SATISFACTORILY GROUTING THE UNBONDED TEST LENGTH. MAINTAINING THE TEMPORARY UNBONDED TEST LENGTH FOR SUBSEQUENT GROUTING IS THE CONTRACTOR'S RESPONSIBILITY.

C. THE ENGINEER SHALL EVALUATE THE RESULTS OF EACH VERIFICATION TEST. NAIL INSTALLATION METHODS THAT DO NOT SATISFY THE NAIL TESTING REQUIREMENTS SHALL BE CONSIDERED INADEQUATE. THE CONTRACTOR SHALL PROPOSE ALTERNATIVE METHODS AND INSTALL REPLACEMENT VERIFICATION TEST NAILS.

D. THE ENGINEER MAY REQUIRE THAT THE CONTRACTOR REPLACE SOME OR ALL OF THE PRODUCTION NAILS REPRESENTED BY INADEQUATE PROOF TESTS.

6. PERMANENT SOIL NAILS (ONLY)

6.1 GENERAL

A. IN ADDITION TO THE REQUIREMENTS OF SECTION 5, PERMANENT NAILS SHALL SATISFY THE REQUIREMENTS OF SECTION 6.

6.2 MATERIALS

A. THE MATERIALS SHALL CONSIST OF THE FOLLOWING:

1. EPOXY COATING, WHERE REQUIRED ON THE PLANS, SHALL CONFORM TO AASHTO M284, MINIMUM 12 MIL ELECTROSTATICALLY APPLIED, BEND TEST REQUIREMENTS SHALL BE WAIVED.
2. ENCAPSULATION, WHERE REQUIRED ON THE PLANS, SHALL CONSIST OF MINIMUM 0.04-IN CORRUGATED HDPE (CONFORMING TO AASHTO M252) OR PVC (CONFORMING TO ASTM D1784 CLASS 13464-B). ENCAPSULATION SHALL PROVIDE AT LEAST 0.2-IN OF GROUT COVER OVER THE NAIL BAR AND BE RESISTANT TO ULTRA VIOLET LIGHT DEGRADATION, NORMAL HANDLING STRESSES, AND GROUT PRESSURES. THE ENCAPSULATION SHALL BE APPLIED AT THE FACTORY UNDER CONTROLLED CONDITIONS OR, UPON THE ENGINEER'S APPROVAL, MAY BE FIELD CONSTRUCTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. FOR DAMAGED EPOXY COATED NAILS, THE COATING SHALL BE REPAIRED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS USING AN EPOXY FIELD REPAIR KIT APPROVED BY THE EPOXY MANUFACTURER.

C. ENCAPSULATED NAILS SHALL NOT BE TRANSPORTED UNTIL THE GROUT HAS REACHED SUFFICIENT STRENGTH TO RESIST DAMAGE DURING HANDLING. ENCAPSULATED NAILS SHALL NOT BE HANDLED IN A WAY THAT WILL CAUSE LARGE DEFLECTIONS DURING HANDLING. ANY ENCAPSULATED NAILS THAT ARE DAMAGED OR DEFECTIVE SHALL BE REPAIRED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR REMOVED FROM THE SITE.

7. TEMPORARY AND PERMANENT SHOTCRETE

7.1 GENERAL

A. ALL SHOTCRETE SHALL COMPLY WITH THE REQUIREMENTS OF ACI 506.2-95 EXCEPT AS SPECIFIED OTHERWISE HEREIN. THE OWNER SHALL CONTRACT AN INDEPENDENT TESTING LABORATORY TO CORE AND TEST SHOTCRETE PANELS AND INSPECT ALL SHOTCRETE AND STEEL REINFORCEMENT PLACEMENT IN ACCORDANCE WITH ACI 506.4R-94.

B. ALL WORKERS, INCLUDING FOREMAN, NOZZLEMEN, FINISHERS AND DELIVERY EQUIPMENT OPERATORS, SHALL BE FULLY QUALIFIED TO PERFORM THE WORK. QUALIFICATION OF THE NOZZLEMEN SHALL BE BASED ON THE RESULTS OF TEST PANELS AS REQUIRED HEREIN, UNLESS APPROVED OTHERWISE BY THE ENGINEER.

C. AT LEAST 15 DAYS PRIOR TO INITIATING THE WORK, THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER FOR REVIEW AND APPROVAL:

1. WRITTEN DOCUMENTATION OF THE NOZZLEMENS QUALIFICATIONS AND PROPOSED METHOD OF SHOTCRETE PLACEMENT.
2. SHOTCRETE MIX DESIGN INCLUDING: BRAND AND TYPE OF PORTLAND CEMENT; SOURCE, GRADATION, AND QUALITY OF AGGREGATES; MIX PROPORTIONS BY WEIGHT; PROPOSED ADMIXTURES AND THEIR MANUFACTURER, DOSAGE, AND TECHNICAL LITERATURE; AND COMPRESSIVE STRENGTH TEST RESULTS FROM THE SUPPLIER NO OLDER THAN 6 MONTHS VERIFYING THE 28-DAY COMPRESSIVE STRENGTH.
3. ONCE AVAILABLE, CERTIFIED MILL TESTS FOR ALL REINFORCING STEEL FROM EACH HEAT SPECIFYING THE MINIMUM ULTIMATE STRENGTH, YIELD STRENGTH, ELONGATION, AND COMPOSITION.
4. SPECIFICATION AND DATA FOR REVIEW ON EQUIPMENT PROPOSED FOR THE PROJECT INCLUDING SHOTCRETING AND COMPRESSED AIR EQUIPMENT, PROPOSED ACCESS ARRANGEMENTS, AND CAPACITIES.
5. METHODS OF CONTROLLING THE LOCATION OF THE FINISH FACE AND DETERMINING SHOTCRETE THICKNESS.

7.2 MATERIALS

A. ALL MATERIALS FOR SHOTCRETE SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.

1. CEMENT SHALL CONFORM TO ASTM C150 / AASHTO M85, TYPE I.
2. FINE AGGREGATE SHALL CONFORM TO ASTM C33 / AASHTO M6.
3. COARSE AGGREGATE SHALL CONFORM TO AASHTO M-80, CLASS B.
4. WATER SHALL BE POTABLE, CLEAN, AND FREE FROM SUBSTANCES DELETERIOUS TO CONCRETE AND STEEL, OR THAT WOULD CAUSE STAINING.
5. ACCELERATOR SHALL BE THE FLUID TYPE, APPLIED AT NOZZLE, AND MEET THE REQUIREMENTS HEREIN.
6. WATER-REDUCER AND SUPER-PLASTICIZER SHALL CONFORM TO ASTM C494 / AASHTO M194, TYPE A, D, F, G.
7. AIR-ENTRAINING AGENT SHALL CONFORM TO ASTM C260 / AASHTO M154.
8. FLY ASH SHALL CONFORM TO ASTM C618 / AASHTO M295, TYPE F OR G, CEMENT REPLACEMENT UP TO 35% BY WEIGHT OF CEMENT.
9. SILICA FUME SHALL CONFORM TO ASTM C1240, 90% MINIMUM SILICON DIOXIDE SOLIDS CONTENT, NOT TO EXCEED 12% BY WEIGHT OF CEMENT.
10. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 / AASHTO M55.
11. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 / AASHTO M31, GRADE 60. ALL REINFORCING STEEL DETAILS SHALL CONFORM TO ACI 315.
12. CURING COMPOUNDS SHALL CONFORM TO AASHTO M148, TYPE 1D OR TYPE 2.
13. FILM PROTECTION FOR CURING SHALL CONFORM TO AASHTO M171 OR POLYETHYLENE FILM.

B. SHOTCRETE ADMIXTURES SHALL NOT BE USED UNLESS APPROVED BY THE ENGINEER. ADMIXTURES USED TO ENTRAIN AIR, TO REDUCE WATER-CEMENT RATIO, TO RETARD OR ACCELERATE SETTING TIME, OR TO ACCELERATE THE DEVELOPMENT OF STRENGTH, SHALL BE THOROUGHLY MIXED INTO THE SHOTCRETE AT THE RATE SPECIFIED BY THE MANUFACTURER UNLESS SPECIFIED OTHERWISE. ACCELERATING ADDITIVES SHALL BE COMPATIBLE WITH THE CEMENT USED, BE NON-CORROSIVE TO STEEL AND SHALL NOT PROMOTE OTHER DETRIMENTAL EFFECTS SUCH AS CRACKING OR EXCESSIVE SHRINKAGE. THE MAXIMUM ALLOWABLE CHLORIDE ION CONTENT OF ALL INGREDIENTS SHALL NOT EXCEED 0.10 PERCENT WHEN TESTED PER AASHTO T260.

C. MATERIALS SHALL BE DELIVERED, STORED AND HANDLED TO PREVENT CONTAMINATION, SEGREGATION, CORROSION OR DAMAGE. LIQUID ADMIXTURES SHALL BE STORED TO PREVENT EVAPORATION AND FREEZING.

D. AGGREGATES FOR SHOTCRETE SHALL MEET THE STRENGTH AND DURABILITY REQUIREMENT OF AASHTO M80 AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE SIZE	PERCENT PASSING BY WEIGHT	SIEVE SIZE	PERCENT PASSING BY WEIGHT
1/2 INCH	100	NO. 16	35-55
3/8 INCH	90-100	NO. 30	20-35
NO. 4	70-85	NO. 50	8-20
NO. 8	50-70	NO. 100	2-10

E. CEMENT CONTENT SHALL BE AT LEAST 600 POUNDS PER CUBIC YARD. THE WATER/CEMENT RATIO SHALL NOT BE GREATER THAN 0.45. FOR WET-MIX SHOTCRETE EXPOSED TO FREEZING AND THAWING, THE AIR CONTENT AT THE TRUCK SHALL BE BETWEEN 7 TO 10 PERCENT WHEN TESTED IN ACCORDANCE WITH ASTM C231 / AASHTO T152.

F. SHOTCRETE SHALL BE PROPORTIONED TO ATTAIN A COMPRESSIVE STRENGTH OF 2000 PSI IN 3 DAYS AND 4000 PSI IN 28 DAYS. THE AVERAGE COMPRESSIVE STRENGTH OF EACH SET OF THREE CORES EXTRACTED FROM TEST PANELS OR WALL FACE MUST BE EQUAL TO OR EXCEED 85%, WITH NO INDIVIDUAL CORE LESS THAN 75% OF THE SPECIFIED COMPRESSIVE STRENGTH IN ACCORDANCE WITH ACI 506.2.

G. AGGREGATE AND CEMENT MAY BE BATCHED BY WEIGHT OR BY VOLUME IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM C94 / AASHTO M157. MIXING EQUIPMENT SHALL BE CAPABLE OF THOROUGHLY MIXING THE MATERIALS IN SUFFICIENT QUANTITY TO MAINTAIN PLACING CONTINUITY. READY-MIX SHOTCRETE SHALL BE DELIVERED AND PLACED WITHIN 1-1/2 HOURS OF THE BATCH TIME UNLESS APPROVED OTHERWISE BY THE ENGINEER.

7.3 TEST PANELS

A. IN GENERAL, PRECONSTRUCTION AND PRODUCTION SHOTCRETE TEST PANELS SHALL BE REQUIRED. HOWEVER, DEPENDING ON THE AMOUNT OF SHOTCRETE WALL REINFORCEMENT, THE ENGINEER MAY WAIVE THE REQUIREMENTS FOR A REINFORCED PRECONSTRUCTION TEST PANEL. PRECONSTRUCTION AND PRODUCTION TEST PANELS SHALL NOT BE DISTURBED OR MOVED WITHIN THE FIRST 24 HOURS AFTER SHOOTING. TEST PANELS SHALL BE FIELD CURED UNDER CONDITIONS SIMILAR TO THOSE ANTICIPATED FOR THE WORK. SHOTCRETING AND CORING OF TEST PANELS SHALL BE PERFORMED BY QUALIFIED PERSONNEL IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE NOT LESS THAN 2 DAYS PRIOR TO THE SHOOTING OF THE PRECONSTRUCTION TEST PANELS.

B. EACH NOZZLEMAN SHALL FURNISH AT LEAST TWO PRECONSTRUCTION TEST PANELS FOR EACH PROPOSED MIXTURE BEING CONSIDERED AND FOR EACH SHOOTING POSITION ENCOUNTERED ON THE JOB. PRECONSTRUCTION TEST PANELS SHALL BE MADE BY EACH APPLICATION CREW USING THE EQUIPMENT, MATERIALS, MIXTURE PROPORTIONS, AND PROCEDURES PROPOSED FOR THE JOB PRIOR TO THE COMMENCEMENT OF WORK.

C. PRECONSTRUCTION TEST PANELS SHALL BE 30 INCHES X 30 INCHES (MINIMUM), IN ACCORDANCE WITH ACI 506.2-95 AND THE FOLLOWING:

1. ONE TEST PANEL SHALL BE THE MAXIMUM SHOTCRETE THICKNESS SHOWN ON THE PLANS AND SHALL INCLUDE THE MAXIMUM ANTICIPATED REINFORCING CONGESTION. CORES EXTRACTED FROM THE REINFORCED TEST PANEL SHALL DEMONSTRATE ENCAPSULATION OF THE REINFORCEMENT IN ACCORDANCE WITH ACI 506.2 EQUAL TO CORE GRADE 2 OR BETTER.
2. ONE TEST PANEL SHALL BE UNREINFORCED, AT LEAST 6 INCHES THICK, AND USED FOR COMPRESSIVE STRENGTH TESTING.
3. THE SIDES OF THE TEST PANELS SHALL BE CHAMFERED OUTWARD AT 45 DEGREES OVER THE FULL THICKNESS OF THE PANEL.

D. THE CONTRACTOR SHALL FURNISH AT LEAST ONE PRODUCTION TEST PANEL OR, IN LIEU OF PRODUCTION TEST PANELS, SIX 3-INCH DIAMETER CORES FROM THE SHOTCRETE FACE DURING THE FIRST APPLICATION OF SHOTCRETE AND HENCEFORTH FOR EVERY FIFTH APPLICATION OF SHOTCRETE, OR EVERY 5000 SQUARE FEET, OR 50 CUBIC YARDS OF SHOTCRETE PLACED, WHICHEVER IS LESS. THE PRODUCTION TEST PANELS SHALL BE CONSTRUCTED SIMULTANEOUSLY WITH THE SHOTCRETE FACING INSTALLATION AT TIMES DESIGNATED BY THE OWNER'S REPRESENTATIVE. THE PRODUCTION TEST PANELS SHALL HAVE MINIMUM DIMENSIONS OF 18 INCHES X 18 INCHES X 6 INCHES.

E. SHOTCRETE WILL BE ACCEPTED BASED ON THE 28-DAY STRENGTH OF CORES TAKEN FROM THE PRODUCTION TEST PANELS. THE FREQUENCY SPECIFIED FOR THE PRODUCTION TEST PANELS IS APPROXIMATE. A GREATER NUMBER OF PANELS MAY BE REQUIRED BY THE ENGINEER.

F. AT LEAST SIX CORES WILL BE CUT FROM EACH PRECONSTRUCTION AND PRODUCTION TEST PANEL FOR COMPRESSIVE STRENGTH TESTING. CORES SHALL BE SOAKED IN WATER FOR AT LEAST 40 HOURS IN ACCORDANCE WITH AASHTO T24 OR ACI 506.2. CORES SHALL BE AT LEAST 3 INCHES IN DIAMETER AND SHALL HAVE A MINIMUM LENGTH TO DIAMETER RATIO OF ONE. WHEN THE LENGTH OF A CORE IS LESS THAN TWICE THE DIAMETER, APPLY THE CORRECTION FACTORS GIVEN IN ASTM C42 TO OBTAIN THE COMPRESSIVE STRENGTH OF INDIVIDUAL CORES. THREE CORES SHALL BE TESTED AT 3-DAYS, AND THREE CORES SHALL BE TESTED AT 28-DAYS FOR COMPRESSIVE STRENGTH. CORE HOLES IN THE WALL SHALL BE FILLED WITH PATCHING MORTAR AFTER CLEANING AND THOROUGH DAMPENING.

7.4 EXECUTION OF PRODUCTION SHOTCRETE WORK

7.4.1 ALIGNMENT CONTROL

A. ALIGNMENT WIRES AND/OR THICKNESS CONTROL PINS SHALL BE PROVIDED AS NECESSARY TO ESTABLISH AND MAINTAIN THE MINIMUM SHOTCRETE THICKNESS SHOWN ON THE PLANS. THE MAXIMUM DISTANCE BETWEEN THE WIRES AND/OR THICKNESS CONTROL PINS ON ANY SURFACE SHALL BE EQUAL TO THE VERTICAL NAIL SPACING. THE CONTRACTOR SHALL ENSURE THAT ALIGNMENT WIRES ARE TIGHT, TRUE TO LINE, AND PLACED TO ALLOW FURTHER TIGHTENING.

7.4.2 SURFACE PREPARATION

A. PRIOR TO SHOTCRETING THE UNGROUTED ZONE ABOVE THE NAIL GROUT AT THE EXCAVATION CUT FACE (BIRDS BEAK), THE CONTRACTOR SHALL REMOVE ALL LOOSE MATERIALS FROM THE SURFACE OF THE GROUT.

B. THE CONTRACTOR SHALL REMOVE ALL LOOSE MATERIALS AND LOOSE DRIED SHOTCRETE FROM PREVIOUS PLACEMENT OPERATIONS AND FROM ALL RECEIVING SURFACES BY METHODS ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. THE REMOVAL SHALL BE ACCOMPLISHED IN SUCH A MANNER AS NOT TO LOOSEN, CRACK, OR SHATTER THE SURFACES TO RECEIVE THE SHOTCRETE. ANY SURFACE MATERIAL THAT, IN THE OPINION OF THE OWNER'S REPRESENTATIVE, IS SO LOOSENED OR DAMAGED SHALL BE REMOVED TO SUFFICIENT DEPTH TO PROVIDE A BASE THAT IS SUITABLE TO RECEIVE THE SHOTCRETE. MATERIAL THAT LOOSENS AS THE SHOTCRETE IS APPLIED SHALL BE REMOVED. SHOTCRETE SHALL NOT BE PLACED ON FROZEN SURFACES.

7.4.3 DELIVERY AND APPLICATION

A. A CLEAN, DRY, OIL-FREE SUPPLY OF COMPRESSED AIR SUFFICIENT FOR MAINTAINING ADEQUATE NOZZLE VELOCITY FOR ALL PARTS OF THE WORK AND FOR SIMULTANEOUS OPERATION OF A BLOW PIPE FOR CLEANING AWAY REBOUND SHALL BE MAINTAINED AT ALL TIMES. THE EQUIPMENT SHALL BE CAPABLE OF DELIVERING THE PREMIXED MATERIAL ACCURATELY, UNIFORMLY, AND CONTINUOUSLY THROUGH THE DELIVERY HOSE.

B. THE SHOTCRETE SHALL BE APPLIED FROM THE LOWER PART OF THE WORK AREA UPWARDS TO PREVENT ACCUMULATION OF REBOUND ON UNCOVERED SURFACES. THICKNESS, METHODS OF SUPPORT, AIR PRESSURE, AND RATE OF PLACEMENT OF SHOTCRETE SHALL BE CONTROLLED TO PREVENT SAGGING OR SLOUGHING OF FRESHLY APPLIED SHOTCRETE. WHERE SHOTCRETE IS USED TO FILL THE BIRD'S BEAK, THE NOZZLE SHALL BE POSITIONED INTO THE MOUTH OF THE DRILLHOLE TO COMPLETELY FILL THE VOID. REBOUND SHALL NOT BE WORKED BACK INTO THE PLACEMENT NOR SHALL THE REBOUND BE SALVAGED. REBOUND THAT DOES NOT FALL CLEAR OF THE WORKING AREA SHALL BE REMOVED. THE NOZZLE SHALL BE HELD AT A DISTANCE AND AT AN ANGLE APPROXIMATELY PERPENDICULAR TO THE WORKING FACE SO THAT REBOUND WILL BE MINIMAL AND COMPACTION WILL BE MAXIMIZED. THE NOZZLE SHOULD BE ROTATED STEADILY IN A SMALL CIRCULAR PATTERN.

C. SHOTCRETE PLACEMENT SHALL BE BY THE BENCH GUNNING METHOD WHEN THE THICKNESS OF THE SHOTCRETE LAYER IS 6 INCHES OR GREATER. THE GUNNING METHOD SHALL CONSIST OF BUILDING UP A THICK LAYER OF SHOTCRETE FROM THE BOTTOM OF THE LIFT AND MAINTAINING THE TOP SURFACE AT APPROXIMATELY A 45-DEGREE SLOPE.

7.4.4 VISUAL OBSERVATION

A. A CLEARLY DEFINED PATTERN OF CONTINUOUS HORIZONTAL OR VERTICAL RIDGES OR DEPRESSIONS AT THE REINFORCING ELEMENTS AFTER THEY ARE COVERED WILL BE CONSIDERED INDICATION OF INSUFFICIENT COVER OF REINFORCEMENT OR POOR APPLICATION AND PROBABLE VOID. IN THIS CASE, THE WORK SHALL BE IMMEDIATELY SUSPENDED AND THE WORK CAREFULLY INSPECTED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL IMPLEMENT AND COMPLETE CORRECTIVE MEASURES PRIOR TO RESUMING THE SHOTCRETE OPERATIONS.

B. THE SHOTCRETING PROCEDURE MAY BE CORRECTED BY ADJUSTING THE NOZZLE DISTANCE AND ORIENTATION PERPENDICULAR TO THE SURFACE, ADJUSTING THE WATER CONTENT OF THE SHOTCRETE MIX, OR OTHER MEANS ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. ALL OVERSPRAY AND REBOUND SHALL BE REMOVED FROM THE SURFACE.

C. SURFACE DEFECTS SHALL BE REPAIRED AS SOON AS POSSIBLE AFTER INITIAL PLACEMENT OF SHOTCRETE. ALL SHOTCRETE THAT LACKS UNIFORMITY, EXHIBITS SEGREGATION, SAGGING, HONEYCOMBING, OR LAMINATION, OR CONTAINS ANY VOIDS OR SAND POCKETS SHALL BE REMOVED AND REPLACED WITH FRESH SHOTCRETE BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.

7.4.5 ATTACHMENT OF THE NAIL HEAD CONNECTION HARDWARE

A. FOR BEARING PLATE CONNECTIONS, THE PLATE SHALL BE WET-SET WHILE THE SHOTCRETE IS PLASTIC TO ASSURE FULL SHOTCRETE BEARING BEHIND THE PLATE. HOWEVER, THE RETENTION NUT SHALL ONLY BE HAND TIGHTENED SUCH THAT FULL BEARING IS ACHIEVED WITHOUT EXCESSIVELY SQUEEZING FRESH SHOTCRETE OUT FROM UNDER THE PLATE.

7.4.6 CONSTRUCTION JOINTS

A. CONSTRUCTION JOINTS SHALL BE TAPERED TOWARD THE EXCAVATION FACE OVER A MINIMUM DISTANCE EQUAL TO THE THICKNESS OF THE SHOTCRETE LAYER. THE SURFACE OF THE JOINTS SHALL BE ROUGH AND CLEANED OF ALL LAITANCE AND FOREIGN SUBSTANCES PRIOR TO SHOTCRETE PLACEMENT.

7.4.7 FINISHING AND CURING REQUIREMENTS

A. TEMPORARY SHOTCRETE MAY BE LEFT WITH AN AS-SHOT GUN FINISH.

B. THERE ARE NO SPECIFIC CURING REQUIREMENTS FOR TEMPORARY SHOTCRETE.

7.4.8 WEATHER LIMITATIONS

A. SHOTCRETE SHALL NOT BE PLACED IN COLD WEATHER UNLESS ADEQUATELY PROTECTED WHEN THE AMBIENT TEMPERATURE IS BELOW 40° F AND FALLING AND/OR WHEN THE SHOTCRETE IS LIKELY TO BE SUBJECTED TO FREEZING TEMPERATURES BEFORE REACHING A MINIMUM STRENGTH OF 750 PSI. COLD WEATHER PROTECTION SHALL BE MAINTAINED UNTIL THE STRENGTH OF THE SHOTCRETE IS GREATER THAN 750 PSI. COLD WEATHER PROTECTION SHALL INCLUDE HEATING UNDER TENTS, BLANKETS OR OTHER MEANS ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. THE TEMPERATURE OF THE SHOTCRETE, WHEN DEPOSITED, SHALL BE NOT LESS THAN 50° F NOR MORE THAN 80° F. THE AIR IN CONTACT WITH SHOTCRETE SURFACES SHALL BE MAINTAINED AT TEMPERATURES ABOVE 32° F FOR A MINIMUM OF 7 DAYS.

B. SHOTCRETE APPLICATION SHALL ALSO BE SUSPENDED DURING HIGH WINDS AND HEAVY RAINS WHEN IN THE OPINION OF THE OWNER'S REPRESENTATIVE THE QUALITY OF THE APPLICATION IS NOT ACCEPTABLE. NEWLY-PLACED SHOTCRETE EXPOSED TO RAIN THAT WASHES OUT CEMENT OR OTHERWISE MAKES THE SHOTCRETE UNACCEPTABLE TO THE OWNER'S REPRESENTATIVE SHALL BE REMOVED AND REPLACED. THE CONTRACTOR SHALL PROVIDE ADEQUATELY SECURED POLYETHYLENE SHEETING OR EQUIVALENT WHEN ADVERSE EXPOSURE TO WEATHER IS ANTICIPATED.

7.4.9 TOLERANCES

A. THE TOLERANCES FOR SHOTCRETE FACINGS SHALL BE AS FOLLOWS:

1. THE VERTICAL LOCATION OF A HORIZONTAL SHOTCRETE JOINT SHALL BE WITHIN 1 FOOT OF THE ELEVATION SHOWN ON THE PLANS.
2. THE SHOTCRETE WALL THICKNESS SHALL BE NO LESS THAN THAT SHOWN ON THE PLANS MINUS 0.5 INCHES.
3. THE HORIZONTAL AND VERTICAL LOCATIONS OF REINFORCING BARS SHALL BE WITHIN 1 INCH OF THE LOCATIONS SHOWN ON THE PLANS.
4. REINFORCING BAR LAP LENGTHS SHALL BE NO LESS THAN THAT SHOWN ON THE PLANS MINUS 1 INCH.
5. REINFORCING BAR SPACING SHALL NOT EXCEED THAT SHOWN ON THE PLANS PLUS 1 INCH.

8. PERMANENT SHOTCRETE (ONLY)

8.1 GENERAL

A. IN ADDITION TO THE REQUIREMENTS OF SECTION 7, PERMANENT SHOTCRETE SHALL SATISFY THE REQUIREMENTS OF SECTION 8.

8.2 SUBMITTALS

A. AT LEAST 15 DAYS PRIOR TO INITIATING THE WORK, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL:

1. WRITTEN DOCUMENTATION OF THE FINISHERS QUALIFICATIONS.
2. SHOP DRAWINGS OF THE REINFORCING LAYOUT AND SCHEDULES.

8.3 EXECUTION OF PRODUCTION SHOTCRETE WORK

8.3.1 ATTACHMENT OF THE NAIL HEAD CONNECTION HARDWARE

A. FOR EMBEDED PLATE CONNECTIONS (TYPICALLY WITH HEADED STUDS), THE EMBEDMENTS SHALL BE LOCATED WITHIN THE WALL SUCH THAT THE PROPER SHOTCRETE COVER IS PROVIDED AS SHOWN ON THE PLANS. IN ADDITION, THE PLATE, WASHER, AND NUT SHALL INSTALLED SO THAT THEY HAVE SUFFICIENT CONTACT WITH EACH OTHER AS SHOWN ON THE PLANS.

8.3.2 CONSTRUCTION JOINTS

A. CONSTRUCTION JOINTS SHALL BE WATERTIGHT AND UNIFORMLY TAPERED TOWARD THE EXCAVATION FACE OVER A MINIMUM DISTANCE EQUAL TO THE THICKNESS OF THE SHOTCRETE LAYER. THE SURFACE OF THE JOINTS SHALL BE ROUGH, CLEAN, SOUND AND DAMP. THE HARDENED SURFACE SHALL BE CLEANED OF ALL LAITANCE, FOREIGN SUBSTANCES, WASHED WITH CLEAN WATER, AND WETTED THOROUGHLY IMMEDIATELY PRIOR TO PLACEMENT OF FRESH SHOTCRETE.

8.3.3 FINISHING AND CURING REQUIREMENTS

A. SHOTCRETE FINISH SHALL BE AS INDICATED ON THE PLANS.

B. THE SHOTCRETE SHALL BE PROTECTED FROM LOSS OF MOISTURE FOR AT LEAST 7 DAYS AFTER PLACEMENT. WHEN SHOTCRETE IS BEING PROTECTED FROM LOW TEMPERATURES, CURING SHALL BE TERMINATED NO SOONER THAN ONE DAY AFTER THE REMOVAL OF LOW TEMPERATURE PROTECTION. CURING OF SHOTCRETE SHALL BE BY METHODS THAT WILL KEEP SHOTCRETE SURFACES ADEQUATELY WET AND PROTECTED DURING THE SPECIFIED PERIOD. CURING SHALL COMMENCE WITHIN ONE HOUR OF SHOTCRETE APPLICATION. WHEN THE AMBIENT TEMPERATURE EXCEEDS 80 DEGREES FAHRENHEIT, THE CONTRACTOR SHALL PLAN THE WORK SUCH THAT CURING CAN COMMENCE IMMEDIATELY AFTER FINISHING. THE CURING SHALL BE COMPLETED USING WATER, MEMBRANE, OR FILM CURING METHODS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

C. FOR WATER CURING, THE RATE OF WATER APPLICATION SHALL BE REGULATED TO PROVIDE COMPLETE SURFACE COVERAGE WITH A MINIMUM OF RUNOFF.

D. FOR MEMBRANE CURING, CURING COMPOUNDS SHALL NOT BE USED ON ANY SURFACES AGAINST WHICH ADDITIONAL SHOTCRETE OR OTHER FINISHING MATERIALS ARE TO BE BONDED UNLESS THE SURFACE IS SANDBLASTED IN A MANNER ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. MEMBRANE CURING COMPOUNDS SHALL BE SPRAY APPLIED AS QUICKLY AS PRACTICAL AFTER INITIAL SHOTCRETE SET AT A COVERAGE OF NOT LESS THAN 40 SQUARE FEET PER GALLON.

E. FOR FILM CURING, POLYETHYLENE SHEETING MAY BE USED TO SUPPLEMENT WATER CURING ON SHOTCRETE THAT WILL BE COVERED LATER WITH ADDITIONAL SHOTCRETE OR CONCRETE. THE SHEETING SHALL COMPLETELY COVER ALL SURFACES, AND HAVE EDGES OVERLAPPED FOR PROPER SEALING AND ANCHORAGES.

8.3.4 TOLERANCES

A. THE TOLERANCES FOR SHOTCRETE FACINGS SHALL BE AS FOLLOWS:

1. THE VERTICAL LOCATION OF A HORIZONTAL SHOTCRETE JOINT SHALL BE WITHIN 0.5 FEET OF THE ELEVATION SHOWN ON THE PLANS.
2. THE SHOTCRETE WALL THICKNESS SHALL BE NO LESS THAN THAT SHOWN ON THE PLANS MINUS 0.5 INCHES.
3. THE HORIZONTAL AND VERTICAL LOCATIONS OF REINFORCING BARS SHALL BE WITHIN 1 INCH OF THE LOCATIONS SHOWN ON THE PLANS.
4. REINFORCING BAR LAP LENGTHS SHALL BE NO LESS THAN THAT SHOWN ON THE PLANS MINUS 1 INCH.
5. REINFORCING BAR SPACINGS SHALL NOT EXCEED THAT SHOWN ON THE PLANS PLUS 1 INCH.
6. THE DEVIATION IN PLANENESS OF THE FINISHED WALL SURFACE SHALL NOT EXCEED 0.5 INCHES IN 10 FEET.

9. NAIL HEAD CONNECTION HARDWARE

A. DEPENDING ON THE CONNECTION DETAIL SHOWN ON THE PLANS, THE NAIL HEAD CONNECTION HARDWARE MAY CONSIST OF ONE OR MORE OF THE FOLLOWING: EMBEDDED OR BEARING STEEL PLATES PER ASTM A36 / AASHTO M270, GRADE 36; NUTS & WASHERS PER AASHTO M291, GRADE B, HEXAGONAL FITTED WITH BEVELED WASHER OR SPHERICAL SEAT TO PROVIDE UNIFORM BEARING; AND HEADED STUDS PER ASTM A108 OR APPROVED EQUAL.

B. STEEL PLATE DIMENSIONS SHALL BE WITHIN 0.25 INCHES OF THAT SHOWN ON THE PLANS. HEADED STUDS SHALL BE LOCATED ON THE PLATES WITHIN 0.25 INCHES OF THAT SHOWN ON THE PLANS.

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Date: **3/15/2021 Pre-App**
2/14/2022 Permit Submittal
2202-225-SUB2 August 25th, 2022

Scale:

Sheet:

Specifications

SH7.1

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF MERCER ISLAND STANDARD SPECIFICATIONS, AND WSDOT/APWA STANDARD SPECIFICATIONS, LATEST EDITION. THE CITY OF MERCER ISLAND RESERVES THE RIGHT TO REJECT ANY DAMAGED AND/OR NON-COMPLIANT CONSTRUCTION MATERIAL.
2. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH THE CITY OF MERCER ISLAND CONSTRUCTION INSPECTION PERSONNEL.
3. AN APPROVED PLAN SET MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
4. ALL SITE WORK IMPROVEMENTS SHALL BE CONSTRUCTED TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
6. ANY APPROVED CUTS OF EXISTING PUBLIC ROADWAYS SHALL BE BACK FILLED AND COMPACTED IN ACCORDANCE WITH CITY OF MERCER ISLAND STANDARDS. ALL CUTS INTO EXISTING ASPHALT SHALL BE ALONG NEAT, CONTINUOUS, SAWED, OR WHEEL CUT LINES. A TEMPORARY COLD MIX PATCH MUST BE PLACED IMMEDIATELY AFTER BACKFILL AND COMPACTION. THIS EXISTING ROAD CUT SHALL BE REPLACED WITH AT LEAST THREE (3) INCHES OF COMPACTED CL "B" ASPHALT CONCRETE, SIX (6) INCH CRUSHED ROCK SURFACING TOP COURSE (5/8 INCH MINUS), AS REQUIRED DEPENDENT UPON A SOILS ENGINEER'S RECOMMENDATION AND TESTS. IN NO CASE SHALL THE REPLACEMENT BE LESS THAN THE EXISTING SECTION.
7. PAVED SURFACES INCLUDING ROADWAYS, SIDEWALKS, AND CURBS THAT ARE DAMAGED BY NEW CONSTRUCTION SHALL BE REPAIRED AS REQUIRED BY THE CITY OF MERCER ISLAND INSPECTOR.
8. ALL LOCATIONS OF EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
9. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL CASTINGS AND UTILITIES DURING CONSTRUCTION AND SHALL CONTACT THE UNDERGROUND UTILITIES LOCATOR SERVICE (1-800-424-5555) AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
10. THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLE RIMS, DRAINAGE STRUCTURE LIDS, VALVE BOXES, AND UTILITY ACCESS STRUCTURES TO FINISH GRADE WITHIN AREAS AFFECTED BY THE PROPOSED IMPROVEMENTS.
11. UTILITY SERVICE CONNECTIONS SHOWN ON THIS PLAN ARE TO BE MAINTAINED PRIVATELY AND NOT BY THE CITY MERCER ISLAND.
12. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE NATURAL OR PUBLIC DRAINAGE SYSTEM. AS CONSTRUCTION PROGRESSES AND UNEXPECTED (SEASONAL) CONDITIONS DICTATE, MORE SILTATION CONTROL FACILITIES MAY BE REQUIRED TO INSURE COMPLETE SILTATION CONTROL OF THE PROJECT. THEREFORE, DURING THE COURSE OF CONSTRUCTION IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE CONTRACTOR TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES THAT MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES.
13. THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. WASHING OF THESE STREETS WILL NOT BE ALLOWED WITHOUT PRIOR CITY OF MERCER ISLAND APPROVAL.
14. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE TRAFFIC CONTROL MANUAL.
15. CARE SHALL BE EXERCISED WHEN EXCAVATING NEAR EXISTING CHARGED WATER MAINS.

SURVEY NOTE:

UNDERGROUND UTILITIES AND EXISTING IMPROVEMENTS SHOWN ARE BASED UPON THE SURVEY "TOPOGRAPHIC AND BOUNDARDY SURVEY, STEINBORN PROPERTY, BY TERRANE, DATED FEBRUARY 21, 2021 AND RECORD DRAWINGS. NO WARRANTY OR GUARANTEE OF ACCURACY OR COMPLETENESS IS EITHER IMPLIED OR EXPRESSED. EXISTING UNDERGROUND UTILITIES AND IMPROVEMENTS HAVE BEEN SHOWN ON THIS DRAWING FOR THE PURPOSE OF ASSISTING THE CONTRACTOR IN LOCATING SAID UTILITIES AND IMPROVEMENTS IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING WITH APPROPRIATE AGENCIES THAT MAY HAVE UNDERGROUND UTILITIES AND IMPROVEMENTS WITHIN THE PROJECT LIMITS AND FOR CHECKING LOCATIONS IN THE FIELD. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGE TO UNDERGROUND UTILITIES AND IMPROVEMENTS RESULTING FROM HIS OPERATION.

VERTICAL DATUM

NAVD88 PER GPS OBSERVATIONS

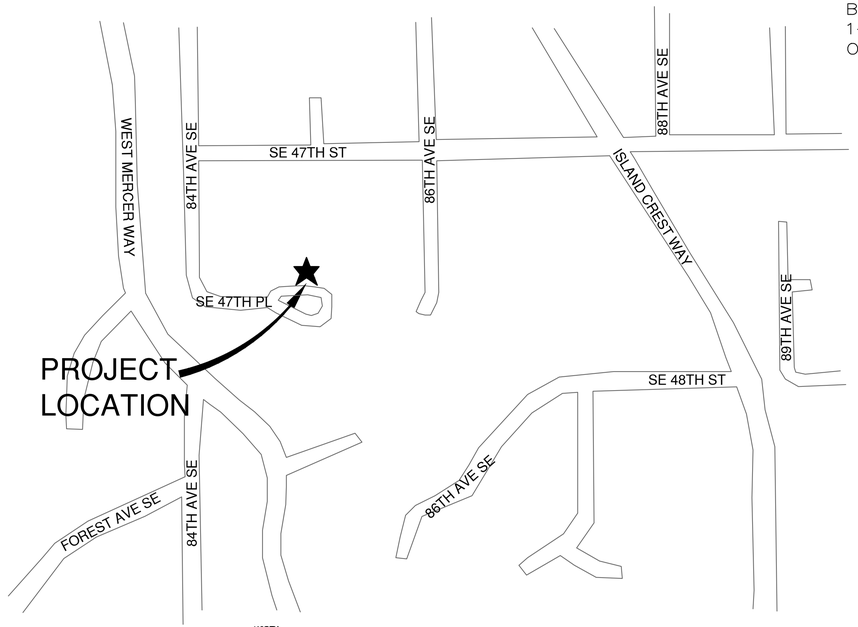
FIELD DATA FOR THIS SURVEY WAS OBTAINED BY DIRECT FIELD MEASUREMENTS WITH A CALIBRATED ELECTRONIC 5-SECOND TOTAL STATION AND/OR SURVEY GRADE GPS OBSERVATIONS. ALL ANGULAR AND LINEAR RELATIONSHIPS ARE ACCURATE AND MEET THE STANDARDS SET BY WAC 332-130-090.

GENERAL DRAINAGE NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF MERCER ISLAND STANDARD SPECIFICATIONS AND WSDOT/APWA STANDARD SPECIFICATIONS, LATEST EDITION AND THE REQUIREMENTS OF THE DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
2. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH CITY OF MERCER ISLAND CONSTRUCTION INSPECTION PERSONNEL.
3. ALL STORM DRAINAGE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE APPROVED PLANS. ANY DEVIATION FROM THESE PLANS WILL REQUIRE APPROVAL FROM THE OWNER, ENGINEER AND APPROPRIATE PUBLIC AGENCIES.
4. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. ALL STORM DRAIN PIPE MAY BE CONSTRUCTED OF ONE OF THE FOLLOWING MATERIALS UNLESS OTHERWISE SPECIFIED IN THE PLANS. ALL PIPE JOINTS MUST BE GASKETED WATERTIGHT AND MUST BE OF THE SAME MATERIAL AS THE PIPE. ALL PIPE SHALL HAVE A MINIMUM COVER AS SPECIFIED AND SHALL BE ADEQUATELY PROTECTED DURING CONSTRUCTION (REFER TO THE MANUFACTURE'S RECOMMENDATIONS FOR MINIMUM COVER FOR HEAVY EQUIPMENT LOADINGS). THE CITY OF MERCER ISLAND PUBLIC WORKS DEPARTMENT SHALL EXERCISE THE OPTION TO ACCEPT OR REJECT ALL DAMAGED OR NON-COMPLIANT CONSTRUCTION MATERIAL. THE CONTRACTOR/DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REJECTED OR SUBSTITUTED CONSTRUCTION MATERIAL.
6. PIPE SHALL BE AS FOLLOWS: PVC – FOUR (4) INCH THROUGH EIGHTEEN (18) INCH DIAMETER PIPE, WITH TWENTY FOUR (24) INCH TO THIRTY SIX (36) INCH OF COVER SHALL BE IN ACCORDANCE WITH ASTM D3034 SDR 21. FOUR (4) INCH THROUGH EIGHTEEN (18) INCH DIAMETER PIPE, WITH ASTM D3034 SDR 35 SHALL HAVE THIRTY SIX (36) INCHES MINIMUM COVER. ALL JOINTS SHALL BE PUSH-ON WITH RUBBER GASKETS. PVC STORM PIPE REQUIRES SAND COLLARS MEETING ASTM D-3034-78 SDR 35 SPECIFICATIONS (I.E. CATCH BASIN CONNECTION) OR KOR-N-SEAL BOOTS.
7. ALL PIPE BEDDING SHALL BE APWA TYPE "F" FOR FLEXIBLE PIPE (I.E. PVC, SMP OR ADS). BEDDING MATERIAL SHALL BE 5/8 INCH MINUS CRUSHED ROCK ONLY.
8. ALL TRENCH BACKFILL IN AREAS OF FUTURE PAVEMENT OR STRUCTURAL LOADING SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D 1557-70 (MODIFIED PROCTOR). ALL OTHER AREAS SHALL BE COMPACTED TO 90 PERCENT MINIMUM).
9. CONSTRUCTION OF DEWATERING (GROUNDWATER INTERCEPTION) SYSTEMS SHALL BE IN ACCORDANCE WITH THE APWA STANDARD SPECIFICATIONS, SECTION 61-3.02.
10. THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. WASHING THESE STREETS WILL NOT BE ALLOWED WITHOUT PRIOR CITY OF MERCER ISLAND APPROVAL.
11. ALL STORMWATER FACILITIES WILL BE INSTALLED AND IN OPERATION PRIOR TO OR IN CONJUNCTION WITH ALL CONSTRUCTION ACTIVITY UNLESS THAT ACTIVITY EXCEEDS THE CAPACITY AND INTENT OF THE EROSION/SEDIMENTATION CONTROL FACILITY OR UNLESS OTHERWISE APPROVED BY THE CITY.
12. RELAY EXISTING SERVICE DRAINS AND SIDE SEWERS TO CLEAR OVER OR UNDER THE NEW UTILITY AS APPROVED BY THE INSPECTOR.

EROSION CONTROL/CONSTRUCTION SEQUENCE

1. ARRANGE AND ATTEND PRE-CONSTRUCTION MEETING WITH BETWEEN OWNER OR OWNER'S REPRESENTATIVE AND CITY OF MERCER ISLAND SITE INSPECTOR.
2. CONTRACTOR'S SURVEYOR TO ESTABLISH AND STAKE OUT CONTROL POINTS FOR WORK.
3. INSTALL STRAW WATTLE BARRIERS AND GRATE INLET PROTECTION.
4. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE (IF REQUIRED).
5. CLEAR AND GRUB AREA.
6. CONSTRUCT OR INSTALL SOIL STABILIZATION MEASURES.
7. COORDINATE REMOVAL AND CAPPING OF EXISTING UTILITY LINES WITH APPROPRIATE PURVEYOR.
8. GRADE SITE PER PLAN. STABILIZE GRADED AREAS WITH TEMPORARY EROSION CONTROL MEASURES AS REQUIRED.
9. CONSTRUCT SITE IMPROVEMENTS.
10. HYDROSEED REMAINING DISTURBED AREAS.
11. RETURN SILTATION CONTROL AREAS TO ORIGINAL GROUND CONDITIONS.
12. REMOVE REMAINING TEMPORARY EROSION/SEDIMENTATION CONTROL ONLY AFTER SITE HAS BEEN STABILIZED AND CITY OF MERCER ISLAND SITE INSPECTOR HAS APPROVED THE REMOVAL.



NORTH

VICINITY MAP
Scale: 1" = 200'

CONSTRUCTION SEDIMENT CONTROL (CSC) NOTES

1. APPROVAL OF THIS CONSTRUCTION SEDIMENT CONTROL PLAN (CSC) DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
2. THE IMPLEMENTATION OF THESE CSC AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE CSC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
3. THE CSC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS.
4. THE CSC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE CSC FACILITIES SHALL BE UPGRADED (E.G. ADDITIONAL SUMPS, RELOCATION OF DITCHES AND SILT FENCES, ETC.) AS NEEDED FOR UNEXPECTED STORM EVENTS AND AS THE CITY REQUIRES.
5. THE CSC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING AND OPERATION.
6. ANY AREA STRIPPED OF VEGETATION, INCLUDING ROADWAY EMBANKMENTS, WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF TWO (2) DAYS, SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED CSC METHODS (E.G. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.) GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH OCTOBER INCLUSIVE.
7. ANY AREA NEEDING CSC MEASURE, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED WITHIN FIFTEEN (15) DAYS.
8. THE CSC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 48 HOURS FOLLOWING A STORM EVENT AND AS THE CITY DEEMS NECESSARY.
9. AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
10. STABILIZED CONSTRUCTION ENTRANCES AND WASH PADS PER CITY STANDARDS, SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
11. DURING THE TIME PERIOD OF NOVEMBER 1ST THROUGH MARCH 31ST, ALL PROJECT DISTURBED AREAS THAT ARE TO BE LEFT UNWORKED FOR MORE THAN TWO (2) DAYS SHALL BE COVERED BY ONE OF THE FOLLOWING COVER MEASURES: MULCH, SODDING OR PLASTIC COVERING.
12. WHERE SEEDING FOR TEMPORARY EROSION CONTROL IS REQUIRED, FAST GERMINATING GRASSES SHALL BE APPLIED AT AN APPROPRIATE (E.G. ANNUAL OR PERENNIAL RYE APPLIED AT APPROXIMATELY 80 POUNDS PER ACRE).
13. WHERE STRAW MULCH FOR TEMPORARY EROSION CONTROL IS REQUIRED, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF THREE (3) INCHES OR 3,000 LBS/ACRE.
14. AS CONSTRUCTION PROGRESSES AND UNEXPECTED SEASONAL CONDITIONS DICTATE, AND AS THE CITY REQUIRES, THE PERMITTEE SHOULD ANTICIPATE THAT MORE CSC MEASURES WILL BE NECESSARY TO PROTECT ADJACENT PROPERTIES AND ENSURE MINIMUM WATER QUALITY FOR SITE RUNOFF. IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO ADDRESS DEFICIENT CSC CONDITIONS AND PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE MINIMUM REQUIREMENTS OUTLINED ON THE APPROVED PLANS.
15. FILTER FABRIC FENCE SHALL BE USED WHERE NOTED ON THE PLANS OR AS DIRECTED BY THE CITY.

CALL 48 HOURS BEFORE YOU DIG
1-800-424-5555
OR CALL 8-1-1

PROJECT ADDRESS:

8435 SE 47th Place, Mercer Island, WA 98040

LEGAL DESCRIPTION:

LOT 4, HILL HIGH ESTATES AS RECORDED IN VOLUME 68 OF PLATS, PAGE 28, RECORDS OF KING COUNTY, WASHINGTON.

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

PARCEL NUMBER:

331750-0040

LOT AREA:

19,361 SF

ECTYPOS
ARCHITECTURE
4212 W. Mercer Way
Mercer Island, WA 98040
t. (206) 232-9147
f. (206) 275-0312

WR Consulting, Inc.
Civil Engineer:
WR Consulting, Inc.
3611 45th Ave W.
Seattle, WA 98199
P: 206.285.1593

JOHN W. RUNDAHL
STATE OF WASHINGTON
21551
REGISTERED
PROFESSIONAL ENGINEER
2/17/2022

STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date:
2/17/2022 Permit Set
3/14/2022 Permit Set
7/22/2022 Permit Rev. Set

Scale: As Noted
Sheet: 1 of 5
GENERAL NOTES
C1

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TREE PROTECTION NOTES:

1. ALL TREES NOT INDICATED FOR REMOVAL SHALL REMAIN UNDISTURBED.
2. INSTALL ADDITIONAL TREE PROTECTION FENCING AS NEEDED TO PREVENT DAMAGE TO EXISTING TREES.
3. EXCESS EXCAVATED MATERIALS SHALL NOT BE DISPOSED OF ON-SITE OR PLACED ON ANY ROOT ZONE OF EXISTING TREES TO REMAIN.
4. SPOILS, EXCESS MATERIALS AND CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE HILLSIDE AND DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS.

LEGEND

- INLET PROTECTION
- REMOVE TREE ×
- SILT FENCE
- STRAW WATTLE/COIR LOG
- STABILIZED CONSTRUCTION ENTRANCE
- TREE PROTECTION FENCE

TESC SEASONAL WAIVER NOTES:

1. DURING CONSTRUCTION OF DETENTION SYSTEM OR OTHER SITE WORK, A STORMWATER MANAGEMENT FACILITY INCLUDING STORAGE (EG. BAKER TANKS), PUMPS, TREATMENT COMPONENTS AND SETTLING MEASURES SHALL BE IN PLACE AS NEEDED TO CONTROL SEDIMENT WHEN DISCHARGING STORMWATER TO THE STORM DRAIN SYSTEM.
2. THE STORMWATER MANAGEMENT FACILITY SHALL BE MAINTAINED AND OPERATED AS REQUIRED TO PREVENT THE DISCHARGE OF SEDIMENT LADEN SOILS FROM THE SITE.

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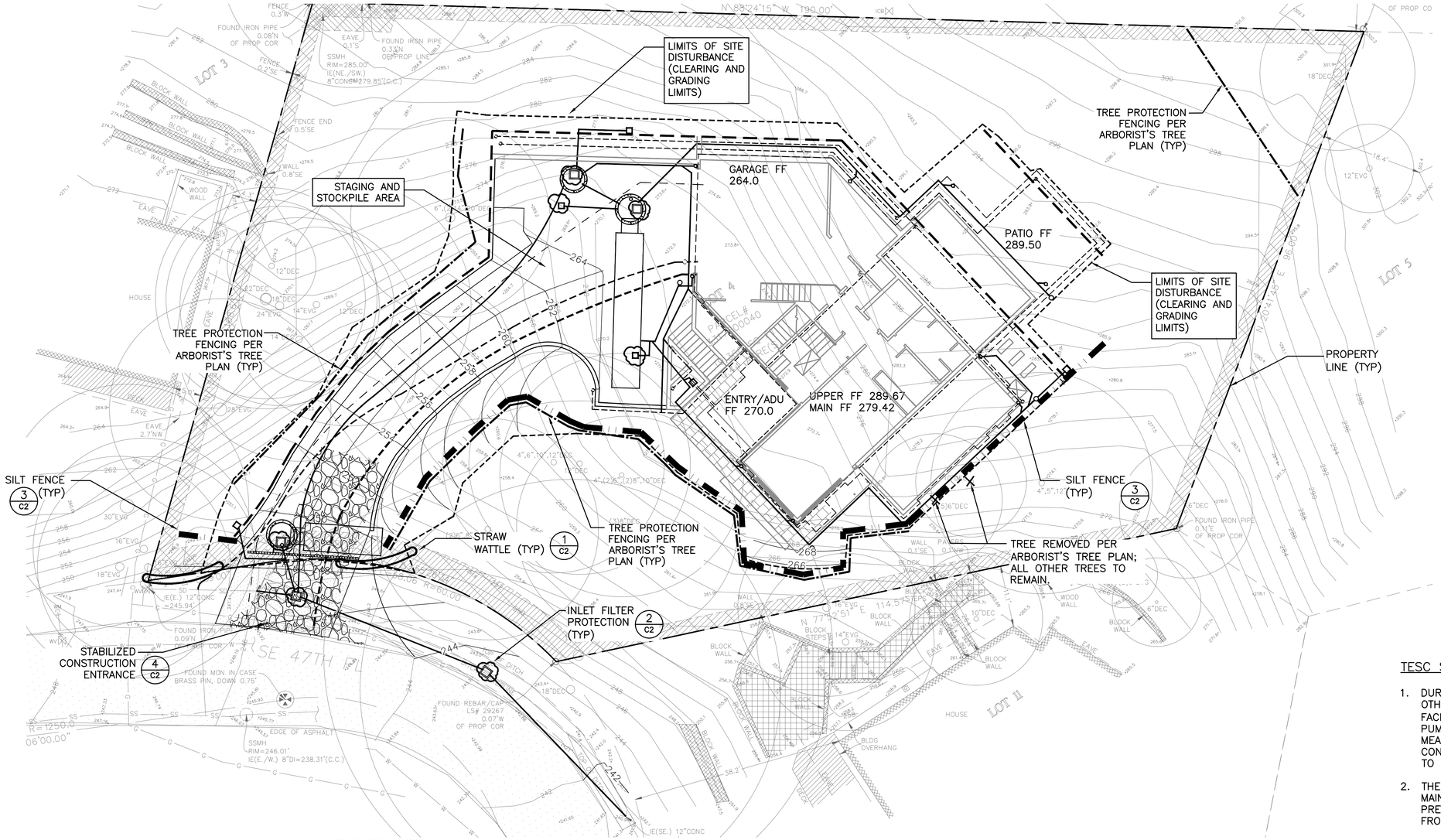
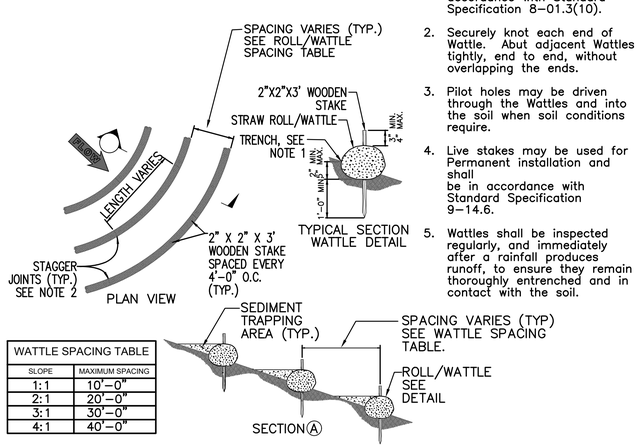
Scale: 1" = 10'

Sheet: 2 of 5

CSC PLAN AND DETAILS

C2





WATTLE SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1	10'-0"
2:1	20'-0"
3:1	30'-0"
4:1	40'-0"

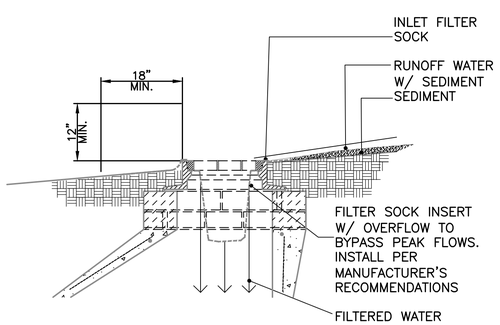
WATTLE DETAIL NOTES

1. Install Wattles along contours. Installation shall be in accordance with Standard Specification 8-01.3(10).
2. Securely knot each end of Wattle. Abut adjacent Wattles tightly, end to end, without overlapping the ends.
3. Pilot holes may be driven through the Wattles and into the soil when soil conditions require.
4. Live stakes may be used for Permanent installation and shall be in accordance with Standard Specification 9-14.6.
5. Wattles shall be inspected regularly, and immediately after a rainfall produces runoff, to ensure they remain thoroughly entrenched and in contact with the soil.

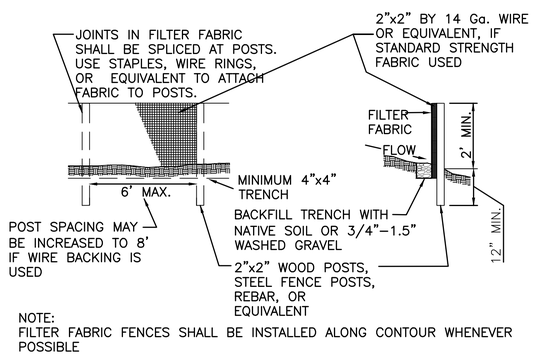
1/C2 STRAW ROLL (WATTLE) DETAIL
SCALE: N.T.S.

NORTH

CONSTRUCTION SEDIMENT CONTROL (CSC) PLAN
0 5 10 20
SCALE: 1" =10'

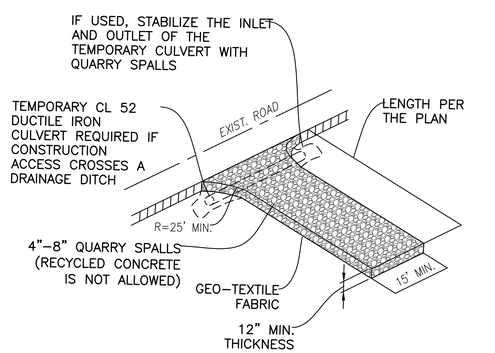


2/C2 INLET PROTECTION DETAIL
SCALE: N.T.S.



NOTE:
FILTER FABRIC FENCES SHALL BE INSTALLED ALONG CONTOUR WHENEVER POSSIBLE

3/C2 SILT FENCE DETAIL
SCALE: N.T.S.



4/C2 STABILIZED CONSTRUCTION ACCESS
SCALE: N.T.S.

CONNECT AREA DRAIN AT WALL GUTTER TO TO CB (TYP)

FND DRAIN AT BASE OF WALL, SEE Sh1.0 (TYP)

CONNECT FND AND WALL DRAINS TO CB W/4"ø SD (TYP)

RELOCATE CB 2 AWAY FROM PROPOSED FOOTING. SEE MEMO: PROJECT 2202-225 SUB 2 - ANCILLARY COMMENTS

FND DRAIN AT PLANTER, SEE ARCH (TYP)

CB TYPE 2–48" W/ SOLID COVER, EL. 264.0
IE 4"ø (N&NE) 261.0
IE 6"ø (SE) 257.3
IE 6"ø (SW) 257.1

AREA DRAIN RIM EL. 263.9 W/ 10 LF 4"ø SD

6"ø SD @ MIN. 2%

NOTE:
1.5"ø METER AND WATER SERVICE PER CITY OF MI. FINAL METER AND SERVICE LOCATION TO BE DETERMINED BY PUBLIC WORKS.

GAS SERVICE PER PSE

SOIL NAILING STABILIZATION, SEE Sh1.0 (TYP)

2 / C4.1 STORAGE NO. 2 14 LF 60"ø, SEE SHEET C4

140 LF 2"ø WATER SERVICE, CONNECT TO 2"ø METER

CB TYPE 2–54" W/ GRATE INLET RIM EL. 249.0
IE 6"ø 244.5
IE 60"ø 244.0

CONNECT AREA DRAIN AT WALL GUTTER TO TO CB (TYP)

1 / C4.1 110 LF 4" SANITARY SIDE SEWER, CONNECT TO EXIST. APPROX. ELEV. 238.5, (FIELD VERIFY LOCATION AND DEPTH)

GAS SERVICE, BY PSE

EX. SSS, FIELD VERIFY DEPTH AND LOCATION

8 LF 12"ø CONNECT EX. CULVERT TO CB

HMA APRON IN RIGHT OF WAY; MAX. WIDTH 20 FT PER CITY OF M.I.

NOTE:
THE TV INSPECTION OF THE EXISTING SIDE SEWER TO THE CITY SEWER MAIN ON SE 47TH PL IS REQUIRED PRIOR TO ANY WORK RELATED TO THE SIDE SEWER. IF THE RESULT OF THE TV INSPECTION IS NOT IN SATISFACTORY CONDITION, AS DETERMINED BY THE CITY OF MERCER ISLAND INSPECTOR, THE REPLACEMENT OF THE EXISTING SIDE SEWER IS REQUIRED.

CB TYPE 2–54" W/ GRATE INLET RIM EL. 263.9
IE 4"ø (NE & W) 262.0
IE 6"ø (NW) 257.5
IE 60"ø 257.0

42 LF 4"ø SD @ MIN. 2%

GARAGE FF 264.0

STORAGE NO.1 31 LF 60"ø, SEE SHEET C4

2 / C4.1

SS CO., CONNECT SSS, IE 257.0

4"ø SD CO IE 262.5

CONNECT FND DRAIN AND WALL DRAIN (TYP) IE 262.0±

IE 4"ø 256.0
IE 60"ø 257.0

AREA DRAIN RIM EL. 263.9

ENTRY/ADU FF 270.0

UPPER FF 289.67
MAIN FF 279.42

IE 4"ø 262.0

ELEC. CONDUITS PER PSE FOR POWER AND DATA FOR UG SERVICE

IE 6"ø 246.0
IE 36"ø 242.5

20 LF TRENCH DRAIN RIM EL. 248.8

65 LF 4"ø SD @ MIN. 2%, CONNECT FND AND WALL DRAINS

CB#1 TYPE 1 W/ GRATE INLET RIM EL. 246.8
IE 6"ø 242.3
IE 12"ø (W) 243.5
IE 12"ø (E) 241.8

36 LF 12"ø SD @ 3.6%

CB#2 TYPE 1 W/GRATE INLET RIM EL. 242.9
IE 12"ø 240.5

SAWCUT AND REPLACE HMA PAVING AS REQUIRED (TYP)

36 LF 12"ø DI SD @ 1%

38 LF 10"ø SD @ 7.9%

FILL EX. DITCH AND HYDROSEED (TYP)

CONNECT TO EX. CULVERT IE 240.12

IE 12 IN CNC NW"= 240.12

CONNECT DS W/4"ø SD (TYP)

IE 4"ø 282.0

OUTLINE OF STRUCTURE ABOVE (TYP)

PATIO FF 289.50

95 LF 4"ø SD @ MIN. 2%

FND AND WALL DRAINS 4"ø PERF @ MIN. 0.3% (TYP)

4"ø SD CO IE 286.0

SOIL NAILING STABILIZATION, SEE Sh1.0 (TYP)

4"ø SD CO IE 276.0

58 LF 4"ø SD @ MIN. 2%

4"ø SD CO IE 266.0

50 LF 4"ø SD @ MIN. 2%

NOTE:
SEE POST–CONSTRUCTION SOIL QUALITY AND DEPTH REQUIREMENTS SHEET C4.1

CB 25b–23

CB 25b–24

NORTH

DRAINAGE AND UTILITY PLAN

0 5 10 20
SCALE: 1" =10'

CALL 48 HOURS BEFORE YOU DIG
1–800–424–5555
OR CALL 8–1–1

DETENTION TANK CONSTRUCTION SEQUENCING NOTES:

1. DETENTION TANK AND ASSOCIATED STRUCTURES SHALL BE INSTALLED ONLY AFTER SOIL NAILING STABILIZATION IMPROVEMENTS ARE COMPLETE.
2. EXCAVATION FOR DETENTION TANKS AND OTHER UTILITIES SHALL BE A SINGLE VERTICAL WALL TRENCH WITH TEMPORARY SHORING AND SAFETY SYSTEMS AS REQUIRED.
3. EXCAVATION FOR DETENTION FACILITIES SHALL BE REVIEWED AND APPROVED BY CITY OF MI INSPECTOR PRIOR TO FURTHER CONSTRUCTION.
4. THE DETENTION TANKS SHALL BE LOWERED INTO PLACE AND BACKFILLED AS INDICATED. EXCESS SPOILS SHALL BE REMOVED FROM THE SITE IMMEDIATELY.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ALL TRANSITION COUPLINGS (FERNCO REDUCERS AND COUPLINGS) AS NEEDED FOR CONNECTIONS TO BLDG UTILITIES
2. INVERT ELEVATIONS ARE APPROXIMATE. ADJUST INVERT ELEVATIONS AS NEEDED TO COORDINATE WITH BLDG UTILITIES AND EXISTING GRADES.
3. SEE ARCHITECTURE PLANS FOR BUILDING AND SITE FURNISHINGS DETAILS.
5. FOUNDATION DRAINS FOR THE STRUCTURES ARE SHOWN ALONG THE BUILDING PERIMETER OR WALL FOR CLARITY. ADJUST LOCATION TO DRAIN GROUNDWATER FROM RETAINED SOIL AT THE WALLS AND RELIEVE HYDROSTATIC PRESSURE AGAINST THE STRUCTURE.

LEGEND

- AREA DRAIN
- CATCH BASIN, TYPE 1
- CATCH BASIN, TYPE 2–48"
- CATCH BASIN, TYPE 2–54"
- CLEAN OUT
- DOWNSPOUT CONNECTION
- FOUNDATION DRAIN
- FOUNDATION DRAIN CLEANOUT
- NATURAL GAS
- SANITARY SIDE SEWER
- STORM DRAIN
- WATER SERVICE

NOTE: SEE ADDITIONAL DETENTION PIPE DETAILS SHEET C4

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JOHN W. RUNDALL — STATE OF WASHINGTON — 21551 — REGISTERED PROFESSIONAL ENGINEER
2/17/2022

STEINBORN RESIDENCE
New Residence
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Mercer Island, WA 98040

Date:
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Scale: 1" = 10 '
Sheet: 3 of 5

DRAINAGE AND UTILITY PLAN

C3

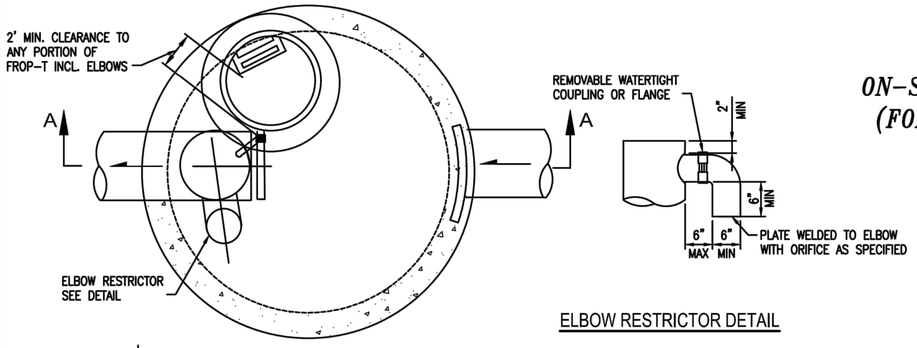
CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555
OR CALL 8-1-1

ATTACHMENT 1
CITY OF MERCER ISLAND
ON-SITE DETENTION SYSTEM WORKSHEET
(FOR NEW PLUS REPLACED IMPERVIOUS AREA OF 9,500 SF OR LESS)

DETENTION TANK NOTES:

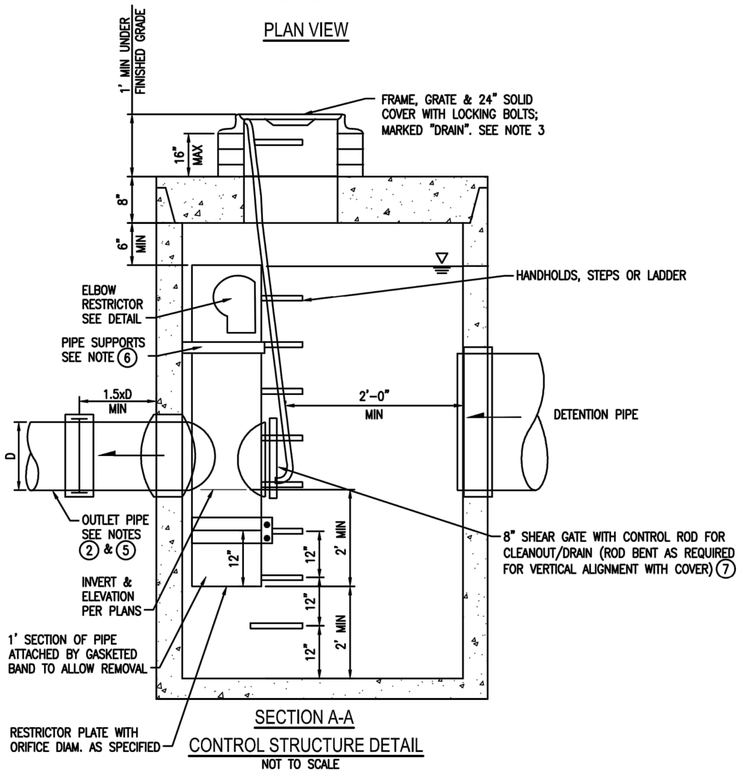
1. THE DETENTION PIPE MATERIAL SHALL BE WATERTIGHT AS OPPOSED TO "SOIL TIGHT".
2. THE DETENTION TANKS SHALL BE ADS N-12 WT (WATERTIGHT) IB PIPE WITH JOINTS IN ACCORDANCE WITH ASTM D3212 LAB TEST AND ASTM F1417 WATERTIGHT FIELD TEST.
3. THE PIPE MATERIAL SELECTED SHALL CONFORM TO THE TESTING REQUIREMENTS IN SECTION 7-17.3(2)F OF THE 2020 WSDOT STANDARD SPECIFICATIONS EXCEPT THE DETENTION PIPE SHALL BE TESTED IN ITS ENTIRETY RATHER THAN ONE JOINT AT A TIME.

OWNER: Dan and Susan Steinborn
PERMIT #: _____
ADDRESS: 8435 SE 47th PLACE, MERCER ISLAND, WA
PREPARED BY: JOHN W. RUNDALL, P.E.
PHONE: 206-850-1686
DATE: JUNE 10, 2022
NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): 5,795 SF
SOIL TYPE: TYPE D
DETENTION PIPE DIA (INCH): 60" ø
DETENTION PIPE LENGTH (FT): 37
PIPE MATERIAL: ADS N-12 WT W/WATERTIGHT IB PIPE JOINTS
ORIFICE #1 DIA SEE TABLES BELOW:
ORIFICE #2 DIA



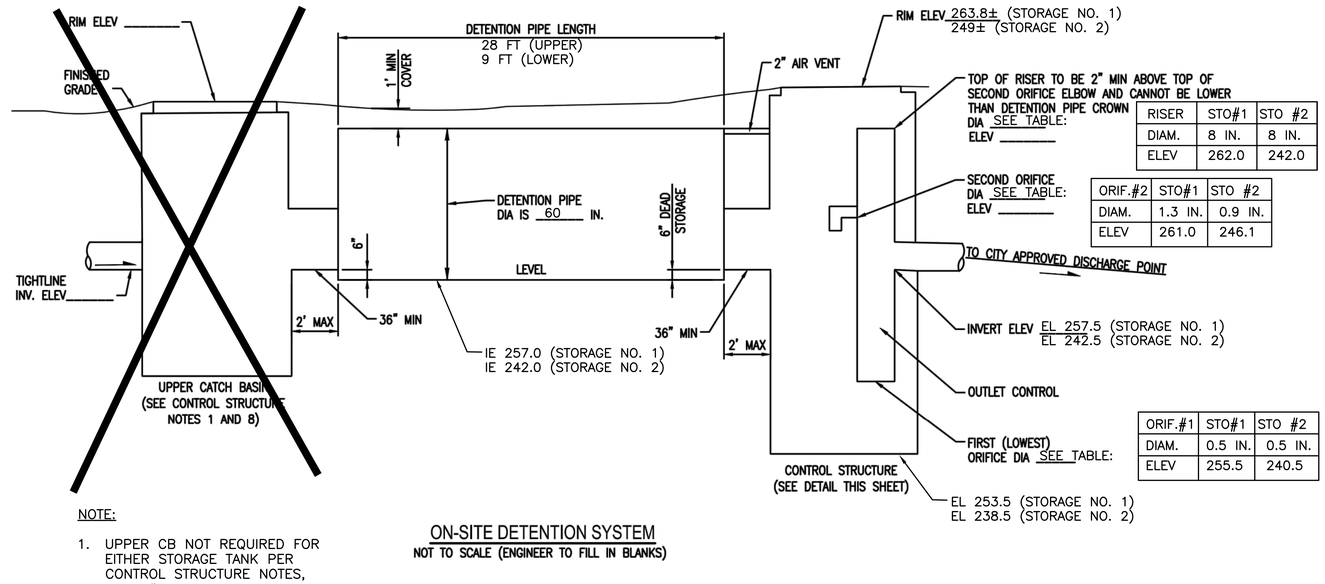
PLAN VIEW

ELBOW RESTRICTOR DETAIL



SECTION A-A

CONTROL STRUCTURE DETAIL
NOT TO SCALE



RISER	STO#1	STO #2
DIAM.	8 IN.	8 IN.
ELEV	262.0	242.0

ORIF.#2	STO#1	STO #2
DIAM.	1.3 IN.	0.9 IN.
ELEV	261.0	246.1

ORIF.#1	STO#1	STO #2
DIAM.	0.5 IN.	0.5 IN.
ELEV	255.5	240.5

NOTE:

1. UPPER CB NOT REQUIRED FOR EITHER STORAGE TANK PER CONTROL STRUCTURE NOTES, NOTE #8.

ON-SITE DETENTION SYSTEM
NOT TO SCALE (ENGINEER TO FILL IN BLANKS)

CONTROL STRUCTURE NOTES:

1. USE A MINIMUM OF A 54 IN. DIAM. TYPE 2 CATCH BASIN. THE ACTUAL SIZE IS DEPENDENT ON CONNECTING PIPE MATERIAL AND DIAMETER.
2. OUTLET PIPE: MIN. 6 INCH.
3. METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PREFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT 1.
4. FRAME AND LADDER OR STEPS OFFSET SO:
   A. CLEANOUT GATE IS VISIBLE FROM TOP;
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE;
   C. FRAME IS CLEAR OF CURB.
5. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE, OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4 IN.
6. PROVIDE AT LEAST ONE 3 X 0.090 GAUGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL WITH 5/8 IN. STANLESS STEEL EXPANSION BOLTS OR EMBEDDED SUPPORTS 2 IN. INTO CATCH BASIN WALL (MAXIMUM 3'-0" VERTICAL SPACING).
7. THE SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION ZG32A; OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B.
   THE LIFT HANDLE SHALL BE MADE OF A SIMILAR METAL TO THE GATE (TO PREVENT GALVANIC CORROSION), IT MAY BE OF SOLID ROD OR HOLLOW TUBING, WITH ADJUSTABLE HOOK AS REQUIRED.
   A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND THE GATE FLANGE. INSTALL THE GATE SO THAT THE LEVEL-LINE MARK IS LEVEL WHEN THE GATE IS CLOSED.
   THE MATING SURFACES OF THE LID AND THE BODY SHALL BE MACHINED FOR PROPER FIT.
   ALL SHEAR GATE BOLTS SHALL BE STAINLESS STEEL.
8. THE UPPER CATCH BASIN IS REQUIRED IF THE LENGTH OF THE DETENTION PIPE IS GREATER THAN 50 FT.

ON-SITE DETENTION SYSTEM NOTES:

1. CALL DEVELOPMENT SERVICES (206-275-7605) 24 HOURS IN ADVANCE FOR A DETENTION SYSTEM INSPECTION BEFORE BACKFILLING AND FOR FINAL INSPECTIONS.
2. RESPONSIBILITY FOR OPERATION AND MAINTANANCE OF DRAINAGE SYSTEMS ON PRIVATE PROPERTY IS RESPONSIBILITY OF THE PROPERTY OWNER. MATERIAL ACCUMULATED IN THE STORAGE PIPE MUST BE REMOVED FROM CATCH BASINS TO ALLOW PROPER OPERATION. THE OUTLET CONTROL ORIFICE MUST BE KEPT OPEN AT ALL TIMES.
3. PIPE MATERIAL, JOINT, AND PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH SECTION 7.04 AND 9.05 OF THE WSDOT STANDARD SPECIFICATION FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, LATEST VERSION. SUCH MATERIALS INCLUDE THE FOLLOWING, LINED CORRUGATED POLYETHYLENE PIPE (LCPE), ALUMINIZED TYPE 2 CORRUGATED STEEL PIPE AND PIPE ARCH (MEETS AASHTO DESIGNATIONS M274 AND M36), CORRUGATED OR SPIRAL RIB ALUMINUM PIPE, OR REINFORCED CONCRETE PIPE. CORRUGATED STEEL PIPE IS NOT ALLOWED.
4. FOOTING DRAINS SHALL NOT BE CONNECTED TO THE DETENTION SYSTEM.

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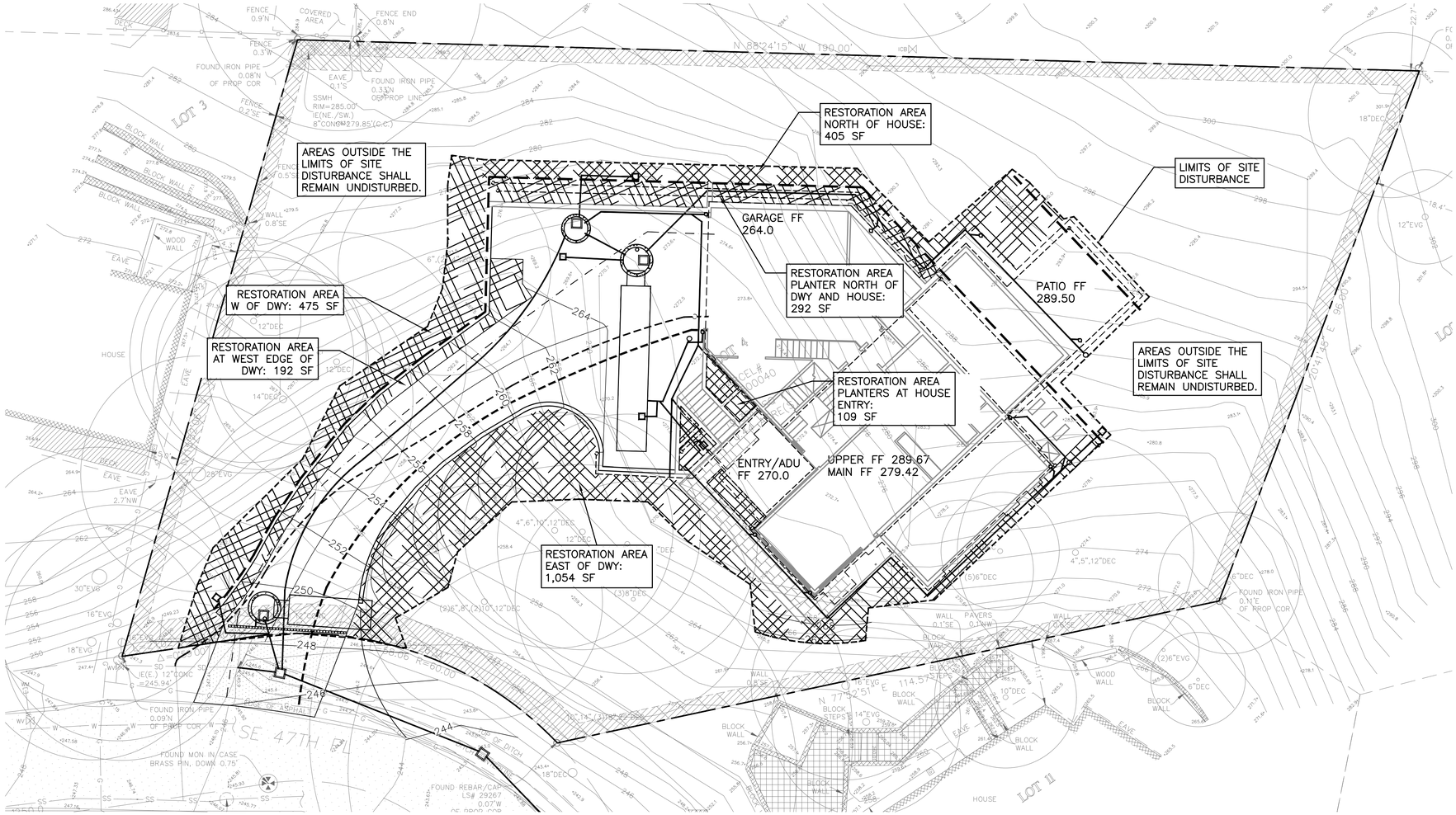
DETENTION TANK DETAILS
C4



NORTH

POST–CONSTRUCTION SOIL QUALITY AND DEPTH PLAN

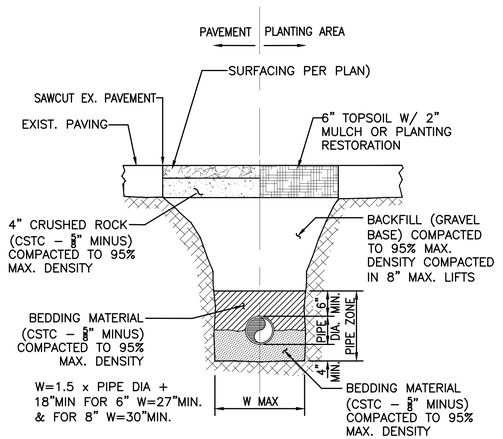
0 5 10 20

SCALE: 1" =10'

RESTORATION AREAS	AREA(SF)
NORTH OF HOUSE	405 SF
WEST OF DRIVEWAY	475 SF
EAST OF DRIVEWAY	1,054 SF
PLANTER AT WEST EDGE OF DWY	192 SF
PLANTER N. OF DWY AND HOUSE	292 SF
PLANTERS AT ENTRY	109 SF

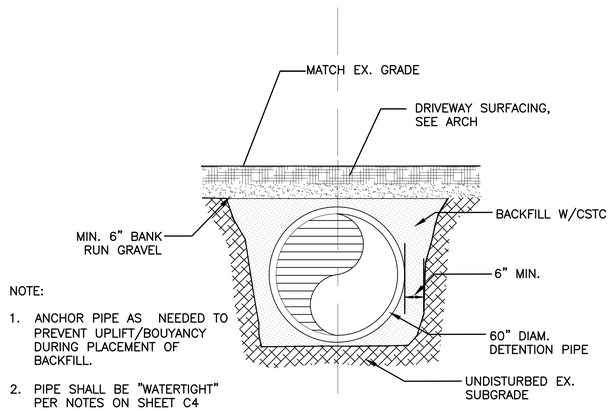
SOIL RESTORATION REQUIREMENTS:

1. IN ALL AREAS DISTURBED BY CONSTRUCTION AND IN NEW PLANTERS AND PLANTING BEDS AS INDICATED ON THE PLAN.
2. SOIL RESTORATION SHALL BE IN ACCORDANCE WITH CITY OF MERCER ISLAND POST–CONSTRUCTION SOIL–MANAGEMENT MINIMUM REQUIREMENT #5, BMP T5.13
3. SOIL RESTORATION SHALL BE AS FOLLOWS: TILL IN 3" COMPOST OR IMPORT 8" OF COMPOST AMENDED TOPSOIL



1 C4.1 UTILITY TRENCH DETAIL

NTS



NOTE:

1. ANCHOR PIPE AS NEEDED TO PREVENT UPLIFT/BOUYANCY DURING PLACEMENT OF BACKFILL.
2. PIPE SHALL BE "WATERTIGHT" PER NOTES ON SHEET C4

2 C4.1 DETENTION PIPE DETAIL

NTS

CALL 48 HOURS
BEFORE YOU DIG
1–800–424–5555
OR CALL 8–1–1

ECTYPOS
ARCHITECTURE

4212 W. Mercer Way
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t. (206) 232-9147
f. (206) 275-0312

WR Consulting, Inc.

Civil Engineer:
WR Consulting, Inc.
3611 45th Ave W.
Seattle, WA 98199
P: 206.285.1593

JOHN W. RUNDALL
STATE OF WASHINGTON
21551
REGISTERED
PROFESSIONAL ENGINEER
2/17/2022

STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date:
2/17/2022 Permit Set
3/14/2022 Permit Set
7/22/2022 Permit Rev. Set

Scale: 1" = 10 '

Sheet: 5 of 5

DRAINAGE DETAILS

C4.1

EXISTING TREE SCHEDULE

Arborists NW Tree Inventory

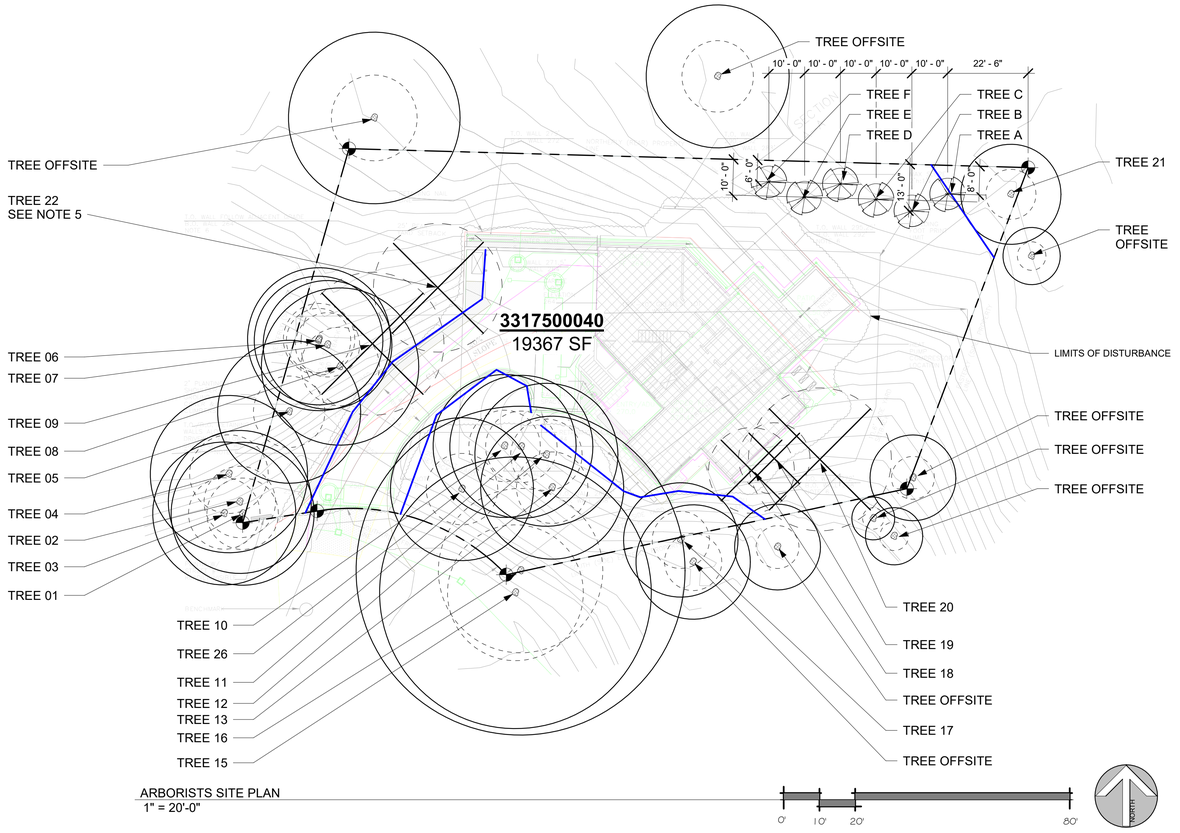
Tree Number	Common name	Scientific Name	# of Trunks	DBH (Inches)	Dripline (Feet)	Condition	Retain	Notes
1	DOUGLAS FIR	Pseudotsuga menziesii	1	14	19	FAIR	YES	
2	DOUGLAS FIR	Pseudotsuga menziesii	1	15	12	FAIR	YES	
3	DOUGLAS FIR	Pseudotsuga menziesii	1	18	12	FAIR	YES	
4	DOUGLAS FIR	Pseudotsuga menziesii	1	25	19	FAIR	YES	
5	DOUGLAS FIR	Pseudotsuga menziesii	1	21	20	FAIR	YES	
6	CHERRY	Prunus avium	1	16	12	FAIR	YES	
7	DOUGLAS FIR	Pseudotsuga menziesii	1	15	14	FAIR	YES	
8	BIG LEAF MAPLE	Acer macrophyllum		14	18	FAIR	YES	
9	BIG LEAF MAPLE	Acer macrophyllum	1	12	14	FAIR	NO	
10	BIG LEAF MAPLE	Acer macrophyllum	4	17.2	18	FAIR	YES	STUMP SPROUTED
11	BIG LEAF MAPLE	Acer macrophyllum	1	12	12	FAIR	YES	
12	BIG LEAF MAPLE	Acer macrophyllum	6	17.7	18	FAIR	YES	STUMP SPROUTED
13	BIG LEAF MAPLE	Acer macrophyllum	3	13.8	14	FAIR	YES	STUMP SPROUTED
14	BIG LEAF MAPLE	Acer macrophyllum	6	20.6	18	FAIR	YES	STUMP SPROUTED
15	BIG LEAF MAPLE	Acer macrophyllum	1	18	27	FAIR	YES	STUMP SPROUTED
16	BIG LEAF MAPLE	Acer macrophyllum	6	31	20	FAIR	YES	STUMP SPROUTED
17	DOUGLAS FIR	Pseudotsuga menziesii	1	16	14	FAIR	YES	
18	BIG LEAF MAPLE	Acer macrophyllum	5	17.4	14	FAIR	NO	STUMP SPROUTED
19	BIG LEAF MAPLE	Acer macrophyllum	1	10	18	FAIR	NO	
20	BIG LEAF MAPLE	Acer macrophyllum	3	13.6	18	FAIR	NO	STUMP SPROUTED
21	DOUGLAS FIR	Pseudotsuga menziesii	1	18	14	FAIR	YES	
22	SCOULERS WILLOW	Salix scoulerlana	4	28.7	16	FAIR	NO	CLINGING TO STEEP EDGE
23	BIG LEAF MAPLE	Acer macrophyllum	1	10	12	FAIR	YES	STUMP SPROUTED - OFF SITE
24	DOUGLAS FIR	Pseudotsuga menziesii	1	14	14	GOOD	YES	OFF SITE
25	BIG LEAF MAPLE	Acer macrophyllum	1	6	10	FAIR	YES	OFF SITE
26	BIG LEAF MAPLE	Acer macrophyllum	4	18.2	14	FAIR	YES	STUMP SPROUTED
27	DOUGLAS FIR	Pseudotsuga menziesii	1	8.4	10	FAIR	YES	OFF SITE
28	BIG LEAF MAPLE	Acer macrophyllum	1	6	10	FAIR	YES	OFF SITE
29	DOUGLAS FIR	Pseudotsuga menziesii	1	12	12	FAIR	YES	OFF SITE
30	DOUGLAS FIR	Pseudotsuga menziesii	1					
31	DOUGLAS FIR	Pseudotsuga menziesii	1	34	26	FAIR	YES	OFF SITE
		Total DBH		**492.6**				
		Retained DBH		410.9				
		Retained Percentage		**83.4%**				

REPLACEMENT TREE SCHEDULE

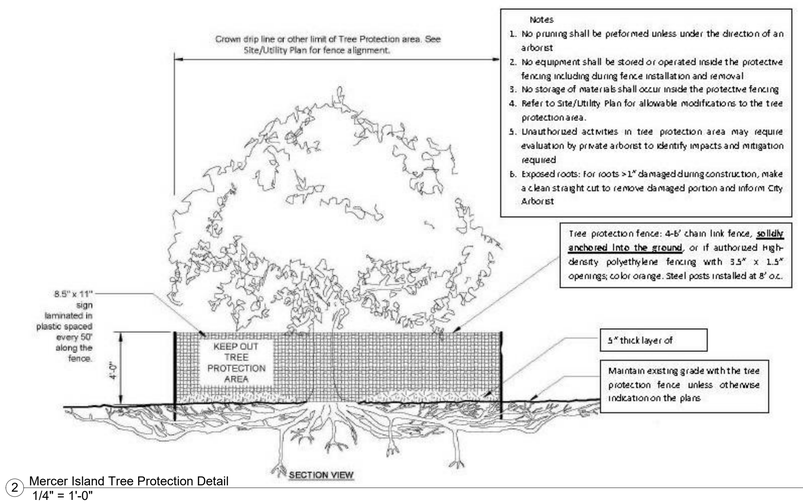
TREE #	COMMON NAME	LATIN NAME	SIZE	QTY
A	EXCELSA CEDAR	Thuja Plicata Excelsa	8'-10'	1
B	EXCELSA CEDAR	Thuja Plicata Excelsa	8'-10'	1
C	EXCELSA CEDAR	Thuja Plicata Excelsa	8'-10'	1
D	EXCELSA CEDAR	Thuja Plicata Excelsa	8'-10'	1
E	EXCELSA CEDAR	Thuja Plicata Excelsa	8'-10'	1
F	EXCELSA CEDAR	Thuja Plicata Excelsa	8'-10'	1

GENERAL ARBORISTS NOTES:

1. PROJECT ARBORIST MUST BE ON-SITE DURING EXCAVATION ALONG THE DRIVEWAY.
2. THE LAWN AND LANDSCAPE AREAS ARE REQUIRED TO PROVIDE POST-CONSTURCTION SOIL QUALITY AND DEPTH IN ACCORDANCE WITH BMP T5.13. THE PROJECT ARBORIST MUST PROVIDE A LETTER OF CERTIFICATION TO ENSURE THAT THE LAWN AND LANDSCAPE AREAS ARE MEETING THE POST-CONSTRUCTION SOIL QUALITY AND DEPTH REQUIREMENTS ON THE APPROVED PLAN SET PRIOR TO FINAL INSPECTION OF THE PROJECT.
3. PURSUANT TO MICC 19.10.070,D, TREES SHALL BE MAINTAINED IN A HEALTHY CONDITION FOR 5 YEARS. DEAD OR DEPRESSED TREES SHALL BE REPLACED.
4. REFER TO C4 FOR THE POST-CONSTRUCTION SOIL QUALITY AND DEPTH PLAN.
5. SEE ATTACHED ARBORISTS REPORT.



ARBORISTS SITE PLAN
1" = 20'-0"



2 Mercer Island Tree Protection Detail
1/4" = 1'-0"

	TREE DRIP LINE (DL)
	DIAMETER STANDARD HEIGHT (DSH)
	EVERGREEN TREE
	DECIDUOUS TREE
	TREE TO BE REMOVED
	TREE PROTECTION FENCING
	NEW TREE

PREPARED BY:

NEAL BAKER
ARBORISTS NW.COM
ISA CERT. PN1075A
TRAQ ISA (TREE RISK ASSESSMENT QUALIFIED)
MEMBER AREA & SOCA
PH: 206 779 2579

arboristsNW

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ONLINE: https://arboristsnw.com/
PHONE: 206-779-2579
EMAIL: neal@arboristsnw.com

No.	Description	Date

84xx SE 47TH PL, MERCER ISLAND, WA 98040

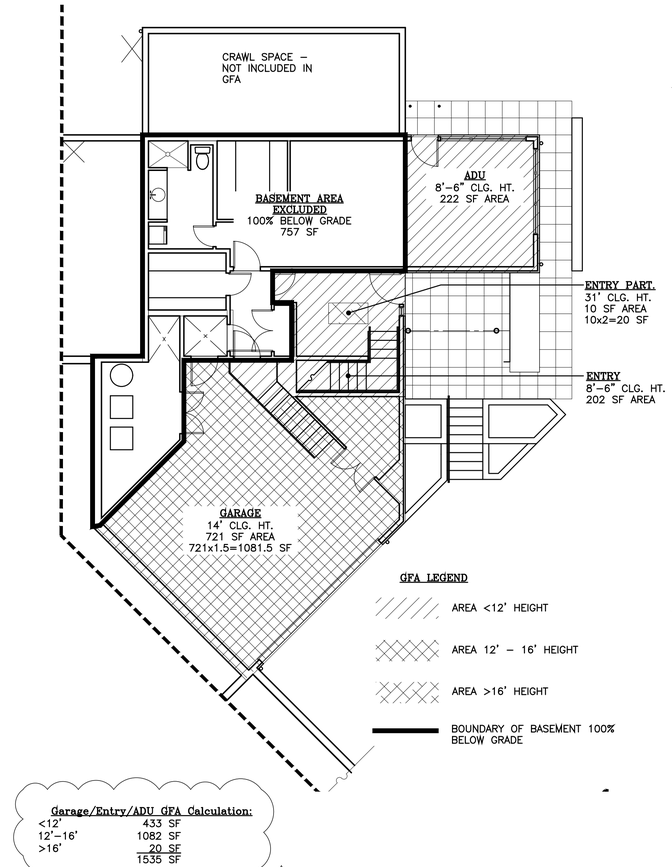
ARBORIST TREE PLAN

Project number	21029
Date	--
Drawn by	CW
Checked by	NB

AR-1

Scale: As indicated

9/29/2022 10:44:21 AM



Garage/Entry/ADU GFA Calculation:

<12'	433 SF
12'–16'	1082 SF
>16'	20 SF
	1535 SF

NORTH

1 Lower Floor Plan GFA Calculation
scale: 1/8"=1'–0"

Enclosed Crawl Space Ventilation Under Heated

TOTAL AREA: 318 SF

VENTILATION REQUIRED W/ CLASS I VAPOR BARRIER: 1 SF/300 SF

REQUIRED VENTILATION: 1.06 SF OR 152.64 SI

PROVIDED VENTILATION @ EXTERIOR WALLS: 186 SI

NOTE: NFVA – NET FREE VENT AREA

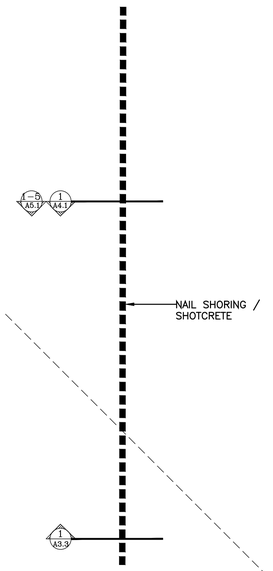
Conditioned Space Square Footage: 1107.6SF

Fire Area Square Footage

ATTACHED GARAGE/MECHANICAL ROOM/ELEVATOR:	932.7 SF
ADU / ENTRY HALL:	800.0 SF
ENTRY CANOPY:	117.3 SF

Floor Plan Notes

1. Stair design deferred submittal. Structural Engineer to provide connection specifications.
2. See Sheet A0.1 for General Notes in common.
3. Fire Code Alternate minimum requirements:
   13R Sprinkler System Plus – Design Build per 2016 NFPA
   1 HR 5/8" GWB throughout
   Solid core doors throughout except at closets.
4. Energy Performance Requirements:
   EC 2.2 – Air Leakage Control and Efficient Ventilation: Reduce tested air leakage to 2.0 air changes per hour maximum @ 50 Pascals
   EC 4.2 – High Efficiency HVAC Distribution System: Hydronic in–floor piping throughout all conditioned spaces.
5. Vapor Retarder Required – Low/no VOC vapor barrier primer on all painted surfaces per IRC 702.7

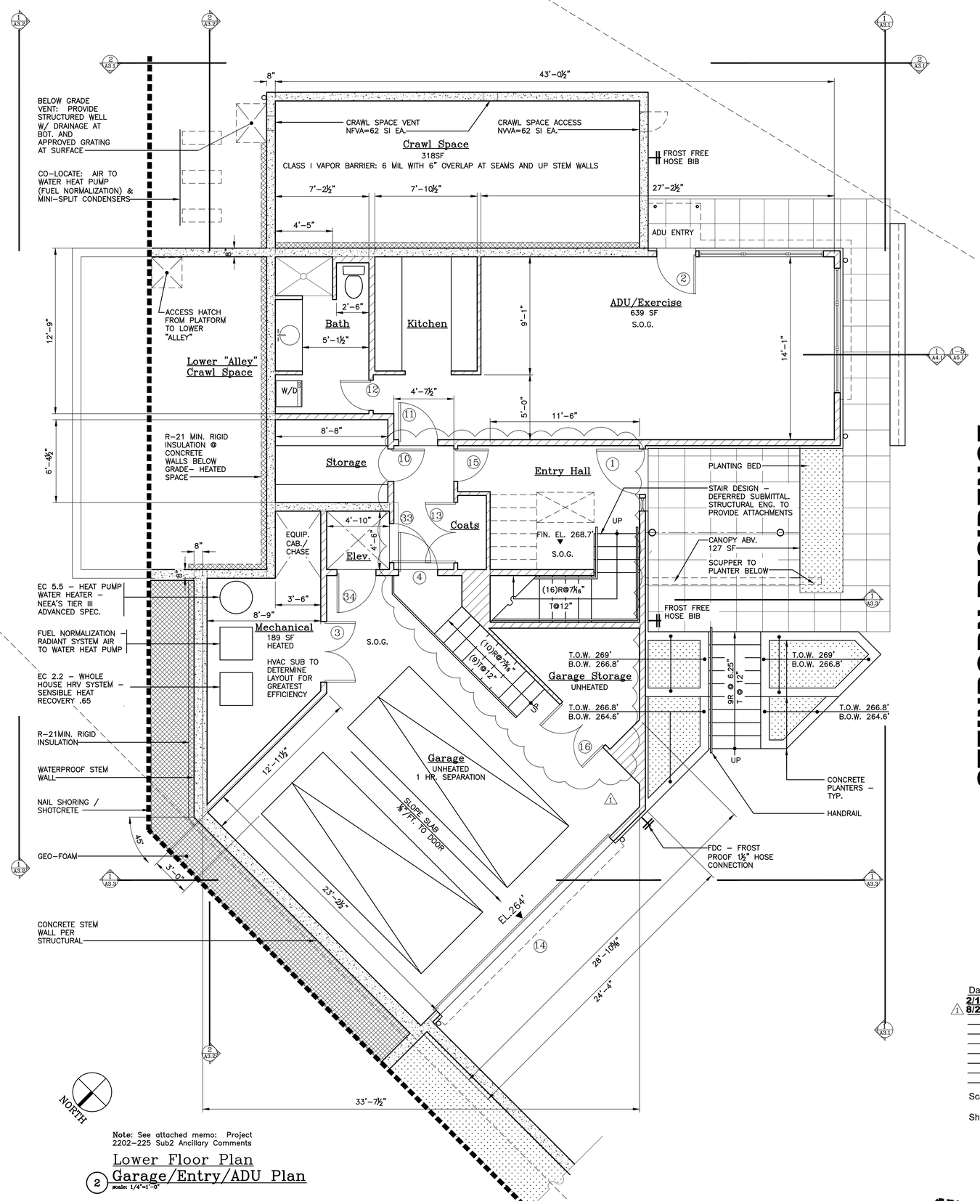


Graphic Scale

1' 5' 10'
0

Plan Framing Legend

- CONCRETE WALL
- WOOD FRAME WALL
- WINDOW OPENING
- DOOR OPENING
- POCKET DOOR OPENING
- DECK PARAPET



NORTH

Note: See attached memo: Project 2202–225 Sub2 Ancillary Comments

Lower Floor Plan
2 Garage/Entry/ADU Plan
scale: 1/4"=1'–0"

ECTYPOS ARCHITECTURE
4212 W. Mercer Way
Mercer Island, WA 98040
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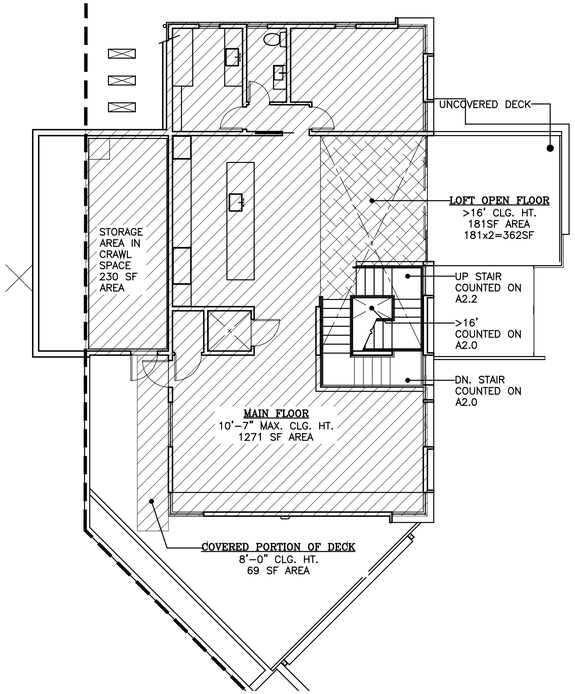
7785 REGISTERED ARCHITECT
LUCIA PIRZIO–BIROLI
STATE OF WASHINGTON

STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date: **3/15/2021 Pre-App**
1 **2/14/2022 Permit Submittal**
1 **8/25/2022 Sub2-2202-225**

Scale:

Sheet:
Lower Floor Plan
A2.0



GFA LEGEND

AREA <12' HEIGHT

AREA >16' HEIGHT

Main Floor GFA Calculation:	
<12'	1501 SF
COVERED DECK	69 SF
>16' (SFx2)	362 SF
	1932 SF

NORTH

1 Main Floor GFA Calculation
scale: 1/8"=1'-0"

Enclosed Crawl Space Ventilation Under Heated

TOTAL AREA: 344 SF

VENTILATION REQUIRED W/ CLASS I VAPOR BARRIER: 1 SF/300 SF

REQUIRED VENTILATION: 1.146 SF OR 165 SI

PROVIDED VENTILATION @ EXTERIOR WALLS: 186 SI

NOTE: NFVA – NET FREE VENT AREA

Conditioned Space Square Footage:	1446 SF

Fire Area Square Footage

MAIN FLOOR AREA NOT INCLUDING STAIRS:	1421.5 SF
STORAGE ARE (PORTION OF CRAWL SPACE)	230.0 SF
COVERED DECK:	69.0 SF
Roof Deck Square Footage:	673.0 SF

Floor Plan Notes

1. Stair design deferred submittal. Structural Engineer to provide connection specifications.
2. See Sheet A0.1 for General Notes in common.
3. Fire Code Alternate minimum requirements:
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   1 HR 5/8" GWB throughout
   Solid core doors throughout except at closets.
4. Energy Performance Requirements:
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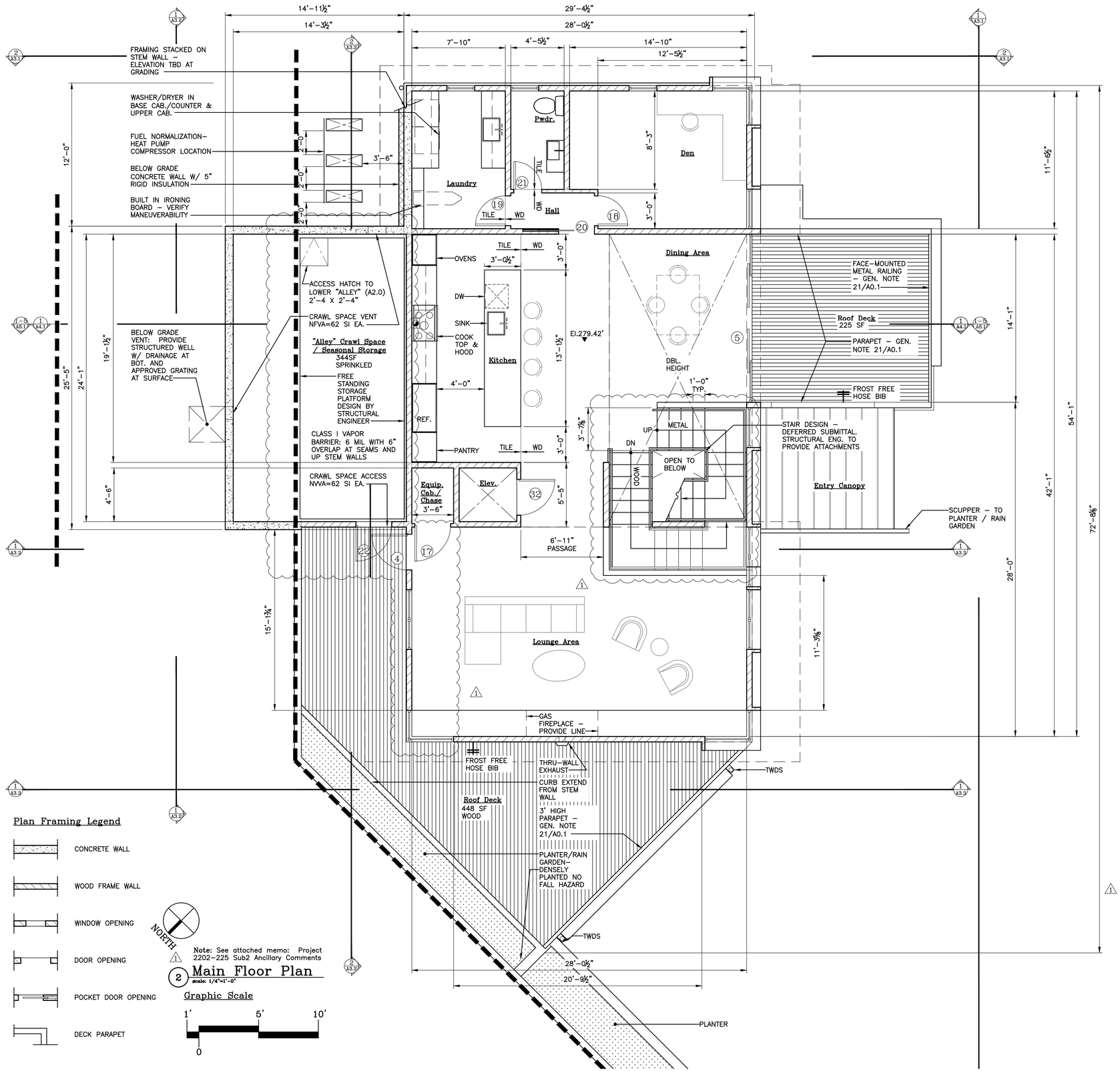
   EC 4.2 – High Efficiency HVAC Distribution System: Hydronic in-floor piping throughout all conditioned spaces.
5. Vapor Retarder Required – Low/no VOC vapor barrier primer on all painted surfaces per IRC 702.7



Plan Framing Legend

- CONCRETE WALL
- WOOD FRAME WALL
- WINDOW OPENING
- DOOR OPENING
- POCKET DOOR OPENING
- DECK PARAPET

NORTH

Note: See attached memo: Project 2202–225 Sub2 Ancillary Comments

2 Main Floor Plan
scale: 1/4"=1'-0"

Graphic Scale

1' 5' 10'
0

ECTYPOS
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4212 W. Mercer Way
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7785 REGISTERED ARCHITECT
LUCIA PIRZIO–BIROLI
STATE OF WASHINGTON

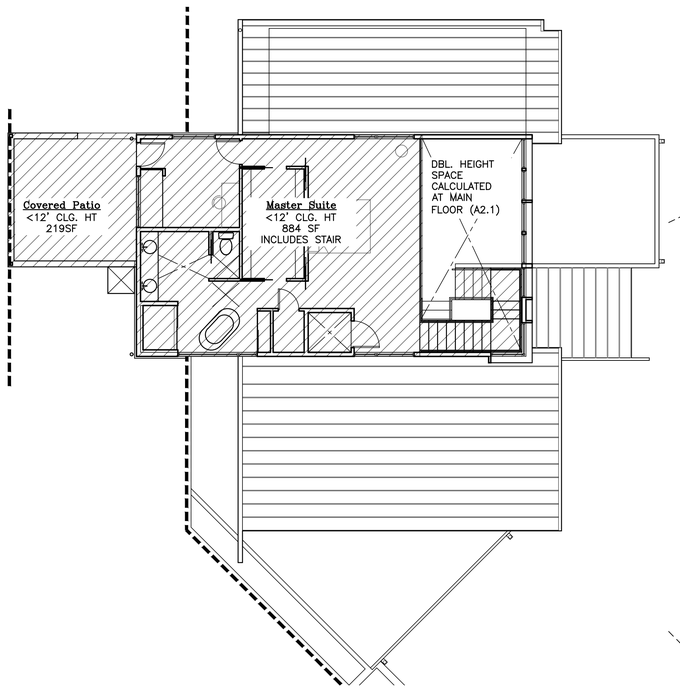
STEINBORN RESIDENCE

New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date: 3/15/2021 Pre-App
2/14/2022 Permit Submittal
1 8/25/2022 Sub2-2202-225

Scale:

Sheet:
Main Floor Plan
A2.1



GFA LEGEND

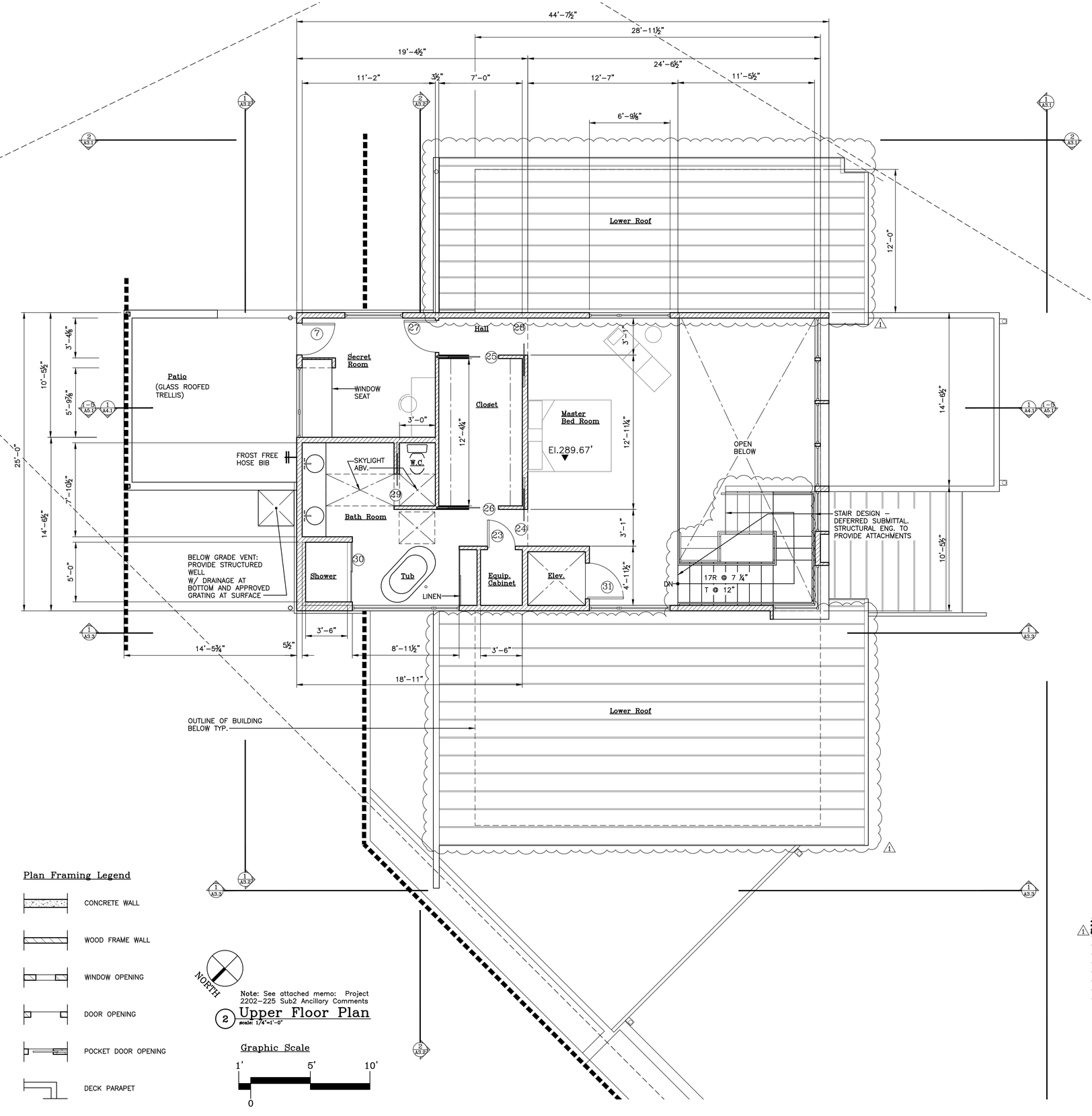
AREA <12' HEIGHT

Upper Floor GFA Calculation:	
<12'	884 SF
COVERED PATIO	219 SF
	1103 SF

1

NORTH

1 Upper Floor Plan GFA Calculation
scale: 1/8"=1'-0"



Plan Framing Legend

- CONCRETE WALL
- WOOD FRAME WALL
- WINDOW OPENING
- DOOR OPENING
- POCKET DOOR OPENING
- DECK PARAPET

NORTH

Note: See attached memo: Project 2202-225 Sub2 Ancillary Comments

2 Upper Floor Plan
scale: 1/4"=1'-0"

Graphic Scale

1' 5' 10'
0

Conditioned Space Square Footage: 928.3SF

Fire Area Square Footage

MASTER SUITE AREA NOT INCLUDING DOUBLE HEIGHT SPACE BELOW:	877.7 SF
COVERED PATIO:	190 SF

Floor Plan Notes

1. Stair design deferred submittal. Structural Engineer to provide connection specifications.
2. See Sheet A0.1 for General Notes in common.
3. Fire Code Alternate minimum requirements:
   13R Sprinkler System Plus – Design Build per 2016 NFPA
   1 HR ⅝" GWB throughout
   Solid core doors throughout except at closets.
4. Energy Performance Requirements:
   EC 2.2 – Air Leakage Control and Efficient Ventilation: Reduce tested air leakage to 2.0 air changes per hour maximum @ 50 Pascals
   EC 4.2 – High Efficiency HVAC Distribution System: Hydronic in-floor piping throughout all conditioned spaces.
5. Vapor Retarder Required – Low/no VOC vapor barrier primer on all painted surfaces per IRC 702.7

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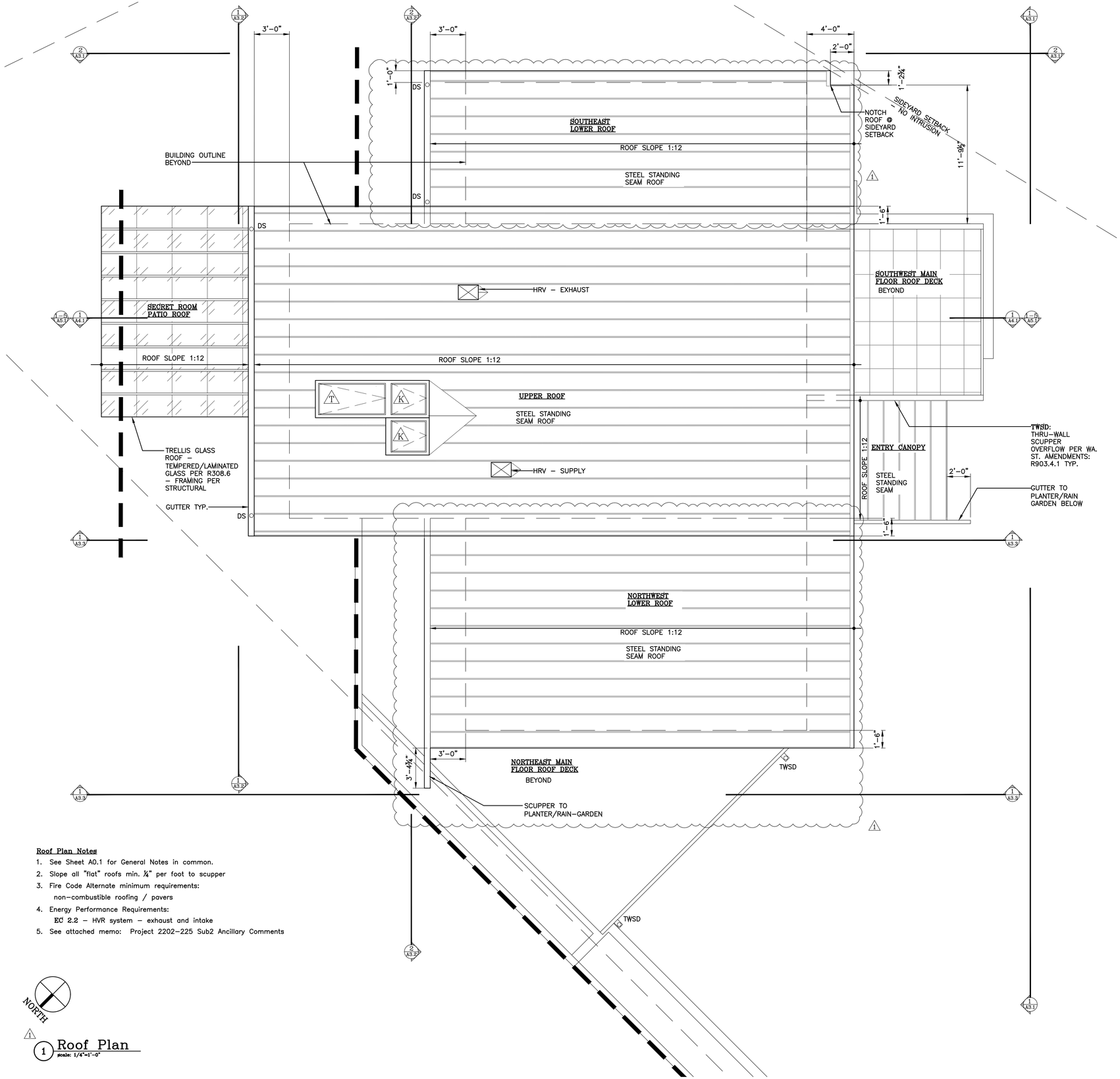
8/25/2022 Sub2-2202-225

Scale:

Sheet:
Upper Floor Plan
A2.2



Roof Plan Notes

1. See Sheet A0.1 for General Notes in common.
2. Slope all "flat" roofs min. ¼" per foot to scupper
3. Fire Code Alternate minimum requirements:
   non-combustible roofing / pavers
4. Energy Performance Requirements:
   EC 2.2 – HVR system – exhaust and intake
5. See attached memo: Project 2202-225 Sub2 Ancillary Comments

NORTH

1 Roof Plan
scale: 1/4"=1'-0"

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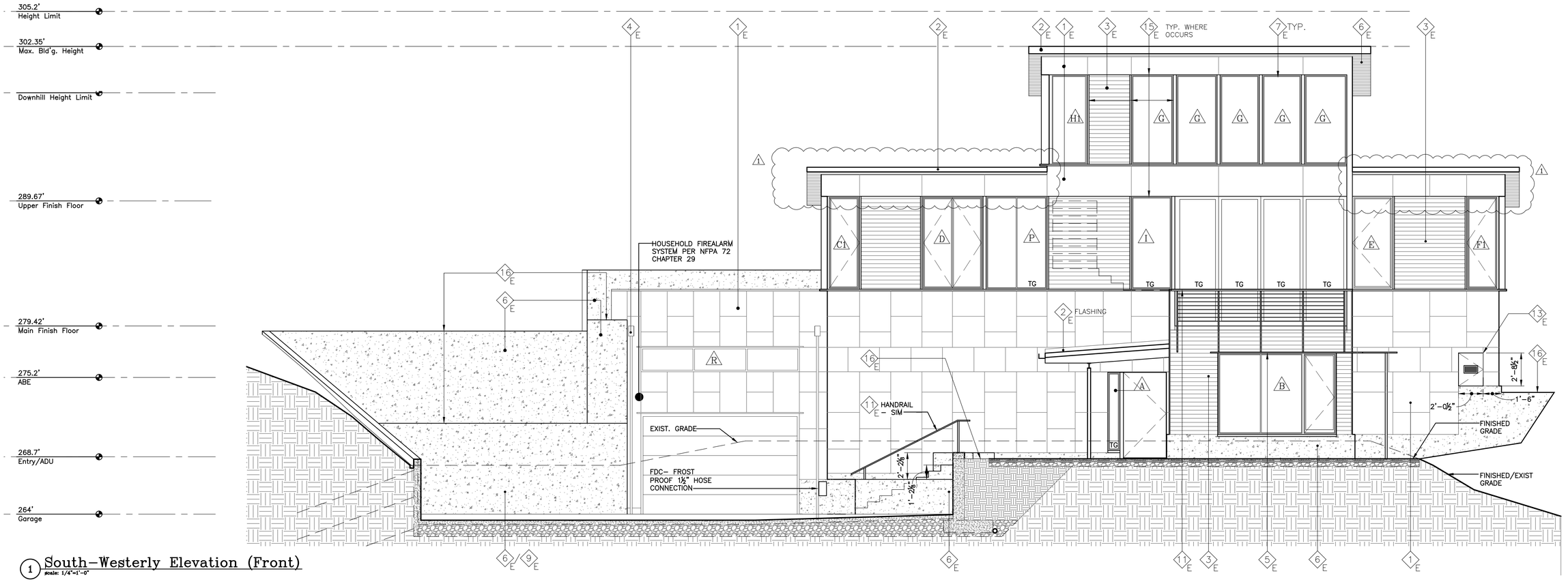
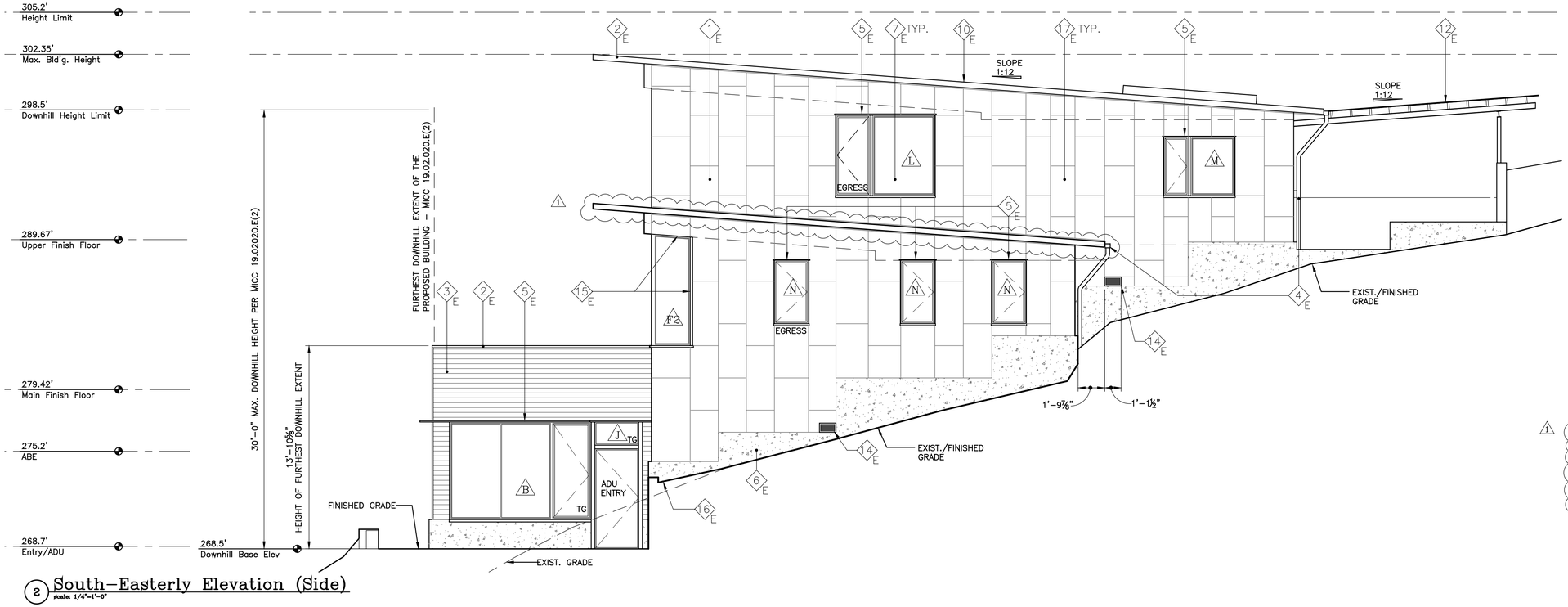
Scale:

Sheet:
Roof Plan
A2.3



1 South–Westerly Elevation (Front)
scale: 1/4"=1'–0"



2 South–Easterly Elevation (Side)
scale: 1/4"=1'–0"

EXTERIOR MATERIAL LEGEND:

Note: See attached memo: Project 2202–225 Sub2 Ancillary Comments

1E EQUITONE FIBER CEMENT PANEL W/ EXPOSED FASTENERS – COLOR TBD

2E METAL TRIM/COPING/FLASHING/SILL – COLOR TO COMPLIMENT FIBER CEMENT PANEL

3E HORIZONTAL CLEAR CEDAR SHIPLAP SIDING – STAIN COLOR TBD

4E METAL GUTTER/OVERFLOW SCUPPER/DOWNSPOUT METAL – COLOR TO MATCH METAL TRIM/GUTTERS ETC.

5E STEEL EYEBROW – 14 GAUGE – COLOR TO MATCH METAL TRIM/GUTTERS ETC.

6E CONCRETE STEM WALLS/PLANTERS – ARCHITECTURAL APPEARANCE GRADE WHERE EXPOSED

7E FIBERGLASS WINDOWS

8E CLEAR CEDAR T&G SOFFIT – STAIN TBD

9E ESPALIER GREEN WALL – STEEL WIRE ROPE & HARDWARE

10E STANDING SEAM METAL ROOF AND RELATED METAL TRIM – COLOR TBD.

11E STAINLESS STEEL GUARDRAIL WITH WOOD TOP RAIL– FACE MOUNTED. SEE GENERAL NOTE #21 ON A0.1

12E STEEL/WOOD/GLASS PERGOLA – OVERHEAD GLAZING PER IRC 308.6

13E 18"x24" ACCESS OPENING W/ CRAWL SPACE VENT NFVA: 62SI – PER IRC R408.4/WAC 51–51 R408

14E CRAWL SPACE VENT NFVA: 62SI – PER WAC 51–51 R408 AT BELOW GRADE VENTS PROVIDE STRUCTURED WELL WITH GRAVEL 6" BELOW VENT & DRAIN TO CONNECTED DRAINAGE SYSTEM.

1 15E ELECTRIC ROLLER SHADES W/ LATERAL TRACK "FINS"

16E DENSELY PLANTED VEGETATION – NO FALL RISK

17E MEET OR EXCEED EC 1.4 – EFFICIENT BUILDING ENVELOPE

ECTYPOS
ARCHITECTURE

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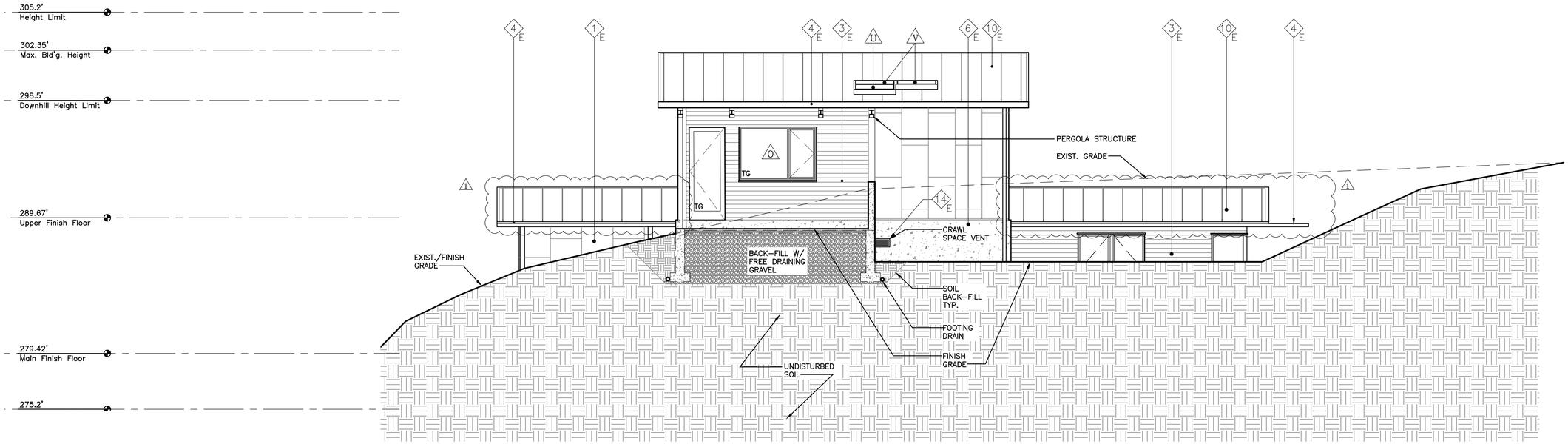
2/14/2022 Permit Submittal
1 **8/25/2022 Sub2-2202-225**

Scale:

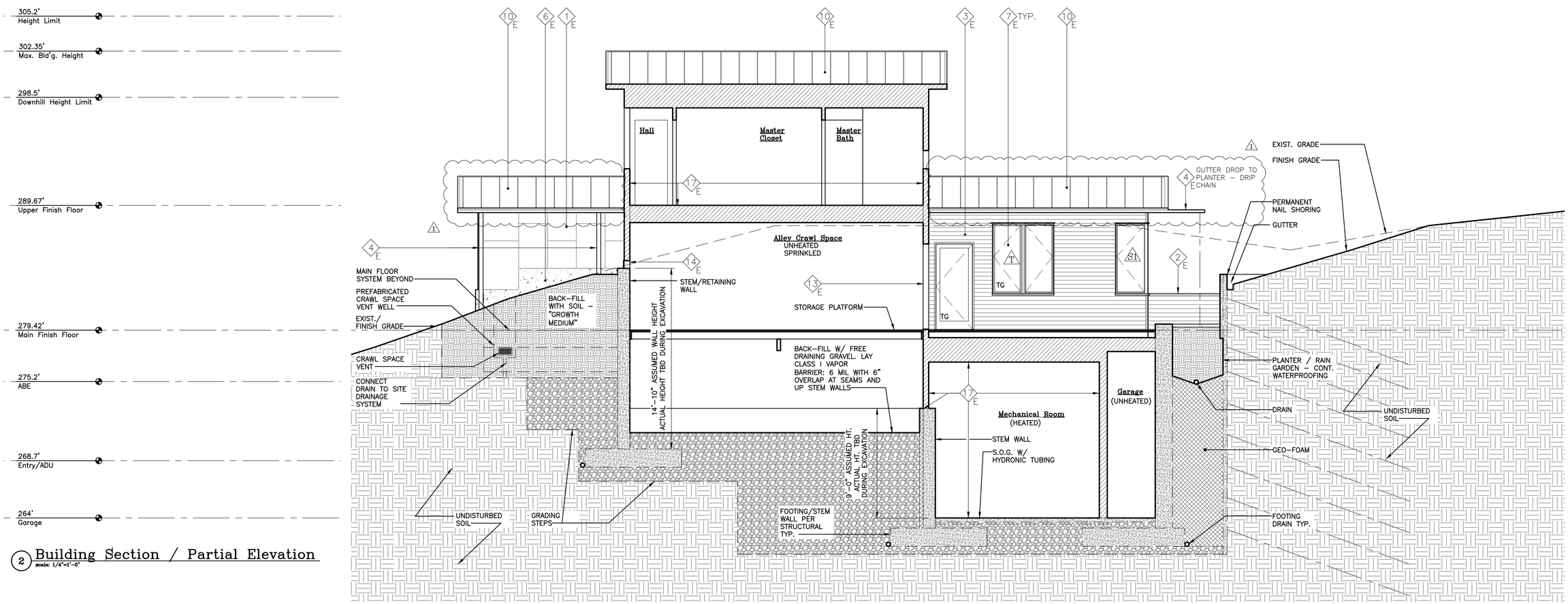
Sheet:

Elevations

A3.1



1 North-Easterly Elevation (Rear)
scale: 1/4"=1'-0"



2 Building Section / Partial Elevation
scale: 1/4"=1'-0"

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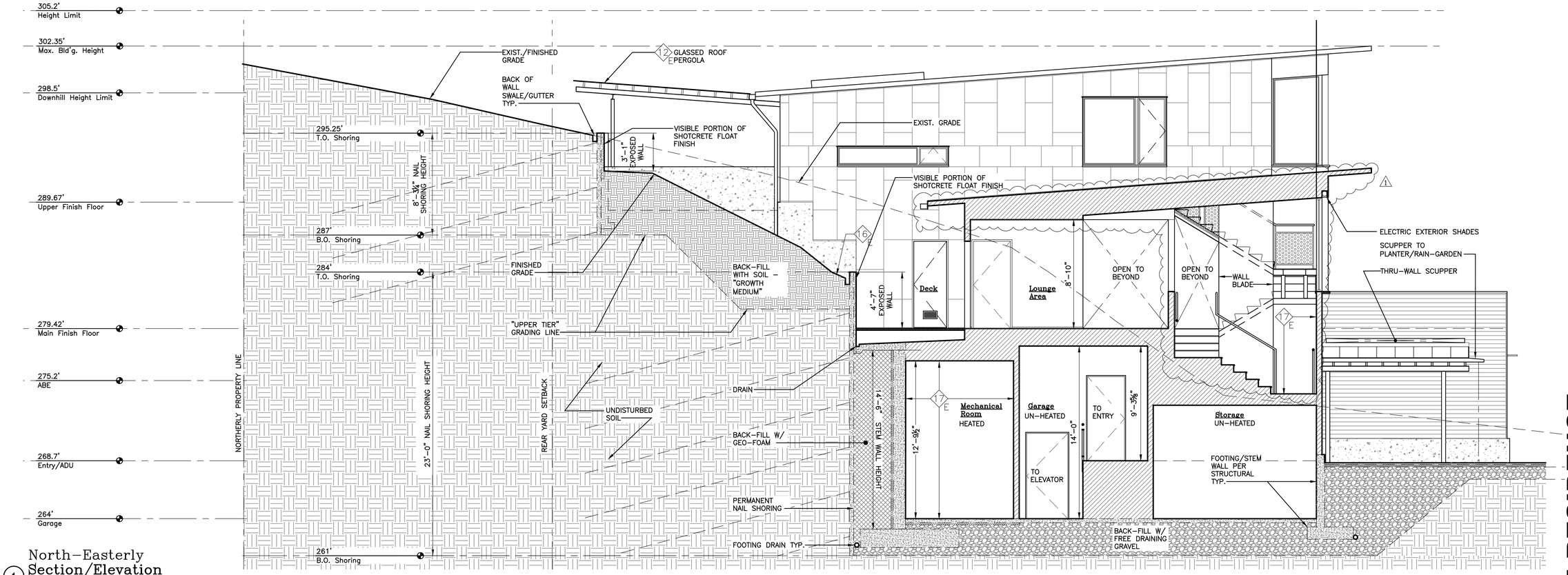
Scale:

Sheet:

Elevations/ Sections
A3.2



North-Easterly
Section/Elevation
1 scale: 1/4"=1'-0"

EXTERIOR MATERIAL LEGEND:

Note: See attached memo: Project 2202-225 Sub2 Ancillary Comments

1 E EQUITONE FIBER CEMENT PANEL W/ EXPOSED FASTENERS - COLOR TBD

2 E METAL TRIM/COPING/FLASHING/SILL - COLOR TO COMPLIMENT FIBER CEMENT PANEL

3 E HORIZONTAL CLEAR CEDAR SHIPLAP SIDING - STAIN COLOR TBD

4 E METAL GUTTER/OVERFLOW SCUPPER/DOWNSPOUT METAL - COLOR TO MATCH METAL TRIM/GUTTERS ETC.

5 E STEEL EYEBROW - 14 GAUGE - COLOR TO MATCH METAL TRIM/GUTTERS ETC.

6 E CONCRETE STEM WALLS/PLANTERS - ARCHITECTURAL APPEARANCE GRADE WHERE EXPOSED

7 E FIBERGLASS WINDOWS

8 E CLEAR CEDAR T&G SOFFIT - STAIN TBD

9 E ESPALIER GREEN WALL - STEEL WIRE ROPE & HARDWARE

10 E STANDING SEAM METAL ROOF AND RELATED METAL TRIM - COLOR TBD.

11 E STAINLESS STEEL GUARDRAIL WITH WOOD TOP RAIL- FACE MOUNTED. SEE GENERAL NOTE #21 ON A0.1

12 E STEEL/WOOD/GLASS PERGOLA - OVERHEAD GLAZING PER IRC 308.6

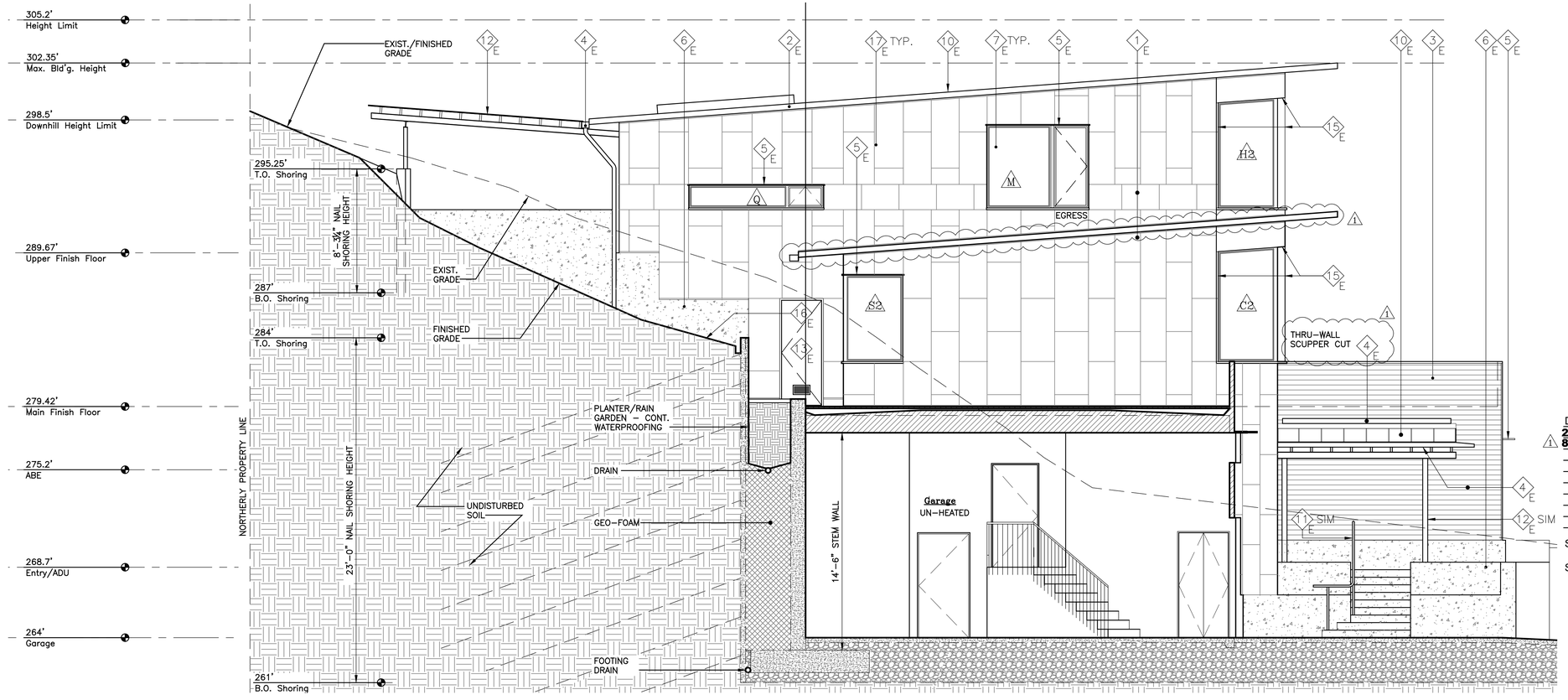
13 E 18"x24" ACCESS OPENING W/ CRAWL SPACE VENT NFVA: 62SI - PER IRC R408.4/WAC 51-51 R408

14 E CRAWL SPACE VENT NFVA: 62SI - PER WAC 51-51 R408 AT BELOW GRADE VENTS PROVIDE STRUCTURED WELL WITH GRAVEL 6" BELOW VENT & DRAIN TO CONNECTED DRAINAGE SYSTEM.

15 E ELECTRIC ROLLER SHADES W/ LATERAL TRACK "FINS"

16 E DENSELY PLANTED VEGETATION - NO FALL RISK

17 E MEET OR EXCEED EC 1.4 - EFFICIENT BUILDING ENVELOPE



North-Easterly
Section/Elevation
2 scale: 1/4"=1'-0"

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7785 REGISTERED ARCHITECT
LUCIA PIRZIO-BIROLI
STATE OF WASHINGTON

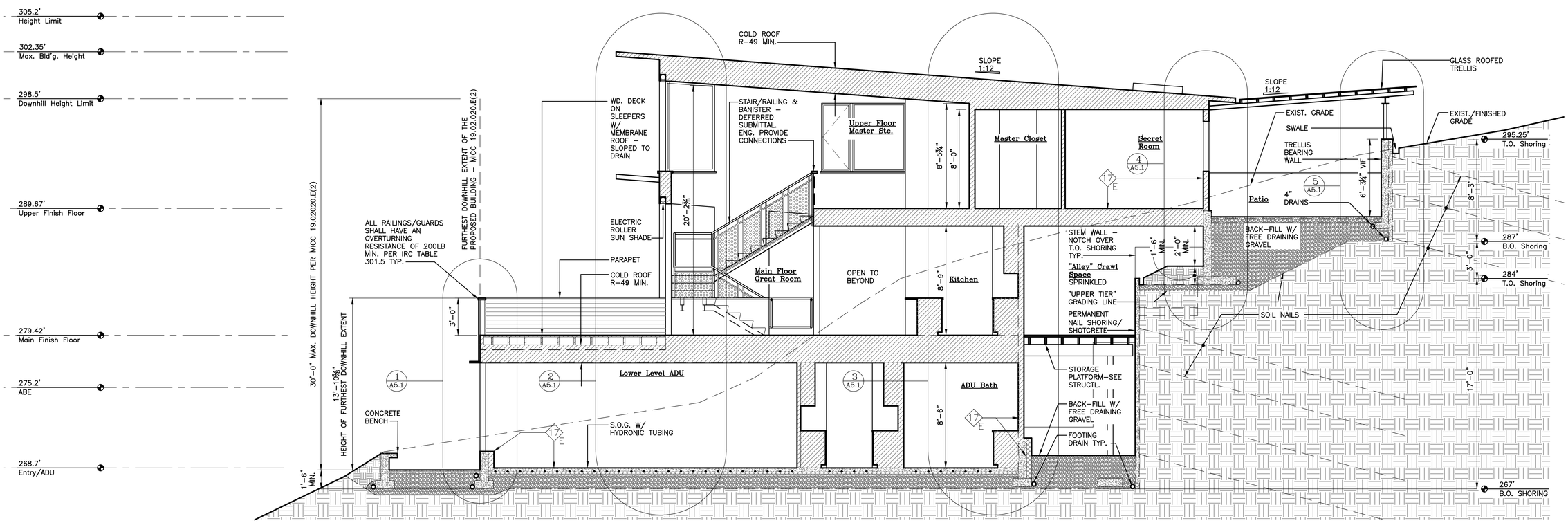
STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date: **3/15/2021 Pre-App**
2/14/2022 Permit Submittal
1 **8/25/2022 Sub2-2202-225**

Scale:

Sheet:

Elevations/ Sections
A3.3



1 General Building Section
scale: 1/4"=1'-0"

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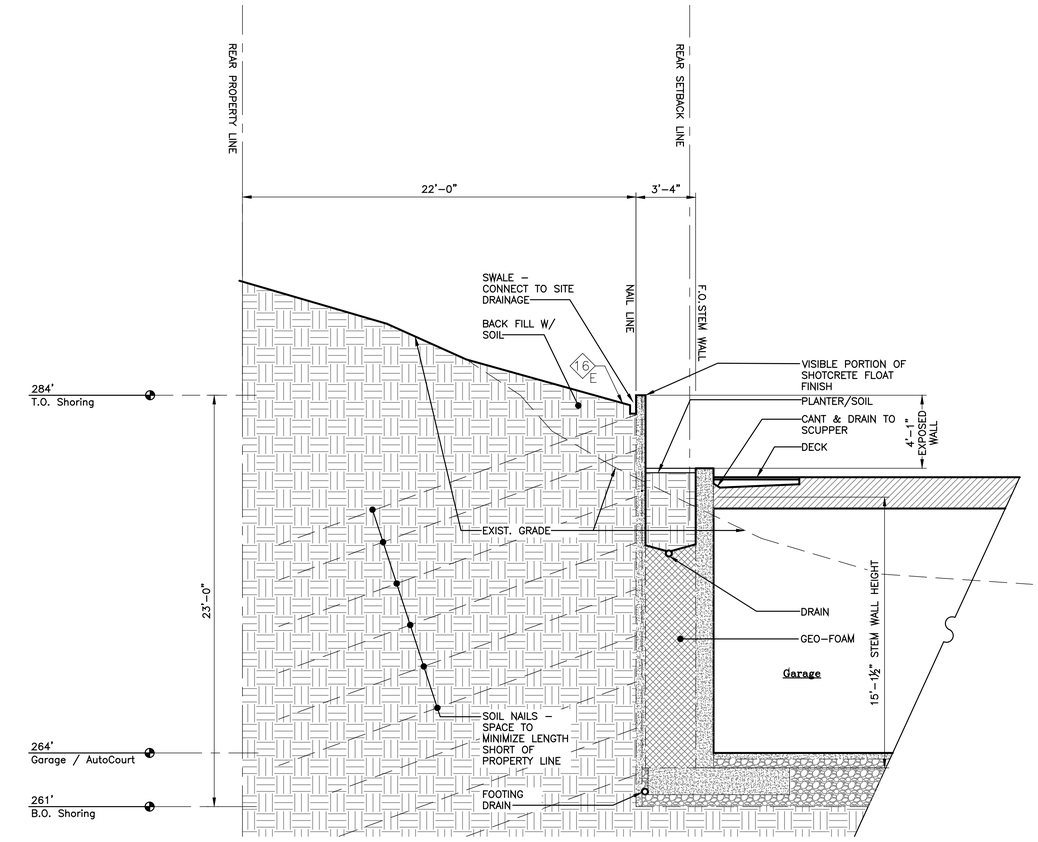
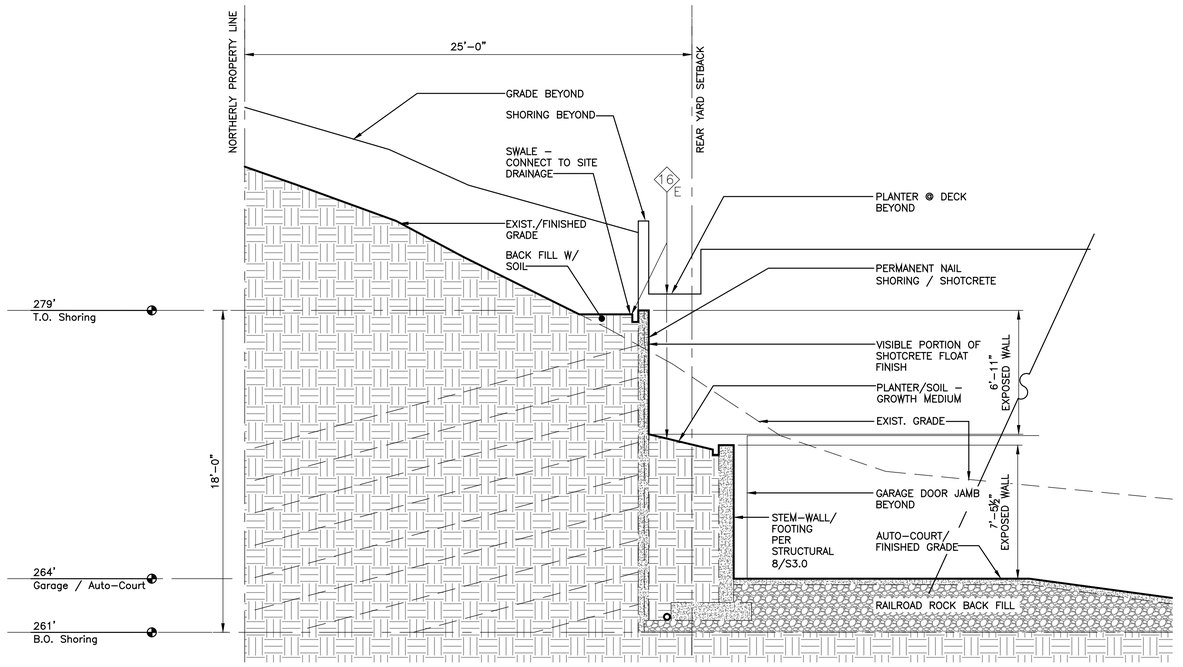
Scale:

Sheet:

Building Sections
A4.1



1 General Section @ Shoring/Deck Planter
scale: 1/4"=1'-0"



2 General Section @ Shoring/Driveway Planter
scale: 1/4"=1'-0"

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Scale:

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Building Sections
A4.2

306.5'
Height Limit

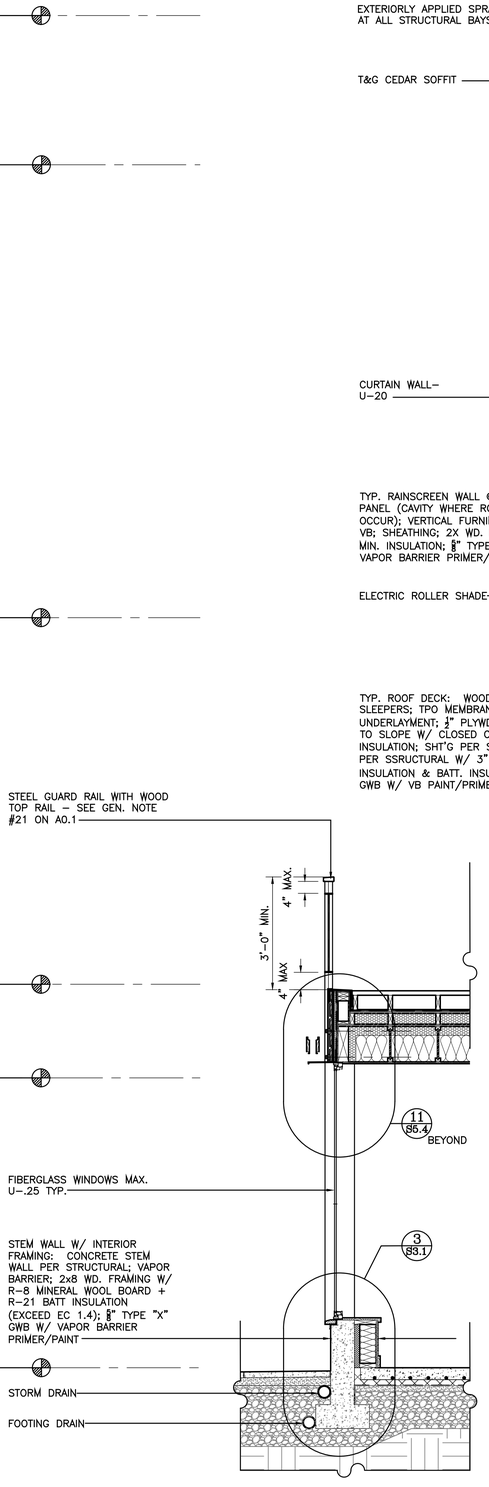
302.33'
Max. Bld'g. Height

289.67'
Upper Finish Floor

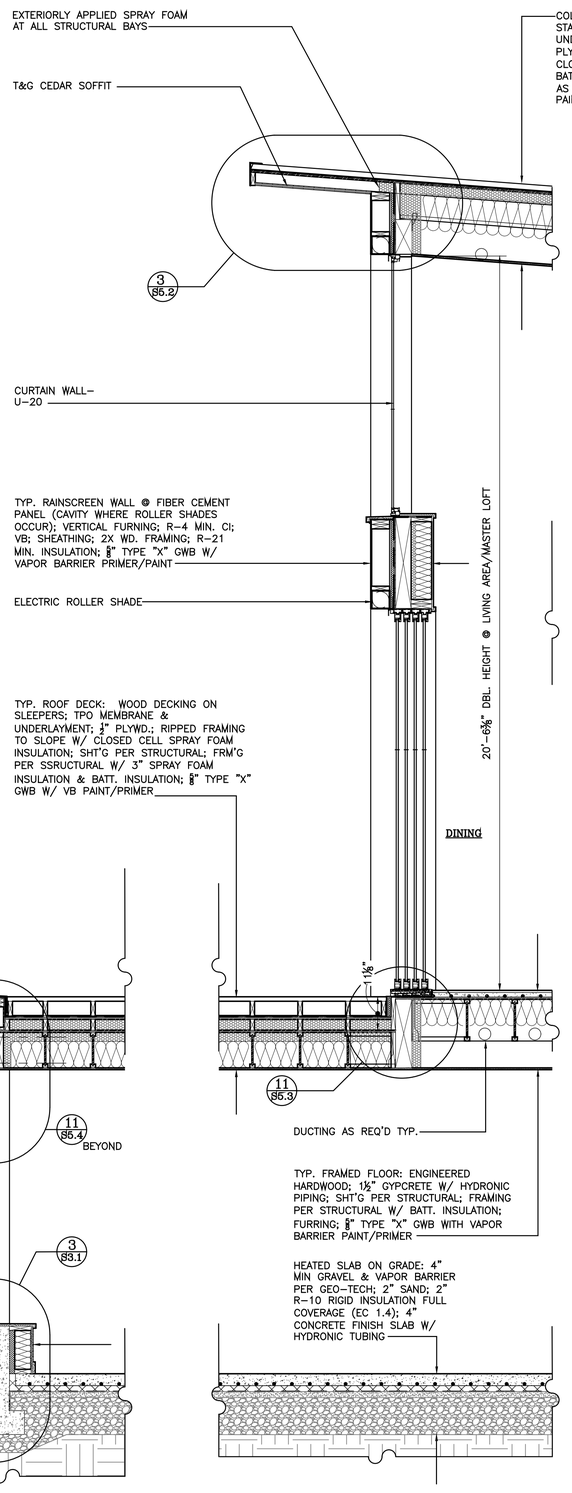
279.42'
Main Finish Floor

276.8'
ABE

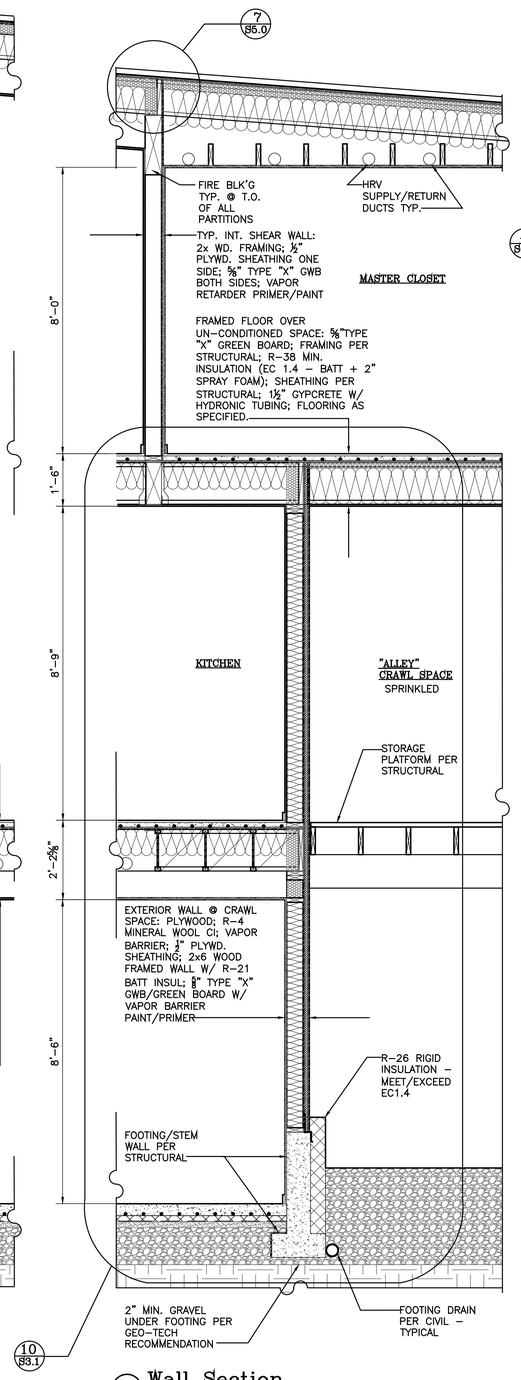
268.7'
Entry/ADU
Downhill Base
Elevation



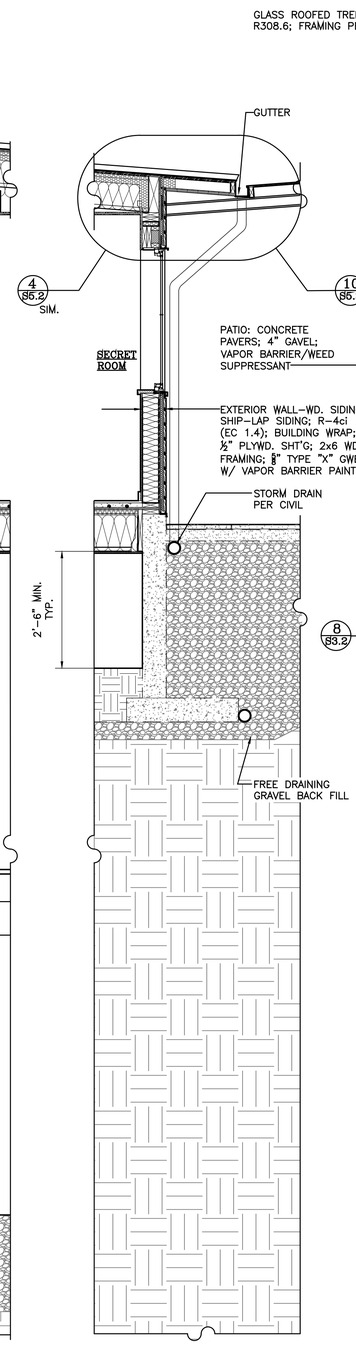
1 Wall Section
scale: 1/2"=1'-0"



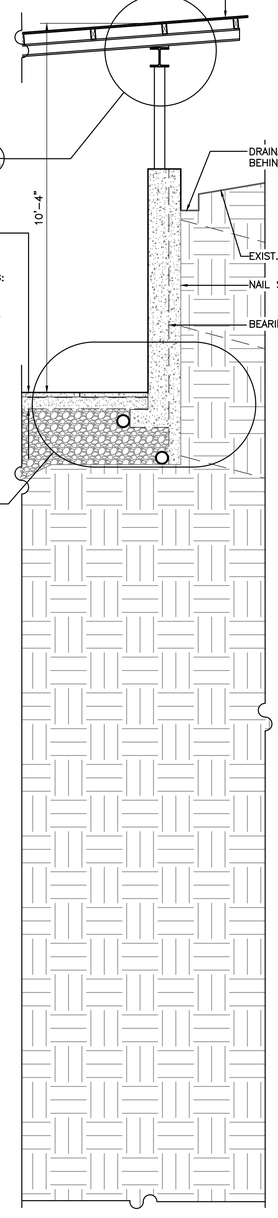
2 Wall Section
scale: 1/2"=1'-0"



3 Wall Section
scale: 1/2"=1'-0"



4 Wall Section
scale: 1/2"=1'-0"



5 Wall Section
scale: 1/2"=1'-0"

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Sheet:

Wall Section
A5.1

Window Schedule

TAG	WINDOW R.O. Notes 1, 2 & 9 width		height	UNIT AREA square ft.	QTY.	TOTAL window area	MAX U-VALUE NOTE 6 ⚠1	UA VALUE	HEAD HEIGHT (AFF)	TYPE OPERATION NOTES 3&5	SCREEN NOTE 8	TYPE	FRAME / FINISH	GLASS NOTES 4&7	MANUF. ⚠1	NOTES
A	1'-0"	x	6'-4"	6.3 SQ. FT.	1	6.3 SQ. FT.	0.25	1.6 SQ. FT.	7'-0"	FIX			FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON/LAM	MARVIN	COORDINATE W/ ADJ. DOOR & CONCRETE
B	9'-8"	x	6'-8"	64.4 SQ. FT.	2	128.9 SQ. FT.	0.25	32.2 SQ. FT.	8'-6"	FIX/CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	SEE ELEVATIONS/COORD. RAILING STANCHIONS
C1	2'-6"	x	7'-7 ½"	19.1 SQ. FT.	1	19.1 SQ. FT.	0.25	4.8 SQ. FT.	10'-7 1/2"	CASE	X	CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORD. W/ "C2"
C2	3'-10"	x	VARIES	29.6 SQ. FT.	1	29.6 SQ. FT.	0.25	7.4 SQ. FT.	FOLLOW ROOF	FIX		CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORD. W/ "C1"
D	5'-0"	x	7'-7 ½"	38.1 SQ. FT.	1	38.1 SQ. FT.	0.25	9.5 SQ. FT.	10'-7 1/2"	FIX	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	
E	2'-6"	x	7'-7 ½"	19.1 SQ. FT.	1	19.1 SQ. FT.	0.25	4.8 SQ. FT.	10'-7 1/2"	CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	EGRESS
F1	2'-6"	x	7'-7 ½"	19.1 SQ. FT.	1	19.1 SQ. FT.	0.25	4.8 SQ. FT.	10'-7 1/2"	CASE	X	CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE W/ "F2"
F2	3'-10"	x	VARIES	29.6 SQ. FT.	1	29.6 SQ. FT.	0.25	7.4 SQ. FT.	FOLLOW ROOF	FIX		CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE W/ "F1"
G	3'-4"	x	7'-4"	24.4 SQ. FT.	5	122.2 SQ. FT.	0.25	30.6 SQ. FT.	10'-4"	FIX			FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE WITH DOOR PANELS BELOW
H1	3'-8"	x	7'-4"	26.9 SQ. FT.	1	26.9 SQ. FT.	0.25	6.7 SQ. FT.	10'-4"	FIX		CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE W/ "H2"
H2	3'-10"	x	VARIES	28.3 SQ. FT.	1	28.3 SQ. FT.	0.25	7.1 SQ. FT.	FOLLOW ROOF	FIX		CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE W/ "H1"
I	3'-4"	x	7'-7 ½"	25.4 SQ. FT.	1	25.4 SQ. FT.	0.25	6.4 SQ. FT.	10'-7 1/2"	FIX	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE W/ OVERHEAD DOOR
J	5'-0"	x	7'-7 ½"	38.1 SQ. FT.	1	38.1 SQ. FT.	0.25	9.5 SQ. FT.	10'-7 1/2"	CASE	X				MARVIN	
K	3'-0"	x	1'-6"	4.5 SQ. FT.	3	13.5 SQ. FT.	0.25	3.4 SQ. FT.		FIX		TRANSOM	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORDINATE W/ DOOR
L	6'-9"	x	5'-6"	37.1 SQ. FT.	1	37.1 SQ. FT.	0.25	9.3 SQ. FT.	8'-6"	FIX/CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	EGRESS/ALIGN SILL W/ "K" / MIRROR "M"
M	6'-9"	x	5'-6"	37.1 SQ. FT.	1	37.1 SQ. FT.	0.25	9.3 SQ. FT.	8'-6"	FIX/CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	EGRESS/MIRROR "L"
N	2'-4"	x	4'-4"	10.1 SQ. FT.	3	30.3 SQ. FT.	0.25	7.6 SQ. FT.	8'-10"	CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	EGRESS AS SHOWN ON 2/A3.1
O	4'-10"	x	4'-0"	19.3 SQ. FT.	1	19.3 SQ. FT.	0.25	4.8 SQ. FT.	7'-0"	FIX/CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	
P	5'-10"	x	4'-0"	23.3 SQ. FT.	1	23.3 SQ. FT.	0.25	5.8 SQ. FT.	7'-0"	FIX/CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	
Q	8'-11 1/2"	x	1'-6"	13.4 SQ. FT.	1	13.4 SQ. FT.	0.25	3.4 SQ. FT.	4'-6" VIF	FIX/CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	VERIFY SILL W/ ADJACENT TUB HEIGHT
R	2'-0"	x	13'-4"	26.7 SQ. FT.	1	26.7 SQ. FT.	0.25	6.7 SQ. FT.	13'-8" VIF	FIX			FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORD. W/ GARAGE DOOR AND TRACKS
S1	2'-6"	x	5'-9"	14.4 SQ. FT.	1	14.4 SQ. FT.	0.25	3.6 SQ. FT.	8'-9"	CASE	X	CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	ALIGN WITH "C1" OPPOSITE / COORD. W/ "S2"
S2	3'-10"	x	5'-9"	22.0 SQ. FT.	1	22.0 SQ. FT.	0.25	5.5 SQ. FT.	8'-9"	FIX		CORNER	FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	COORD. W/ "S1"
T	5'-0"	x	5'-9"	28.8 SQ. FT.	1	28.8 SQ. FT.	0.25	7.2 SQ. FT.	8'-9"	CASE	X		FIBERGLASS/BLACK	LO-E3/LOW ERS/ARGON	MARVIN	ALIGN W/ "D" OPPOSITE
U	2'-10 5/8"	x	4'-2 5/8"	12.2 SQ. FT.	1	12.2 SQ. FT.	0.48	5.8 SQ. FT.	NA	"FRESH AIR"	X	SKYLIGHT	FIBERGLASS/BLACK	LO-E366/TG/LAM	VELUX	ELECTRIC/SHADE
V	2'-10 5/8"	x	2'-10 5/8"	8.3 SQ. FT.	2	16.7 SQ. FT.	0.48	8.0 SQ. FT.	NA	"FRESH AIR"	X	SKYLIGHT	FIBERGLASS/BLACK	LO-E366/TG/LAM	VELUX	ELECTRIC/SHADE
WINDOW UA:				WINDOW AREA		825.5 SQ. FT.	TOTAL UA	213.0 SQ. FT.								

WINDOW NOTES:

1. CONTRACTOR SHALL MEASURE ACTUAL FRAMED OPENINGS PRIOR TO ORDERING UNITS. ROUGH OPENING PER MANUFACTURER'S REQUIREMENTS.
2. WINDOW MANUFACTURER: MARVIN EXCEPT AS NOTED OTHERWISE
3. WINDOW MANUFACTURER TO VERIFY OPERATION AND WIDTH OPENING – COORDINATE WITH ARCHITECT WHERE DIFFERS FROM DRAWINGS
4. TEMPERED GLASS: WITHIN TWO FEET OF ALL EXTERIOR DOORS, WITHIN 18" OF FLOOR, IN SHOWERS AND OTHER HAZARDOUS LOCATIONS AS IDENTIFIED IN IRC R308.4. SEE ELEVATIONS FOR TEMPERED LIGHTS.
5. EGRESS WINDOWS AT SLEEPING ROOMS SHALL MEET IRC R310
6. ⚠1 EC 1.4: **EFFICIENT BUILDING ENVELOPE** ALL NEW EXTERIOR WINDOWS SHALL MEET MINIMUM U-25 MINIMUM COMPLIANCE.
7. OBSCURED GLASS AS NOTED.
8. SCREENS ON ALL OPERABLE WINDOWS. CONNECT SCREENS TO SECURITY SYSTEM.
9. ALL OPERABLE WINDOWS CONNECTED TO WHOLE-HOUSE SECURITY SYSTEM

ABBREVIATIONS

AWN	AWNING
CASE	CASEMENT
CLR	CLEAR
DBL	DOUBLE GLAZING
FIX	FIXED
HC	HOLLOW CORE
LAM	LAMINATED
LO-E	LOW-EMISSIVITY
MIN	MINUTE
OBS	OBSCURE
R.O.	ROUGH OPENING
SC	SOLID CORE
SLD	SLIDING
SL	SKYLIGHT
STORE	STOREFRONT
TBD	TO BE DETERMINED
TG	TEMPERED GLASS
UA	U-VALUE AREA
WD	WOOD

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Scale:

Sheet:

Window Schedule
A9.1

Exterior Door to Conditioned Space

TAG	PANEL SIZE width		PANEL SIZE height	UNIT AREA square ft.	PANEL QTY.	TOTAL door area	MAX U-VALUE	UA VALUE	Thickness	Location	TYPE	HARDWARE NOTE 3	MATERIAL/FINISH	FRAME/FINISH	GLASS	MANUF.	COLOR	NOTES
1	3'-6"	x	7'-0"	24.5 SQ. FT.	1	24.5 SQ. FT.	.46	11.3 SQ. FT.	0'-1 3/4"	ENTRY	SC/INSULATED/SLAB	DEADBOLT/TBD	WD/TBD	WD./TBD	NA	CUSTOM	TBD	COORD W/ SIDELIGHT WINDOW "A"
2	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.46	9.7 SQ. FT.	0'-1 3/4"	ADU ENTRY	SC/FLUSH/INSULATED	DEADBOLT/LEVER	WD/STAIN	WD./STAIN	NA	TBD	TBD	COORD. W/ TRANSOM "K"
3	2'-4"	x	7'-0"	16.3 SQ. FT.	2	32.7 SQ. FT.	.46	15.0 SQ. FT.	0'-1 3/4"	GARAGE/MECH.	SC/FLUSH/INSULATED	SELF-CLOSING/LEVER	WD/STAIN	WD./STAIN	NA	TBD	MATCH INT. DOORS	20 MINUTE
4	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.46	9.7 SQ. FT.	0'-1 3/4"	GARAGE/ENTRY	SC/FLUSH/INSULATED	SELF-CLOSING/LEVER	WD./STAIN	WD./STAIN	NA	TBD	MATCH INT. DOORS	20 MINUTE
5	3'-6"	x	10'-7"	37.0 SQ. FT.	4	148.2 SQ. FT.	.25	37.0 SQ. FT.	0'-1 3/4"	MAIN DINING/DECK 1	STORE/MULTI-SLIDE	TRACK/3 PT. LOCK	FIBERGLASS/MATCH WINDOWS	FIBERGLASS/FACTORY	LO-E3/LO-ERS/ARGON/TG	MARVIN	BLACK	NOTE 4
6	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.25	5.3 SQ. FT.	0'-1 3/4"	MAIN LOUNGE/DECK 2	STORE/INSULATED	DEADBOLT/LEVER	FIBERGLASS/MATCH WINDOWS	FIBERGLASS/FACTORY	LO-E3/LO-ERS/ARGON/TG	MARVIN	BLACK	
7	2'-8"	x	7'-0"	18.7 SQ. FT.	1	18.7 SQ. FT.	.25	4.7 SQ. FT.	0'-1 3/4"	SECRET ROOM/ PATIO	STORE/INSULATED	DEADBOLT/LEVER	FIBERGLASS/MATCH WINDOWS	FIBERGLASS/FACTORY	LO-E3/LO-ERS/ARGON/TG	MARVIN	BLACK	
31	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.46	9.7 SQ. FT.	0'-1 3/4"	ELEVATOR/ MASTER STE	SC/FLUSH/INSULATED	SELF-CLOSING/LEVER	WD./STAIN	WD./STAIN	NA	TBD	MATCH INT. DOORS	20 MINUTE
32	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.46	9.7 SQ. FT.	0'-1 3/4"	ELEVATOR/ MAIN FLOOR	SC/FLUSH/INSULATED	SELF-CLOSING/LEVER	WD./STAIN	WD./STAIN	NA	TBD	MATCH INT. DOORS	20 MINUTE
33	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.46	9.7 SQ. FT.	0'-1 3/4"	ELEVATOR/ENTRY	SC/FLUSH/INSULATED	SELF-CLOSING/LEVER	WD./STAIN	WD./STAIN	NA	TBD	MATCH INT. DOORS	20 MINUTE
34	3'-0"	x	7'-0"	21.0 SQ. FT.	1	21.0 SQ. FT.	.46	9.7 SQ. FT.	0'-1 3/4"	ELEVATOR/GARAGE	SC/FLUSH/INSULATED	SELF-CLOSING/LEVER	WD./STAIN	WD./STAIN	NA	TBD	MATCH INT. DOORS	20 MINUTE
AREA DOORS IMPACTING UA:				EXT. DOOR AREA		268.3 SQ. FT.	TOTAL UA	87.9 SQ. FT.										

ELEVATOR DOORS NOTE 13

EXTERIOR DOOR NOTES:

1. CONTRACTOR SHALL MEASURE ACTUAL FRAMED OPENINGS PRIOR TO ORDERING UNITS. ROUGH OPENING PER MANUFACTURER'S REQUIREMENTS.
2. UNIT BREAK DOWN W/ IN ROUGH OPENING
3. (3) MINIMUM HEAVY DUTY CONCEALED HINGES MIN. AT ALL EXTERIOR SWING DOORS
4. 3 POINT LOCKING SYSTEM MINIMUM
5. MANUFACTURER: MARVIN EXCEPT AS NOTED OTHERWISE
6. MANUFACTURER TO VERIFY OPERATION AND WIDTH OPENING – COORDINATE WITH ARCHITECT WHERE DIFFERS FROM DRAWINGS
7. TEMPERED GLASS: WITHIN TWO FEET OF ALL EXTERIOR DOORS, WITHIN 18" OF FLOOR, IN SHOWERS AND OTHER HAZARDOUS LOCATIONS AS IDENTIFIED IN IRC R308.4
8. GLASS – LO-E3/LOW ERS/ARGON FILLED AT ALL WINDOWS AND STOREFRONT DOORS
9. EGRESS WINDOWS AT SLEEPING ROOMS SHALL MEET IRC R310. NOTED ON ELEVATIONS
10. **EC 1.4: EFFICIENT BUILDING ENVELOPE** ALL NEW EXTERIOR WINDOWS AND GLAZED DOORS SHALL MEET MINIMUM U-25 MINIMUM COMPLIANCE.
11. OBSCURED GLASS AS NOTED.
12. SCREENS ON ALL OPERABLE WINDOWS, SLIDING GLASS DOORS AND SWING DOORS AS NOTED.
13. ALL EXTERIOR DOORS AND SCREENS CONNECTED TO WHOLEHOUSE SECURITY SYSTEM.
14. ELEVATOR DOORS: 20 MINUTE WITH SELF-CLOSING HARDWARE

ABBREVIATIONS

AWN	AWNING
CASE	CASEMENT
CLR	CLEAR
DBL	DOUBLE GLAZING
FIX	FIXED
HC	HOLLOW CORE
LAM	LAMINATED
LO-E	LOW-EMISSIVITY
MIN	MINUTE
OBS	OBSCURE
R.C.	ROLLER CATCH
R.O.	ROUGH OPENING
SC	SOLID CORE
SLD	SLIDING
SL	SKYLIGHT
STORE	STOREFRONT
TBD	TO BE DETERMINED
TG	TEMPERED GLASS
TRPL	TRIPLE
UA	U-VALUE AREA
WD	WOOD

Interior Door Schedule & Doors From Un-conditioned Space to Exterior

TAG	PANEL SIZE (NOTE #4) width		PANEL SIZE height	PANEL QTY.	UNIT AREA square ft.	Thickness	TYPE	LOCATION	MATERIAL/ FINISH	GLASS	HARDWARE NOTES 2&3	MANUF.	NOTES
10	2'-6"	x	7'-0"	1	17.5 SQ. FT.	0'-1 3/8"	HC/SLAB	ENTRY HALL/STORAGE	WOOD/TBD	NA	PULL/RC	TBD.	NOTE 4
11	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/8"	SC/SLAB	ENTRY HALL/ADU	WOOD/TBD	NA	SELF-CLOSING/LEVER/ DEADBOLT	TBD	20 MIN. DOOR/PROVIDE SEPARATE LOCKS BOTH SIDES
12	2'-4"	x	7'-0"	1	16.3 SQ. FT.	0'-1 3/8"	SC/SLAB	ADU/BATH	WOOD/TBD	NA	LEVER/PRIVACY	TBD	NOTE 4
13	2'-4"	x	7'-0"	2	16.3 SQ. FT.	0'-1 3/8"	HC/SLAB	ENTRY COATS	WOOD/TBD	N/A	PULLS/RC	TBD	NOTE 4
14	18'-0"	x	8'-0"	1	144.0 SQ. FT.	0'-1 3/4"	SECTIONAL	GARAGE	WD. FACED/STAIN	N/A	MOTORIZED TRACK	TBD	MATCH CEDAR SIDING FINISH
15	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/8"	SC/SLAB/PKT	ENTRY HALL	WOOD/TBD	N/A	FLUSH PULL	TBD	SEE NOTE 4/PART OF FLUSH PANEL SYSTEM
16	2'-6"	x	7'-0"	2	17.5 SQ. FT.	0'-1 3/8"	HC/SLAB	GARAGE STORAGE	WOOD/TBD	N/A	PULL/RC	TBD	NOTE 4
17	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/8"	HC/SLAB	LOUNGE/EQUIP.	WOOD/TBD	N/A	PULL/RC	TBD	NOTE 4
18	2'-6"	x	7'-0"	1	17.5 SQ. FT.	0'-1 3/8"	SC/SLAB	HALL/DEN-GUEST	WOOD/TBD	N/A	LEVER/PRIVACY	TBD	NOTE 4
19	2'-6"	x	7'-0"	1	17.5 SQ. FT.	0'-1 3/8"	SC/SLAB	HALL/LAUNDRY	WOOD/TBD	N/A	LEVER/PASS	TBD	NOTE 4
20	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/8"	STORE/PKT	GREAT ROOM/HALL	WOOD/TBD	OBS/TG	FLUSH PULL	TBD	NOTE 4
21	2'-4"	x	7'-0"	1	16.3 SQ. FT.	0'-1 3/8"	SC/SLAB	HALL/GUEST BATH	WOOD/TBD	N/A	LEVER/PRIVACY	TBD	NOTE 4
22	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/4"	SC/SLAB	DECK/"ALLEY"	MATCH ADJ. SIDING	N/A	LEVER/DEADBOLT	TBD	MATCH SIDING/PROVIDE GRILL W/ MIN. NVVA=62SI
23	2'-4"	x	7'-0"	1	16.3 SQ. FT.	0'-1 3/8"	SC/SLAB	MASTER BATH/EQUIP CABINET	WOOD/TBD	N/A	PULL/RC	TBD	NOTE 4
24	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/8"	SC/PKT	MASTER BED/BATH	WOOD/TBD	N/A	FLUSH PULL	TBD	NOTE 4
25	2'-6"	x	7'-0"	1	17.5 SQ. FT.	0'-1 3/8"	SC/SLAB	CLOSET/HALL	WOOD/TBD	N/A	FLUSH PULL	TBD	NOTE 4
26	2'-6"	x	7'-0"	1	17.5 SQ. FT.	0'-1 3/8"	SC/SLAB	CLOSET/HALL	WOOD/TBD	N/A	FLUSH PULL	TBD	NOTE 4
27	2'-8"	x	7'-0"	1	18.7 SQ. FT.	0'-1 3/8"	STORE	SECRET ROOM/HALL	WOOD/TBD	OBS/TG	LEVER/PRIVACY	TBD	NOTE 4
28	3'-0"	x	7'-0"	1	21.0 SQ. FT.	0'-1 3/8"	SC/PKT	MASTER BED/HALL	WOOD/TBD	N/A	FLUSH PULL	TBD	NOTE 4
29	2'-6"	x	7'-0"	1	17.5 SQ. FT.	0'-1 3/8"	SC/SLAB	MSTR. BATH/W.C.	WOOD/TBD	N/A	LEVER/PRIVACY	TBD	NOTE 4
30	3'-0"	x	6'-8"	1	20.0 SQ. FT.	0'-0 3/8"	SHOWER	MASTER BATH	FRAMELESS SHOWER	LAMINATED/TG	CHROME TRACK/PULL	TBD	4" UNDER-CUT/COORD. W/ SHOWER ENCLOSURE

INTERIOR DOOR NOTES:

1. ALL NON-CLOSET FLUSH DOORS – SOLID CORE
2. (3) HINGES MINIMUM
3. HANDLE LEVER UNO
4. UNDERCUT DOORS ½" TO HABITABLE SPACES AS NECESSARY TO MEET WHOLE HOUSE VENTILATION REQUIREMENTS
5. MEASURE PRIOR TO ORDERING DOORS.

ECTYPOS ARCHITECTURE
4212 W. Mercer Way
Mercer Island, WA 98040
t. (206) 232-9147
f. (206) 275-0312

7785 REGISTERED ARCHITECT
LUCIA PIRZIO-BIROLI
STATE OF WASHINGTON

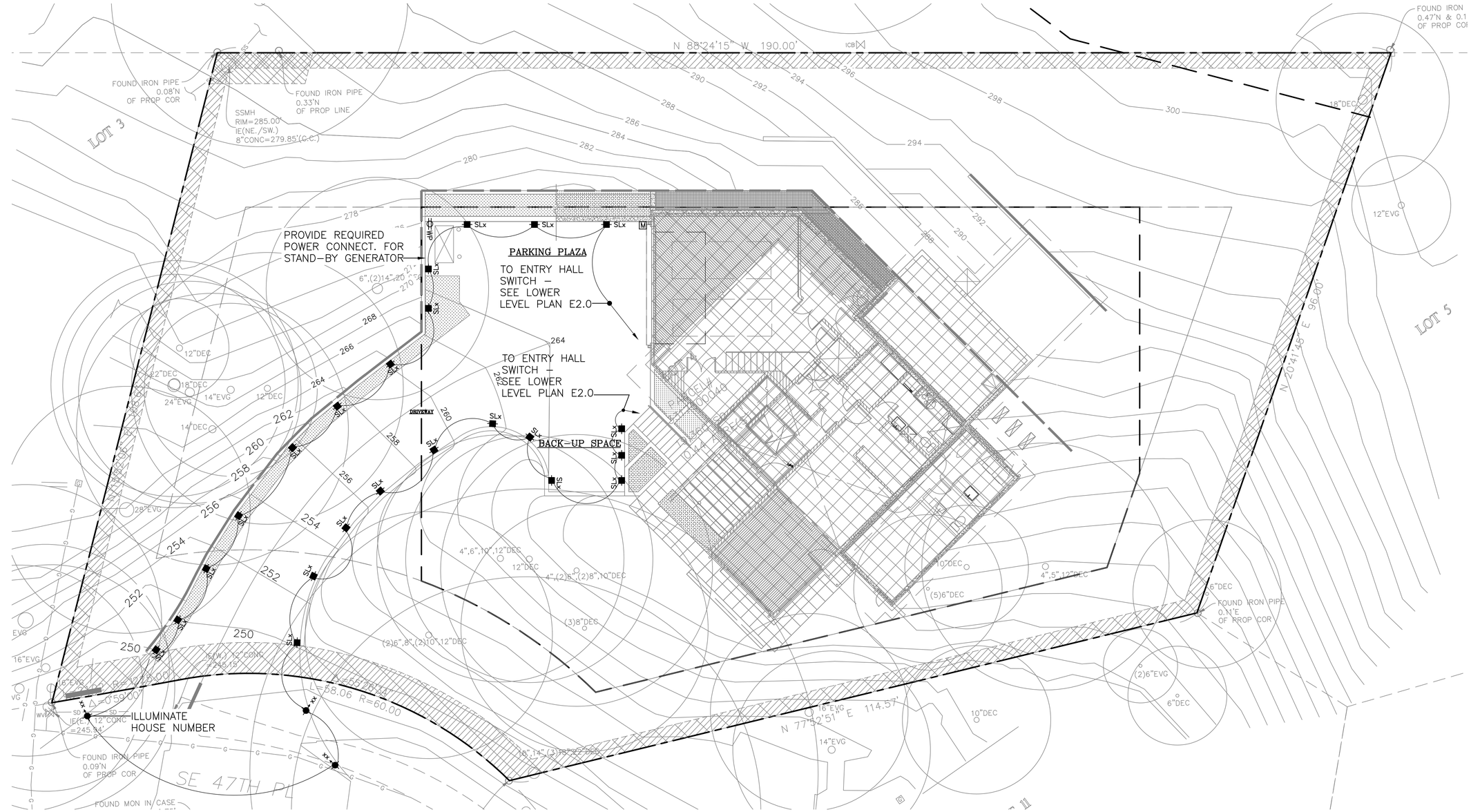
STEINBORN RESIDENCE
New Residence
8435 SE 47th PL.
Mercer Island, WA 98040

Date: **3/15/2021 Pre-App**
2/14/2022 Permit Submittal
⚠ **8/25/2022 Sub2-2202-225**

Scale:

Sheet:

Door Schedule
A9.2



N

1 Site Electrical Plan

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

Power and Lighting Legend

XX CFM	Recessed Ceiling Mounted Exhaust Fan
SC	Recessed Ceiling Mounted Smoke Detector/Carbon Monoxide
HD	Heat Detector / Heat Alarm
C	Cable Connection
C	Floor Mounted Cable Connection
	Dedicated Data Outlet (CatVI)
S	Switch
S3	Switch, Multi-way
SD	Switch, Dimmer
S3D	Switch, Dimmer/Multi-way
Dr. Act.	Switch, Door Activated
	Duplex Outlet
GFI	Ground Fault Circuit Interupter
WP	Exterior Duplex Outlet
	Four-plex Outlet
	Floor Mounted Duplex Outlet
	Strip Outlets
220V	220 V Outlet
P	Breaker Panel
M	Meter
S	Security Panel
xx	Recessed Ceiling Mounted LED Downlight
xx	Recessed Ceiling Mounted LED Wallwasher
xx	Surface Ceiling Mounted LED Downlight
Sxx	Surface Mounted Wall LED Sconce
TLxx	Surface Mounted Track LED Lighting
UCxx	Surface Mounted Undercabinet Strip LED Lighting
RLxx	Ribbon LED linear light
Pxx	Pendant Fixture
Pxx	Cluster Pendant Fixture
SDLx	Surface Mounted Downlight
xx	Surface Mounted LED Batten Fixture
xx	Recessed Mounted Wall LED Washer
xx	Recessed Wall LED Light
xx	Exterior Recessed Ceiling Mounted LED Downlight
xx	Exterior Ground LED Light
Sxx	Exterior Surface Mounted Wall LED Sconce
SLx	Exterior Recessed Wall LED Step Light
DBx	Exterior Direct Burial Uplight
xx	Pool Light
	Waste Disposal
	Level 2 240V EV Charger
	Ceiling Fan with Light
SC	Security Camera w/ Night Vision Capability

NOTES:
1- INSTALL HOUSEHOLD FIRE ALARM
2- INSTALL COMPREHENSIVE SECURITY

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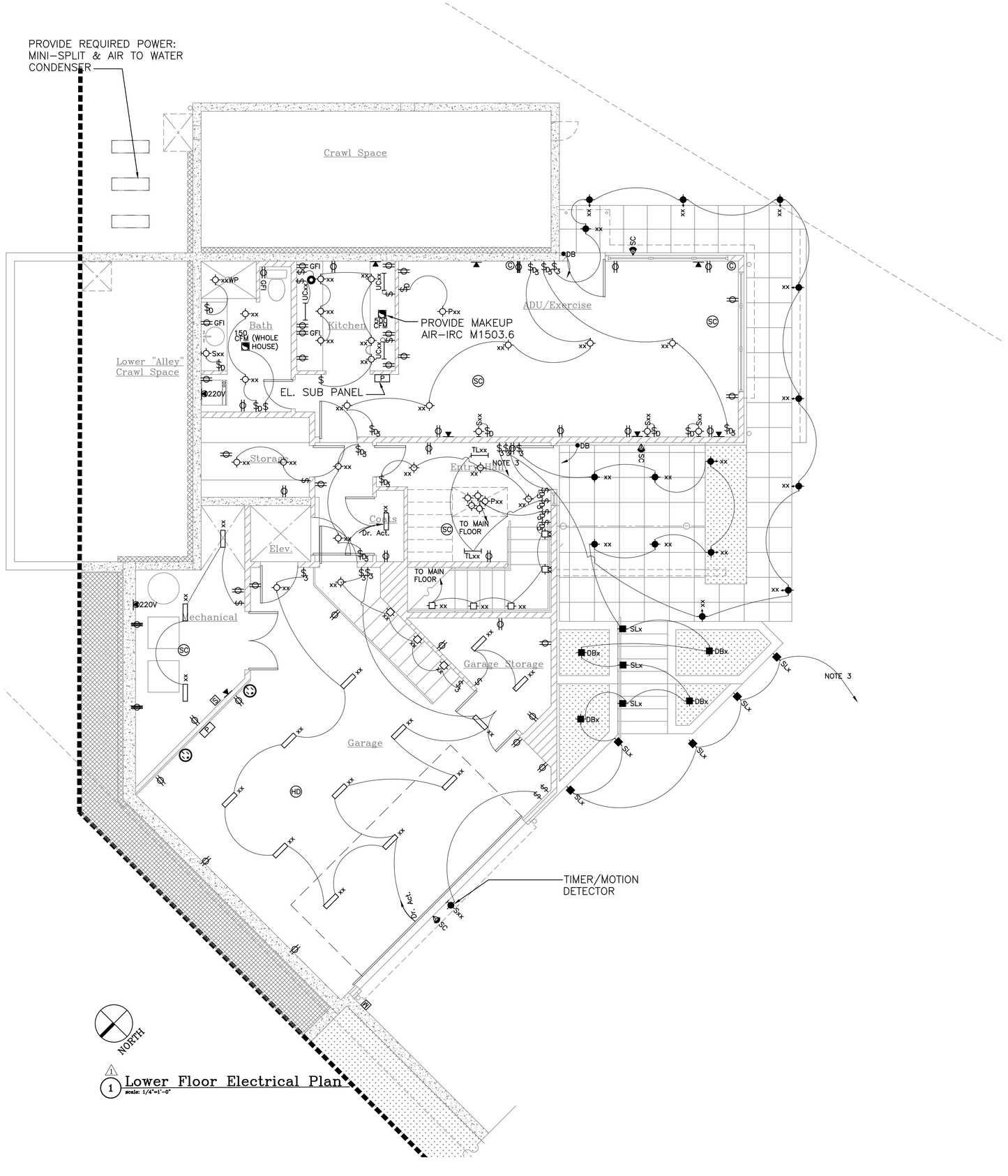
Scale:

Sheet:

Site Electrical Plan

E1.0



Power and Lighting Legend

xx CFM	Recessed Ceiling Mounted Exhaust Fan
SC	Recessed Ceiling Mounted Smoke Detector/Carbon Monoxide
HD	Heat Detector / Heat Alarm
C	Cable Connection
	Floor Mounted Cable Connection
	Dedicated Data Outlet (CatVI)
	Switch
3	Switch, Multi-way
D	Switch, Dimmer
3,D	Switch, Dimmer/Multi-way
Dr. Act.	Switch, Door Activated
	Duplex Outlet
GFI	Ground Fault Circuit Interupter
WP	Exterior Duplex Outlet
	Four-plex Outlet
	Floor Mounted Duplex Outlet
	Strip Outlets
220V	220 V Outlet
P	Breaker Panel
M	Meter
S	Security Panel
xx	Recessed Ceiling Mounted LED Downlight
xx	Recessed Ceiling Mounted LED Wallwasher
xx	Surface Ceiling Mounted LED Downlight
Sxx	Surface Mounted Wall LED Sconce
TLxx	Surface Mounted Track LED Lighting
UCxx	Surface Mounted Undercabinet Strip LED Lighting
RLxx	Ribbon LED linear light
Pxx	Pendant Fixture
Pxx	Cluster Pendant Fixture
SDLx	Surface Mounted Downlight
xx	Surface Mounted LED Batten Fixture
xx	Recessed Step LED Light
xx	Exterior Recessed Ceiling Mounted LED Downlight
xx	Exterior Ground LED Light
Sxx	Exterior Surface Mounted Wall LED Sconce
SLx	Exterior Recessed Wall LED Step Light
DBx	Exterior Direct Burial Uplight
xx	Pool Light
	Waste Disposal
EV	Level 2 240V EV Charger
SC	Security Camera w/ Night Vision Capability
DB	DOOR BELL

Notes:
1. Install household fire alarm system as outlined in General Notes on A0.1
2. Install comprehensive security system as specified.
3. To parking plaza and driveway lighting – see E1.0 for site electrical plan.

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Scale:

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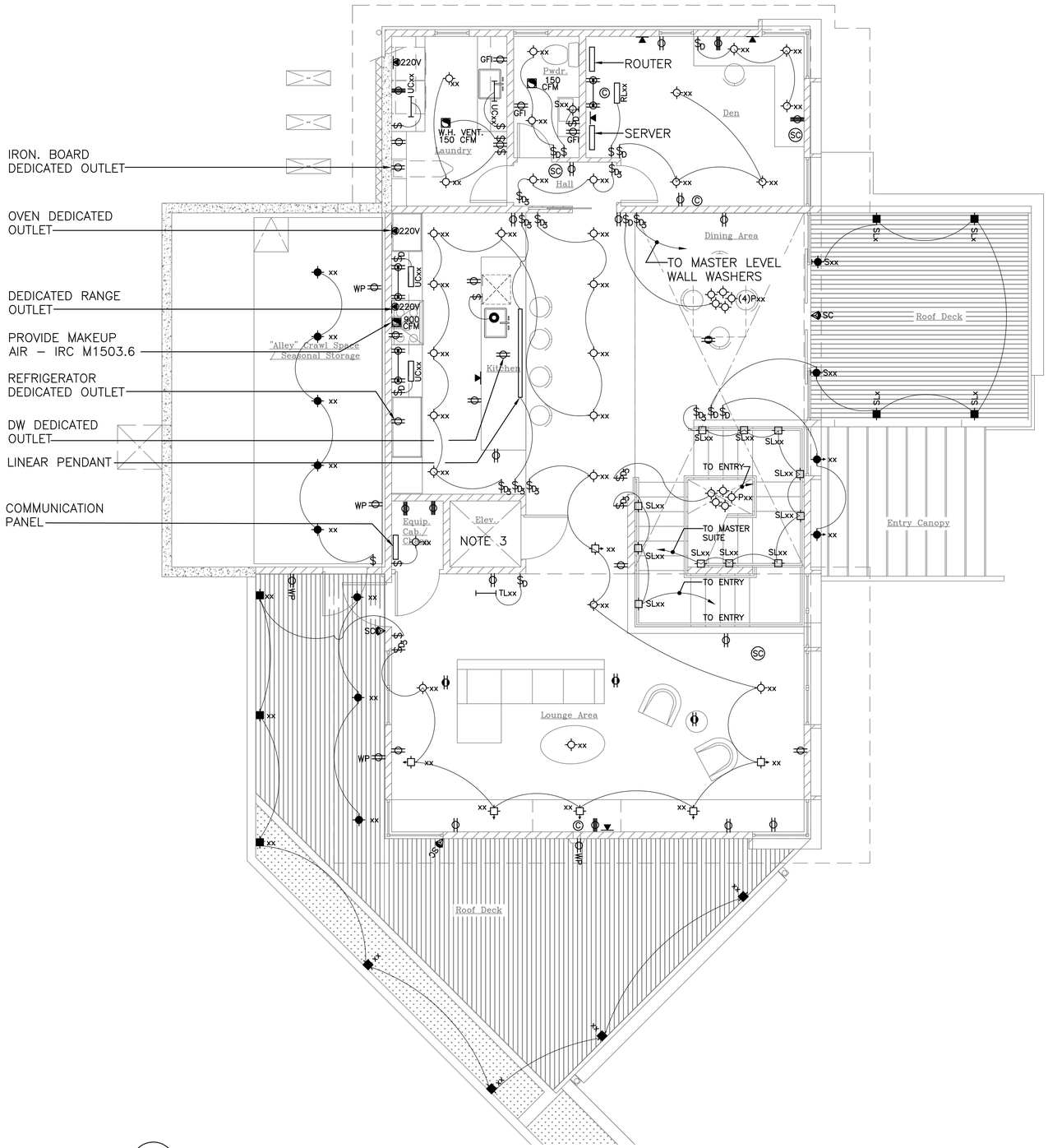
Lower Floor
Electrical Plan

E2.0



NORTH

1 Main Floor Electrical Plan
scale: 1/4"=1'-0"

Power and Lighting Legend

xx CFM	Recessed Ceiling Mounted Exhaust Fan
SC	Recessed Ceiling Mounted Smoke Detector/Carbon Monoxide
HD	Heat Detector / Heat Alarm
C	Cable Connection
	Floor Mounted Cable Connection
	Dedicated Data Outlet (CatVI)
	Switch
	Switch, Multi-way
	Switch, Dimmer
	Switch, Dimmer/Multi-way
Dr. Act.	Switch, Door Activated
	Duplex Outlet
GFI	Ground Fault Circuit Interupter
WP	Exterior Duplex Outlet
	Four-plex Outlet
	Floor Mounted Duplex Outlet
	Strip Outlets
220V	220 V Outlet
P	Breaker Panel
M	Meter
S	Security Panel
xx	Recessed Ceiling Mounted LED Downlight
xx	Recessed Ceiling Mounted LED Wallwasher
xx	Surface Ceiling Mounted LED Downlight
Sxx	Surface Mounted Wall LED Sconce
TLxx	Surface Mounted Track LED Lighting
UCxx	Surface Mounted Undercabinet Strip LED Lighting
RLxx	Ribbon LED linear light
Pxx	Pendant Fixture
Pxx	Cluster Pendant Fixture
SDLx	Surface Mounted Downlight
xx	Surface Mounted LED Batten Fixture
xx	Recessed Wall LED Light
xx	Exterior Recessed Ceiling Mounted LED Downlight
xx	Exterior Ground LED Light
Sxx	Exterior Surface Mounted Wall LED Sconce
SLx	Exterior Recessed Wall LED Step Light
DBx	Exterior Direct Burial Uplight
xx	Pool Light
	Waste Disposal
EV	Level 2 240V EV Charger
SC	Security Camera w/ Night Vision Capability
DB	DOOR BELL

Notes:
1. Install household fire alarm system as outlined in General Notes on A0.1
2. Install comprehensive security system as specified.
3. Provide all necessary power for elevator

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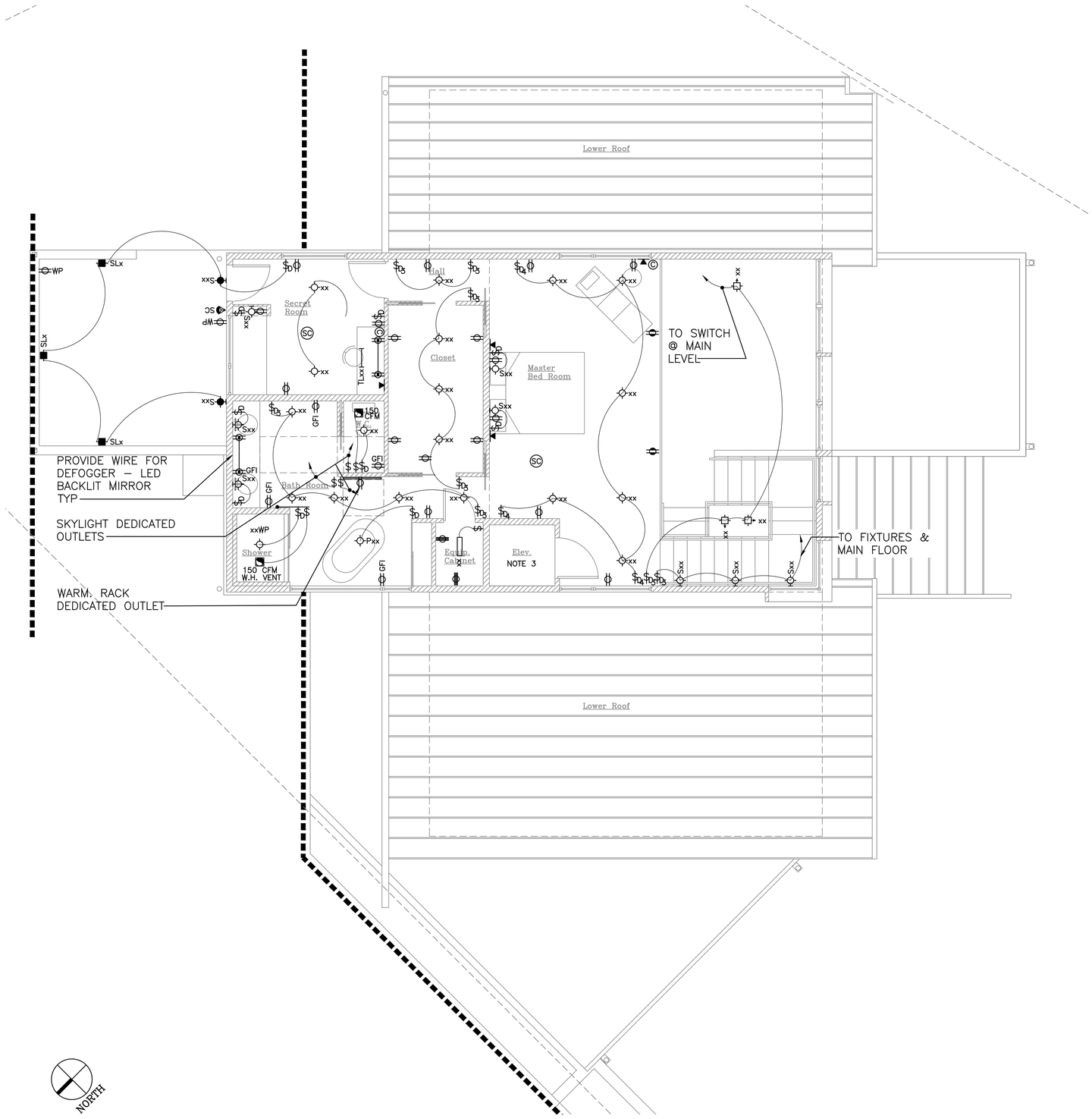
Scale:

Sheet:
Main Floor Electrical Plan

E2.1



NORTH

⚠1 **1 Upper Floor Electrical Plan**
scale: 1/4"=1'-0"

Power and Lighting Legend

XX CFM	Recessed Ceiling Mounted Exhaust Fan
SC	Recessed Ceiling Mounted Smoke Detector/Carbon Monoxide
HD	Heat Detector / Heat Alarm
C	Cable Connection
C	Floor Mounted Cable Connection
	Dedicated Data Outlet (CatVI)
	Switch
3	Switch, Multi-way
D	Switch, Dimmer
D 3	Switch, Dimmer/Multi-way
Dr. Act.	Switch, Door Activated
	Duplex Outlet
GFI	Ground Fault Circuit Interupter
WP	Exterior Duplex Outlet
	Four-plex Outlet
	Floor Mounted Duplex Outlet
	Strip Outlets
220V	220 V Outlet
P	Breaker Panel
M	Meter
S	Security Panel
xx	Recessed Ceiling Mounted LED Downlight
xx	Recessed Ceiling Mounted LED Wallwasher
xx	Surface Ceiling Mounted LED Downlight
Sxx	Surface Mounted Wall LED Sconce
TLxx	Surface Mounted Track LED Lighting
UCxx	Surface Mounted Undercabinet Strip LED Lighting
RLxx	Ribbon LED linear light
Pxx	Pendant Fixture
Pxx	Cluster Pendant Fixture
SDLx	Surface Mounted Downlight
xx	Surface Mounted LED Batten Fixture
xx	Recessed Mounted Wall LED Washer
xx	Recessed Wall LED Light
xx	Exterior Recessed Ceiling Mounted LED Downlight
xx	Exterior Ground LED Light
Sxx	Exterior Surface Mounted Wall LED Sconce
SLx	Exterior Recessed Wall LED Step Light
DBx	Exterior Direct Burial Uplight
xx	Pool Light
	Waste Disposal
EV	Level 2 240V EV Charger
	Ceiling Fan with Light
SC	Security Camera w/ Night Vision Capability

Notes:
1. Install household fire alarm system as outlined in General Notes on A0.1
2. Install comprehensive security system as specified.
3. Provide all necessary power for elevator

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ARCHITECTURE

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Scale:

Sheet:
Upper Floor Electrical Plan
E2.2

-GENERAL STRUCTURAL NOTES

(The following apply unless shown otherwise on the plans)

CRITERIA

1. ALL MATERIALS WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE 2018 INTERNATIONAL BUILDING CODE (IBC) INCLUDING WASHINGTON STATE MODIFICATIONS.

2. DESIGN LOADING CRITERIA

SNOW LOAD	GROUND SNOW LOAD, P_g = 25 PSF RAIN ON SNOW SURCHARGE = 5 PSF
FLOOR LIVE LOAD (RESIDENTIAL)	40 PSF
FLOOR LIVE LOAD (RESIDENTIAL BALCONIES AND DECKS)	60 PSF
GUARDRAILS/BALCONY RAILS (RESIDENTIAL)	200 LBS.
WIND (MAIN WIND FORCE RESISTING SYSTEM)	BASIC WIND SPEED = 97 MPH ALLOWABLE STRESS DESIGN WIND SPEED = 75 MPH IMPORTANCE FACTOR, I_w= 1.0 RISK CATEGORY = II TOPOGRAPHIC FACTOR, K_{zt} = 1.60 EXPOSURE CATEGORY = C INTERNAL PRESSURE COEFFICIENT, (GC_{pi})= 0.18/-0.18
GROSS WIND PRESSURES FOR COMPONENTS AND CLADDING	ZONE 1 = -61.2 PSF ZONE 2 = -80.5 PSF ZONE 3 = -109.8 PSF ZONE 4 = -61.6 PSF ZONE 5 = -51.3 PSF

NOTE: WIND PRESSURES ARE BASED ON TRIBUTARY AREAS LESS THAN 10 SQ-FT

EARTHQUAKE (EQUIVALENT LATERAL FORCE PROCEDURE)	S_s= 1.439 S_{DS} = 0.959 S_1= 0.5 S_{D1} = 0.6 IMPORTANCE FACTOR, I_e= 1.0 SITE CLASS D SEISMIC DESIGN CATEGORY= D RISK CATEGORY = II R = 6.5 FOR WOOD STRUCTURAL PANEL SHEAR WALLS OVER STRENGTH FACTOR, Ω_0 = 3.0 DEFLECTION AMPLIFICATION FACTOR, C_d = 4.0 REDUNDANCY FACTOR = 1.0 SEISMIC RESPONSE COEFFICIENT, C_s = 0.148 SEISMIC BASE SHEAR = 24.5 KIPS
RAIN INTENSITY	1.0 INCHES/HOUR

3. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS FOR BIDDING AND CONSTRUCTION. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS FOR COMPATIBILITY AND SHALL NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. ALL DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE INTENDED FOR REFERENCE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.

4. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS, MEMBER SIZES, AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE STRUCTURAL DRAWINGS ARE INTENDED AS GUIDELINES ONLY AND MUST BE VERIFIED.

5. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR THE STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM THE WORK. THE STRUCTURAL ENGINEER HAS NO OVERALL SUPERVISORY AUTHORITY OR ACTUAL AND/OR DIRECT RESPONSIBILITY FOR THE SPECIFIC WORKING CONDITIONS AT THE SITE AND/OR FOR ANY HAZARDS RESULTING FROM THE ACTIONS OF ANY TRADE CONTRACTOR. THE STRUCTURAL ENGINEER HAS NO DUTY TO INSPECT, SUPERVISE, NOTE, CORRECT, OR REPORT ANY HEALTH OR SAFETY DEFICIENCIES OF THE OWNER, CONTRACTORS, OR OTHER ENTITIES OR PERSONS AT THE PROJECT SITE.

7. CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT.

8. 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 THE STRUCTURAL ENGINEER.

9. ALL STRUCTURAL SYSTEMS WHICH ARE TO BE COMPOSED OF COMPONENTS TO BE FIELD ERECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE, AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.

10. MECHANICAL / ELECTRICAL / PLUMBING: CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING THE LOCATION, LOADS, AND ANCHORAGE OF ALL MECHANICAL, ELECTRICAL, PLUMBING, AND SPRINKLER ATTACHMENTS IN EXCESS OF 50 POUNDS TO STRUCTURAL ENGINEER FOR REVIEW PRIOR TO INSTALLATION. ALL DETAILS NECESSARY FOR ATTACHING THESE SYSTEMS TO THE BASE BUILDING STRUCTURE, INCLUDING THE DESIGN AND DETAILING OF THE DESIGNATED SEISMIC LOAD RESISTING SYSTEM AS REQUIRED BY SECTION 1705.12.4 OF THE INTERNATIONAL BUILDING CODE, ARE THE RESPONSIBILITY OF THE SUPPLIER OF THAT EQUIPMENT AND MUST BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WASHINGTON.

11. SUBMITTAL REVIEW PERIOD: SUBMITTALS SHALL BE MADE IN TIME TO ALLOW MINIMUM OF TWO WEEKS FOR REVIEW BY THE ARCHITECT/ENGINEER PRIOR TO FABRICATION.

12. GENERAL CONTRACTOR'S PRIOR REVIEW OF SUBMITTALS: PRIOR TO SUBMISSION TO THE ARCHITECT/ENGINEER THE CONTRACTOR SHALL REVIEW THE SUBMITTAL FOR COMPLETENESS. DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER AND THEREFORE MUST BE VERIFIED BY THE GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE ALL NECESSARY DIMENSIONAL INFORMATION REQUESTED BY THE DETAILER AND SHALL PROVIDE THE GENERAL CONTRACTOR'S REVIEW STAMP AND SIGNATURE PRIOR TO FORWARDING THE SUBMITTAL TO THE ARCHITECT/ENGINEER.

13. SHOP DRAWINGS FOR:
    - A. REINFORCING STEEL (FOR BOTH CONCRETE AND MASONRY CONSTRUCTION)
    - B. STRUCTURAL STEEL
    - C. GLUED LAMINATED MEMBERS
    - D. OPEN WEB WOOD (OR COMBINATION WOOD/STEEL) TRUSSES
    - E. CONNECTOR PLATE WOOD ROOF TRUSSES
    - F. PLYWOOD WEB JOISTS

SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION OF THESE ITEMS. CONTRACTOR SHALL ALSO SUBMIT SHOP DRAWINGS TO THE BUILDING DEPARTMENT AS REQUIRED. SHOP DRAWINGS FOR CONNECTOR PLATE WOOD ROOF TRUSSES SHALL ALSO BE SUBMITTED TO THE MECHANICAL ENGINEER FOR COORDINATION.

CONTRACTOR SHALL SUBMIT WALL ELEVATION DRAWINGS OF AT LEAST 1/8" = 1'-0" SCALE INDICATING CONNECTION EMBEDMENTS AND WALL OPENINGS FOR REVIEW PRIOR TO CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH REINFORCEMENT SHOP DRAWINGS.

14. SHOP DRAWING REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD, THEREFORE, MUST BE VERIFIED BY THE CONTRACTOR. CONTRACTOR SHALL REVIEW AND STAMP DRAWINGS PRIOR TO REVIEW BY ENGINEER OF RECORD. CONTRACTOR SHALL REVIEW DRAWINGS FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND ALL SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL, THERETO.

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, BY INDICATING WHICH MATERIAL IS INTENDED TO BE FURNISHED AND INSTALLED AND BY DETAILING THE INTENDED FABRICATION AND INSTALLATION METHODS. 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.

DEFERRED SUBMITTALS FOR BUILDING COMPONENTS INCLUDING, BUT NOT LIMITED TOO, STAIRS, PREFABRICATED CONNECTOR PLATE WOOD ROOF TRUSSES, AND EXTERIOR CLADDING SHALL INCLUDE THE ENGINEER'S STAMP FOR THE 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 AND ALL NECESSARY CONNECTIONS NOT SPECIFICALLY CALLED OUT ON ARCHITECTURAL OR STRUCTURAL DRAWINGS. DEFERRED SUBMITTALS SHALL INDICATE MAGNITUDE AND DIRECTION OF ALL LOADS IMPOSED ON BASIC STRUCTURE. DESIGN CALCULATIONS SHALL BE INCLUDED IN THE SUBMITTAL.

15. STATEMENT SPECIAL INSPECTIONS:
    THE FOLLOWING CONSTRUCTION TYPES ARE TO BE REVIEWED BY A SPECIAL INSPECTOR DESIGNATED BY THE OWNER OR ARCHITECT. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION. SPECIAL INSPECTION SHALL CONFORM TO SECTION 1704 OF THE 2018 INTERNATIONAL BUILDING CODE. SPECIAL INSPECTION AGENCY SHALL BE RESPONSIBLE FOR KEEPING RECORDS OF SPECIAL INSPECTIONS AND TESTS. THE ARCHITECT, STRUCTURAL ENGINEER, AND BUILDING DEPARTMENT SHALL BE FURNISHED WITH COPIES OF ALL INSPECTION REPORTS AND TEST RESULTS.

    SOILS: SHALL BE SPECIAL INSPECTED AS REQUIRED IN THE INTERNATIONAL BUILDING CODE SECTION 1705.6 AND AS DIRECTED IN THE GEOTECHNICAL REPORT.

    STEEL CONSTRUCTION AND WELDING: SHALL BE SPECIAL INSPECTED AS REQUIRED IN THE INTERNATIONAL BUILDING CODE SECTION 1705.2, AISC 360-16, AISC 341-16, AWS D1.1, AND AWS D1.8.

    POST INSTALLED ANCHORS: PERIODIC SPECIAL INSPECTION IN ACCORDANCE WITH THE PRODUCTS APPROVED ICC-ES REPORT.

16. THE CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND OR SEISMIC FORCE RESISTING SYSTEM, DESIGNATED WIND OR SEISMIC SYSTEM, OR SEISMIC FORCE RESISTING COMPONENT SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND OWNER PRIOR TO COMMENCEMENT OF WORK AS REQUIRED BY SECTION 1704.4 OF THE INTERNATIONAL BUILDING CODE.

GEOTECHNICAL

17. 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 WORKING WITH THE TESTING LAB AND SOILS ENGINEER. BACKFILL BEHIND ALL RETAINING WALLS WITH FREE DRAINING GRANULAR FILL AND PROVIDE FOR SUBSURFACE DRAINAGE AS NOTED IN THE SOILS REPORT.

ALLOWABLE SOIL PRESSURE	4,000 PSF
LATERAL EARTH PRESSURE (RESTRAINED/UNRESTRAINED)	60 PCF/40 PCF
LATERAL EARTH PRESSURE (SEISMIC)	9H (ULTIMATE LOAD)
PASSIVE EARTH PRESSURE (ULTIMATE)	300 PCF
COEFFICIENT OF FRICTION (ULTIMATE)	0.45

SOILS REPORT REFERENCE: REPORT JN 21061 ISSUED BY GEOTECH CONSULTANTS INC., MARCH 23, 2021

ALL PILE SIZES, EXCEPT 2-INCH DIAMETER PILES, SHALL BE SUBJECT TO ASTM LOAD TESTING ON A MINIMUM OF 3% OF PILES, UP TO 5 PILES MAXIMUM (1 MINIMUM). TESTING SHALL BE IN ACCORDANCE WITH ASTM STANDARD D1143-81 FOR PILES UNDER STATIC AXIAL COMPRESSIVE LOAD.

AS INDICATED IN THE GEOTECHNICAL REPORT PIPE PILES DRIVEN USING HAMMERS AND DRIVING RATES SHOWN BELOW MAY BE ASSIGNED THE FOLLOWING COMPRESSIVE CAPACITIES.

PILE DIAMETER	FINAL DRIVING RATE	JACKHAMMER WEIGHT	CAPACITY
3-INCH DIAMETER PILE (COMPRESSION)	12 SEC/INCH	650 POUND HAMMER	6 TONS

IF 140 POUND HAMMER IS USED TO INSTALL 2-INCH DIAMETER PIPE PILES THE CONTRACTOR SHALL VERIFY THE REQUIRED REFUSAL CRITERIA USING A 90 POUND HAMMER IF REQUIRED BY THE GEOTECHNICAL ENGINEER. THE DRIVING CRITERIA, FOR 3-INCH DIAMETER PILES, IS VALID ONLY FOR HYDRAULIC HAMMERS MOUNTED ON SLIDING LEADS THAT ALLOW THE HAMMER TO SIT ON TOP OF THE PILE DURING INSTALLATION.

MINIMUM PILE EMBEDMENT SHALL NOT BE LESS THAN 6'-0" AND FINAL LENGTH OF 2-INCH DIAMETER PIPE PILES SHALL NOT EXCEED 30'-0". INDIVIDUAL PILE SECTIONS SHALL BE CONNECTED USING SLEEVE COUPLERS INSTALLED BY WABO CERTIFIED WELDERS. ALTERNATE COUPLING METHODS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION.

STEEL PIPE SHALL CONFORM TO ASTM A 53, TYPE E OR S, GRADE B, Fy = 35 KSI. MINIMUM PILE WEIGHT FOR 2-INCH DIAMETER PIPE SHALL BE EXTRA-STRONG (SCHEDULE 80) AS NOTED IN THE AISC STEEL CONSTRUCTION MANUAL. MINIMUM PIPE WEIGHT FOR ALL OTHER PILES SHALL BE AS RECOMMENDED IN THE GEOTECHNICAL REPORT. PIPE PILES SHALL BE GALVANIZED.

PILE INSTALLATION AND TESTING SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER.

CONCRETE

18. CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED, AND PLACED IN ACCORDANCE WITH ACI 318-14 AND ACI 301-16. CONCRETE SHALL ATTAIN A 28-DAY STRENGTH (f'c) OF 3500 PSI BASED ON EXPOSURE CLASS F1, SHALL CONTAIN NO LESS THAN 5-1/2 SACKS OF CEMENT, HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45, MAXIMUM AGGREGATE OF ¾-INCH, AND A SLUMP OF 5 INCHES OR LESS. CONCRETE HAS BEEN DESIGNED BASED ON A CONCRETE STRENGTH (f'c) OF 2500 PSI PER INTERNATIONAL BUILDING CODE SECTION 1705.3 EXCEPTION 2.3 TO AVOID SPECIAL INSPECTIONS AND MATERIAL TESTING.

    ALL CONCRETE WITH SURFACES EXPOSED TO STANDING WATER SHALL BE AIR-ENTRAINED WITH AN AIR-ENTRAINING AGENT CONFORMING TO ASTM C260, C494M, AND C618. UNLESS OTHERWISE NOTED THE TOTAL AIR CONTENT SHALL BE 5%. AIR CONTENT SHALL BE SAMPLED IN ACCORDANCE WITH ASTM C172 AND AIR CONTENT MEASURED IN ACCORDANCE WITH ASTM C231 OR C173.

    CONCRETE MAY BE PLACED BY THE "SHOTCRETE" METHOD, PROVIDED THE APPROVALS, TESTS, AND INSPECTIONS REQUIRED BY BUILDING DEPARTMENT ARE OBTAINED. SHOTCRETE MATERIALS, EQUIPMENT, PROCEDURES, PROPORTIONS, BATCHING AND MIXING, AND PLACEMENT SHALL BE IN ACCORDANCE WITH ACI 506R-05, ACI 506.2-13, ACI 506.4R-94 AND INTERNATIONAL BUILDING CODE SECTION 1908.

19. REINFORCING STEEL SHALL CONFORM TO ASTM A615 (INCLUDING SUPPLEMENTS S1), GRADE 60, Fy = 60,000 PSI. EXCEPTIONS: ANY BARS SPECIFICALLY SO NOTED ON THE DRAWINGS SHALL BE GRADE 40, Fy = 40,000 PSI.

WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185

20. DETAILING OF REINFORCING STEEL (INCLUDING HOOKS AND BENDS) SHALL BE IN ACCORDANCE WITH ACI SP-66-04 AND ACI 318-14 CHAPTER 25. LAP ALL REINFORCEMENTS AS FOLLOWS:

BAR SIZE	MINIMUM LAP LENGTH	MINIMUM HOOK EMBEDMENT
#3	24-INCHES	6-INCHES
#4	31-INCHES	8-INCHES
#5	39-INCHES	11-INCHES

PROVIDE CORNER BARS AT ALL WALL AND FOOTING INTERSECTIONS. LAP ADJACENT MATS OF WELDED WIRE FABRIC A MINIMUM OF 8" 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. FIELD BENDING OF GRADE 60 REINFORCEMENT SHALL NOT BE ALLOWED.

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

FOOTINGS AND OTHER UNFORMED SURFACES CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
ALL OTHER CASES	1-1/2"

22. SLABS-ON-GRADE: UNLESS NOTED OTHERWISE SHALL BE 4" CONCRETE, REINFORCED WITH 6X6 W1.4XW1.4 WELDED WIRE FABRIC CENTERED IN SLAB. UNLESS OTHERWISE DIRECTED BY SOILS REPORT PROVIDE MINIMUM 10 MIL VAPOR BARRIER OVER 4" OF COMPACTED SAND OR GRAVEL.

23. 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. TOLERANCES FOR ALL STRUCTURAL CONCRETE AND REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI 117-10 AND ACI 117.1R-14.

24. 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. GROUT STRENGTH SHALL BE AT LEAST EQUAL TO THE MATERIAL ON WHICH IT IS PLACED (3,000 PSI MINIMUM).

POST INSTALLED ANCHORS

25. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER—OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REINFORCEMENT. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND ICC-ES REPORT. SUBSTITUTION REQUESTS, FOR PRODUCTS OTHER THAN THOSE SPECIFIED BELOW, SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER-OF-RECORD ALONG WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF WASHINGTON. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING EQUIVALENT PERFORMANCE VALUES (MINIMUM) OF THE SPECIFIED PRODUCT USING THE APPROPRIATE DESIGN PROCEDURE AND/OR STANDARD(S) AS REQUIRED BY THE INTERNATIONAL BUILDING CODE. SUBSTITUTIONS SHALL HAVE CURRENT ICC-ES APPROVAL.

A. CONCRETE ANCHORS
1. MECHANICAL ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ACI 355.2 AND ICC-ES AC193. PRE-APPROVED MECHANICAL ANCHORS INCLUDE:
    - a. SIMPSON STRONG-TIE "STRONG-BOLT 2" (ICC-ES ESR-3037)
    - b. SIMPSON STRONG-TIE "TITEN-HD" (ICC-ES ESR-2713)
    - c. HILTI "KWIK BOLT TZ" (ICC-ES ESR-1917)

2. ADHESIVE ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC308. PRE-APPROVED ADHESIVE ANCHORS INCLUDE:
    - a. SIMPSON STRONG-TIE "SET-XP" (ICC-ES ESR-2508)
    - b. SIMPSON STRONG-TIE "AT-XP" (IAPMO UES ER-263)
    - c. HILTI "HIT-RE 500-V3" (ICC-ES ESR-3814)
    - d. HILTI "HIT-HY 200" (ICC-ES ESR-3187)

STEEL

26. STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE LATEST EDITIONS OF THE A.I.S.C. SPECIFICATIONS AND CODES AS FOLLOWS:
    1. AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
    2. AISC 303-16 CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, AMENDED BY THE DELETION OF THE FOLLOWING SENTENCE IN PARAGRAPH 4.2.1: "THIS APPROVAL CONSTITUTES THE OWNER'S ACCEPTANCE OF ALL RESPONSIBILITY FOR THE DESIGN ADEQUACY OF ANY DETAIL CONFIGURATION OF CONNECTIONS DEVELOPED BY THE FABRICATOR AS PART OF HIS PREPARATION OF THESE SHOP DRAWINGS."
    3. AISC 341-16 SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS
    4. SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.
    5. AMERICAN WELDING SOCIETY (AWS) STRUCTURAL WELDING CODE D1.1 AND D1.4

27. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

TYPE OF MEMBER	ASTM SPECIFICATION	Fy
PLATES, ANGLES, AND RODS	A36	36 KSI
WIDE FLANGE SHAPES AND CHANNELS	A992	50 KSI
PIPE COLUMNS	A53 (TYPE E OR S. GRADE B)	35 KSI
STRUCTURAL TUBING (SQUARE OR RECTANGULAR)	A500 (GRADE B)	46 KSI
ANCHOR BOLTS (EMBEDDED IN MASONRY OR CONCRETE)	A307	
CONNECTION BOLTS (3/4" ROUND, UNLESS SHOWN OTHERWISE)	A325-N	
THREADED RODS FOR EPOXY GROUTED CONNECTIONS	A36 OR A307 GRADE C	36 KSI

28. ALL BEAM PENETRATIONS NOT SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION.

29. ARCHITECTURALLY EXPOSED STRUCTURAL STEEL SHALL CONFORM TO SECTION 10 OF THE AISC 303-10. ANY STRUCTURAL STEEL THAT IS EXPOSED TO VIEW UPON COMPLETION OF THE PROJECT SHALL BE CONSIDERED ARCHITECTURALLY EXPOSED. SEE PROJECT SPECIFICATIONS FOR SPECIFIC FABRICATION AND ERECTION REQUIREMENTS.

30. ALL A-325 CONNECTION BOLTS SHALL BE INSTALLED TO THE SNUG-TIGHT CONDITION PER AISC SPECIFICATIONS. INSTALL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS.

34. ALL WELDING SHALL BE IN CONFORMANCE WITH AISC AND AWS STANDARDS AND SHALL BE PERFORMED BY WABO CERTIFIED WELDERS USING E70 XX ELECTRODES UNLESS OTHERWISE NOTED. ONLY PREQUALIFIED WELDS (AS DEFINED BY AWS) SHALL BE USED.

NICHOLAS V.H. CARTER — STATE OF WASHINGTON — 21770 — STRUCTURAL — PROFESSIONAL ENGINEER

BYKONEN CARTER QUINN — STRUCTURAL ENGINEERING

STEINBORN RESIDENCE

New Residence

8435 SE 47th PL.

Mercer Island, WA 98040

Date:
2/14/2022 Permit Submittal
⚠ 8/25/2022 Sub2-2202-225

IF SHEET IS NOT 24"x36" IT HAS BEEN RESCALED

General Structural Notes

S1.0

WOOD

35. FRAMING LUMBER SHALL BE KILN DRIED OR MC-19, AND GRADED AND MARKED IN CONFORMANCE WITH WCLIB STANDARD GRADING RULES FOR WEST COAST LUMBER NO. 17, LATEST EDITION. FURNISH TO THE FOLLOWING MINIMUM STANDARDS.

JOISTS:	HEM-FIR NO. 2 (UNLESS NOTED OTHERWISE ON PLANS)
(2X, 3X, AND 4X MEMBERS)	MINIMUM BASE VALUE, F_b = 850 PSI
BEAM AND STRINGERS:	DOUGLAS FIR LARCH NO. 1
(6 X AND LARGER MEMBERS)	MINIMUM BASIC DESIGN STRESS, F_b = 1,350 PSI
POSTS AND TIMBERS:	DOUGLAS FIR LARCH NO. 1
(6 X AND LARGER MEMBERS)	MINIMUM BASIC DESIGN STRESS, F_b = 1,200 PSI, F_C = 1,000 PSI
STUDS PLATES & MISCELLANEOUS LIGHT FRAMING	DOUGLAS FIR LARCH OR HEM-FIR NO. 2, MINIMUM BASIC DESIGN STRESS F_b = 850 PSI, F_C = 1,300 PSI
2X AND 3X TONGUE AND GROOVE DECKING	HEM-FIR COMMERCIAL DEX, F_b = 1,350 PSI

36. PARALLEL STRAND LUMBER (PSL): EACH PIECE SHALL BEAR A STAMP OR STAMPS NOTING THE NAME AND PLANT NUMBER OF THE MANUFACTURER, THE GRADE, PRODUCT DESIGNATION OR TYPE, THE PRODUCTION DATE, SPECIES OR SPECIES GROUP DESIGNATION, AND THE QUALITY CONTROL AGENCY. MEMBERS SHALL BE GLUED WITH A WATERPROOF ADHESIVE MEETING THE REQUIREMENTS OF ASTM D2559 WITH ALL GRAIN PARALLEL WITH THE LENGTH OF THE MEMBER. STRUCTURAL CAPACITIES SHALL BE ESTABLISHED IN ACCORDANCE WITH ASTM D5456 AND PRODUCT SHALL HAVE AN APPROVED ICC-ES EVALUATION REPORT. MEMBERS SHALL BE TRANSPORTED AND STORED PER MANUFACTURERS RECOMMENDATIONS AND SHALL NOT BE EXPOSED TO PROLONGED MOISTURE. MINIMUM REQUIRED DESIGN PROPERTIES: F_b = 2900 PSI, E = 2000,000 PSI, Fv = 290 PSI.

DESIGN SHOWN ON PLANS IS BASED ON LUMBER MANUFACTURED BY THE WEYERHAEUSER. ALTERNATE MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER. ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE ICC-ES APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH MEMBERS PROVIDED.

37. LAMINATED VENEER LUMBER (LVL): EACH PIECE SHALL BEAR A STAMP OR STAMPS NOTING THE NAME AND PLANT NUMBER OF THE MANUFACTURER, THE GRADE, PRODUCT DESIGNATION OR TYPE, THE PRODUCTION DATE, SPECIES OR SPECIES GROUP DESIGNATION, AND THE QUALITY CONTROL AGENCY. MEMBERS SHALL BE GLUED WITH A WATERPROOF ADHESIVE MEETING THE REQUIREMENTS OF ASTM D2559 WITH ALL GRAIN PARALLEL WITH THE LENGTH OF THE MEMBER. STRUCTURAL CAPACITIES SHALL BE ESTABLISHED IN ACCORDANCE WITH ASTM D5456 AND PRODUCT SHALL HAVE AN APPROVED ICC-ES EVALUATION REPORT. MEMBERS SHALL BE TRANSPORTED AND STORED PER MANUFACTURERS RECOMMENDATIONS AND SHALL NOT BE EXPOSED TO PROLONGED MOISTURE. MINIMUM REQUIRED DESIGN PROPERTIES: F_b = 2600 PSI, Fv = 285 PSI, E = 2,000,000 PSI.

DESIGN SHOWN ON PLANS IS BASED ON LUMBER MANUFACTURED BY WEYERHAEUSER. ALTERNATE MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER, ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE ICC-ES APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH MEMBERS PROVIDED.

38. LAMINATED STRAND LUMBER (LSL): EACH PIECE SHALL BEAR A STAMP OR STAMPS NOTING THE NAME AND PLANT NUMBER OF THE MANUFACTURER, THE GRADE, PRODUCT DESIGNATION OR TYPE, THE PRODUCTION DATE, SPECIES OR SPECIES GROUP DESIGNATION, AND THE QUALITY CONTROL AGENCY. MEMBERS SHALL BE GLUED WITH A WATERPROOF ADHESIVE MEETING THE REQUIREMENTS OF ASTM D2559 WITH ALL GRAIN PARALLEL WITH THE LENGTH OF THE MEMBER. STRUCTURAL CAPACITIES SHALL BE ESTABLISHED IN ACCORDANCE WITH ASTM D5456 AND PRODUCT SHALL HAVE AN APPROVED ICC-ES EVALUATION REPORT. MEMBERS SHALL BE TRANSPORTED AND STORED PER MANUFACTURERS RECOMMENDATIONS AND SHALL NOT BE EXPOSED TO PROLONGED MOISTURE. MINIMUM REQUIRED DESIGN PROPERTIES: F_b = 2325 PSI, Fv = 310 PSI, E = 1,550,000 PSI,

LSL RIM JOISTS SHALL CONFORM TO ANSI/APA PRR 410 AND SHALL BE MARKED IN ACCORDANCE WITH THE STANDARD.

DESIGN SHOWN ON PLANS IS BASED ON LUMBER MANUFACTURED BY WEYERHAEUSER. ALTERNATE MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER, ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE ICC-ES APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH MEMBERS PROVIDED.

39. PREFABRICATED PLYWOOD WEB JOIST DESIGN SHOWN ON PLANS IS BASED ON JOIST MANUFACTURED BY THE WEYERHAEUSER. ALTERNATE PLYWOOD WEB JOIST MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER. ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE ICC-ES APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH PLYWOOD WEB JOIST PROVIDED.

40. PLYWOOD SHEATHING SHALL BE GRADE C-D, EXTERIOR GLUE OR STRUCTURAL II, EXTERIOR GLUE IN CONFORMANCE WITH DOC PS 1-09 OR PS 2-18 AND AMERICAN PLYWOOD ASSOCIATION PERFORMANCE STANDARD PRP-108. ORIENTED STRAND BOARD OF EQUIVALENT THICKNESS, EXPOSURE RATING AND PANEL INDEX MAY BE USED IN LIEU OF PLYWOOD. SEE PLANS FOR THICKNESS, PANEL IDENTIFICATION INDEX AND NAILING REQUIREMENTS. EACH PANEL SHALL BE IDENTIFIED FOR GRADE AND GLUE TYPE BY THE TRADEMARKS OF AN APPROVED TESTING AND GRADING AGENCY.

41. ALL WOOD PLATES IN DIRECT CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-TREATED WITH AN APPROVED PRESERVATIVE, PROVIDE 2 LAYERS OF ASPHALT IMPREGNATED BUILDING PAPER BETWEEN UNTREATED LEDGERS, BLOCKING, ETC. AND CONCRETE OR MASONRY.

PRESSURE TREATED LUMBER SHALL COMPLY WITH THE AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) STANDARD U1, COMMODITY SPECIFICATION A AS INDICATED BELOW OR HAVE EQUIVALENT ICC-ES APPROVAL.

PROPOSED USE		AWPA USE CATEGORY
RESIDENTIAL DECKS	DECKING	3B
	JOISTS ABOVE GROUND	3B
	POSTS	4A
	RAILING	3B
	LEDGERS	3B
SAWN LUMBER	ABOVE GROUND	3B
PLYWOOD	DAMP ABOVE GROUND	2
	EXTERIOR ABOVE GROUND	3B
SILL PLATES	IN CONTACT WITH CONCRETE OR MASONRY	2
INTERIOR LEDGERS	IN CONTACT WITH CONCRETE OR MASONRY	2

ALL TREATED LUMBER SHALL BEAR THE QUALITY MARK OF AN ACCREDITED INSPECTION AGENCY. THE QUALITY MARK SHALL INCLUDE:

A. IDENTIFICATION OF TREATING MANUFACTURER
B. TYPE OF PRESERVATIVE USED
C. MINIMUM PRESERVATIVE RETENTION (PCF)
D. END USE FOR WHICH THE PRODUCT IS TREATED
E. IDENTITY OF THE ACCREDITED INSPECTION AGENCY
F. STANDARD TO WHICH THE PRODUCT IS TREATED

42. TIMBER CONNECTORS CALLED OUT BY LETTERS AND NUMBERS SHALL BE "STRONG-TIE" BY SIMPSON COMPANY, AS SPECIFIED IN THEIR CATALOG NUMBER C-C-2019. EQUIVALENT DEVICES BY OTHER MANUFACTURERS MAY BE SUBSTITUTED, PROVIDED THEY HAVE ICC-ES APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. PROVIDE NUMBER AND SIZE OF FASTENERS AS SPECIFIED BY MANUFACTURER TO ACHIEVE THE MAXIMUM PUBLISHED ALLOWABLE LOAD. ALL CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE CONNECTOR STRAPS CONNECT TWO MEMBERS, PLACE ONE-HALF OF THE NAILS OR BOLTS IN EACH MEMBER. SHIMS, WHERE REQUIRED, SHALL BE SEASONED AND DRIED AND THE SAME GRADE (MINIMUM) AS MEMBERS CONNECTED.

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. ALL LAG SCREWS SHALL BE INSTALLED IN PRE-DRILLED HOLES.

UNLESS NOTED OTHERWISE ALL SAWN LUMBER JOISTS SHALL BE CONNECTED TO FLUSH BEAMS WITH "LUS" SERIES JOIST HANGERS AND ALL PREFABRICATED PLYWOOD WEB JOISTS SHALL BE CONNECTED TO FLUSH BEAMS WITH "IUS" SERIES JOIST HANGERS.

ALL CONNECTIONS/FASTENERS IN CONTACT WITH PRESERVATIVE-TREATED OR FIRE-RETARDANT-TREATED WOOD, SHALL BE OF HOT DIPPED ZINC-COATED GALVANIZED STEEL OR STAINLESS STEEL. HOT DIPPED GALVANIZED FASTENERS SHOULD CONFORM TO ASTM STANDARD 153, AND HOT DIPPED GALVANIZED CONNECTORS SHOULD CONFORM TO ASTM STANDARD A653 (CLASS G-185). STAINLESS STEEL FASTENERS AND CONNECTORS SHOULD BE TYPE 304 OR 316. NOTE: ELECTROPLATED GALVANIZED FASTENERS AND CONNECTORS ARE NOT TO BE USED WITH PRESSURE TREATED WOOD. SIMPSON PRODUCT FINISHES CORRESPONDING TO THE ABOVE REQUIREMENTS ARE ZMAX (HOT DIPPED GALVANIZED) AND SST300 (STAINLESS STEEL). STAINLESS STEEL HARDWARE AND FASTENERS SHALL NOT BE COMBINED WITH UNTREATED OR GALVANIZED MATERIAL.

43. WOOD FASTENERS:

A. NAIL SIZES SPECIFIED ON DRAWINGS ARE BASED ON THE FOLLOWING SPECIFICATIONS:

SIZE	LENGTH	DIAMETER
6d	2"	0.113"
8d	2-1/2"	0.131"
10d	3"	0.148"
12d	3-1/4"	0.148"
16d	3-1/2"	0.162"

DESIGN IS BASED ON COMMON STEEL WIRE NAILS MEETING THE REQUIREMENTS OF ASTM F1667. USE OF ALTERNATE FASTENERS MUST BE SUBMITTED FOR REVIEW AND APPROVAL BY THE STRUCTURAL ENGINEER PRIOR TO THE START OF CONSTRUCTION.

B. NAILS — PLYWOOD (APA RATED SHEATHING) FASTENERS TO FRAMING SHALL BE DRIVEN FLUSH TO FACE OF SHEATHING WITH NO COUNTERSINKING PERMITTED.

44. WOOD FRAMING NOTES — THE FOLLOWING APPLY UNLESS OTHERWISE SHOWN ON THE PLANS:

A. ALL WOOD FRAMING DETAILS NOT SHOWN OTHERWISE SHALL BE CONSTRUCTED TO THE MINIMUM STANDARDS OF THE INTERNATIONAL BUILDING CODE. MINIMUM NAILING, UNLESS OTHERWISE NOTED, SHALL CONFORM TO TABLE 2304.10.1 OF THE INTERNATIONAL BUILDING CODE. UNLESS NOTED OTHERWISE, ALL NAILS SHALL BE AS SPECIFIED ABOVE. COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS WITH MECHANICAL AND ARCHITECTURAL DRAWINGS. PROVIDE WASHERS UNDER THE HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS BEARING ON WOOD. INSTALLATION OF BOLTS AND LAG SCREWS SHALL CONFORM TO SECTIONS 12.1.3 AND 12.1.4 OF THE 2018 NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. NATURALLY DURABLE OR PRESSURE TREATED WOOD SHALL BE PROVIDED WHERE REQUIRED BY SECTION 2304.12 OF THE INTERNATIONAL BUILDING CODE.

B. WALL FRAMING: ALL STUD WALLS SHOWN AND NOT OTHERWISE NOTED SHALL BE 2X6 AT 16" O.C. TWO STUDS MINIMUM SHALL BE PROVIDED AT THE END OF ALL WALLS AND AT EACH SIDE OF ALL OPENINGS. TWO 2 x 8 HEADERS SHALL BE PROVIDED OVER ALL OPENINGS NOT OTHERWISE NOTED AND SHALL BEAR FULLY ON A MINIMUM OF TWO STUDS. SOLID BLOCKING FOR WOOD COLUMNS SHALL BE PROVIDED THROUGH FLOORS TO SUPPORTS BELOW. PROVIDE SOLID BLOCKING BETWEEN STUDS AT MID_HEIGHT OF ALL STUD WALLS OVER 10' IN HEIGHT.

STUDS MAY BE NOTCHED, CUT, OR PENETRATED WITH ROUND BORED HOLES AS FOLLOWS:

STUD SIZE	MAXIMUM NOTCH / CUT	MAXIMUM BORED HOLE
2X4	7/8"	1-3/8"
2X6	1-3/8"	2-1/8"

BORED HOLES SHALL NOT BE LOCATED WITH 5/8" FROM THE EDGE OF THE STUD OR AT THE SAME LOCATION AS A NOTCH OR CUT.

WALLS SHALL HAVE A SINGLE BOTTOM PLATE AND A DOUBLE TOP PLATE. END NAIL TOP PLATE TO EACH STUD WITH TWO 16d NAILS, AND TOENAIL OR END NAIL EACH STUD TO BOTTOM PLATE WITH TWO 16d NAILS. FACE NAIL DOUBLE TOP PLATE WITH 16d AT 12" O.C. AND LAP MINIMUM 4'-0" AT JOINTS AND PROVIDE EIGHT 16d NAILS AT 4" O.C. EACH SIDE OF JOINT.

ALL STUD WALLS SHALL HAVE THEIR LOWER WOOD PLATES ATTACHED TO WOOD FRAMING BELOW WITH 16d NAILS AT 12" O.C. STAGGERED OR BOLTED TO CONCRETE WITH 5/8" DIAMETER ANCHOR BOLTS (WITH 7" MINIMUM EMBEDMENT) @ 4'_0" O.C. UNLESS INDICATED OTHERWISE. PROVIDE 3"x3" x1/4" HOT-DIPPED GALVANIZED PLATE WASHERS AT ALL ANCHOR BOLTS. INDIVIDUAL MEMBERS OF BUILT_UP POSTS SHALL BE NAILED TO EACH OTHER WITH 16d NAILS @ 12" O.C. STAGGERED. REFER TO THE PLANS AND SHEAR WALL SCHEDULE FOR REQUIRED SHEATHING AND NAILING. WHEN NOT OTHERWISE NOTED, PROVIDE GYPSUM WALLBOARD ON INTERIOR SURFACES NAILED TO ALL STUDS, TOP AND BOTTOM PLATES AND BLOCKING WITH NAILS AT 7" O.C. USE 5d COOLER NAILS FOR 1/2" GWB AND 6d COOLER NAILS FOR 5/8" GWB. PROVIDE 15/32" APA RATED SHEATHING (SPAN RATING 24/0) ON EXTERIOR SURFACES NAILED AT ALL PANEL EDGES (BLOCK UNSUPPORTED EDGES), TOP AND BOTTOM PLATES WITH 8d NAILS @ 6" O.C. AND TO ALL INTERMEDIATE STUDS AND BLOCKING WITH NAILS @ 12" O.C. ALLOW 1/8" SPACING AT ALL PANEL EDGES AND ENDS.

C. FLOOR AND ROOF FRAMING: PROVIDE DOUBLE JOISTS UNDER ALL PARALLEL PARTITIONS THAT EXTEND OVER MORE THAN HALF THE JOIST LENGTH AND AROUND ALL OPENINGS IN FLOORS OR ROOFS UNLESS OTHERWISE NOTED. PROVIDE SOLID BLOCKING AT ALL BEARING POINTS.

NOTCHES AT THE END OF JOISTS AND RAFTERS SHALL NOT EXCEED 1/4 THE DEPTH OF THE MEMBER. NOTCHES IN THE TOP OR BOTTOM SHALL NOT EXCEED 1/6 THE DEPTH OF THE MEMBER AND SHALL NOT BE LOCATED WITHIN THE MIDDLE 1/3 OF THE SPAN. THE DIAMETER OF ROUND HOLES BORED IN JOISTS AND RAFTERS SHALL NOT EXCEED 1/3 OF THE DEPTH OF THE MEMBER AND SHALL NOT BE LOCATED WITHIN 2" FROM THE TOP OR BOTTOM EDGE.

TOENAIL JOISTS TO SUPPORTS WITH TWO 16d NAILS. ATTACH TIMBER JOISTS TO FLUSH HEADERS OR BEAMS WITH SIMPSON METAL JOIST HANGERS IN ACCORDANCE WITH NOTES ABOVE. NAIL ALL MULTI_JOIST BEAMS TOGETHER WITH TWO ROWS OF 16d @ 12" O.C. ATTACH RAFTERS AND ROOF TRUSSES AT BEARING LINES WITH H2.5 @ 24" O.C. UNLESS OTHER METAL CONNECTIONS ARE INDICATED.

UNLESS OTHERWISE NOTED ON THE PLANS, APA RATED ROOF AND FLOOR SHEATHING SHALL BE LAID UP WITH STRENGTH AXIS PERPENDICULAR TO SUPPORTS AND ATTACHED WITH 10d NAILS @ 6" O.C. TO FRAMED PANEL EDGES AND OVER STUD WALLS AS SHOWN ON PLANS AND @ 12" O.C. TO INTERMEDIATE SUPPORTS. PROVIDE APPROVED PLYWOOD EDGE CLIPS CENTERED BETWEEN JOISTS/TRUSSES AT UNBLOCKED ROOF SHEATHING EDGES. ALL FLOOR SHEATHING EDGES SHALL HAVE APPROVED TONGUE_AND_GROOVE JOINTS OR SHALL BE SUPPORTED WITH SOLID BLOCKING. ALLOW 1/8" SPACING AT ALL PANEL EDGES AND ENDS OF ALL ROOF AND FLOOR SHEATHING. TOENAIL BLOCKING TO SUPPORTS WITH 16d NAILS @ 12" O.C. UNLESS OTHERWISE NOTED. AT BLOCKED FLOOR AND ROOF DIAPHRAGMS PROVIDE FLAT 2X BLOCKING AT ALL UNFRAMED PANEL EDGES AND FASTEN SHEATHING TO FRAMING/BLOCKING AS SPECIFIED.

TONGUE AND GROOVE STRUCTURAL ROOF AND FLOOR DECKING SHALL BE INSTALLED AS FOLLOWS:

A. 2X DECKING SHALL BE TOENAILED THROUGH THE TONGUE AND FACE NAILED WITH ONE 16d NAIL PER PIECE PER SUPPORT.

B. 3X AND 4X DECKING SHALL BE TOENAILED WITH ONE 40d NAIL AND FACE NAILED WITH ONE 60d NAIL PER SUPPORT. COURSES SHALL BE SPIKED TOGETHER WITH 8" SPIKES AT 30" O.C. (MAXIMUM) AND AT 10" (MAXIMUM) FROM EACH END OF EACH PIECE. SPIKES SHALL BE INSTALLED IN PREDRILLED EDGE HOLES

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New Residence

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Mercer Island, WA 98040

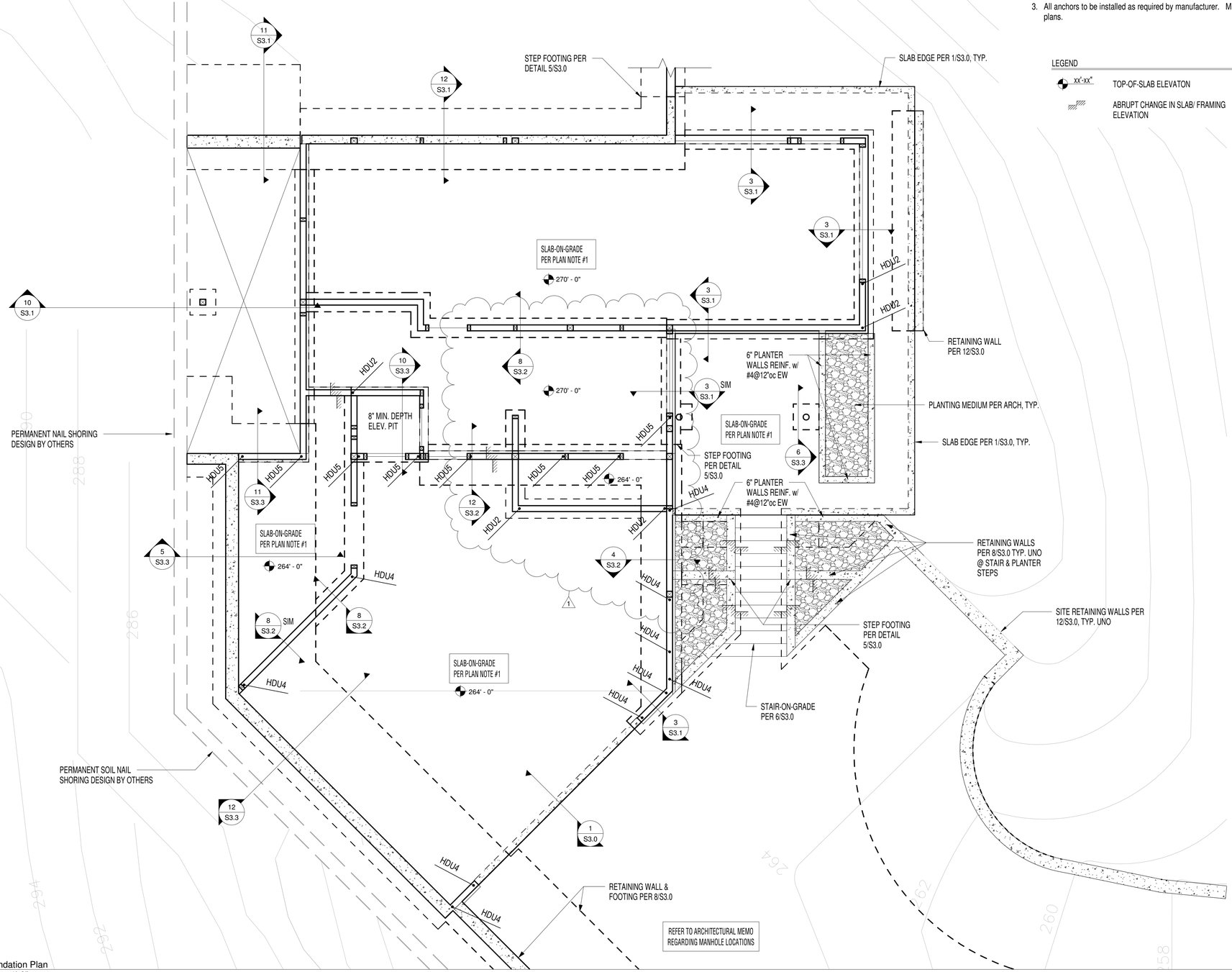
Date:

	2/14/2022	Permit Submittal
⚠1	8/25/2022	Sub2-2202-225

IF SHEET IS NOT 24"x36" IT HAS BEEN RESCALED

General Structural Notes

S1.1



1 Foundation Plan
1/4" = 1'-0"

Foundation Plan Notes

1. All slabs-on-on-grade shall be 4" reinforced with WWF6x6 W1.4xW1.4 u.n.o. Provide minimum 6-mil visqueen vapor barrier under all slabs. Slabs shall be supported on a minimum 4 inches of free draining material.

2. At holdowns provide the following anchor bolts:

Holdown	Anchor
HDU2	SSTB20, embed 16⅝" min. (or ¾"ø bolt, SET-XP epoxy embed 10 min.")
HDU4	SSTB24, embed 16⅝" min. Anchor must be cast-in-place.
HDU5	PAB5, embed 6½" min. into footing. Anchor must be cast-in-place.

3. All anchors to be installed as required by manufacturer. Minimum (2) 2x studs unless otherwise noted on plans.

LEGEND

xx'-xx" TOP-OF-SLAB ELEVATON

ABRUPT CHANGE IN SLAB/ FRAMING ELEVATION

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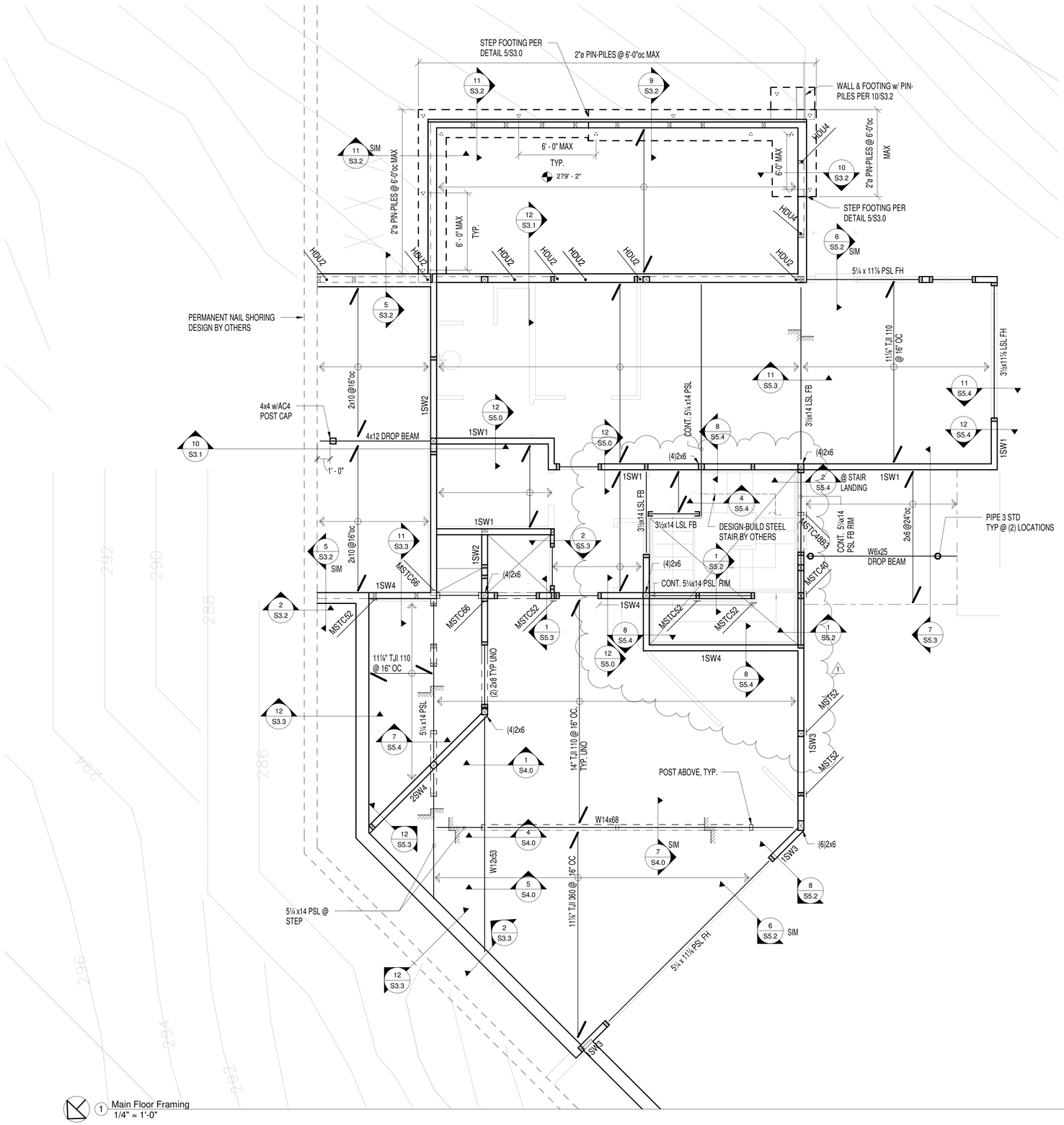
Foundation Plan

S2.0



1 Main Floor Framing
1/4" = 1'-0"

Floor Framing Plan Notes

1. Floor sheathing shall be 23/32" APA, Sturd-I-Floor with a panel index of 40/20. Nail to framing with 10d common nails at 6" oc at panel edges and 12" oc in field unless noted otherwise on plans.
2. All headers and beams shall be (2) 2x8 minimum, u.n.o. Refer to note 3 for support requirements.
3. All columns shall be double stud minimum, u.n.o., with the beam or header bearing fully on the column. Individual studs shall be nailed together per the general structural notes.
4. Exterior wall sheathing shall be 15/32" APA Rated sheathing with a panel index of 24/0 (Oriented strand board of equivalent thickness, exposure rating, and panel index may be used in lieu of plywood at contractors' option).
5. Attach LVL plies w/ (2) SDS25600 @16"oc.

LEGEND

- HANGER
- WALL/ COLUMN BELOW
- WALL/ COLUMN ABOVE
- ABRUPT CHANGE IN SLAB/ FRAMING ELEVATION
- FB INDICATES FLUSH BEAM
- FH INDICATED FLUSH HEADER
- UNO UNLESS NOTED OTHERWISE
- SPAN AND EXTENTS
- SPAN AND EXTENTS THRU-OUT

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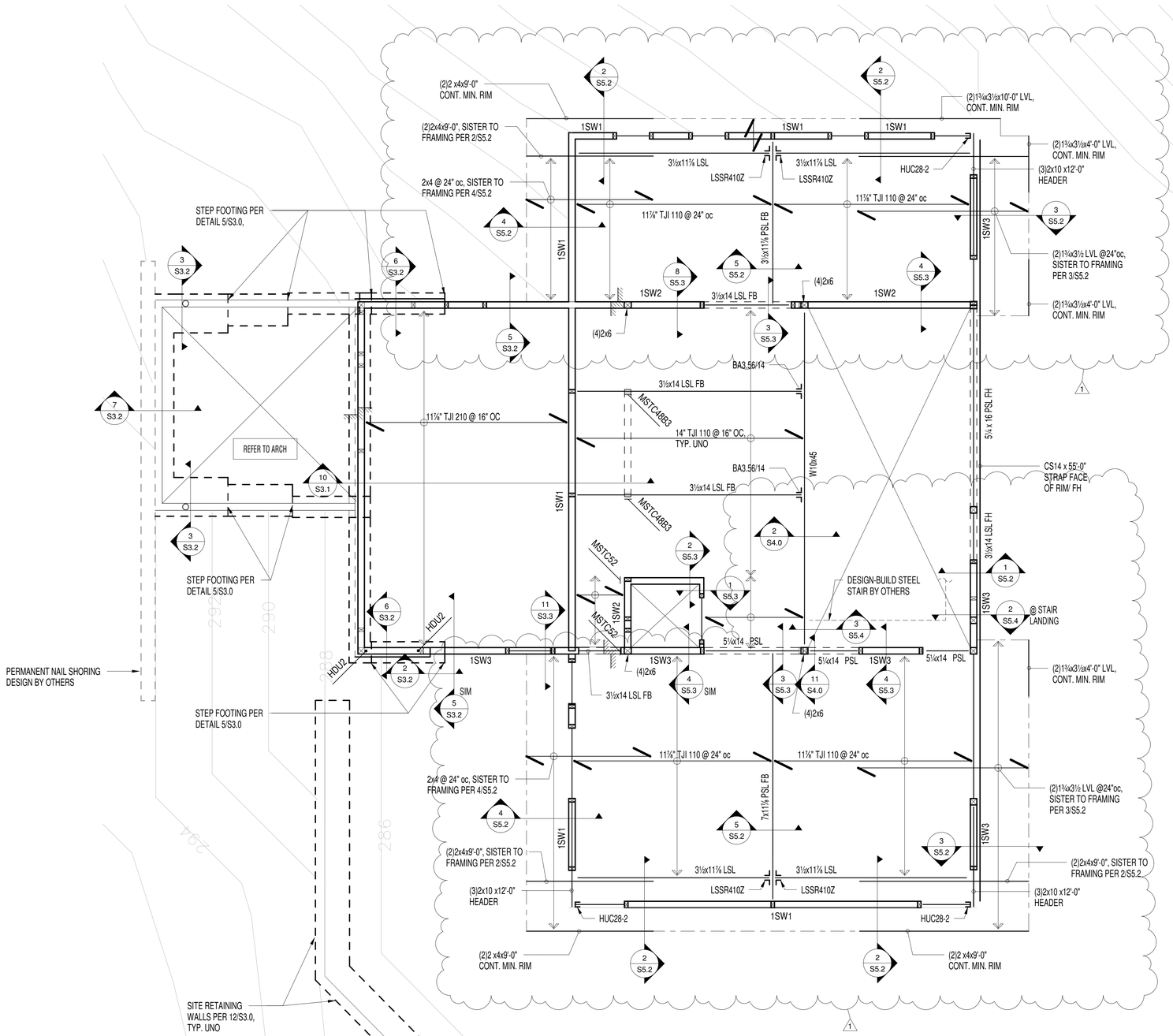
Main Floor Framing Plan

S2.1



1 Upper Floor Framing
1/4" = 1'-0"

Floor Framing Plan Notes

1. Floor sheathing shall be 23/32" APA, Sturd-I-Floor with a panel index of 40/20. Nail to framing with 10d common nails at 6" oc at panel edges and 12" oc in field unless noted otherwise on plans.
2. All headers and beams shall be (2) 2x8 minimum, u.n.o. Refer to note 3 for support requirements.
3. All columns shall be double stud minimum, u.n.o., with the beam or header bearing fully on the column. Individual studs shall be nailed together per the general structural notes.
4. Exterior wall sheathing shall be 15/32" APA Rated sheathing with a panel index of 24/0 (Oriented strand board of equivalent thickness, exposure rating, and panel index may be used in lieu of plywood at contractors' option).
5. Attach LVL plies w/ (2) SDS25600 @16"oc.

LEGEND

	HANGER
	WALL/ COLUMN BELOW
	WALL/ COLUMN ABOVE
	ABRUPT CHANGE IN SLAB/ FRAMING ELEVATION
FB	INDICATES FLUSH BEAM
FH	INDICATED FLUSH HEADER
UNO	UNLESS NOTED OTHERWISE
	SPAN AND EXTENTS
	SPAN AND EXTENTS THRU-OUT

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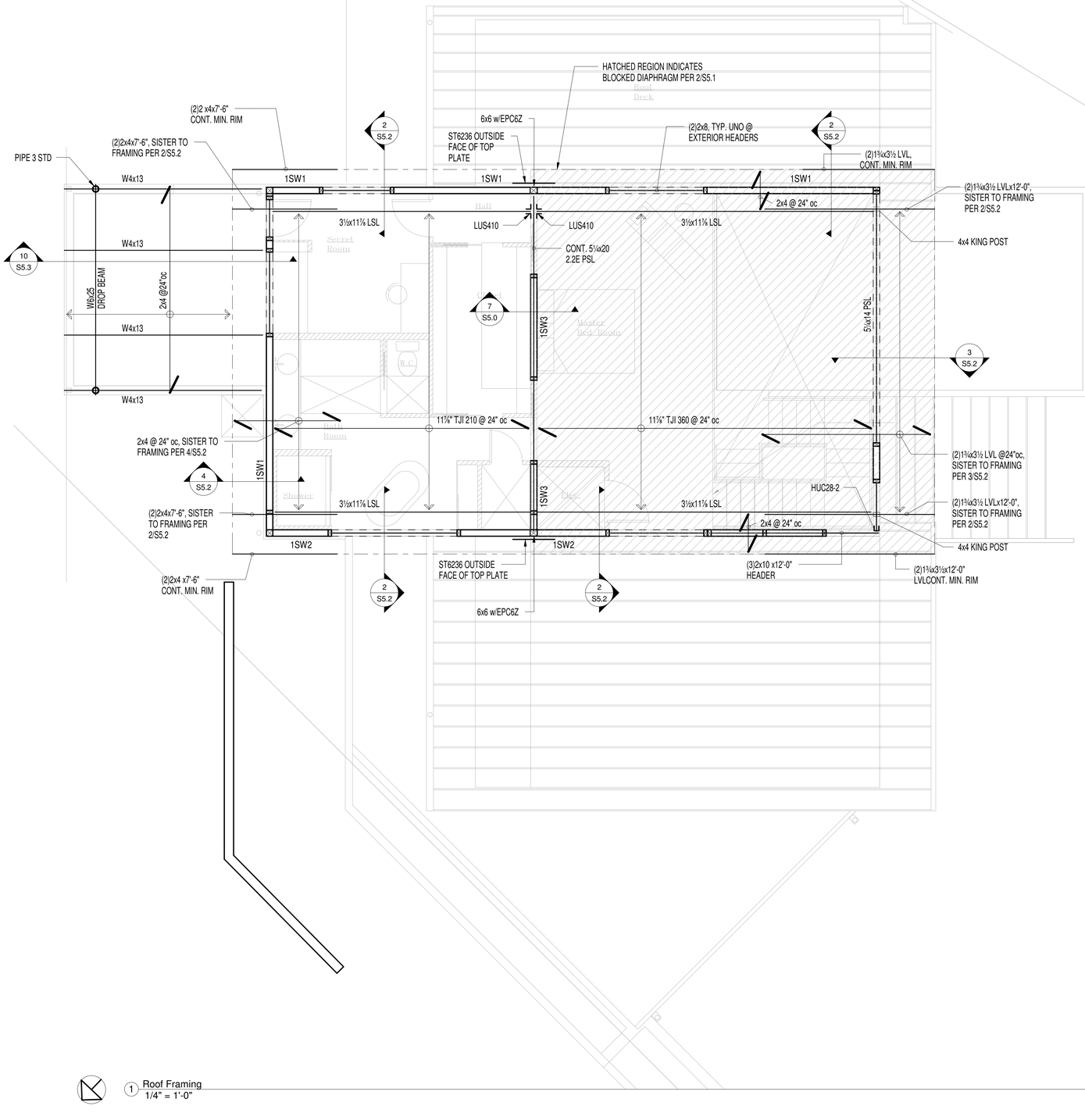
Upper Floor Framing Plan

S2.2



1 Roof Framing
1/4" = 1'-0"

Roof Framing Plan Notes

1. Roof sheathing shall be 15/32" APA Rated sheathing with a panel index of 24/0. Nail to framing with 8d common nails at 6" oc at panel edges and 12" oc in field unless noted otherwise on plans. Where noted on the plans all panel edges shall be block with minimum 2x material.
2. All headers and beams shall be (2) 2x8 minimum, u.n.o. Refer to note 3 for support requirements.
3. All columns shall be double stud minimum, u.n.o., with the beam or header bearing fully on the column. Individual studs shall be nailed together per the general structural notes.
4. Exterior wall sheathing shall be 15/32" APA Rated sheathing with a panel index of 24/0 (Oriented strand board of equivalent thickness, exposure rating, and panel index may be used in lieu of plywood at contractors' option).

LEGEND

	HANGER
	WALL/ COLUMN BELOW
	WALL/ COLUMN ABOVE
	ABRUPT CHANGE IN SLAB/ FRAMING ELEVATION
FB	INDICATES FLUSH BEAM
FH	INDICATED FLUSH HEADER
UNO	UNLESS NOTED OTHERWISE
	SPAN AND EXTENTS
	SPAN AND EXTENTS THRU-OUT

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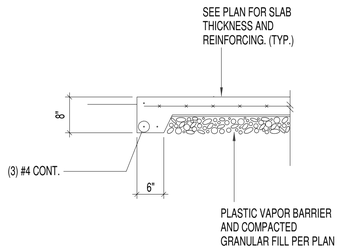
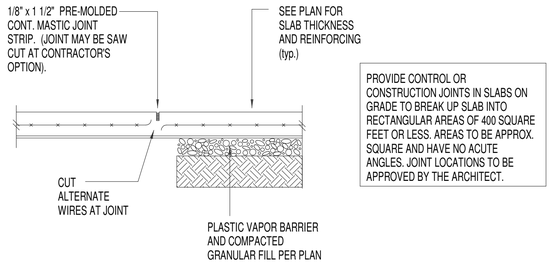
Roof Framing Plan

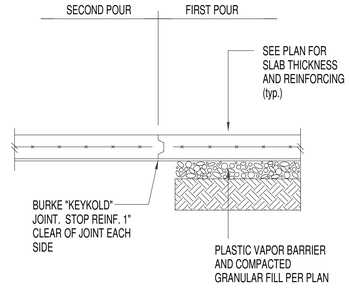
S2.3



Typical Slab Edge 1

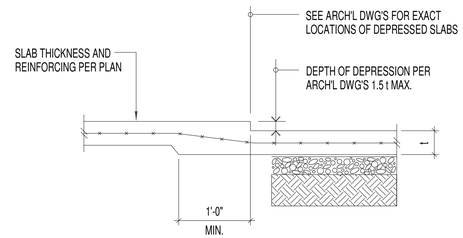


Control Joint

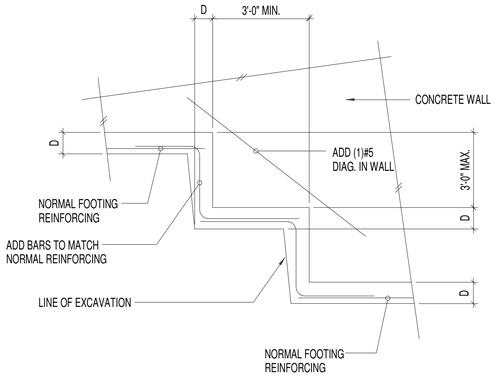


Construction Joint

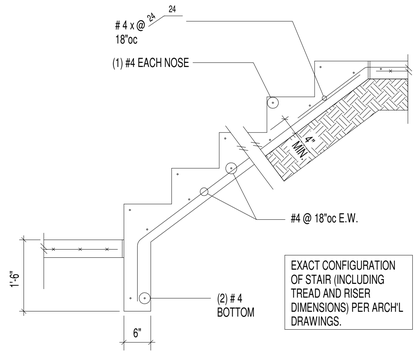
Typical Slab Joints 3



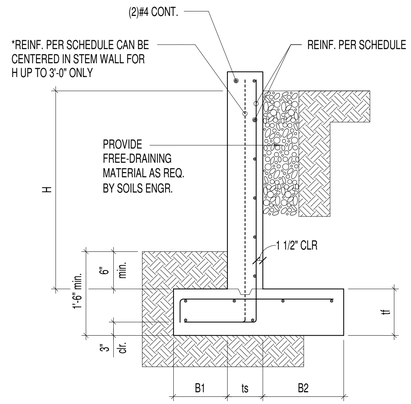
Typical Depressed Slab 4



Typical Stepped Footing 5



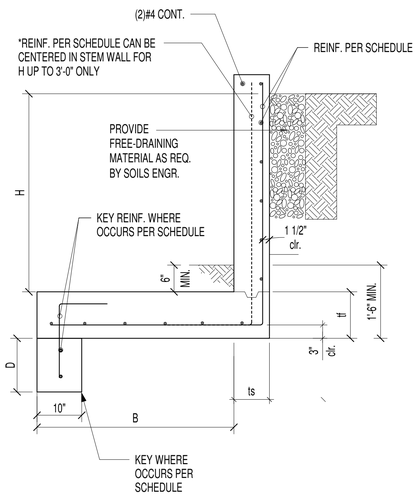
Stair On Grade 6



RETAINING WALL SCHEDULE DATA								
H	tf	B1	ts	B2	Stem Reinforcement		Footing Reinforcement	
					VERT.	HORIZ.	TOP	LONGIT.
*UP TO 3'-0"	10"	5"	8"	5"	#4 @12"oc	#4 @12"oc	#4 @10"oc	(2)#4
4'-0"	10"	5"	8"	16"	#4 @12"oc	#4 @12"oc	#4 @10"oc	(3)#4
5'-0"	10"	5"	8"	22"	#4 @12"oc	#4 @12"oc	#4 @10"oc	(4)#4
6'-0"	12"	9"	8"	28"	#4 @12"oc	#4 @12"oc	#5 @12"oc	(5)#4
7'-0"	12"	12"	10"	32"	#5 @12"oc	#5 @12"oc	#5 @10"oc	(6)#4
8'-0"	12"	12	10"	35"	#5 @12"oc	#5 @12"oc	#5 @10"oc	(7)#4

EQUIVALENT FLUID PRESSURE = 40 PCF
MINIMUM ALLOWABLE BEARING = 4000 PSF
COEFFICIENT OF FRICTION = 0.45 (ULTIMATE)
PASSIVE RESISTANCE = 300 PCF (ULTIMATE)
LATERAL SEISMIC SURCHARGE = 9H (ULTIMATE)

Retaining Wall Schedule 8



Retaining Wall Schedule - Site Walls 12

RETAINING WALL SCHEDULE DATA - SITE WALLS										
H	tf	ts	B	D	Stem Reinforcement		Footing Reinforcement		Key Reinf.	
					VERT.	HORIZ.	TOP	LONGIT.	VERT.	LONGIT.
*UP TO 3'-0"	10"	8"	15"	-	#4 @10"oc	#4 @12"oc	#4 @10"oc	(2)#4	-	-
4'-0"	10"	8"	21"	-	#4 @10"oc	#4 @12"oc	#4 @10"oc	(2)#4	-	-
5'-0"	12"	8"	44"	-	#4 @9"oc	#4 @12"oc	#4 @9"oc	(5)#4	-	-
6'-0"	14"	8"	44"	8"	#5 @12"oc	#4 @12"oc	#5 @12"oc	(6)#5	#4 @12"oc	(1)#4
7'-0"	14"	12"	60"	8"	#5 @12"oc	#5 @12"oc	#5 @10"oc	(6)#5	#4 @12"oc	(1)#4
8'-0"	14"	12"	84"	12"	#5 @10"oc	#5 @12"oc	#5 @10"oc	(8)#5	#4 @12"oc	(1)#4
9'-0"	14"	12"	99"	16"	#5 @8"oc	#5 @12"oc	#5 @8"oc	(9)#5	#4 @10"oc	(2)#4
10'-0"	16"	12"	123"	18"	#6 @10"oc	#5 @12"oc	#6 @10"oc	(12)#5	#4 @10"oc	(2)#4

EQUIVALENT FLUID PRESSURE = 40 PCF
MINIMUM ALLOWABLE BEARING = 4000 PSF
COEFFICIENT OF FRICTION = 0.45 (ULTIMATE)
PASSIVE RESISTANCE = 300 PCF (ULTIMATE)
LATERAL SEISMIC SURCHARGE = 9H (ULTIMATE)

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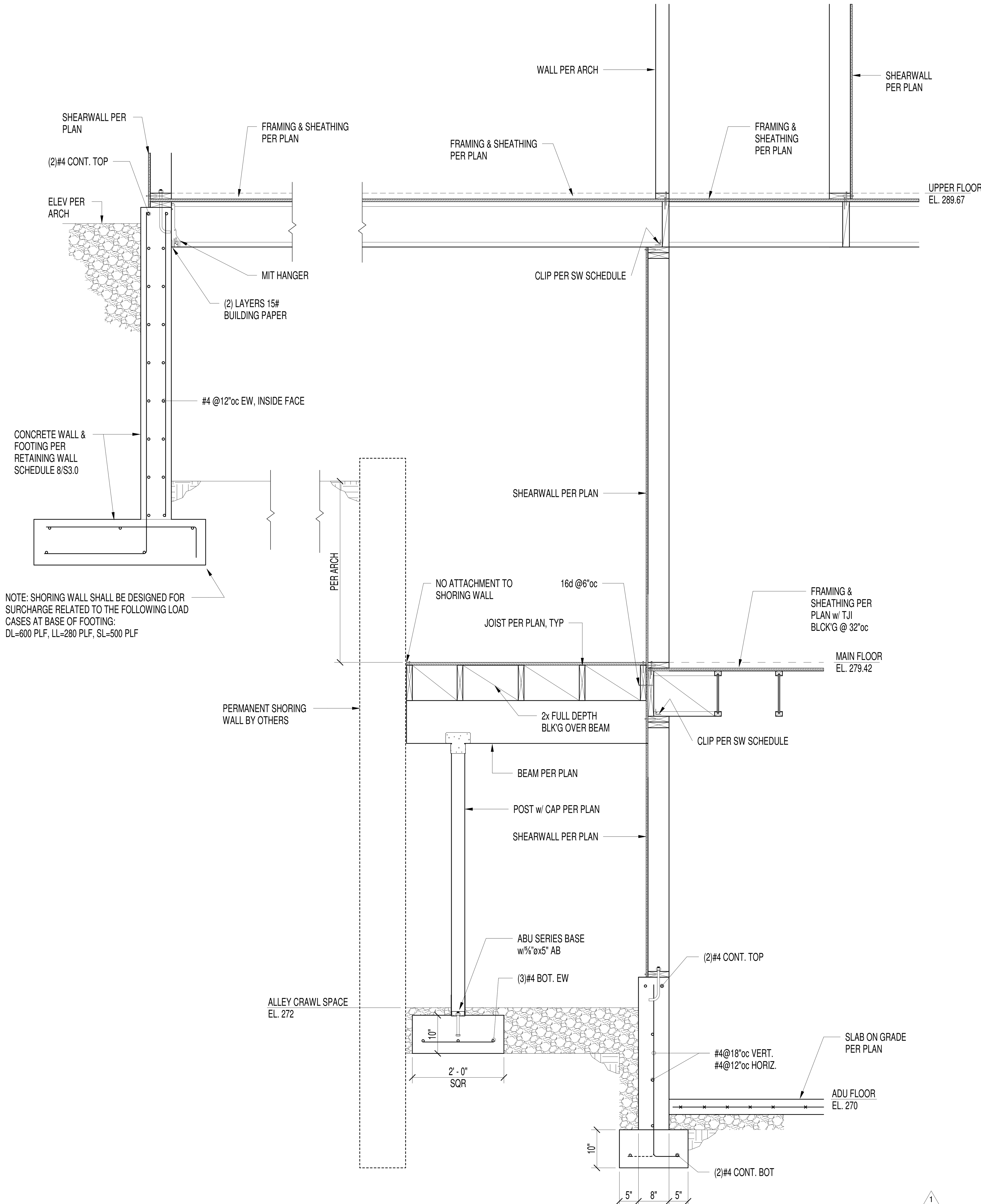
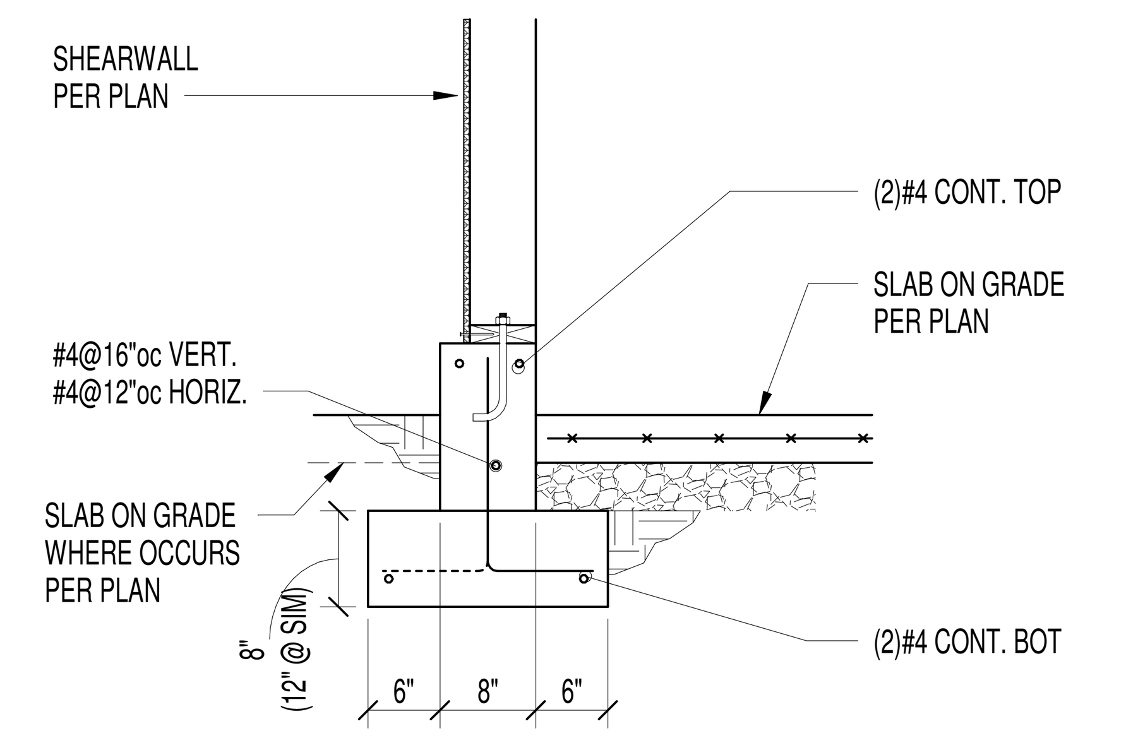
Concrete Details

S3.0



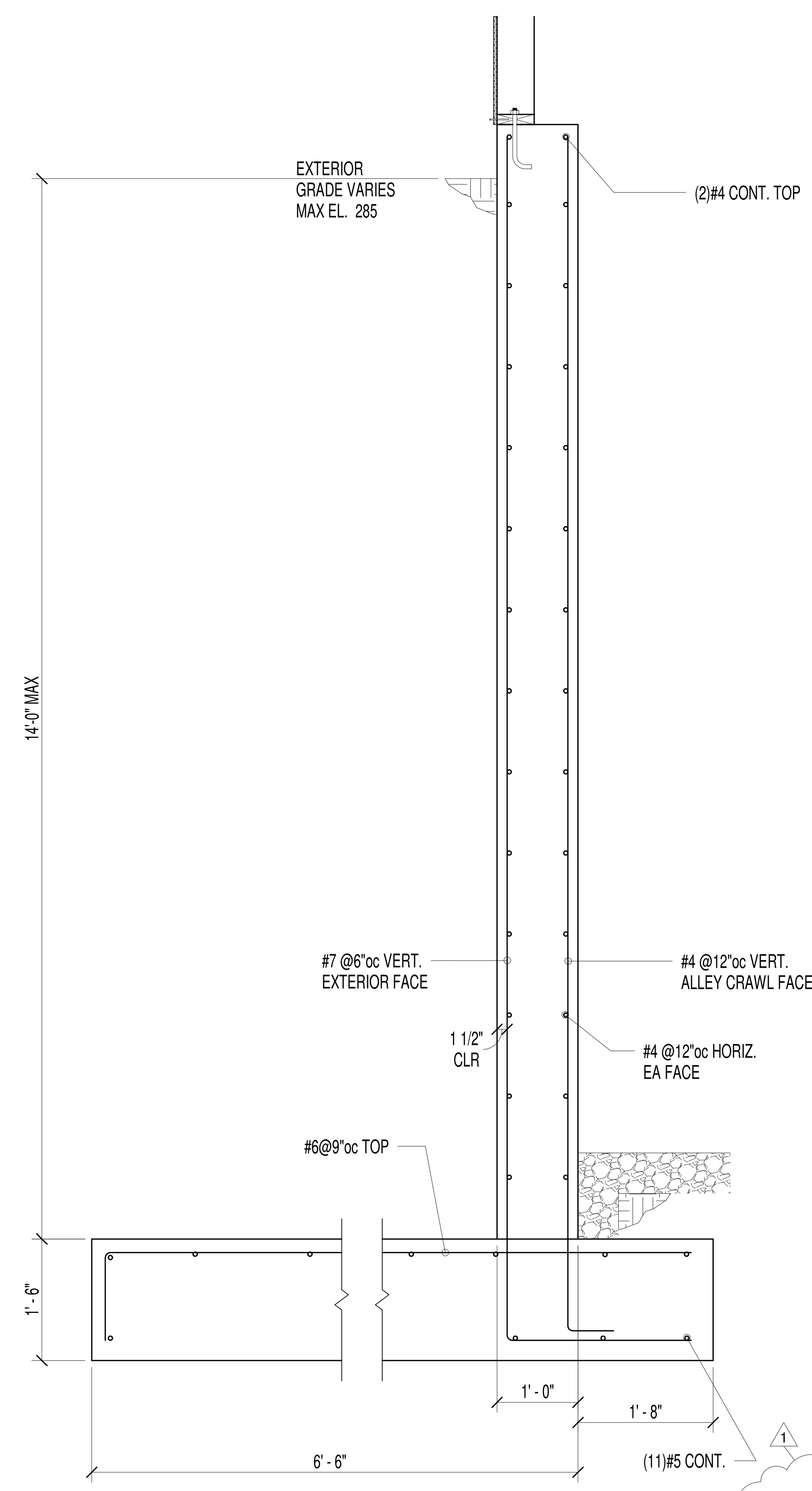
Section thru NE wall @ Stair



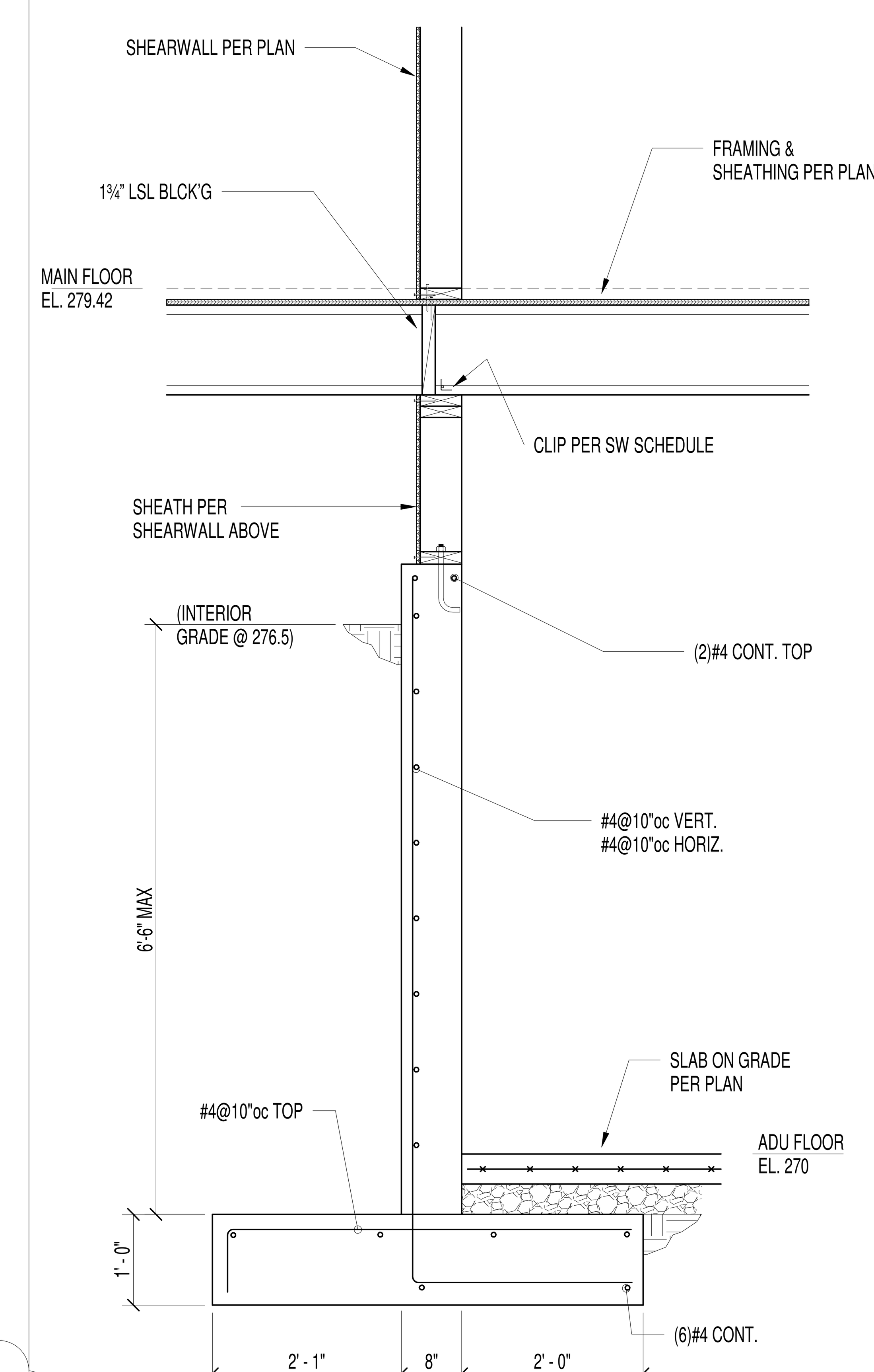
Section SW ADU/Entry 3

1

4

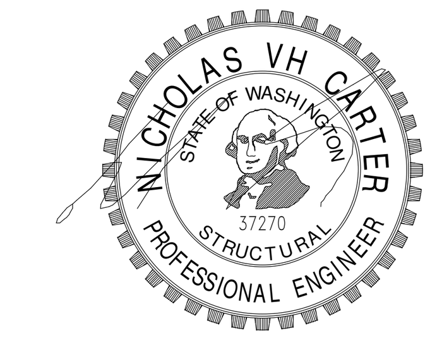


Section thru SE elevation @ ADU/Laundry



12

Section thru SE elevation @ ADU/Laundry



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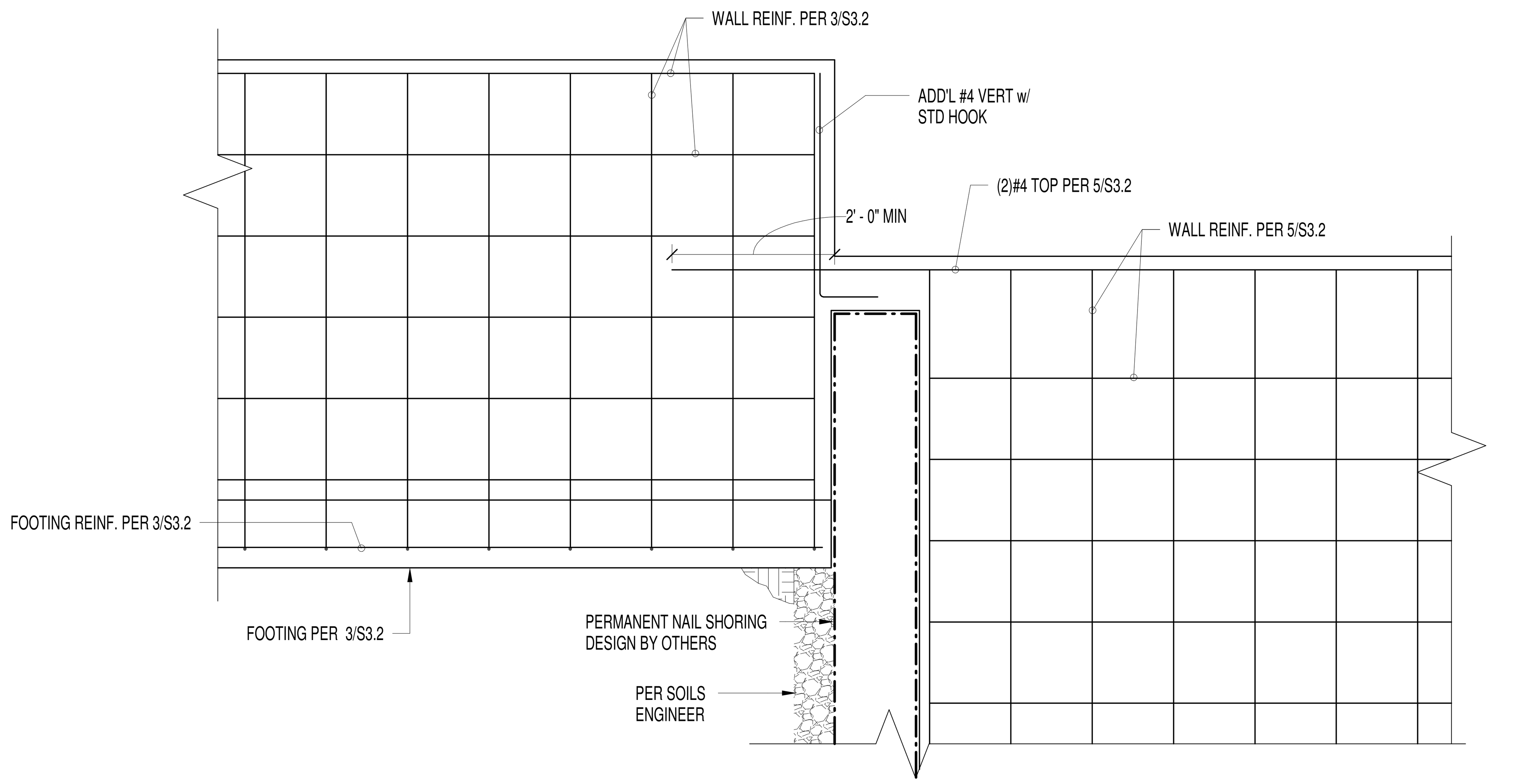
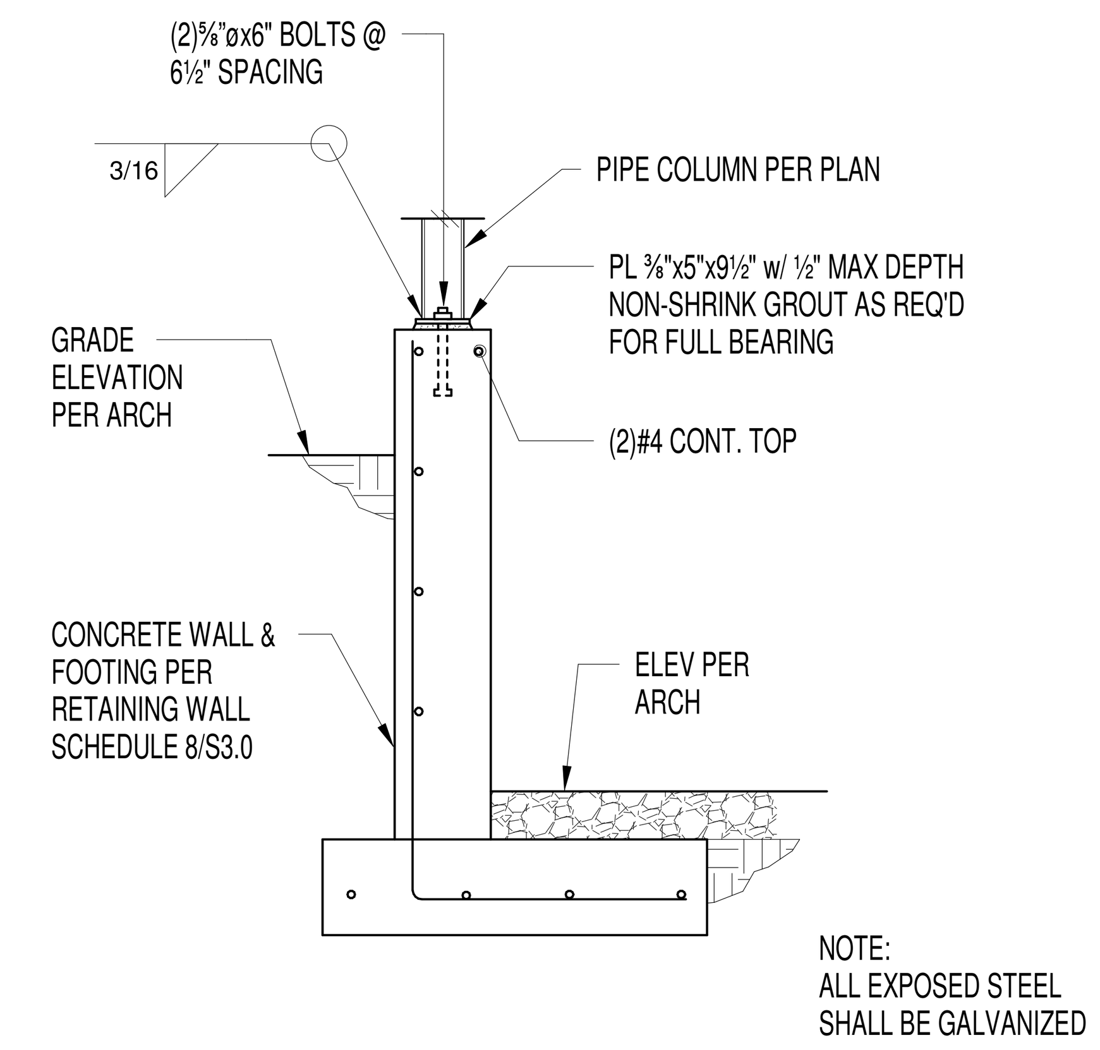
Concrete Details

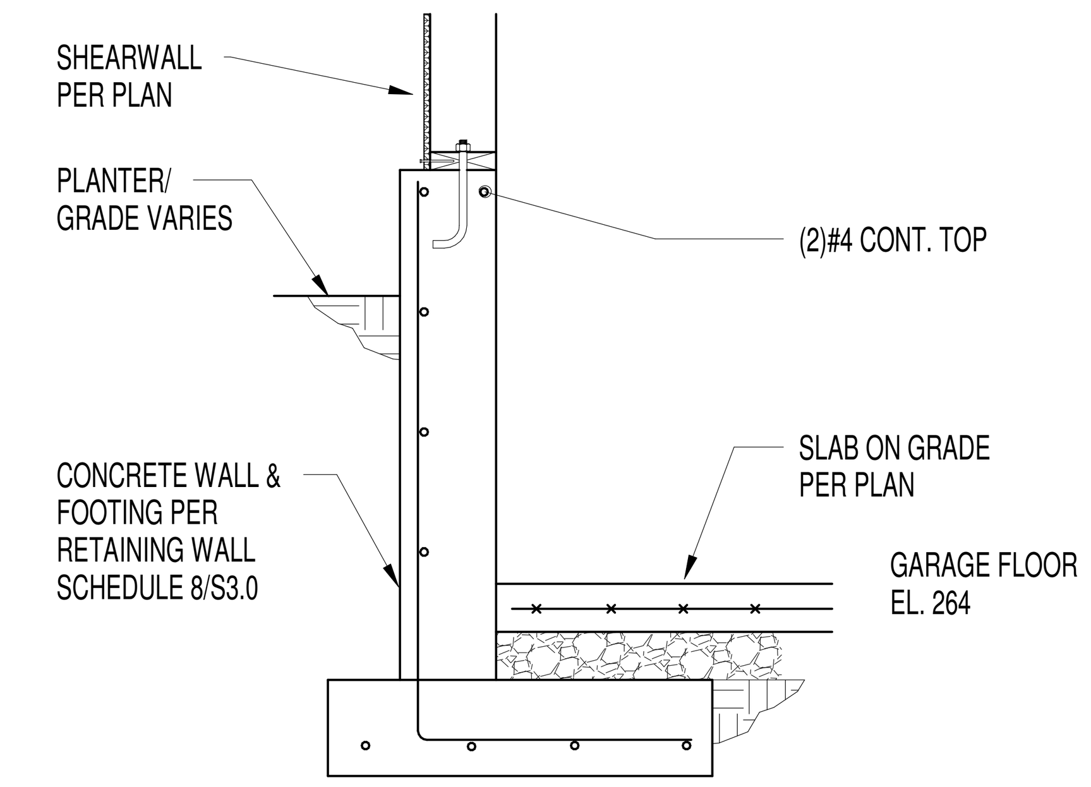
S3.1



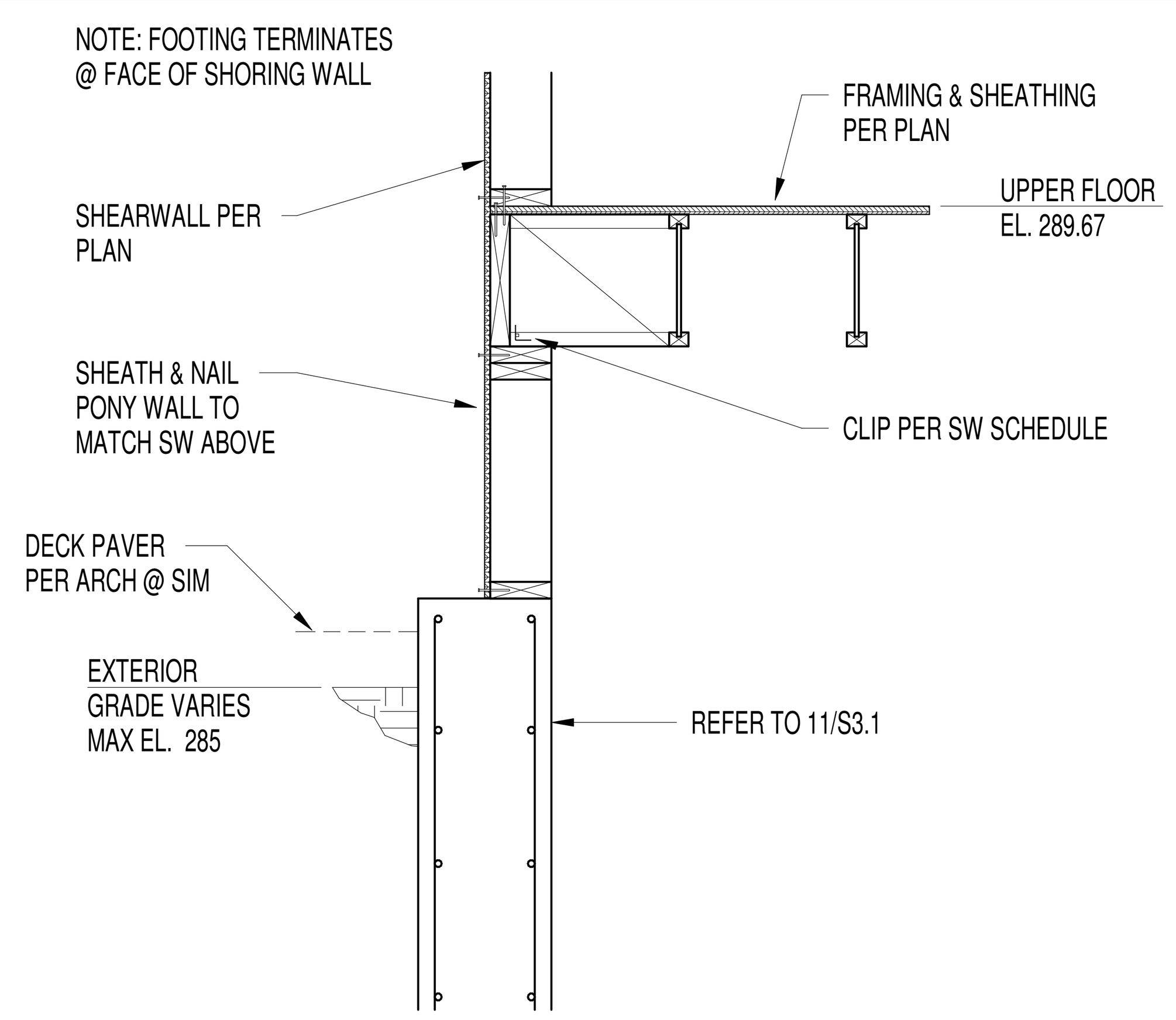
Wall Elevation 2



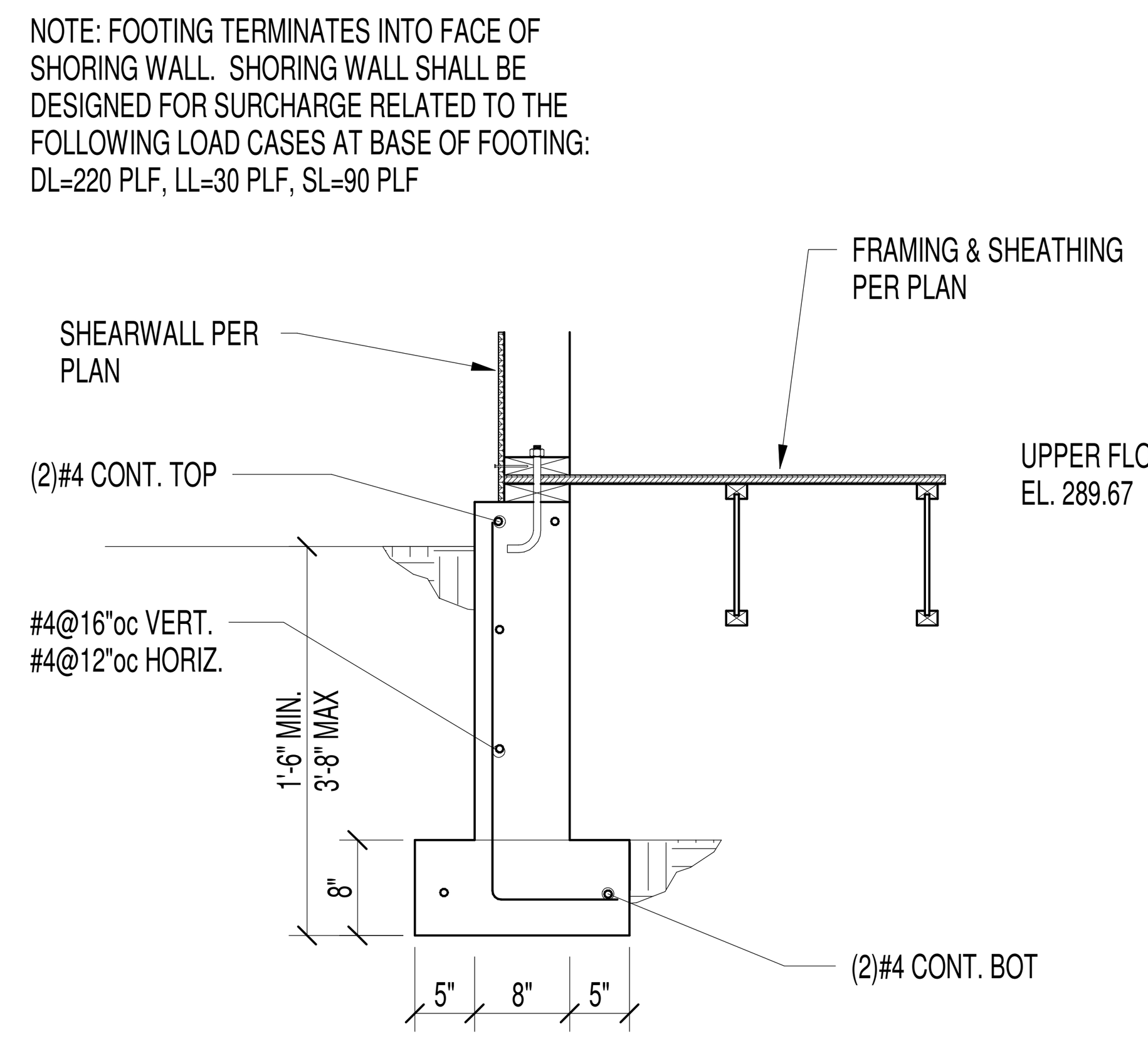
Trellis Post Base 3



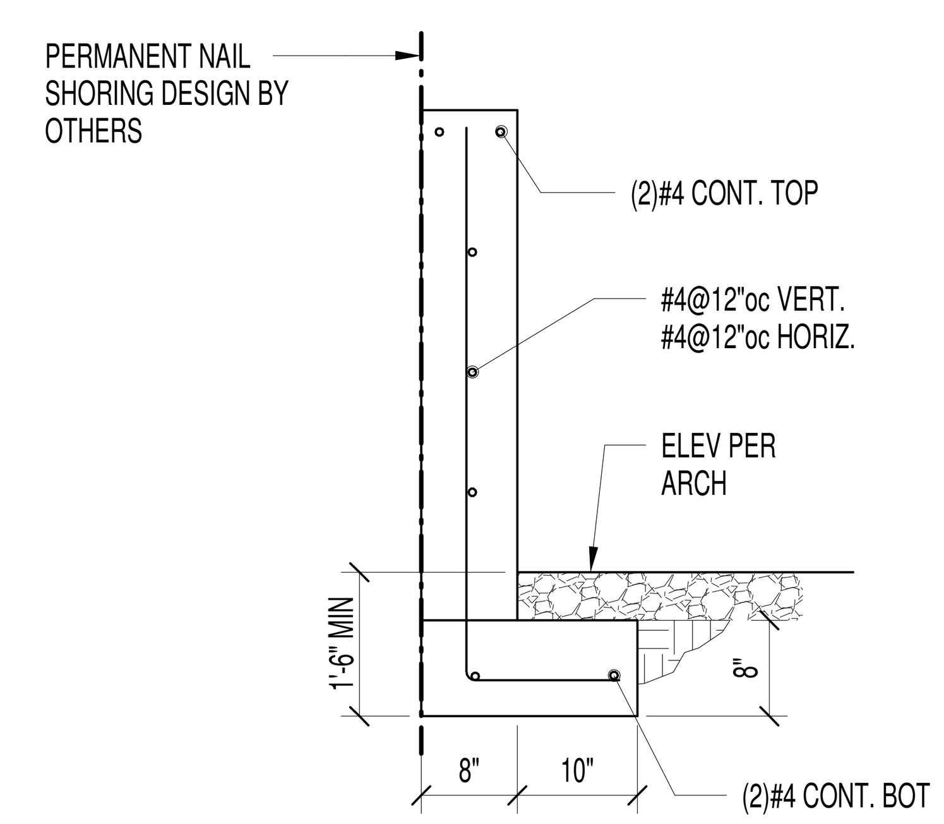
Garage SW @ Entry Planters 4



Section thru SW & NE elevations @ Secret Room/Bath 5



SE/NW @ Secret Room/Bath (NE of Shoring Wall) 6



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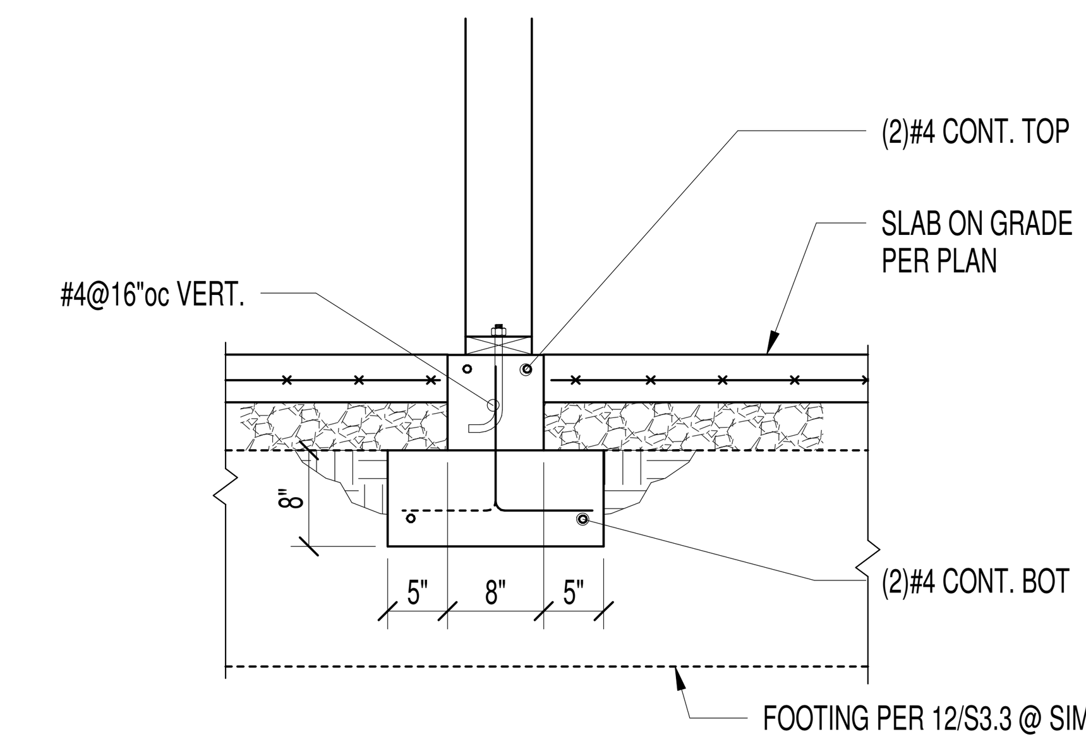
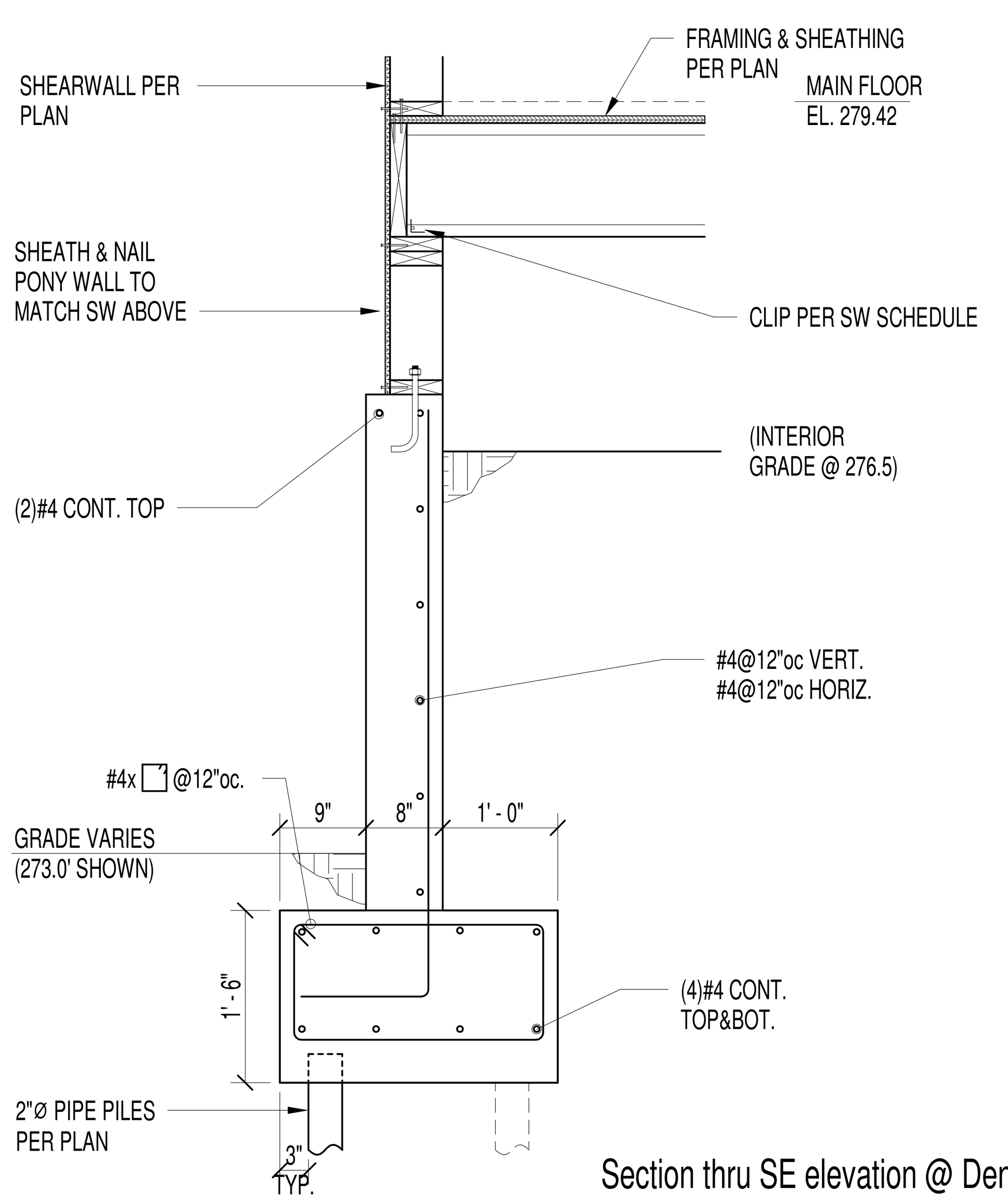
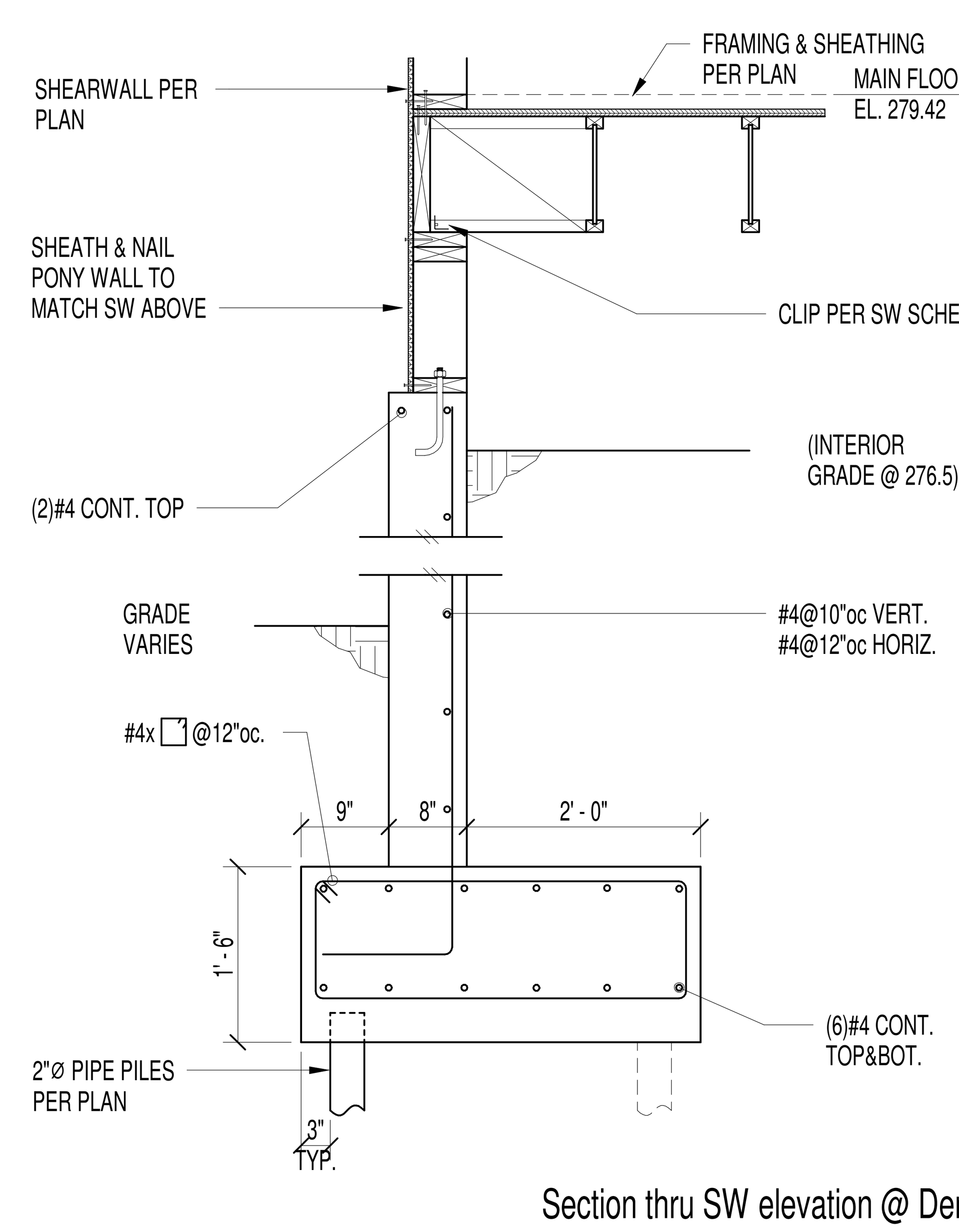


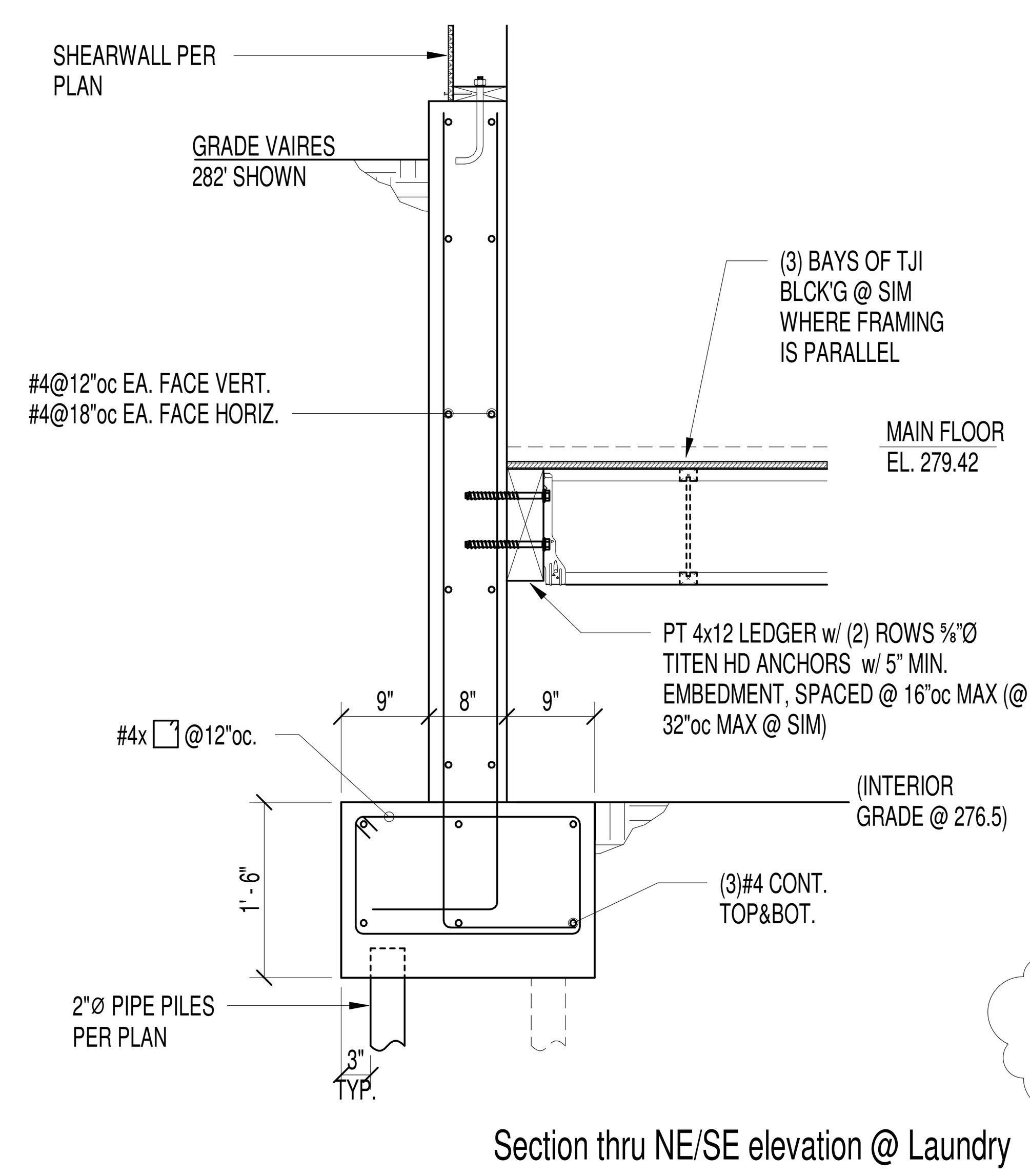
Interior Bearing Stem Wall 8



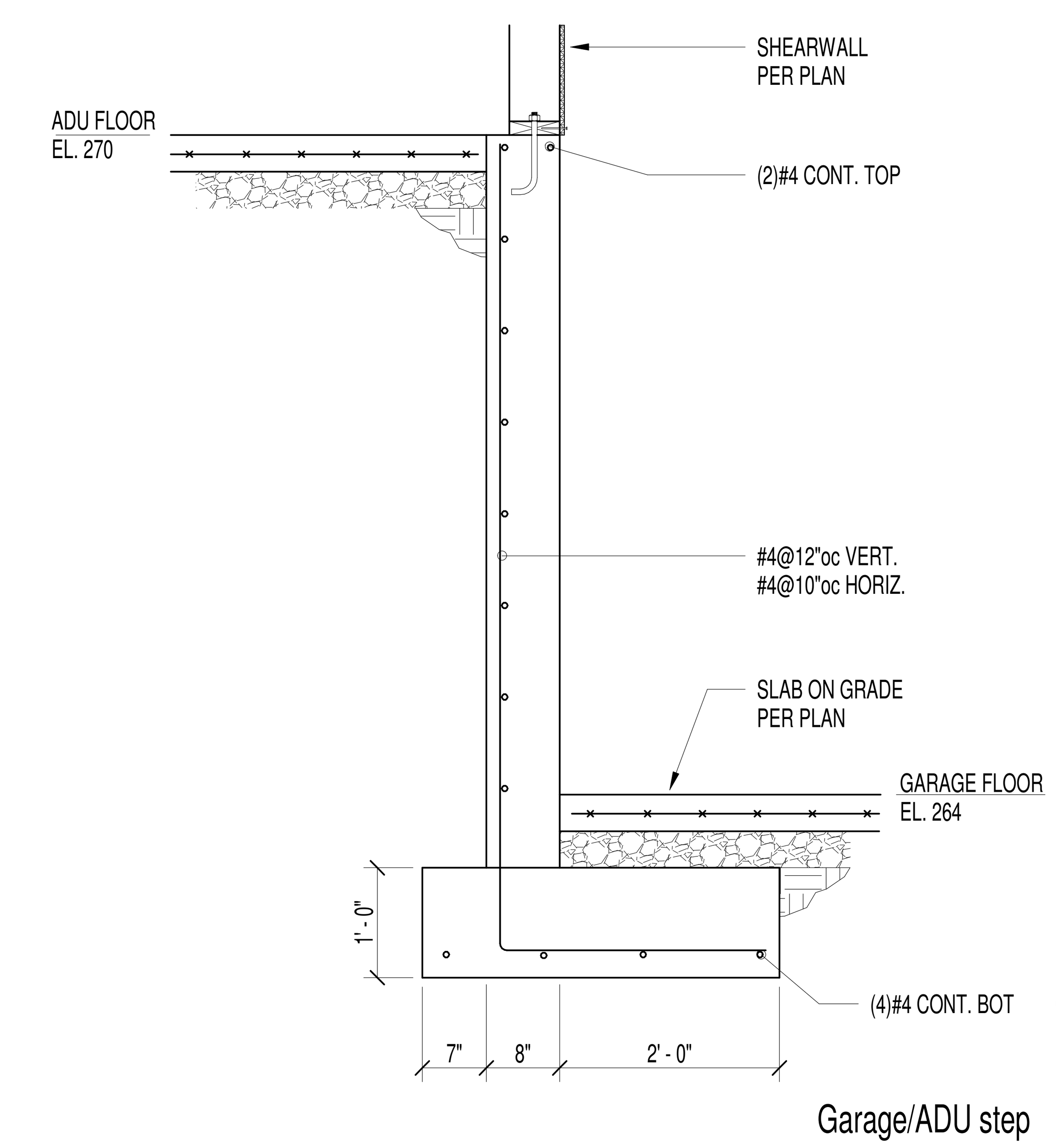
Section thru SE elevation @ Den/Laundry 9



Section thru SW elevation @ Den/Laundry 10



Section thru NE/SE elevation @ Laundry 11



Garage/ADU step 12

NICHOLAS VH CARTER
STATE OF WASHINGTON
37270
STRUCTURAL
PROFESSIONAL ENGINEER

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STEINBORN RESIDENCE

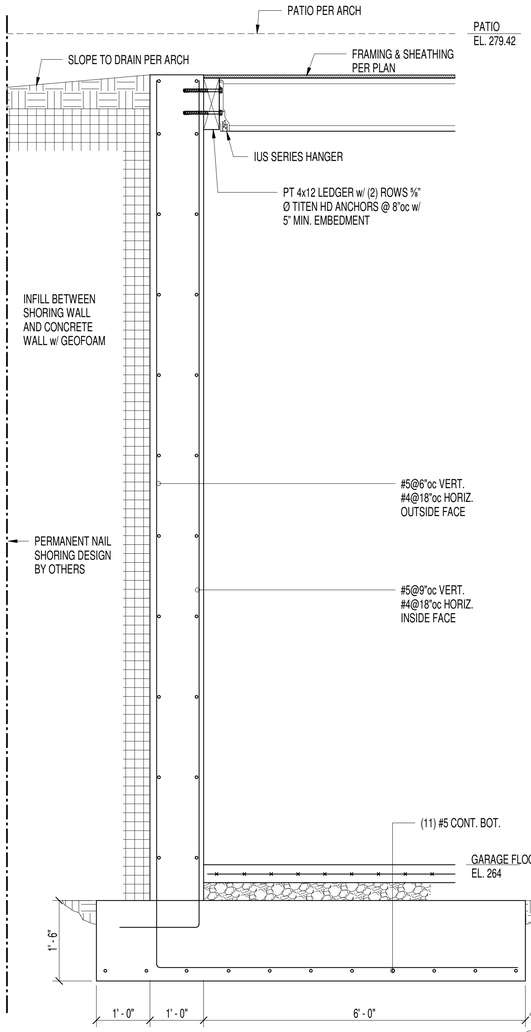
New Residenice
8435 SE 47th PL.
Mercer Island, WA 98040

Date:	
2/14/2022	Permit Submittal
1 8/25/2022	Sub2-2202-225

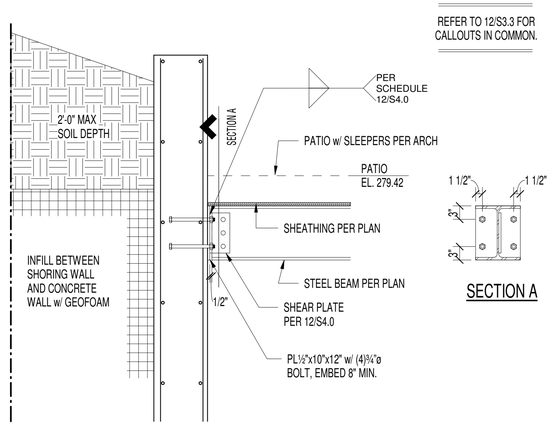
IF SHEET IS NOT 24"x36" IT HAS BEEN RESCALED

Concrete Details

S3.2

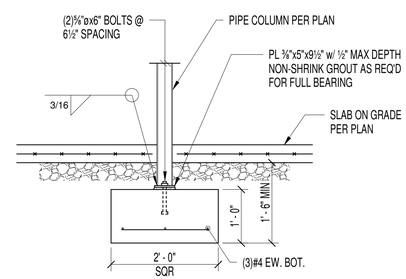


Section thru Garage Wall - Drain 5

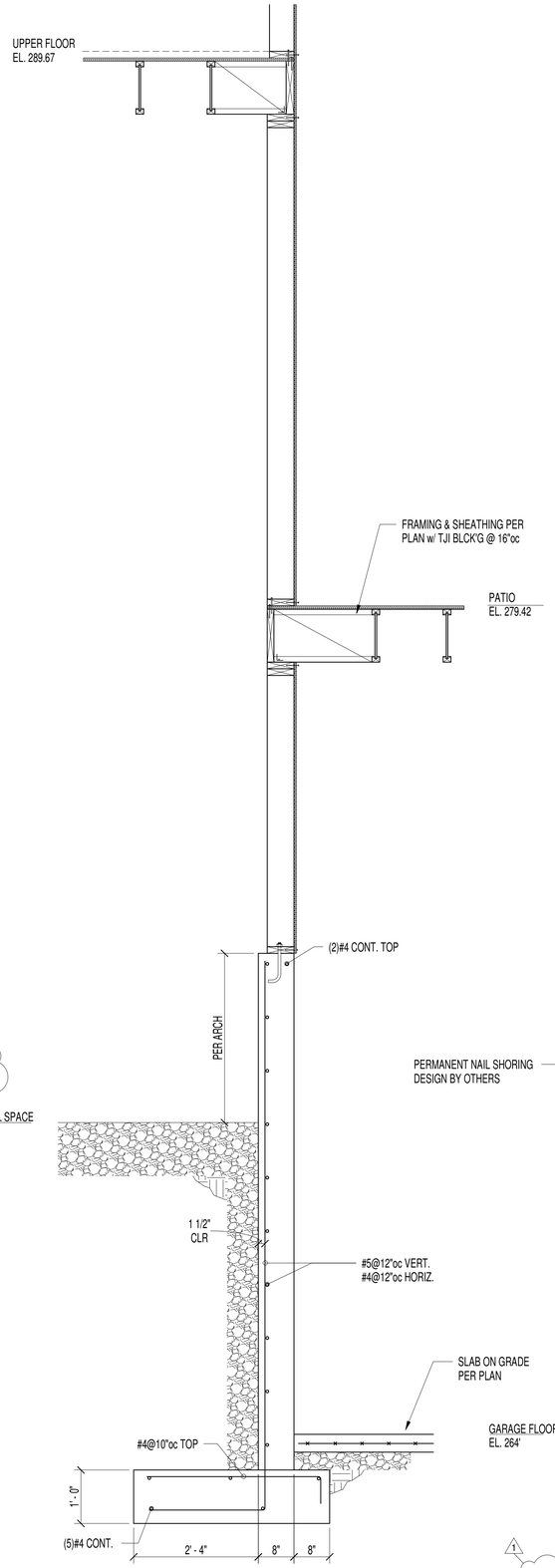


SECTION A

Section thru Garage Wall at Steel Beam 2



Entry Canopy Post Base 6



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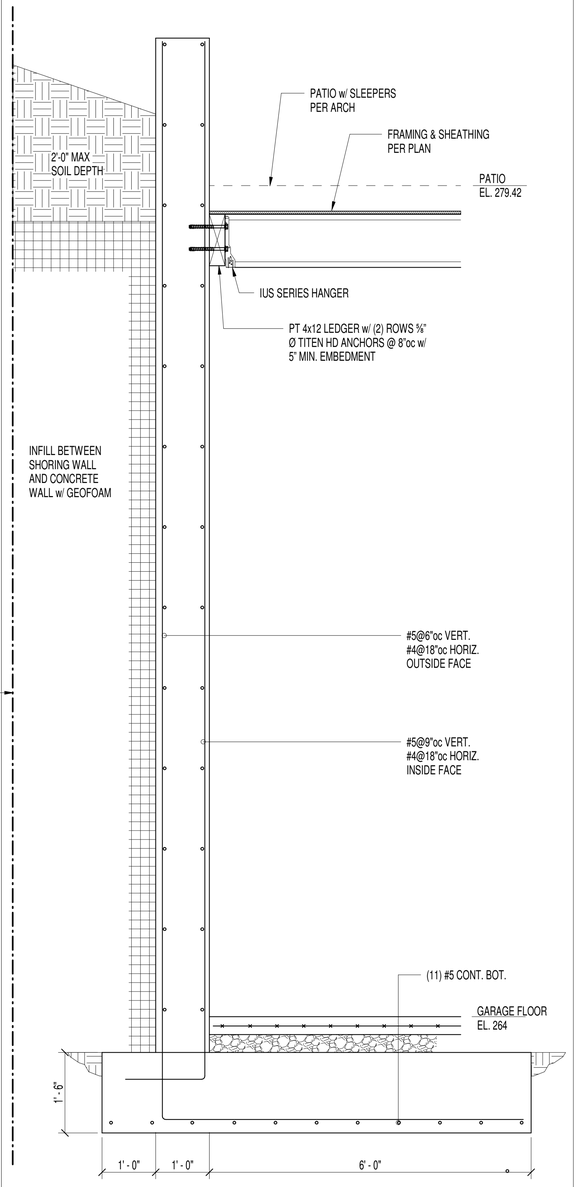
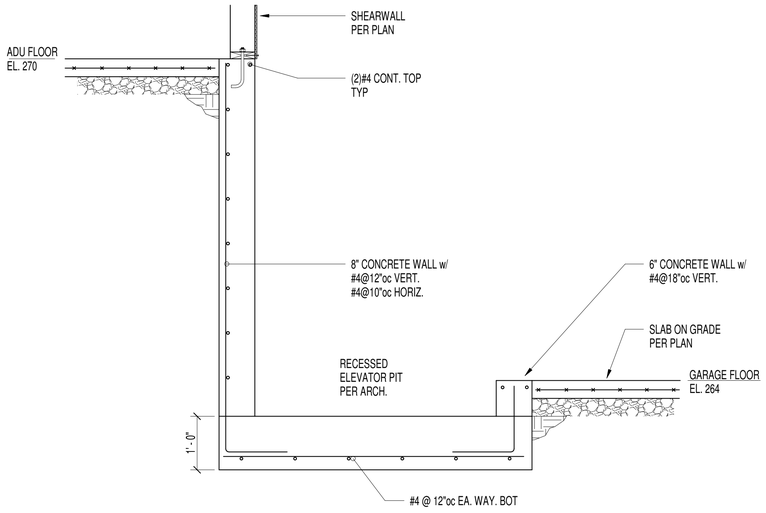


Section thru Garage Wall 12



Elevator Pit 10

ALLEY CRAWL SPACE
EL. 272'

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21770
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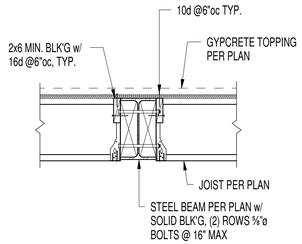
Concrete Details

S3.3



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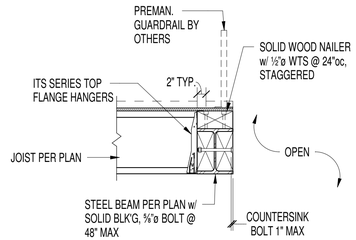

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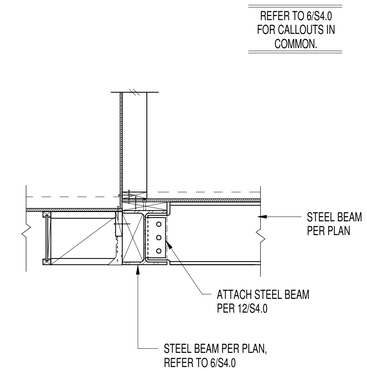

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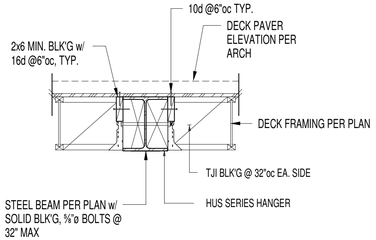

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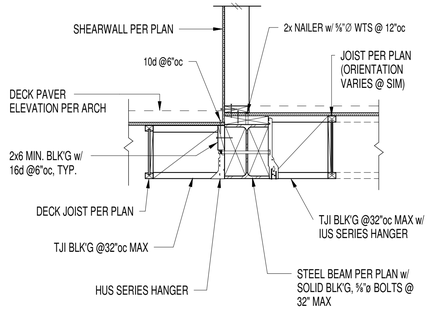

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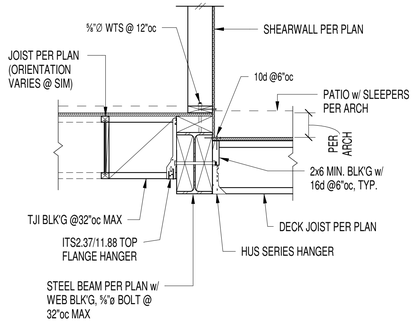

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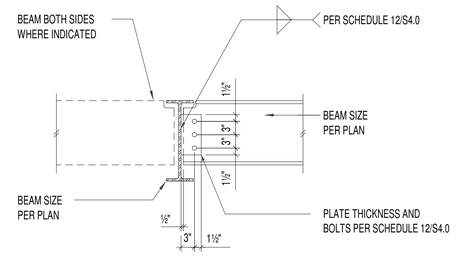
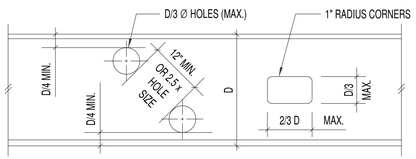


Typical Beam To Beam Connection

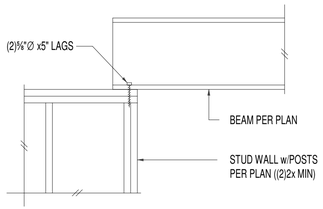
8



1. CONTRACTOR SHALL COORDINATE SIZES AND LOCATIONS OF ALL BEAM PENETRATIONS, ALL PENETRATIONS LARGER THAN 2"Ø SHALL BE SHOWN ON SHOP DRAWINGS OR SKETCHES AND SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. FIELD CUTTING NOT PERMITTED WITHOUT APPROVAL.
2. OPENINGS MAY OCCUR IN MIDDLE HALF OF BEAM LENGTH ONLY.
3. NO CUTTING MAY OCCUR IN TOP OR BOTTOM QUARTER OF BEAM DEPTH.
4. ADJACENT OPENINGS MUST BE SPACED AT THE LESSER OF, 12" OR 2.5 x LARGER OPENING SIZE, EDGE TO EDGE.
5. MAXIMUM SIZES OF OPENINGS SHALL BE D/3 Ø OR D/3 x 2D/3 AS SHOWN.
6. NO OPENINGS SHALL OCCUR WITHIN 12" OF AN ADJACENT BEAM CONNECTION.
7. REQUIRED OPENINGS NOT MEETING ABOVE CRITERIA SHALL BE SUBMITTED TO ENGINEER FOR REINFORCING DESIGN.

Steel Beam Openings

9



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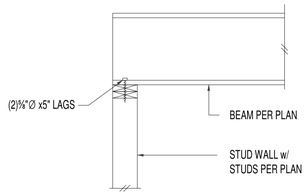

11

SHEAR PLATE SCHEDULE					
BEAM SIZE	NO. OF BOLTS	BOLT SIZE *	PLATE THICKNESS	WELD SIZE	CAPACITY
W10	2	1"Ø	½"	¼"	37.0 k
W12, W14	3	1"Ø	½"	¼"	53.3k

* BOLT TYPE = A325X
PL MATERIAL = A36

12

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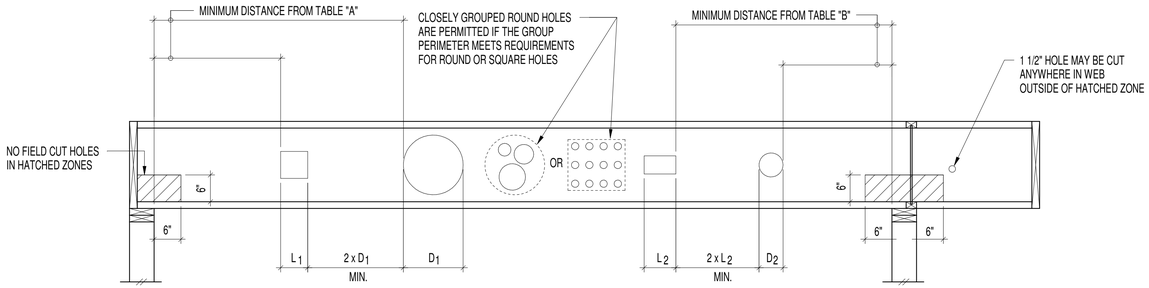
Steel Details

S4.0



DO NOT CUT HOLES LARGER THAN 1 1/2" IN CANTILEVER

TABLE A - END SUPPORT

MINIMUM DISTANCE FROM EDGE OF HOLE TO INSIDE FACE OF NEAREST END SUPPORT

DEPTH	TJI	○ ROUND HOLE SIZE									□ SQUARE OR RECTANGULAR HOLE SIZE								
		2"	3"	4"	5"	6 1/2"	7"	8 7/8"	11"	13"	2"	3"	4"	5"	6 1/2"	7"	8 7/8"	11"	13"
9 1/2"	110	1'-0"	1'-6"	2'-0"	3'-0"	5'-0"	-	-	-	-	1'-0"	1'-6"	2'-6"	3'-6"	4'-6"	-	-	-	-
	210	1'-0"	1'-6"	2'-6"	3'-0"	5'-6"	-	-	-	-	1'-0"	2'-0"	2'-6"	4'-0"	5'-0"	-	-	-	-
	230	1'-6"	2'-0"	2'-6"	3'-6"	5'-6"	-	-	-	-	1'-0"	2'-0"	3'-0"	4'-6"	5'-0"	-	-	-	-
11 7/8"	110	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	5'-6"	-	-	1'-0"	1'-6"	2'-0"	2'-6"	4'-6"	5'-0"	6'-0"	-	-
	210	1'-0"	1'-6"	2'-0"	2'-0"	3'-0"	3'-6"	6'-0"	-	-	1'-0"	1'-6"	2'-6"	3'-0"	5'-0"	5'-6"	6'-6"	-	-
	230	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	6'-6"	-	-	1'-0"	2'-0"	2'-6"	3'-6"	5'-6"	5'-6"	7'-0"	-	-
	360	1'-6"	2'-0"	3'-0"	3'-6"	4'-6"	5'-0"	7'-0"	-	-	1'-6"	2'-6"	3'-6"	4'-6"	6'-6"	6'-6"	7'-6"	-	-
	560	1'-6"	2'-6"	3'-0"	4'-0"	5'-6"	6'-0"	8'-0"	-	-	2'-6"	3'-6"	4'-6"	5'-6"	7'-0"	7'-6"	8'-0"	-	-
14"	110	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	3'-0"	5'-6"	-	1'-0"	1'-0"	1'-6"	2'-0"	3'-6"	4'-0"	6'-0"	8'-0"	-
	210	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-6"	3'-6"	6'-0"	-	1'-0"	1'-0"	2'-0"	2'-6"	4'-0"	4'-6"	6'-6"	8'-6"	-
	230	1'-0"	1'-0"	1'-0"	1'-6"	2'-6"	2'-6"	4'-0"	7'-0"	-	1'-0"	1'-0"	2'-0"	3'-0"	4'-0"	5'-0"	7'-0"	9'-0"	-
	360	1'-0"	1'-0"	1'-6"	2'-6"	3'-6"	4'-0"	5'-6"	8'-0"	-	1'-0"	1'-6"	2'-6"	4'-0"	6'-0"	6'-6"	8'-0"	9'-6"	-
	560	1'-0"	1'-0"	2'-0"	3'-0"	4'-6"	5'-0"	6'-6"	9'-0"	-	1'-6"	3'-0"	4'-0"	5'-0"	7'-0"	7'-6"	9'-0"	10'-0"	-

TABLE B - INTERMEDIATE OR CANTILEVER SUPPORT

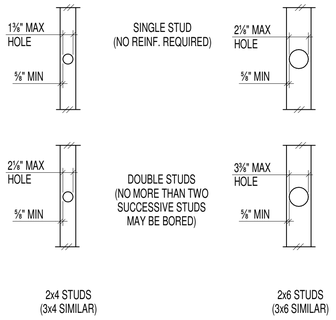
MINIMUM DISTANCE FROM EDGE OF HOLE TO INSIDE FACE OF NEAREST INTERMEDIATE OR CANTILEVER SUPPORT

DEPTH	TJI	○ ROUND HOLE SIZE									□ SQUARE OR RECTANGULAR HOLE SIZE								
		2"	3"	4"	5"	6 1/2"	7"	8 7/8"	11"	13"	2"	3"	4"	5"	6 1/2"	7"	8 7/8"	11"	13"
9 1/2"	110	2'-0"	2'-6"	3'-6"	4'-6"	7'-6"	-	-	-	-	1'-6"	2'-6"	3'-6"	5'-6"	6'-6"	-	-	-	-
	210	2'-0"	2'-6"	3'-6"	5'-0"	8'-0"	-	-	-	-	2'-0"	3'-0"	4'-0"	6'-6"	7'-6"	-	-	-	-
	230	2'-6"	3'-0"	4'-0"	5'-6"	8'-6"	-	-	-	-	2'-0"	3'-6"	4'-6"	6'-6"	7'-6"	-	-	-	-
11 7/8"	110	1'-0"	1'-0"	1'-6"	2'-6"	4'-0"	4'-6"	8'-6"	-	-	1'-0"	1'-6"	2'-6"	4'-0"	7'-0"	7'-0"	9'-6"	-	-
	210	1'-0"	1'-0"	2'-0"	3'-0"	4'-6"	5'-0"	9'-0"	-	-	1'-0"	2'-0"	3'-0"	4'-6"	8'-0"	8'-0"	10'-0"	-	-
	230	1'-0"	2'-0"	2'-6"	3'-6"	5'-0"	5'-6"	10'-0"	-	-	1'-0"	2'-6"	3'-6"	5'-0"	8'-6"	9'-0"	10'-6"	-	-
	360	2'-0"	3'-0"	4'-0"	5'-6"	7'-0"	7'-6"	11'-0"	-	-	2'-0"	3'-6"	5'-0"	7'-0"	9'-6"	9'-6"	11'-0"	-	-
	560	1'-6"	3'-0"	4'-6"	5'-6"	8'-0"	8'-6"	12'-0"	-	-	3'-0"	4'-6"	6'-0"	8'-0"	10'-6"	11'-0"	12'-0"	-	-
14"	110	1'-0"	1'-0"	1'-0"	1'-0"	2'-0"	2'-6"	4'-6"	8'-6"	-	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"	6'-0"	9'-0"	12'-0"	-
	210	1'-0"	1'-0"	1'-0"	1'-0"	2'-6"	3'-0"	5'-6"	9'-6"	-	1'-0"	1'-0"	2'-0"	3'-6"	6'-0"	7'-0"	10'-0"	13'-0"	-
	230	1'-0"	1'-0"	1'-0"	2'-0"	3'-6"	4'-0"	6'-0"	10'-6"	-	1'-0"	1'-0"	2'-6"	4'-0"	6'-6"	7'-6"	11'-0"	13'-6"	-
	360	1'-0"	1'-0"	2'-0"	3'-6"	5'-6"	6'-0"	8'-6"	12'-6"	-	1'-0"	2'-0"	4'-0"	5'-6"	9'-0"	10'-0"	12'-0"	14'-0"	-
	560	1'-0"	1'-0"	1'-6"	3'-6"	5'-6"	6'-6"	9'-6"	13'-6"	-	1'-0"	3'-0"	5'-0"	7'-0"	10'-0"	11'-0"	13'-6"	15'-0"	-

GENERAL NOTES:

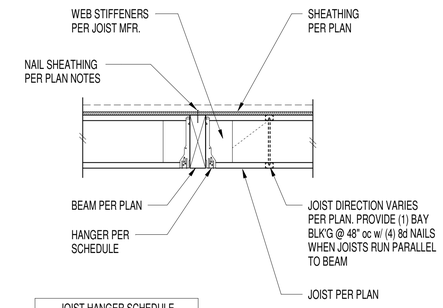
- HOLES MAY BE LOCATED VERTICALLY ANYWHERE WITHIN THE WEB. LEAVE 1/8" OF WEB (MINIMUM) AT TOP AND BOTTOM OF HOLE.
- KNOCKOUTS ARE LOCATED IN WEB AT APPROXIMATELY 12" ON-CENTER; THEY DO NOT AFFECT HOLE PLACEMENT AND MAY BE LOCATED IN THE HATCHED ZONE.
- FOR SIMPLE SPAN (5' MINIMUM) UNIFORMLY LOADED JOISTS MEETING THE REQUIREMENTS OF THIS GUIDE, ONE MAXIMUM SIZE ROUND HOLE MAY BE OCATED AT THE CENTER OF THE JOIST SPAN PROVIDED THAT NO OTHER HOLES OCCUR IN THE JOIST.
- DISTANCES ARE BASED ON THE MAXIMUM UNFORM LOADS SHOWN IN THIS GUIDE. FOR OTHER LOAD CONDITOINS OR HOLE CONFIGURATIONS, USE FORTE SOFTWARE OR CONTACT YOUR WEYERHAEUSER REPRESENTATIVE.
- DO NOT CUT OR NOTCH FLANGE.

Allowable TJI Joist Penetrations 10



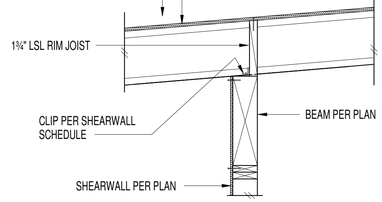
NOTE: BORED HOLES SHALL NOT BE LOCATED @ THE SAME SECTION OF STUD AS A NOTCH.

Holes Allowed Through Studs 3



JOIST HANGER SCHEDULE	
JOIST	HANGER
11⅞" TJI 110	HUS1.81/11
11⅞" TJI 360	HU3511
14" TJI 110	IUS1.81/14

Typical Beam 4



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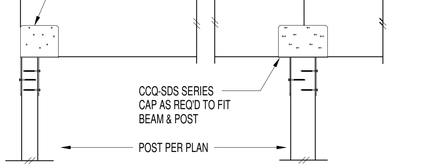
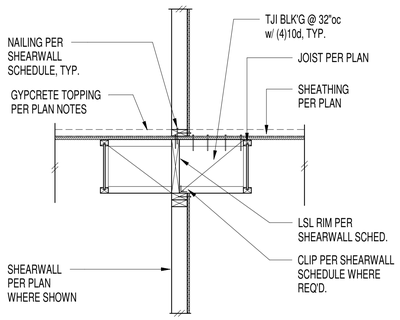


Typical Beam To Isolated Post Connection 8



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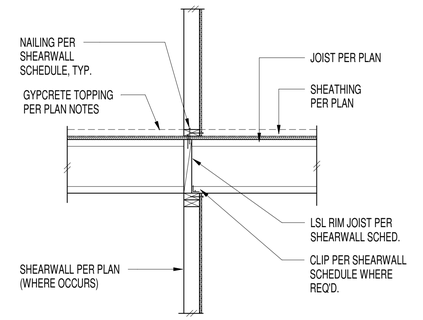

12

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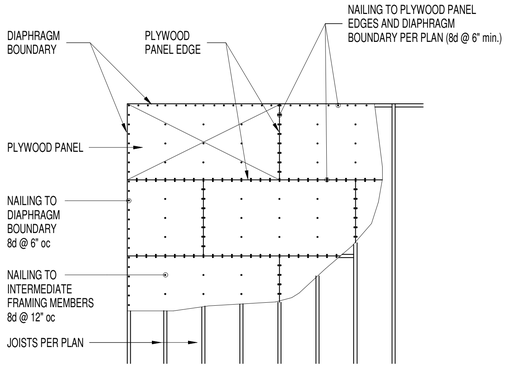
Date:
2/14/2022 Permit Submittal
⚠1 8/25/2022 Sub2-2202-225

IF SHEET IS NOT 24"x36" IT HAS BEEN RESCALED

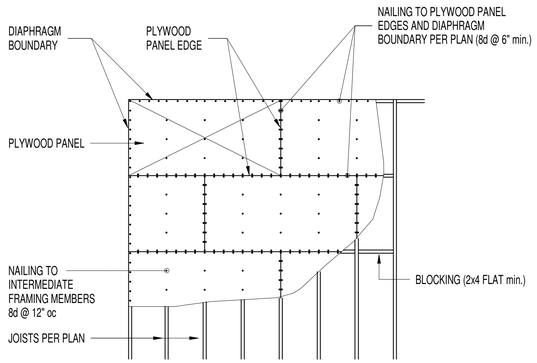
Typical Wood Details

S5.0



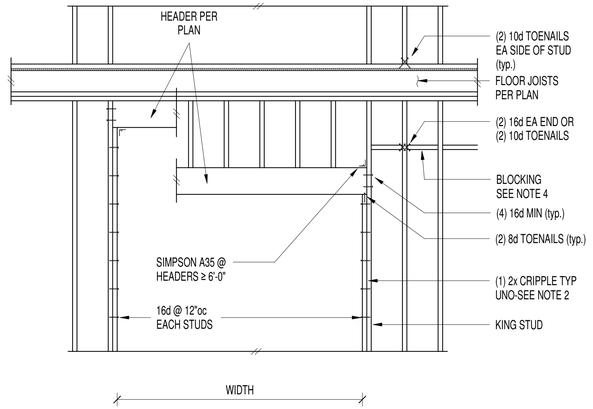
NOTE:
BEARING AND SHEAR WALL INTERSECTIONS SHALL BE CONSIDERED DIAPHRAGM BOUNDARIES, TYP

Typical Un-Blocked Plywood Roof/Floor Sheathing Layout 1



NOTE:
BEARING AND SHEAR WALL INTERSECTIONS SHALL BE CONSIDERED DIAPHRAGM BOUNDARIES, TYP

Typical Blocked Sheathing Layout 2



Scale : N.T.S.

Typical Wall Opening Framing Elevation 4

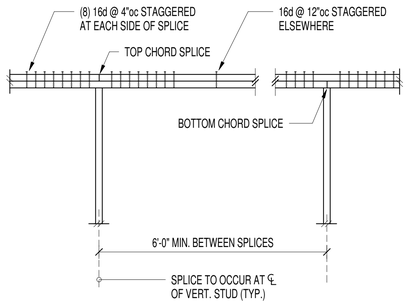
NOTES:

1. HEADERS PER PLAN

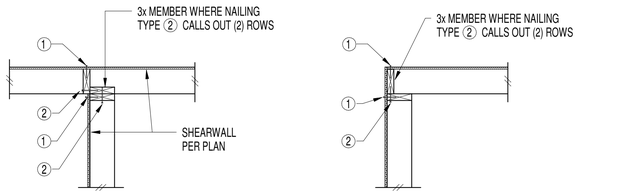
2. PROVIDE (1) 2x CRIPPLE STUDS MINIMUM TYPICAL, U.O.N.

3. SEE ARCHITECTURAL DRAWINGS FOR OPENING SIZES AND LOCATIONS

4. 2x SOLID BLOCKING REQUIRED AT CEILING LINE, ALL PANEL EDGES, AND @ 8'-0"oc MAX.



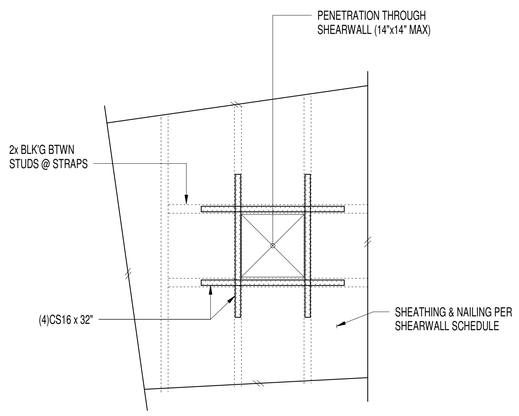
Typical Top Plate Splice - Side View 5



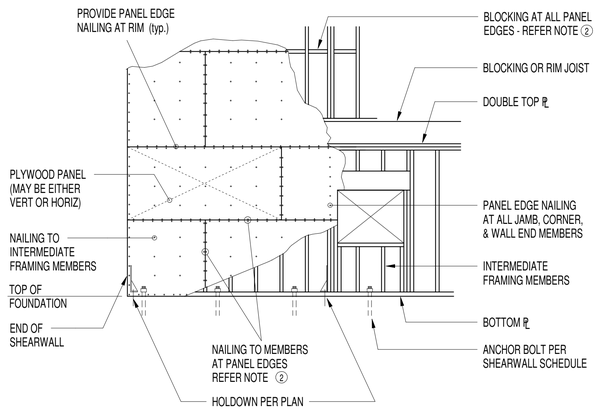
① PLYWOOD PANEL EDGE NAILING PER SHEARWALL SCHEDULE TO MATCH BOTTOM PLATE

② NAILING PER SHEARWALL SCHEDULE

Shearwall Intersection 8



Penetration Through Shearwall 9



Typical Shearwall Panel Elevation

SHEAR WALL SCHEDULE

#SW#	SHEATHING	BLOCKING	PANEL EDGE NAILING ①	ATTACHMENT TO TOP PLATE ③	BOTTOM PLATE ATTACHMENT			CAPACITY (plf) SEISMIC
					LSL RIM JOIST REQ'D.	FACENAILING TO WOOD BELOW ⑤	ANCHOR BOLTING TO CONC. BELOW ⑥	
1SW1	15/32" APA RATED SHEATHING	YES	10d @ 6"oc	CLIP @ 16"oc	1¾" LSL	NAILS @ 6"oc	5/8"Ø @ 48"oc	260 PLF
1SW2	15/32" APA RATED SHEATHING	YES	10d @ 4"oc	CLIP @ 16"oc	1¾" LSL	NAILS @ 4¾"oc	5/8"Ø @ 48"oc	380 PLF
1SW3	15/32" APA RATED SHEATHING	YES	10d @ 2"oc ②	CLIP @ 12"oc	3½" LSL ④	(2) ROWS NAILS @ 5¾"oc	5/8"Ø @ 24"oc	640 PLF
2SW4	15/32" APA RATED SHEATHING EA SIDE	YES	10d @ 4"oc ②	CLIP @ 10"oc	3½" LSL ④	(2) ROWS NAILS @ 4¾"oc	5/8"Ø @ 24"oc ⑦	760 PLF

① NAILS SHALL BE 10d COMMON. NAILING APPLIES TO ALL PANEL EDGES (BLOCK ALL UNSUPPORTED PANEL EDGES), TOP & BOTTOM PLATES AND BLOCKING. NAIL TO INTERMEDIATE FRAMING MEMBERS w/ 10d @ 12"oc. (NOTE: WHERE STUD SPACING IS 24" oc, NAIL TO INTERMEDIATE FRAMING MEMBERS w/ 10d @ 6" oc)

② FRAMING AT ADJOINING PANEL EDGES SHALL BE 3 INCH NOMINAL OR WIDER AND NAILS SHALL BE STAGGERED.

③ CLIP SHALL BE EITHER A35 OR LTP4, CLIP MAY BE OMITTED WHEN ADJOINING PANEL EDGES OCCUR @ RIM JOIST AS SHOWN IN ELEVATION.

④ ROWS MUST BE OFFSET AT LEAST ½" AND STAGGERED.

⑤ NAILS SHALL BE 10d COMMON (0.148Ø x 3½")
SCREWS SHALL BE SIMPSON SDS25500 (¼"Ø x 5" MIN.)

⑥ PROVIDE 3"x3"x0.229" PLATE WASHER AT ALL ANCHOR BOLTS. ANCHOR BOLTS SHALL BE POSITIONED SUCH THAT PLATE EDGE OF PLATE WASHER IS WITHIN ½" OF THE EDGE OF THE BOTTOM PLATE (PLATE WASHER MAY BE DIAGONALLY SLOTTED WITH A WIDTH OF UP TO 13/16" AND A LENGTH NOT TO EXCEED 1¾"

⑦ ALTERNATE PLATE WASHERS TO PROVIDE ½" DIMENSION ON EACH SIDE OF THE SHEARWALL

12

NICHOLAS VH CARTER
STATE OF WASHINGTON
47270
STRUCTURAL
PROFESSIONAL ENGINEER

BYKONEN CARTER QUINN
STRUCTURAL ENGINEERING

STEINBORN RESIDENCE

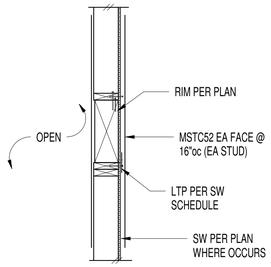
New Residenice
8435 SE 47th PL.
Mercer Island, WA 98040

Date:
2/14/2022 Permit Submittal
⚠1 8/25/2022 Sub2-2202-225

IF SHEET IS NOT 24"x36" IT HAS BEEN RESCALED

Typical Wood Lateral Details

S5.1



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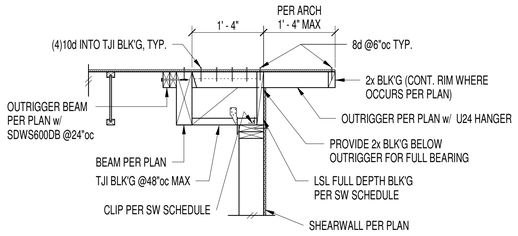

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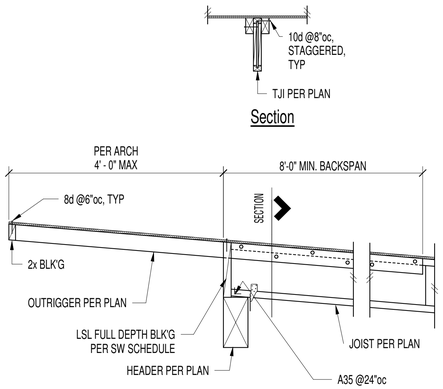

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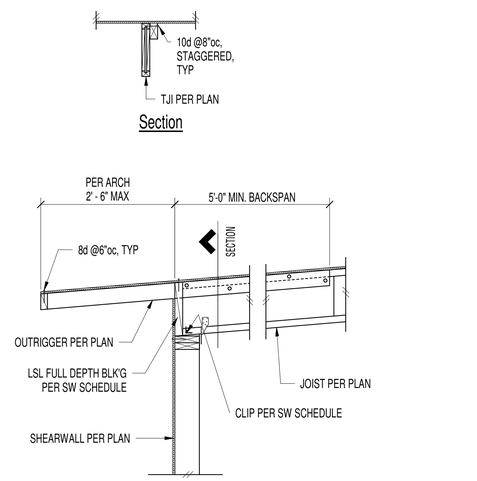

4

5

Deck Parapet - Flush Rim Header

6

Deck Parapet - Parallel framing

7

Deck Parapet - Perpendicular Framing

8

Knee-wall - Flush Beam

9

10

11

12

NICHOLAS VH CARTER
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New Residence
8435 SE 47th PL.
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2/14/2022	**Permit Submittal**
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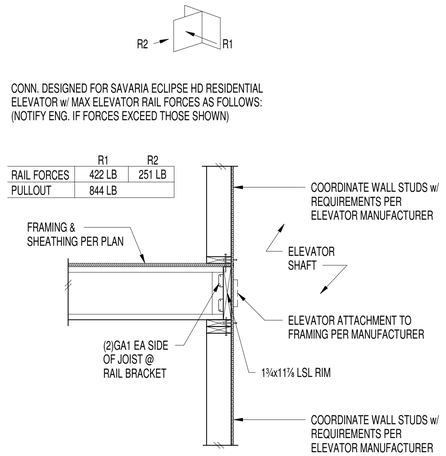
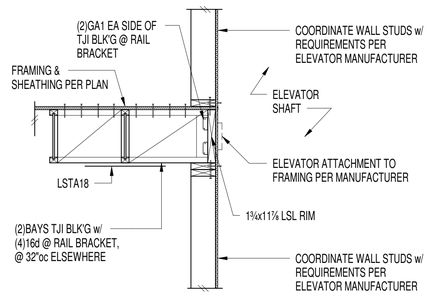
Wood Details

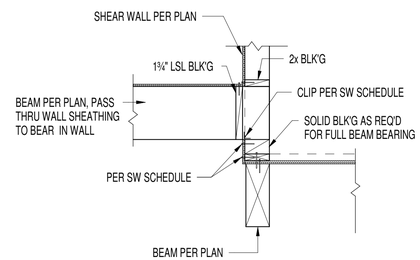
S5.2



Elevator Bracket w/ Perpendicular Framing 1



Typ. Elevator Bracket w/ Parallel Framing 2



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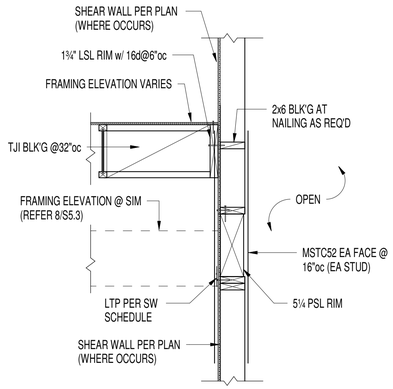

4

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PLAN VIEW

Fall Arrest Anchor 6

7

8

STEINBORN RESIDENCE
New Residence
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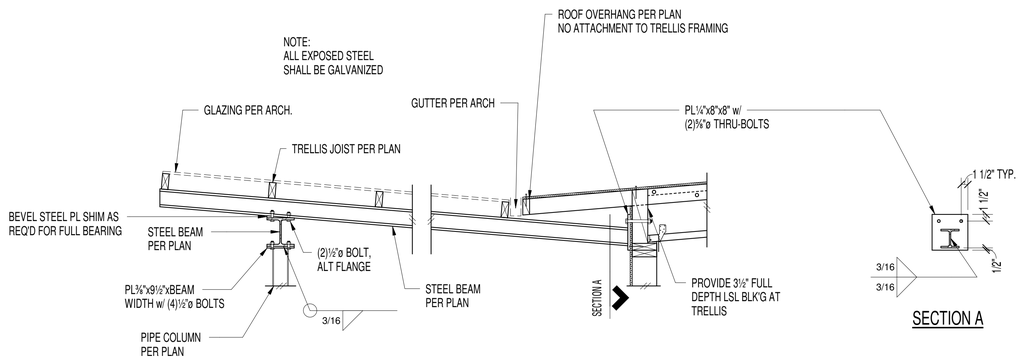
Mercer Island, WA 98040



SECTION A

10

11

12

Date:
2/14/2022 Permit Submittal
1 8/25/2022 Sub2-2202-225

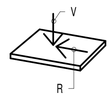
IF SHEET IS NOT 24"x36" IT HAS BEEN RESCALED

Wood Details

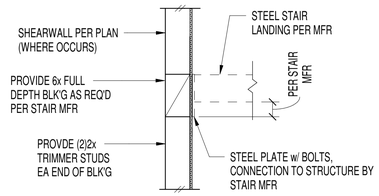
S5.3

1

NOTES:
1. STRUCTURE IS DESIGNED FOR FORCES IMPOSED BY PREFABRICATED STEEL STAIR. LOADING ASSUMES SINGLE STRINGER. NOTIFY ENGINEER OF RECORD IF FORCES EXCEED THOSE SHOWN.
2. STEEL PLATE CONNECTION IS BY MANUFACTURER AND SHALL BE PER MANUFACTURER SHOP DRAWINGS AND CALCULATIONS.



MAXIMUM TOTAL LOAD FORCES AS FOLLOWS (REFER TO NOTE 1):
V=2250 #
R=1508 #
(NOTIFY ENGINEER OF RECORD IF FORCES EXCEED THOSE SHOWN).



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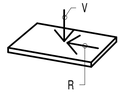

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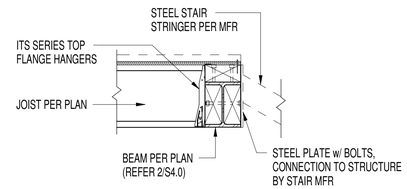

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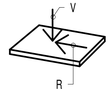

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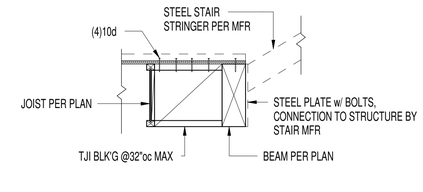

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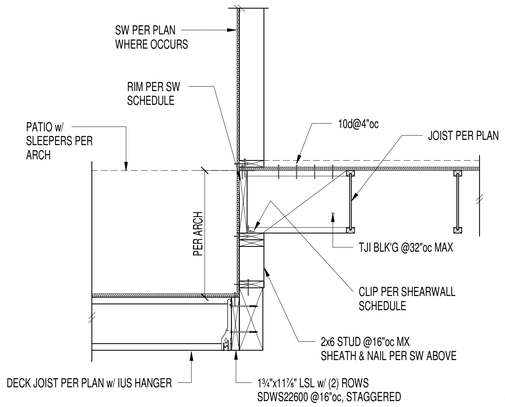

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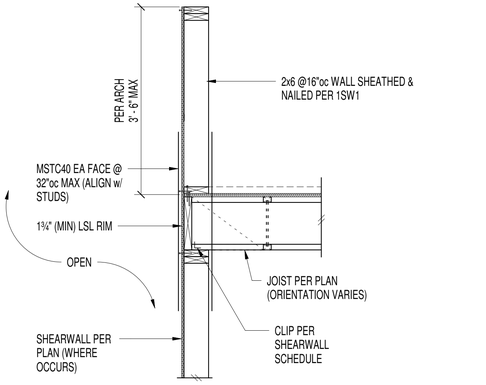

Stair Partial height wall

8

9

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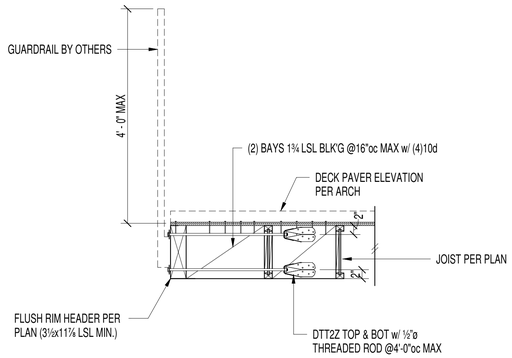
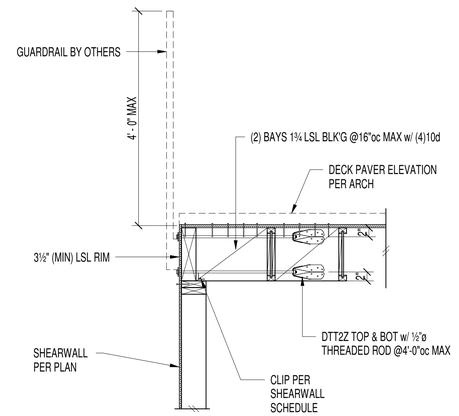


Deck Rail - Flush Rim Header

11



Deck Rail - Parallel framing

12

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Wood Details

S5.4