MITCHELL ENGINEERING INC.

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SCOPE OF WORK:

↳ LATERAL & GRAVITY FOR 3-STORY HOME SHOWN ON SHEETS A1, A2, A3 & A4 CONTAINED WITHIN.

ROOF FRAMING (SHT A4)

RAFTER #1 (LU = 15'-0")

W.L. = 80 PLF

$M = 80 \times 15.5^2 / 8 = 2402 \times 12 / 875 \times 1.15 = 29 \text{ in}^3 \leq$ #1

C 16"oc. $29 \times 16 / 24'' \quad 19 \text{ in}^3 \leq$ 2x10 HF #2 @ 16"oc

$\Delta_{LL}/240 = 0.775$

$= 5 \times 40 \times 16/12 \times 15.5^4 \times 172^2 / 384 \times 1.3 \times 10^6 \times .775$

$= 69 \text{ in}^4 \leq 92 \text{ in}^4$ ✓

2x10 HF #2 @ 16"oc ||

MICHAEL MITCHELL
STATE OF WASHINGTON
20775
REGISTERED
PROFESSIONAL ENGINEER

PREPARED BY M.M PROJECT Cindy Larsen SHEET NO. #1 OF 25

DATE 4/6/19 SUBJECT LANIER - PFLEGER JOB NO. 019-124

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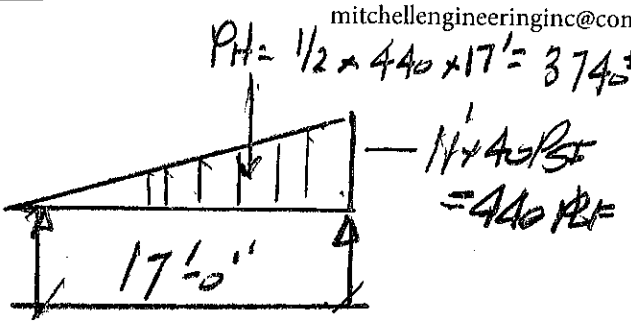
BEAM #1 (LU = 17'-0")



M = .125 × 3740 × 17 = 8157 × 12 / 875 × 1.15 = 97 in³ < 6×12

W/ 9.L. = 8157 × 12 / 2400 × 1.15 = 36 in³ 5½ × 9

Δ @ 240 = 0.25"

L = 0.0134 × 3740# × 17³ / 1.6 × 10⁶ × .25 = 270 in⁴ < 311

BEAM #1 - 6×12 DF #2
OR 9.L 3½ × 10½

BEAM #2 (LU = 8'-0")

Point Load = 6' × 5' × 40 PSF = 1200#

M = 1200 × 8/4 + 150 × 8²/8 = 3600 × 12 / 875 × 1.15 = 42"

BEAM #2 - 6×10 DF #2

PREPARED BY M.M PROJECT LANIER - PARKER SHEET NO. #2 OF
DATE 4/6/19 SUBJECT JOB NO. 019-124

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BEAM #3 (LH = 6'-0")

W = 12' × 40 PSF = 480 PLF

M = 480 × 6²/8 = 2160 × 12 / 0.75 × 1.15 = 25 in³ ≤

4 × 10 DF #2

UPPER ROOF / LOW ROOF FLASHING (SHEET A3)

BEAM #4 (LH = 15'-0")

WT. L = 9' × 50 PSF + 10 = 550 PLF

M = 550 × 15²/8 = 15900 × 12 / 2400 = 80 in³ ≤

Δ CL/360 = 0.50

I = 5 × 550 × 15⁴ × 1728 / 384 × 1.6 × 10⁶ × 1.50 = 69 in⁴

4 L. 5 1/2 × 13 1/2

BM #5 (LH = 16'-0")

WT. L = 12' × 30 PSF = 600 PLF

M = 600 × 16²/8 = 19200 × 12 / 2400 × 1.4 = 96 in³ ≤ 5 1/2 × 12

Δ CL/360 = 0.533

I = 5 × 600 × 16⁴ × 1728 / 384 × 1.6 × 10⁶ × .533 = 922 in⁴

4 L. 5 1/2 × 13 1/2

PREPARED BY M.M. PROJECT LANIER - PFLEGER SHEET NO. 3 OF

DATE 4/4/19 SUBJECT JOB NO. 019-124

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BEAM #6 (LL-13'-0") (SIMPLIFY LOADING

W: 14' x 40 PSF = 560 PLF

M - 560 x 13²/8 = 11800 x 12/2400 x 1.15 = 52 - 4L.5 1/2 x 9

ΔQL/240 = 0.05

-5 x 360 x 13⁴ x 1728 / 3.4 x 1.6 x 10⁶ x 0.05 = 3.2 — 4L.3 1/2 x 10 1/2

BEAM #7 (LL-19'-0")

WT.L = 8' x 40 = 320 PLF

M - 320 x 19²/8 = 14400 x 12/2400 x 1.15 = 62 -

ΔQL/240 = 0.95

-5 x 320 x 19⁴ x 1728 / 3.4 x 1.6 x 10⁶ x .95

= 54 — 4L 5 1/2 x 12

BEAM #8 (LL-17'-0")

WT.L = 5' x 70 PSF = 350 PLF

M - 350 x 17²/8 = 12truss x 12 / 2400 = 63 in³

ΔQL/360 = 0.56

-5 x 350 x 17⁴ x 1728 / 3.4 x 1.6 x 10⁶ x .56 = 0521.

4L 5 1/2 x 13 1/2

PREPARED BY M.M. PROJECT LANIER - FLEGER SHEET NO. #4 OF

DATE 4/10/19 SUBJECT JOB NO. 019-L04

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BEAM #9 (LL = 12'-0")

WT. L: 8' x 40 PSF = 320

M = 320 x 12² / 8 = 5760 x 12 / 950 = 72 - 6x12 #SE

Δ_QL/240 = 0.60

5 x 320 x 12⁴ x 1728 / 384 x 1.6 x 10⁶ x 1.00 = .15"

BEAM #9 6x12 DF #2

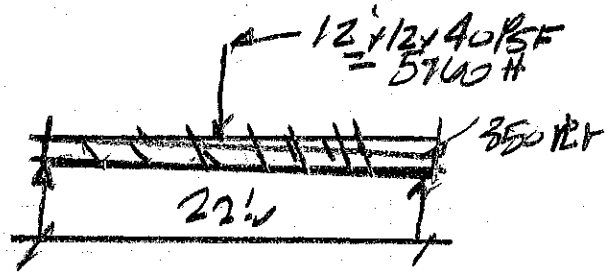
BEAM #10 (LL = 12'-0")

WT. L = 14' x 40 PSF = 560 PLF

M = 560 x 12.5² / 8 = 10,937.5 x 12 / 2400 = 51.1 in²

— BEAM #10 - G.L 5 1/2 x 10 1/2

BEAM #11 (LL = 22'-0")



PREPARED BY M.M. PROJECT LANIER PLEASANT SHEET NO. #5 OF ___

DATE 4/10/19 SUBJECT ___ JOB NO. 019-124

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M-+ 5760 x 22/4 + 350 x 27²/8 = 52900 x 12 / 24w x 11.5
= 229 ≤ 5 1/2 x 12

Δ@ L/360 = 0.73
- 5+ 350 x 22⁴ x 172 ≤ / 3≤4 x 1.5 x 16⁴ x .73 =
1400
+ 5760 x 22³ - 172 ≤ / 4 ≤ x 1.5 x 16⁴ x .73
= 160 ≤ + 1400
= 30 ≤ x 40/50
= 2400
≥ 5 1/2 x 19 1/2

MAIN FLOOR FRAMING (SHEET A2)

BM #12 (L4 = 14'-0")

Wt. L = 2.5' x 75 PSF = 190 PLF

M-+ 190 x 14²/8 = 4450 x 12 / 875 = 61.5 P.T 6x12

BEAM #12 - 6x12 H.F #2 (P.T)

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DATE 4/6/19 SUBJECT JOB NO. 19-124

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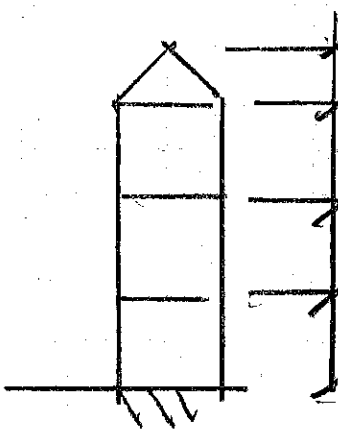
BEAM #3 (Lt=17'-0")

$W_T = 9' \times 75 PSF = 675 PLF$

$M \rightarrow 675 \times 17^2/8 = 24,300 \times 12 / 2400 \times .83$
$= 146 in^3$
G.L. $5\frac{1}{2} \times 13\frac{1}{2}$

$\Delta_{LL}/360 = 0.57$
$= 5 \times 675 \times 174 \times 172^3 / 30^4 \times 1.6 \times 10^6 \times .90 \times 57$
$= 137 - GL\ 5\frac{1}{2} \times 13\frac{1}{2}$

LATERAL



$14.4 PSF \times 1.3 \times 1.07 \times 12' = 375 PLF$

$9' \times 12.9 \times 1.3 \times 1.07 = 266 PLF$

$10' \times 12.9 \times 1.3 \times 1.07 = 200 PLF$

PREPARED BY M.M PROJECT LANIER - PFLUEGER SHEET NO. 17 OF
DATE 4/10/19 SUBJECT JOB NO. 019-184

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SEISMIC D.L.

@ UPPER FLOOR
a) ROOF - 1672 SF × 15 PSF = 25 K
b) WALLS - 152' × 4' × 5 PSF = 5 K - 30 K

@ MAIN FLR
a) UPPER FLR - 1440 × 20 = 29 K
b) LOW ROOF 1536 SF × 15 = 23 K — 67 K
c) WALLS - 240 × 5 × 5 = 15 K

$V_S = 139 \times .18 = 25$ K

@ LOWER LEVEL

MAIN FLR & DECK - 1600 SF × 20 = 32 K
WALLS - 10 K - 42 K

- 30 K × 30' = 1140 — 9.6 K
67 K × 20' = 1340 — 11.5 K
42 K × 10' = 420 — 3.7 K
2900

@ TOP RATE

9200 / 36 = 272 PLF
9300 / 40' = 245 PLF ← WIND CONTROL BOTH DIRECTIONS

PREPARED BY M.M. PROJECT LANIER - PFLEGER SHEET NO. 10 OF
DATE 4/10/19 SUBJECT JOB NO. 019-104

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SHEAR FRONT/BACK.

@ UPPER FLR
@ grids - 3 - 375 x 12' = 4750#/15' = 45 - P1-2
5 - 375 x 12' = 4750/15 = 45 - P1-2

O.T. - 45 x 1.5 x 4/6 = 30 - MSTC40 -

@ MAIN FLR

@ grids 1 - 3375 + 240 x 13' = 6033/20' = 341 - P1-3
4 - 3375 + 240 x 31' = 11021/22 - 521 - P1-2
5/6 - 6750 + 240 x 23' = 12000/14 - 857 - P2-2
7 - 240 x 2' = 2120/16 - 133 - P1-6

@ LOWER LEVEL -

@ grids 1, 2, 4' - 5" to conc.
7 - 2120 + 220 x 10' = 4920/24' - 205 - P1-4

SHEAR SIDE/SIDE

@ UPPER FLR
@ grids A - 375 x 19' - 7120#/16 - 445 - P1-2
F - 375 x 19' - 7120#/12 - 593 - P2-3

@ MAIN FLR
@ grids A/B - 7120 + 240 x 5' - 9200/14' - 657 - P2-3
C/D - 7120 + 240 x 23' = 12640/36 - 351 - P1-4
G/H - 7120 + 240 x 12' = 10000/14 - 715 - P2-3

PREPARED BY MM PROJECT Lanier - Pflueger SHEET NO. #9 OF
DATE 4/4/19 SUBJECT JOB NO. 019-124

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@ LOWER LEVEL

@ GRIDS A/B. - 72"ø + 2"ø + 10 = 12080/20 - 464 - R-2

P - CONC.
A - CAP

PREPARED BY M.M. PROJECT LANIER - PRESSLER SHEET NO. 10 OF

DATE 4/16/19 SUBJECT JOB NO. 019-124

SHEAR WALL SCHEDULE

Shear Wall Designation	Nail Size	Nail Spacing				ALLOWABLE SHEAR Hem-Fir #2 #/Ft
		Edges	Studs	Top/Btm. Plate	Blocking Req'd.	
P1-6	8d	6"	12"	6"	Yes	210
P1-4	8d	4"	12"	4"	Yes	310
P1-3	8d	3"	12"	3"	Yes	400
P1-2	8d	2"	12"	2"	Yes	525
P2-3	8d	3"	12"	3"	Yes	800
P2-2	8d	2"	12"	~~3"~~ 2"	Yes	1050

Shear Wall Notes:

1. P1 - 7/16 A.P.A. rated Plywood or Orientated Strand Board (O.S.B.) on one side of wall.
   P2 - 7/16 A.P.A. rated Plywood or Orientated Strand Board (O.S.B.) on each side of wall.
2. For P1-3, P1-2, P2-3, & P2-2 shear walls use 3x studs at adjoining panel edges. Nailing shall be staggered
3. Nails shall be 8d common. (d = .131 inch)
4. Where plywood is installed on both sides of wall plywood joints shall fall on separate studs each side.
5. All panel edges backed with 2-inch nominal framing for P1-6 & P1-4 shear wall. All panels edges backed with 3x framing at P1-3, P1-2, P2-3, & P2-2 shear walls. Install panels either horizontally or vertically. Space nails @ 10 inches on center @ intermediate supports.
6. All anchor bolts shall be installed with hot dipped galvanized plate washers.
7. Refer to foundation plan for anchor bolt size, spacing and mudsill/rim connections.

STRUCTURAL NOTES

CODE:
DESIGN IS IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE (I.B.C.) AS AMENDED BY THE LOCAL BUILDING DEPARTMENT.

LIVE LOADS:
ROOF----------25PSF
FLOOR----------40PSF
DECK----------60PSF
LATERAL

WIND----------EXPOSURE C, 85MPH/110MPH(ULT)/ WIND PER ASCE 7-10, SECTION 28.6.3 Ktz=1.6

SEISMIC----------SITE CLASS D. SEISMIC PER ASCE 7-10, SIMPLIFIED LATERAL FORCE SYSTEM, SECTION 12.14.8

FOUNDATIONS:
EXTEND FOOTINGS TO FIRM UNDISTURBED SOIL, BEARING CAPACITY OF 3000PSF. ALL EXTERIOR FOOTINGS SHALL EXTEND A MINIMUM OF 1'-6" BELOW ADJACENT EXTERIOR GRADE. FOUNDATION DESIGN IS IN ACCORDANCE WITH THE GEOTECHNICAL REPORT PREPARED BY GEOTECH CONSULTANTS DATED SEPTEMBER 27, 2018.

CAST-IN-PLACE CONCRETE:
F'c=3000 PSI @ 28 DAYS. MINIMUM 5-1/2 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE AND MAXIMUM OF 6-3/4 GALLONS OF WATER PER 94# SACK OF CEMENT. NO SPECIAL INSPECTION REQUIRED. CONCRETE SHALL COMPLY WITH ACI 318-14 SECTION 26.4.2.1. MAXIMUM SLUMP IS 4 INCHES. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE. ALL REINFORCING STEEL, DOWELS, ANCHOR BOLTS, AND OTHER INSERTS SHALL BE SECURED IN POSITION PRIOR TO POURING CONCRETE. ANCHOR BOLTS FOR PRESSURE TREATED SILL PLATES TO FOUNDATION WALLS TO BE 5/8 INCH DIAMETER WITH 7 INCH MINIMUM EMBEDMENT INTO CONCRETE AND MAXIMUM SPACING OF 2 FEET ON CENTER. MINIMUM 2 BOLTS PER SILL PLATE PIECE. ONE BOLT TO BE PLACED WITHIN 6 INCHES OF EACH END OF THE SILL PLATE. DIPPED GALVANIZED CONNECTORS SHALL CONFORM TO ASTM STANDARD 153 AND HOT DIPPED GALVANIZED CONNECTORS SHALL CONFORM TO ASTM A653M CLASS G-185. STAINLESS STEEL FASTENERS AND CONNECTORS SHALL BE TYPE 304 OR 316. SIMPSON PRODUCT FINISHES CORRESPONDING TO THESE REQUIREMENTS ARE ZMAX (HOT DIPPED GALVANIZED) AND SST 300 (STAINLESS STEEL). FASTNERS FOR PRESSURE TREATED AND FIRE-RETARDANT TREATED WOOD SHALL BE ZMAX HOT DIPPED GALVANIZED (G185).

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE PLACED IN CONFORMANCE WITH THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND THE MANUAL OF STANDARD PRACTICE FOR REINFORCED CONCRETE CONSTRUCTION BY CRSI. DEFORMED REINFORCING STEEL BARS SHALL CONFORM TO ASTM A-615 GRADE 40 FOR #5 AND SMALLER REINFORCEMENT AND GRADE 60 FOR #6 AND LARGER. ALL REINFORCING BAR BENDS SHALL BE MADE COLD WITH A MINIMUM RADIUS OF 6 BAR DIAMETERS (1'-7" MINIMUM). CORNER BARS (2'-0" BEND) SHALL BE PROVIDED FOR ALL HORIZONTAL REINFORCEMENT. LAP ALL BARS A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE. UNLESS NOTE OTHERWISE ON THE DRAWINGS REINFORCING STEEL SHALL HAVE THE FOLLOWING MINIMUM COVER:

CONCRETE CAST AGAINST EARTH	3 INCHES
CONCRETE EXPOSED TO EARTH OR WEATHER:	
#6 THROUGH #18 BARS	2 INCHES
#5 BAR AND SMALLER	1-1/2 INCHES

STRUCTURAL TIMBER:

ALL LUMBER SHALL CONFORM TO WWPA GRADING RULES FOR WESTERN LUMBER, LATEST EDITION. PROVIDE CUT WASHERS UNDER ALL NUTS AND BOLTS BEARING AGAINST WOOD. ALL WOOD IN CONTACT WITH CONCRETE SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AWPA U1 AND M4 STANDARDS. ALL STRUCTURAL LUMBER SHALL BE AS NOTED BELOW:

2X FLOOR JOIST	HEM-FIR#2----------Fb=850 PSI
2X ROOF RAFTERS	HEM-FIR#2----------Fb=850 PSI
4X BEAMS	DOUG-FIR/LARCH #2----Fb=850PSI
6X BEAMS	DOUG-FIR/LARCH #2----Fb=850PSI
LUMBER NOT NOTED	HEM-FIR #2----------Fb=850 PSI

MISCELLANEOUS HANGERS TO BE SIMPSON OR APPROVED EQUAL. ALL HANGERS SHALL BE FASTENED TO WOOD WITH PROPER NAILS. ALL HOLES SHALL BE NAILED. MACHINE BOLTS TO BE A-307. ANCHOR BOLTS INTO CONCRETE SHALL BE 5/8 INCH DIAMETER WITH 7 INCHES OF EMBEDMENT INTO CONCRETE UNLESS NOTED OTHERWISE ON THE PLANS. ALL NAILS SHALL BE COMMON WIRE NAILS. NAILING SHALL BE IN ACCORDANCE WITH THE CURRENT I.B.C. SCHEDULE.

FLOOR SHEATHING:

SHEATHING SHALL BE ¾ INCH TONGUE AND GROOVE A.P.A. RATED SHEATHING. SPAN RATING 48/24 WITH LONG DIMENSION PERPENDICULAR TO SUPPORTS. UNLESS NOTED OTHERWISE NAIL WITH 8d COMMON NAILS AT 6 INCHES ON CENTER AT SUPPORTED PANEL EDGES AND 10 INCHES ON CENTER AT INTERMEDIATE SUPPORTS. THE FLOOR SHEATHING SHALL BE GLUED TO THE JOIST AND THE TONGUE AND GROOVE JOINTS WITH AN APPROVED ADHESIVE.

WALL SHEATHING:
SHEATHING SHALL BE 7/16 INCH A.P.A. RATED SHEATHING, SPAN RATING 24/0. PANEL END JOINTS SHALL OCCUR AT SUPPORTS. NAIL PANEL EDGES WITH 8d NAILS AT 6 INCHES ON CENTER AND 10 INCHES ON CENTER AT INTERMEDIATE SUPPORTS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

GLU-LAMINATED TIMBER:
LAMINATED TIMBER SHALL BE DOUGLAS-FIR/LARCH KILM DRYED. STRESS GRADE COMBINATION OF 24F-V4 FOR SIMPLE SPANS AND 24F-V8 FOR CANTILEVER AND CONTINUOUS BEAMS.

ROOF SHEATHING:
SHEATHING SHALL BE 7/16 INCH A.P.A. RATED SHEATHING. SPAN RATING 32/16, INSTALLED WITH LONG DIMENSION ACROSS SUPPORT. PANEL END JOINTS SHALL OCCUR AT SUPPORTS. NAIL PANEL EDGES WITH 8d NAILS SPACED AT 4 INCHES ON CENTER AND 10 INCHES ON CENTER AT INTERMEDIATE SUPPORTS.

FLOOR FRAMING:
PROVIDE FULL DEPTH BLOCKING FOR JOIST AT THE SUPPORTS. FLUSH BEAMS (FB) AND HEADERS NOT CALLED OUT ON THE PLANS SHALL BE (2)2X8. ALL VERTICALLY LAMINATED COLUMNS AND HEADERS SHALL BE SPIKED TOGETHER WITH 16d NAILS SPACED AT 6 INCHES ON CENTER.

BEARING WALL FRAMING:
ALL DOOR AND WINDOW HEADERS NOT CALLED OUT ON THE PLANS SHALL BE (2) 2X8 HEM-FIR#2 WITH ONE CRIPPLE AND ONE STUD AT EACH END FOR OPENINGS 4 FEET WIDE OR LESS. ALL COLUMNS NOT CALLED OUT ON THE PLANS SHALL BE (2) STUDS SPIKED TOGETHER WITH 12d NAILS AT 12 INCHES ON CENTER. PROVIDE 2 LAYERS OF BUILDING PAPER BETWEEN WOOD AND CONCRETE. WALLS SHALL HAVE A SINGLE BOTTOM PLATE AND DOUBLE TOP PLATE. END NAIL TOP PLATES AND BOTTOM PLATES TO EACH STUD WITH 2-16d NAILS. FACE NAIL DOUBLE TOP PLATE WITH 16d NAILS AT 10 INCHES ON CENTER. LAP AND FACE NAIL PLATES WITH 2-16d NAILS AT EACH SPLICE, CORNER INTERSECTION. STAGGER SPLICES A MINIMUM OF 48 INCHES.

Criteria

Retained Height	=	4.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	0.0 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
NOT USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	1,500.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	35.0 psf/ft
Toe Active Pressure	=	35.0 psf/ft
Passive Pressure	=	250.0 psf/ft
Soil Density	=	110.00 pcf
Footing||Soil Friction	=	0.300
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	1.00 ft
Heel Width	=	1.25
Total Footing Width	=	2.25
Footing Thickness	=	10.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,000 psi Fy = 40,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top = 2.00 in @ Btm.= 3.00 in

Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	2.46 OK

Slab Resists All Sliding !

Total Bearing Load	=	1,052 lbs
...resultant ecc.	=	2.62 in
Soil Pressure @ Toe	=	740 psf OK
Soil Pressure @ Heel	=	195 psf OK
Allowable	=	1,500 psf

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	792 psf
ACI Factored @ Heel	=	209 psf
Footing Shear @ Toe	=	3.4 psi OK
Footing Shear @ Heel	=	4.6 psi OK
Allowable	=	76.0 psi

Sliding Calcs Slab Resists All Sliding !

Lateral Sliding Force	=	396.7 lbs
less 100% Passive Force	= -	86.8 lbs
less 100% Friction Force	= -	281.4 lbs
Added Force Req'd	=	28.5 lbs NG
....for 1.5 : 1 Stability	=	226.8 lbs NG

Load Factors

Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction — Top Stem

Design Height Above Ftg	ft =		Stem OK 0.00
Wall Material Above "Ht"	=		Concrete
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		18.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.244
Total Force @ Section	lbs =		448.0
Moment....Actual	ft-# =		597.3
Moment.....Allowable	=		2,447.6
Shear.....Actual	psi =		6.0
Shear.....Allowable	psi =		67.1
Wall Weight	=		100.0
Rebar Depth 'd'	in =		6.25
LAP SPLICE IF ABOVE	in =		13.95
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		6.26
Masonry Data			
f'm	psi =		
Fs	psi =		
Solid Grouting	=		
Special Inspection	=		
Modular Ratio 'n'	=		
Short Term Factor	=		
Equiv. Solid Thick.	=		
Masonry Block Type	=		Medium Weight
Masonry Design Method	=		ASD
Concrete Data			
f'c	psi =		2,000.0
Fy	psi =		40,000.0

4'-0" R. RETAINING WALL W/ S.O.G. RESISTING SLIDING #15
Soil Beg- 1500 PSF

Footing Design Results

		Toe	Heel
Factored Pressure	=	792	209 psf
Mu' : Upward	=	353	44 ft-#
Mu' : Downward	=	75	222 ft-#
Mu: Design	=	278	178 ft-#
Actual 1-Way Shear	=	3.42	4.58 psi
Allow 1-Way Shear	=	76.03	76.03 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	408.8	1.61	658.7
Toe Active Pressure	=	-12.2	0.28	-3.4
Surcharge Over Toe	=			
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=			
Total	=	396.7	**O.T.M.** =	655.3
Resisting/Overturning Ratio		=	**2.46**	
Vertical Loads used for Soil Pressure	=	1,051.9 lbs		

Vertical component of active pressure used for soil pressure

		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Soil Over Heel	=	256.7	1.96	502.6
Sloped Soil Over Heel	=			
Surcharge Over Heel	=			
Adjacent Footing Load	=			
Axial Dead Load on Stem	=		0.00	
Soil Over Toe	=			
Surcharge Over Toe	=			
Stem Weight(s)	=	400.0	1.33	533.3
Earth @ Stem Transitions	=			
Footing Weight	=	281.3	1.13	316.4
Key Weight	=			
Vert. Component	=	113.9	2.25	256.4
Total	=	1,051.9 lbs	**R.M.**=	1,608.7

DESIGNER NOTES:

4'-0" R. W/ S.O.G. Resisting Sliding - Soil Berg - 150 PSF #16

Criteria

Retained Height	=	6.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	0.0 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
NOT USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	1,500.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	35.0 psf/ft
Toe Active Pressure	=	35.0 psf/ft
Passive Pressure	=	250.0 psf/ft
Soil Density	=	110.00 pcf
Footing||Soil Friction	=	0.300
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	1.50 ft
Heel Width	=	1.25
Total Footing Width	=	2.75
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,000 psi Fy = 40,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top = 2.00 in @ Btm.= 3.00 in

Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	1.64 OK
Slab Resists All Sliding !		
Total Bearing Load	=	1,636 lbs
...resultant ecc.	=	7.14 in
Soil Pressure @ Toe	=	1,399 psf OK
Soil Pressure @ Heel	=	0 psf OK
Allowable	=	1,500 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	1,434 psf
ACI Factored @ Heel	=	0 psf
Footing Shear @ Toe	=	7.8 psi OK
Footing Shear @ Heel	=	8.2 psi OK
Allowable	=	76.0 psi

Sliding Calcs Slab Resists All Sliding !

Lateral Sliding Force	=	840.0 lbs
less 100% Passive Force	= -	125.0 lbs
less 100% Friction Force	= -	419.3 lbs
Added Force Req'd	=	295.8 lbs NG
....for 1.5 : 1 Stability	=	715.8 lbs NG

Load Factors

Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction — Top Stem

Design Height Above Ftg	ft =		Stem OK 0.00
Wall Material Above "Ht"	=		Concrete
Thickness	=		8.00
Rebar Size	=		# 4
Rebar Spacing	=		16.00
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		0.734
Total Force @ Section	lbs =		1,008.0
Moment....Actual	ft-# =		2,016.0
Moment.....Allowable	=		2,746.1
Shear.....Actual	psi =		13.4
Shear.....Allowable	psi =		67.1
Wall Weight	=		100.0
Rebar Depth 'd'	in =		6.25
LAP SPLICE IF ABOVE	in =		13.95
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		6.26
Masonry Data			
f'm	psi =		
Fs	psi =		
Solid Grouting	=		
Special Inspection	=		
Modular Ratio 'n'	=		
Short Term Factor	=		
Equiv. Solid Thick.	=		
Masonry Block Type	=		Medium Weight
Masonry Design Method	=		ASD
Concrete Data			
f'c	psi =		2,000.0
Fy	psi =		40,000.0

Col 11 Ft. RETAINING WALL W/ SLIDING RESISTING SLAB ON SOIL BRG - 1500 PSF

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,434	0 psf
Mu' : Upward	=	1,268	1 ft-#
Mu' : Downward	=	203	388 ft-#
Mu: Design	=	1,066	388 ft-#
Actual 1-Way Shear	=	7.85	8.25 psi
Allow 1-Way Shear	=	76.03	76.03 psi
Toe Reinforcing	=	None Spec'd	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#			.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	=	857.5	2.33	2,000.8	Soil Over Heel	=	385.0	2.46	946.5
Toe Active Pressure	=	-17.5	0.33	-5.8	Sloped Soil Over Heel	=			
Surcharge Over Toe	=				Surcharge Over Heel	=			
Adjacent Footing Load	=				Adjacent Footing Load	=			
Added Lateral Load	=				Axial Dead Load on Stem	=		0.00	
Load @ Stem Above Soil	=				Soil Over Toe	=			
					Surcharge Over Toe	=			
					Stem Weight(s)	=	600.0	1.83	1,100.0
					Earth @ Stem Transitions	=			
					Footing Weight	=	412.5	1.38	567.2
					Key Weight	=			
					Vert. Component	=	239.0	2.75	657.2
Total	=	840.0	**O.T.M.** =	1,995.0	**Total** =		1,636.5 lbs	**R.M.**=	3,270.9

Resisting/Overturning Ratio = **1.64**

Vertical Loads used for Soil Pressure = 1,636.5 lbs

Vertical component of active pressure used for soil pressure

DESIGNER NOTES:

Col 1' Ht. W/ Soil Resisting Sliding
Soil Bng - 150 PSF

#18

Criteria

Retained Height	=	10.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	0.00 in
Water height over heel	=	0.0 ft
Wind on Stem	=	0.0 psf

Vertical component of active lateral soil pressure options:
USED for Soil Pressure.
NOT USED for Sliding Resistance.
USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	1,500.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	35.0 psf/ft
Toe Active Pressure	=	35.0 psf/ft
Passive Pressure	=	250.0 psf/ft
Soil Density	=	110.00 pcf
Footing||Soil Friction	=	0.300
Soil height to ignore for passive pressure	=	0.00 in

Footing Dimensions & Strengths

Toe Width	=	3.50 ft
Heel Width	=	1.50
Total Footing Width	=	5.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,000 psi Fy = 40,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top = 2.00 in @ Btm.= 3.00 in

Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

*Design Summary

Wall Stability Ratios

Overturning	=	1.66	OK

Slab Resists All Sliding !

Total Bearing Load	=	3,257 lbs	
...resultant ecc.	=	11.20 in	
Soil Pressure @ Toe	=	1,386 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	1,500 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	1,362 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	21.3 psi	OK
Footing Shear @ Heel	=	18.9 psi	OK
Allowable	=	76.0 psi	

Sliding Calcs Slab Resists All Sliding !

Lateral Sliding Force	=	2,100.0 lbs	
less 100% Passive Force	= -	125.0 lbs	
less 100% Friction Force	= -	800.0 lbs	
Added Force Req'd	=	1,175.0 lbs	NG
....for 1.5 : 1 Stability	=	2,225.0 lbs	NG

Load Factors

Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction — Top Stem

			Stem OK
Design Height Above Ftg	ft =		0.00
Wall Material Above "Ht"	=		Concrete
Thickness	=		8.00
Rebar Size	=		# 5
Rebar Spacing	=		6.75
Rebar Placed at	=		Edge
Design Data			
fb/FB + fa/Fa	=		**1.000**
Total Force @ Section	lbs =		2,800.0
Moment....Actual	ft-# =		9,333.3
Moment.....Allowable	=		9,334.0
Shear.....Actual	psi =		37.7
Shear.....Allowable	psi =		67.1
Wall Weight	=		100.0
Rebar Depth 'd'	in =		6.19
LAP SPLICE IF ABOVE	in =		17.44
LAP SPLICE IF BELOW	in =		
HOOK EMBED INTO FTG	in =		7.83
Masonry Data			
f'm	psi =		
Fs	psi =		
Solid Grouting	=		
Special Inspection	=		
Modular Ratio 'n'	=		
Short Term Factor	=		
Equiv. Solid Thick.	=		
Masonry Block Type	=		Medium Weight
Masonry Design Method	=		ASD
Concrete Data			
f'c	psi =		2,000.0
Fy	psi =		40,000.0

10' Ht w/ 5.04 Resisting Sliding
1500 PSF / 35 PCF

#19

Footing Design Results

		Toe	Heel
Factored Pressure	=	1,362	0 psf
Mu' : Upward	=	6,270	7 ft-#
Mu' : Downward	=	1,103	1,308 ft-#
Mu: Design	=	5,168	1,300 ft-#
Actual 1-Way Shear	=	21.27	18.89 psi
Allow 1-Way Shear	=	76.03	76.03 psi
Toe Reinforcing	=	# 5 @ 13.50 in	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 8.75 in, #5@ 13.50 in, #6@ 19.25 in, #7@ 26.25 in, #8@ 34.50 in, #9@ 43
Heel: Not req'd, Mu < S * Fr
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#			.....RESISTING..... Force lbs	Distance ft	Moment ft-#
Item									
Heel Active Pressure	=	2,117.5	3.67	7,764.2	Soil Over Heel	=	916.7	4.58	4,201.4
Toe Active Pressure	=	-17.5	0.33	-5.8	Sloped Soil Over Heel	=			
Surcharge Over Toe	=				Surcharge Over Heel	=			
Adjacent Footing Load	=				Adjacent Footing Load	=			
Added Lateral Load	=				Axial Dead Load on Stem	=		0.00	
Load @ Stem Above Soil	=				Soil Over Toe	=			
					Surcharge Over Toe	=			
					Stem Weight(s)	=	1,000.0	3.83	3,833.3
					Earth @ Stem Transitions	=			
					Footing Weight	=	750.0	2.50	1,875.0
					Key Weight	=			
					Vert. Component	=	590.2	5.00	2,950.8
Total	=	2,100.0	**O.T.M.** =	7,758.3	**Total** =		3,256.8 lbs	**R.M.**=	12,860.5

Resisting/Overturning Ratio = **1.66**

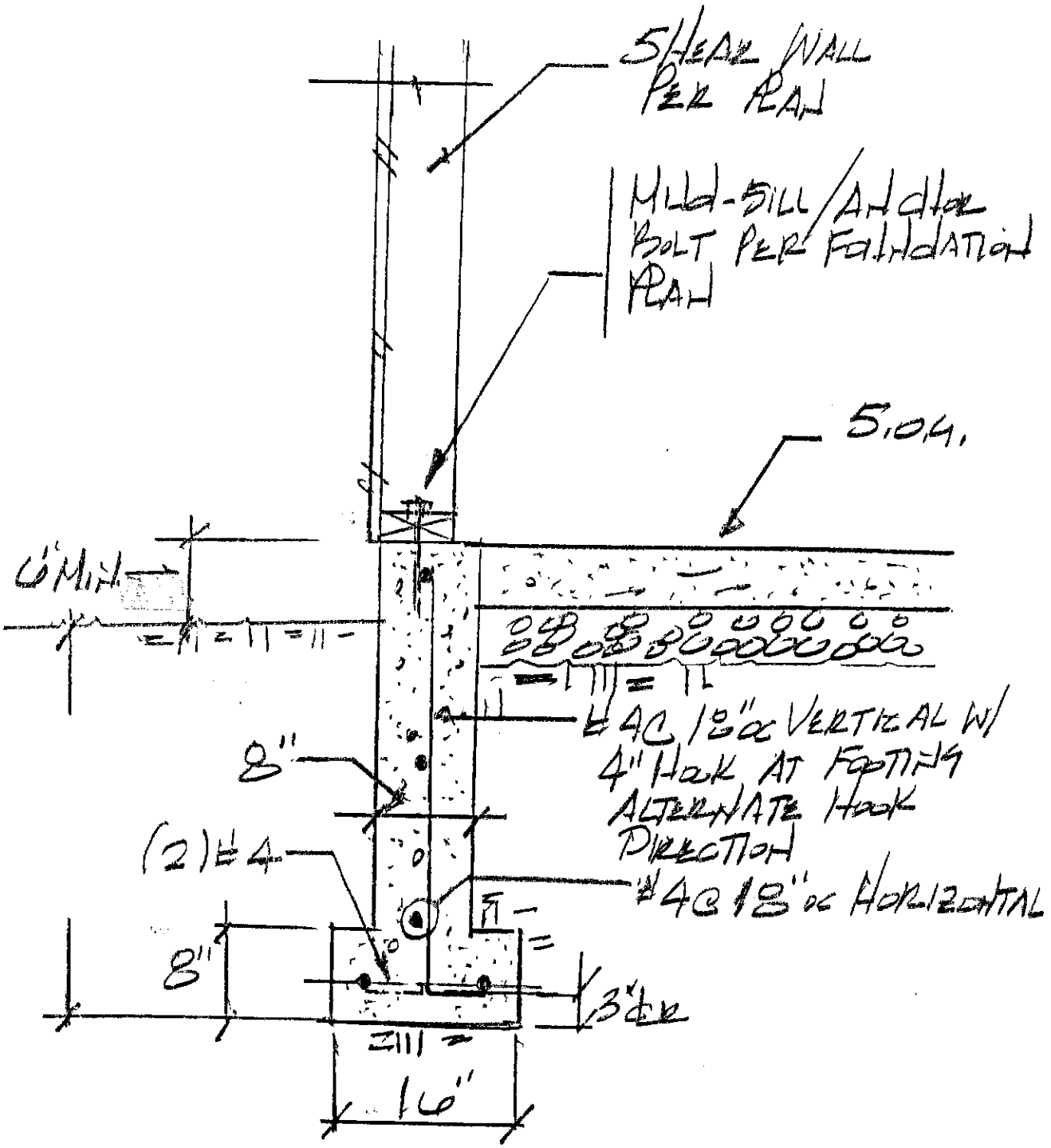
Vertical Loads used for Soil Pressure = 3,256.8 lbs

Vertical component of active pressure used for soil pressure

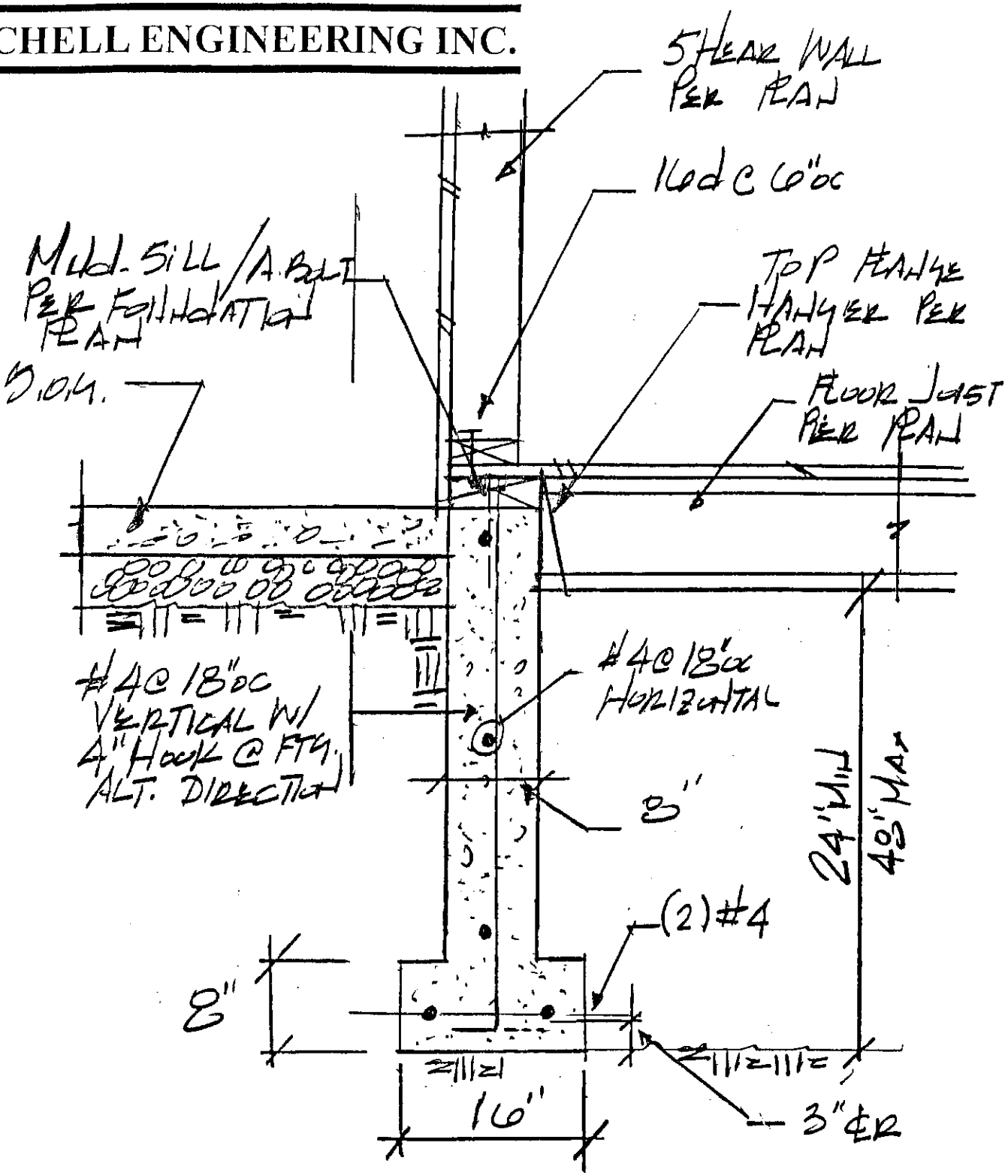
DESIGNER NOTES:

10' HT W/ 5.0.4 RESISTING SLIDING
1500 PSF / 35 K.F.

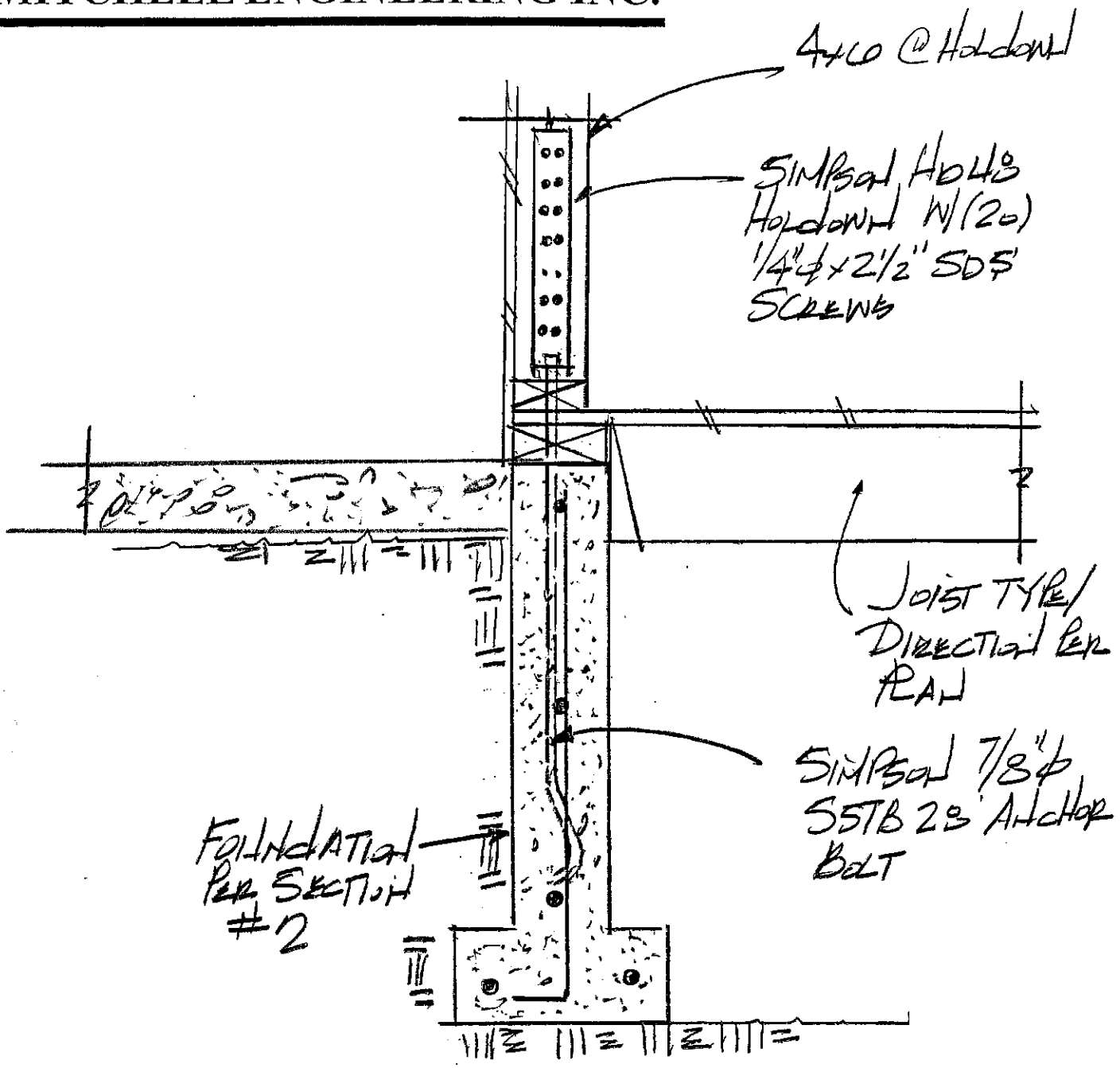
#20


5/HEAR WALL PER PLAN
MILL-SILL/ANCHOR BOLT PER FOUNDATION PLAN
5.0%
6" MIN
#4 @ 18" oc VERTICAL W/ 4" HOOK AT FOOTING ALTERNATE HOOK DIRECTION
8"
(2) #4
#4 @ 18" oc HORIZONTAL
8"
3" CLR
16"

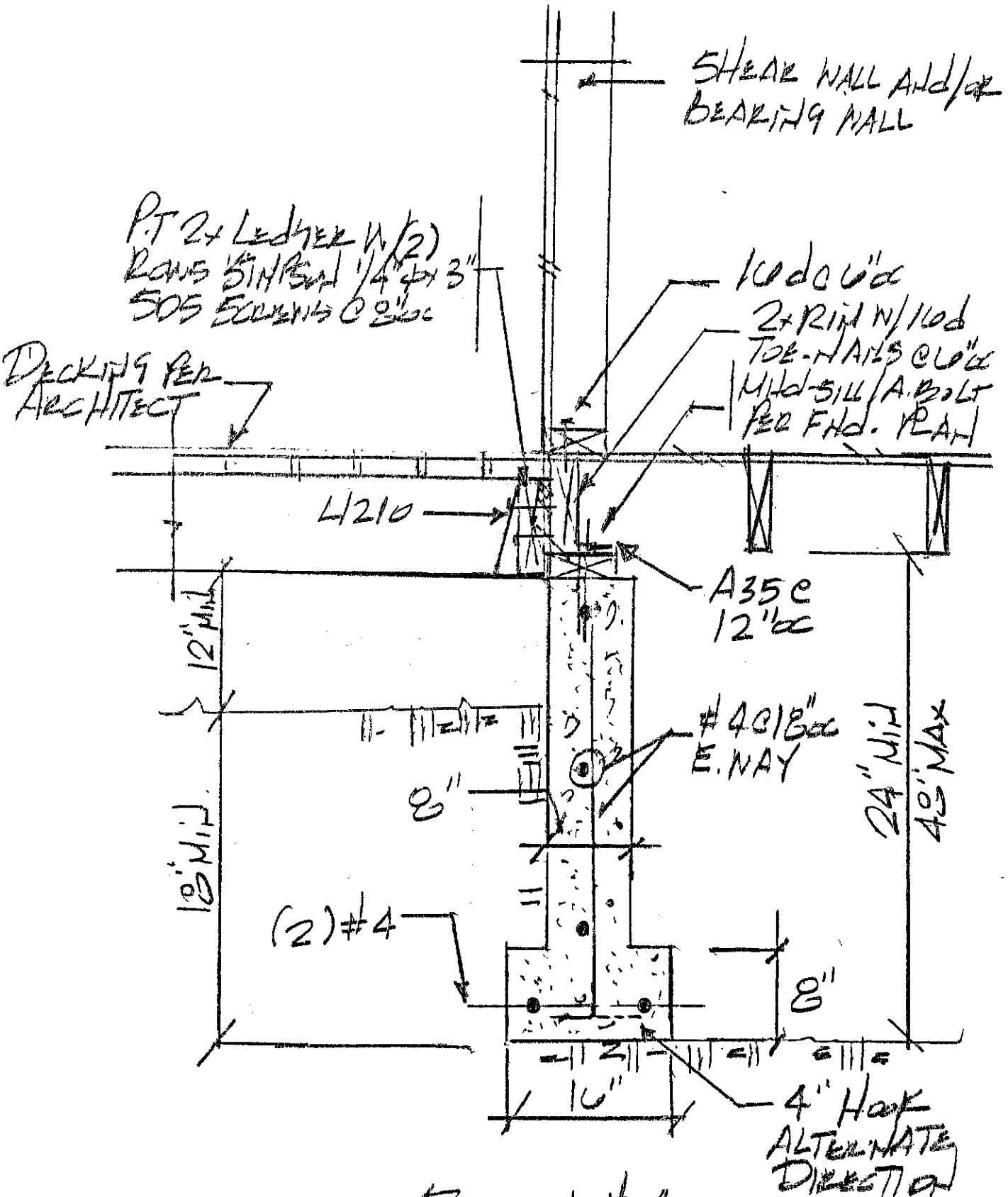
SECTION #1


SHEAR WALL PER PLAN
16d @ 6"oc
MUD. SILL / A.BLT PER FOUNDATION PLAN
SIDING
TOP FLANGE HANGER PER PLAN
FLOOR JOIST PER PLAN
#4 @ 18"oc VERTICAL W/ 4" HOOK @ FTG. ALT. DIRECTION
#4 @ 18"oc HORIZONTAL
3"
24" MIN
48" MAX
(2) #4
8"
16"
3" CLR

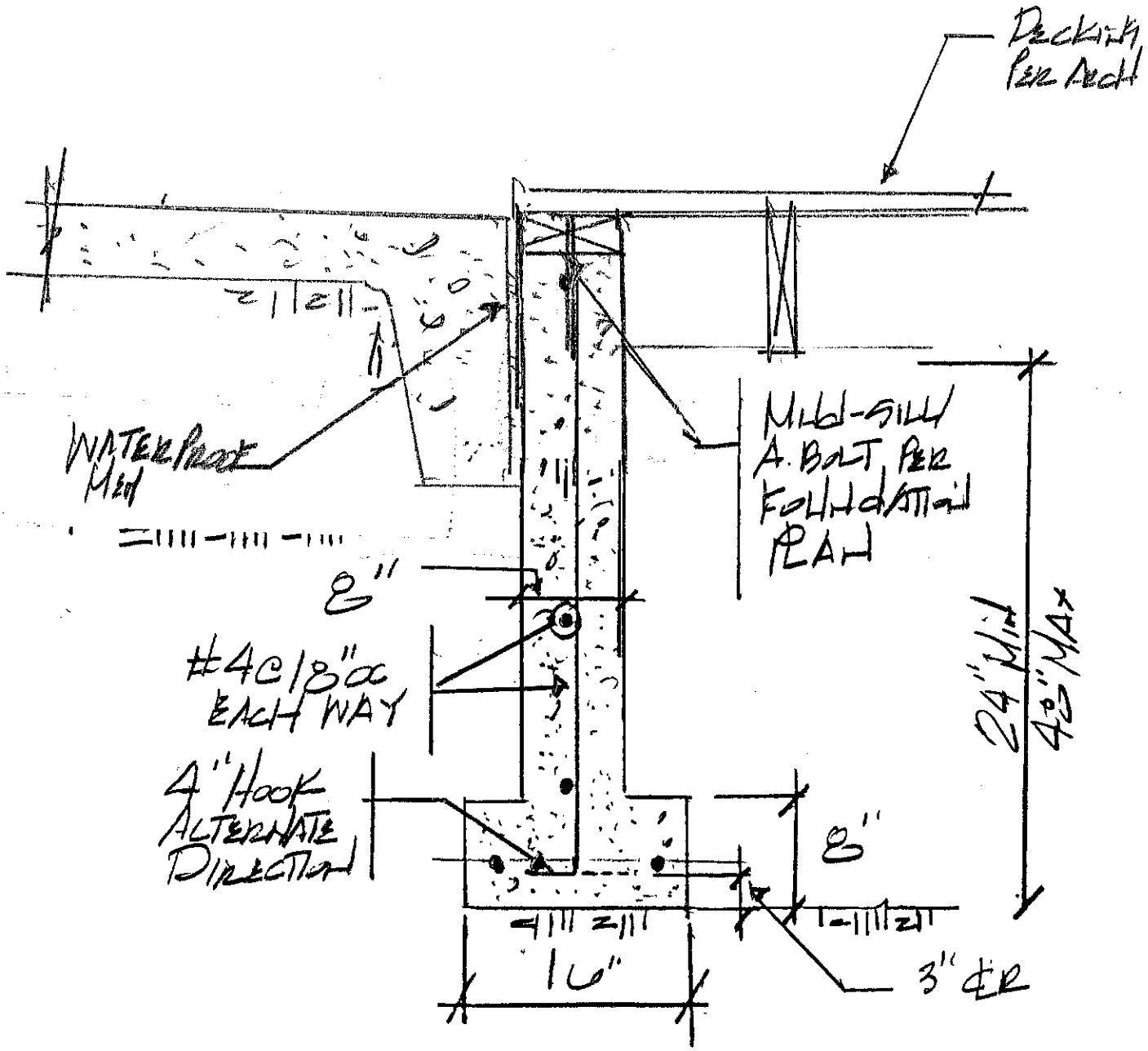
SECTION #2


4x6 @ Holdown
SIMPSON HD4S HOLDOWN W/(20) 1/4"ϕ x 2 1/2" SDS SCREWS
JOIST TYPE/ DIRECTION PER PLAN
SIMPSON 7/8"ϕ SSTB 28 ANCHOR BOLT
FOUNDATION PER SECTION #2

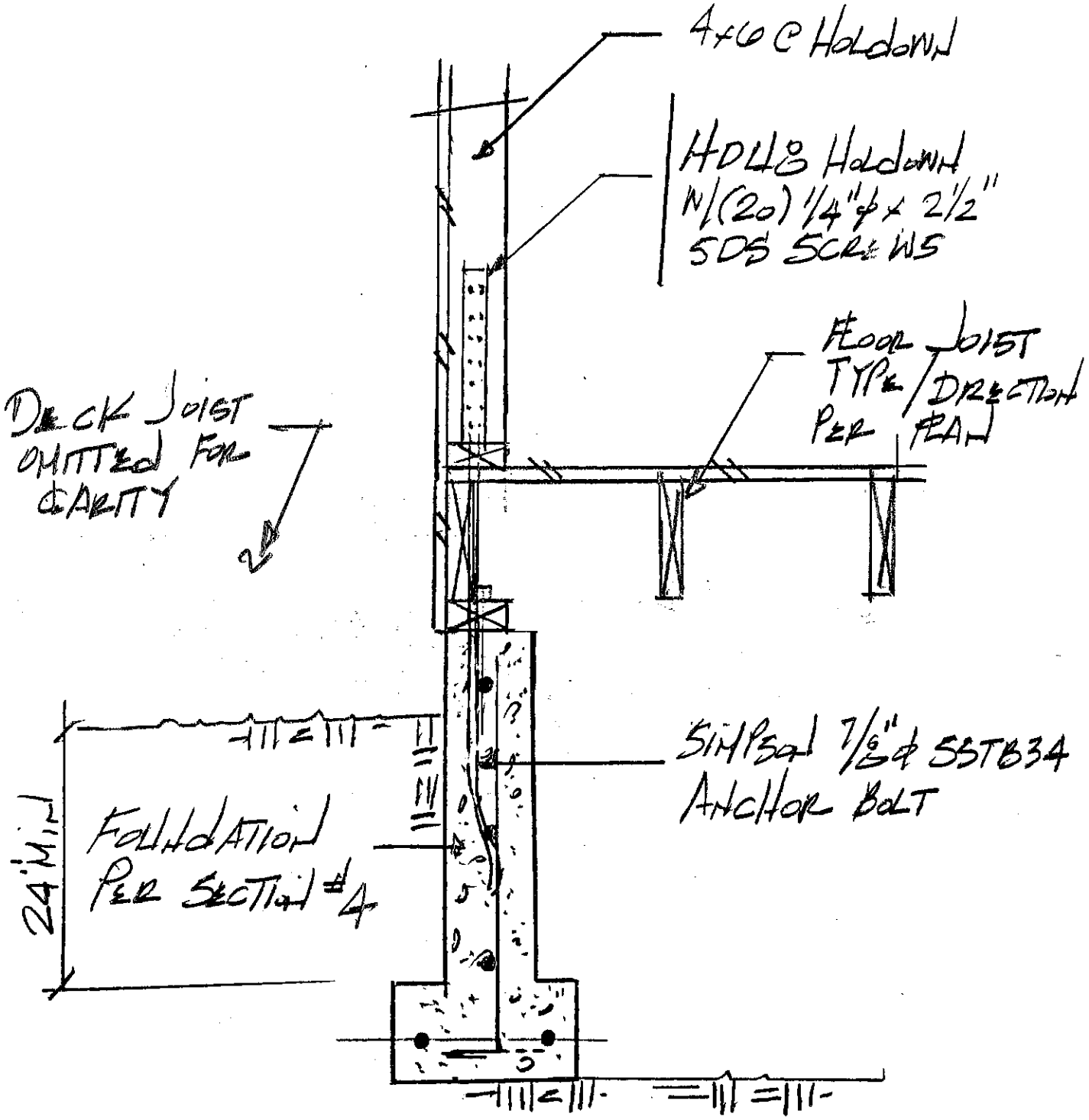
SECTION # 3


SHEAR WALL AND/OR BEARING WALL
P.T 2x LEDGER W/(2) ROWS 5/8" Ø 1/4" x 3" SDS SCREWS @ 8" o.c
10d @ 6" o.c
2x RIM W/ 10d TOE-NAILS @ 6" o.c
MUD-SILL / A.B. @ 4'-0" MAX PER FND. PLAN
DECKING PER ARCHITECT
L/210
A35 @ 12" o.c
12" MIN
#4 @ 18" o.c E.WAY
8"
18" MIN
24" MIN
40" MAX
(2) #4
8"
16"
4" HOOK ALTERNATE DIRECTION

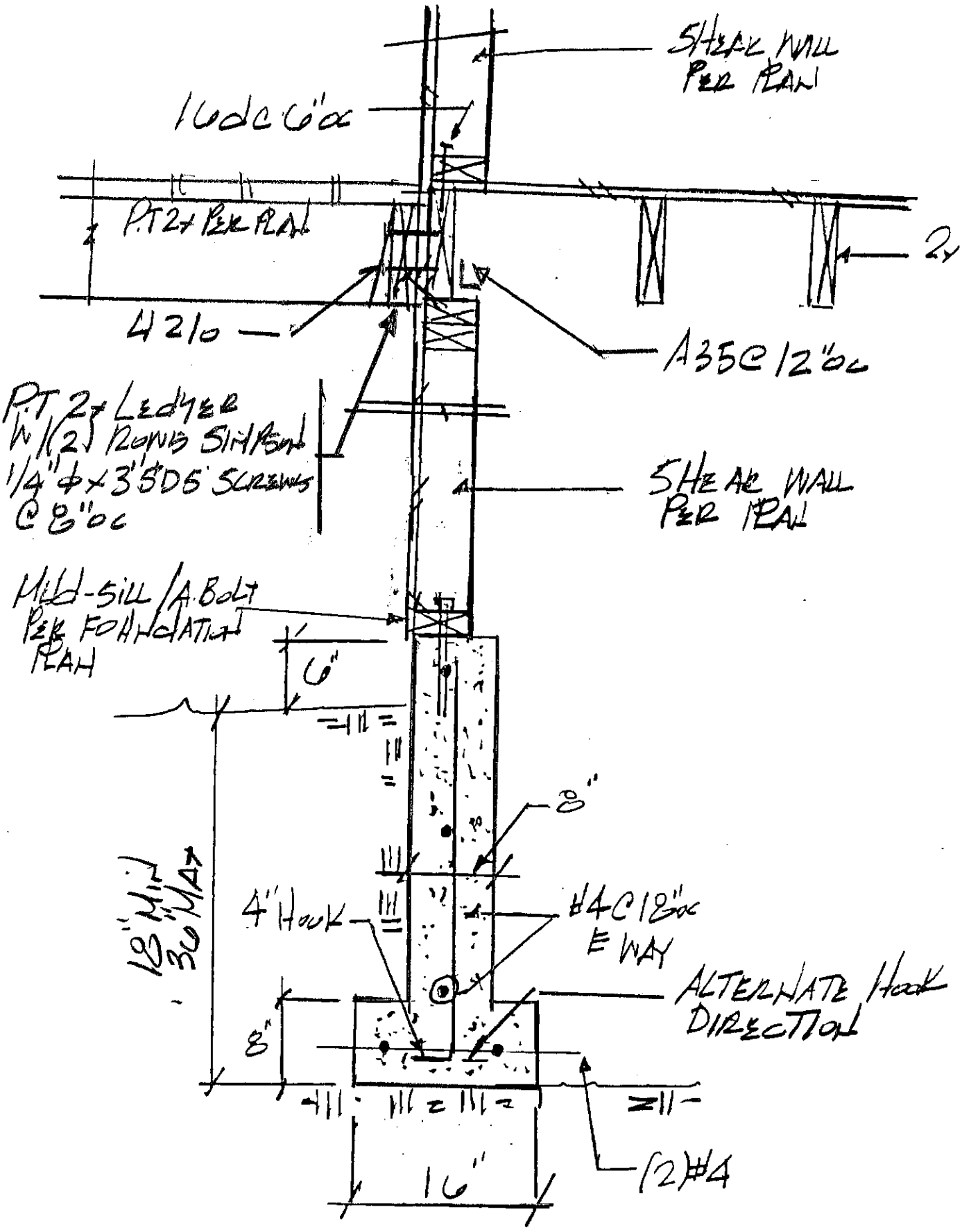
Section #4


Decking
Per Arch
Mud-Sill
A. Bolt, Per
Foundation
Plan
Water Proof
Mem
8"
#4 @ 18" oc
Each Way
4" Hook
Alternate
Direction
8"
24" Min
48" Max
3" Clr
16"

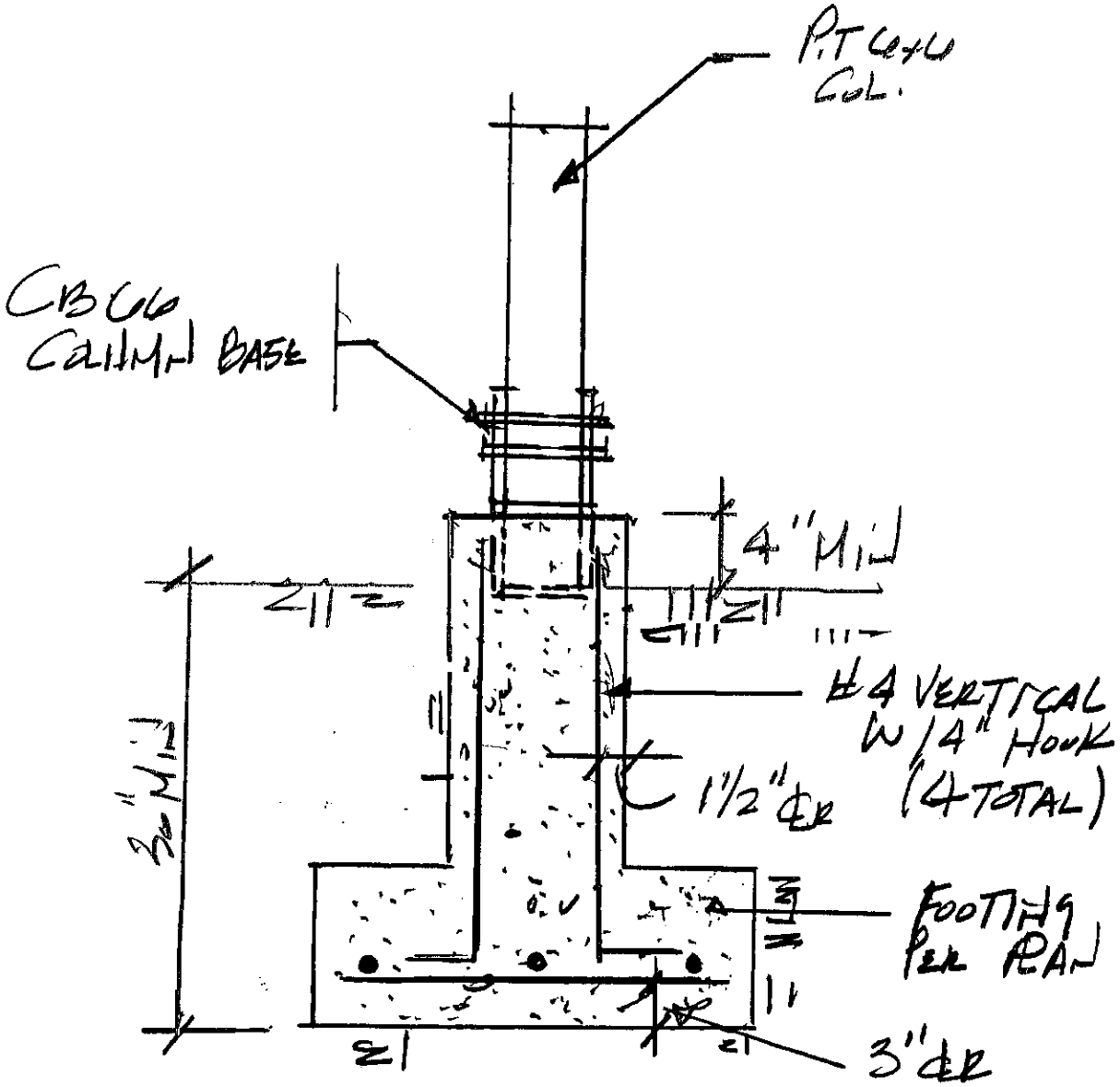
Section #5


4x6 @ Holdown
HDU8 Holdown
W/(20) 1/4"ϕ x 2 1/2"
SDS SCREWS
Floor Joist
TYP. / DIRECTION
PER PLAN
Deck Joist
OMITTED FOR
CLARITY
SIMPSON 7/8"ϕ SSTB34
ANCHOR BOLT
FOUNDATION
PER SECTION #4
24" MIN.

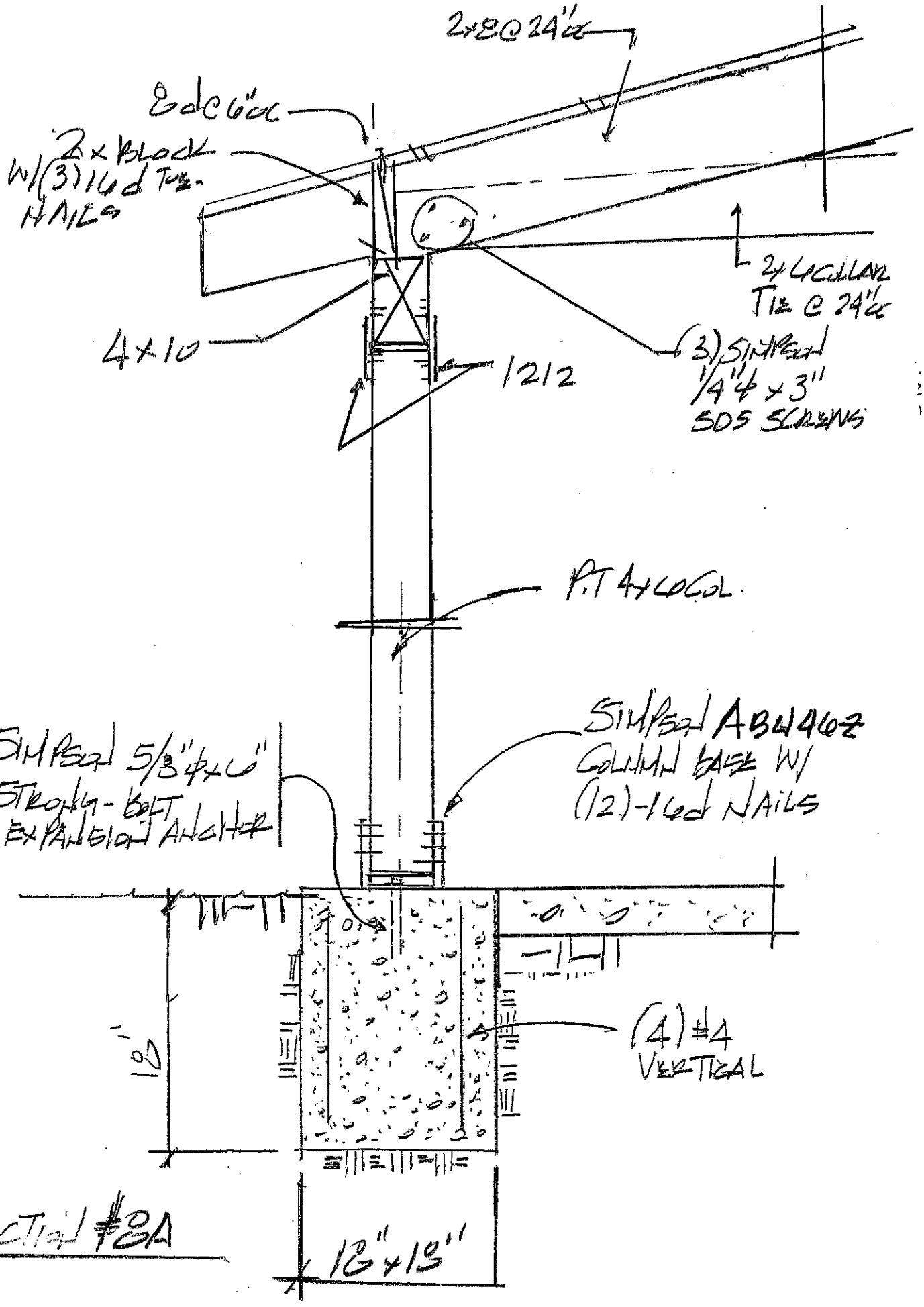
SECTION # 6

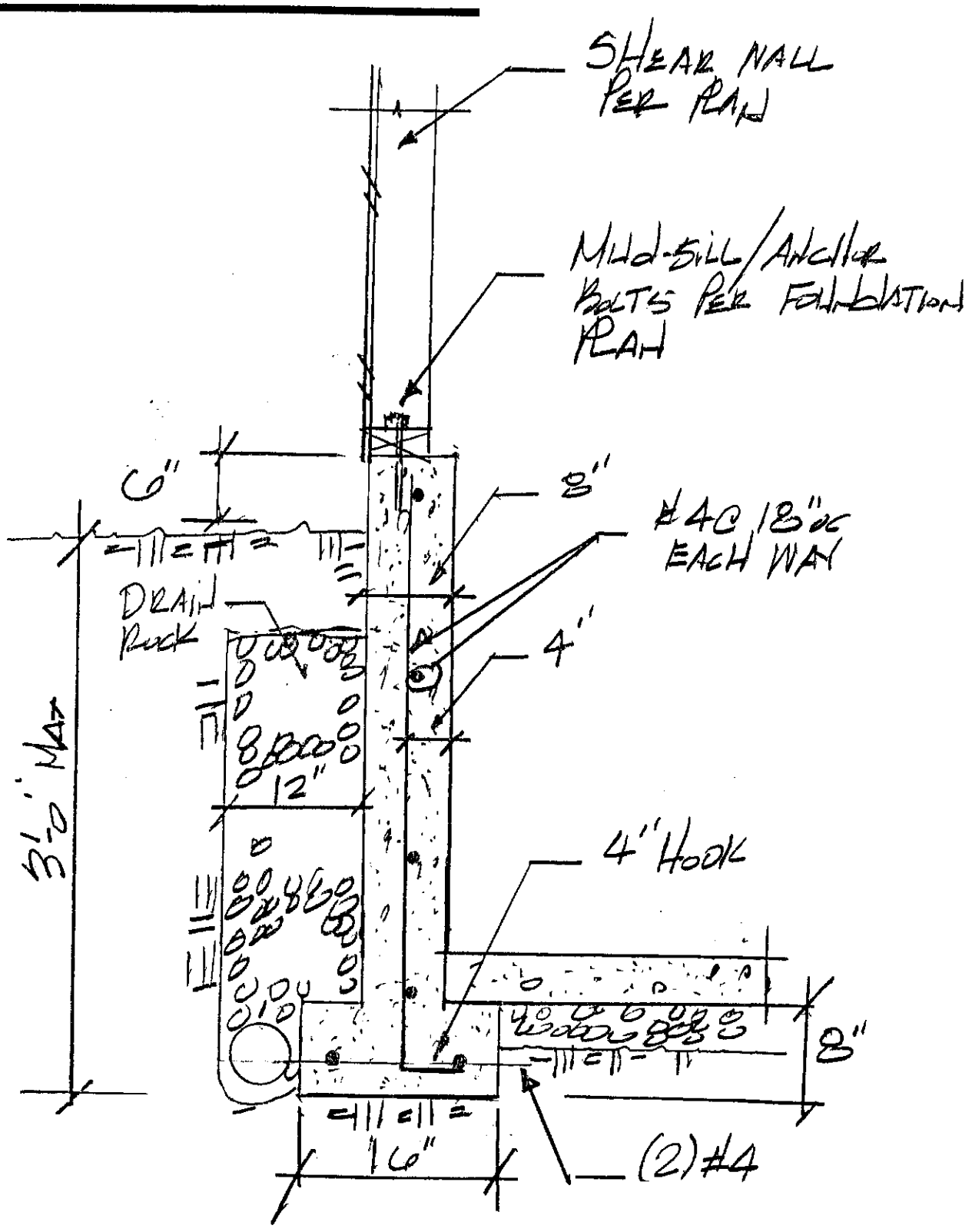

SHEAR WALL PER PLAN
16dc @ 6"oc
PT 2x PER PLAN
2x
4 2 1o
A35 @ 12"oc
PT 2x Ledger W/ (2) Rows SIMPSON 1/4" ϕ x 3" SDS SCREWS @ 8"oc
SHEAR WALL PER PLAN
Mud-Sill / A.Bolt PER FOUNDATION PLAN
6"
8"
18" MIN 30" MAX
4" Hook
#4 @ 18"oc E WAY
ALTERNATE Hook DIRECTION
8"
(2)#4
16"

SECTION #7

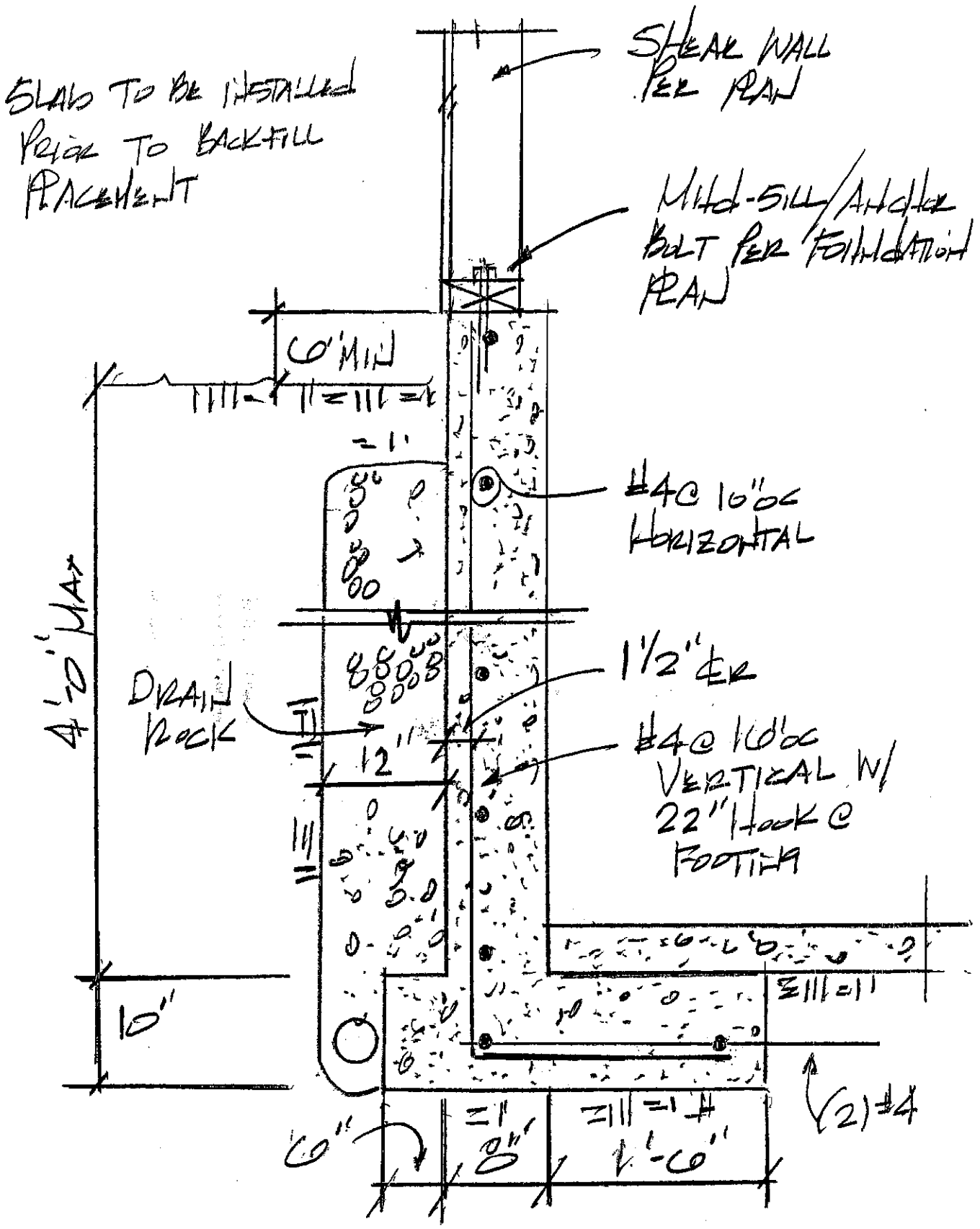

P.T 6x6 COL.
CB66 CAST-IN-PL BASE
4" MIN
2"
2"
2"
#4 VERTICAL W/ 4" HOOK (4 TOTAL)
1½" CLR
FOOTING PER PLAN
3" MIN
2"
2"
3" CLR

SECTION #8

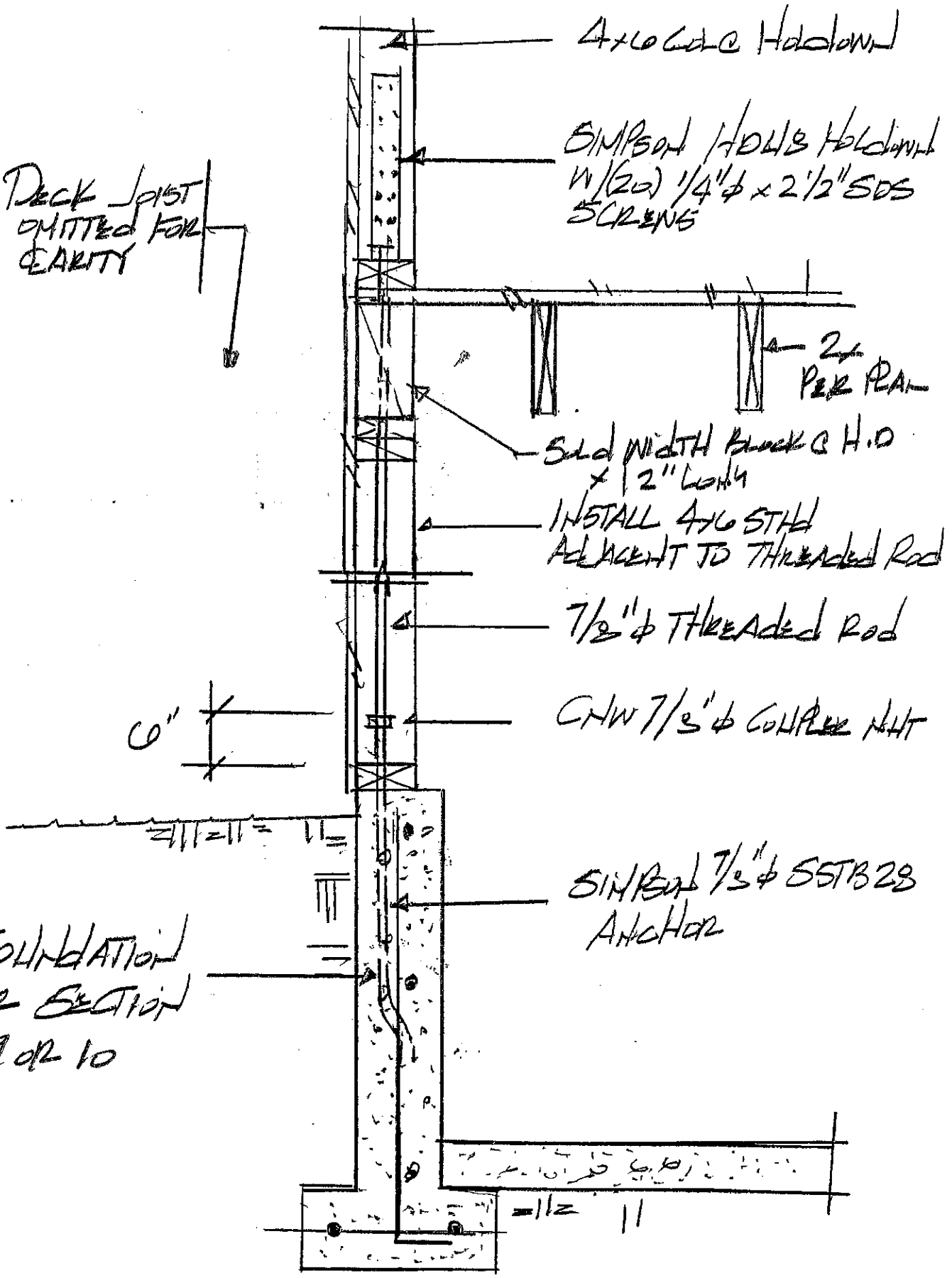

2×8 @ 24" oc
8dc 6" oc
2× BLOCK W/ (3) 16d TOE-NAILS
2× COLLAR TIE @ 24" oc
4×10
12|2
(3) SIMPSON 1/4" ϕ × 3" SDS SCREWS
P.T 4×COL.
SIMPSON 5/8" ϕ × 6" STRONG-BOLT EXPANSION ANCHOR
SIMPSON ABU40Z COLUMN BASE W/ (12)-16d NAILS
(4) #4 VERTICAL
12"
SECTION #8A
12" × 12"


SHEAR WALL PER PLAN
MUD-SILL/ANCHOR BOLTS PER FOUNDATION PLAN
6"
8"
#4 @ 18" oc EACH WAY
DRAIN ROCK
4"
3'-0" MAX
12"
4" HOOK
8"
16"
(2) #4

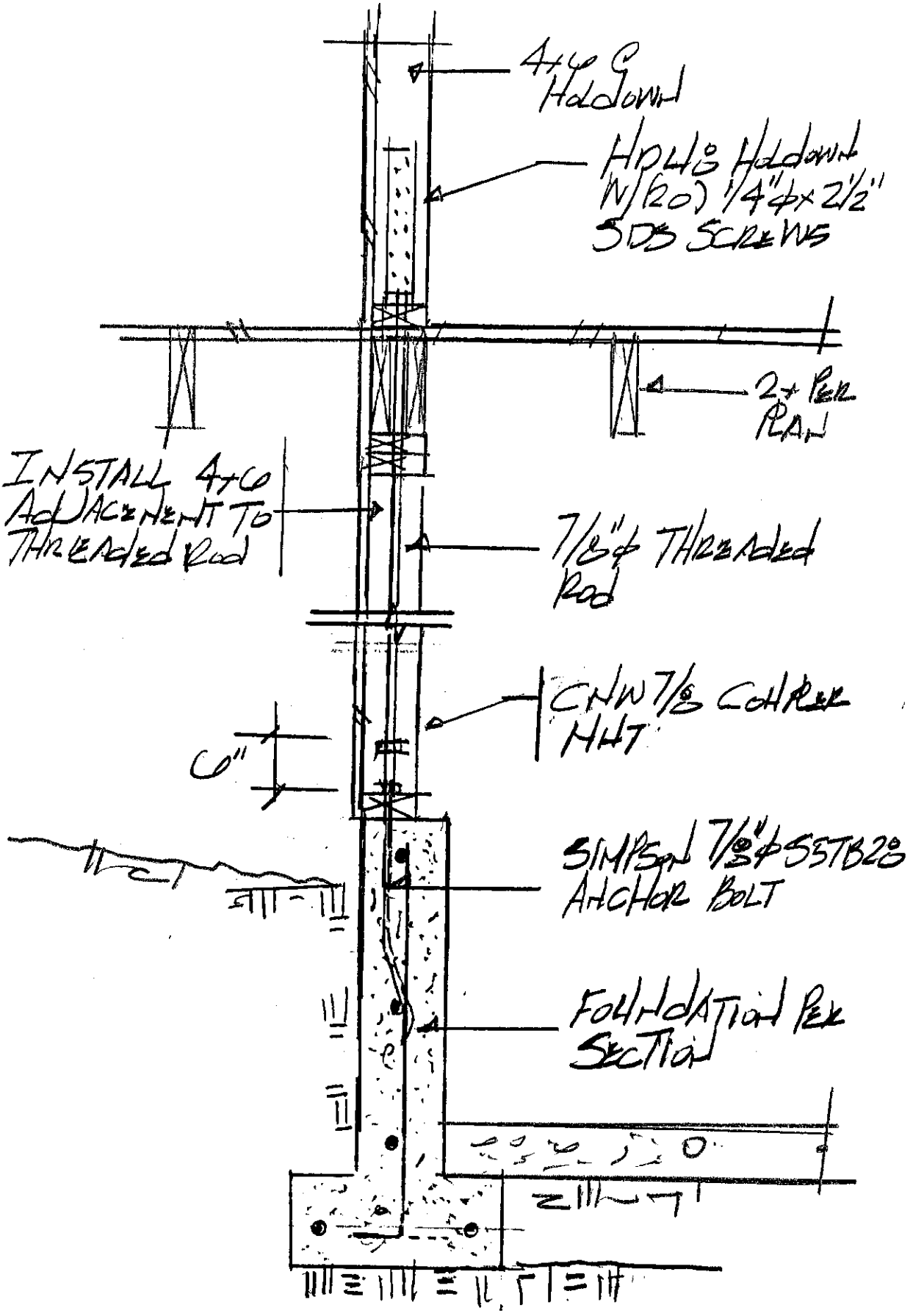
SECTION #9


SLAB TO BE INSTALLED PRIOR TO BACKFILL PLACEMENT
SHEAR WALL PER PLAN
MTD-SILL/ANCHOR BOLT PER FOUNDATION PLAN
6" MIN
#4 @ 16" OC HORIZONTAL
4'-0" MAX
DRAIN ROCK
1 1/2" CLR
#4 @ 16" OC VERTICAL W/ 22" HOOK @ FOOTING
12"
10"
(2) #4
6"
8"
1'-6"

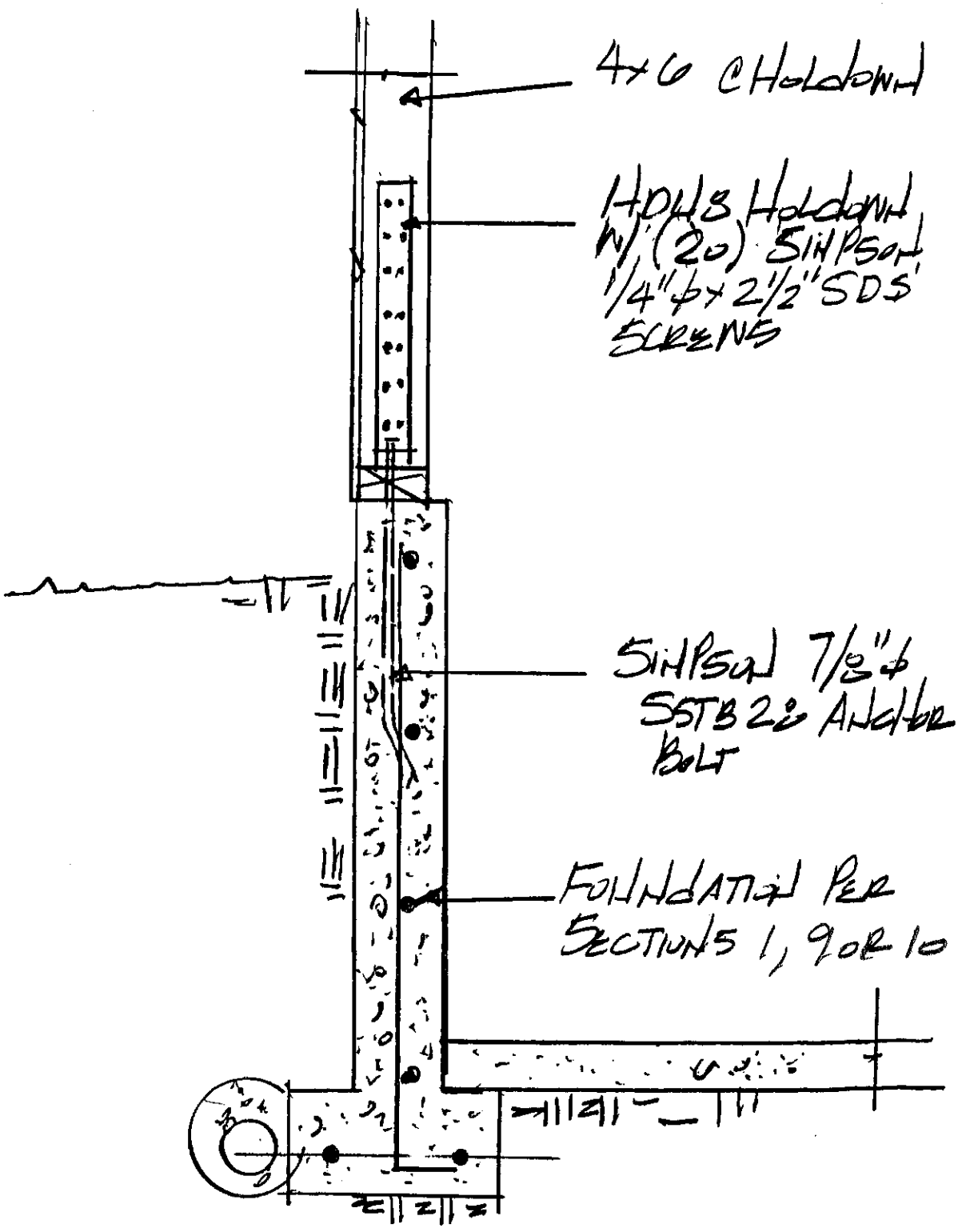
SECTION #10


4x6 cdc Holdown
SIMPSON HDU8 Holdown W/(20) 1/4"ϕ x 2 1/2" SDS SCREWS
DECK JOIST OMITTED FOR CLARITY
2x PER REAR
SOLID WIDTH BLOCK @ H.D x 12" LONG
INSTALL 4x6 STUD ADJACENT TO THREADED ROD
7/8"ϕ THREADED ROD
CNW 7/8"ϕ COUPLER NUT
6"
SIMPSON 7/8"ϕ SSTB28 ANCHOR
FOUNDATION PER SECTION #9 OR 10

SECTION #11


4+6 C Holdown
HPU6 Holdown W/(20) 1/4"ϕ x 2½" SDS SCREWS
2+ PER PLAN
INSTALL 4+6 ADJACENT TO THREADED ROD
7/8"ϕ THREADED ROD
CNW 7/8 COUPLER NUT
6"
SIMPSON 7/8"ϕ SSTB28 ANCHOR BOLT
FOUNDATION PER SECTION

SECTION # 11A


4x6 @ Holdown
HDU8 Holdown w/ (20) SIMPSON 1/4"ϕ x 2 1/2" SDS SCREWS
SIMPSON 7/8"ϕ SSTB28 ANCHOR BOLT
FOUNDATION PER SECTIONS 1, 9 OR 10

SECTION #12

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Redmond, WA 98052
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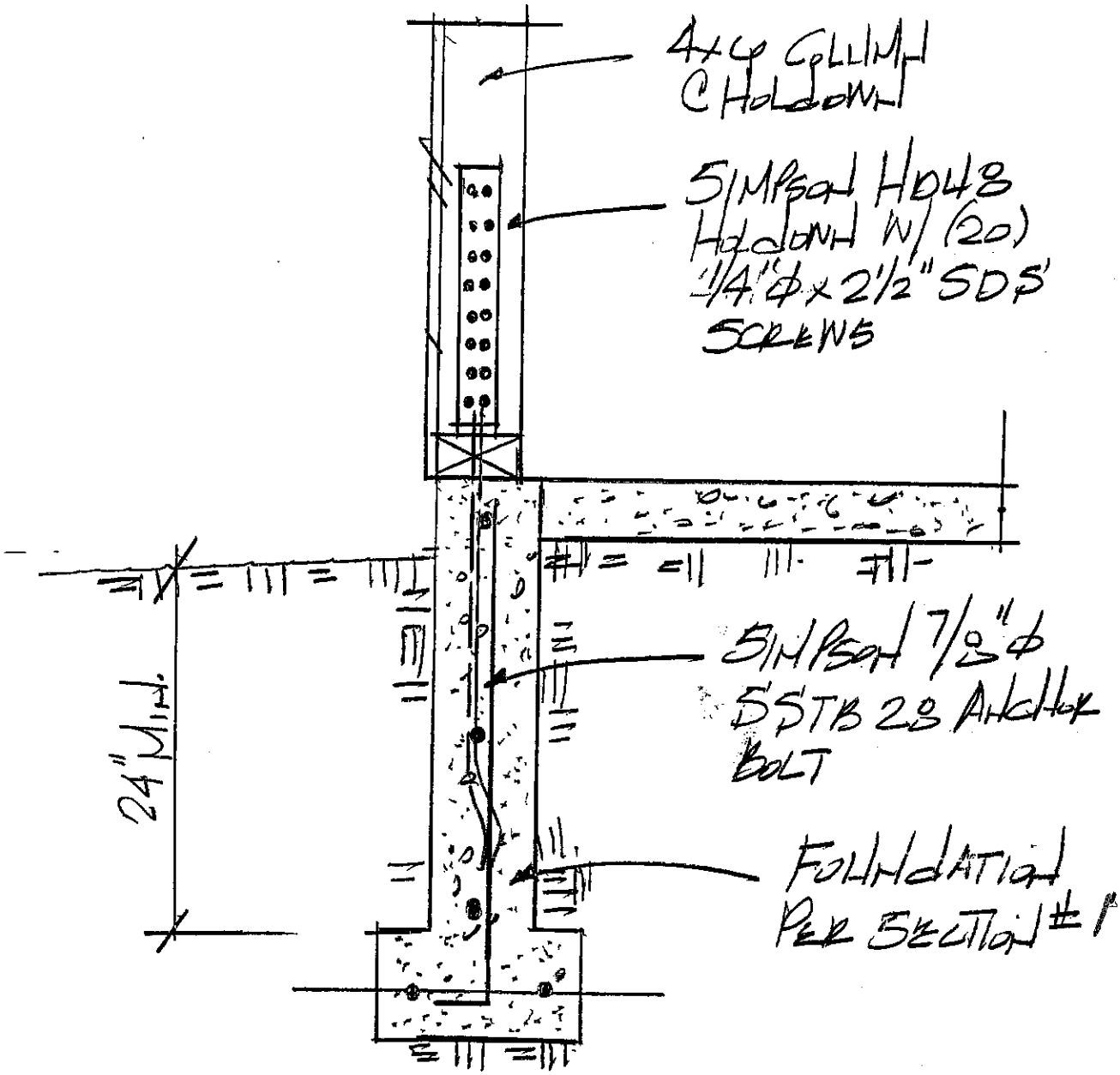
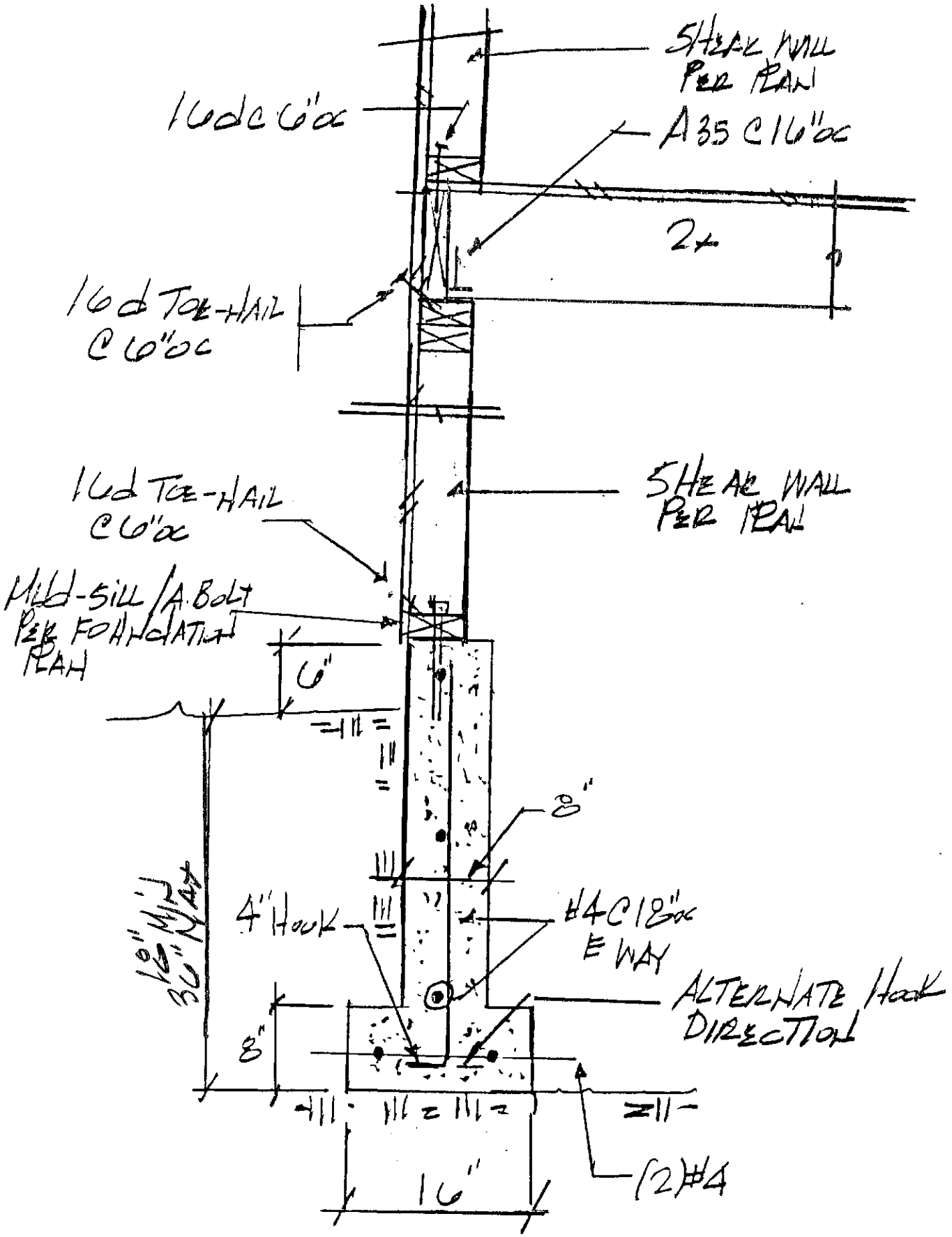
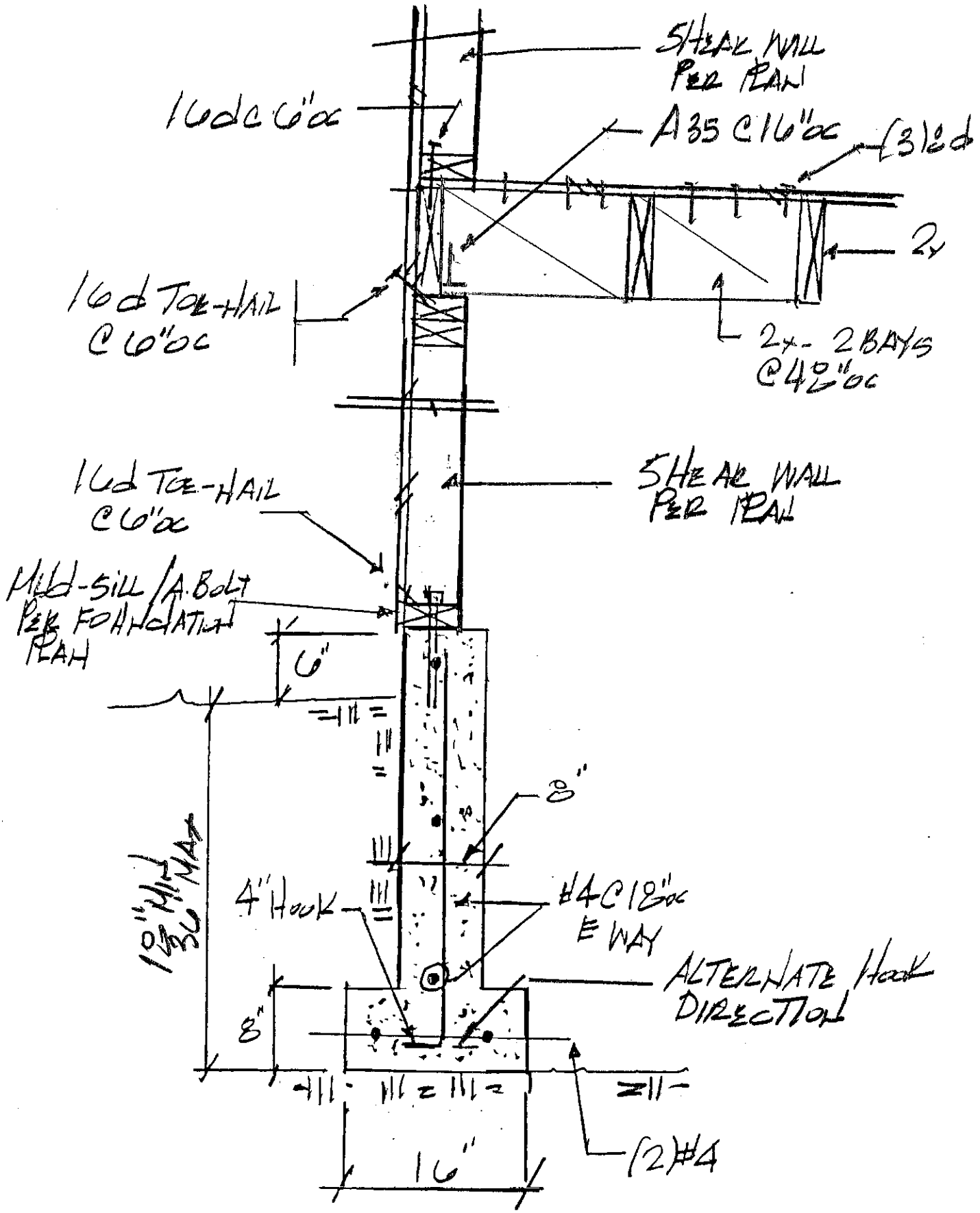
mitchellengineeringinc@comcast.net



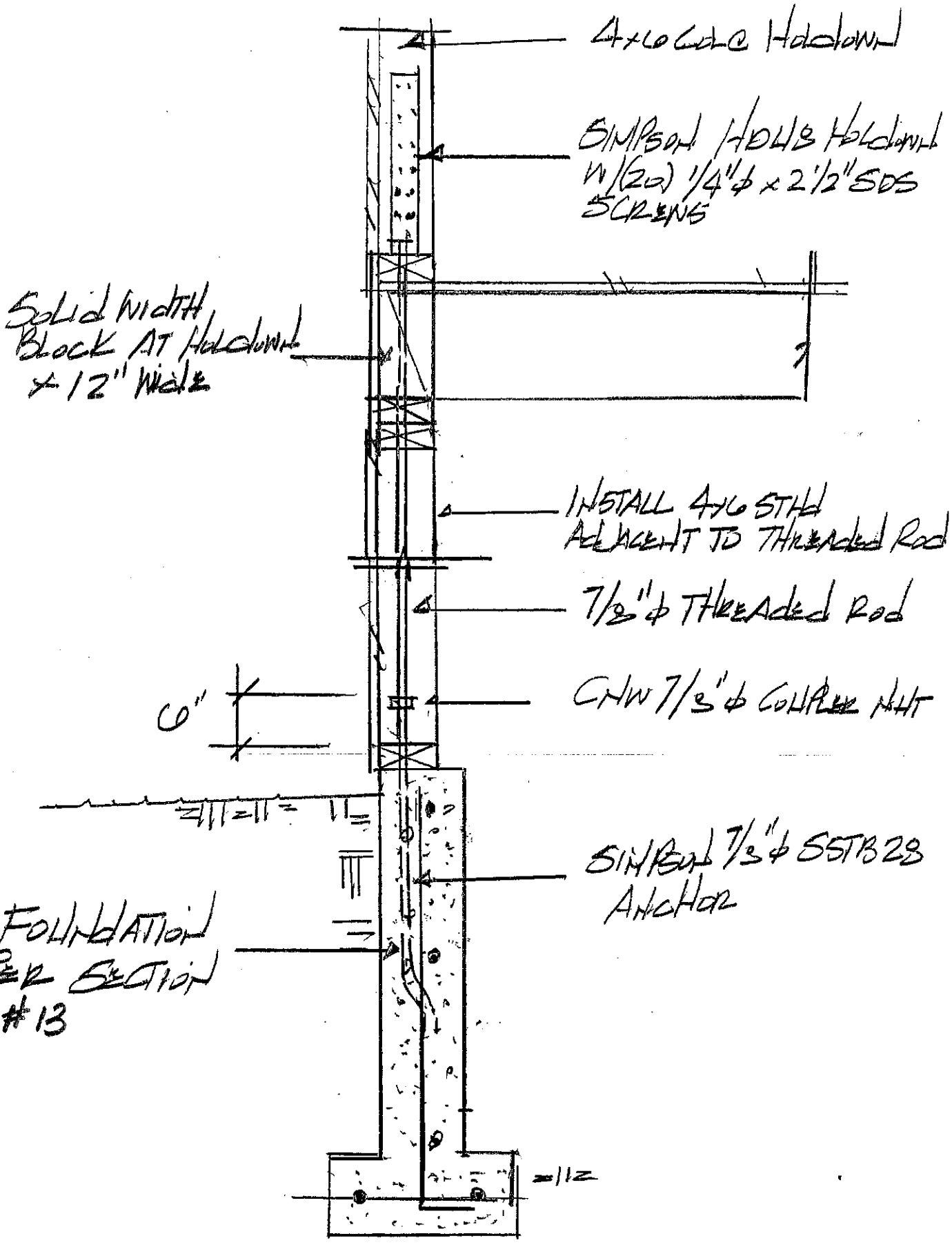
SECTION #12A


SHEAR WALL PER PLAN
16d @ 6"oc
A35 @ 16"oc
2x
16d TOE-NAIL @ 6"oc
16d TOE-NAIL @ 6"oc
SHEAR WALL PER PLAN
MUD-SILL/A.BOLT PER FOUNDATION PLAN
6"
8"
4" HOOK
#4 @ 18"oc E WAY
ALTERNATE HOOK DIRECTION
8"
(2)#4
16"

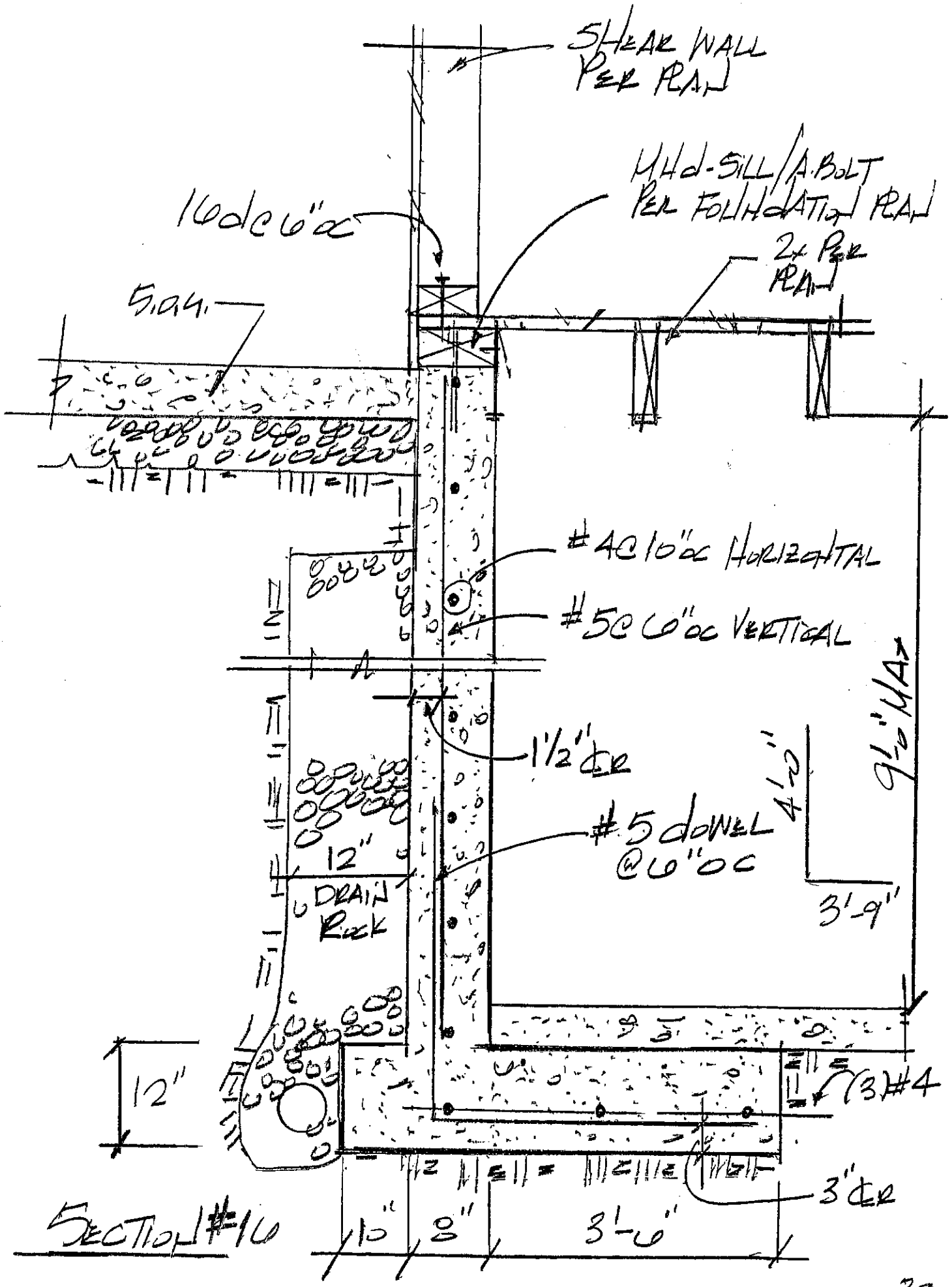
SECTION #13


SHEAR WALL PER PLAN
16dc 6"oc
A35 C16"oc
(3)2d
2x
16d TOE-NAIL C6"oc
2x- 2BAYS @40"oc
16d TOE-NAIL C6"oc
SHEAR WALL PER PLAN
MUD-SILL/A.BOLT PER FOUNDATION PLAN
6"
8"
12"MIN
4" HOOK
#4C18"oc E WAY
ALTERNATE HOOK DIRECTION
8"
16"
(2)#4

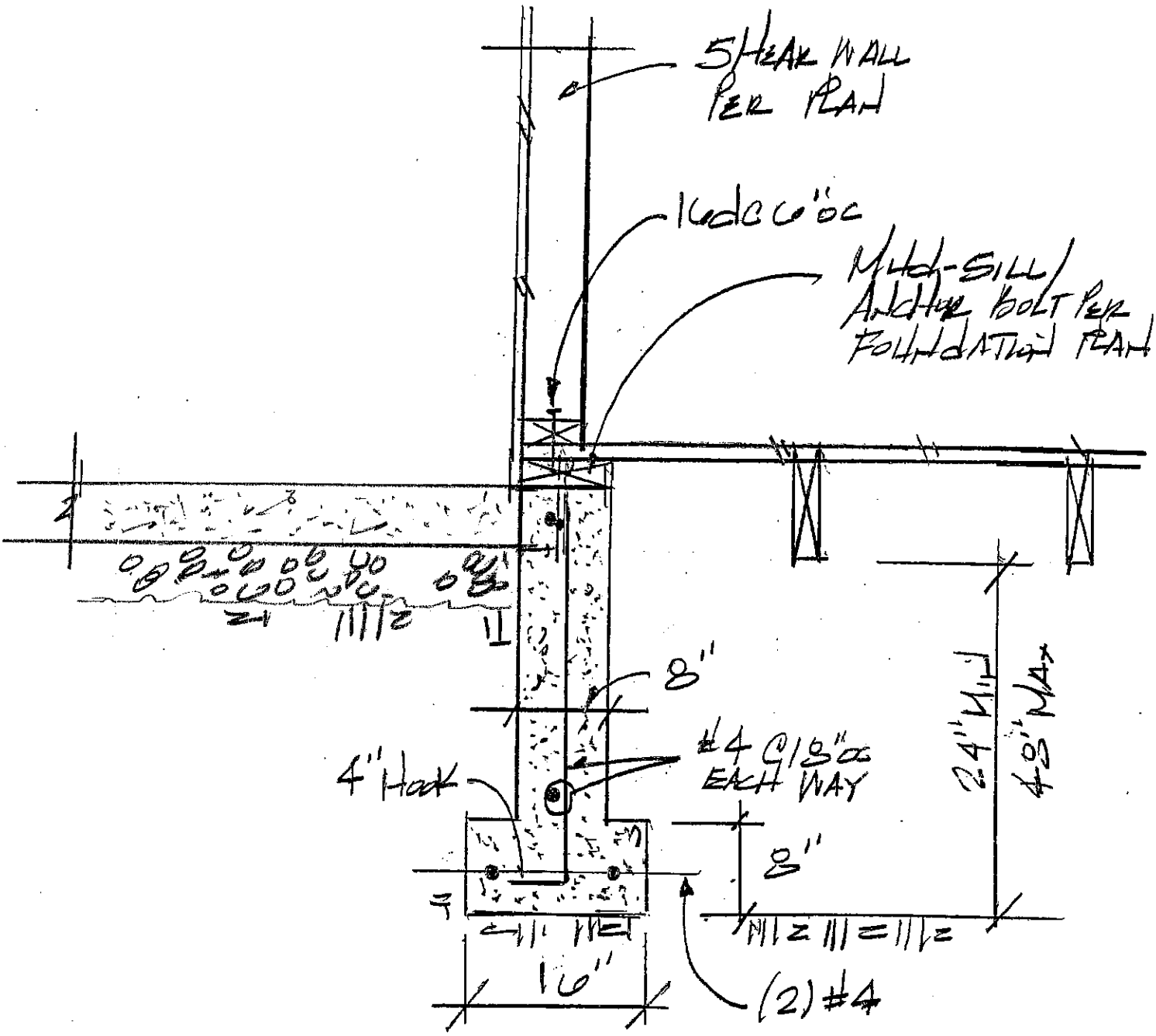
SECTION #14


4x6 Cut @ Holdown
SIMPSON HDU8 Holdown
W/(20) 1/4"ϕ x 2 1/2" SDS
SCREWS
Solid Width
Block AT Holdown
x 12" Wide
INSTALL 4x6 STUD
ADJACENT TO THREADED ROD
7/8"ϕ THREADED ROD
CMW 7/8"ϕ COUPLER NUT
6"
SIMPSON 7/8"ϕ SSTB28
ANCHOR
FOUNDATION
PER SECTION
#13

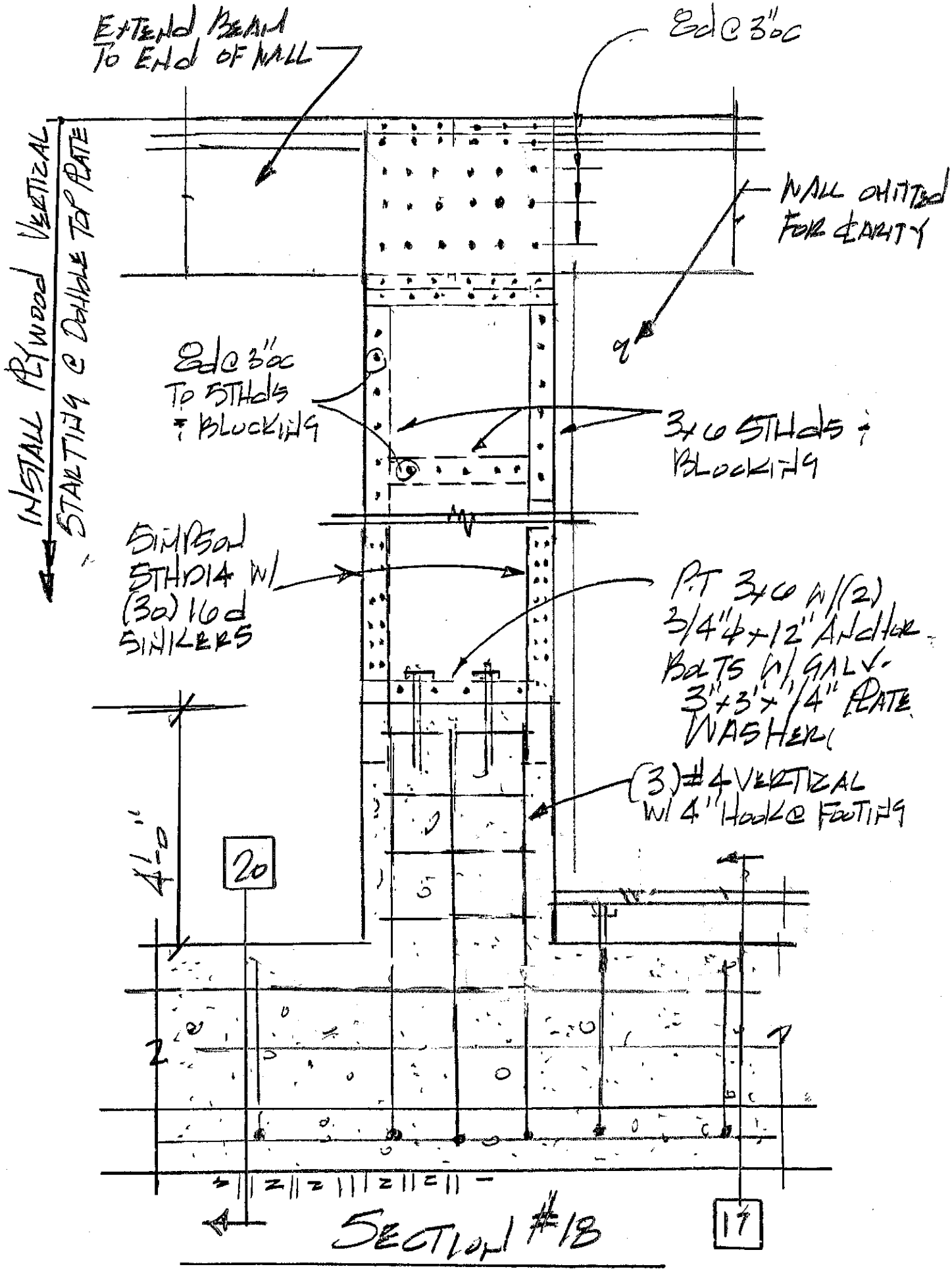
SECTION #15


SHEAR WALL PER PLAN
HHd-SILL/A.BOLT PER FOUNDATION PLAN
16dc 6"oc
2x PER PLAN
SLAB
#4C 10"oc HORIZONTAL
#5C 6"oc VERTICAL
1½" CLR
#5 DOWEL @6"oc
4'-0"
9'-0" MAX
3'-9"
12"
DRAIN Rock
12"
(3)#4
3" CLR
10"
8"
3'-6"

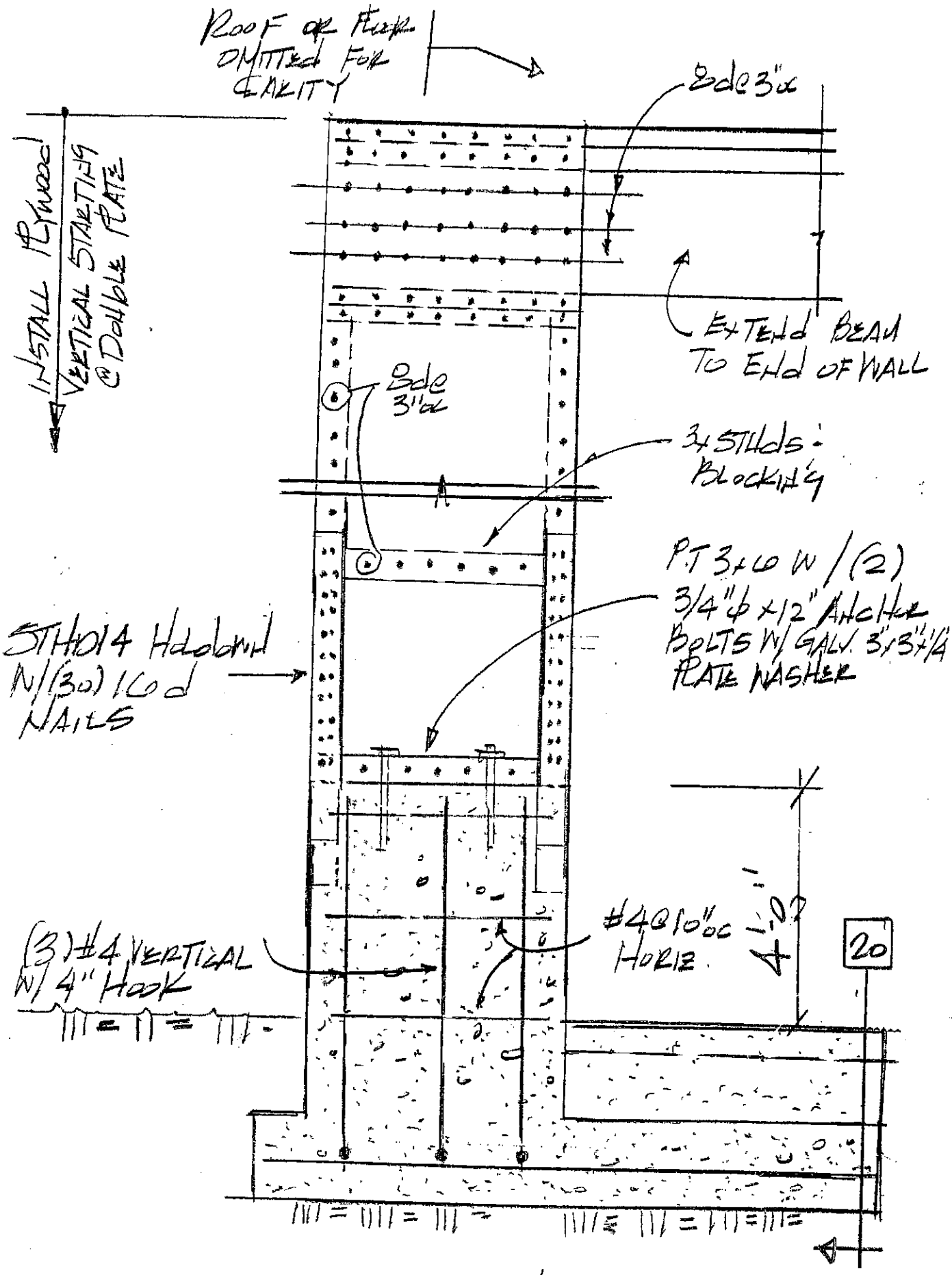
SECTION #16


5/HEAR WALL
PER PLAN
16dc @ 16"oc
MUD-SILL/
ANCHOR BOLT PER
FOUNDATION PLAN
8"
#4 @ 18"oc
EACH WAY
4" Hook
24" MIN
48" MAX
8"
16"
(2) #4

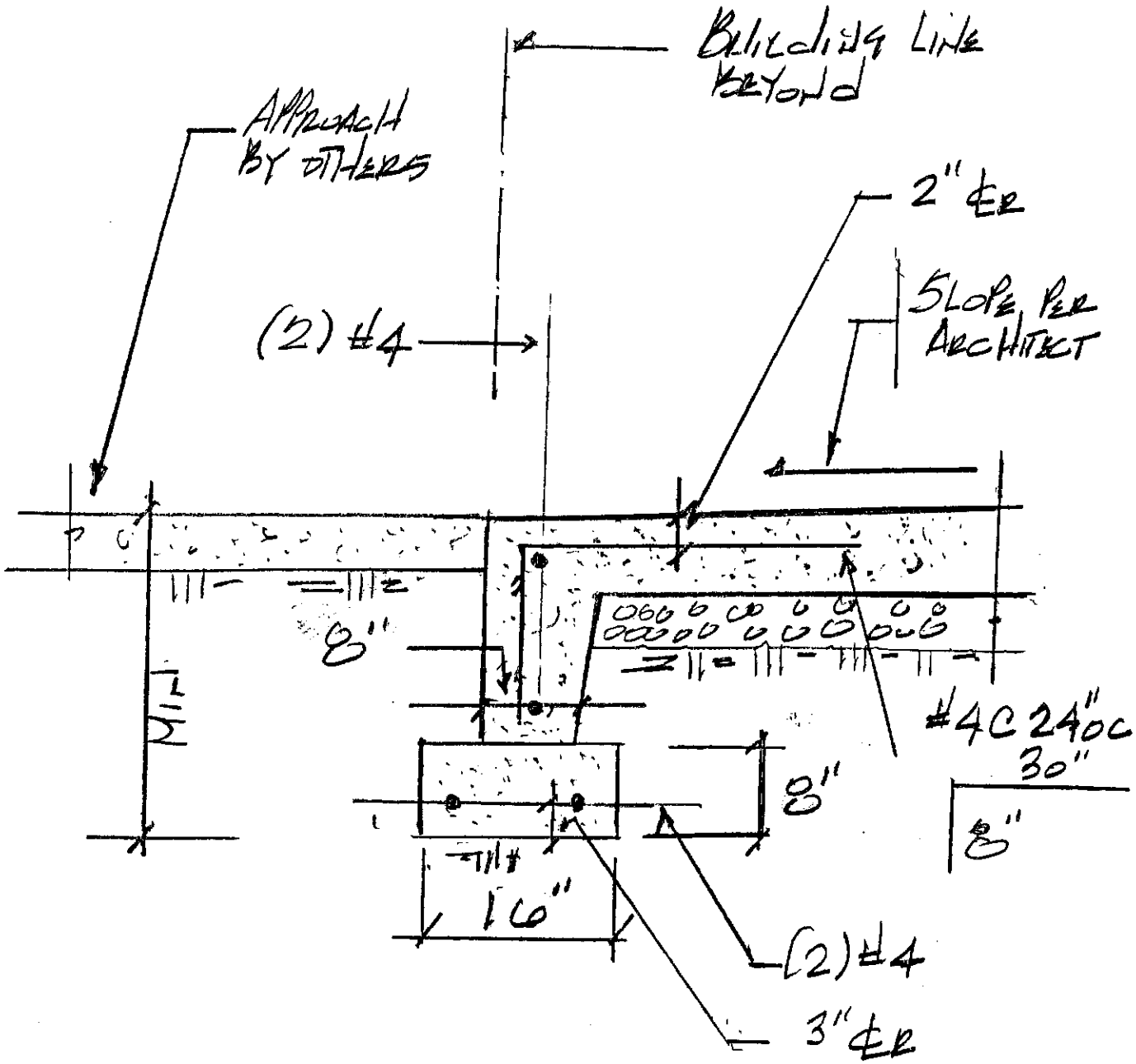
SECTION #17


EXTEND BEAM TO END OF WALL
Edc @ 3"oc
WALL OMITTED FOR CLARITY
INSTALL PLYWOOD VERTICAL STAINING @ DOUBLE TOP PLATE
Edc @ 3"oc TO STUDS & BLOCKING
3x6 STUDS & BLOCKING
SIMPSON STUD14 W/ (30) 16d SINKERS
P.T 3x6 W/(2) 3/4"ø x 12" ANCHOR BOLTS W/ GALV. 3"x3"x1/4" PLATE WASHER
(3) #4 VERTICAL W/ 4" HOOK @ FOOTING
4'-0"
20
17
2'-0"

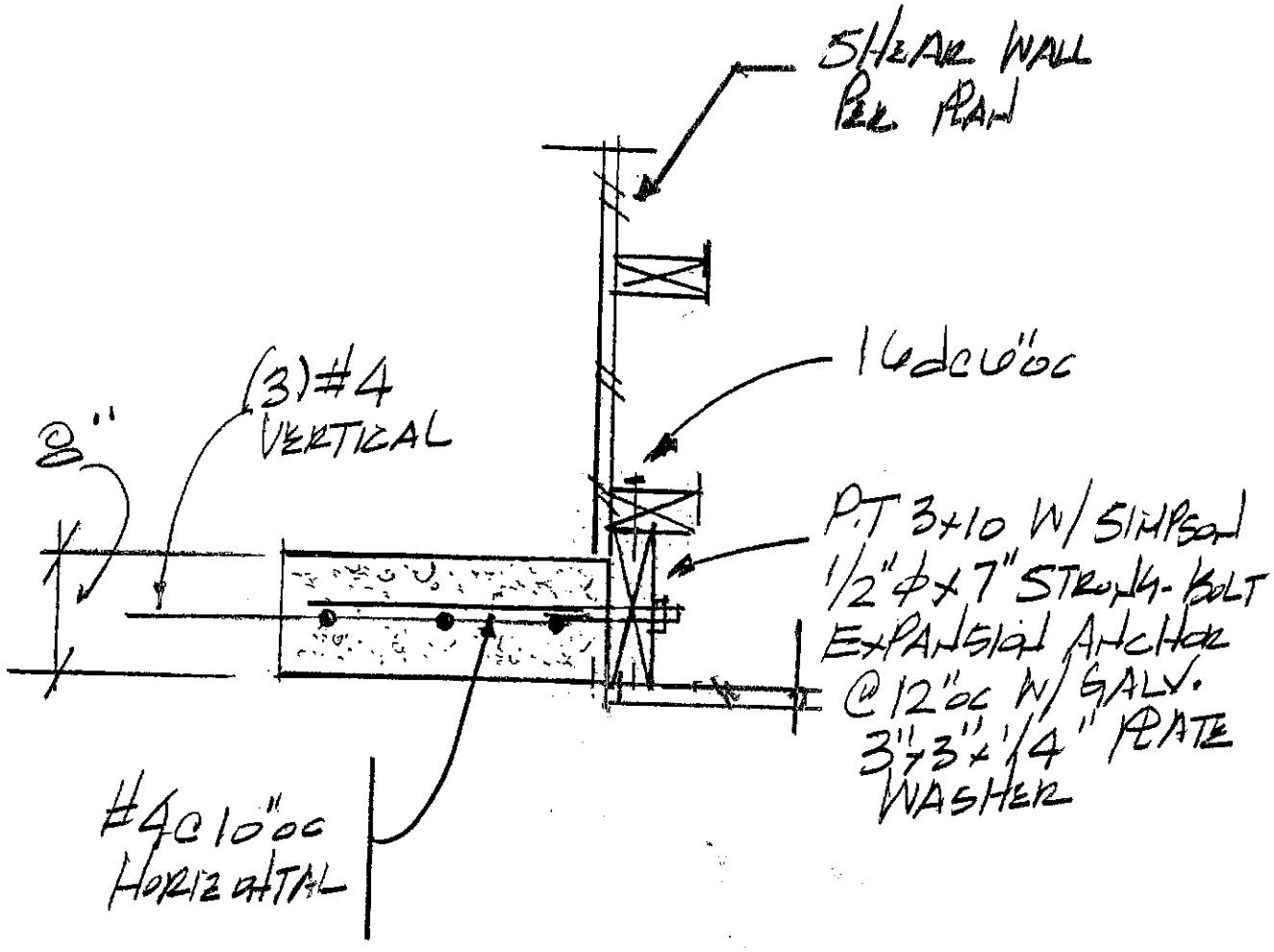
SECTION #18


ROOF OR FLOOR OMITTED FOR CLARITY
2x6 @ 16" o.c.
INSTALL PLYWOOD VERTICAL STIFFENING @ DOUBLE PLATE
EXTEND BEAM TO END OF WALL
2x6 @ 16" o.c.
3x STUDS : BLOCKING
P.T 3x10 W/ (2) 3/4" ϕ x 12" ANCHOR BOLTS W/ GALV. 3"x3"x1/4" PLATE WASHER
STHD14 HOLDOWN W/ (30) 10d NAILS
#4 @ 10" o.c. HORIZ.
(3) #4 VERTICAL W/ 4" HOOK
1'-0"
20

SECTION #19

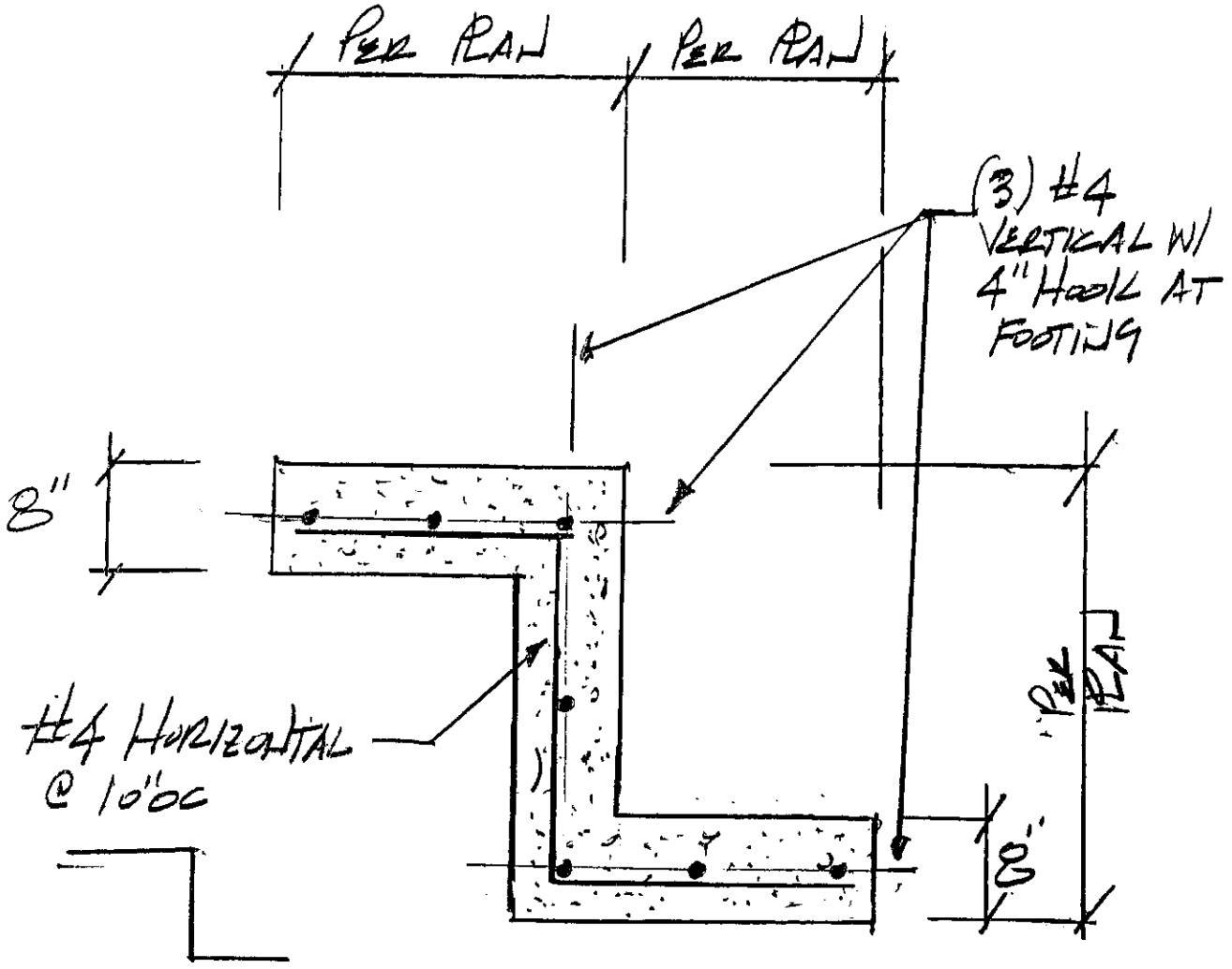

Building Line Beyond
Approach By Others
2" ℄ ER
Slope Per Architect
(2) #4
8"
#4 C 24" oc
30"
8"
8"
16"
(2) #4
3" ℄ ER

Section #20



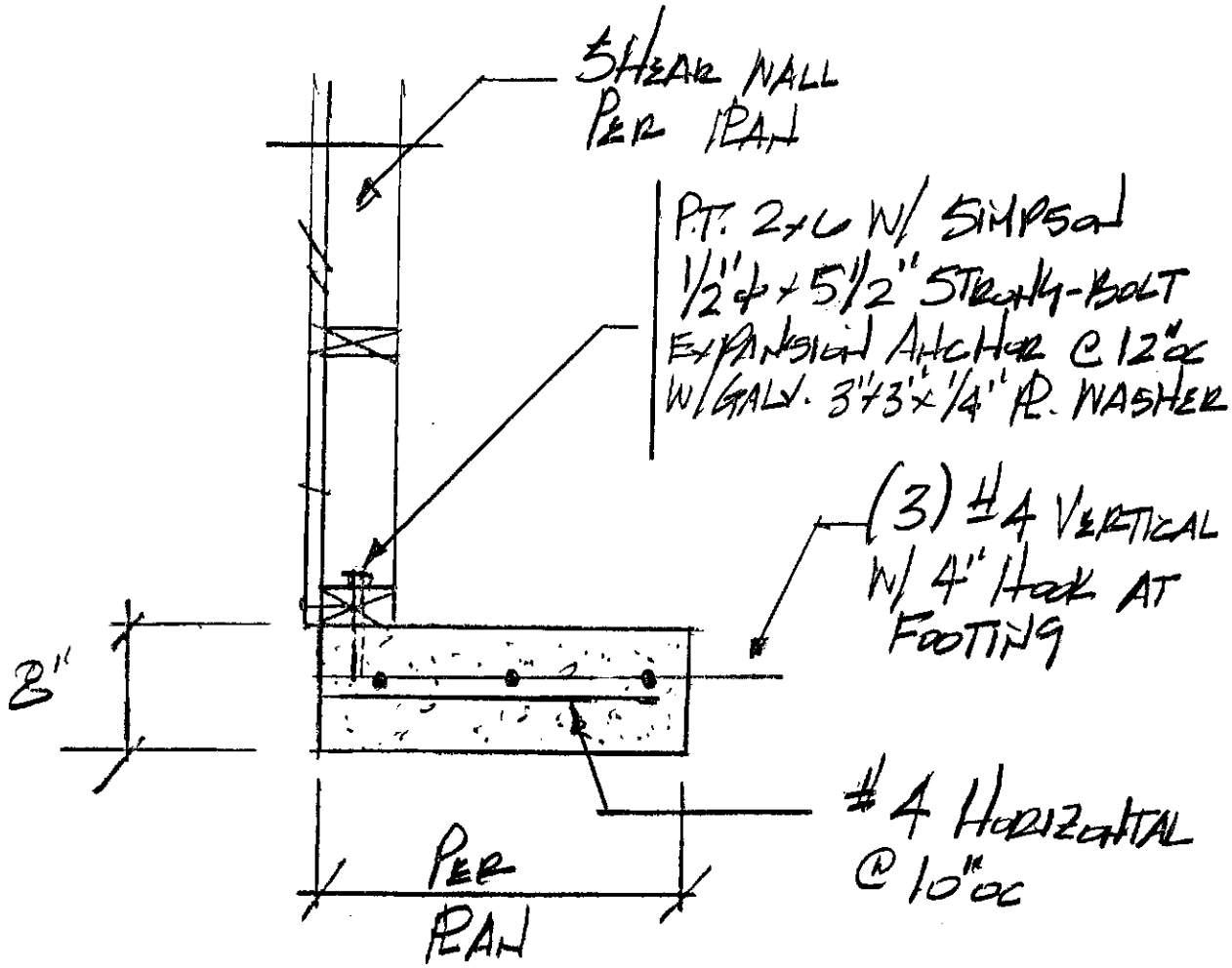
PLAN

DETAIL # 21



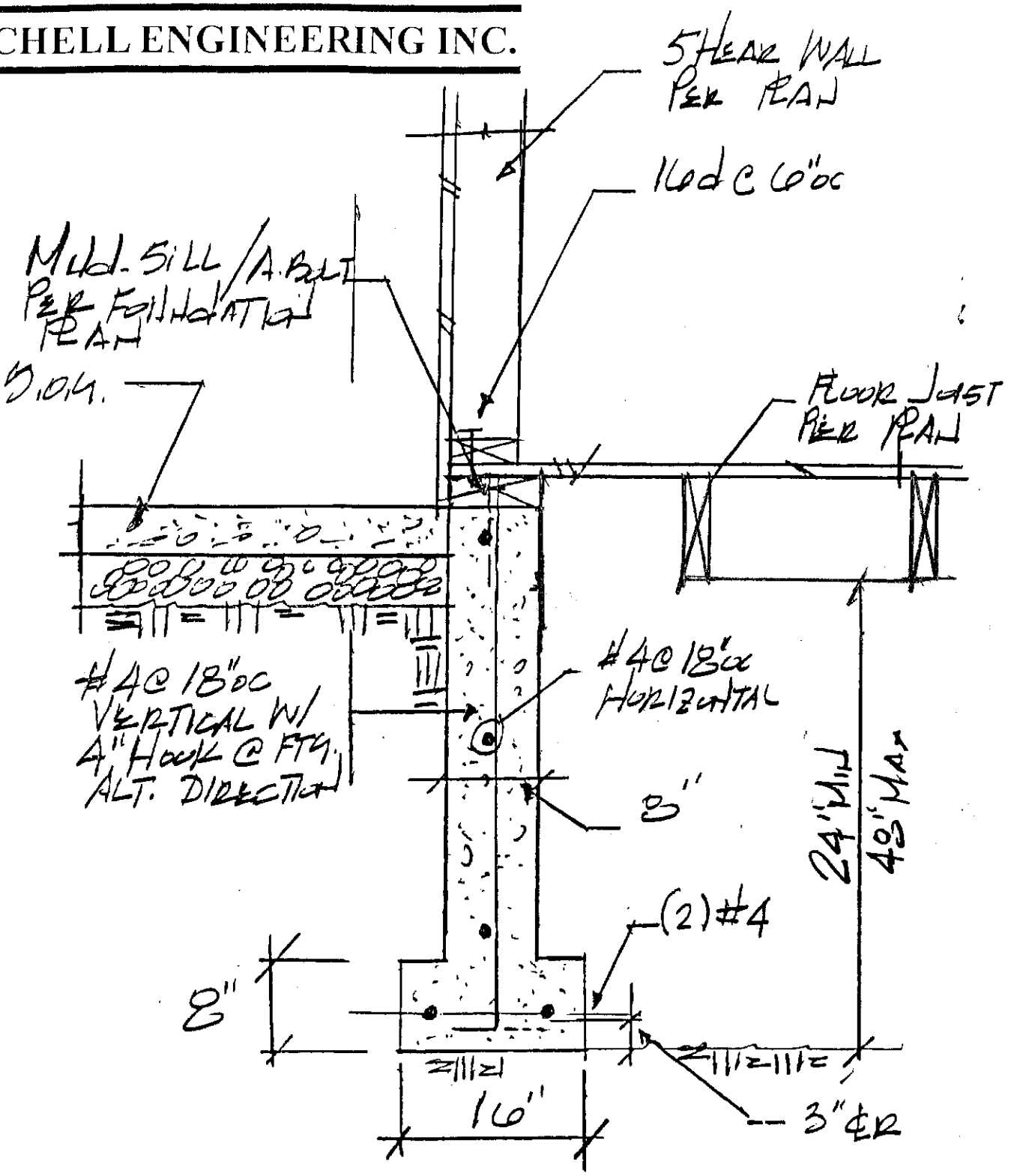
PLAN

DETAIL #22

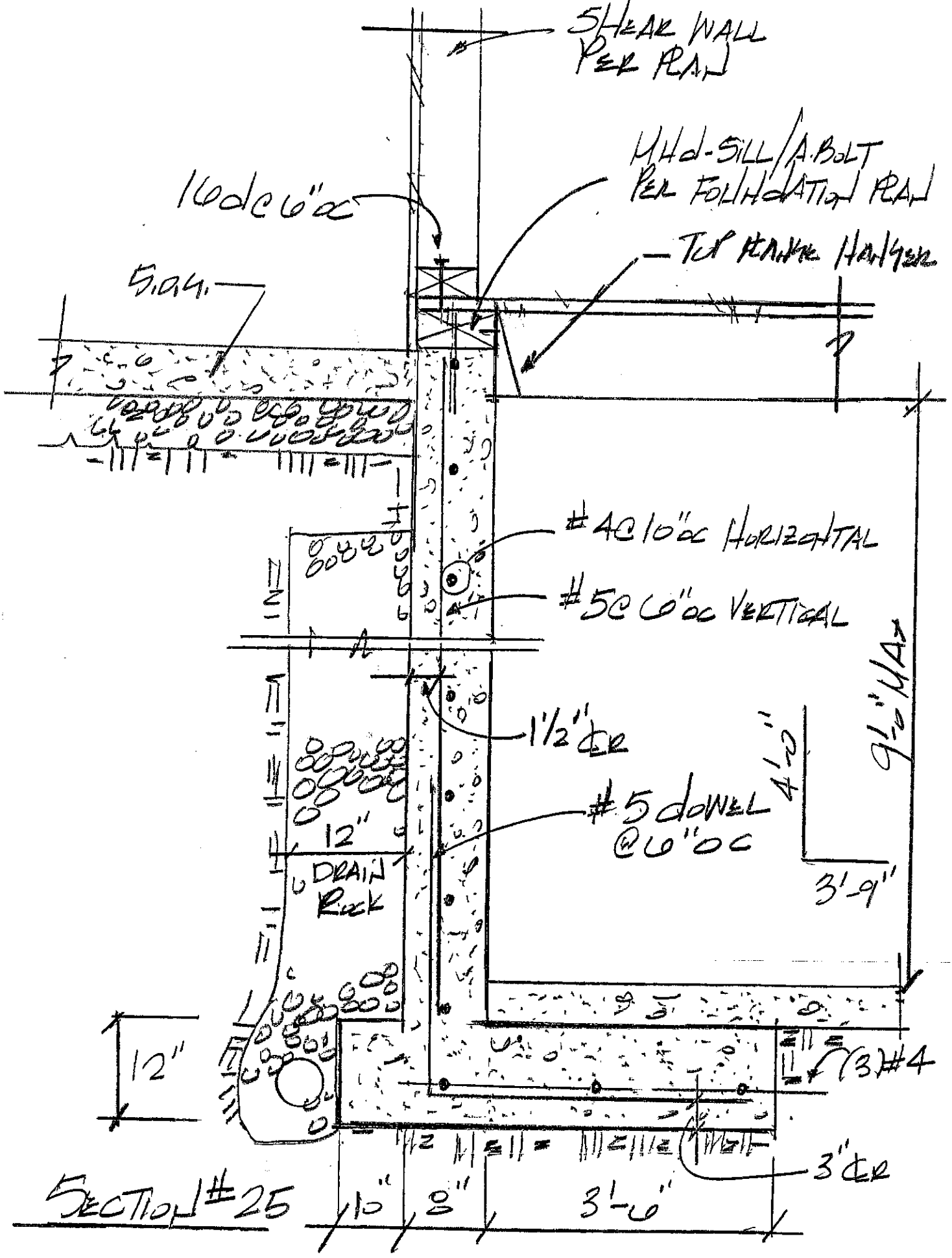


PLAN

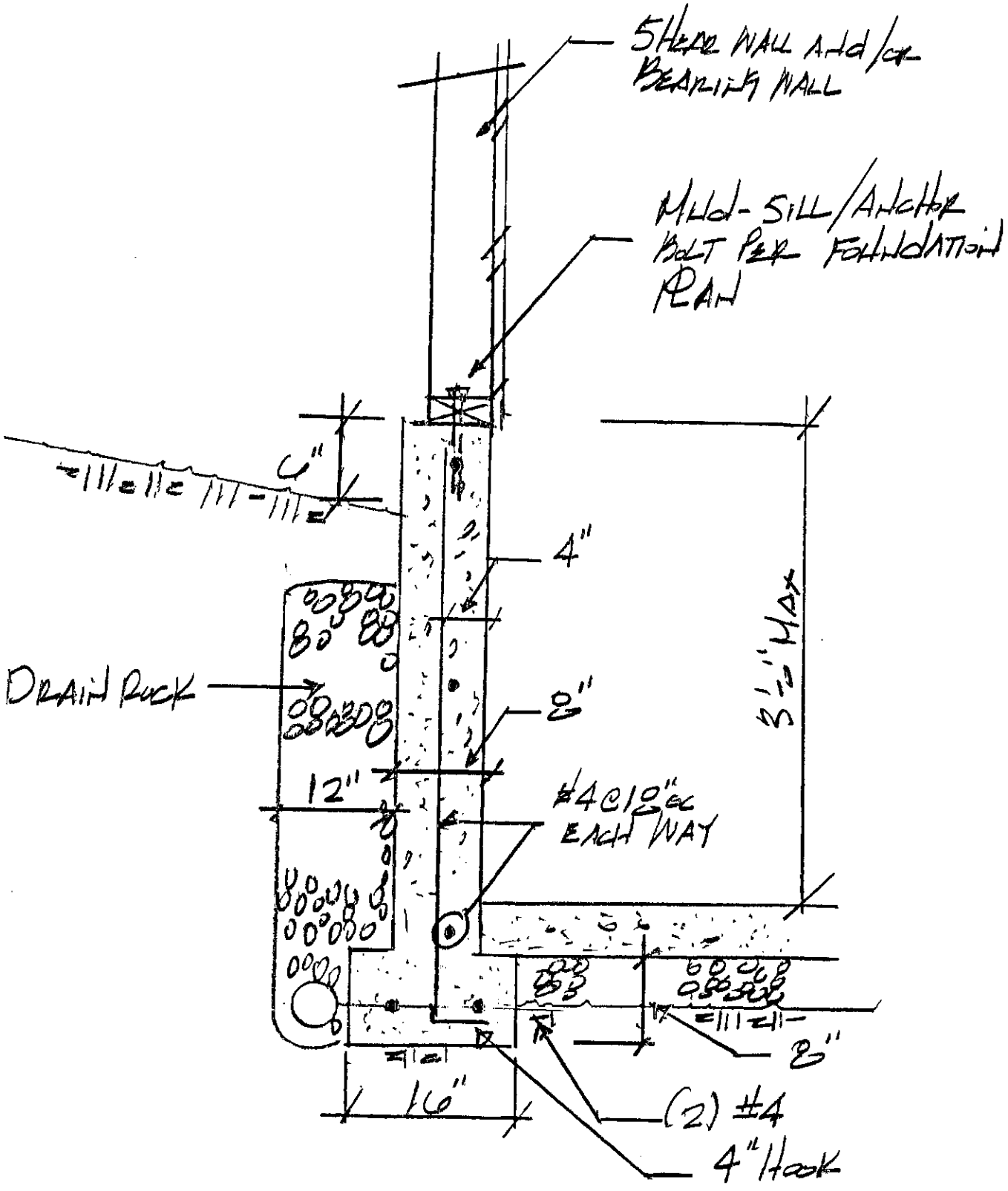
DETAIL # 23


SHEAR WALL PER PLAN
16d @ 6"oc
MUD SILL / A.BLT PER FOUNDATION PLAN
S.O.G.
FLOOR JOIST PER PLAN
#4 @ 18"oc VERTICAL W/ 4" HOOK @ FTG. ALT. DIRECTION
#4 @ 18"oc HORIZONTAL
8"
24" MIN
48" MAX
(2) #4
8"
16"
3" CLR

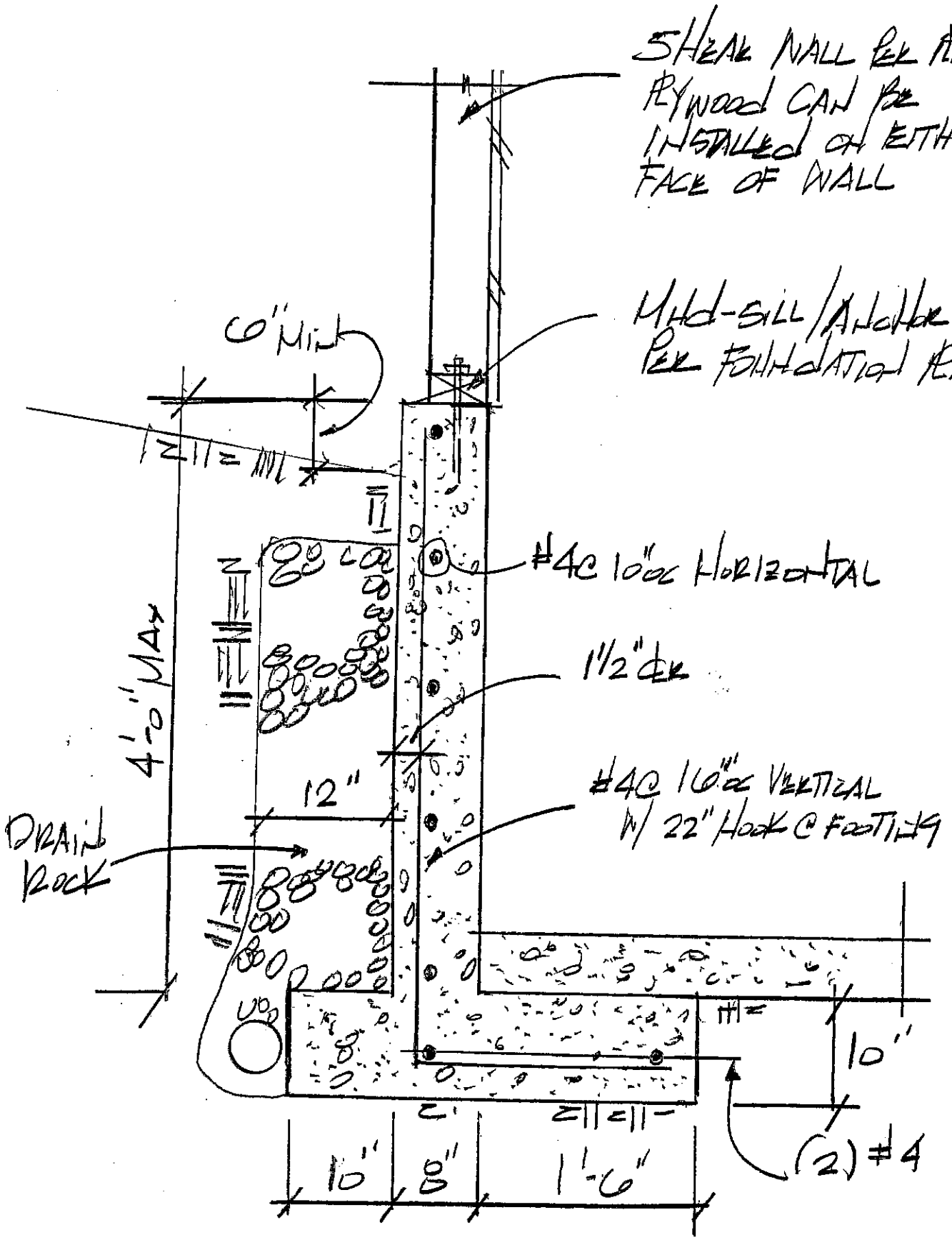
SECTION #24


SHEAR WALL PER PLAN
HHd-SILL/A.BOLT PER FOUNDATION PLAN
16dc 6"oc
TOP PLATE HARDWARE
SLAB
#4@10"oc HORIZONTAL
#5@6"oc VERTICAL
1½" CLR
#5 DOWEL @6"oc
4'-2"
9'-0" MAX
3'-9"
12"
DRAIN ROCK
12"
(3)#4
3" CLR
10"
8"
3'-0"

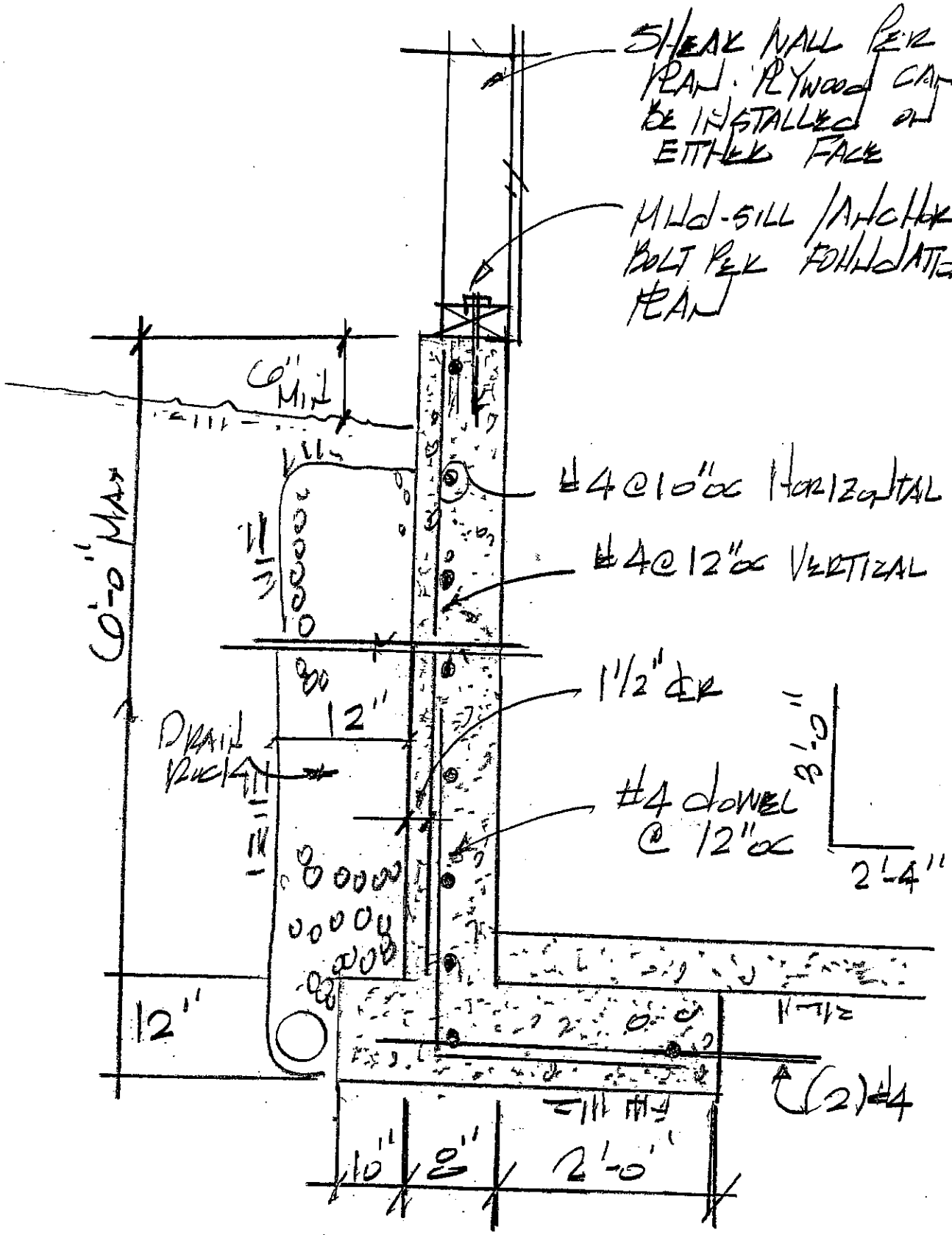
SECTION #25


SHEAR WALL AND/OR BEARING WALL
MUD-SILL/ANCHOR BOLT PER FOUNDATION PLAN
6"
4"
DRAIN ROCK
8"
12"
#4@10" oc EACH WAY
3'-11" MAX
8"
16"
(2) #4
4" Hook

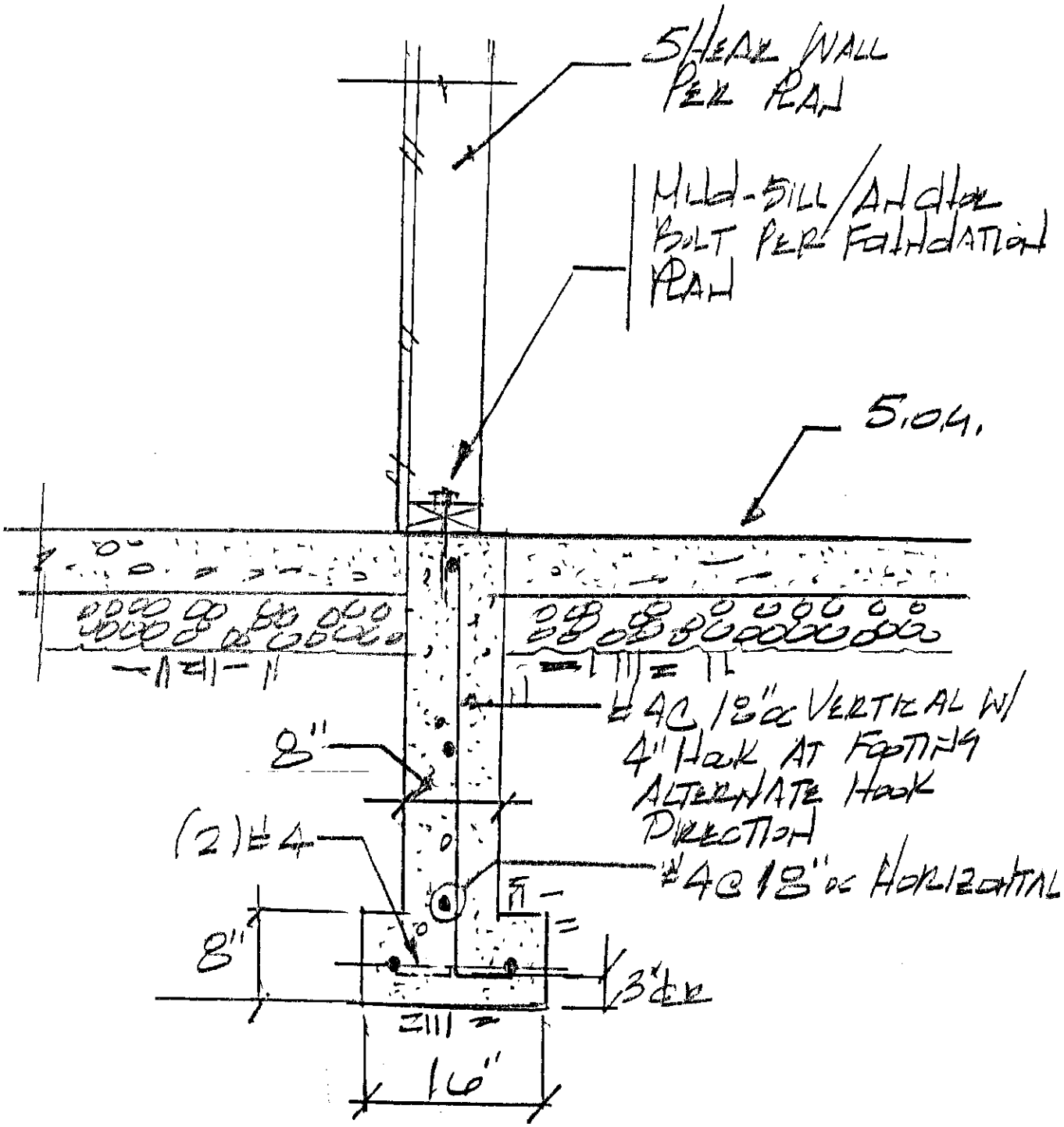
SECTION #26


SHEAR WALL PER PLAN
PLYWOOD CAN BE INSTALLED ON EITHER FACE OF WALL
MUD-SILL/ANCHOR-BOLT PER FOUNDATION PLAN
6" MIN
#4 @ 10" oc HORIZONTAL
1 1/2" CLR
4'-0" MAX
12"
#4 @ 16" oc VERTICAL W/ 22" HOOK @ FOOTING
DRAIN ROCK
10"
10"
8"
1'-6"
(2) #4

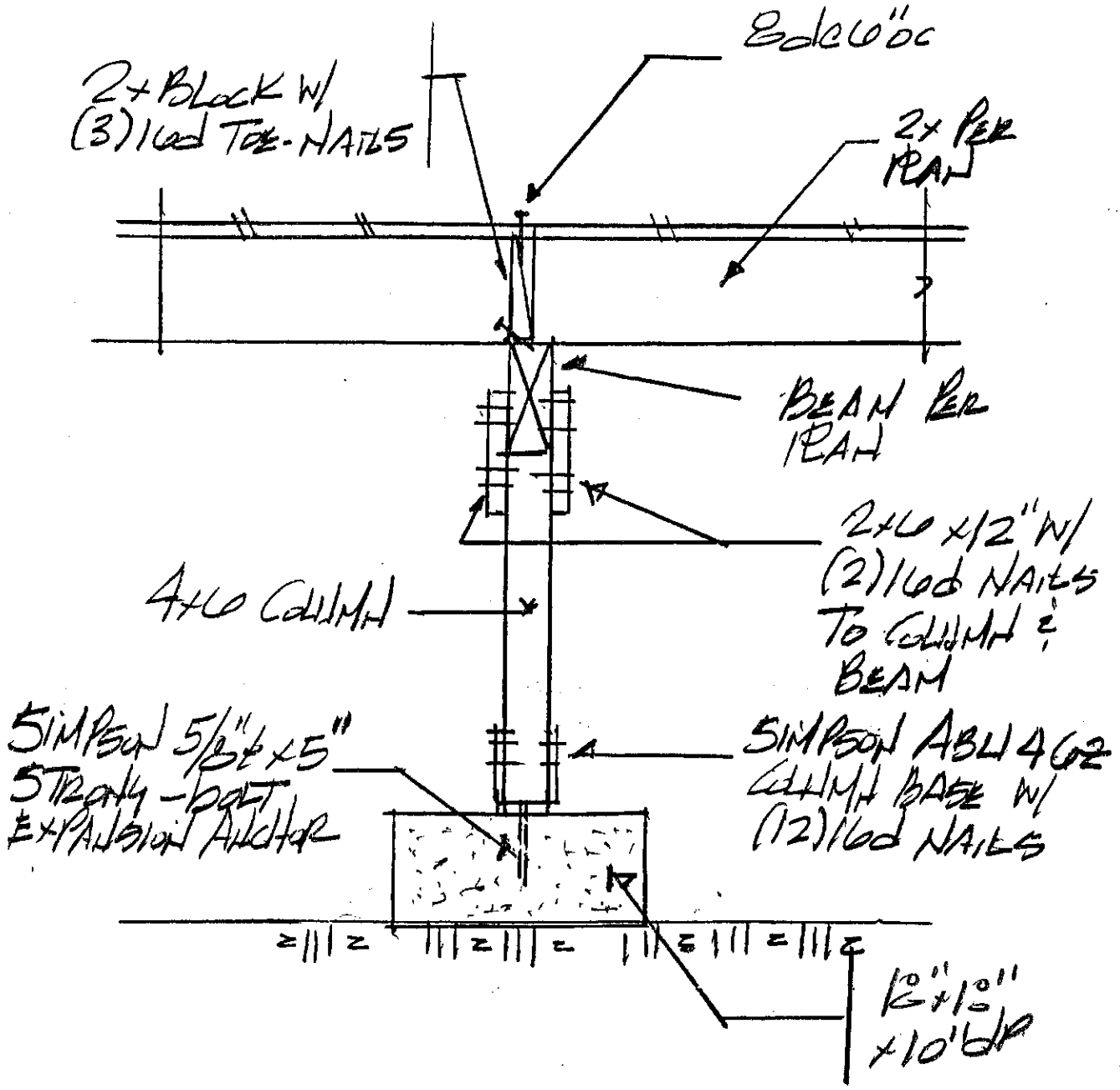
SECTION #21


SHEAR WALL PER PLAN. PLYWOOD CAN BE INSTALLED ON EITHER FACE
MUD-SILL / ANCHOR BOLT PER FOUNDATION PLAN
6" MIN
#4 @ 10" oc HORIZONTAL
#4 @ 12" oc VERTICAL
6'-0" MAX
1 1/2" CLR
12"
DRAIN ROCK
#4 DOWEL @ 12" oc
3'-0"
2'-4"
12"
1'-1 1/2"
(2) #4
10"
8"
2'-0"

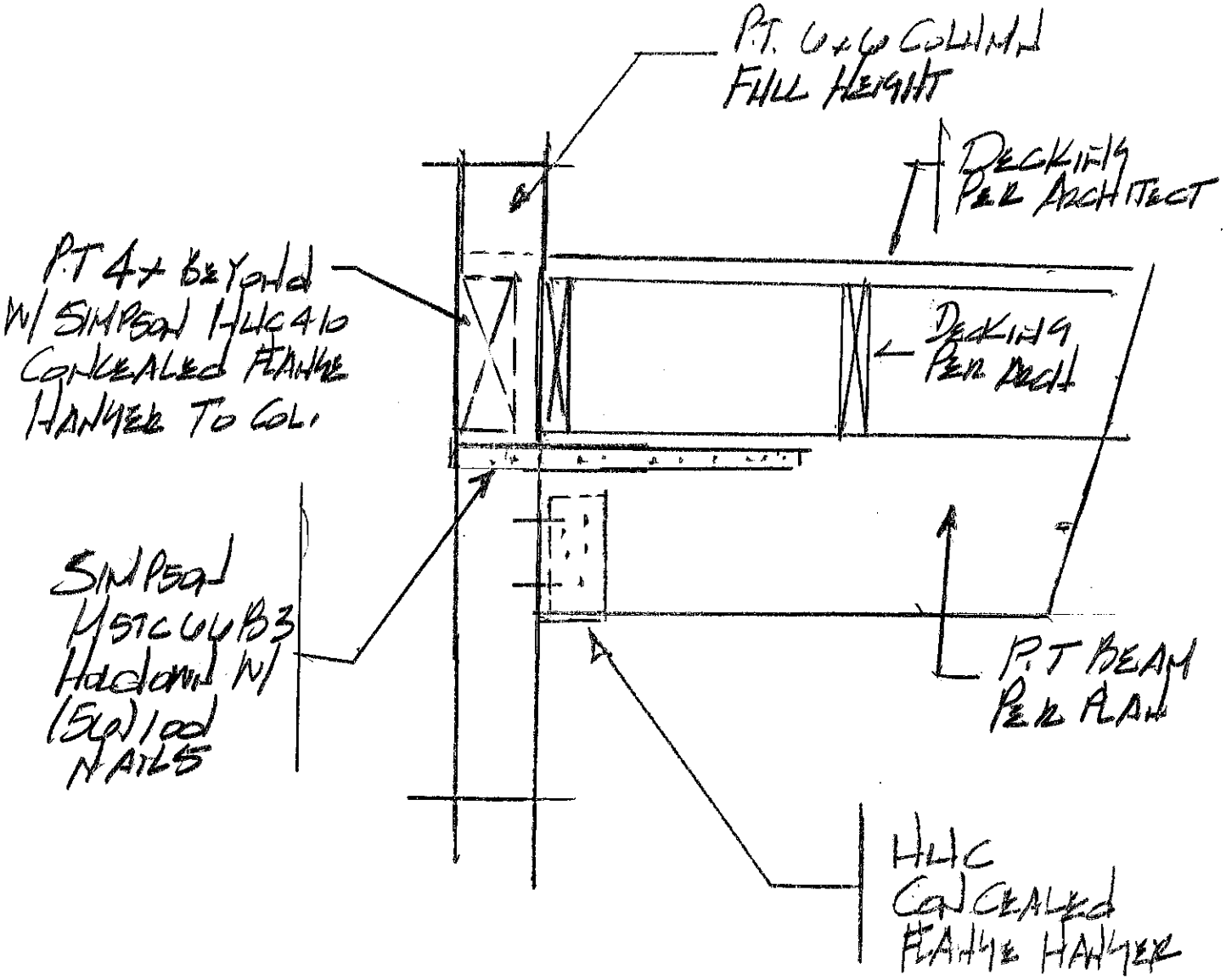
SECTION #22


5/ HEAD WALL PER PLAN
MUD-SILL/ ANCHOR BOLT PER FOUNDATION PLAN
5.0.G.
#4 @ 18" oc VERTICAL W/ 4" HOOK AT FOOTING ALTERNATE HOOK DIRECTION
8"
(2) #4
#4 @ 18" oc HORIZONTAL
8"
3" CLR
16"

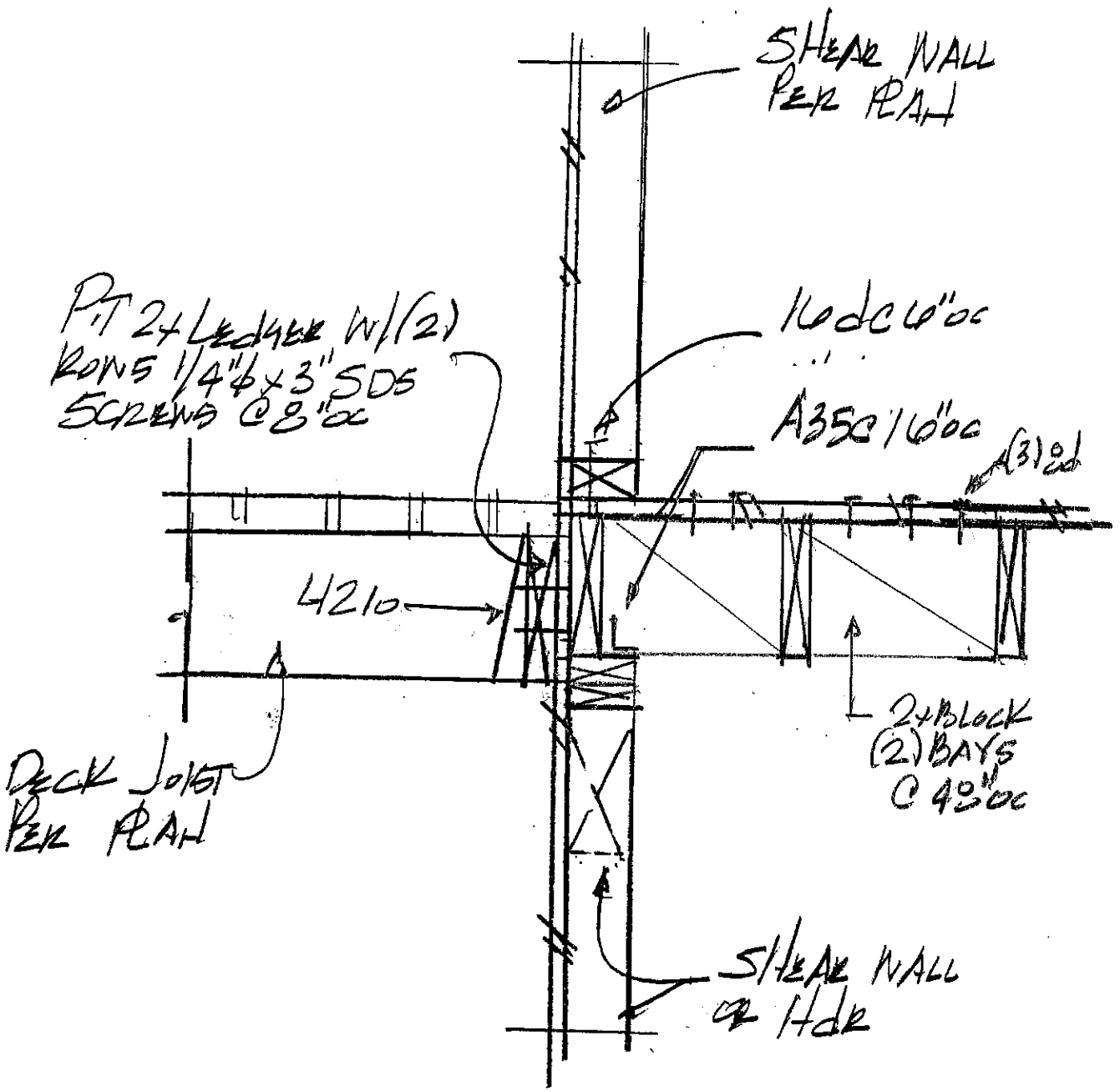
SECTION # 29


8 @ 6" oc
2x Block w/
(3) 16d Toe-Nails
2x Rim
Joist
Beam Per
Plan
2x6 x 12" w/
(2) 16d Nails
To Col/Mt &
Beam
4x6 Col/Mt
Simpson ABU 46Z
Col/Mt Base w/
(12) 16d Nails
Simpson 5/8" Ø x 5"
Strong-Bolt
Expansion Anchor
12" x 10"
x 10' Ftg

Section # 30


P.T. 6x6 COLUMN FULL HEIGHT
DECKING PER ARCHITECT
P.T 4x BEYOND W/ SIMPSON HUC410 CONCEALED FLANGE HANGER TO COL.
DECKING PER DECK
SIMPSON MSTC40YB3 HOLDOWN W/ (52) 10d NAILS
P.T BEAM PER PLAN
HUC CONCEALED FLANGE HANGER

Section #31


SHEAR WALL PER PLAN
P.T 2x LEDGER W/(2) ROWS 1/4"ø x 3" SDS SCREWS @ 8" oc
16dc 6" oc
A35 @ 16" oc
(3) 2x
4210
DECK JOIST PER PLAN
2x BLOCK (2) BAYS @ 48" oc
SHEAR WALL OR HDR

SECTION # 32

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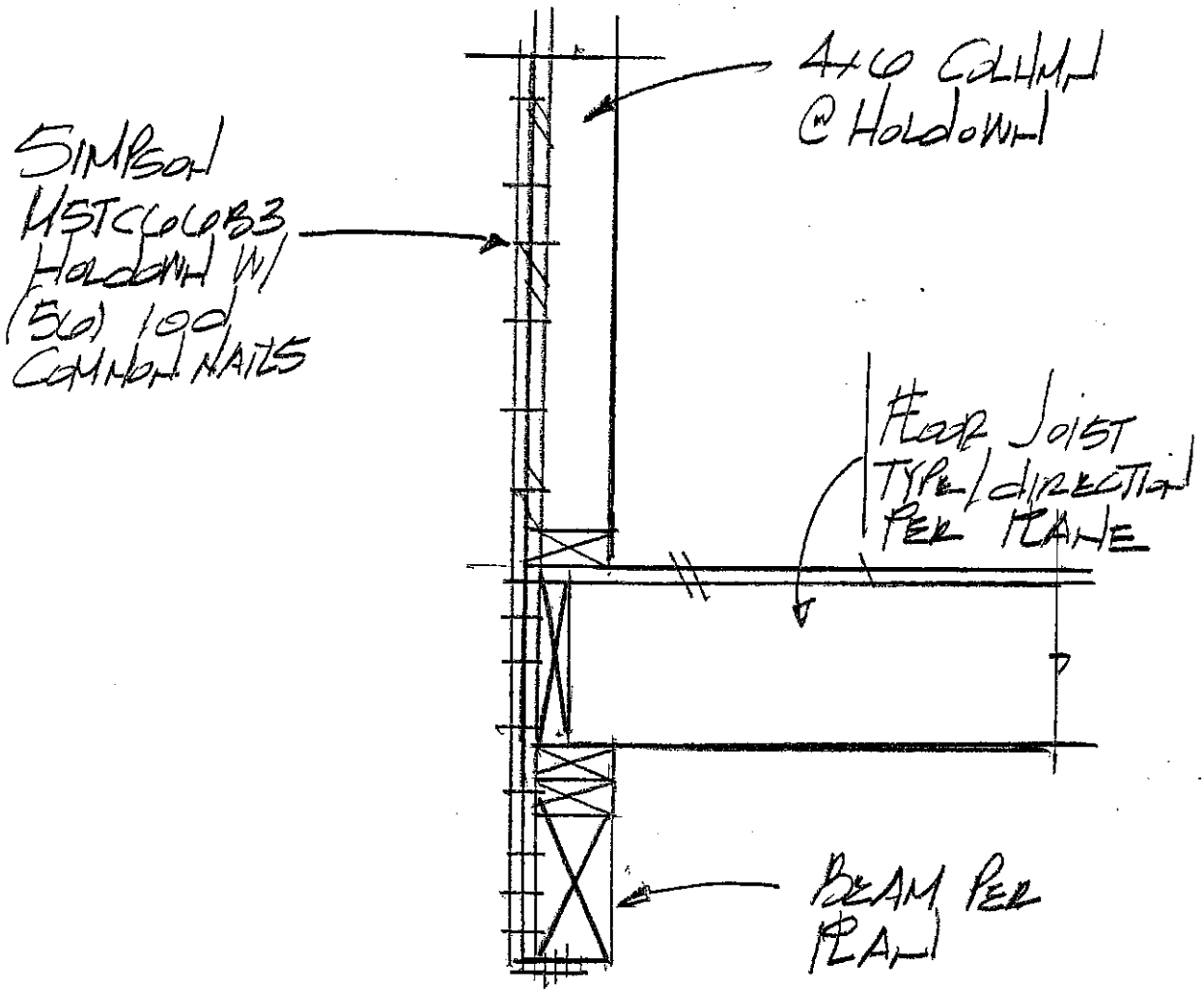
mitchellengineeringinc@comcast.net



SECTION #33

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No Section
#34

PREPARED BY _____ PROJECT _____ SHEET NO. ____ OF ____

DATE _____ SUBJECT _____ JOB NO. _____

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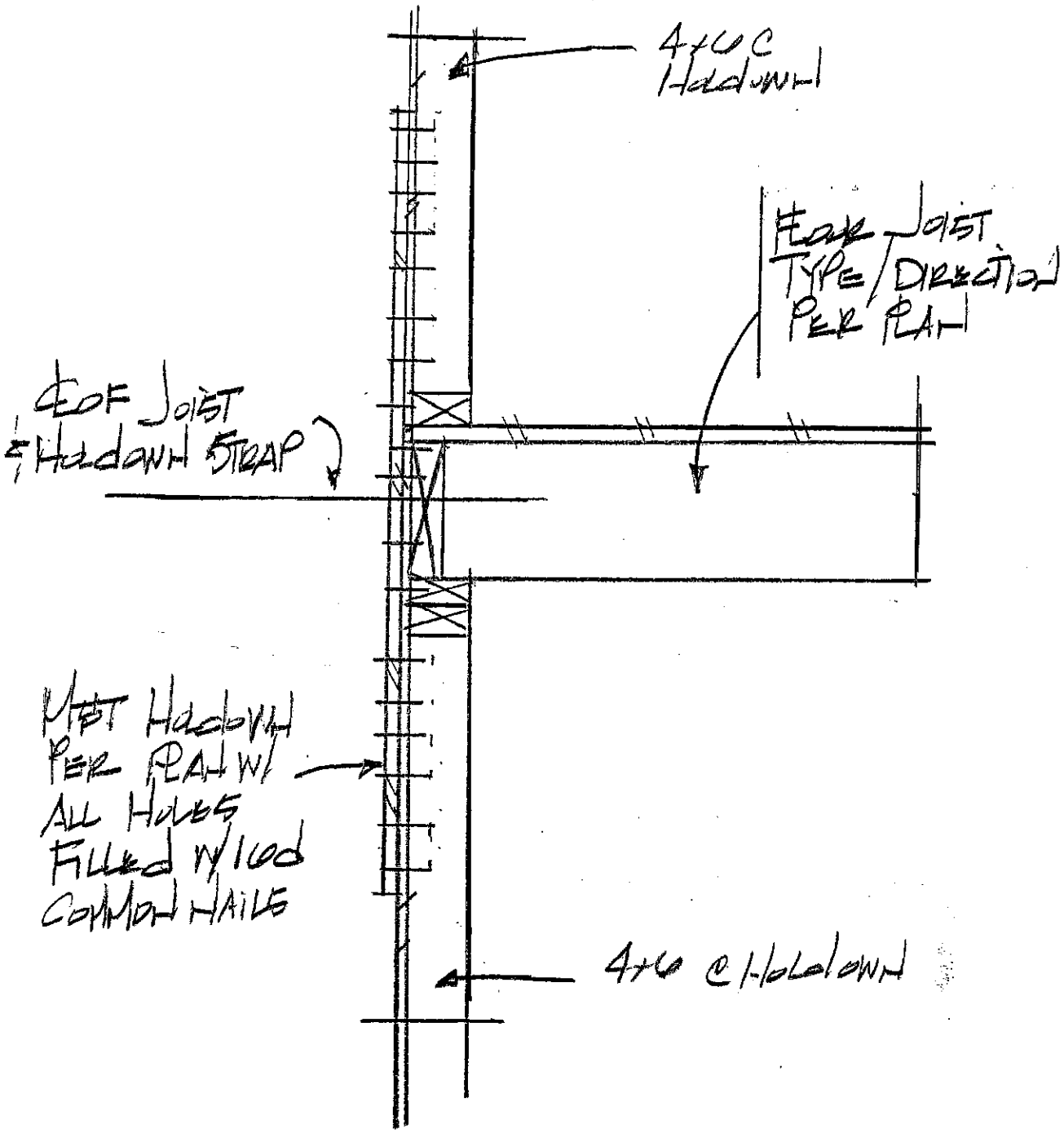
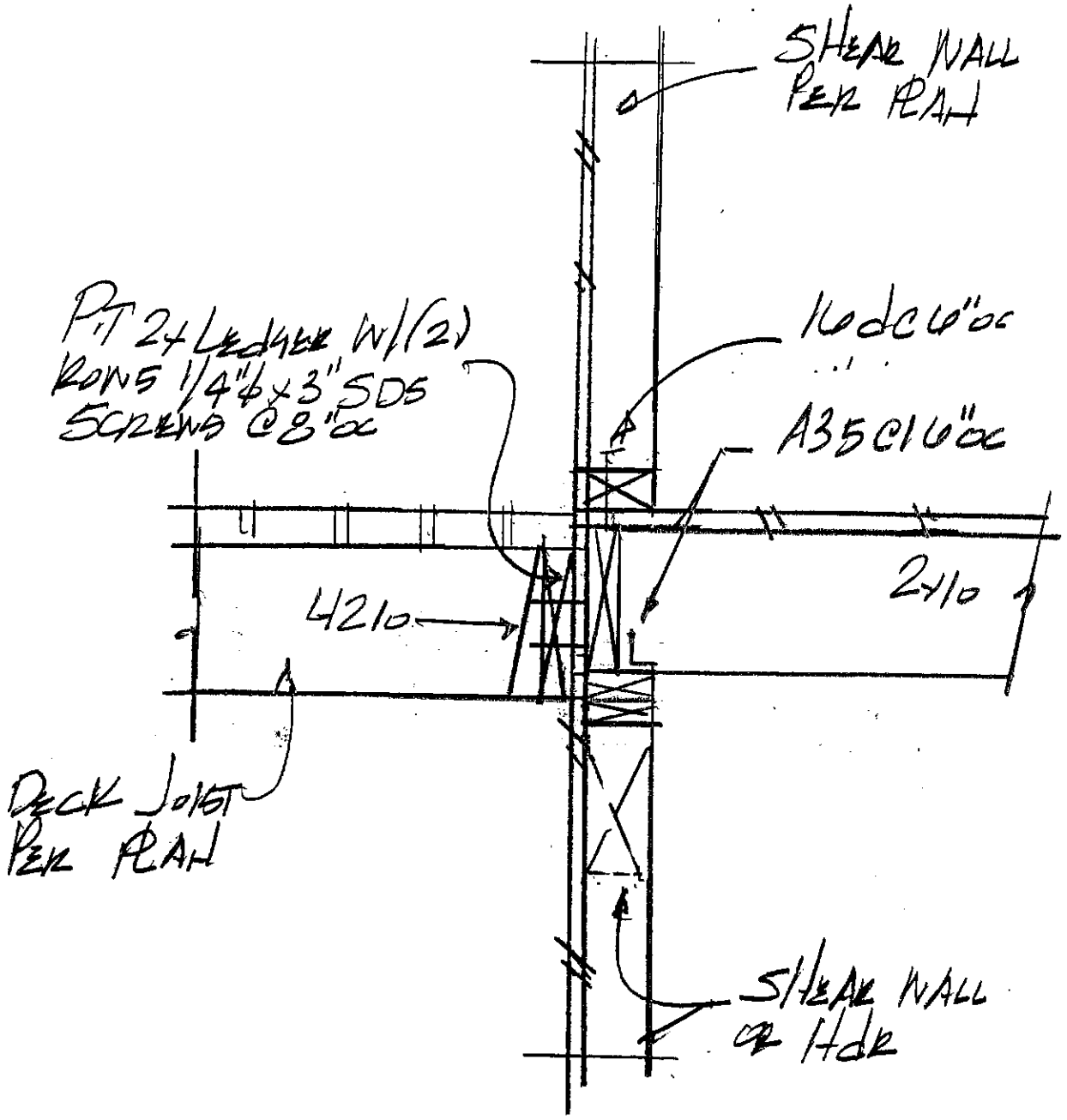


SECTION #35


SHEAR WALL PER PLAN
P.T 2x LEDGER W/(2) ROWS 1/4"ϕx3" SDS SCREWS @8"oc
16dc16"oc
A35@16"oc
2x10
4x10
DECK JOIST PER PLAN
SHEAR WALL OR HDR

SECTION #30

MITCHELL ENGINEERING INC.

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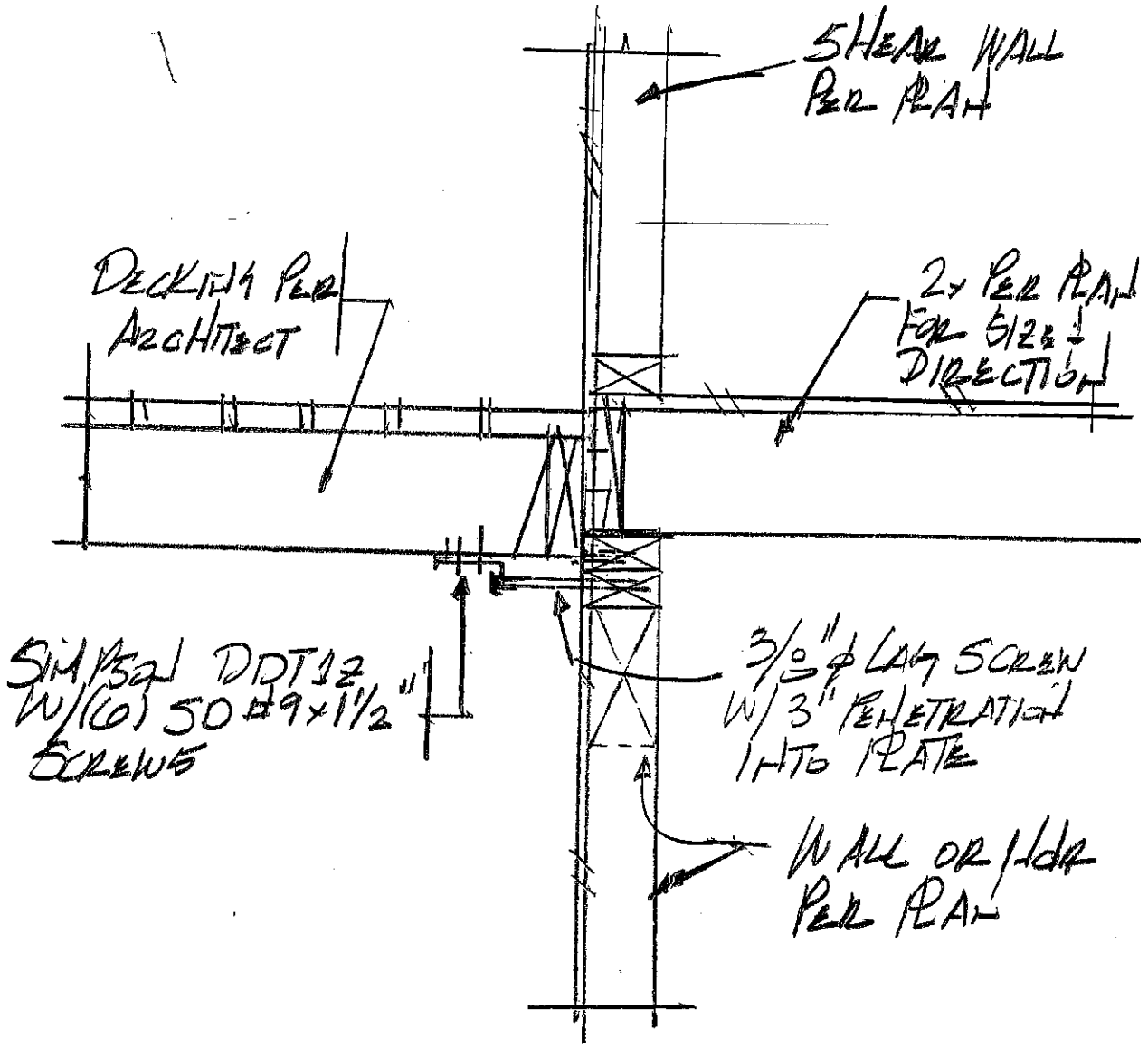
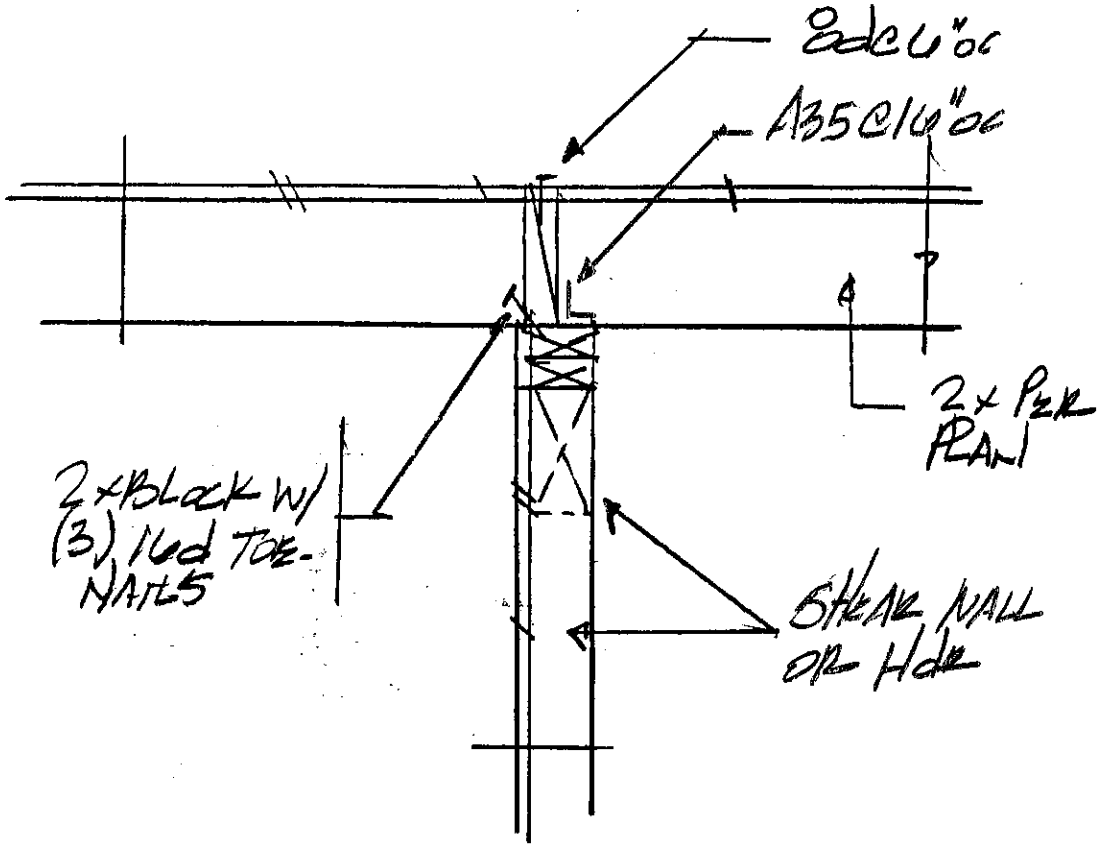
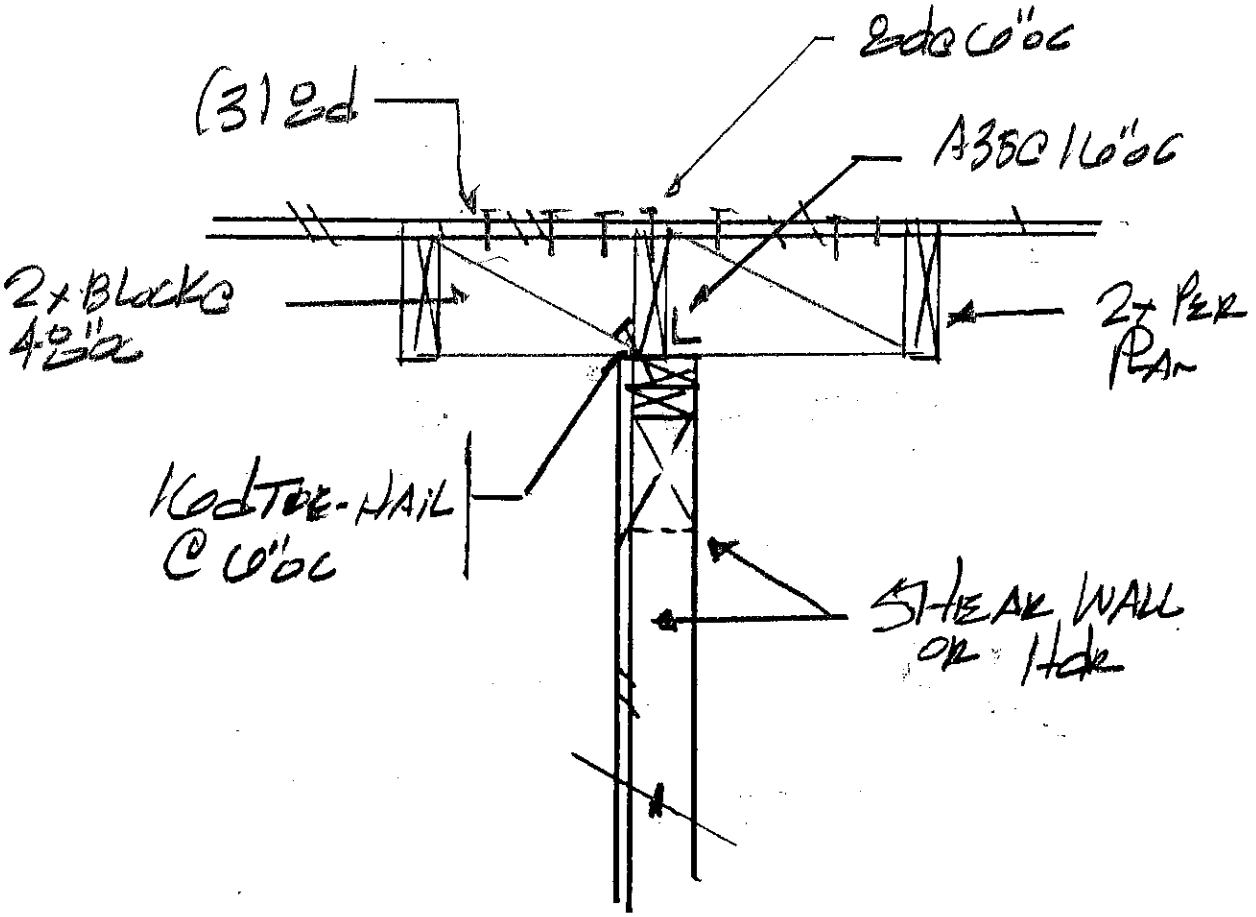


Section #37

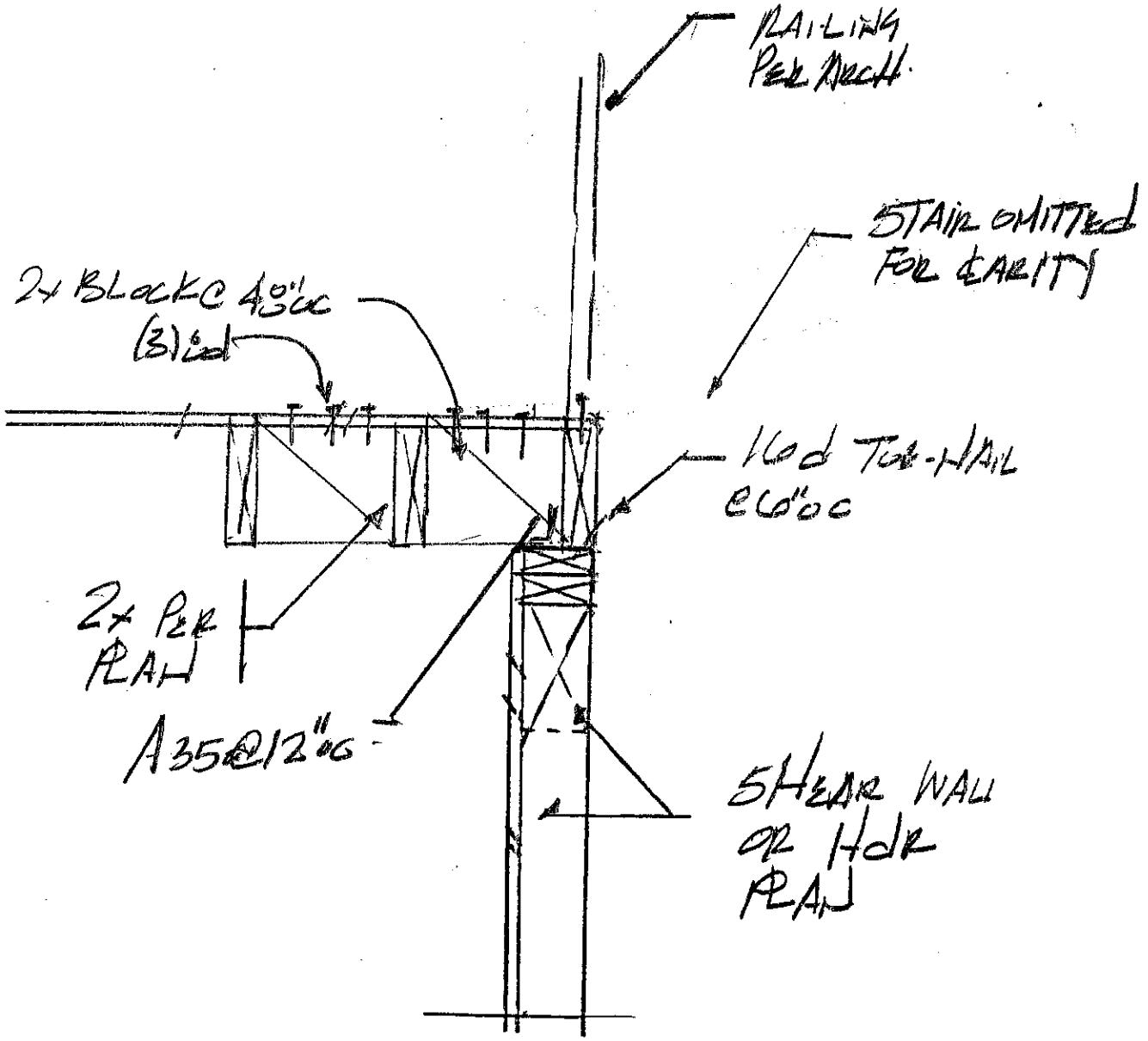
Ca


Edge 6" oc
A35 @ 16" oc
2x PLATE
2x BLOCK W/ (3) 16d TOE-NAILS
SHEAR WALL OR HOLD

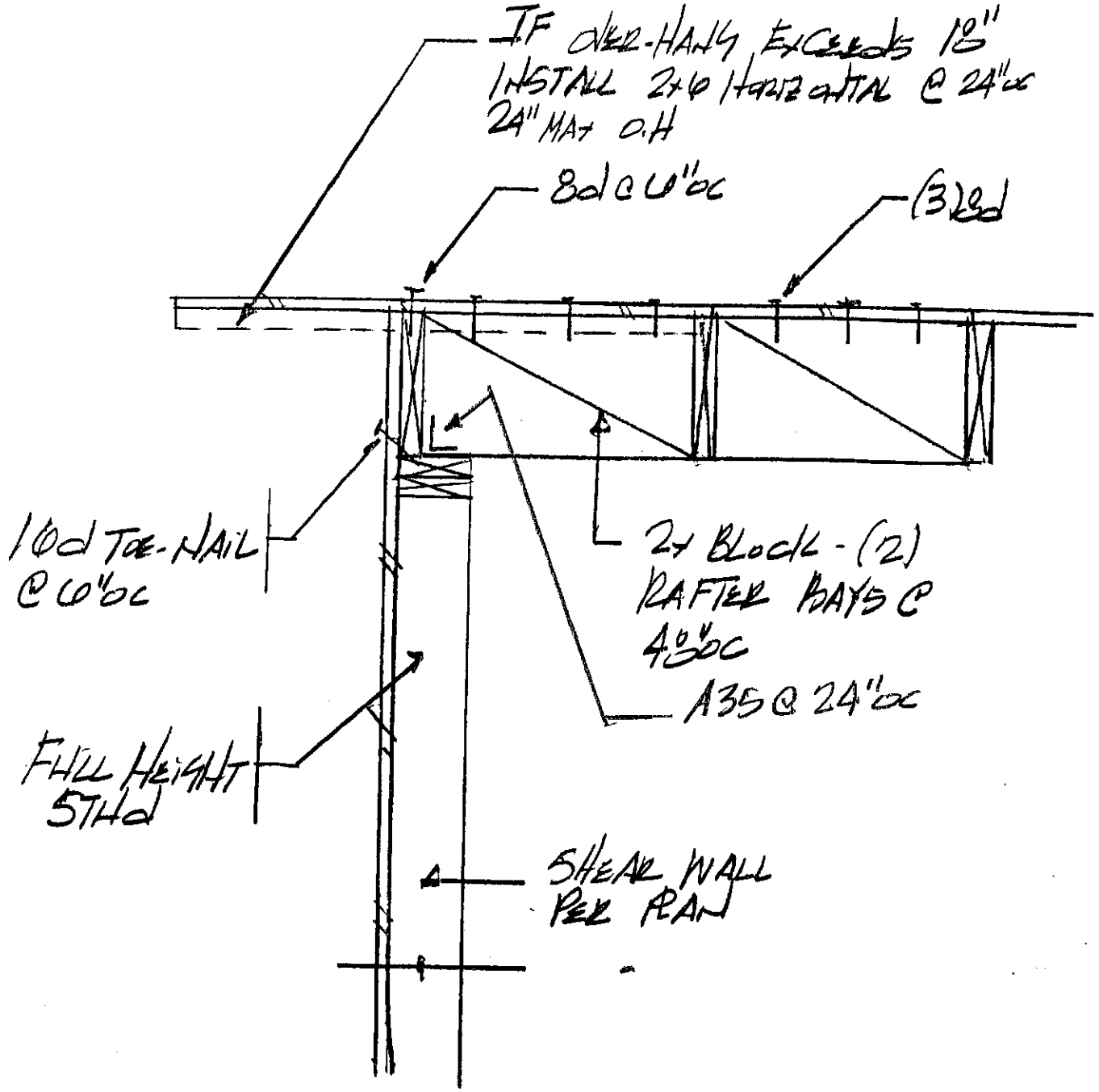
SECTION #30


(3) 8d
8d @ 6" oc
A35 @ 16" oc
2x Blocks
4-2x
2x PER PLAN
HOLDTITE-NAIL
@ 6" oc
SHEAR WALL
OR HDR

SECTION #39


RAILING PER ARCH.
STAIR OMITTED FOR CLARITY
2x BLOCK @ 40"oc (3) 16d
16d TOE-NAIL @ 6"o c
2x PER PLAN
A35 @ 12"oc
SHEAR WALL OR HDR PLAN

SECTION # 40


IF OVER-HANG EXCEEDS 12"
INSTALL 2x6 HORIZONTAL @ 24" oc
24" MAX O.H
8d @ 6" oc
(3) 8d
16d TOE-NAIL
@ 6" oc
2x BLOCK - (2)
RAFTER BAYS @
4'-0" oc
A35 @ 24" oc
FULL HEIGHT
STUD
SHEAR WALL
PER PLAN

SECTION #41

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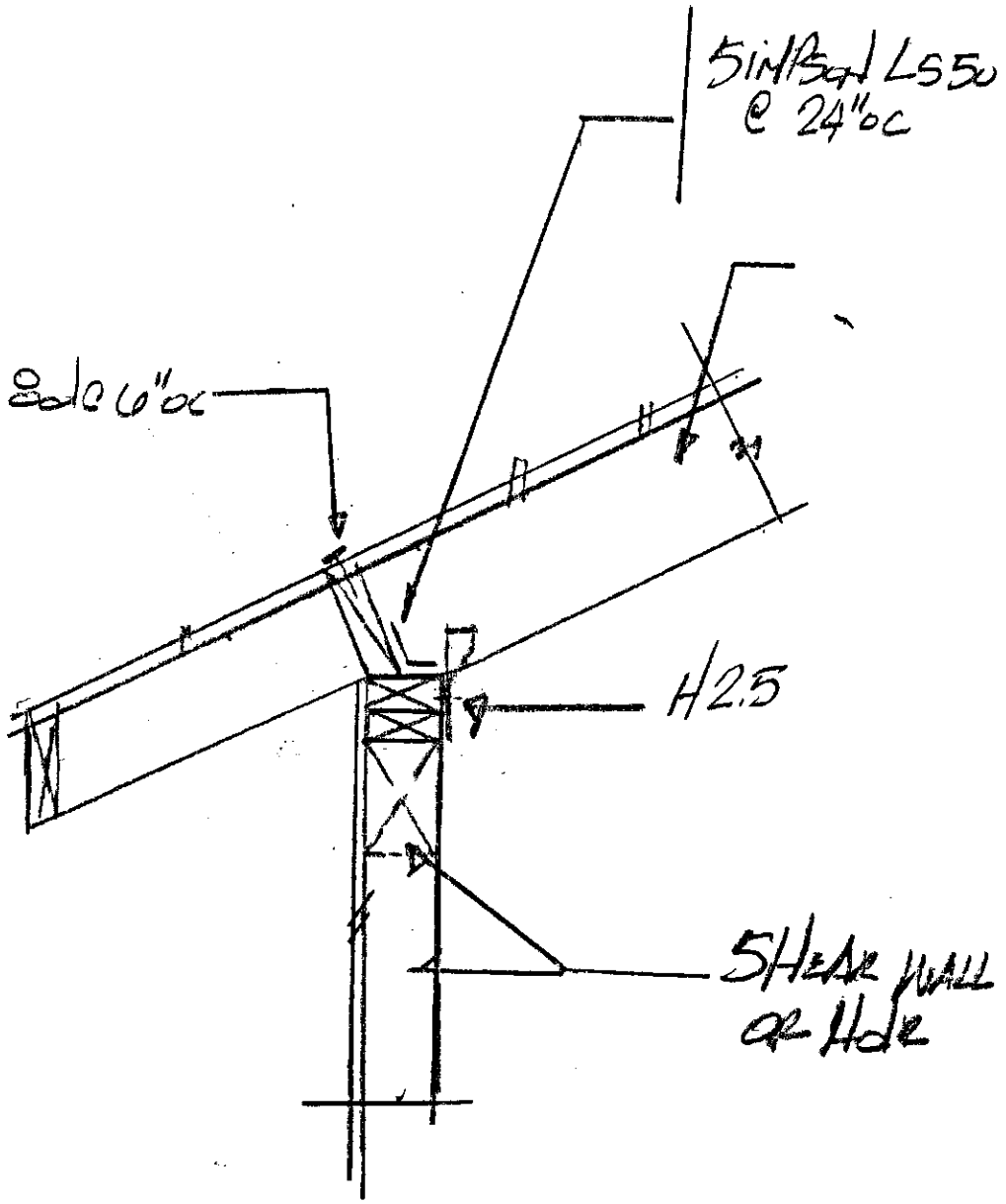
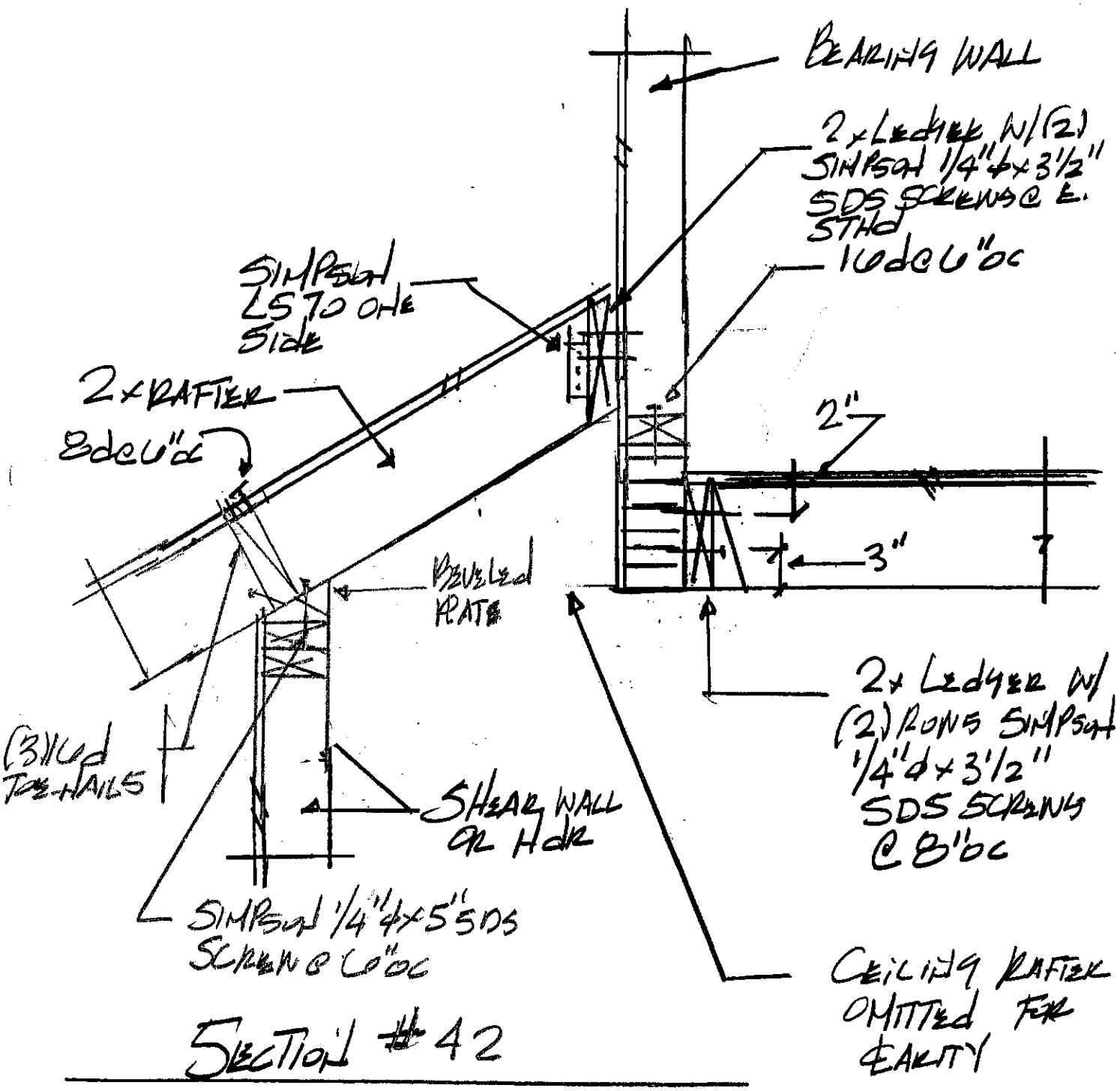


SECTION #41A

MITCHELL ENGINEERING INC.



SECTION #42

MITCHELL ENGINEERING INC.

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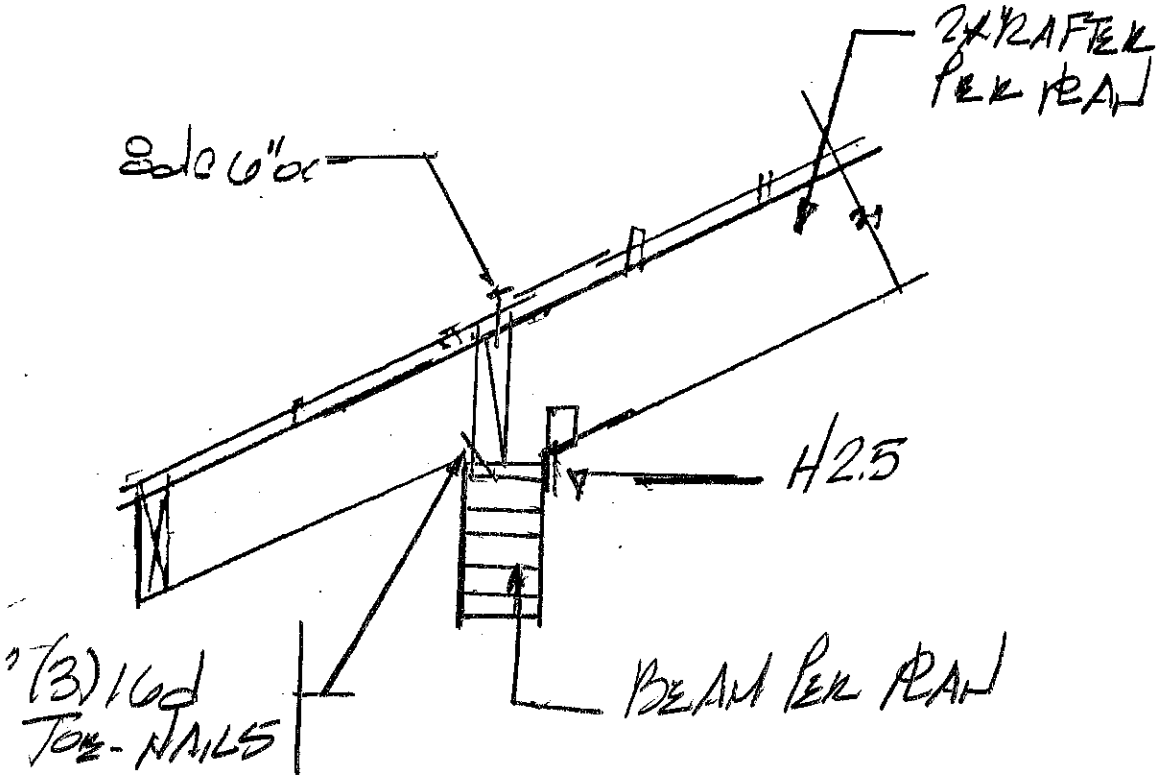
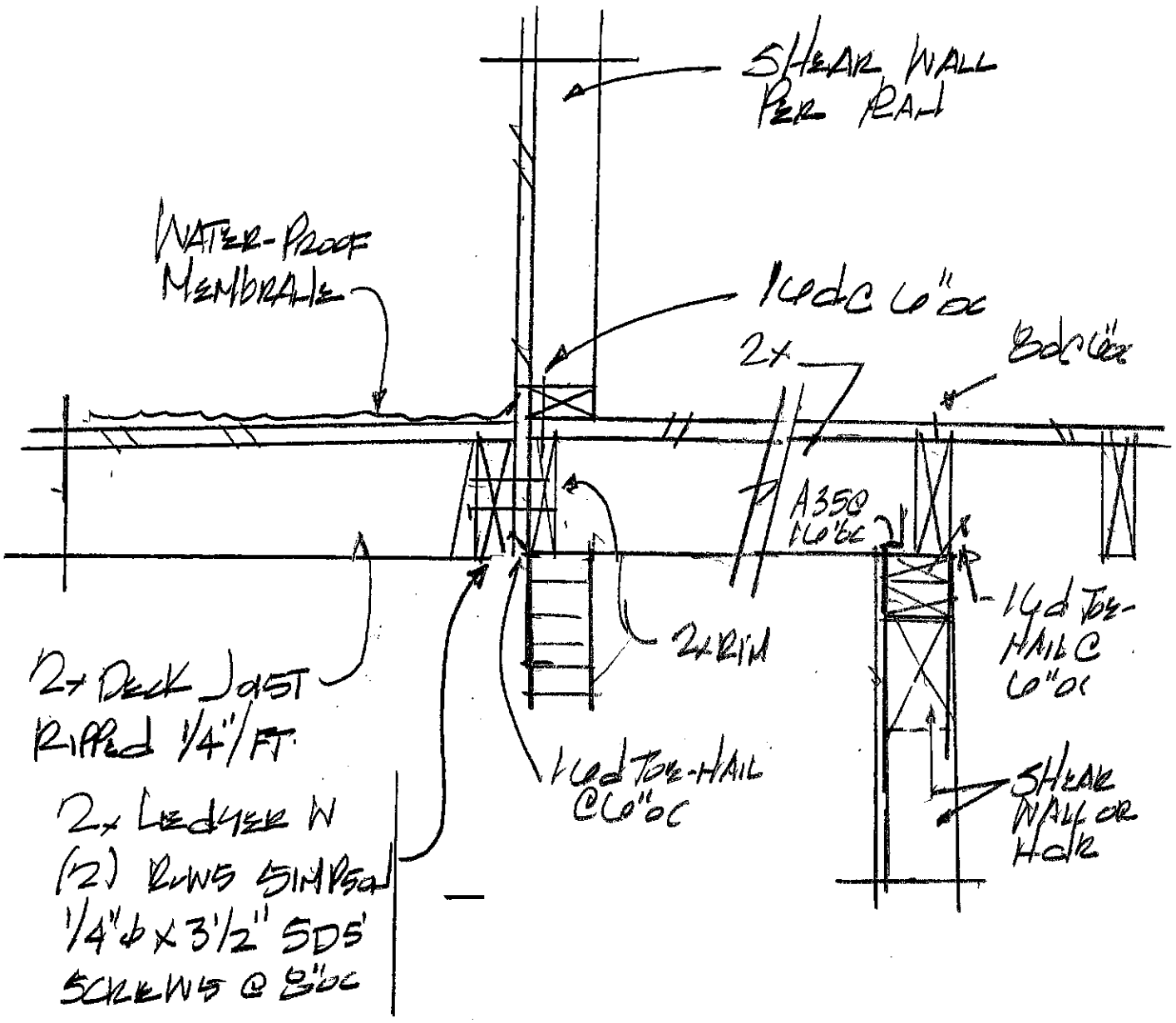
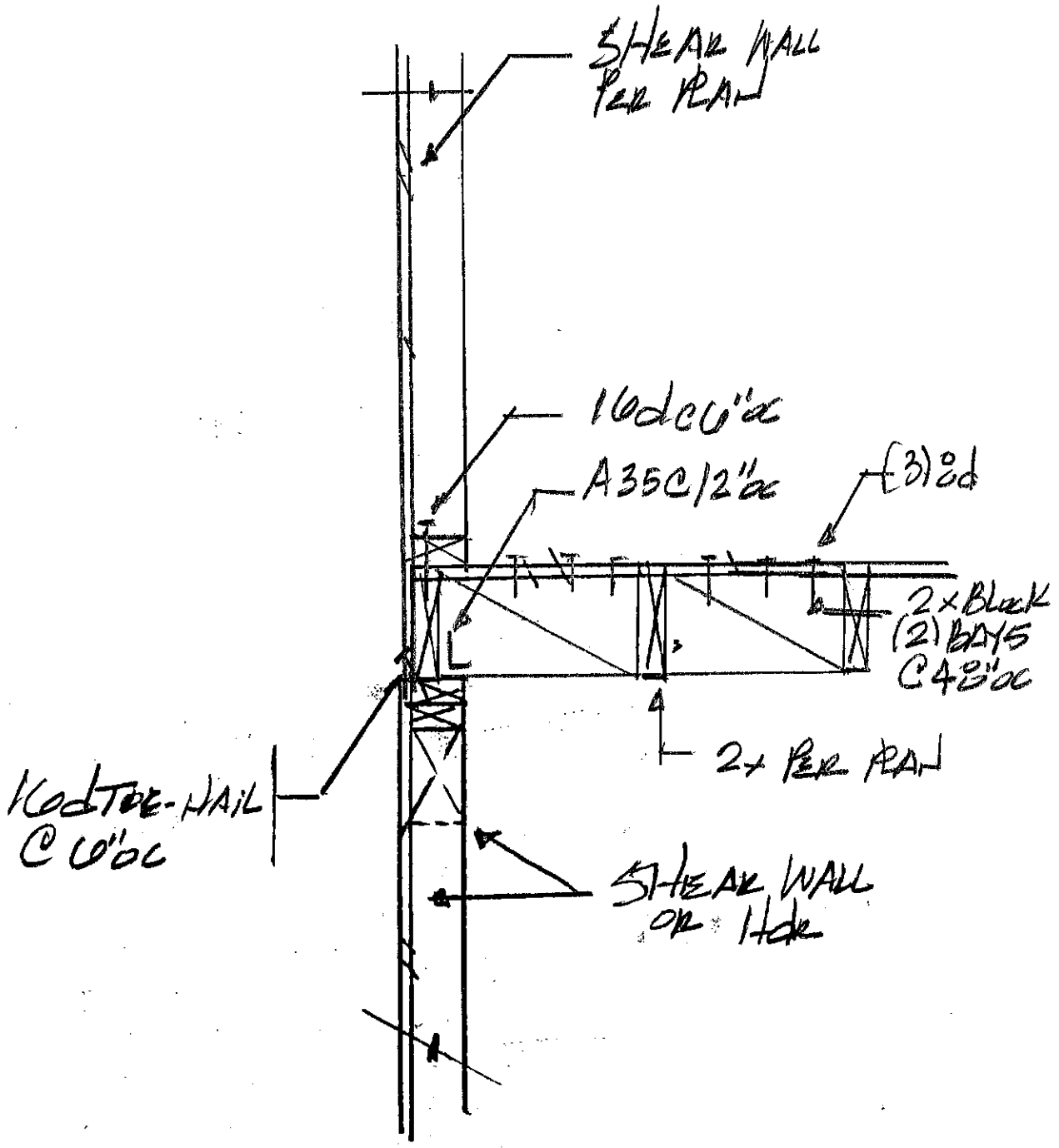
Redmond, WA 98052
(425) 747-1500
mitchellengineeringinc@comcast.net



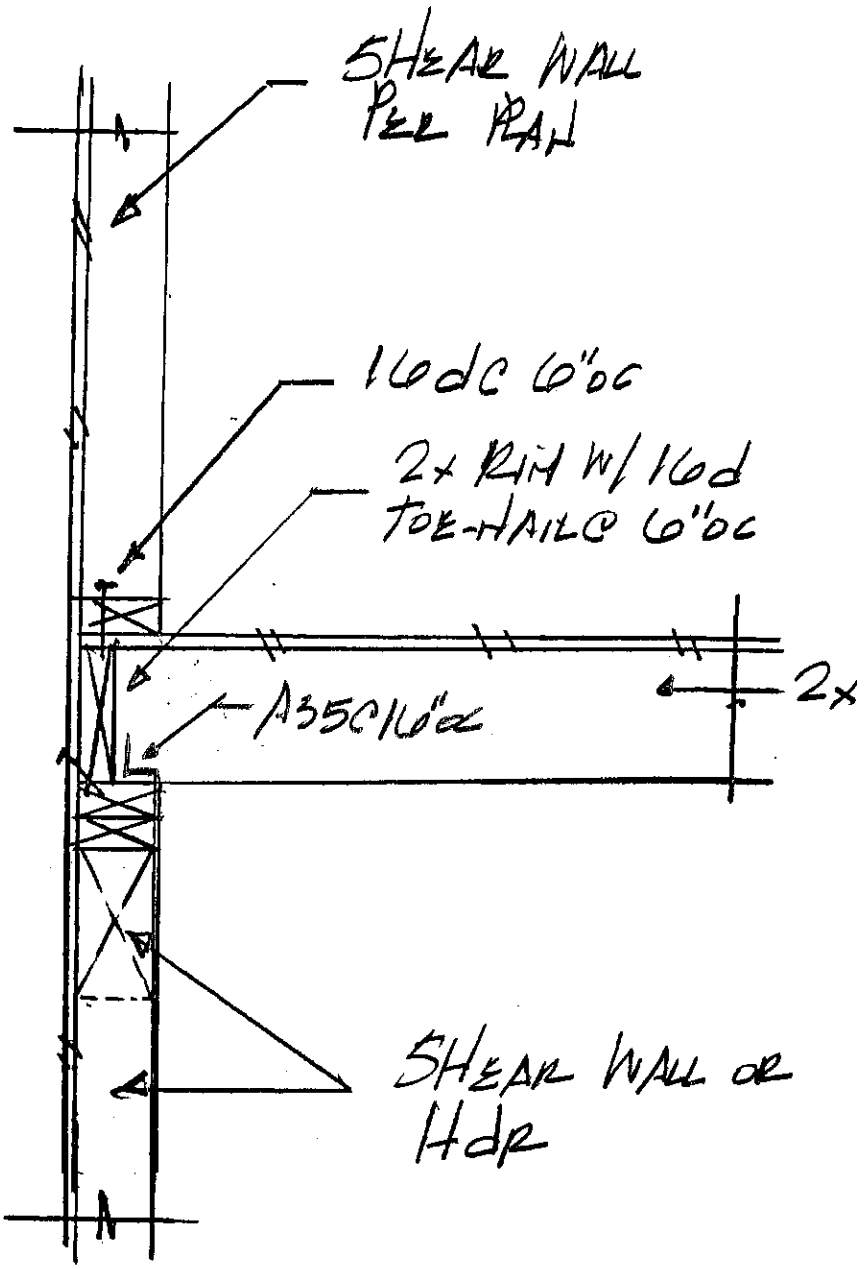
SECTION #43


SHEAR WALL PER PLAN
WATER-PROOF MEMBRANE
16d @ 6" oc
2x
Bdr Blk
A350 @ 6" oc
2x RIM
16d TOE-NAIL @ 6" oc
2x DECK JOIST RIPPED 1/4"/FT.
16d TOE-NAIL @ 6" oc
2x LEDGER W (2) ROWS SIMPSON 1/4" ϕ x 3 1/2" SDS SCREWS @ 8" oc
SHEAR WALL OR HDR

SECTION #44


SHEAR WALL PER PLAN
16dc@6"oc
A35@12"oc
(3)2x
2x BLOCK (2) BAYS @48"oc
2x PER PLAN
16d TOE-NAIL @6"oc
SHEAR WALL OR HDR

SECTION # 45


SHEAR WALL PER PLAN
16dc 6"oc
2x RIM W/ 16d TOE-NAILC 6"oc
2x
A35C16"oc
SHEAR WALL OR HDR

SECTION #46

MITCHELL ENGINEERING INC.

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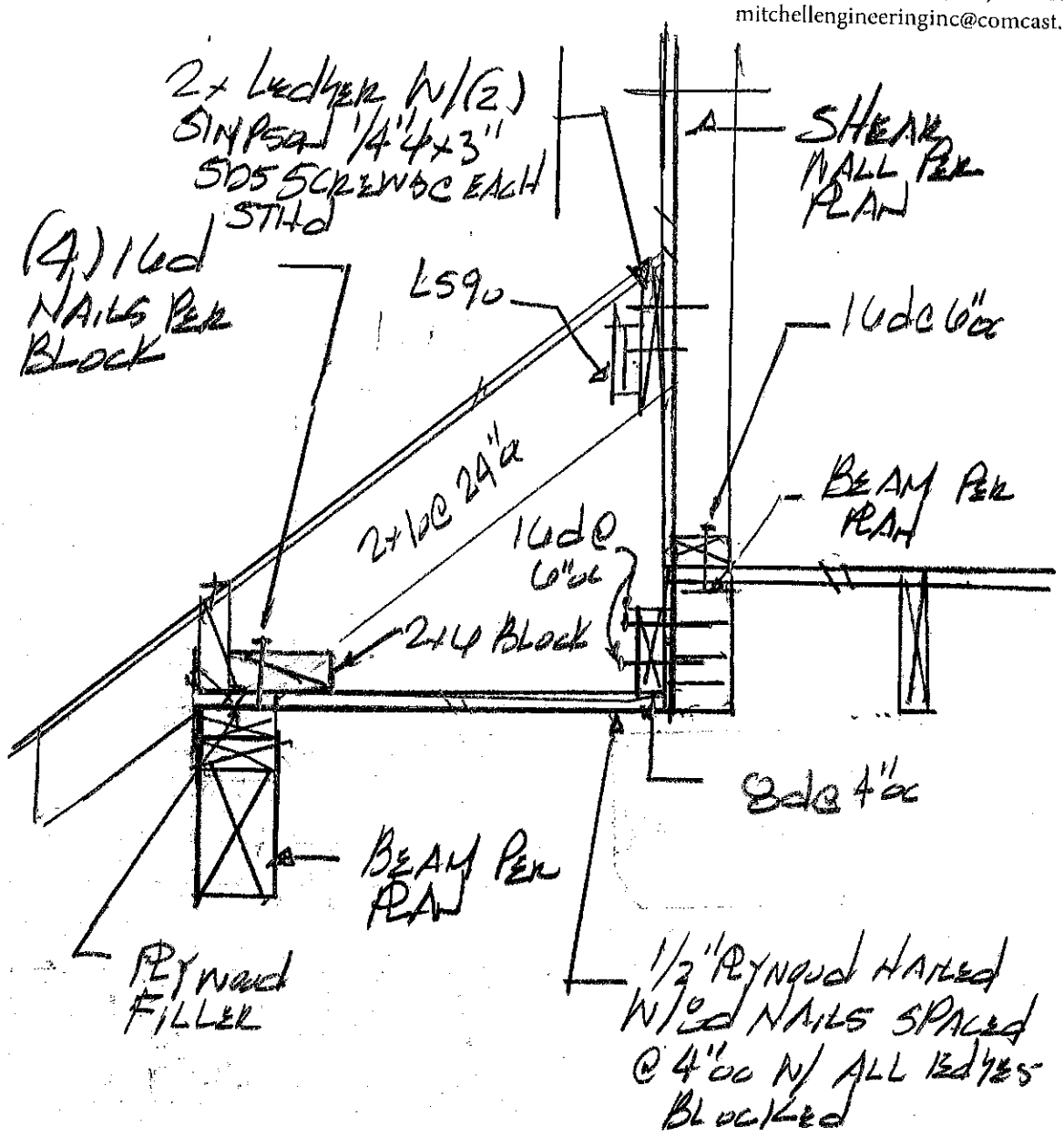
Redmond, WA 9805
(425) 747-150
mitchellengineeringinc@comcast.ne



SECTION 47

MITCHELL ENGINEERING INC.

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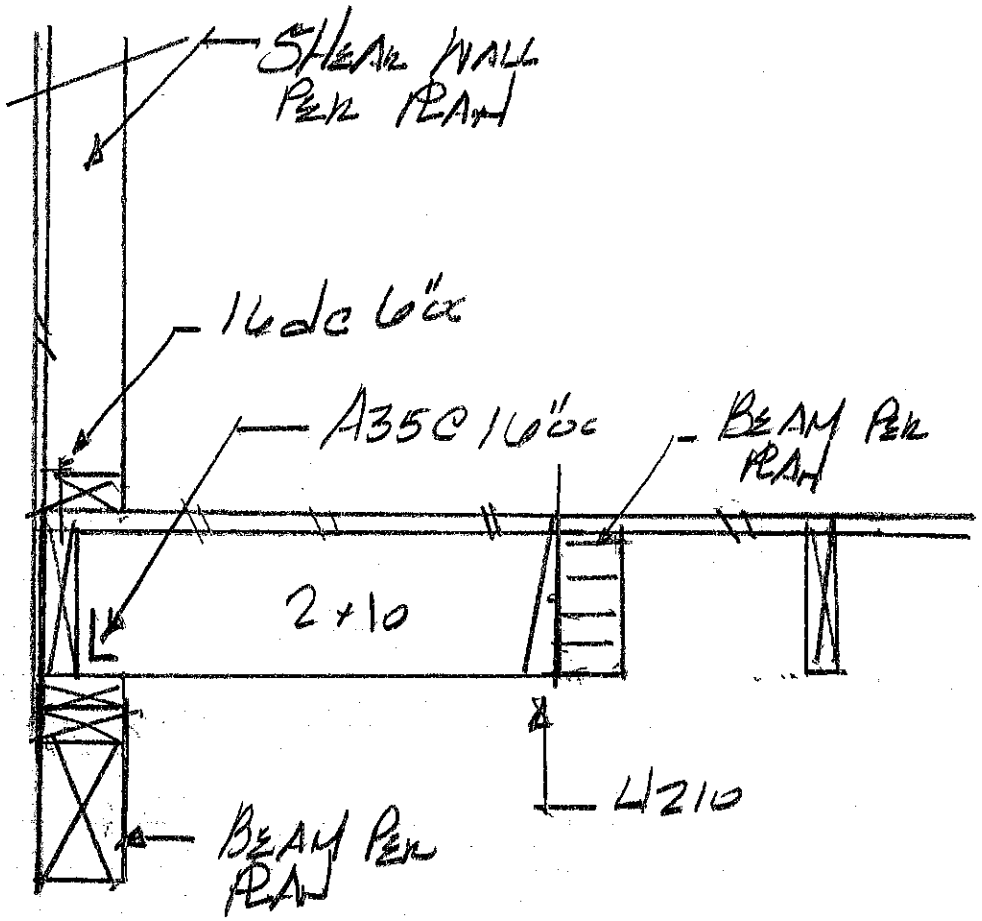
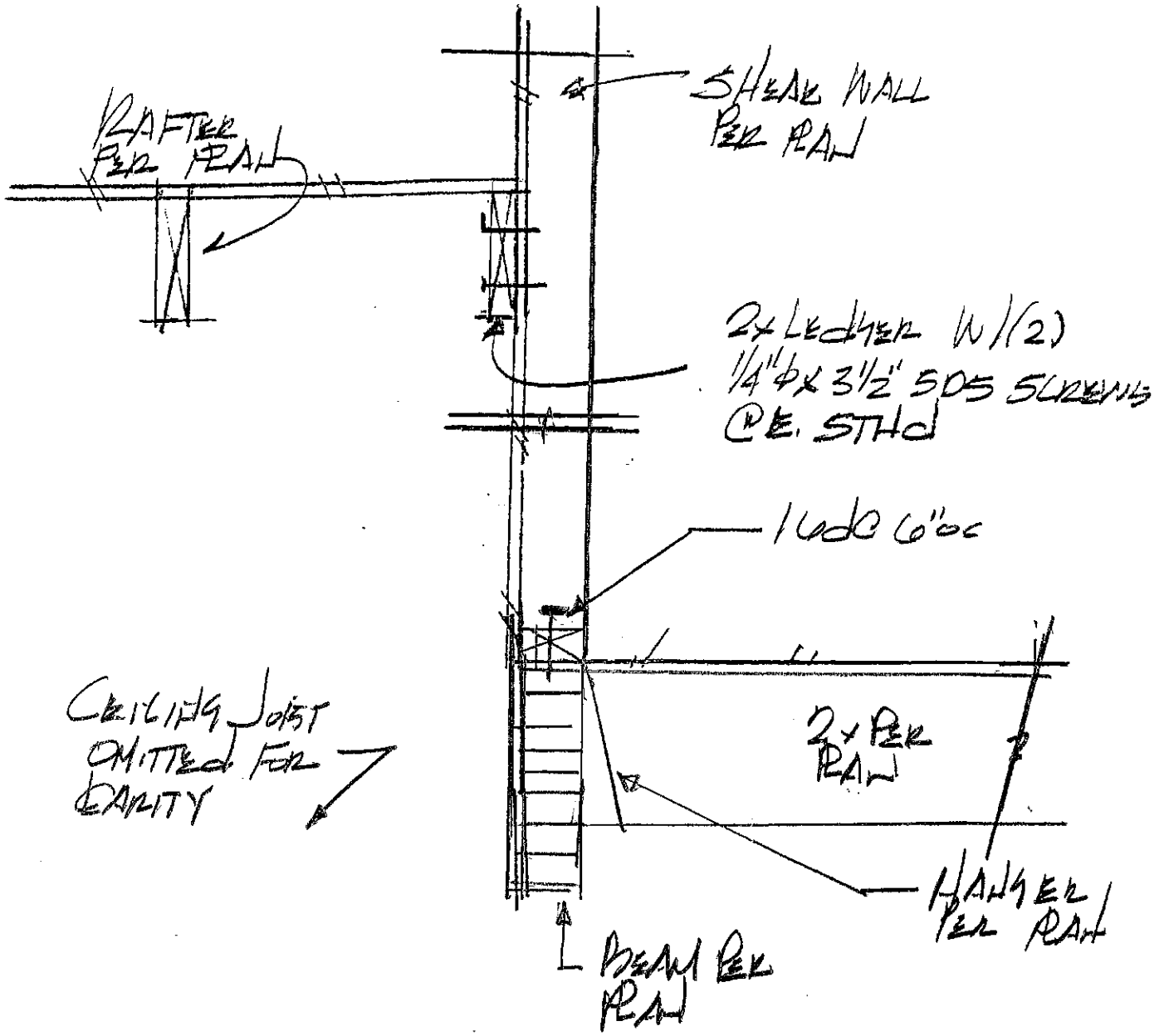
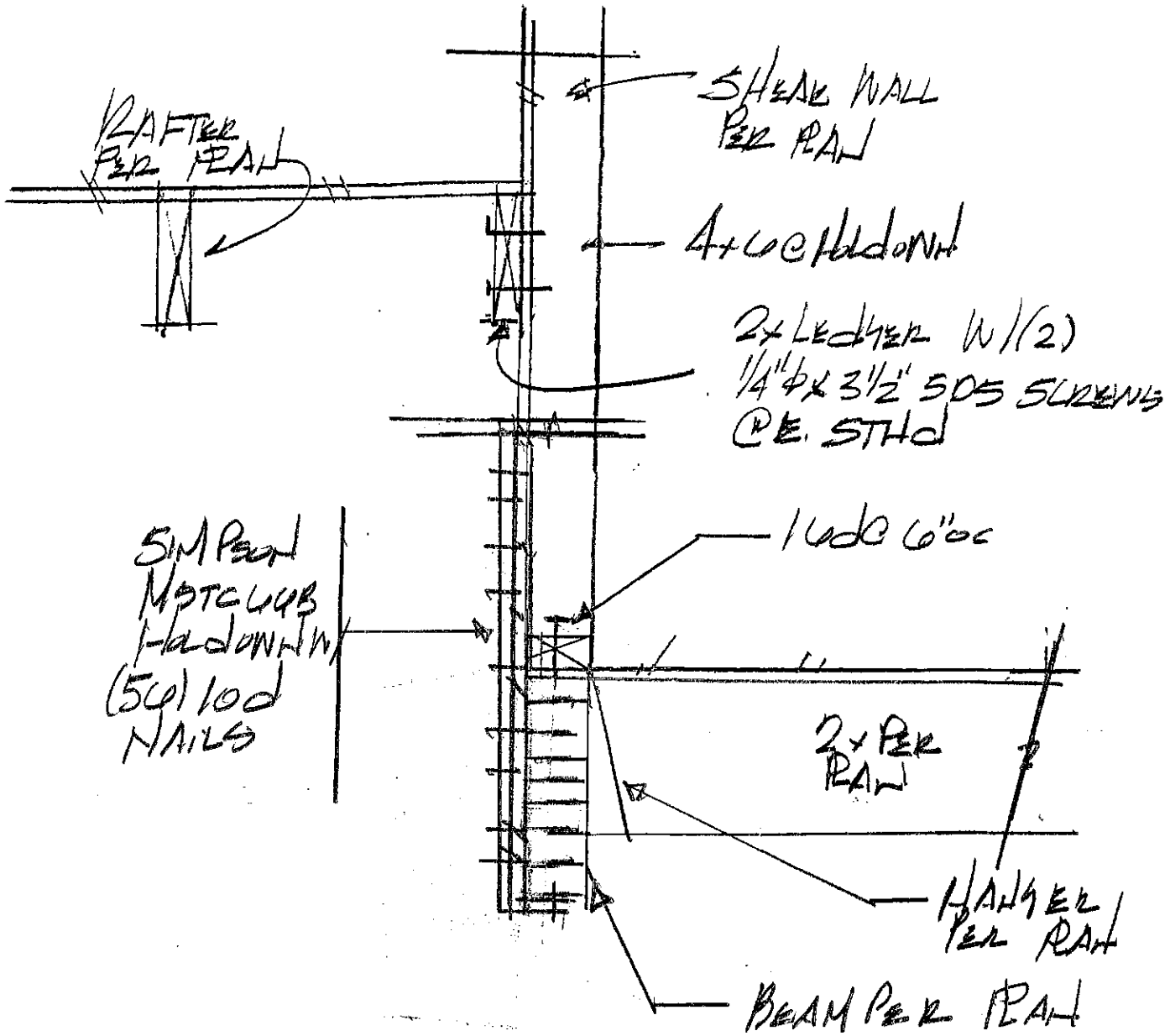
Redmond, WA 98052
(425) 747-1500
mitchellengineeringinc@comcast.net



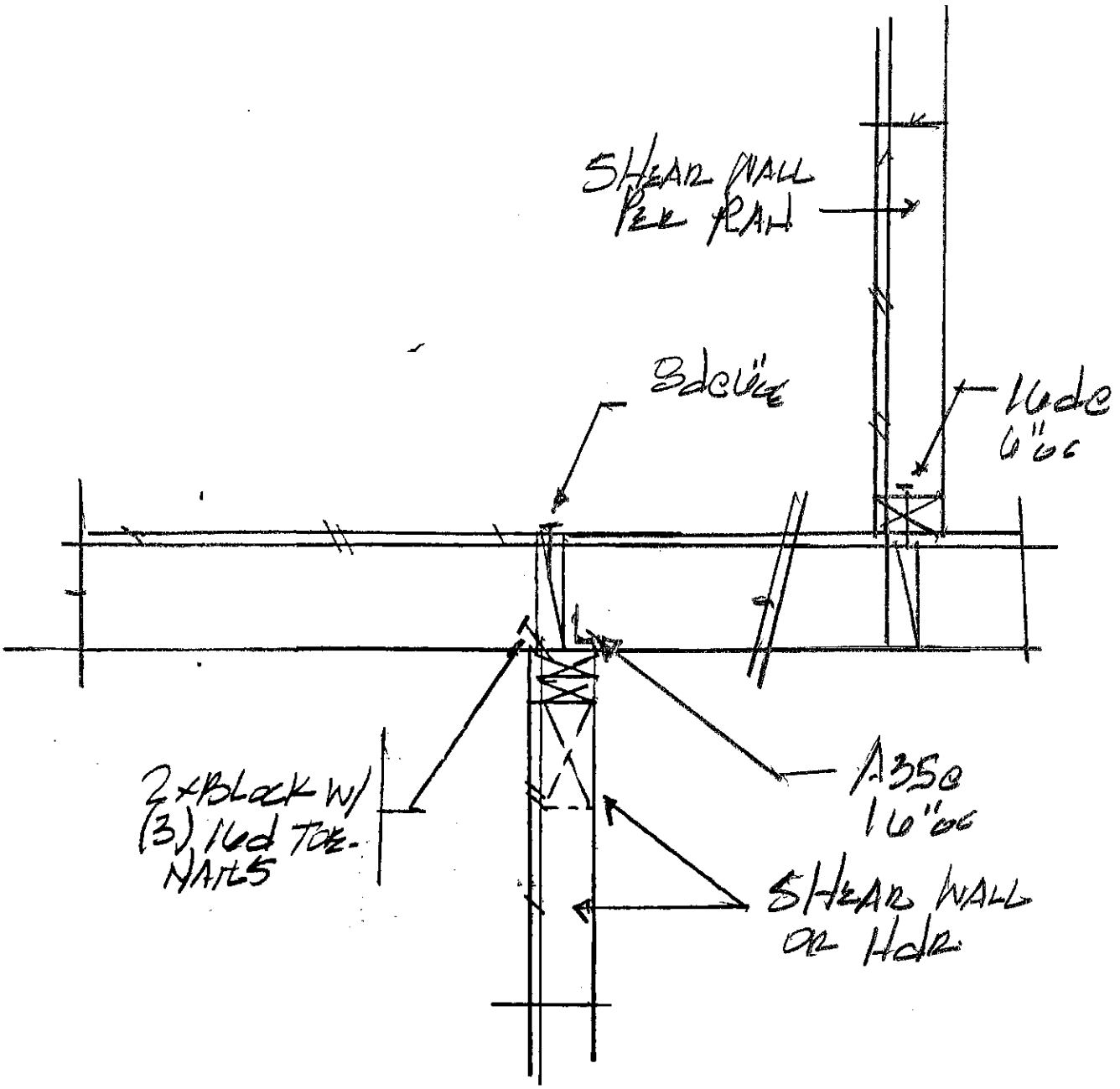
SECTION 4B


SHEAR WALL PER PLAN
RAFTER PER PLAN
2x LEDGER W/(2) 1/4"ϕx 3 1/2" SDS SCREWS @E. STUD
1 ea @ 6'oc
CEILING JOIST OMITTED FOR CLARITY
2x PER PLAN
HANGER PER PLAN
BEAM PER PLAN

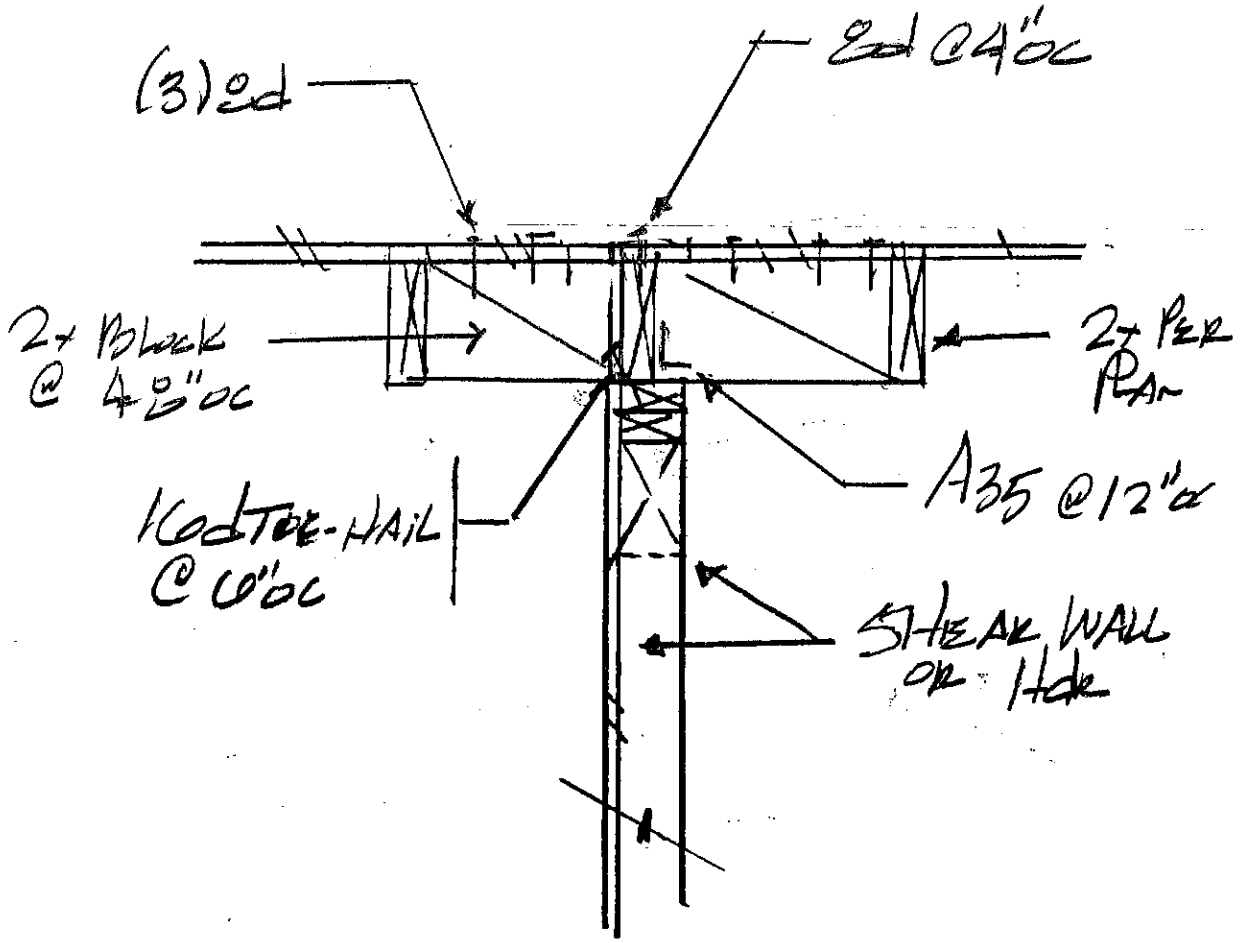
Section #49


RAFTER PER PLAN
SHEAR WALL PER PLAN
4+ OC HOLDOWN
2x LEDGER W/(2) 1/4" ϕ x 3 1/2" SDS SCREWS @ E. STUD
SIMPSON MSTC40B 1-HOLDOWN W/ (56) 10d NAILS
10dC 6"oc
2x PER PLAN
HANGER PER PLAN
BEAM PER PLAN

Section # 50


SHEAR WALL PER PLAN
8d @ 6"
16d @ 6" oc
2x BLOCK W/ (3) 16d TOE-NAILS
A35 @ 16" oc
SHEAR WALL OR HDR

SECTION # 51


(3) 8d
8d @ 4" oc
2x Block @ 48" oc
2x PER PLAN
A35 @ 12" oc
KodTek-Nail @ 0" oc
SHEAR WALL OR HDR

SECTION #52

MITCHELL ENGINEERING INC.

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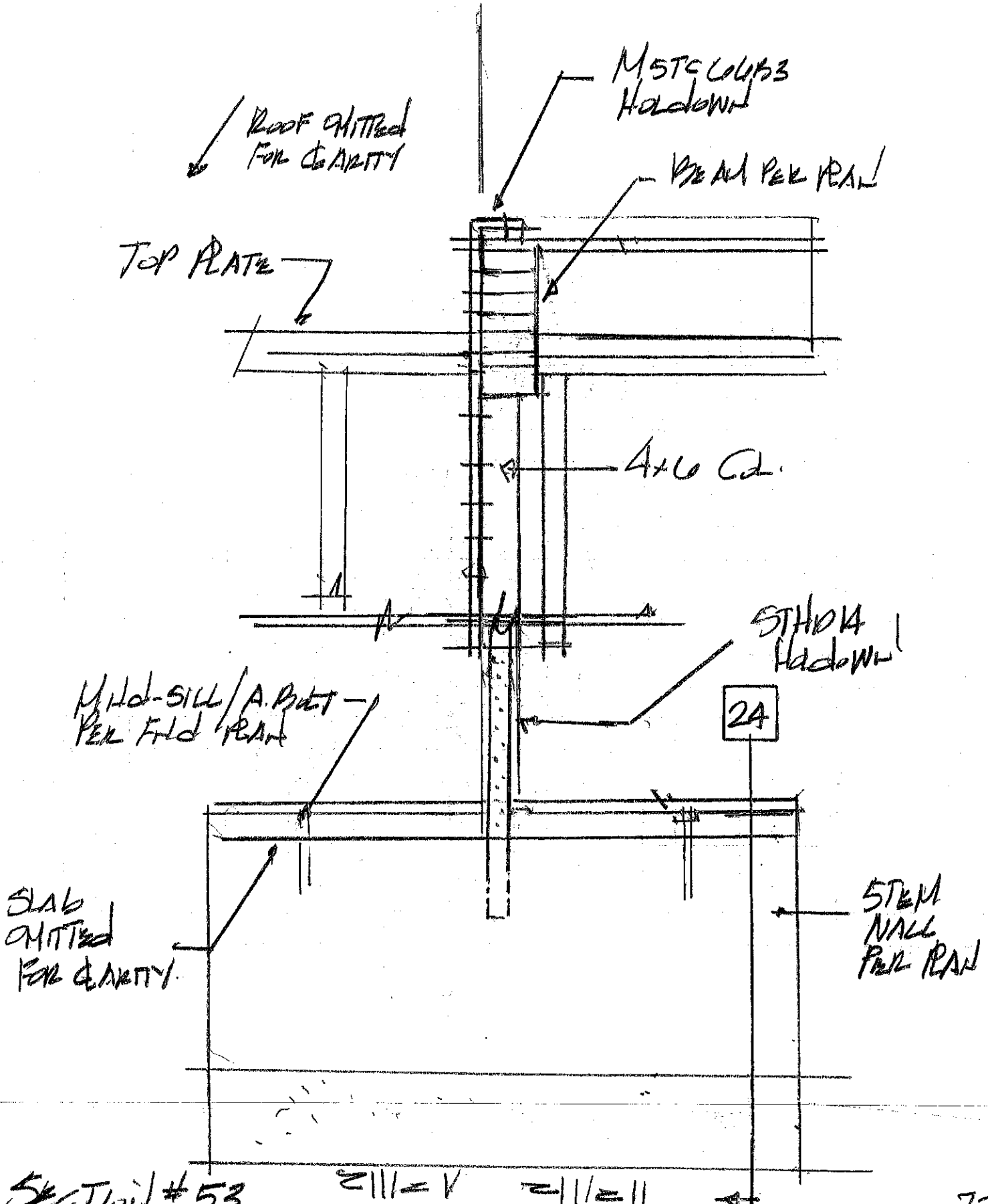
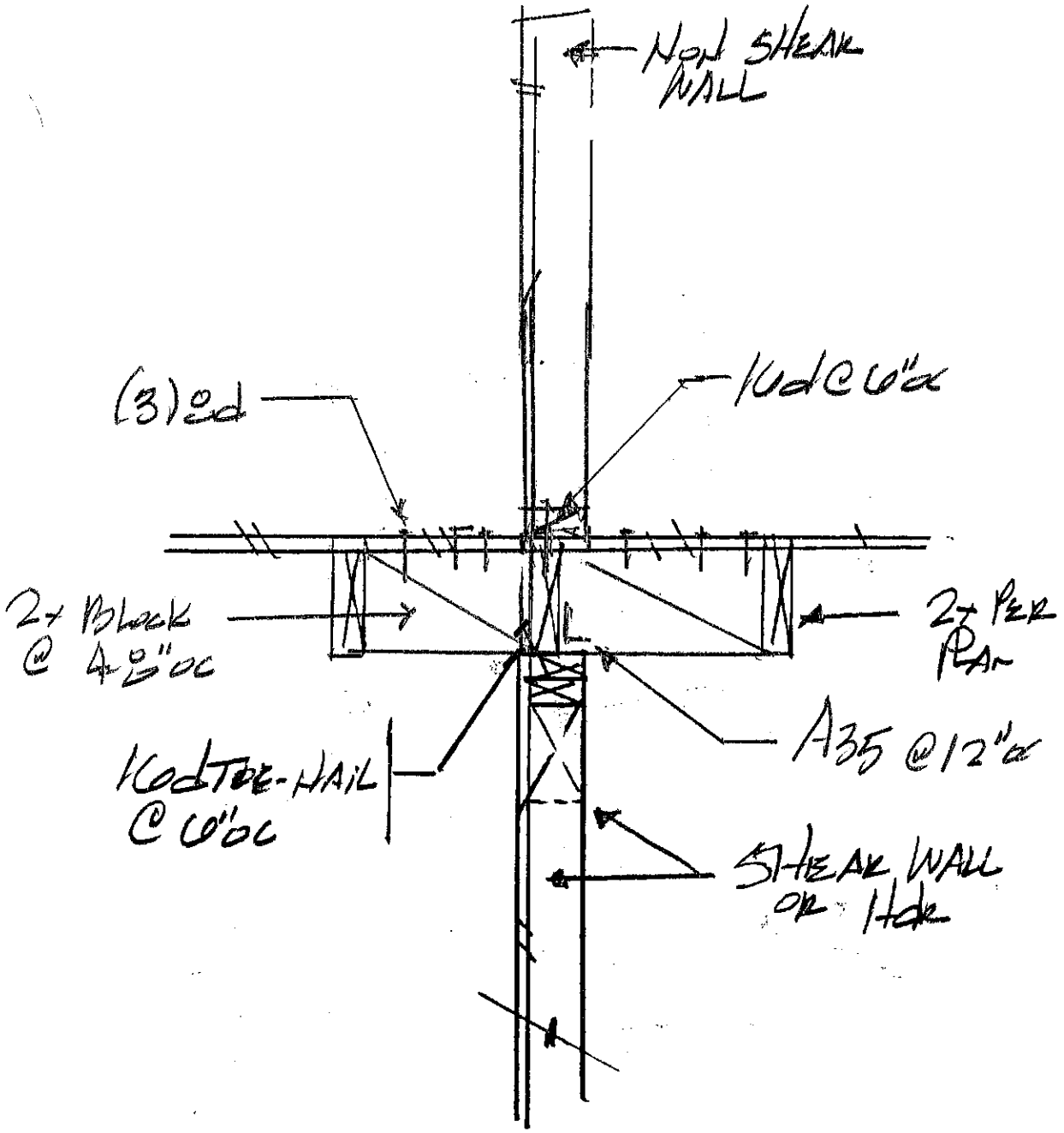
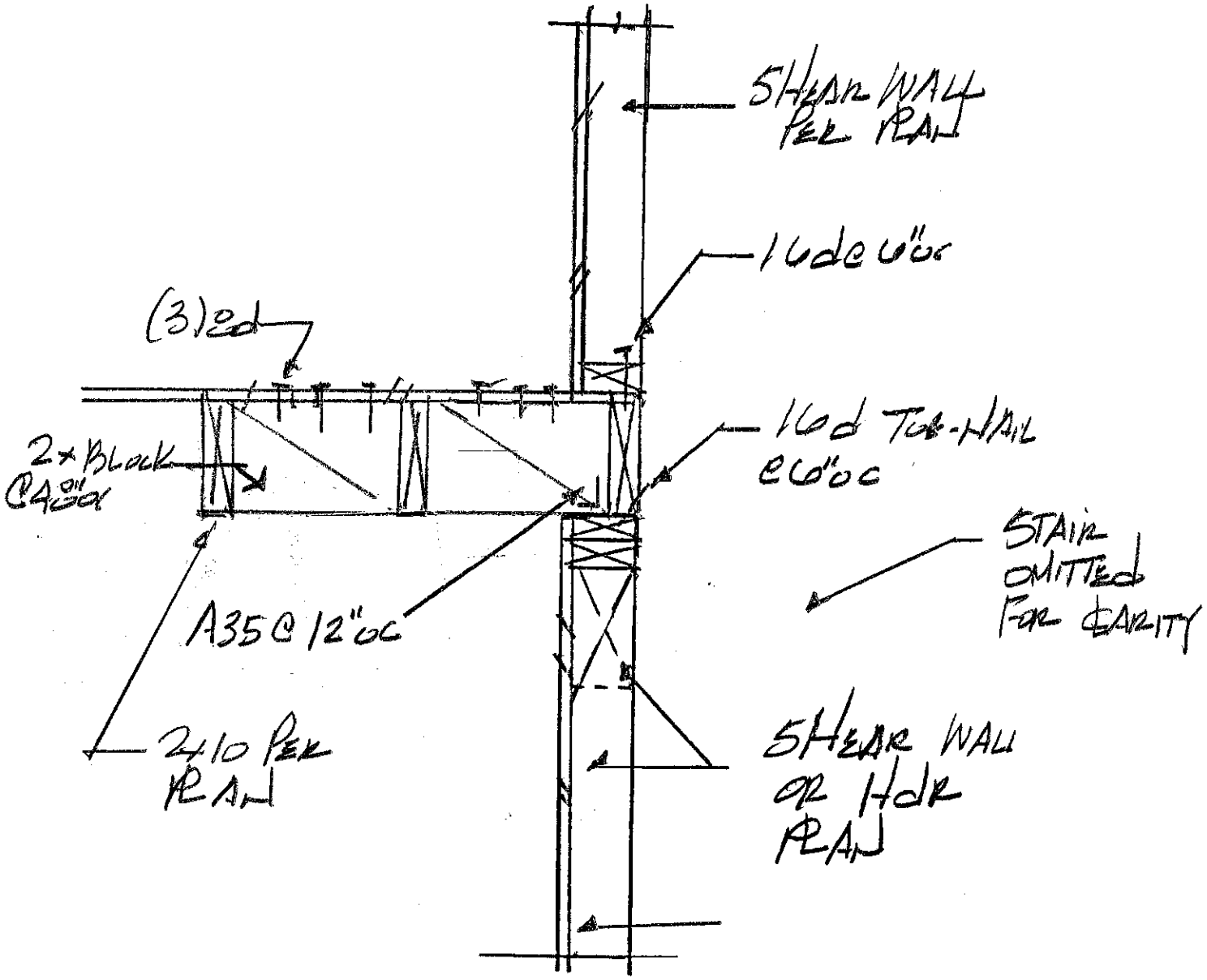


SECTION #53 2"=1' 2"=1"


NON SHEAR WALL
(3) 8d
10d @ 6" oc
2x BLOCK @ 48" oc
2x PER PLATE
A35 @ 12" oc
10d TOE-NAIL @ 6" oc
SHEAR WALL OR HDR

SECTION #54


SHEAR WALL PER PLAN
16d @ 6"oc
(3) 2x6
16d TOE-NAIL @ 6"oc
2x BLOCK @ 4'0" oc
STAIR OMITTED FOR CLARITY
A35 @ 12"oc
2x10 PER PLAN
SHEAR WALL OR HDR PLAN

SECTION # 55

MITCHELL ENGINEERING INC.

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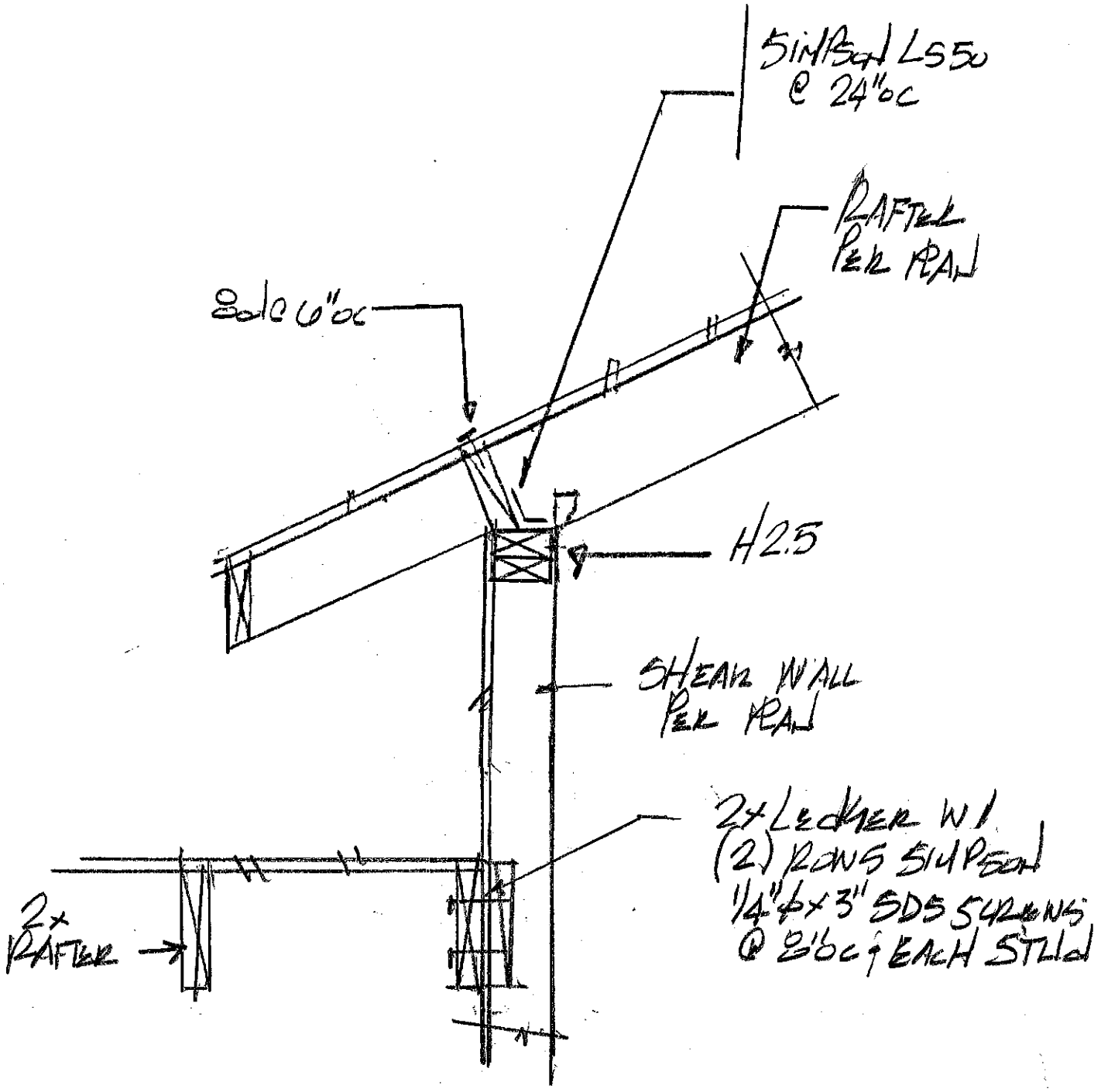
mitchellengineeringinc@comcast.net



Section #50

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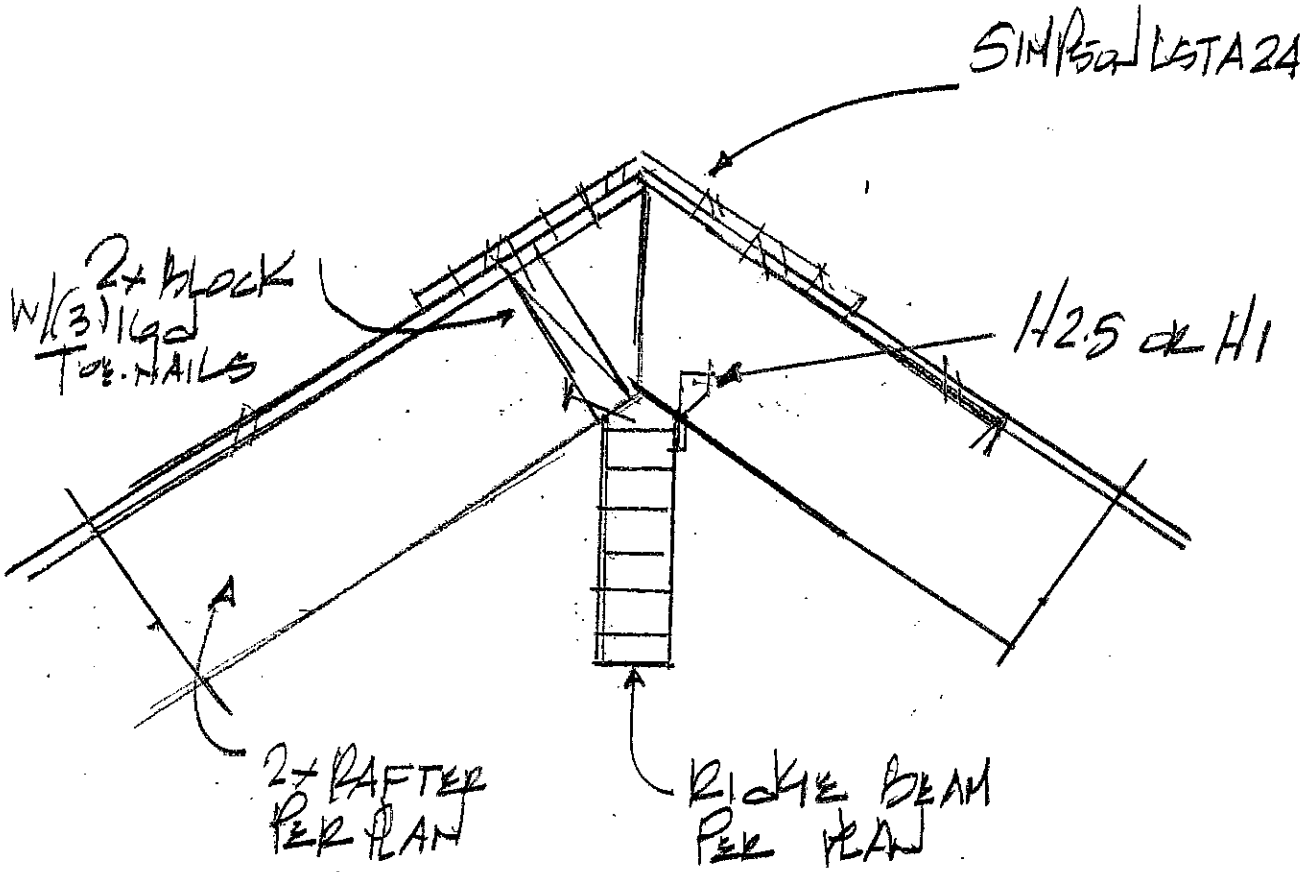
(425) 747-1500
mitchellengineeringinc@comcast.net



Section #57

MITCHELL ENGINEERING INC.

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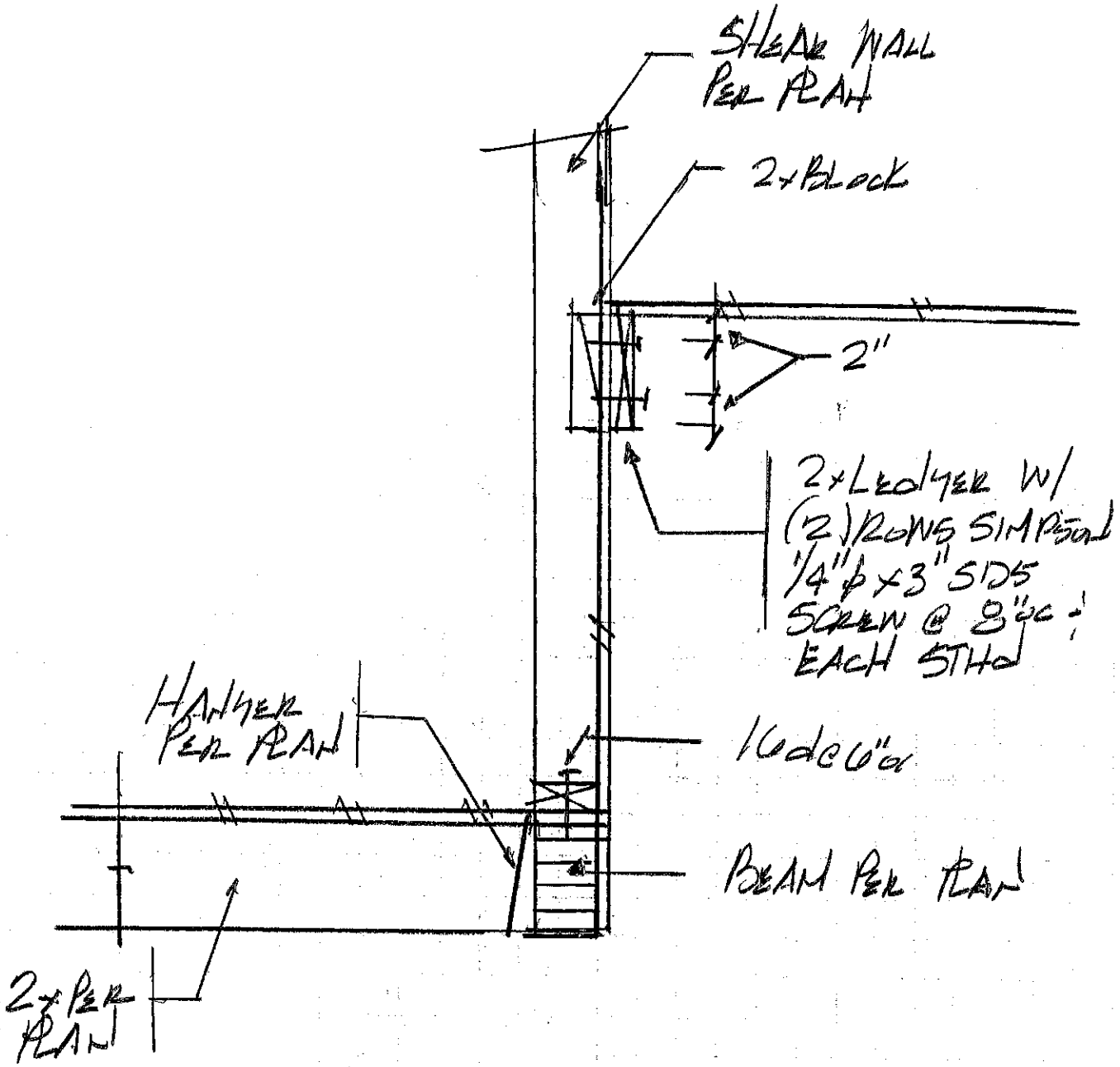
Redmond, WA 98052
(425) 747-1500
mitchellengineeringinc@comcast.net



SECTION # 52

MITCHELL ENGINEERING INC.

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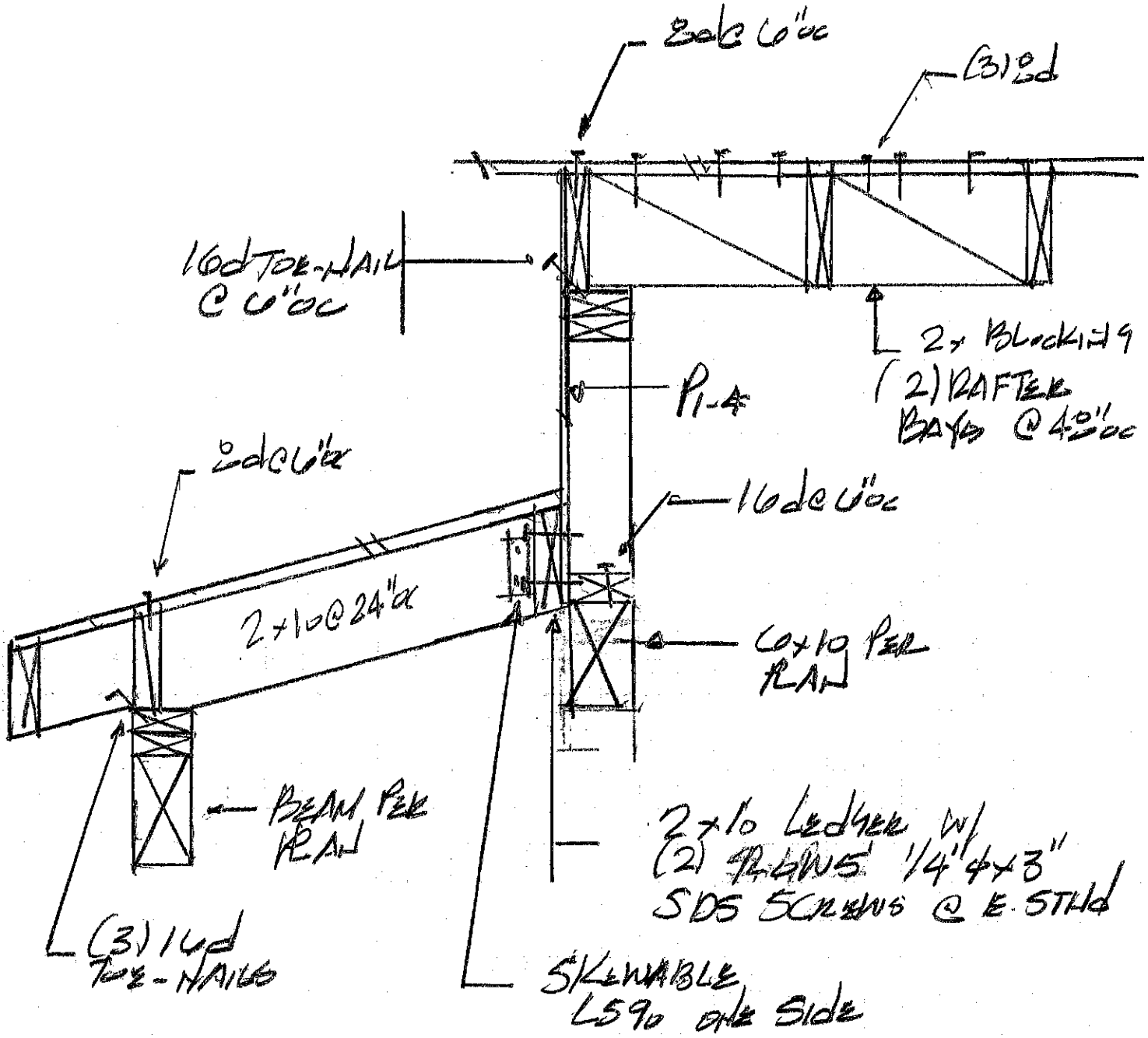
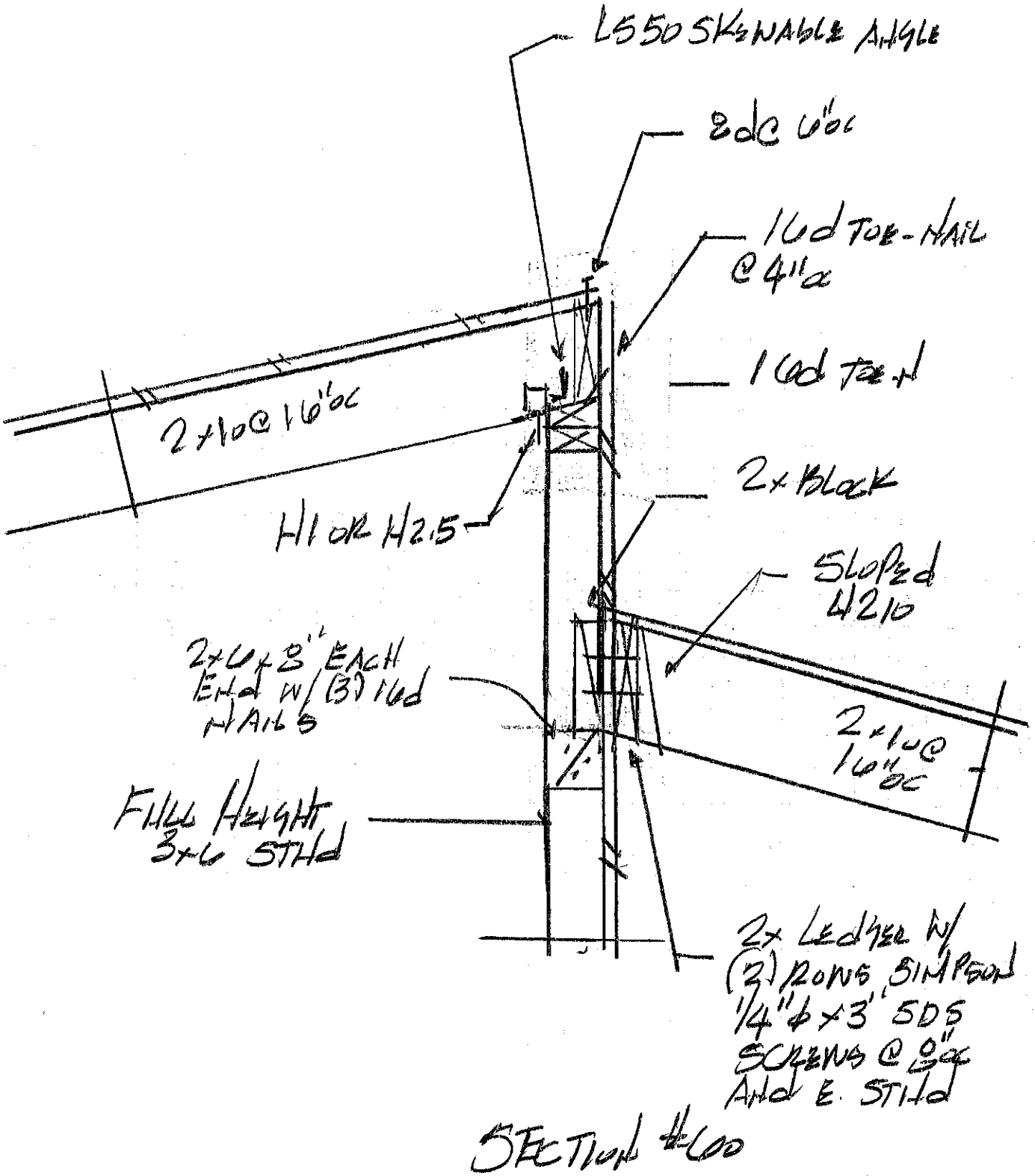
Redmond, WA 98052
(425) 747-1500
mitchellengineeringinc@comcast.net



SECTION "S9"

MITCHELL ENGINEERING INC.

7821 - 168th Ave. N.E.
Redmond, WA 98052
(425) 747-1500
mitchellengineeringinc@comcast.net



SECTION #100

MITCHELL ENGINEERING INC.

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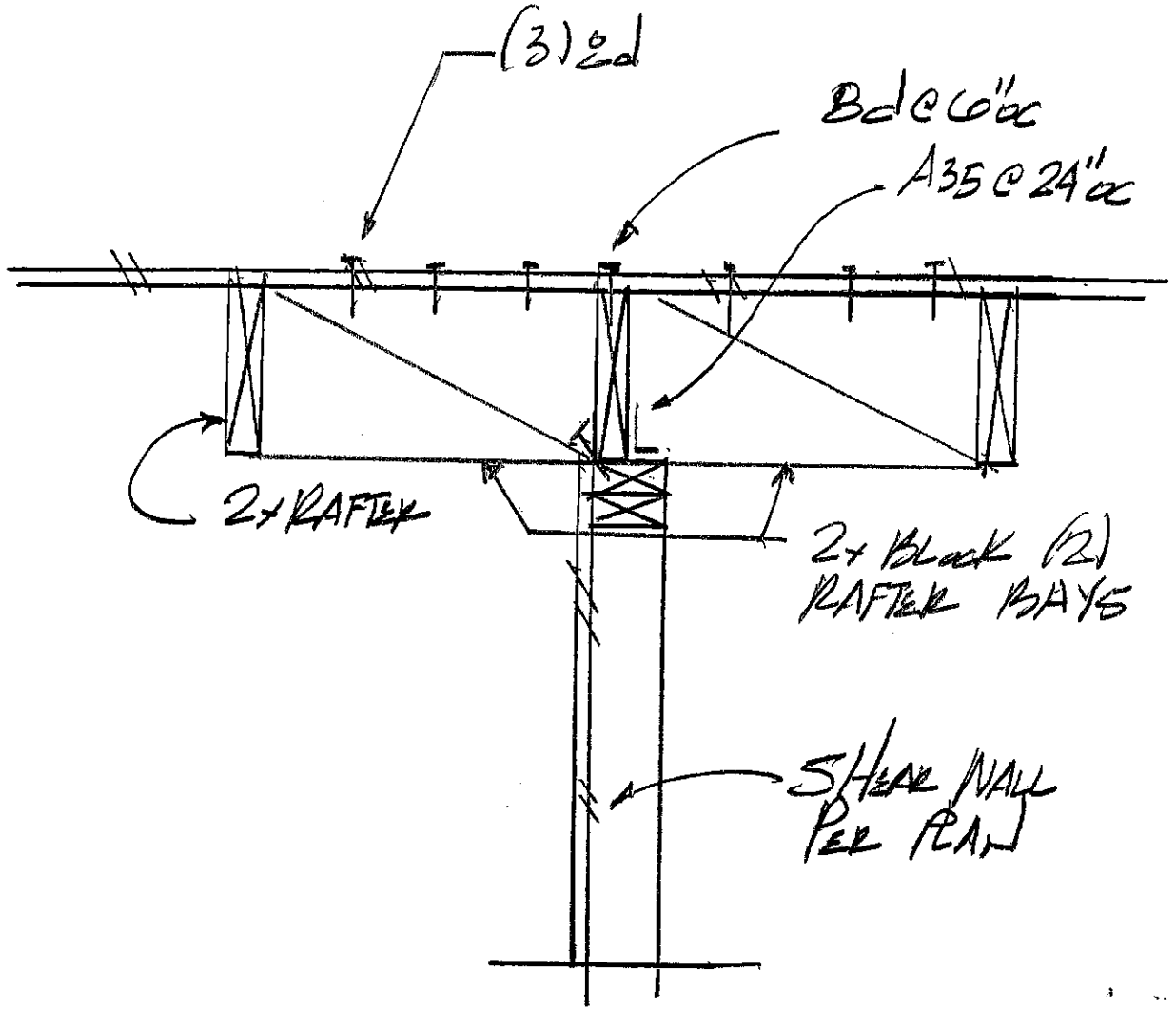
Redmond, WA 98052
(425) 747-1500
mitchellengineeringinc@comcast.net



SECTION #C01

TYPICAL MUD SILL PT 3x6 W/3/4"ϕx12" ANCHOR BOLTS @24"oc W/GALV. 3"x3"x1/4" PLATE WASHER WHERE JOIST ARE RUNNING FROM MUD-SILL PT 3x RIPPED TO STEM-WALL WIDTH W/CENTER-SHNK 3/4"ϕ x12" ANCHOR BOLTS @ 24"oc W/GALV. 3"x3"x1/4" PLATE WASHER

HDU8 PER SECTION #10

HDU2 HOLDOWN PER SECTION #11

TYPICAL FOOTING 30"x30"x12"dp W/(3) #4 EACH WAY (10 PLACES)

HDU2 HOLDOWN PER SECTION #12

P.T. 4x4 COL. W/CBSQ COLUMN BASE (10 PLACES)

TYPICAL HOLDOWN HOLE PER SECTION #12A TYPICAL (4 U.N.O)

5THD14 HOLDOWN W/(30) 16d SINKERS

5THD14

4" CONCRETE SLAB OVER 4" GRANULAR FILL OVER 6MIL VAPOR BARRIER (5.0.4)

HDU8 PER SECTION #3 OR 5M.

HDU8 PER SECTION 11A

DETAIL #22 (REV.)

DETAIL #23

DETAIL #21

CRAWLSPACE

5.0.4

HDU8 HOLDOWN PER SECTION #11

HDU2 HOLDOWN PER SECTION 11A

HDU8 HOLDOWN PER SECTION #15

FOOTING SCHEDULE
F1 - 3'x3'x12"dp W/ (3) #4 E. WAY

FOUNDATION PLAN - SCALE 1/8"=1'-0"±

PROJ. 019-184

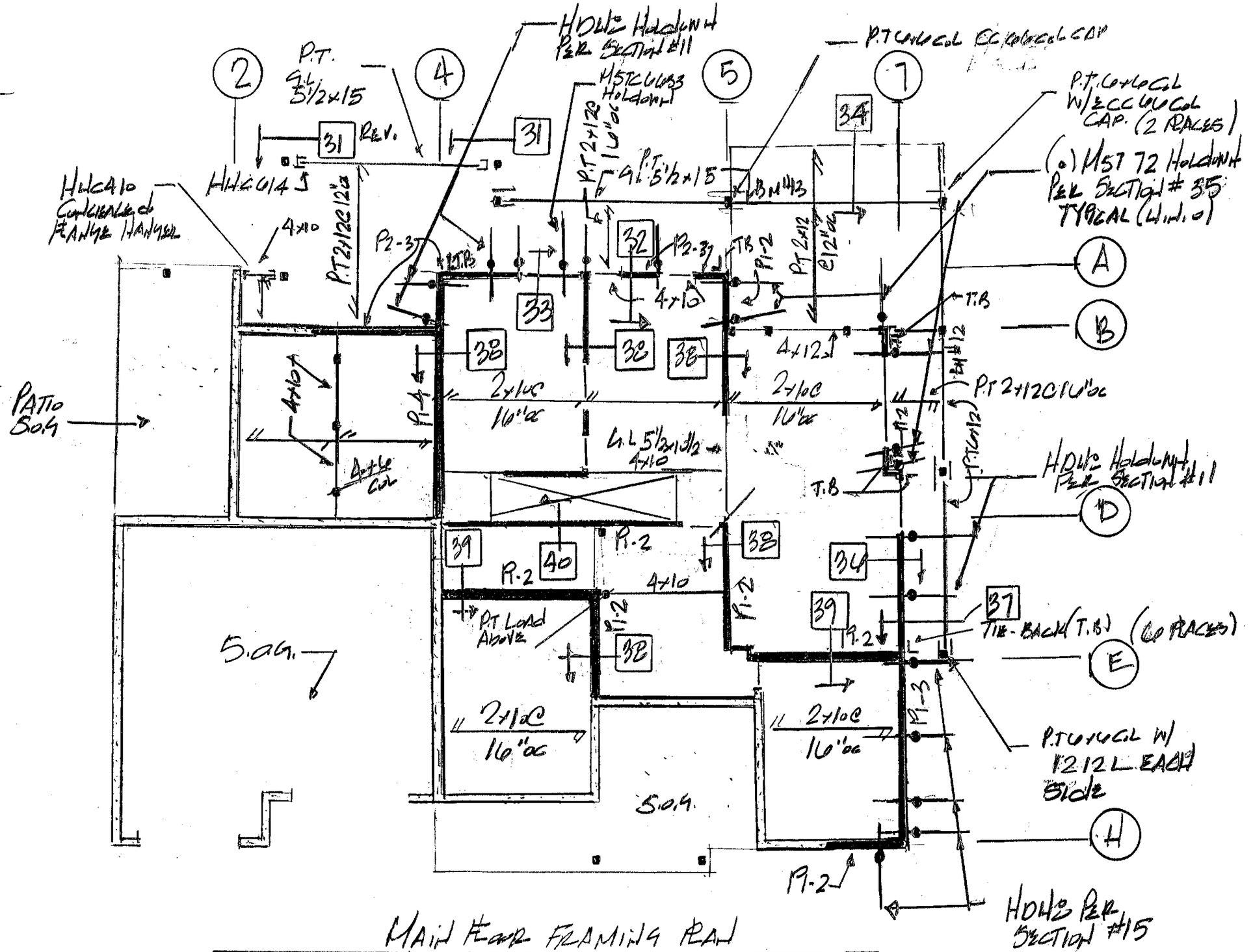
A1

FACE MOUNT HANGERS

2x10 – HU210
4x10 – HU410

TOP FLANGE HANGERS

2x10 – HU210TF
4x10 – HU410TF



MAIN FLOOR FRAMING PLAN
SHEAR WALLS BTW LOWER/MAIN FLOOR
LOWER LEVEL ARCHITECTURAL PLAN
PROJ. 019-124

FACE MOUNT HANGER

2x10 OR 2x12 - HU210
4x10 OR 4x12 - HU410
OR HUC410 CONCEALED FACE MOUNT HANGER

G.L. 5½x9 - HHGL10
G.L. (3)4x9 - HGHT10

KING POST (K.P.)
(2) 2x6 COL
TYPICAL

MSTC40B3 HOLD-DOWN PER SECTION #50

4x12 DF#2

G.L. (3)4x12

(*) DENOTES MST72 HOLD-DOWN PER SECTION #35 OR TO COLUMN

(2) 2x6 COL. (TYPICAL)

G.L. 5½x10½

2x10 RAFTERS @ 24" OC TYPICAL

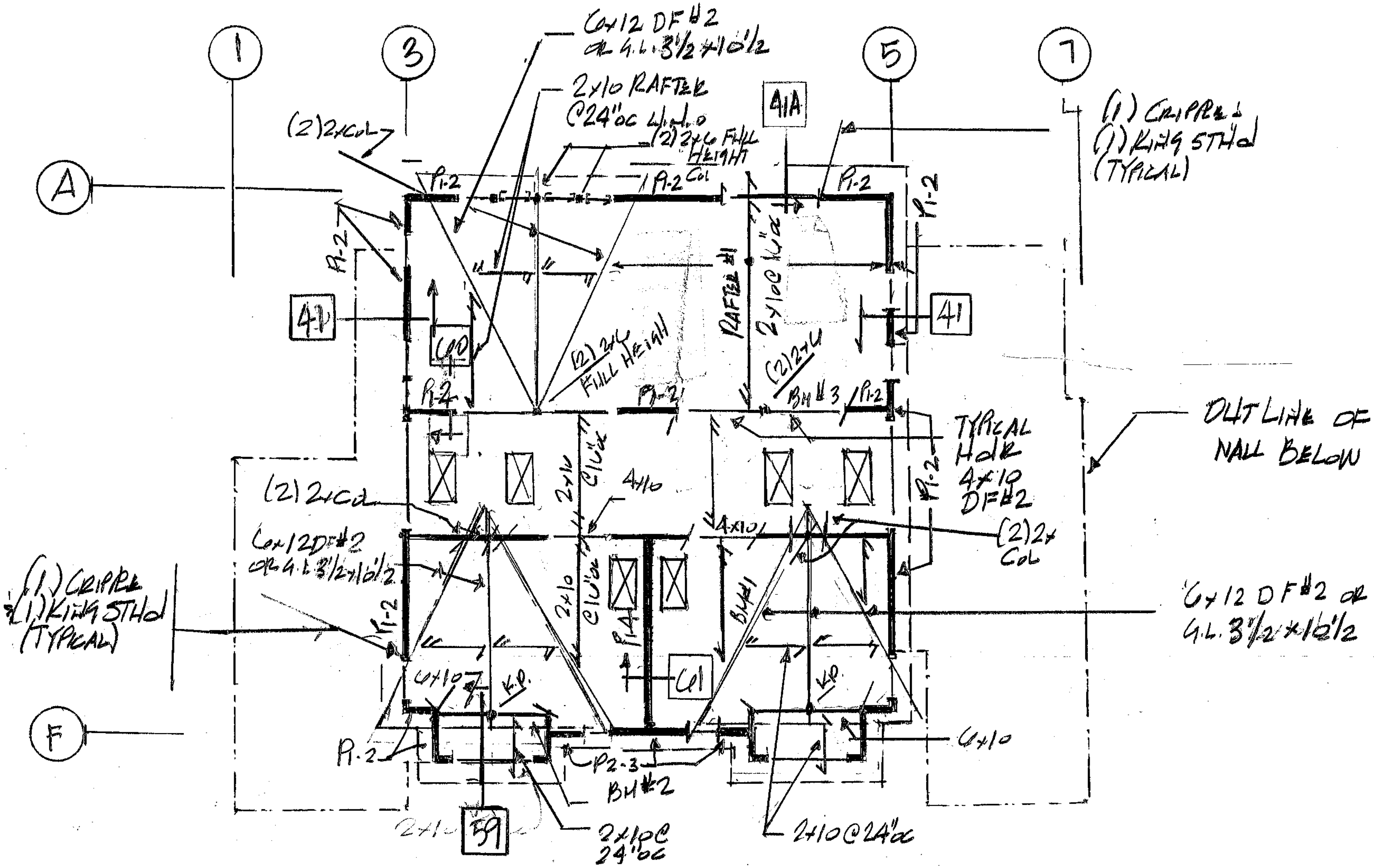
K.P. (KING POST)

UPPER FLOOR / LOW ROOF FRAMING PLAN

SHEAR WALLS BTW. MAIN / UPPER FL. - LOW ROOF

MAIN FLOOR ARCHITECTURAL PLAN

PROJ. 019-124



ROOF FRAMING PLAN

SHEAR WALLS BTN. UPPER FLR/ROOF
UPPER FLOOR ARCHITECTURAL PLAN
PROJ. 019-124