STRUCTURAL-CALC, L L C

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Thank you for inquiring about **LatPro,** our lateral engineering program. Included is a floor plan and a copy of the lateral engineering report for a two-story residence which we have submitted and received a building permit from our building department. The lateral engineering report is simple to read and comprehend, and should easily receive approval from your building department.

The lateral analysis is based on a grid system you create on a set of the floor plan drawings. The additional uplift analysis can be done right over a set of elevation drawings. This will allow you to look at the building plans while you produce the lateral engineering and to be aware of any unusual design features so you don't have to create another plan and grid system, which decreases the possibility of errors. LatPro is the safest and easiest lateral engineering system available today.

We have included an upper and lower floor plan for an actual residence and the lateral engineering report for this house. As you can see, the gridlines denote wall lines running in either the north-south or east-west direction that contain shear walls. The shear wall types and lengths are shown in the hexagon-shaped symbol along the wall lines.

The lateral engineering report starts with the basic UBC **Seismic Force Factors** that are required with each analysis. The building departments are always looking for this information on each individual project. The report then lists the areas of the roof and floor and lengths of the walls and quantifies the total dead load of the various parts of the structure for each floor. Then the seismic forces are listed for each story of the building.

Next the basic UBC **Wind Force Factors** are listed. The roof and floor diaphragm and wall heights are listed along with the wind forces in both the vertical and horizontal directions. This is followed by the **Upper Story Diaphragm** notation, sizes and gridlines and then the width and area of each diaphragm. Then each side of the diaphragm is given the governing force and whether it is wind or seismic.

The **Tributary Lengths on Upper Story Walls** follow this, showing walls running north-south and east-west. This is broken out by gridline, the percentage of tributary area, the length of tributary area, the force, any additional force, force from the gridline above, and the total force on each gridline.

Upper Story Shear Walls running both north-south and east-west are next listed by gridline and wall number. The length of each shear wall is listed along with its height, type, dead load location, whether it is an exterior or interior wall, the tributary length of dead load, and any added forces from architectural features such as small decks (added dead load, added tributary length, or added crushing). Then the unit shear is listed for each wall with the total shear force, the shear wall type and maximum unit shear allowed by that wall type.

The **Upper Story Connectors** running both north-south and east-west follow this, also listed by gridline and wall number. The connection type, the floor joist depth, concrete stem wall width and end distance are then listed. Then the uplift is listed in pounds followed by the connector and required anchor bolt or rod, and the maximum uplift allowed. This information is followed by the shear wall's edge member uplift, the edge member, and the maximum allowable edge member uplift. Finally the crushing at the base of the shear wall and the metal bearing plate (if required) is reported.

The **Post and Post Connectors** section lists the posts and post connectors that have been designed to transfer shear wall uplift and crushing forces to the foundation. The first Post and Post Connector section lists the shear wall that the post supports, the post height, any added crushing, the uplift on the post, and the compression on the post. The minimum post follows, with the post's maximum allowable uplift, and the post's maximum allowable compression. The Post and Post Connector Continued section lists the shear wall that the post supports again. This is followed by the uplift, and minimum post. The connection type, floor joist depth, stem wall width, post end distance, and connector follows. The maximum uplift for the post's strap is then listed with the metal bearing plate (if required), and the anchor bolt or rod for the strap.

To make it easier on building officials, we follow the report with a section listed as **Lateral Requirements** that lists the required shear walls and the required straps and holdowns. Under the section, **Required Shear Walls**, we list the shear walls that will be required with the project under site-built walls and then under Simpson pre-built shear walls.

The **Site-Built Shear Walls** are listed by wall type, sheathing type and nailing spacing, and number of sides with sheathing. This is followed by the connection from the joists/ blocking/ or rafters to the top plates along the wall line, the bottom connection from the bottom plate of the shear wall to floor or rim joist or blocking, and the anchor bolt connection to a concrete foundation. If staggered edge nailing is required is called out next along with the shear wall panel edge framing size and maximum force allowed for each shear wall.

The **Simpson Pre-Built Shear Walls** are listed by wall type, Simpson wall name used when ordering the walls and number of sides with sheathing. This is followed by the connection from the Simpson wall to the top plates, the connection from the joists/ blocking/ or rafters to the top plates along the wall line and the bottom connection from the bottom plate of the shear wall to floor or rim joist or blocking, and the anchor bolt connection to a concrete foundation. The allowable compression load is called out next, then the allowable uplift tension, and then the maximum force allowable.

The **Required Straps and Holdowns** section lists Simpson holdowns and straps starting with strap tie holdowns on concrete foundations, straps on second floor applications, HD holdowns, the anchor bolts and the all thread rod, ATR, for HD holdowns. The **Strap Tie Holdowns** lists the Simpson strap tie holdown model number, the minimum stem wall width (if with a slab on grade, no minimum necessary), the minimum length of the strap tie holdown into the concrete, Le, the minimum amount of nails into the wood member above and the strap length of the nailed portion, and the allowable tension loads depending on the distance of the strap to the corner of the concrete foundation.

The **Straps for Second Floor Application** section lists the Simpson strap model number, the framing clear span between strap nailing for floor joist and plate depth, the number of fastener nails, and the allowable tension load for the strap. The **HD Holdowns with Anchor Bolts** section lists the Simpson model number,

the holdown width, the anchor bolt diameter, and the allowable tension loads depending on the length of the bolts into the vertical wood member on the side of the shear wall.

The **Anchor Bolts for HD Holdowns** section lists the Simpson model number of the anchor bolt, the required stem wall width (if with a slab on grade, no minimum necessary), the anchor bolt diameter, the minimum embedment length into the concrete footing, and the allowable tension load for the bolt. The **All Thread Rod for HD holdowns** section lists the model number, the diameter, and the allowable pounds of load.

If there was a raised floor on this structure, then you would see a section named **Coupler Nuts for Threaded Rods** which would list the coupler nut model number and the diameter of the threaded rod. If there was a need for a bearing plate to reduce crushing on the wood members below a shear wall, then you would see a section named **Metal Bearing Plates** which would list the model number of the Simpson bearing plate and its length, width and thickness.

The lateral program report then lists all the shear walls and the relevant information about each wall that is written to a text file and can be imported into a CADD drawing to be submitted with the construction documents. The final section of the report is an error check in the analysis and will read, “No errors detected” when everything is entered correctly.

Please contact us if you have any additional questions, need more information or if you would like to order a copy of this lateral engineering software program.

Thank you,

Ruel Czach
President, Structural-Calc, LLC

PROJECT TITLE: Sample Report **PROJECT #:** **DATE: 05-16-2003** **USER'S INITIALS: MJA**

SEISMIC FORCE FACTORS:

Seismic Zone: 4 (1,2A,2B,3,4)	Soil Profile: SD	Z: 0.40
Seismic Source Type: B	Ca: 0.44	Na: 1.00
Occupancy Category: 1.00	R: 5.50	rmax: 1.92
Distance to Seismic Source: 6	DL FACTOR V: 0.240	p (rho): 1.50
Bearing Wall System: A		

UPPER STORY:

	AREA/LENGTH	HEIGHT	UNIT DL	UPPER HALF OF WALLS	TOTAL DL
Roof	1131.0 sqft	6.5 ft	19.0 psf		21.49 kips
Upper Floor Exterior Walls	116.0 ft	8.0 ft	9.0 psf	4.18 kips	4.18 kips
Upper Floor Interior Walls	19.5 ft	8.0 ft	7.5 psf	0.58 kips	0.58 kips
Deck	0.0 sqft		0.0 psf		0.00 kips
Special Loads	0.0 sqft		0.0 psf		0.00 kips
TOTAL WEIGHT					26.25 kips

MAIN STORY:

	AREA/LENGTH	HEIGHT	UNIT DL	UPPER HALF LOWER WALLS	BOTTOM HALF UPPER WALLS	TOTAL DL
Roof	0.0 sqft	0.0 ft	0.0 psf			0.00 kips
Main Floor Exterior Walls	116.0 ft	8.5 ft	9.0 psf	4.44 kips	4.18 kips	8.61 kips
Main Floor Interior Walls	0.0 ft	0.0 ft	0.0 psf	0.00 kips	0.00 kips	0.00 kips
Upper Floor	792.0 sqft		11.5 psf			9.11 kips
Deck	35.0 sqft		9.0 psf			0.32 kips
Special Loads	0.0 sqft		0.0 psf			0.00 kips
TOTAL WEIGHT						18.04 kips

SEISMIC FORCES:	FORCE/SQFT	SHEAR FORCE	SEISMIC FORCE
Total Base Shear:		10.63 kips	11.39 kips
Upper Story:	5.97 psf	6.30 kips	6.75 kips
Main Story:	5.61 psf	4.33 kips	4.64 kips

WIND FORCE FACTORS:

Exposure:	B	
Cq:	0.7 (On Horizontal Projected Area)	1.3 (On Vertical Projected Area)
Basic Wind Speed:	70 mph	

WIND FORCES:

	FLOOR JOIST DEPTH BELOW	MAX HEIGHT	STORY HT.	UNIT WIND H.	UNIT WIND V.	DESIGN WIND HOR.
Upper Story:	12.00 in	24.00 ft	10.50 ft	10.97 psf	5.91 psf	115.23 plf
Main Story:	0.00 in	12.50 ft	9.25 ft	10.16 psf	5.47 psf	93.94 plf

UPPER STORY DIAPHRAGM

	RUNNING N-S			RUNNING E-W				RUNNING N-S		RUNNING E-W	
DIA	E GRID	W GRID	WIDTH	N GRID	S GRID	WIDTH	AREA	UNIT SHEAR	WIND/SEIS	UNIT SHEAR	WIND/SEIS
U1	1	3	43.5	B	A	26.0	1131.0	155.2 plf (SEISMIC)		259.6 plf (SEISMIC)	

UPPER STORY LATERAL FORCES N-S: TRIBUTARY AREA METHOD (FLEXIBLE DIAPHRAGM ANALYSIS)

GRID LINE	DOCUMENTATION	TRIBUTARY LENGTH (ft)	FLOOR OFFSET (ft)	ADDED FORCE (lb)	TRIBUTARY FORCE (lb)	FORCE ABOVE (lb)	LATERAL FORCE (lb)
1	50%(1-2)(U1)=50%(38)	19.00	0.00	0.0	2948.3	0.0	2948.3
2	50%(1-2)(U1)=50%(38)	19.00	0.00	0.0	2948.3	0.0	3801.7
	100%(2-3)(U1)=100%(5.5)	5.50	0.00	0.0	853.4		

UPPER STORY LATERAL FORCES E-W: TRIBUTARY AREA METHOD (FLEXIBLE DIAPHRAGM ANALYSIS)

GRID LINE	DOCUMENTATION	TRIBUTARY LENGTH (ft)	FLOOR OFFSET (ft)	ADDED FORCE (lb)	TRIBUTARY FORCE (lb)	FORCE ABOVE (lb)	LATERAL FORCE (lb)
A	50%(A-B)(U1)=50%(26)	13.00	0.00	0.0	3375.0	0.0	3375.0
B	50%(A-B)(U1)=50%(26)	13.00	0.00	0.0	3375.0	0.0	3375.0

UPPER STORY SHEAR WALLS RUNNING N-S

GRID LINE	WALL #	LEN (ft)	HEI (ft)	WID (in)	TYPE	DEAD LOAD FROM	INT/ EXT	TRIB LEN (ft)	ADDED D.L. (psf)	ADDED T.L. (ft)	ADDED CRUSH (lb)	UNIT SHEAR (plf)	SHEAR FORCE (lb)	SHEAR WALL OR TIE PLATE	MAX SHEAR (lb)	UPLIFT LINK
1	I N	6.5	8.0	4	PANL	ROOF	EXT	7.0	0.0	0.0	450.0	347	2255	B	2470	-
	I S	-	-	4	PANL	-	-	-	0.0	0.0	0.0	347	2255	B	2470	-
	II N	2.0	8.0	4	SEC	ROOF	EXT	3.5	0.0	0.0	0.0	347	694	Q8B	1106	-
	II S	-	-	4	SEC	-	-	-	0.0	0.0	450.0	347	694	Q8B	1106	-
2	I	5.0	8.0	4	PANL	ROOF	EXT	8.0	0.0	0.0	750.0	543	2716	D	3200	-
	II N	2.0	8.0	4	SEC	ROOF	EXT	3.5	0.0	0.0	0.0	543	1086	Q8B	1106	-
	II S	-	-	4	SEC	-	-	-	0.0	0.0	750.0	543	1086	Q8B	1106	-

UPPER STORY SHEAR WALLS RUNNING E-W

GRID LINE	WALL #	LEN (ft)	HEI (ft)	WID (in)	TYPE	DEAD LOAD FROM	INT/ EXT	TRIB LEN (ft)	ADDED D.L. (psf)	ADDED T.L. (ft)	ADDED CRUSH (lb)	UNIT SHEAR (plf)	SHEAR FORCE (lb)	SHEAR WALL OR TIE PLATE	MAX SHEAR (lb)	UPLIFT LINK
A	I E	2.0	8.0	4	SEC	ROOF	EXT	3.5	0.0	0.0	0.0	202	405	Q8B	1106	-
	I W	-	-	4	SEC	-	-	-	0.0	0.0	500.0	202	405	Q8B	1106	-
	II E	12.0	8.0	4	PANL	ROOF	EXT	9.0	0.0	0.0	500.0	202	2430	A	3120	-
	II W	-	-	4	PANL	-	-	-	0.0	0.0	900.0	202	2430	A	3120	-
	III	2.7	8.0	4	SEC	ROOF	EXT	13.0	0.0	0.0	900.0	202	541	Q8C	1485	-
B	I E	4.2	8.0	4	PANL	ROOF	EXT	3.0	0.0	0.0	0.0	265	1125	B	1615	-
	I W	-	-	4	PANL	-	-	-	0.0	0.0	1200.0	265	1125	B	1615	-
	II E	4.5	8.0	4	PANL	ROOF	EXT	13.0	0.0	0.0	1200.0	265	1191	B	1710	-
	II W	-	-	4	PANL	-	-	-	0.0	0.0	1200.0	265	1191	B	1710	-
	III E	4.0	8.0	4	PANL	ROOF	EXT	3.5	0.0	0.0	1200.0	265	1059	B	1520	-
	III W	-	-	4	PANL	-	-	-	0.0	0.0	0.0	265	1059	B	1520	-

UPPER STORY SHEAR WALL CONNECTORS RUNNING N-S

GRID LINE	WALL #	CONNECT TO	FLOOR JOIST DEPTH (in)	STEM WALL (in)	END DIST (in)	CONNCTR UPLIFT (lb)	CONNECTOR	ANCHOR BOLT/ ROD	CONNCTR MAXIMUM UPLIFT (lb)	EDGE MEMBER UPLIFT (lb)	WALL EDGE MEMBER	MAX EDGE MEMBER UPLIFT (lb)	CRUSH (lb)	METAL BEARING PLATE
1	I N	POST	11.88	-	-	2175	MSTI60	-	2516	2175	3x4 STAN	4800	4089	-
	I S	SHEAR WALL	11.88	-	-	2175	MSTI60	-	2516	2175	3x4 STAN	4800	3639	-
	II N	SHEAR WALL	11.88	-	3.5	2650	PROVIDED	ATR-7/8	9900	2650	-	-	2908	PROVIDED
	II S	SHEAR WALL	11.88	-	3.5	2650	PROVIDED	ATR-7/8	9900	2650	-	-	3358	PROVIDED
2	I	POST	11.88	-	-	3841	HD8A	ATR-7/8	5415	3841	3x4 STAN	4800	5855	BP1
	II N	SHEAR WALL	11.88	-	3.5	4220	PROVIDED	ATR-7/8	9900	4220	-	-	4478	PROVIDED
	II S	POST	11.88	-	3.5	4220	PROVIDED	ATR-7/8	9900	4220	-	-	5228	PROVIDED

UPPER STORY SHEAR WALL CONNECTORS RUNNING E-W

GRID LINE	WALL #	CONNECT TO	FLOOR JOIST DEPTH (in)	STEM WALL (in)	END DIST (in)	CONNCTR UPLIFT (lb)	CONNECTOR	ANCHOR BOLT/ ROD	CONNCTR MAXIMUM UPLIFT (lb)	EDGE MEMBER UPLIFT (lb)	WALL EDGE MEMBER	MAX EDGE MEMBER UPLIFT (lb)	CRUSH (lb)	METAL BEARING PLATE
A	I E	SHEAR WALL	11.88	-	3.5	1495	PROVIDED	ATR-7/8	9900	1495	-	-	1753	PROVIDED
	I W	SHEAR WALL	11.88	-	3.5	1495	PROVIDED	ATR-7/8	9900	1495	-	-	2253	PROVIDED
	II E	POST	11.88	-	-	307	MSTI36	-	988	307	2-2x4 STAN	5761	4172	-
	II W	POST	11.88	-	-	307	MSTI36	-	988	307	2-2x4 STAN	5761	4572	-
	III	POST	11.88	-	24.0	1236	PROVIDED	ATR-7/8	9900	1236	-	-	3179	PROVIDED
B	I E	SHEAR WALL	11.88	-	-	1871	MSTI60	-	2516	1871	2-2x4 STAN	5761	2360	-
	I W	HEADER	11.88	-	-	3087	HD5A	ATR-5/8+LBP	3095	1871	2-2x4 STAN	5761	3560	-
	II E	HEADER	11.88	-	-	2428	HD2A	ATR-5/8+LBP	2565	1472	2-2x4 STAN	5761	5806	-
	II W	HEADER	11.88	-	-	2428	HD2A	ATR-5/8+LBP	2565	1472	2-2x4 STAN	5761	5806	-
	III E	HEADER	11.88	-	-	3083	HD5A	ATR-5/8+LBP	3095	1868	2-2x4 STAN	5761	4960	-
	III W	POST V.O.	11.88	-	-	3083	MSTI72	-	3251	1868	2-2x4 STAN	5761	3760	-

MAIN STORY DIAPHRAGM

DIA	RUNNING N-S E GRID	W GRID	WIDTH	RUNNING E-W N GRID	S GRID	WIDTH	AREA	RUNNING N-S UNIT SHEAR	WIND/SEIS	RUNNING E-W UNIT SHEAR	WIND/SEIS
M1	1	2	36.0	B	A	22.0	792.0	123.4 plf	(SEISMIC)	201.9 plf	(SEISMIC)
M2	2	3	3.3	A.5	A	10.0	33.0	93.9 plf	(WIND)	93.9 plf	(WIND)

PROJECT TITLE: Sample Report **PROJECT #:** **DATE: 05-16-2003** **USER'S INITIALS: MJA**

MAIN STORY LATERAL FORCES N-S: TRIBUTARY AREA METHOD (FLEXIBLE DIAPHRAGM ANALYSIS)

GRID LINE	DOCUMENTATION	TRIBUTARY LENGTH (ft)	FLOOR OFFSET (ft)	ADDED FORCE (lb)	TRIBUTARY FORCE (lb)	FORCE ABOVE (lb)	LATERAL FORCE (lb)
1	50%(1-2)(M1)=50%(36)	18.00	0.00	0.0	2220.8	2948.3	5169.0
2	50%(1-2)(M1)=50%(36)	18.00	0.00	0.0	2220.8	3801.7	6331.6
	100%(2-3)(M2)=100%(3.5)	3.29	0.00	0.0	309.1		

MAIN STORY LATERAL FORCES E-W: TRIBUTARY AREA METHOD (FLEXIBLE DIAPHRAGM ANALYSIS)

GRID LINE	DOCUMENTATION	TRIBUTARY LENGTH (ft)	FLOOR OFFSET (ft)	ADDED FORCE (lb)	TRIBUTARY FORCE (lb)	FORCE ABOVE (lb)	LATERAL FORCE (lb)
A	67%(A-B)(M1)=67%(22)	14.74	0.00	0.0	2975.8	3375.0	7290.2
	100%(A-A.5)(M2)=100%(10)	10.00	0.00	0.0	939.4		
B	33%(A-B)(M1)=33%(22)	7.26	0.00	0.0	1465.7	3375.0	4840.7

MAIN STORY SHEAR WALLS RUNNING N-S

GRID LINE	WALL #	LEN (ft)	HEI (ft)	WID (in)	TYPE	DEAD LOAD FROM	INT/ EXT	TRIB LEN (ft)	ADDED D.L. (psf)	ADDED T.L. (ft)	ADDED CRUSH (lb)	UNIT SHEAR (plf)	SHEAR FORCE (lb)	SHEAR WALL OR TIE PLATE	MAX SHEAR (lb)	UPLIFT LINK
1	I N	7.5	8.0	4	PANL	UF	EXT	0.67	0.0	0.0	100.0	544	4081	D	4800	-
	I S	-	-	4	PANL	-	-	-	0.0	0.0	0.0	544	4081	D	4800	1-I S
	II N	2.0	9.0	4	STAN	UF	EXT	0.67	0.0	0.0	0.0	544	1088	S9B	1586	1-II N
	II S	-	-	4	STAN	-	-	-	0.0	0.0	100.0	544	1088	S9B	1586	1-II S
2	I N	22.0	7.0	4	PANL	UF	EXT	0.67	0.0	0.0	0.0	288	6332	B	8360	2-II N
	I S	-	-	4	PANL	-	-	-	0.0	0.0	0.0	288	6332	B	8360	-

MAIN STORY SHEAR WALLS RUNNING E-W

GRID LINE	WALL #	LEN (ft)	HEI (ft)	WID (in)	TYPE	DEAD LOAD FROM	INT/ EXT	TRIB LEN (ft)	ADDED D.L. (psf)	ADDED T.L. (ft)	ADDED CRUSH (lb)	UNIT SHEAR (plf)	SHEAR FORCE (lb)	SHEAR WALL OR TIE PLATE	MAX SHEAR (lb)	UPLIFT LINK
A	I E	36.0	7.0	4	PANL	UF	EXT	11.0	0.0	0.0	0.0	203	7290	A	9360	A-I E
	I W	-	-	4	PANL	-	-	-	0.0	0.0	0.0	203	7290	A	9360	-
B	I E	1.8	7.0	4	PORT	UF	EXT	11.0	0.0	0.0	2750.0	593	1086	P7B	2187	B-I E
	I W	-	-	4	PORT	-	-	-	0.0	0.0	2750.0	593	1086	P7B	2187	-
	II E	1.8	7.0	4	PORT	UF	EXT	11.0	0.0	0.0	6000.0	593	1086	P7B	2187	B-I E
	II W	-	-	4	PORT	-	-	-	0.0	0.0	5500.0	593	1086	P7B	2187	-
	III E	4.5	8.7	4	PANL	UF	EXT	11.0	0.0	0.0	5500.0	593	2670	D	2880	-
	III W	-	-	4	PANL	-	-	-	0.0	0.0	1500.0	593	2670	D	2880	-

MAIN STORY SHEAR WALL CONNECTORS RUNNING N-S

GRID LINE	WALL #	CONNECT TO	FLOOR JOIST DEPTH (in)	STEM WALL (in)	END DIST (in)	CONNCTR UPLIFT (lb)	ANCHOR BOLT/ CONNECTOR	ROD	CONNCTR MAXIMUM UPLIFT (lb)	EDGE MEMBER UPLIFT (lb)	WALL EDGE MEMBER	MAX EDGE MEMBER UPLIFT (lb)	CRUSH (lb)	METAL BEARING PLATE
1	I N	CONC SLAB	-	6	24.0	4084	STHD14	-	4805	4059	3x4 STAN	4800	4511	-
	I S	CONC SLAB	-	6	24.0	4084	STHD14	-	4805	4059	3x4 STAN	4800	4411	-
	II N	CONC SLAB	-	8	0.0	4817	PROVIDED	SSTB28	7690	4811	-	-	4912	-
	II S	CONC SLAB	-	8	0.0	4817	PROVIDED	SSTB28	7690	4811	-	-	5012	-
2	I N	CONC SLAB	-	8	0.0	4220	HD8A	SSTB28	5415	4220	3x4 STAN	4800	4478	-
	I S	CONC SLAB	-	8	0.0	1536	HPAHD22	-	2210	1536	3x4 STAN	4800	2184	-

MAIN STORY SHEAR WALL CONNECTORS RUNNING E-W

GRID LINE	WALL #	CONNECT TO	FLOOR JOIST DEPTH (in)	STEM WALL (in)	END DIST (in)	CONNCTR UPLIFT (lb)	ANCHOR BOLT/ CONNECTOR	ROD	CONNCTR MAXIMUM UPLIFT (lb)	EDGE MEMBER UPLIFT (lb)	WALL EDGE MEMBER	MAX EDGE MEMBER UPLIFT (lb)	CRUSH (lb)	METAL BEARING PLATE
A	I E	CONC SLAB	-	6	0.0	1495	LSTHD8	-	1825	1495	2-2x4 STAN	5761	5972	-
	I W	CONC SLAB	-	6	0.0	226	PAHD42	-	1225	226	2-2x4 STAN	5761	5972	-
B	I E	CONC SLAB	-	-	0.0	3997	PROVIDED	SSTB28	8325	3997	-	-	7134	-
	I W	CONC SLAB	-	-	0.0	3997	PROVIDED	SSTB28	8325	3997	-	-	7134	-
	II E	CONC SLAB	-	-	24.0	3997	PROVIDED	SSTB28	8325	3997	-	-	10384	-
	II W	CONC SLAB	-	-	24.0	3997	PROVIDED	SSTB28	8325	3997	-	-	9884	-
	III E	CONC SLAB	-	6	24.0	4746	STHD14	-	4805	4746	3x4 STAN	4800	11230	BP1
	III W	CONC SLAB	-	6	24.0	4746	STHD14	-	4805	4746	4x4 NO.2	14052	7230	-

MAIN STORY POSTS AND POST CONNECTORS SUPPORTING SHEAR WALLS ABOVE RUNNING N-S

SUPPORTS SHEAR WALL	HEIGHT (ft)	ADDED CRUSH (lb)	UPLIFT (lb)	COMP. (lb)	MINIMUM POST	MAX UPLIFT (lb)	MAX COMP. (lb)	METAL BEARING PLATE
1 I N-Upper	8.0	0.0	2175	4089	2-2x4 STAN	5761	4102	-
2 I-Upper	7.0	0.0	3841	5855	2-2x4 NO.2	8030	5893	-
2 II S-Upper	7.0	0.0	4220	5228	2-2x4 STAN	5761	5262	-

MAIN STORY POSTS AND POST CONNECTORS SUPPORTING SHEAR WALLS ABOVE RUNNING E-W

SUPPORTS SHEAR WALL	HEIGHT (ft)	ADDED CRUSH (lb)	UPLIFT (lb)	COMP. (lb)	MINIMUM POST	MAX UPLIFT (lb)	MAX COMP. (lb)	METAL BEARING PLATE
A II E-Upper	7.0	0.0	307	4172	2-2x4 STAN	5761	5262	-
A II W-Upper	7.0	0.0	307	4572	2-2x4 STAN	5761	5262	-
A III-Upper	7.0	0.0	1236	3179	2-2x4 STAN	5761	5262	-
B III W-Upper	7.0	0.0	3083	3760	4x4 NO.2	14052	9166	-

MAIN STORY POSTS AND POST CONNECTORS SUPPORTING SHEAR WALLS ABOVE RUNNING N-S CONTINUED

SUPPORTS SHEAR WALL	UPLIFT (lb)	MINIMUM POST	CONNECT TO	FLOOR JOIST DEPTH	STEM WALL (in)	END DIST (in)	CONNECTOR	ANCHOR BOLT/ ROD	MAXIMUM UPLIFT (lb)
1 I N-Upper	2175	2-2x4 STAN	CONC SLAB	-	6	24.0	PAHD42	-	2205
2 I-Upper	3841	2-2x4 NO.2	CONC SLAB	-	6	24.0	STHD14	-	4805
2 II S-Upper	4220	2-2x4 STAN	CONC SLAB	-	6	3.5	STHD14	-	4397

MAIN STORY POSTS AND POST CONNECTORS SUPPORTING SHEAR WALLS ABOVE RUNNING E-W CONTINUED

SUPPORTS SHEAR WALL	UPLIFT (lb)	MINIMUM POST	CONNECT TO	FLOOR JOIST DEPTH	STEM WALL (in)	END DIST (in)	CONNECTOR	ANCHOR BOLT/ ROD	MAXIMUM UPLIFT (lb)
A II E-Upper	307	2-2x4 STAN	CONC SLAB	-	6	14.0	PAHD42	-	2205
A II W-Upper	307	2-2x4 STAN	CONC SLAB	-	6	24.0	PAHD42	-	2205
A III-Upper	1236	2-2x4 STAN	CONC SLAB	-	6	24.0	PAHD42	-	2205
B III W-Upper	3083	4x4 NO.2	CONC SLAB	-	6	0.0	STHD14	-	3800

*** LATERAL REQUIREMENTS ***

REQUIRED SHEAR WALL

SITE-BUILT SHEAR WALLS Type	Sheathing	Sides	Shear Wall/ Connection	Joist/Blkg/ Top Plates	Connection	Bottom Connection	Nail	Panel Framing	(plf)
A	3/8" C-D PLY 8d@6"/12"	1	-	LTP4@24"	LTP4@32"	5/8"Diax12"AB@32"oc	No	2xStuds	260
B	3/8" C-D PLY 8d@4"/12"	1	-	LTP4@12"	LTP4@24"	5/8"Diax12"AB@24"oc	Yes	3xStuds	380
D	3/8" C-D PLY 8d@2"/12"	1	-	LTP4@7"	LTP4@12"	5/8"Diax12"AB@12"oc	Yes	3xStuds	640

SIMPSON PRE-BUILT SHEAR WALLS Type	Model No.	Sides	Shear Wall/ Connection	Joist/Blkg/ Top Plates	Connection	Bottom Connection	Allowable Forces (lbs)	(lbs)	(plf)
S9B	SIMP SW24x9	1	12-SDS 1/4X6	LTP4@5"	-	2-5/8"Diax12"AB	13300	10790	793
Q8B	SIMP SW24x8-RF (2ND FLR)	1	12-SDS 1/4X6	LTP4@7"	16-SDS 1/4X6	-	13300	10790	553
Q8C	SIMP SW32x8-RF (2ND FLR)	1	16-SDS 1/4X6	LTP4@7"	20-SDS 1/4X6	-	13000	10790	556
P7B	SIMP SW22x7x4	1	10-SDS 1/4X6	LTP4@4"	-	2-5/8"Diax12"AB	19100	8325	1195

REQUIRED CONNECTORS

SIMPSON HOLDOWNS AND STRAPS

Strap Tie Holdowns on Slab

Model No.	Minimum Stem Wall	Le	Nails	Nailed Portion (Strap Length)	Allowable Tension Loads 2500 psi concrete Corner End Distance 1/2"	1 1/2"	8"	Equal to Le
Single Pour								
PAHD42	6"	6 1/2"	12-16d	18 5/16"	1225	-	2205	-
HPAHD22	6"	10"	16-16d	24 1/8"	1225	-	3335	-
HPAHD22	8"	10"	23-16d	24 1/8"	2210	-	4875	-
LSTHD8	6"	8"	24-16d sinker	21 5/8"	1825	-	-	1825
STHD14	6"	14"	38-16d sinker	31 5/8"	3800	4295	-	4805

Straps for Second Floor Application

Model No.	Floor Joist Depth (in)	Nailing	Allowable Tension Load (lb)
MSTI36	11 7/8"	16-10dx1 1/2	988
MSTI60	11 7/8"	40-10dx1 1/2	2516
MSTI72	11 7/8"	52-10dx1 1/2	3251

*LatPro assumes that the Clearance Span is 6 1/4" greater than the Floor Joist Depth

HD Holdowns with Anchor Bolts

Model No.	Width	Anchor Diameter	Allowable Tension Loads (lb) Length of Bolt in Vertical Wood Member 2 1/2"	3 1/2"	5 1/2"
HD2A	2 3/4"	5/8"	2565	2775	2760
HD5A	3 1/8"	5/8"	3095	4010	3980
HD8A	3 1/4"	7/8"	5415	7460	7910

Anchor Bolts for HD Holdowns

Model No.	Stemwall Width	Dia.	Min. Embed Le	Allowable Tension Load (lb)
SSTB28	8"	7/8"	24 7/8"	10100

All Thread Rods for HD Holdowns
Second Floor Application Only

Model No.	Dia.	Allowable Tension Load (lb)
ATR-5/8	5/8"	4010
ATR-7/8	7/8"	9900

Metal Bearing Plates

SIMPSON	L	W	Thickness
BP1	3 1/2"	6 1/2"	3/8"

*If bearing plate required then shear wall edge member must be directly connected to bearing plate.

A 3/8" CDX PLYWOOD SHEARWALL W/8d @ 6"/12" O.C.; USE 2-2X STUDS FOR EDGE AND SILL NAILING UNLESS OTHERWISE NOTED; USE LTP4 BOTTOM PLATE TO FLOOR OR RIM JOIST OR BLOCKING @ 32" O.C. OR 16d @ 4" O.C.; USE LTP4 TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 24" O.C.;USE 5/8" DIAMETER x 12" LONG ANCHOR BOLTS @ 32" O.C. WITH 2"x2" BEARING PLATE

B 3/8" CDX PLYWOOD SHEARWALL W/8d @ 4"/12" O.C. STAGGERED; USE 3x NOMINAL STUDS AT STAGGERED EDGE AND SILL NAILING UNLESS OTHERWISE NOTED; USE LTP4 BOTTOM PLATE TO FLOOR OR RIM JOIST OR BLKG @ 12" O.C. OR 16d @ 3" O.C.; USE LTP4 TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 24" O.C.; USE 5/8" DIA. x 12" LONG ANCHOR BOLTS @ 24" O.C. WITH 2"x2" BEARING PLATE

D 3/8" CDX PLYWOOD SHEARWALL W/8d @ 2"/12" O.C. STAGGERED; USE 3x NOMINAL STUDS AT STAGGERED EDGE AND SILL NAILING UNLESS OTHERWISE NOTED; ; USE LTP4 BOTTOM PLATE TO FLOOR OR RIM JOIST OR BLOCKING @ 12" O.C.;USE LTP4 TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 7" O.C.; USE 5/8" DIA. x 12" LONG ANCHOR BOLTS @ 12" O.C. WITH 2"x2" BEARING PLATE

S9B SIMPSON STRONG-WALL SHEARWALL SW24-9 W/ 12-SDS 1/4X6 SCREWS TO TOP PLATES; USE LTP4 @ TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 5" O.C.; USE 2-5/8" DIA x 12" MUDSILL ANCHORS AND 2-SSTB28 HOLDOWN ANCHOR BOLTS

Q8B SIMPSON STRONG-WALL SHEARWALL SW24-8-2RF W/ 12-SDS 1/4X6 SCREWS TO TOP PLATES; USE LTP4 @ TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 7" O.C.; USE 16-SDS 1/4X6 SCREW TO FLOOR FRAMING ELEMENTS

Q8C SIMPSON STRONG-WALL SHEARWALL SW32-8-2RF W/ 16-SDS 1/4X6 SCREWS TO TOP PLATES; USE LTP4 @ TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 7" O.C.; USE 20-SDS 1/4X6 SCREW TO FLOOR FRAMING ELEMENTS

P7B SIMPSON STRONG-WALL SHEARWALL SW22-7-4 W/ 10-SDS 1/4X6 SCREWS TO TOP PLATES; USE LTP4 @ TOP PLATE TO RAFTER, FLOOR OR RIM JOIST OR BLOCKING @ 4" O.C.; USE 2-5/8" DIA x 12" MUDSILL ANCHORS AND 2-SSTB28 HOLDOWN ANCHOR BOLTS; ADD ADDITIONAL RAISED CONCRETE CURB AT PORTAL WALL TO RAISE HEADER TO ADEQUATE HEIGHT FOR GARAGE DOOR OPENING

ERRORS:

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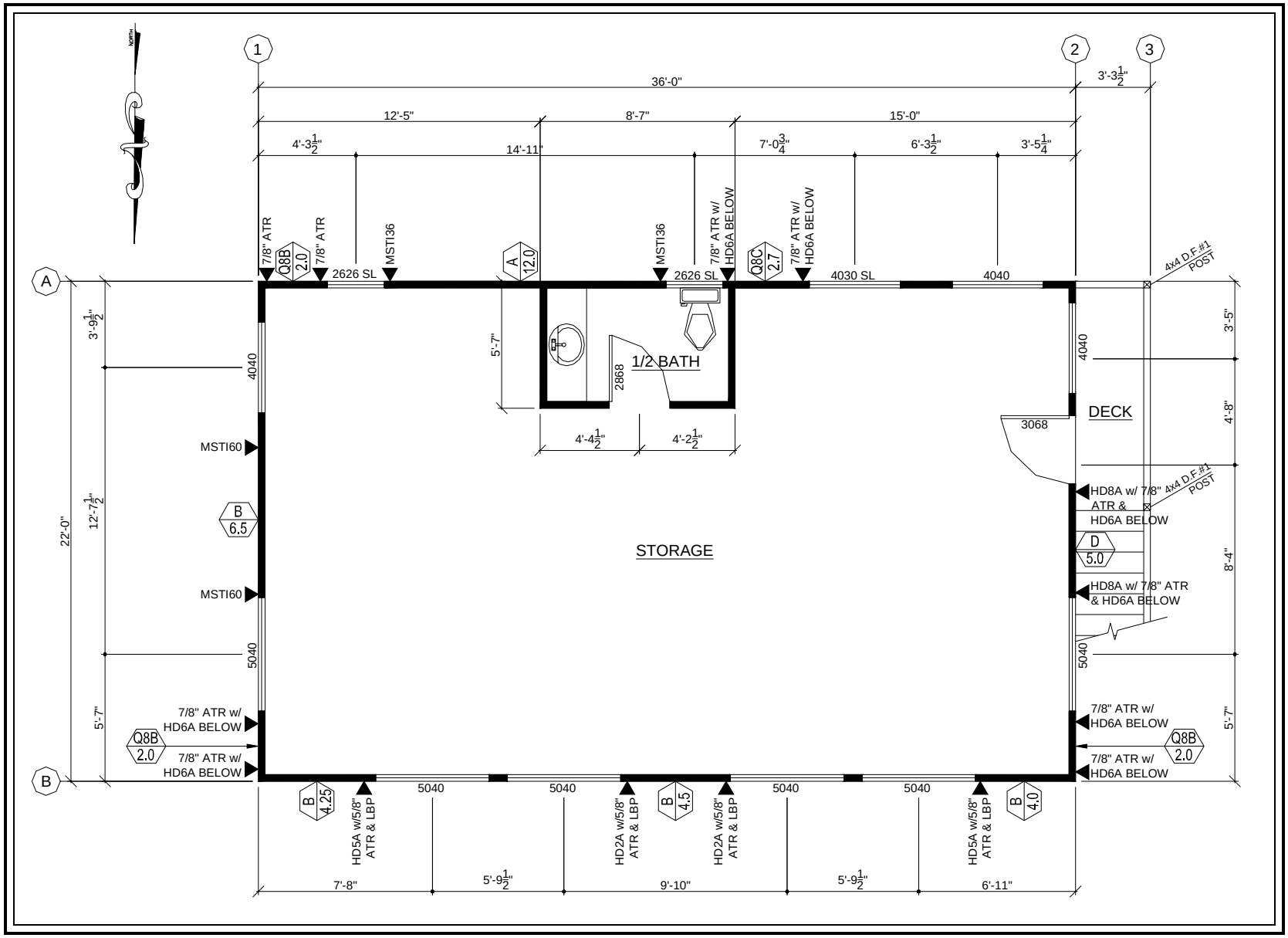
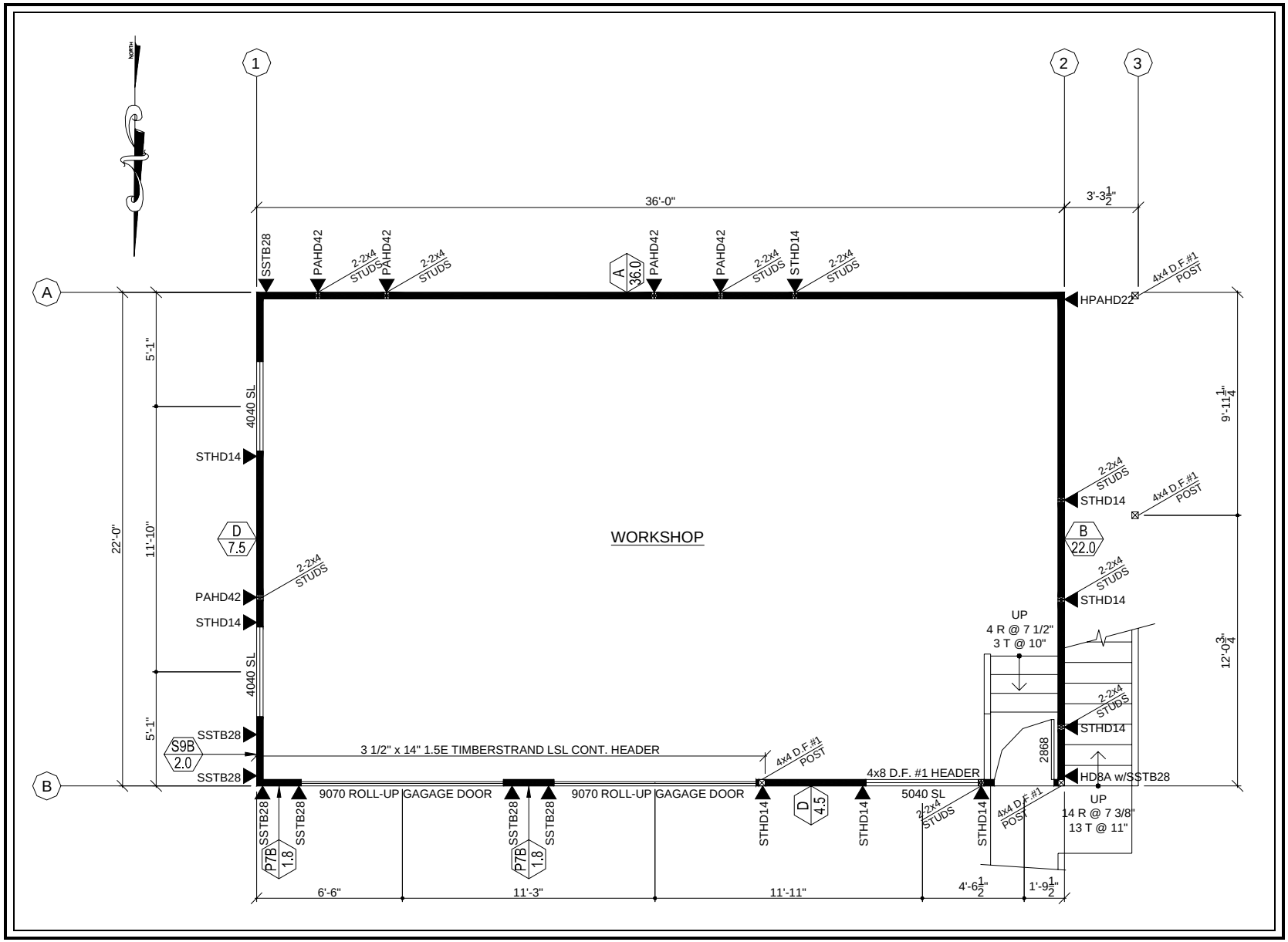
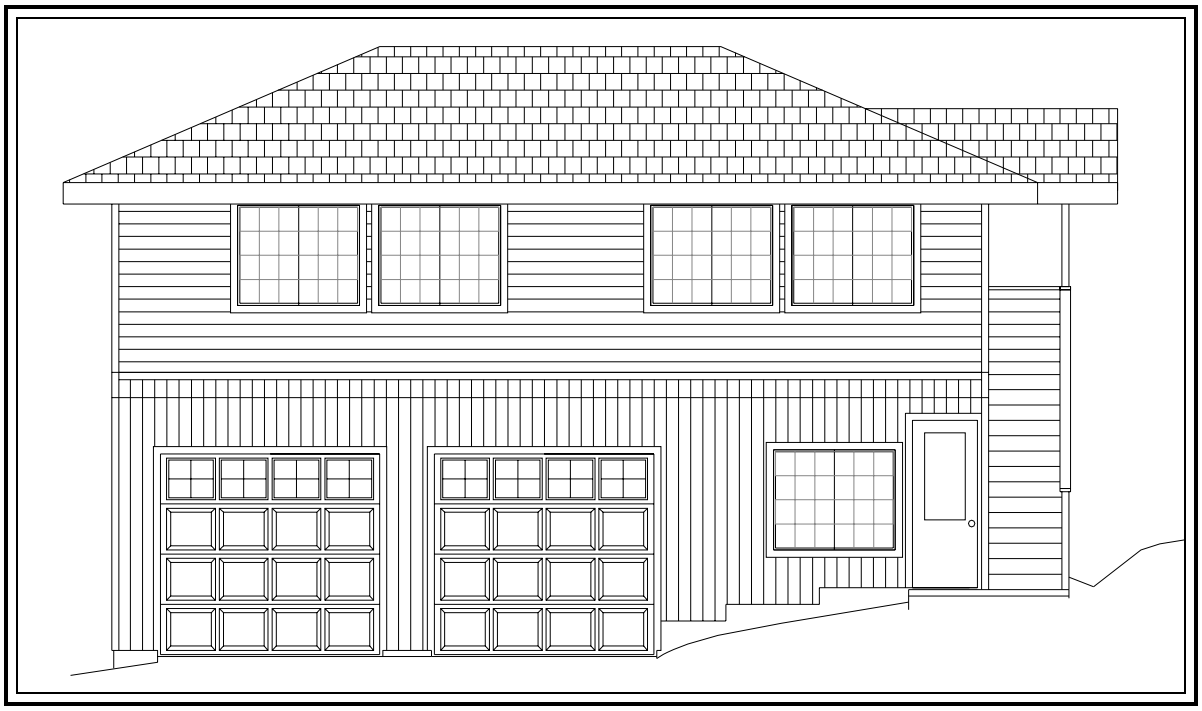


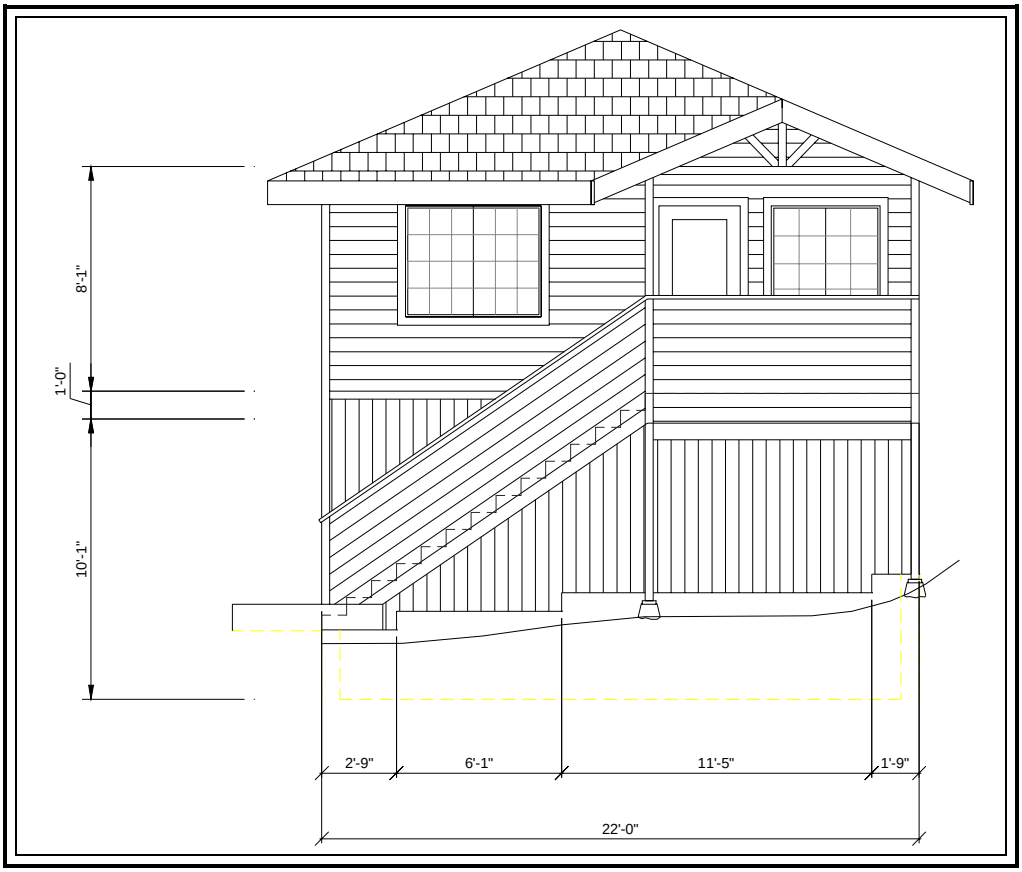
UPPER FLOOR PLAN



LOWER FLOOR PLAN



FRONT ELEVATION



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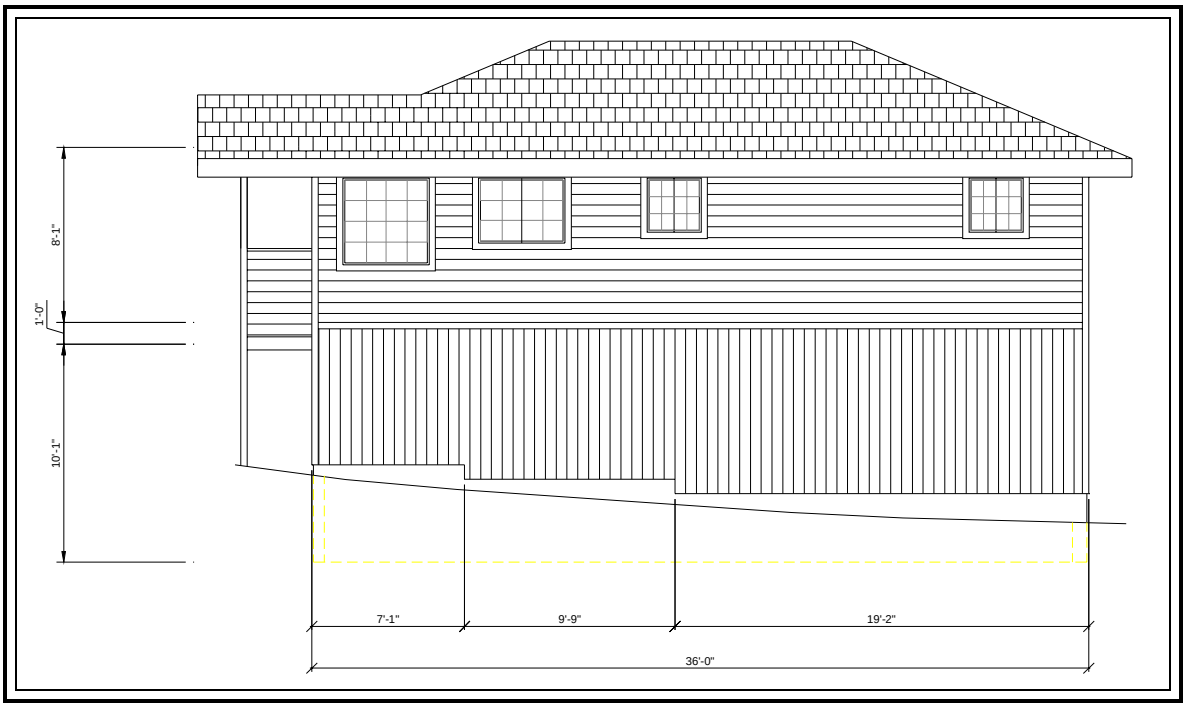
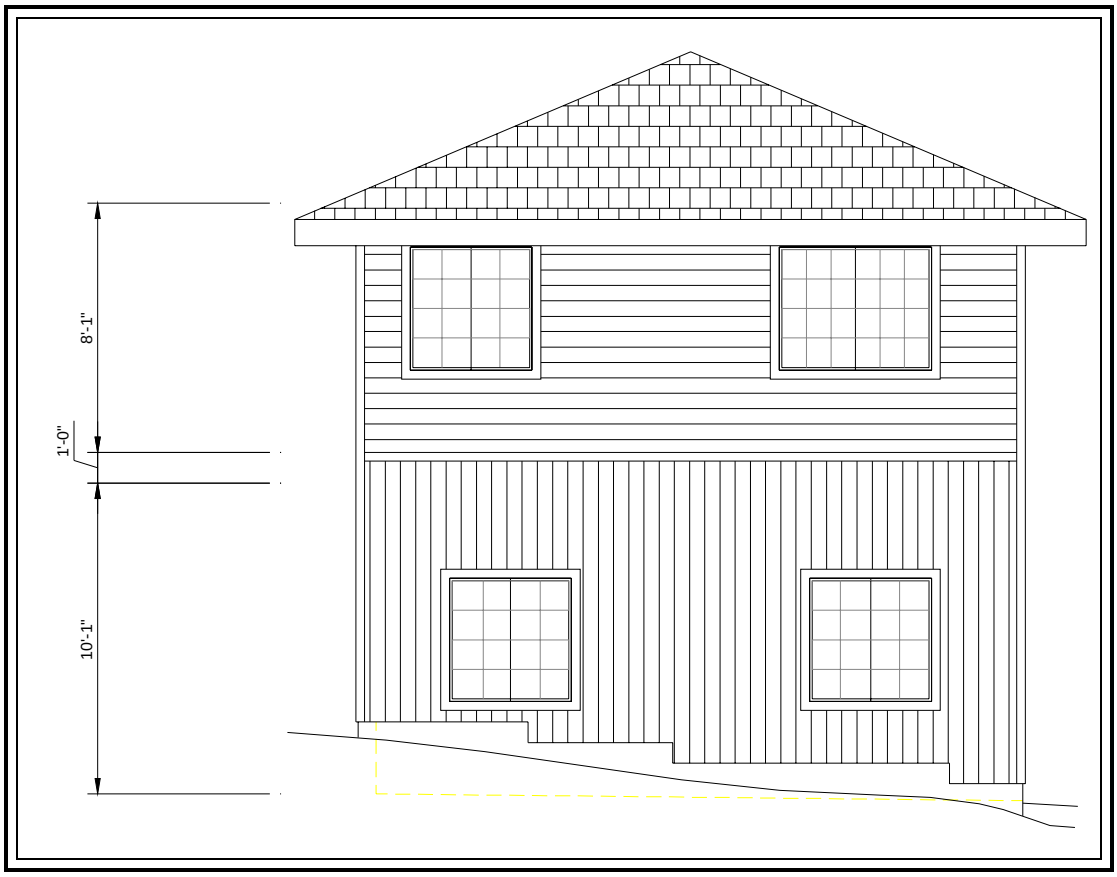


REAR ELEVATION



LEFT ELEVATION