

**d6.1** ABOVE AND BELOW THE MAIN LEVEL

**d6.2** 3 VERY COMMON STORY CONFIGURATIONS

**d6.3** FOUNDATION LEVELS WITHOUT LIVING SPACE

**d6.4** FOUNDATION LEVELS WITH LIVING SPACE

**d6.5** CEILING HEIGHTS\_STANDARD+MECHANICS

**d6.6** CEILING HEIGHTS\_SPACE+SCALE

**d6.7** ATTIC SPACE CODE CLASSIFICATIONS

**d6.8** ATTIC SPACE CODE CLASSIFICATION DESIGN COMPARISONS

**d6.9** MANAGING BUILDING HEIGHT

**d6.10** CONVENTIONAL STAIRS

**d6.11** SPIRAL STAIRS, LADDERS, PULL DN STAIRS, ACCESS OPNGS

**d6.12** DEFINITIONS\_SQUARE FOOTAGE, STORIES, FLOORS

**d6.13** DEFINING THE THERMAL ENVELOPE



**HOW MANY STORIES? ENVELOPE NUMBERS**

**\*SEE d5\_COMPARISON NUMBERS ARE SHOWN ON d5.1. THEY REPRESENT ONE CONSIDERATION. COMMENTS BELOW REPRESENT OTHER CONSIDERATIONS.**

**HOW MANY STORIES? SITE CONSIDERATIONS**

- \*A FLAT SITE**\_ALLOWS A MORE SPREAD OUT SINGLE STORY CONSTRUCTION WITH LITTLE OR NO PENALTY. THAT SAME SITE WOULD OFFER NO REASON NOT TO BUILD UP. FLAT SITES ARE FORGIVING (ASSUMING THE SOIL IS GOOD).
- \*A SEVERELY SLOPED SITE**\_MAY DEFINE & RESTRICT A FOUNDATION FOOTPRINT AND CONSEQUENTLY DICTATE A VERTICAL CONSTRUCTION WITH A NUMBER OF FLOORS TO ACCOMODATE TOTAL LIVING AND SQUARE FOOTAGE REQUIREMENTS.
- \*LOUSY SOFT SOIL**\_MAY HAVE BEARING LIMITATIONS THAT CAN SUPPORT A 1 STORY CONSTRUCTION LOAD BUT NOT A 2 OR 3 STORY LOAD.
- \*HARD TO DIG ROCKY SOIL**\_MAY PREVENT CONTINUOUS FOOTINGS FROM BEING EXCAVATED ECONOMICALLY PER A DESIRED DESIGN LAYOUT. ALTERNATE FOUNDATION TYPE AND MAYBE FOOTPRINT BECOMES DICTATED BY THESE EXCAVATION RESTRICTIONS.

**HOW MANY STORIES? CONSTRUCTION CONSIDERATIONS**

- \*FRAME CONSTRUCTION**\_FROM THAT MAIN LEVEL UP FRAME CONSTRUCTION IS FRAME CONSTRUCTION. WHETHER 1 LEVEL OR 3 LEVELS, THE BASIC CONSTRUCTION REMAINS THE SAME.
- \*WORKING OUTSIDE THE FOOTPRINT**\_IS SIMPLER ON A 1 STORY CONSTRUCTION. LADDERS, AND SCAFFOLDING MAY BE RQUIRED BUT IT IS CLEARLY ALL EASIER TO MANAGE WHEN CLOSER TO THE GROUND. THIS ALSO APPLIES TO MAINTENANCE. 3 AND 3 STORY, AND CONSTRUCTION ON SLOPED SITES, IS LOGICALLY MORE DIFFICULT AND SLOWER.
- \*WORKING INSIDE THE FOOTPRINT**\_ WORKING OFF A FLOOR DECK IS WORKING OFF A FLOOR DECK, WHETHER ON A MAIN LEVEL OR A THIRD LEVEL. STAGING PRODUCT AND EQUIPMENT AND TOOLS IS THE CONSIDERATION. THINKING THROUGH THE TOTAL CONSTRUCTION PROCESS WILL HELP DETERMINE HOW MUCH OF A HANDICAP THAT IS. A WAY TO ELEVATE BULK MATERIALS TO UPPER FLOORS IS A SMALL BIG DEAL.
- \*HVAC COMPLEXITY**\_THE DUCTWORK FOR HVAC SYSTEMS GETS A LITTLE MORE COMPLICATED WITH MORE STORIES. BETTER PLANNING IS ADVISED.
- \*STAIRS**\_TAKE SPACE AND ARE COSTLY TO BUILD
- \*WEATHER**\_PROBABLY DOESN'T EFFECT THE DECISION OF BUILDING UP OR OUT MUCH BUT IT IS WORTH NOTING THAT IT CAN SERIOUSLY EFFECT WORK PACE AND CONSTRUCTION TIME. EXCESSIVE COLD, HEAT AND PRECIPITATION TAKE THEIR TOLL.
- \*WIND**\_HIGH WIND IS ONE SPECIFIC DESIGN CONDITION THAT IN PRINCIPLE FAVORS LOW CONSTRUCTION, AND HIP ROOF GEOMETRY, AS WIND VELOCITY IS TYPICALLY LOWER CLOSER TO THE GROUND, AND THE HIP ROOF HELPS BUFFET WIND. HAVING NOTED THIS, PROPER ENGINEERED CONSTRUCTION CAN MANAGE (MOST)WIND CONDITIONS ALBEIT POSSIBLY AT A COST.

**HOW MANY STORIES? DESIGN & LIFE STYLE CONSIDERATIONS**

- \*LIVING ON OR ABOVE THE GROUND**\_ LIVING ON THE GROUND HAS A GREATER SENSE OF FREEDOM OF MOVEMENT AND CONNECTION WITH THE EARTH. LIVING ABOVE THE GROUND OFFERS A GREATER SENSE OF COMMAND (OF VIEW AND SURROUND) AND OF BEING SECURE AND PROTECTED.
- \*VIEWS**\_WHEN COMPARING SIMPLE RECTANGULAR FOOTPRINTS MULTI STORY DESIGNS OFFER MORE OPPORTUNITY FOR GLASS AND VIEWS FOR MORE SPACES (SEE TOTAL WALL CALCS d5.1). SINGLE STORY DESIGNS HAVE MORE 'BURIED' SPACE. OFF THE GROUND SPACES ALSO OFFER MORE DISTANT VIEWS.
- \*MOBILITY**\_CLEARLY A SINGLE STORY ON THE GROUND CONSTRUCTION MAKES GETTING AROUND EASIER FOR FOLKS WITH MOBILITY LIMITATIONS. HAVING SAID THAT, RESIDENTIAL ELEVATORS AND LIFTS EXIST AND CAN BE INCORPORATED INTO MULTI STORY HOMES IN VERY ACCEPTABLE WAYS.

**OPTIONS ABOVE THE MAIN LEVEL**

**\*COMMENTS ABOVE**\_ARE A FOLLOW UP ON THE NUMBERS SUMMARY IN THE LAST CHAPTER. THESE ARE NECESSARILY GENERIC AND SIMPLISTIC , BUT NONETHELSS VALID. NOTE ENTRIES, GARAGES, PORCHES DO NOT SHOW.....

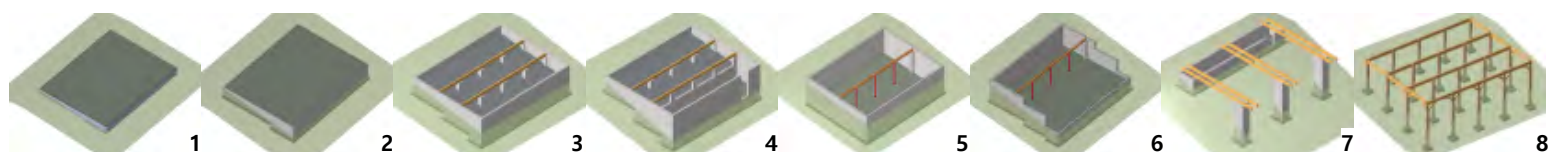
**FOUNDATION LEVELS WITHOUT LIVING SPACE\*\*SEE d6.3**

- 1\*SLAB ON GRADE WITH INTEGRAL FOOTING\_
- 2\*SLAB ON GRADE WITH STEM WALL+FOOTING\_
- 3\*CRAWL SPACE\_
- 4\*CRAWL SPACE WITH STORAGE\_
- 7\*POST AND PIER FOUNDATION\_
- 8\*COMPOSITE CRAWL+PIER FOUNDATION\_

**FOUNDATION LEVELS WITH LIVING SPACE\*\*SEE d6.4**

- 5\*FULL BASEMENT\_
- 6\*WALKOUT BASEMENT\_

**OPTIONS BELOW THE MAIN LEVEL**



## HOW MANY STORIES? A QUICK LOOK AT 3 POPULAR FORMATS

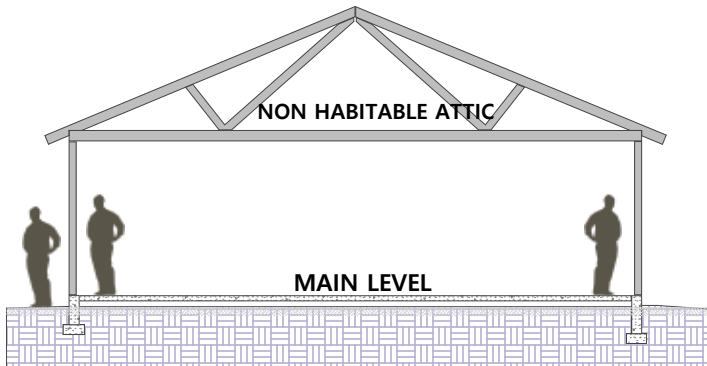
### THE 1 STORY 'SLAB ON GRADE'

**\*SIMPLICITY**\_THE SLAB ON GRADE HOUSE WITH TRUSS ROOF IS THE SIMPLEST CONSTRUCTION ENVELOPE, WHICH TRANSLATES INTO A VERY COST EFFECTIVE PACKAGE. IN SOME REGIONS OF THE COUNTRY THIS IS A DEFAULT FORMAT. FLAT SITES, DRAINABLE SOIL HELP MAKE THIS CONSTRUCTION EASY.

**\*UNINSPIRED**\_THE LOW LOOK AND THE TRUSS ROOF (WHICH OFFERS LIMITED DESIGN OPPORTUNITIES), RESULTS IN A SIMPLE AND POSSIBLY UNINSPIRED EXTERIOR LOOK.

**\*SETTING PRIORITIES**\_THIS COMMENT IS ATTEMPTING TO MAKE A POINT THAT SIMPLE CONSTRUCTION RESULTS IN A SIMPLE LOOK AND USUALLY CONTROLLED AND SIMPLER ONGOING MAINTENANCE.

**\*INTERIORS**\_THE TRUSS ROOF USUALLY RESULTS IN A FLAT CEILING WHICH MEANS INTERIOR SPACE IS CONSISTENT AND PLANAR. SO THE 3RD DIMENSION REMAINS UNEXPLORED. AT THE SAME TIME, A TRUSS TOOF PERMITS A GREAT FREEDOM OF GEOMETRY WITH THE WALL PLANES BELOW AS THEY ARE TYPICALLY NON BEARING.



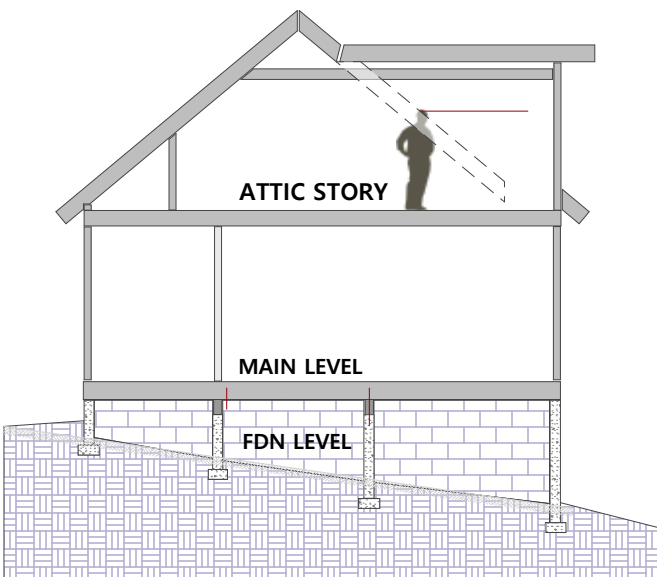
### THE 1 1/2 STORY

**\*MASTER DOWN**\_HAS BECOME MORE OF A STANDARD AND DESIRED BY PEOPLE OF ALL AGES. THIS THROWS SPACE DISTRIBUTION FOR THE GOOD OLD 2 STORY HOME OFF A BIT. THE MAIN FLOOR SIMPLY REQUIRES MORE SPACE THAN THE UPPER.

**\*SMALLER BEDROOMS UP**\_IT USUALLY POSSIBLE TO WORK IN 2 BEDROOMS AND A BATH (AND MAYBE A LITTLE MORE ) INTO THAT HALF FLOOR NESTLED UNDER THE ROOF. THIS WORKS FOR SMALL FAMILIES AND EMPTY NESTERS.

**\*THE SCALE & LOOK**\_THE STORY AND A HALF MAKES IT EASIER TO CREATE A COZY AND COTTAGE LIKE SCALE WHICH DOES HAVE A BROAD APPEAL. THE NORTHEAST'S 'CAPE COD', AND THE SOUTHEAST'S 'LOW COUNTRY' HOME, AND THE BUNGALOW STYLES ALL GAINED POPULARITY FOR MANY GENERATIONS BECAUSE OF THIS HOMEY SCALE, ENHANCED WITH A FRONT PORCH.

**\*BELOW THE MAIN LEVEL**\_THIS STORY AND A HALF FORMAT CAN UTILIZE A SLAB, CRAWL SPACE, OR FULL BASEMENT FOUNDATION SYSTEM **\*NOT SO** **\*NOT AS SIMPLE**\_THE STORY AND A HALF HOME IS GEOMETRICALLY MORE COMPLICATED THAN THE BASE 1 STORY NOTED ABOVE. THE UPPER FLOOR AND ROOF FRAMING CONSTRUCTION CONTRIBUTES TO THAT INCREASED COMPLEXITY.



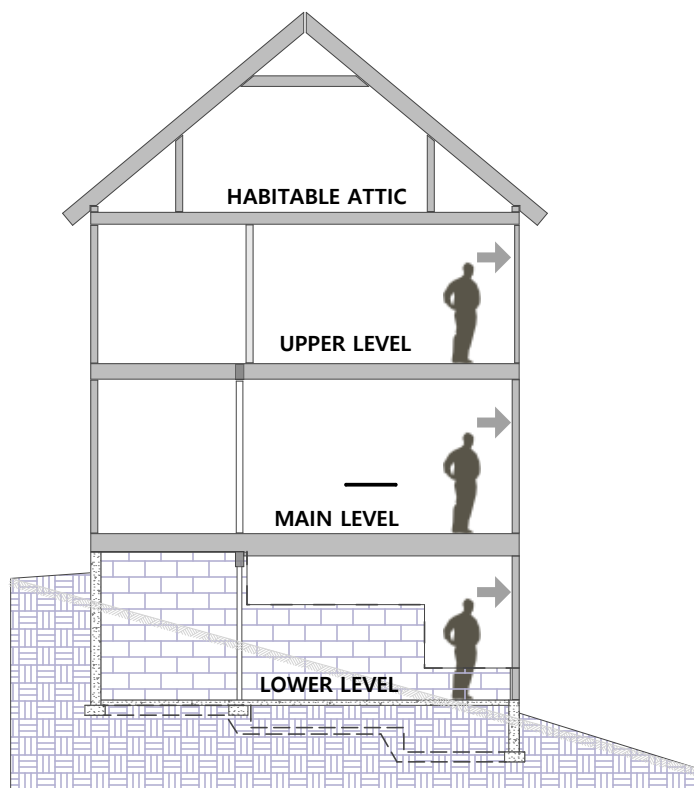
### THE 'MULTI' STORY

**\*STACKED CONSTRUCTION**\_ALTHOUGH UP OFF THE GROUND, THERE IS A COST EFFICIENCY TO STACKED CONSTRUCTION. PART OF THAT EFFICIENCY IS CONTROLLING THE SIZE OF THE FOUNDATION (FOOTPRINT) AS THE FOUNDATION IS USUALLY THE MORE EXPENSIVE IN TERMS OF UNIT CONSTRUCTION. STRUCTURAL ECONOMY IS BENEFITED WITH A FLOOR TO FLOOR BEARING WALL CONSISTENCY WHICH USUALLY DOES TAKE SOME DESIGN WORK TO ACHIEVE.

**\*LOTS OF ROOM**\_PRIMARY REQUIREMENTS ARE TYPICALLY SATISFIED ON THE MAIN AND UPPER LEVELS. THE ATTIC AND OR BASEMENT THEREFORE OFFER A NICE AMOUNT OF SPACE FOR EXPANSION, STORAGE, OR THAT EXTRA GENEROUS SPACE FOR HOBBY OR HOME OFFICE FUNCTION.

**\*STORIES**\_BASED ON THE SPACE CREATED IN THE ATTIC LEVEL, AND THE FOUNDATION LEVEL TREATMENT THIS STACKED CONSTRUCTION ILLUSTRATION COULD BE 2, 3, OR 4 STORIES BY CODE DEFINITION.

**\*OFF THE GROUND**\_AS NOTED THE GLASS POTENTIAL AND VIEWS IN MORE SPACES ARE ENHANCED WITH THIS MULTI STORY FORMAT. AT THE SAME TIME THE REQUIRED STAIRS CAN BE PESKY. AND EXTERIOR MAINTENANCE UP A COUPLE STORIES IS CERTAINLY MORE DIFFICULT.

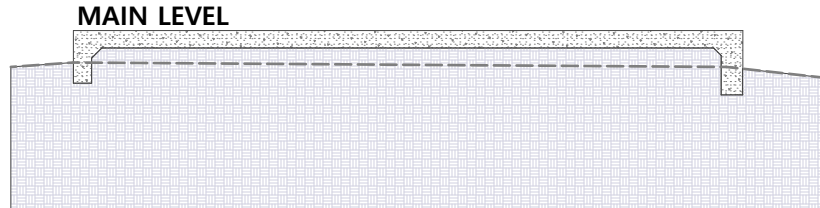
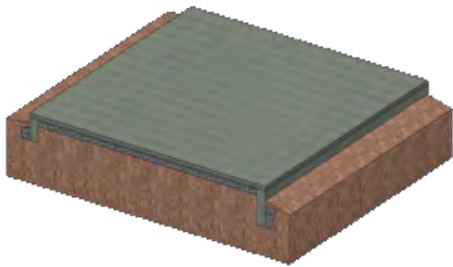


**FOUNDATION LEVEL (NO FINISHED FOOTAGE AND NOT A STORY)**

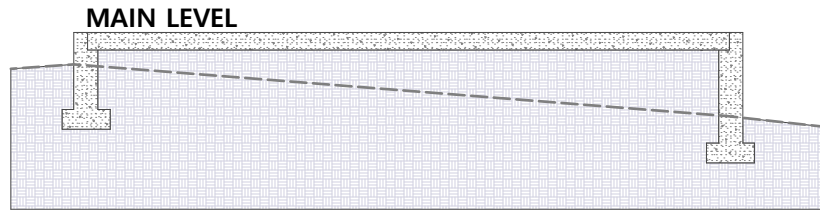
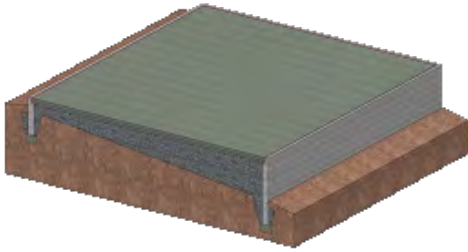
\*COMMONLY USED FOUNDATION SYSTEMS ARE WITHOUT LIVING SPACE AND NOT A STORY

**THE CRAWL SPACE DEFAULT USED DESIGNS THIS PROJECT**

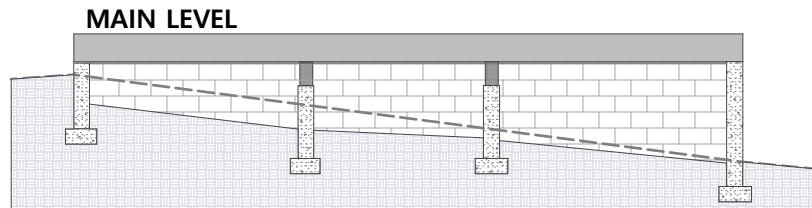
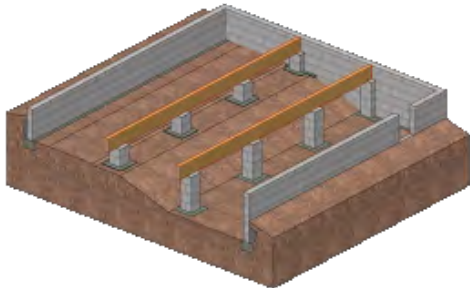
\*ALL DESIGNS THIS PROJECT WITH ALL LIVING SPACE ABOVE GRADE (ABOVE THE MAIN LEVEL) ARE DRAWN WITH A CRAWL SPACE FOUNDATION SYSTEM. ALL DESIGNS CAN BE PLACED UPON ANY OF THESE FOUNDATION SYSTEMS SHOWN BELOW, AND ACCORDINGLY CONVERTED. THE CRAWL SPACE IS SELECTED BECAUSE THE CONVERSION TO ONE OF THESE ALTERNATES IS ON BALANCE EASIER. CONVERTING FROM A SLAB CONFIGURATION TO A FRAME FLOOR CONFIGURATION HAS SOME POTENTIAL COMPLICATIONS. THIS CRAWL SPACE DEFAULT AS BEEN INCLUDED WHILE RECOGNIZING THE MORE PREVALENT SLAB ON GRADE CONSTRUCTION MODEL.



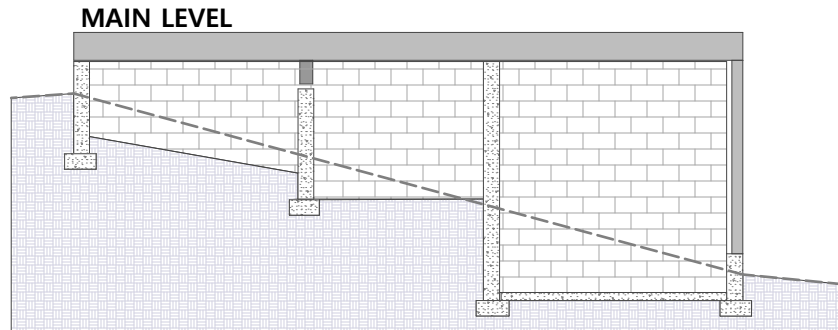
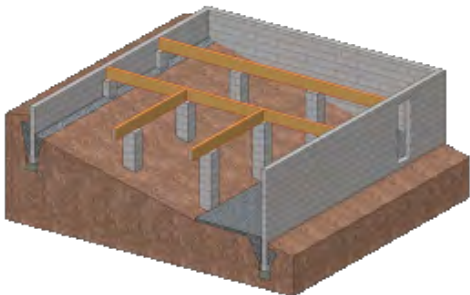
**SLAB ON GRADE WITH INTEGRALFOOTING**



**SLAB ON GRADE WITH STEM WALL+FOOTING**



**CRAWL SPACE**



**CRAWL SPACE WITH WALK-IN STORAGE**

**POST, PIER, PILE FOUNDATION SYSTEMS\_SEE d3.15**

\*LESSS FREQUENTLY USED AS PRIMARY FOUNDATION SYSTEMS BELOW SIMILARLY ARE WITHOUT LIVING SPACE AND NOT A STORY

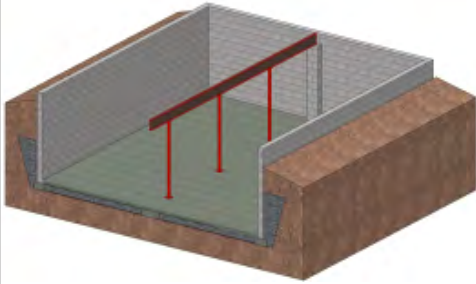


### SITE CHECK FOR LOWER LEVEL POTENTIAL

CHECK TOPO\_SIMPLE PROFILE SECTIONS WILL CLEARLY ILLUSTRATE LOWER LEVEL POTENTIAL. SEE CHAPTER d3 FOR SOME TECHNIQUES.

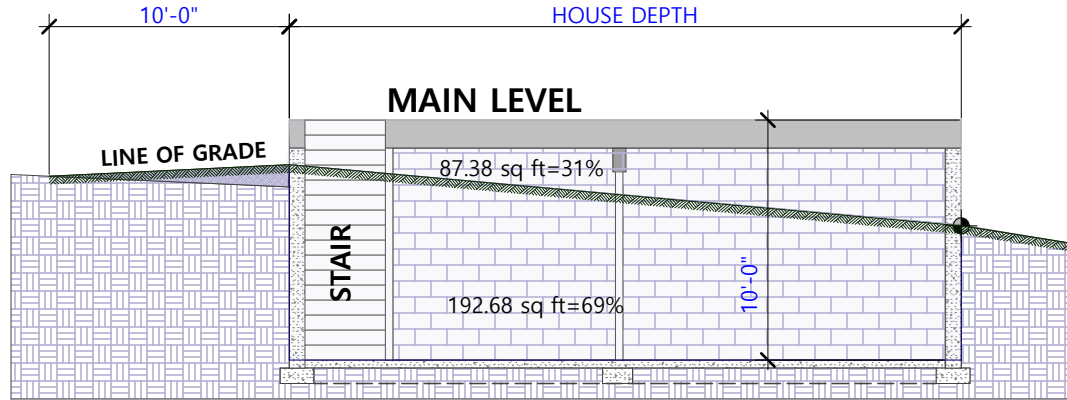
THE 50% RULE WILL DETERMINE WHAT CAN QUALIFY AS A STORY. 50

COMPLIANT STAIR BASEMENT AND LOWER LEVELS REQUIRE A CODE COMPLIANT STAIR DECENDING FROM THE MAIN LEVEL. THIS STAIR, AND THE SPACE IT REQUIRES RENDERS ANY HOME PLAN DESIGNS INCORPORATING LOWER LEVELS DISTINCT AND NOT EASILY INTERCHANGEABLE WITH DESIGNS WITH ALL LIVING SPACE ABOVE GRADE- THAT HAVE NOT CONSIDERED A STAIR.

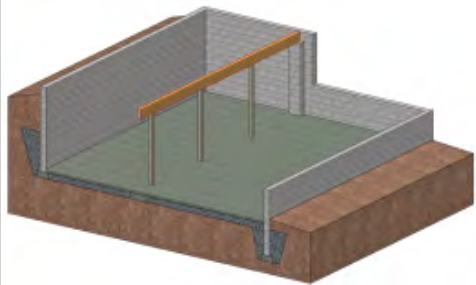


#### BASEMENT LEVEL (NOT A STORY)

\*THERE IS A RECOGNIZED GREY AREA ABOUT HOW THIS BASEMENT SPACE CAN BE USED IF IT DOES NOT CONTAIN AN EMERGENCY EGRESS TO THE OUTSIDE. CHECK WITH LOCAL AUTHORITIES REGARDING PERMISSIONS.



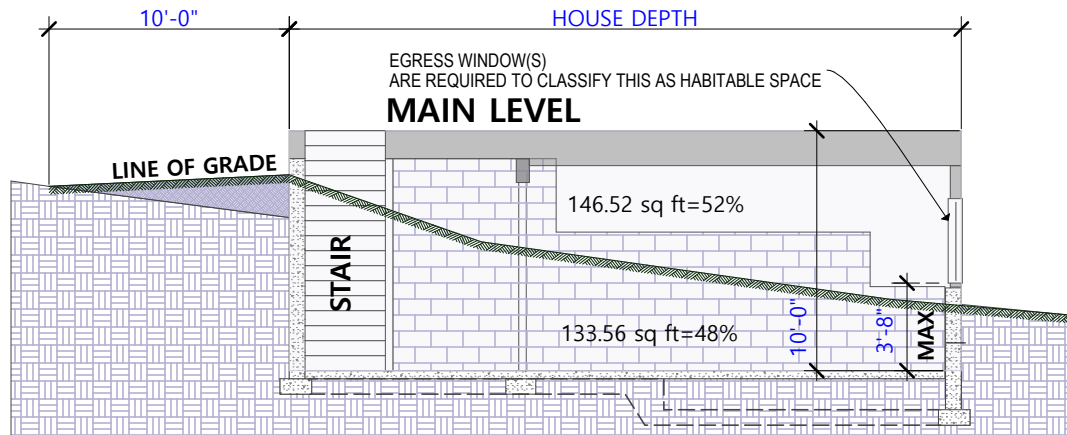
**FULL BASEMENT (not a story)**\_A FULL BASEMENT AS DEFINED AND ILLUSTRATED HERE HAS A HIGHER PERIMETER GRADE, IS MOSTLY BELOW GRADE, AND DOES NOT HAVE ENOUGH WALL SPACE ABOVE GRADE TO INSTALL EGRESS WINDOWS. ANY SPACE THAT IS FINISHED MAY BE VERY USEFUL, BUT IS NOT HABITABLE AND LIKELY NOT CONSIDERED AS FINISHED FOOTAGE BY THE REAL ESTATE INDUSTRY.



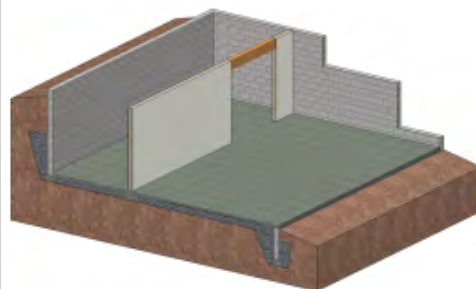
#### DAYLIGHT LOWER LEVEL

\*THIS ILLUSTRATION SHOWS 52% OF SPACE VOLUME ABOVE GRADE AND THIS WOULD THEREFORE QUALIFY AS A STORY.

\*EGRESS WINDOW SILL HT CAN BE NO MORE THAN 44" (3'-8") ABOVE THE FLOOR LEVEL. EGRESS WINDOW(S) OR DOORS DIRECTLY OUTSIDE ARE REQUIRED WHEN 'HABITABLE' SPACE IS CREATED.

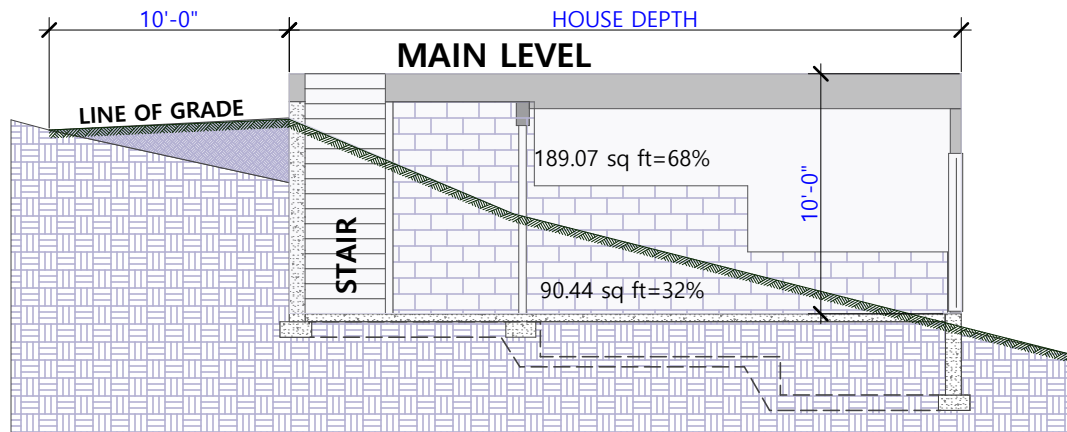


**DAYLIGHT LOWER LEVEL (maybe a story)**\_A DAYLIGHT BASEMENT AS DEFINED AND ILLUSTRATED HERE MUST ALLOW EGRESS WINDOWS TO BE INSTALLED WITHOUT THE USE OF AREAWAYS. THEREFORE HABITABLE SPACE IS POSSIBLE AND CAN BE QUANTIFIED. THE 50% RULE WILL DETERMINE WHETHER THE GRADE LEVEL AROUND THE PERIMETER PERMITS DEFINITION AS A STORY. MORE THAN 50% OF WALL AREA AROUND THE PERIMETER MUST ABOVE GRADE.

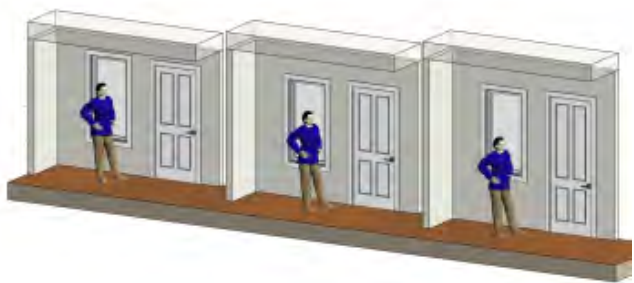


#### WALKOUT LOWER LEVEL DEFAULT

\*ALL DESIGNS THIS PROJECT THAT HAVE A LOWER LEVEL WILL HAVE A WALKOUT CONDITION SHOWN AND WILL QUALIFY AS A STORY. IN ALL CASES WALKOUTS CAN BE CONVERTED TO DAYLIGHT LOWER LEVELS BY SUBSTITUTING WINDOWS FOR THE DOORS.



**WALKOUT LOWER LEVEL (a story)**\_A WALKOUT WILL HAVE A DOOR OR DOORS THAT EXIT TO GRADE. THE REQUIREMENT FOR HABITABLE SPACE AND EGRESS IS MET. TO ACHIEVE THIS THE 50% RULE WILL LIKELY BE MET QUALIFYING THE WALKOUT LOWER LEVEL AS A STORY.



### STANDARD NOMINAL CEILING HEIGHTS

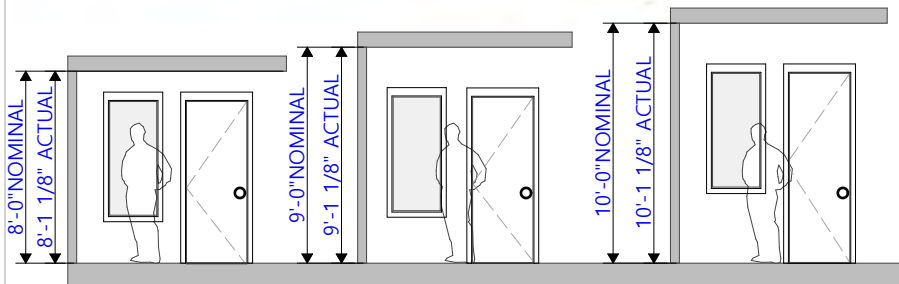
**\*THE BIG PICTURE** THE MOST TYPICAL CONSTRUCTIONS SET A HT FOR BOTH THE EXTERIOR AND INTERIOR WALL HT THAT IS THE CONTROL DIMENSION FOR THAT SAME FLOOR.

**\*STANDARD 8\_8'** WAS A STANDARD FOR MANY YEARS

**\*STANDARD 9'** AS THE SIZE OF OUR AVERAGE HOMES GREW SO DID THE CEILING HT. THE 9' CEILING HT HAS BECOME VERY COMMON AND CONSIDERED A STANDARD BY MANY.

**\*STANDARD 10'** HOMES IN THE LAST COUPLE DECADES THAT EXCEED 3500 SF IN SIZE GRAVITATED TO A 10' CEILING HT NOTABLY ON THE MAIN LEVEL.

**\*PRECUT STUDS** EXIST FOR THESE 3 STANDARD HTS. PRE CUT STUDS ARE EXACTLY CUT TO LENGTH WHERE AS FULL LENGTH STUD (AND OTHER DIMENSIONAL LUMBER) ARE USUALLY BOTH SLIGHTLY OVER THE INDICATED SIZE AND NOT ALL EXACTLY THE SAME LENGTH. WHEN 1 BOTTOM PLATE AND 2 TOP PLATES ARE ADDED TO THE PRECUT STUD THE ACTUAL WALL HEIGHTS EXCEED THE NOMINAL BY 1 1/8". SO THE 8' WALL IS REALLY 8'-1 1/8". CEILING AND FLOOR THICKNESSES USUALLY BRING THAT NET HT BACK CLOSER TO 8'.

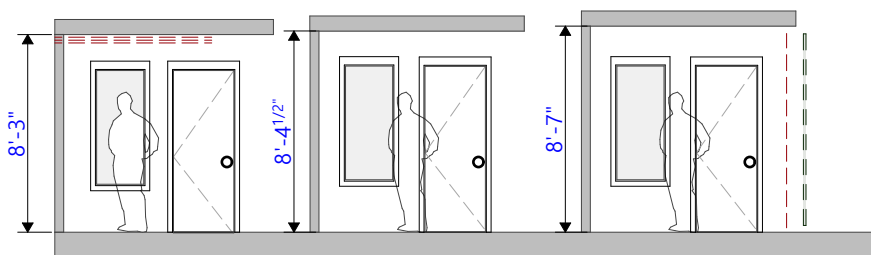


**STANDARD NOMINAL FLAT CEILING HEIGHTS**

### NON STANDARD CEILING HEIGHTS

**\*WALL SYSTEM STANDARDS** MATERIAL STANDARDS AND AVAILABILITY HAVE MADE IT ATTRACTIVE TO STAY WITH STANDARD CEILING HTS. THESE INCLUDE BASICS SUCH AS STUD LENGTHS, EXTERIOR SHEATHING MATERIALS, AND INTERIOR SHEETROCK. BUT \_\_\_\_\_

**\*ANYTHING GOES** WALLS CAN BE BUILT ANY HEIGHT. A LONGER THAN NEEDED STUD CAN BE CUT TO ANY LENGTH AND MANY 'CUTOFFS' FIND A USEFUL PURPOSE AS BLOCKING OR NAILERS. A SCALE FACT IS THAT FOR MOST OF US COMFORT IS FOUND IN CEILINGS BETWEEN 8' AND 9'.

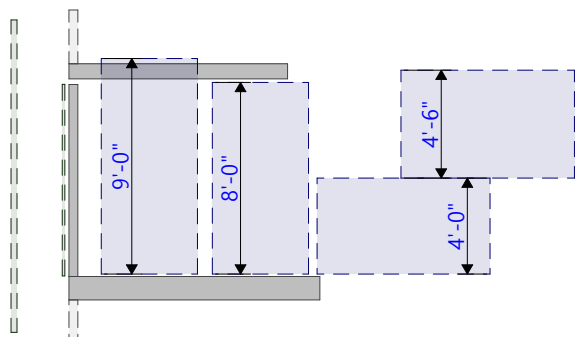


**NON STANDARD CEILING HEIGHTS**

### CONSTRUCTION MATERIAL EFFICIENCY

**\*EXTERIOR SHEETGOODS** AN ECONOMY OF EXTERIOR SHEATHING- OR PANELIZED SIDING CAN BE DESIGNED INTO A PROJECT IN AN EFFORT TO MINIMIZE WASTE. SEVERAL DESIGN AND CONSTRUCTION DECISIONS ARE NEEDED TO ACCOMPLISH THIS--

**\*INTERIOR SHEETGOODS-SHEETROCK** THERE CAN BE AN INCREASED ECONOMY AND LABOR EFFICIENCY WHEN CONFORMING TO (AVAILABLE) SHEETGOODS SIZES AND WALL HEIGHTS. THERE ARE TOO MANY SIZE VARIATIONS AND CONDITIONS TO MAKE INTELLIGENT MENTION OF HERE. SEE CONSTRUCTION GUIDE.



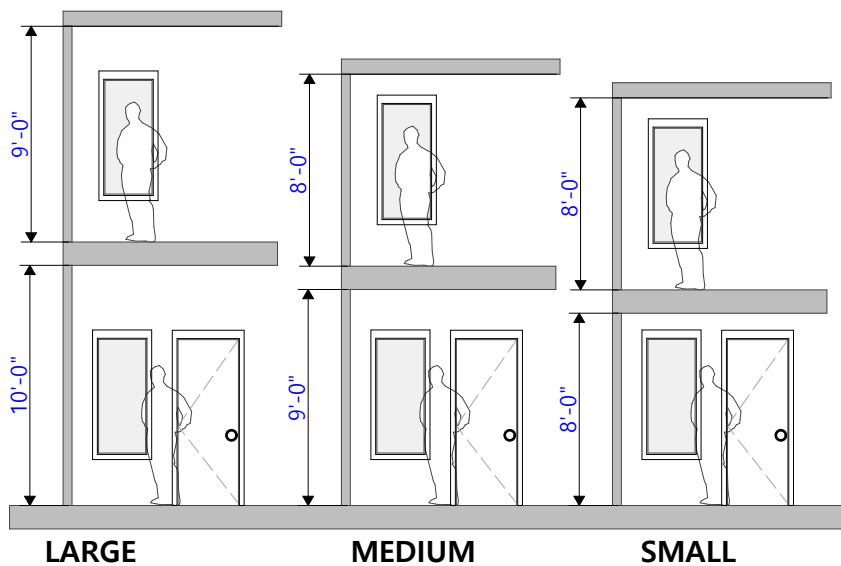
### CHANGING MULTISTORY CEILING HEIGHTS

**\*STANDARDS** IN ANY MULTISTORY HOME THE CEILING HTS CAN BE SELECTED ON A PER LEVEL BASIS. TYPICALLY THE LARGER MORE OPEN LIVING SPACES ARE ON THE MAIN LEVEL AND MAY BE BENEFITED WITH SLIGHTLY HIGHER CEILINGS. AN UPPER LEVEL WITH MOSTLY BEDROOM SPACES ARE WELL SERVED WITH LOWER CEILINGS.

**\*SIZE+SCALE OF HOUSE** IN BIGGER HOMES WITH BIGGER SPACE A HIGHER CEILING IS APPROPRIATE. IN SMALLER HOMES WITH SMALLER SPACE A LOWER CEILING IS APPROPRIATE.

**\*PRICE TO PAY** THE CONSTRUCTION PROCESS FOR THESE DIFFERING CEILING HTS DOES NOT CHANGE MUCH. BUT THERE IS A PROPORTIONAL AMOUNT MORE MATERIAL TO BUY AND INSTALL. THERE ALSO IS A GREATER VOLUME INSIDE TO HEAT AND COOL.

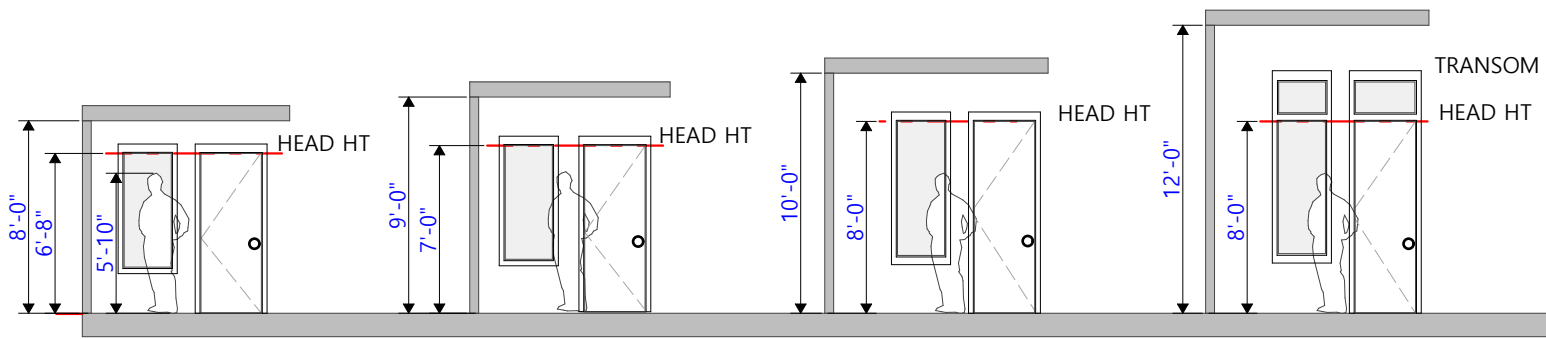
**\*QUALIFYING THE PRICE TO PAY** SOME CONSTRUCTION SCOPES OF WORK ARE PRICED BY SQUARE FT OF FLOOR AREA, WHICH WILL NOT EFFECT THE COST OF INCREASED HEIGHT AND SOME BY SQUARE FT OF SURFACE AREA, WHICH DOES EFFECT THE COST OF INCREASED HEIGHT. ALSO IT IS COMMON TO INCREASE DOOR HTS, WINDOW SIZES, AND SIZES OF TRIMS TO MAINTAIN A PROPORTIONAL LOOK WITH TALLER CEILINGS.



**LARGE**

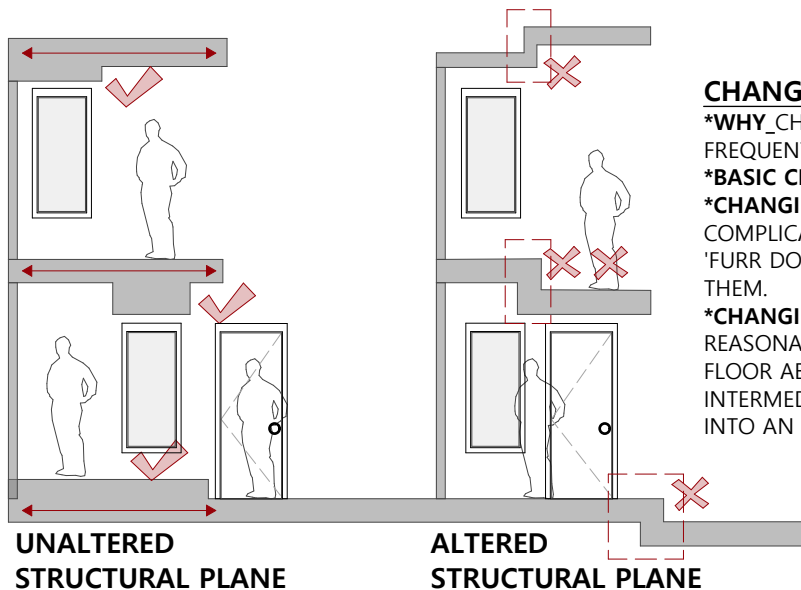
**MEDIUM**

**SMALL**



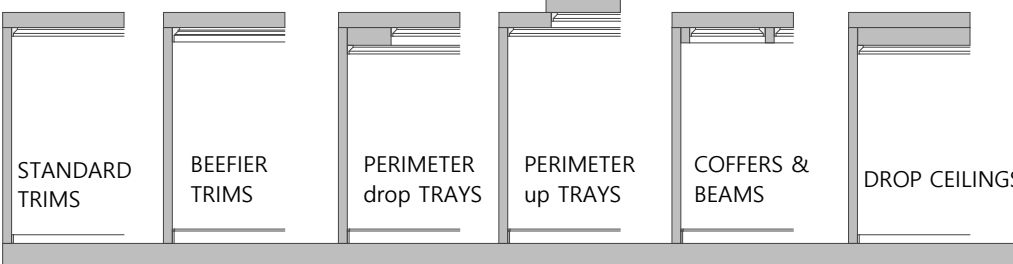
**FLAT CEILINGS AND DOOR & WINDOW HEIGHTS**

- \*THE HEADS (TOP) OF DOORS AND WINDOWS SET A DESIGN LINE IN MANY SPACES. SETTING HEADS AT A COMFORTABLE AND PROPORTIONAL HEIGHT IS SMART.
- \*AS NOTED BELOW THOSE PROPORTIONS CAN BE 'MANAGED' USING TRIM & CEILING TOOLS. TRANSOM WINDOWS ARE ANOTHER VIABLE TOOL IN HIGHER CEILING SPACES.
- \*WINDOWS CAN BE SET AT VARYING HEIGHTS WITH NO REAL COST CONSEQUENCE. DOORS ARE NOT SO FLEXIBLE, AND DO HAVE A COST CONSEQUENCE. THE INDUSTRY STANDARD FOR DOORS IS STILL 6'-8" WHICH IS THE DOOR PANEL SIZE. 7', AND 8' DOORS ARE VERY AVAILABLE, JUST AT A (MOSTLY REASONABLE) PRICE INCREASE.
- \*DOORS & WINDOW HEADS DON'T HAVE TO MATCH BUT CAN LOOK AWKWARD IF MISMATCHED AND NEXT TO EACH OTHER. BECAUSE THE DOOR HEIGHTS ARE LESS FLEXIBLE THEY TEND TO SET THE CONDITION, WITH THE WINDOWS BEING SET TO MATCH.



**CHANGING CEILING HEIGHTS**

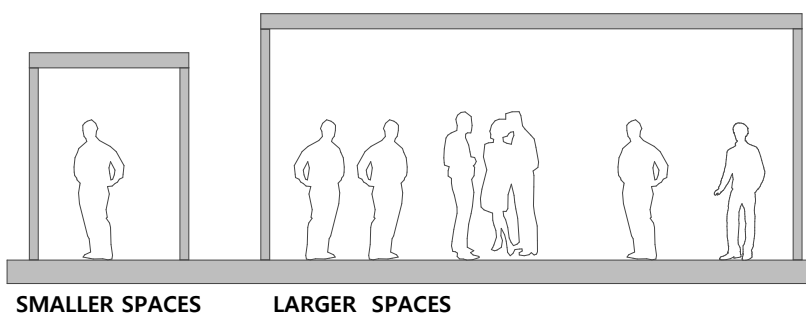
- \*WHY\_CHANGING CEILING HTS WITHIN A CONSTRUCTION LEVEL IS FREQUENTLY DESIREABLE TO MAKE THE DIFFERING SPACES FEEL RIGHT.
- \*BASIC CEILINGS HTS ARE SET BY A FLOOR STRUCTURE.
- \*CHANGING HTS BY NON STRUCTURAL MEANS GENERALLY LESS COMPLICATED AND EXPENSIVE TO 'FURR UP' FLOORS TO RAISE THEM, AND 'FURR DOWN' CEILINGS FROM THE STRUCTURAL FLOOR PLANE TO LOWER THEM.
- \*CHANGING HTS BY CHANGING THE STRUCTURAL FLOOR PLANE, SOMETIMES REASONABLE, AND SOMETIMES NOT CLOSE TO REASONABLE. DROPPING A FLOOR ABOVE A CRAWL SPACE IS DOABLE, MAYBE REASONABLE. DROPPING AN INTERMEDIATE FLOOR PLANE IS LIKELY NOT REASONABLE. RAISING A CEILING INTO AN ATTIC SPACE IS DOABLE, MAYBE REASONABLE.



**CHANGING SCALE 'COSMETICALLY'**

- \*THESE ARE ALL CONVENTIONAL DESIGN 'TOOLS' THAT EFFECT THE SCALE AND FEEL OF A SPACE ALL WITHOUT MAJOR STRUCTURAL CONSEQUENCES
- \*SMALLER SPACES CAN BE DESIGNED TO FEEL BIGGER, AND BIGGER SPACES CAN BE DESIGNED TO FEEL MORE HUMAN & COMFORTABLE.

**FLAT CEILINGS AND CEILING TREATMENTS**

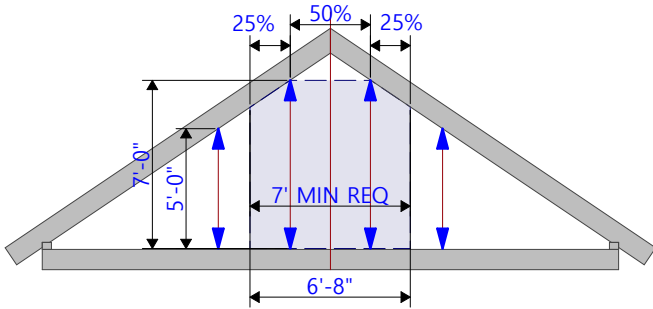


**MISC THOUGHTS ON SPACE, SCALE, + CEIL HT**

- \*LOWER CEILINGS ARE FITTING FOR THE PRIVATE SMALLER SPACE DESIGNED FOR 1 OR 2 PEOPLE
- \*HIGHER CEILINGS ARE FITTING FOR LARGER LIVING SPACES WHERE PEOPLE GATHER.
- \*MANY INDIVIDUALS ARE PREDISPOSED (FOR WHATEVER REASON) TO BEING COMFORTABLE IN SMALLER SPACES (LOWER CEILING SPACES) OR LARGER SPACES (HIGHER CEILINGS).
- \*BIGGER PEOPLE FREQUENTLY JUST NEED BIGGER SPACES. SMALLER PEOPLE NOT NECESSARILY.
- \*IF PLANNING A FAMILY HOME KEEP IN MIND THAT KIDS GROW. 3 TODDLERS TAKE UP AN ENTIRELY DIFFERENT AMOUNT OF SPACE THAN 3 TEENAGERS (WITH FRIENDS).

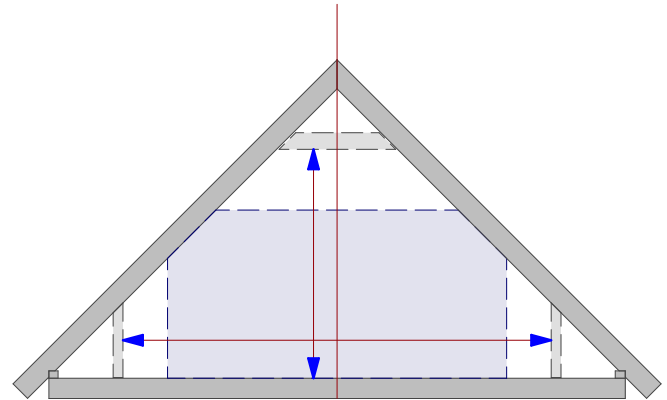
**HABITABLE SPACE REQUIREMENTS**

- \*FLOOR AREA\_MIN 70 SF, MIN 7' WIDTH
- \*CEIL HT\_MIN 7' HIGH
- \*CEIL HT PERCENTAGE FOR SLOPED CEILINGS\_50% OF THE FLOOR AREA MUST AVERAGE A 7' CEIL HEIGHT
- \*WALL HT\_MIN 5' FOR INCLUSION AS 'HABITABLE' OR 'FINISHED'
- \*ACCESS\_FULL COMPLIANT STAIR REQUIRED
- \*LIGHT & VENTILATION\_IS REQUIRED AND CAN BE PROVIDED MECHANICALLY/ARTIFICIALLY OR NATURALLY.
- \*EMERGENCY EGRESS LOCATIONS\_HABITABLE ATTICS REQUIRE 1 EMERGENCY EGRESS OPENING. ROOMS DESIGNATED AS SLEEPING MUST EACH HAVE AN EGRESS OPENING.



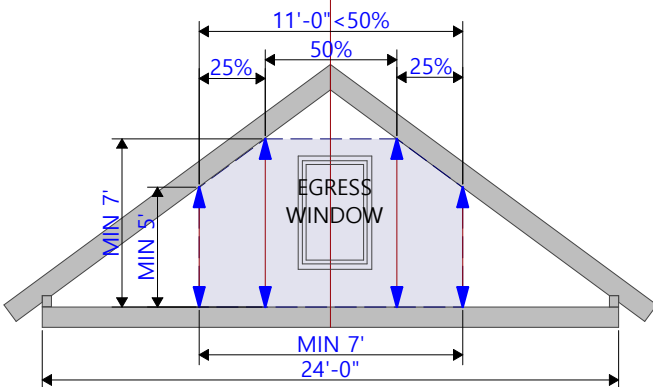
**NON HABITABLE ATTIC SPACE**

\*SPACE NOT MEETING THE SET OF REQUIREMENTS FOR HABITABLE SPACE IS BY DEFAULT NON HABITABLE. SUCH SPACE CAN BE USED FOR STORAGE AND MECHANICAL EQUIPMENT.  
 \*THIS ILLUSTRATION IS NON HABITABLE AS THE 7' MIN WIDTH REQUIREMENT IS NOT MET.  
 \*ACCESS TO THIS SPACE FROM BELOW IS REQUIRED EITHER THRU A SCUTTLE HOLE OR A PULL DN STAIR.



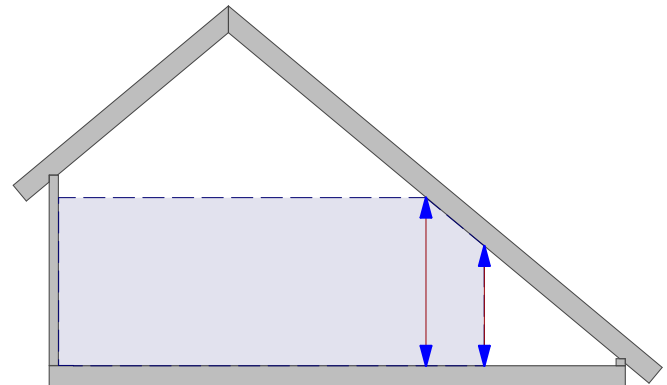
**PLACED WALLS+CEILING**

\*CODE DEFINED HABITABLE SPACE LIMITS CAN BE EXCEEDED AS DEEMED REASONABLE AND USEFUL AS LONG AS THE MINIMUM REQUIREMENTS ARE MET.



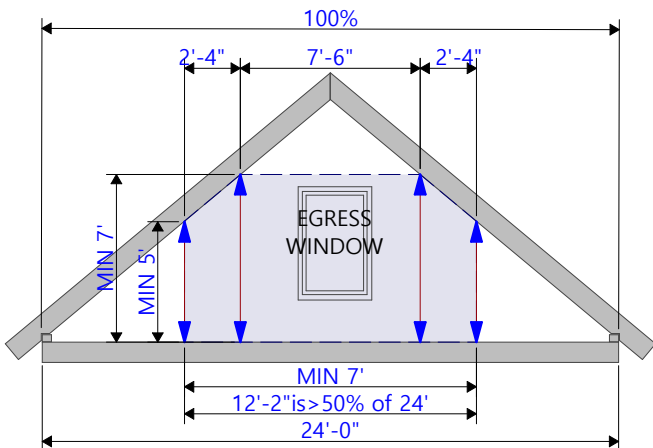
**HABITABLE ATTIC SPACE**

\*FOR A SPACE TO BE OCCUPIED, USED, AND COUNTED AS FINISHED FOOTAGE IT MUST BE 'HABITABLE'.  
 \*CODE REFERENCE R304, R305. SEE ABBREVIATED HABITABLE SPACE REQUIREMENTS ABOVE.  
 \*SPACE REQUIREMENTS FOR HABITABLE SPACE REQUIREMENTS **ARE** MET THIS ILLUSTRATION  
 \*AREA REQUIREMENTS FOR ATTIC STORY QUALIFICATION **ARE NOT** MET THIS ILLUSTRATION.



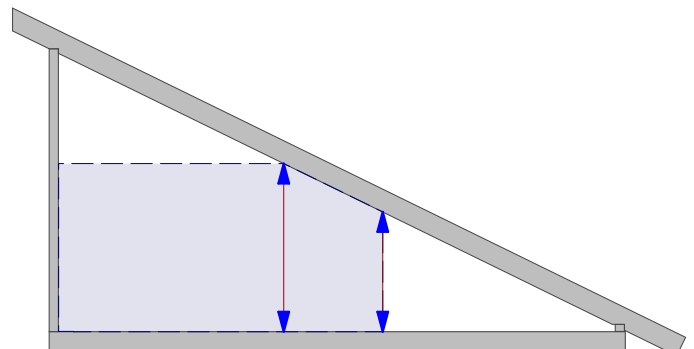
**SLOPE CEILING PERCENTAGE**

\*THE SYMMETRICAL GABLE ROOF ILLUSTRATED AT LEFT, AND LOWER PITCHES IN GENERAL, ARE THE MORE RESTRICTIVE IN ACHIEVING THE MIN 50% MIN 7' HIGH CEILING HT.  
 \*BOTH THE ASSYMETRICAL ROOF ILLUSTRATED ABOVE AND SHED ROOF ILLUSTRATED BELOW PASS THIS 50% REQUIREMENT MORE READILY.



**ATTIC STORY**

\*MORE THAN 50% OF THE TOTAL (GROSS) FLOOR AREA MUST BE HABITABLE.  
 \*SPACE REQUIREMENTS FOR HABITABLE SPACE **ARE** MET.  
 \*AREA REQUIREMENTS FOR ATTIC STORY QUALIFICATION **ARE** MET





ATTIC SPACE CODE CLASSIFICATION DESIGN COMPARISONS

SAMPLE ATTIC SPACES



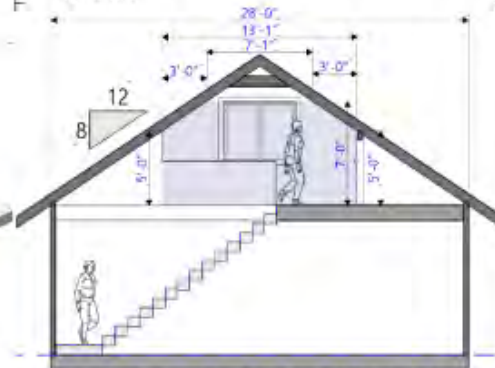
NON HABITABLE ATTIC



THIS SPACE IS NON HABITABLE, LESS THAN 50% OF THE CEILING HT IS 7'H, SO THIS CAN BE USED FOR STORAGE OR MECHANICAL EQUIPMENT ONLY AND HAS BEEN PROVIDED WITH A NON COMPLIANT PULL DN STAIR.



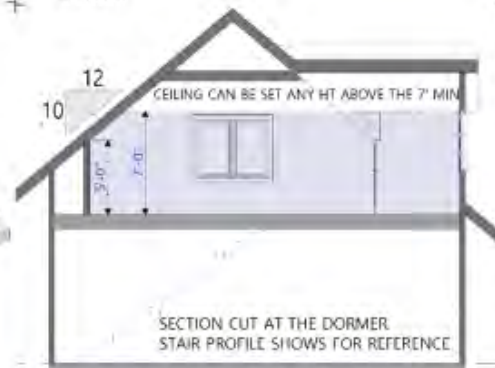
HABITABLE ATTIC



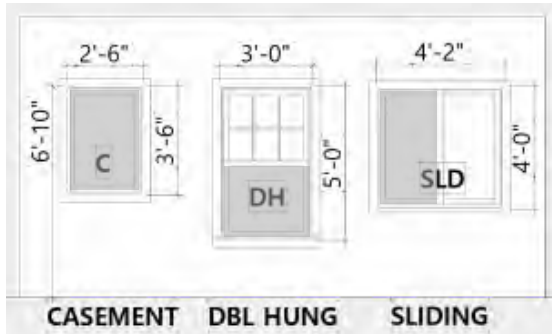
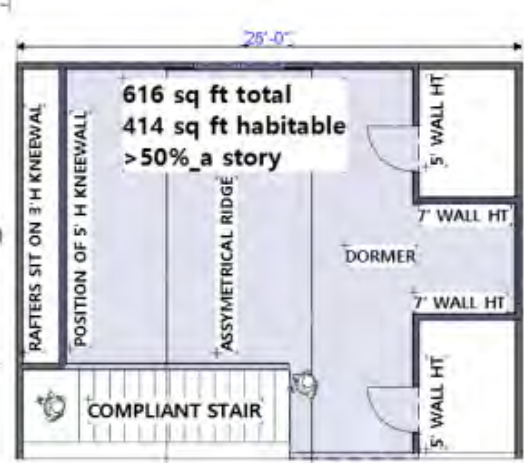
THIS SPACE IS HABITABLE, HAS AN EGRESS WINDOW, AND A COMPLIANT STAIR AND THEREFORE MAY BE USED AS A LIVING OR BEDROOM SPACE AS CHOSEN. THE TOTAL HABITABLE SPACE IS LESS THAN 50% OF THE TOTAL ATTIC FLOOR AREA AND THEREFORE NOT A STORY.



ATTIC STORY



THIS SPACE IS HABITABLE, HAS AN EGRESS WINDOW, AND A COMPLIANT STAIR AND THEREFORE MAY BE USED AS A LIVING OR BEDROOM SPACE AS CHOSEN. THE TOTAL HABITABLE SPACE IS MORE THAN 50% OF THE TOTAL ATTIC FLOOR AREA AND THEREFORE A STORY.



EGRESS REQUIREMENTS- 2 WAYS OUT

- \*GENERAL\_ THE EMERGENCY ESCAPE IDEA IS TO HAVE 2 WAYS OUT OF SPACES IN THE EVENT 1 IS BLOCKED BY SMOKE OR FIRE.
- \*ATTIC SPACES\_ THE LEGAL ACCESS STAIR TO AN ATTIC IS CONSIDERED 1 MEANS OF EGRESS. ONE OTHER MUST BE FOUND IN A HABITABLE ATTIC SPACE AND 1 IN EACH BEDROOM IF THEY ARE INCLUDED IN THE DESIGN. DOORS ARE ACCEPTABLE AS MEANS OF EGRESS BUT NOT USUALLY APPLICABLE IN ATTICS- SO THE WINDOW IS THE CHOICE.
- \*OPENING SIZES FOR WINDOWS\_ THE WINDOW TYPE MUST HAVE A READILY OPENABLE SASH THAT MEETS THESE SIZE REQUIREMENTS\_ MIN 22" WIDE, MIN 20" HIGH. A NET CLEAR OPENING OF 4 SF WITH A MIN OF 5.7 SF OF GLAZING.
- \*CHECK\_ MOST WINDOW MANUFACTURERS WILL DESIGNATE WHICH WINDOWS MEET THIS EGRESS REQUIREMENT IN THEIR SIZING CHARTS. IT IS SMART TO CHECK AS SMALL SASH OPENING DETAILS AND HARDWARE CAN MAKE FRACTIONAL DIFFERENCES.

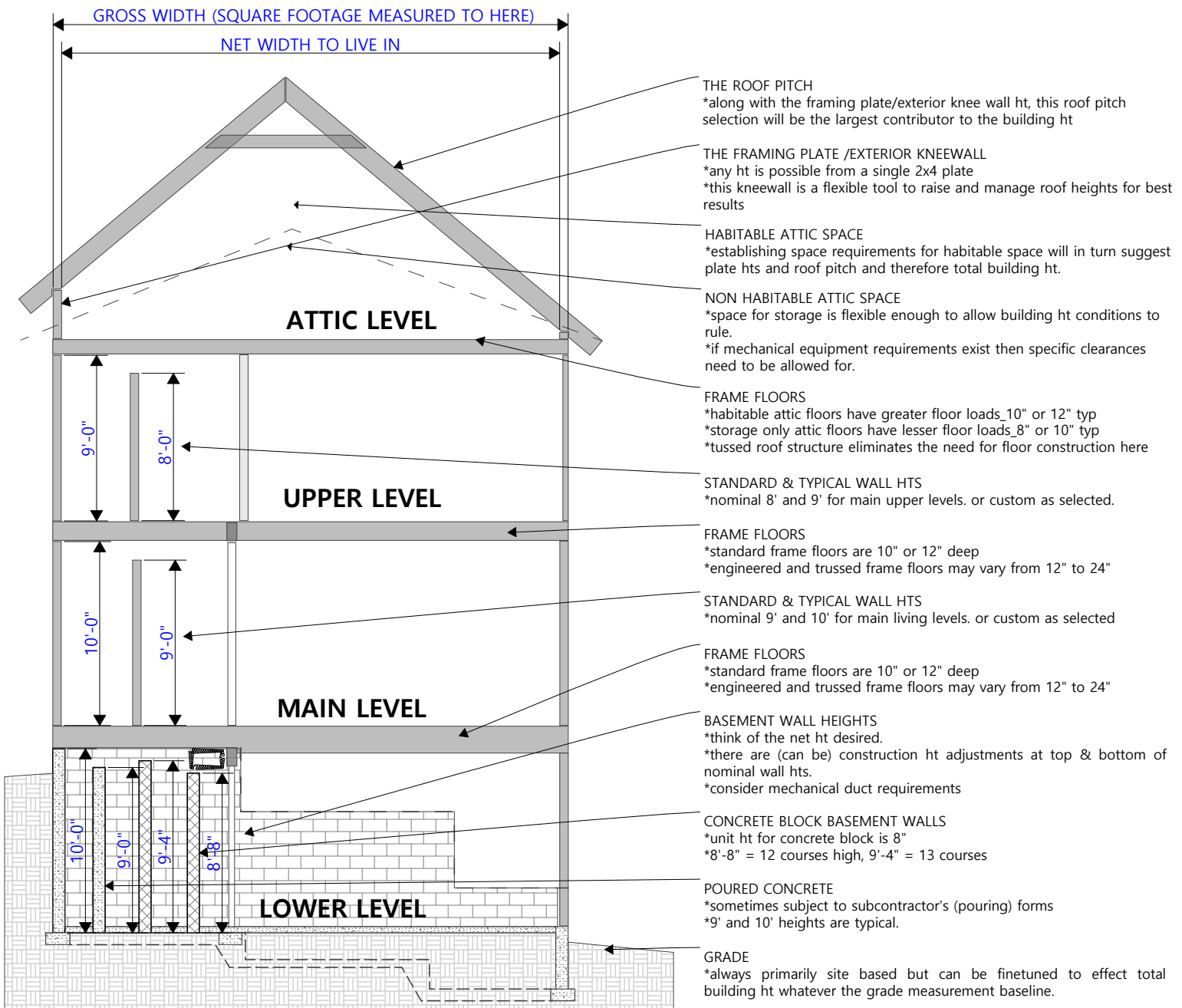
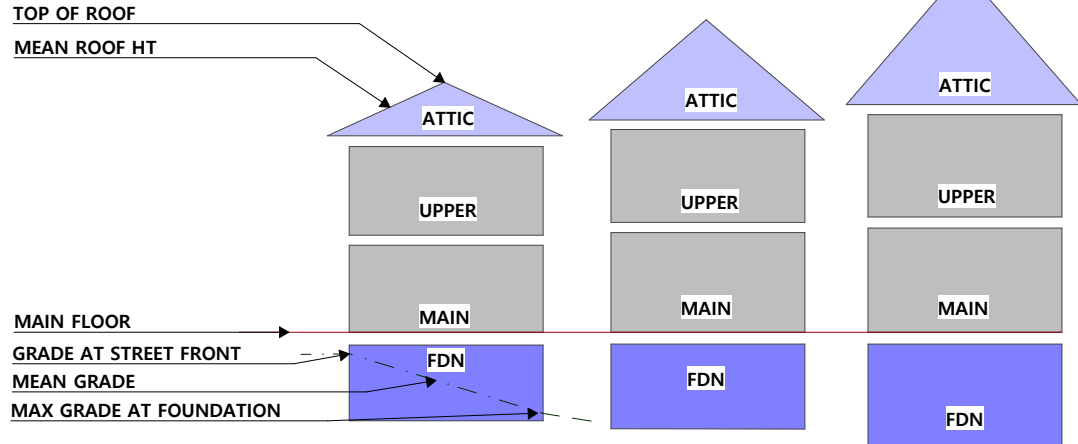
\*CASEMENT SASH OPENS CLOSE TO 100% SO SMALLER WINDOWS CAN MEET THE OPENING STANDARD.  
\*DOUBLE HUNG AND SLIDING WINDOWS ONLY OPEN 50% SO LARGER TOTAL WINDOW SIZES ARE REQUIRED.

### BUILDING HEIGHT restrictions

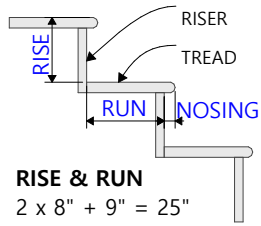
**\*CHECK\_** HEIGHT RESTRICTIONS PER LOCAL ZONING/BUILDING CODES MAY EXIST.

**\*PARAMETERS\_** THE WAYS BUILDING HTS ARE MEASURED VARY PRETTY SIGNIFICANTLY. UNDERSTAND THE METHOD USED TO MEASURE THE HEIGHT. A RESTRICTION MAY, FOR BETTER OR WORSE, DIRECT SPACE & CONSTRUCTION DECISIONS. SEE BELOW FOR CONSTRUCTION ASSEMBLY ITEMS THAT ONE HAS SOME CONTROL OVER.

**\*GRAPHIC ILLUSTRATION\_** AT RIGHT SUGGESTS 3 BUILDING HTS POSSIBLE BY CONTROLLING THOSE CONSTRUCTION ASSEMBLIES



### STAIR SCHEMATIC

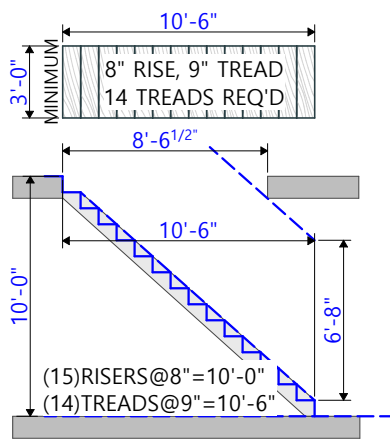


#### RISE & RUN

$2 \times 8" + 9" = 25"$   
 (NO LONGER CODE COMPLIANT)  
 $2 \times 7.5" + 10" = 25"$   
 $2 \times 7" + 11" = 25"$

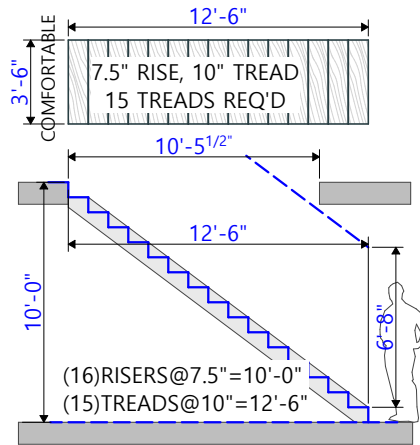
### COMPLIANT STAIR NUMBERS

- \***WIDTH\_MIN** 36" WALL TO WALL. HANDRAILS MAY PROJECT INTO THAT 36". OK FOR PASSING A SINGLE PERSON. CARRYING LARGER ITEMS CAN BE CHALLENGING PARTICULARLY OF THE STAIR TURNS AT ALL
- \***CEIL\_HT\_MINIMUM** 6'-8" HEAD CLEARANCE ALL THE WAY
- \***RISE\_MAX** 7.75" PER 2018 IRC CODE. RISERS ARE REQUIRED MOST CONDITIONS.
- \***TREAD\_MIN** NET TREAD 10" PER 2018 IRC CODE (THE RUN).
- \***NOSING\_OF** 1" (3/4" TO 1 1/4") IS REQUIRED MOST CONDITIONS. THIS IS A SAFETY/TRIP AVOIDANCE ISSUE.
- \***RISE/RUN RULE OF THUMB**  $2 \times \text{RISE} + \text{RUN} = 25" - 26"$ . THIS IS AN INTERESTING EGONOMETRIC RULE OF THUMB FOR 'SINGLE STEP' TREADS. THAT RELATIONSHIP IS USUALLY HARMONIOUS WITH OUR BODY MOVEMENT BOTH ASCENDING AND DESCENDING.
- \***EXCEPTIONS\_** FOR RISE AND TREAD MAY EXIST LOCALLY PERMITTING A SLIGHTLY STEEPER STAIR



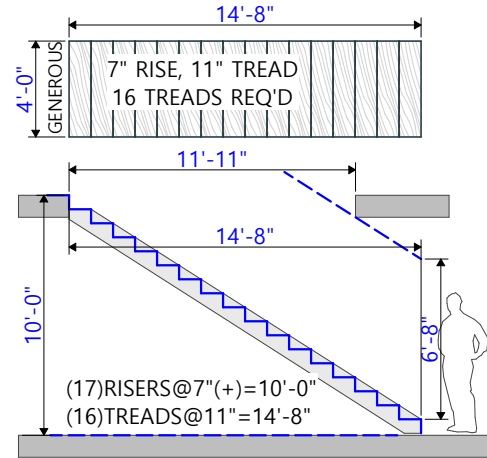
#### STEEP STAIR

NO LONGER NATIONALLY CODE COMPLIANT- CHECK LOCALLY



#### MODERATE (DEFAULT) STAIR

2018 IRC CODE COMPLIANT



#### GENEROUS STAIR

ADA SUGGESTED RUN/RISE

### STAIR SPACE & COMFORT

\***SLOPE COMFORT** THE STEEP STAIR ILLUSTRATED ABOVE IS NO LONGER CODE COMPLIANT. MAYBE FOR THE BEST, AS STEEPER STAIRS CAN BE DANGEROUS., BUT TAKES THE LEAST SPACE. A 7.5" RISE AND 10" TREAD IS A MODERATE SOLUTION, AND A 7" RISE AND 11" TREAD IS CONSIDERED SAFE AND COMFORTABLE FOR ALL, BUT TAKES THE MOST SPACE.

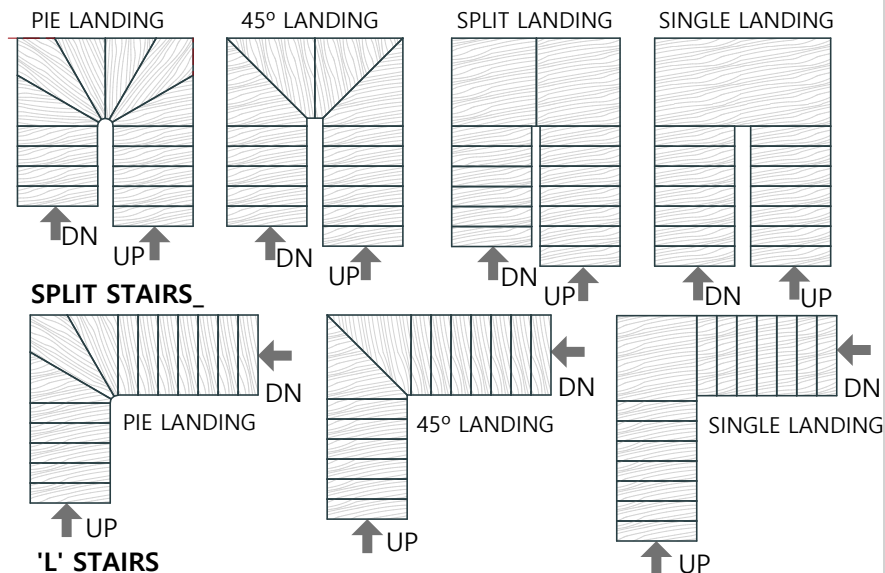
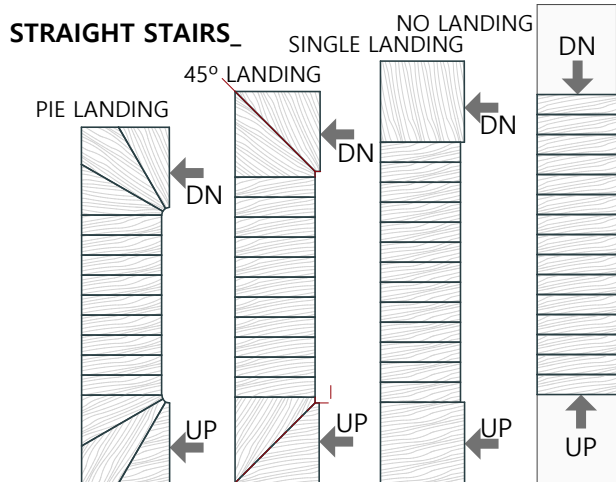
\***LOGIC** THE FREQUENCY OF USE MAY HELP DETERMINE THE APPROPRIATE STAIR SLOPE. FOR AN INFREQUENTLY USED STAIR A STEEPER STAIR SLOPE MAY SUFFICE. ALTERNATIVELY FOR A FREQUENTLY USED STAIR A COMFORTABLE SLOPE IS BETTER. NOTE THAT TALLER PEOPLE HAVE MORE DIFFICULTY WITH STEEP SLOPE STAIRS, AND THE OLDER WE GET THE MORE DIFFICULT AND DANGEROUS STEEP SLOPES ARE.

\***STAIR TO ATTIC** PULL DN LADDER STAIR SOLUTIONS ALLOW ACCEPTABLE ACCESS FOR PEOPLE. PEOPLE CARRYING STUFF UP LADDER STAIRS IS NOT IDEAL, IN FACT DANGEROUS WITHOUT REAL CAUTION. IF 'REAL STAIRS' ARE BUILT THEN BOTH THE STAIRS AND THE SPACE ABOVE MUST BE CODE COMPLIANT AS IT IS ASSUMED THAT SPACE MIGHT BE USED FOR HABITATION. SO THAT SAFER 'REAL STAIR' NECESSARILY CHANGES THE LEVEL OF COMPLICATION OF THE WHOLE CONSTRUCTION.

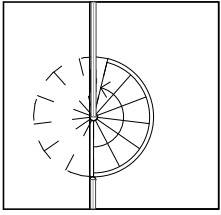
\***CODE COMPLIANT STAIRS** ABOVE NOTED 2018 IRC CODE COMPLIANCE NUMBERS. THIS PROJECT USES THE 7.5"/10" AS THE DEFAULT STAIR. THE STEEPER 8.25"RISE/9"TREAD STAIR MAY STILL BE PERMITTED IN SOME STATES AS FOR EXAMPLE IN NORTH CAROLINA.

### STAIR SHAPES\_

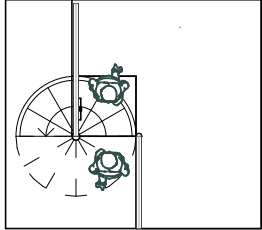
\***FLEXIBILITY** STRAIGHT STAIRS, 'L' STAIRS, SPLIT STAIRS ARE ALL POSSIBILITIES. CLEVERLY FITTING A SITUATION IS USUALLY ACHIEVABLE. THE DESIGN 'LIMITING FACTOR' IS THE RUN/RISE REQUIREMENTS AND THE HEAD CLEARANCE REQUIREMENT.



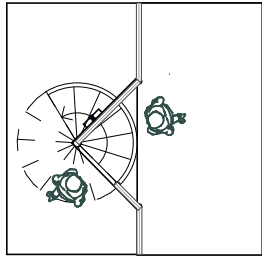
## SPIRAL STAIRS, LADDERS, PULL DN STAIRS, SCUTTLE HOLES



MIGHT SEEM OK IN 2D. BUT A TOTAL FAILURE IN 3D. NOT CLOSE IN HEAD ROOM



THE THICKNESS OF THE TOP RISER/PLATFORM ALLOWS HEADROOM (RED ARROW) TO EXCEED 6'-6".



TOP RISER/PLAFOFRM ALLOWS ROTATION OF STAIR TO FIND A BETTER INGRESS POSITION AND ANGLE.



### LAYOUT THINKING-GENERAL

\***USE**\_NOT A MAIN STREAM EVERYDAY STAIR.BUT IN SMALLER PLANS PARTICULARLY WHEN LOFT SPACES ARE IN PLAY THEY CAN BE A VIABLE CHOICE.

\***LAYOUT**\_SIMPLE IN 2D (A CIRCLE). BUT TRICKY IN 3D. FIRST AND LAST RISER NEED TO BE POSITIONED CORRECTLY AND MIN HEAD CLEARANCE MAINTAINED.

### SPIRAL STAIRS REQUIREMENTS [R311.7.10.1]

\***CLEAR WIDTH AT AND BELOW HANDRAIL**\_26"

(A 5' DIAMETER STAIR MEETS CODE REQUIREMENT)

\***TREAD DEPTH**\_6 3/4" MIN AT 24.5" WALKLINE RADIUS (2015 IRC REVISED AND CONFUSING TERMINOLOGY).

\***RISER**\_MAX 9.5"

\***HEAD CLEARANCE**\_6'-6"

### SPIRAL STAIR ADVANTAGES

\***SIZE**\_THE SPIRAL STAIR TAKES LESS PHYSICAL AND VISUAL SPACE

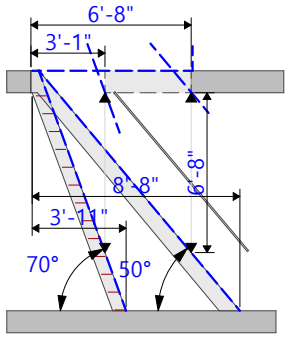
\***FIT**\_DESPITE THE FIRST RISER/LAST RISER CHALLENGE OF THE SPIRAL STAIR, IT CAN BE FIT PRETTY COMFORTABLE INTO MOST PLANS.

\***COST EFFICIENCY**\_PREFAB OR 'KIT' SPIRAL STAIRS ARE WIDELY AVAILABLE. MANY COMMUNITIES HAVE LOCAL FABRICATION SHOPS THAT OFFER A BASIC WELDED UP STEEL STAIR. STICKING WITH A BASIC SELECTION WILL OFFER A PRETTY GOOD VALUE.

### SPIRAL STAIR CONCERNS

\***COMFORT**\_SPIRAL STAIRS ARE STEEPER AND TIGHTER AND JUST PLAIN LESS USER FRIENDLY.

\***FOR STORAGE**\_CARRYING STUFF UP AND DOWN SPIRALS CAN BE DIFFICULT. ANY LARGE (FURNITURE) NEEDS TO BE HOISTED UP USUALLY OVER A RAILING OR LOW WALL IN A TYPICAL LOFT SITUATION.



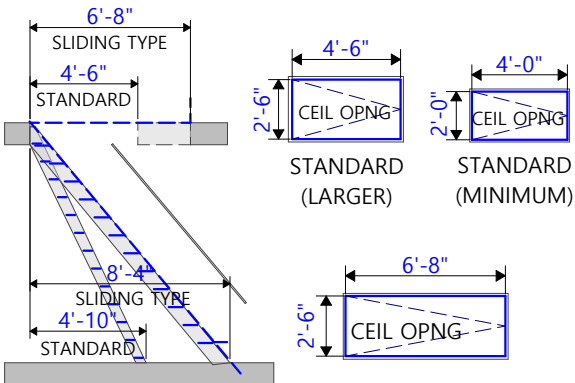
### LOFT ACCESS SPIRAL ALTERNATIVES

\***THE SHIP LADDER AND ALTERNATING STAIR**\_ARE BOTH SPACE SAVING "LADDERS" THAT ARE PERMITTED TO BE PRETTY STEEP. THE GEOMETRY PERMITTED AND THEREFORE SPACE REQUIRED IS THE SAME. THE REAL LIMITATION IS THAT THEY CAN ONLY SERVE LOFT SPACES OF UP TO 200 GROSS SQ FT WHICH IS PRETTY MODEST TO SMALL. FAIR TO SAY THEY ARE MORE DIFFICULT TO GET UP AND DOWN AND CERTAINLY CARRY ITEMS, THAN THE SPIRAL. A SUITABLE APPLICATION IS A LOFT SLEEPING SPACE FOR VISITING KIDS-

\***HEAD CLEARANCE**\_IS ASSUMMED THE SAME 6'-8" AS A CONVENTIONAL STAIR. THIS WOULD APPLY BOTH TO (UNLIKELY) OPENING IN THE FLOOR AND MORE LIKELY ROOF PLANE ABOVE.

\***WIDTH REQ'D**\_20"

\***ANGLE**\_THIS MAX SLOPE ANGLE IS 70°, AND MINIMUM US 50°. THESE ARE THE KEY CONTROL LIMITATIONS AS THEY SET THE FLOOR SPACE REQ'D.



### STANDARD PULL DN ATTIC ACCESS STAIR LADDERS

\***SELECTIONS**\_MANY MANUFACTURERS AND CONSTRUCTION TYPES ARE AVAILABLE. FLOOR TO FLOOR HT AND WEIGHT CAPACITY NEED TO SPECIFIED. THE FUNCTIONING DESIGN OF THESE ARE 'FOLDING' OR 'TELESCOPING'

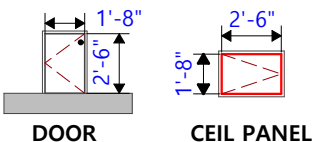
\***TRUSS FRAMING FIT**\_22.5" WIDTH IS A STANDARD MINIMUM (NOMINAL 2")DESIGNED TO FIT BETWEEN 24" OC TRUSSES AND IS A COMMON WIDTH

\***RAFTER FRAMING FIT**\_PERMITS A WIDER UNIT WITH NO PENALTY. 30" IS COMMON.

### SLIDING DISAPPEARING ATTIC ACCESS STAIR LADDERS

\***SOLID STAIR**\_THESE DESIGNS ARE SINGLE PIECE STAIR LADDERS THAT 'HINGE & SLIDE' UP INTO THE ATTIC SPACE. THEY REQUIRE BOTH MORE FLOOR SPACE TO ACCESS AND MORE SPACE IN THE ATTIC TO DISAPPEAR INTO.

\***OPNG SIZE**\_PROPORTIONAL TO LADDER LENGTH DESIGNED FOR A SPECIFIED FLOOR TO FLOOR HEIGHT



**DOOR** **CEIL PANEL**  
MINIMUM DOOR & PANEL SIZES WERE INTENDED AS ACCESS FOR FIRE SFETY PURPOSES. THEY ARE TOO SMALL TO FACILITATE USEFUL STORAGE

### ATTIC ACCESS GENERAL [R807.1]

\***ACCESS REQUIRED**\_ATTIC SPACES EXCEEDING 400 SQ FT IN AREA AND A WITH VERTICAL HT OF 60" OR MORE REQUIRE ACCESS. THEY MAY BE ACCESSED FROM A CEILING BELOW REQUIRING AN ACCESS OPNG WITH REMOVEABLE PANEL OR MOST TYPICALLY A PULL DN LADDER.

\***ACCESS NOT REQUIRED**\_SPACES LESS THAN 400 SF, WITH VERTICAL HTS OF LESS THAN 60", AND OR WHEN NOT OVER THE MAIN HOUSE STRUCTURE SUCH AS PORCHES

\***MIN SIZE**\_20" X 30" FOR DOOR OR CEIL PANEL. CEILING ACCESS REQUIRES A MIN OF 30" HEAD CLEARANCE AT SOME POINT ABOVE THE OPNG.

\***PRACTICAL SIZE**\_FOR INSTALLATION AND SERVICE ACCESS TO MECHANICAL EQUIPMENT, AND ACCESS TO ACTIVE STORAGE, A LARGER ACCESS OPNG WOULD BE REQUIRED.

\***SEALED/INSULATED**\_IF THESE OPENINGS ARE PART OF THE THERMAL ENVELOPE THEY NEED TO BE APPROPRIATELY SEALED AND INSULATED.

**USEABLE SQUARE FOOTAGE, CALCULATED SQUARE FOOTAGE, SALABLE SQUARE FOOTAGE**

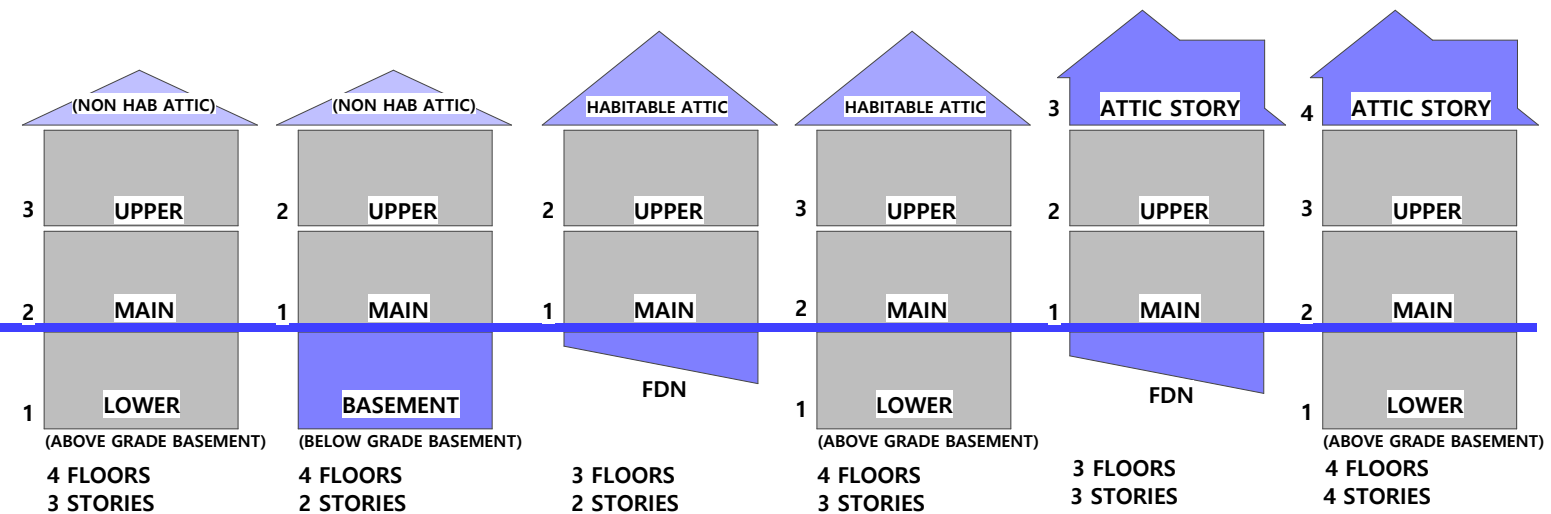
**WHY THE CONFUSION** SQUARE FOOTAGE IS AN IMPORTANT MEASURE OF A HOME'S VALUE. THE TAX COLLECTOR, THE HOME OWNER, AND THE REAL ESTATE AGENT ALL HAVE A VESTED INTEREST IN SQUARE FOOTAGE. SO CALCULATING SQUARE FOOTAGE HAS A HOT POTATO ASPECT TO IT. THIS IS CLEARLY ILLUSTRATED, FOR EXAMPLE, WITH A HOME OWNER'S INTEREST IN KEEPING THEIR FOOTAGE DOWN WHEN TAX APPRAISAL TIME COMES, AND RAISING THEIR FOOTAGE TO A MAX WHEN ITS TIME TO SELL. THE TAX COLLECTOR, AND REAL ESTATE AGENT SIMILARLY ARE NOT EXEMPT FROM FINANCIAL MOTIVATIONS TO MUCK WITH SQUARE FOOTAGE COUNTS.

**USEABLE** THIS IS A GENERALLY DESCRIPTIVE TERM REPRESENTING **ANY** SQUARE FOOTAGE IN A PROJECT THAT IS USEFUL. IT IS NOT CALCULATED IN THE PLANS. THIS CERTAINLY DOES NOT MEAN IT HAS NO VALUE EITHER TO THE HOME OWNER OR A PROSPECTIVE BUYER. ATTIC AND BASEMENT SPACES MAY HAVE USEFUL SPACE THAT DOES NOT MEET THE STANDARDS REQUIRED TO BE 'SALABLE'.

**CALCULATED** THIS PROJECT CALCULATES 'FINISHED AND (HVAC)CONDITIONED' SQUARE FOOTAGE BASED ON CONSTRUCTION CONTROL DIMENSIONS, AND CODE DEFINED HABITABLE SPACE. THE FINISHED AND CONDITIONED REQUIREMENT THEREFORE CANNOT INCLUDE ANY COVERED EXTERIOR LIVING SPACES AS THEY ARE NOT CONDITIONED. DECKS, GARAGES, CRAWL SPACES ARE ALSO NEVER INCLUDED. **SALABLE** THE LOCAL REAL ESTATE COMMUNITY ULTIMATELY ESTABLISHES THE SALABLE SQUARE FOOTAGE, WHICH IS ONE SIGNIFICANT DETERMINANT OF REAL ESTATE VALUE. LOCAL REAL ESTATE ASSOCIATIONS WILL HAVE PUBLISHED GUIDELINES FOR CALCULATING SQUARE FOOTAGE CONSISTENT WITH THE LOCAL MARKET. A MORE COMPLETE DEFINITION IS INCLUDED IN THE WEB SITE MENU ITEM THINGS TO KNOW.

**DISTINCTIONS** AREAS CALCULATED USING CONTROL DIMENSIONS THIS PROJECT WILL BE LESS THAN ALLOWED BY REAL ESTATE STANDARDS BECAUSE THE FINAL EXTERIOR SIDING MATERIALS ARE NOT INCLUDED THESE CALCULATIONS. ATTIC LEVEL FOOTAGES MAY DIFFER AS A STRICT USE OF THE HABITABLE SPACE (5' MIN HEIGHT) MAY NOT BE USED BY THE REAL ESTATE COMMUNITY. LOWER LEVEL FOOTAGES MAY DIFFER BECAUSE HABITABLE LOWER LEVEL SPACE IN SOME AREAS SIMPLY HAS A DISCOUNTED VALUE. IT IS WISE TO CHECK THIS BEFORE SELECTING A DESIGN.

**GROSS SPACE** SHOWS IN THE FOOTAGE BOXES FOR ALL THE PLANS THIS PROJECT. THE FINISHED FOOTAGE HAS ADDED TO IT GARAGE, ENTRY, DECKS ETC THAT ARE FULLY FUNCTIONAL AND VALUABLE BUT ARE NOT CONDITIONED. THESE NON CONDITIONED SPACES ARE LISTED INDIVIDUALLY. THIS SUMMARY DOES NOT INCLUDE 'USEFUL' POTENTIALLY IN ATTIC OR LOWER LEVEL AS DEFINED ABOVE.



**THE NUMBER OF STORIES AND CODE, AND DESIGN DEFAULTS THIS PROJECT**

**STORY** THE VERY TERM 'STORY' IS ALMOST INTERCHANGABLE WITH **FLOOR** AND **LEVEL** BUT IT HAS A CODE SPECIFIC MEANING THAT DISTINGUISHES IT. A FLOOR IS A CONSTRUCTION (LEVEL). A STORY IS A CONSTRUCTION (LEVEL) THAT HAS AT LEAST 50% OF THE FLOOR AREA HABITABLE AND FINISHED. THE CODE'S DEFINITION AND OUR EVERYDAY USE OF THE TERM IS A LITTLE DIFFERENT. WE USE THE TERM MORE GENERICALLY.

**FRAME CONSTRUCTION LIMITS AND CODE** THE IRC (INTERNATIONAL RESIDENTIAL CODE) ADDRESSES PROJECTS UP TO A MAXIMUM OF 3 FRAME CONSTRUCTED STORIES. THE IBC (INTERNATIONAL BUILDING CODE) ADDRESSES 4 AND 5 STORY FRAME CONSTRUCTED PROJECTS WHICH HAVE SLIGHTLY DIFFERENT/MORE STRINGENT COMPLIANCES HAVING MOSTLY TO DO WITH STRUCTURE AND FIRE SAFETY. THESE TALLER FRAME CONSTRUCTED PROJECTS MAY BE APPLICABLE TO LARGER SINGLE FAMILY RESIDENCES, AND FREQUENTLY APARTMENT AND CONDOMINIUM MULTI-FAMILY PROJECTS. THIS PROJECTS DESIGNS ARE ALL 3 STORIES OR LESS.

**LEVELS** THIS PROJECT USES THE TERM 'LEVEL' ON ALL ITS PLANS WHETHER THAT LEVEL QUALIFIES AS A STORY OR NOT. MANY PLANS USE THE TERM 'FLOOR' WHICH IS ALSO AN INDUSTRY ACCEPTED STANDARD TERM. THIS PROJECT PREFERS THE TERM 'LEVEL', AS IT HAS NO CONSTRUCTION SPECIFIC CONNOTATIONS (AS THE TERM FLOOR DOES).

**LOWEST CONSTRUCTION LEVEL (BELOW THE MAIN LEVEL)** THIS PROJECT DISTINGUISHES AND LABELS IN GRADE CONSTRUCTION AS A FOUNDATION LEVEL WHEN NO FINISHED FOOTAGE IS POSSIBLE, OR LOWER LEVEL WHEN IN GRADE CONSTRUCTION OFFERS FINISHED HABITABLE SPACE. DESIGNS WITH A LOWER LEVEL WILL ALL SHOW A SLOPED SITE CONDITION MAKING A DAYLIGHT, OR WALKOUT LOWER LEVEL VIABLE.

**ATTIC INTERPRETION** ATTIC SPACES WITH HABITABLE SPACE AND A COMPLIANT STAIR WILL SPECIFY THE AVAILABLE 'HABITABLE' SQUARE FOOTAGE WHETHER IT IS SHOWN AS FINISHED OR NOT. IN PRACTICE, FITTING A COMPLIANT STAIR IS A MORE LIMITING CONDITION THAN SIMPLY HAVING ATTIC VOLUME. THE USE OF ATTIC SPACE THESE PLANS IS ALWAYS DELIBERATE., AND WILL SHOW A COMPLIANT STAIR THAT MAY BE CONVENTIONAL OR A SPIRAL TYPE. SOME LOFT SPACES MAY SHOW 'LADDER TYPE' STAIRS. THESE REQUIRE UNIFORMLY CHECKING WITH LOCAL OFFICIALS. THE REQUIREMENTS THEMSELVES ARE CLEAR ENOUGH BUT THE 200 GROSS SQ FT THEY SERVE IS NOT.

**DETERMINING THE THERMAL ENVELOPE**

**DEFINITION** A THERMAL ENVELOPE IS DEFINED BY THE CONTINUOUS SURFACES WHERE INSIDE CONDITIONED SPACE MEETS UNCONDITIONED SPACE WITHIN THE BUILDING SHELL AND/OR OUTSIDE SPACE. THE THERMAL ENVELOPE NEEDS TO BE INSULATED AND 'SEALED'.

**TECHNIQUE/METHOD** ENERGY CONSERVATION EFFORTS AND BUILDING SCIENCE HAS TURNED THIS INTO A PRETTY BIG TOPIC. BOILED DOWN, ENERGY CONSERVATION IS BASED ON THE QUALITY OF THE INSTALLATION OF THE INSULATION AND 'SEALING', AND THE TOTAL SURFACE AREA. THIS EXERCISE SUMMARIZES THE SURFACE AREA AND VOLUME MATH COMPARING 2 ENVELOPE CHOICES FOR EACH OF THE 3 BUILDING FOUNDATIONS. THESE NUMBERS ARE IMPORTANT BUT ONLY PART OF THE DECISION PROCESS.

