BUSINESS CONDO CONVERSION

1000 Laconia Road Sanbornton, NH 03269 Project Status 02/27/2024

D R A W I N G S

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DRAWING LIST - General

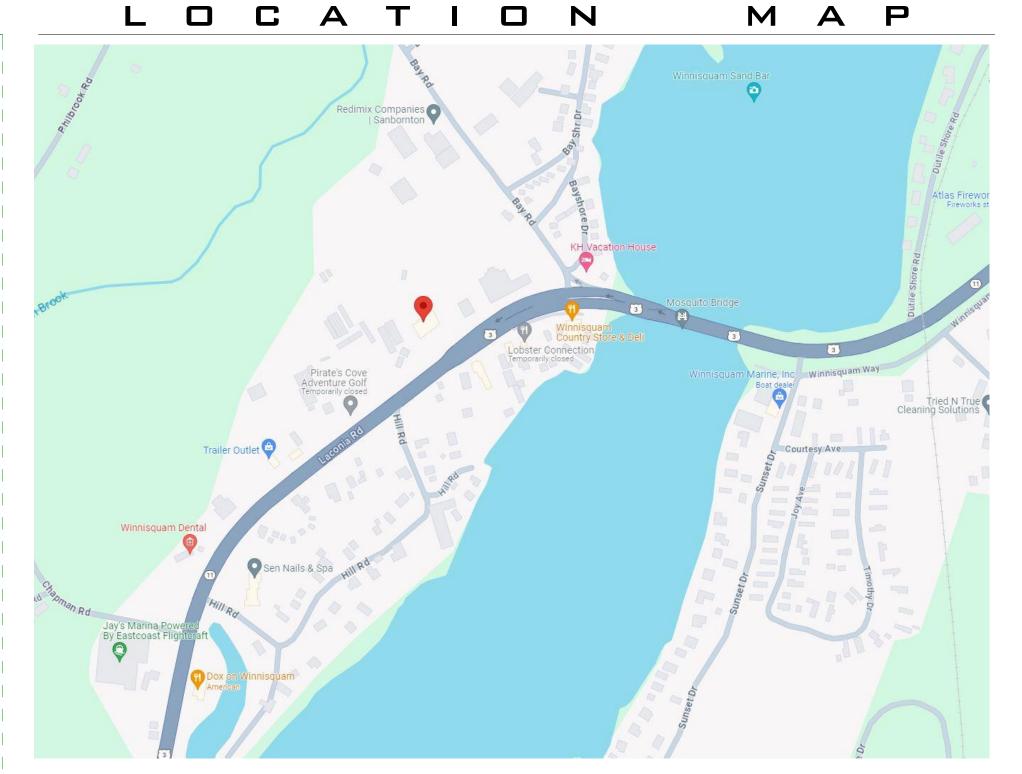
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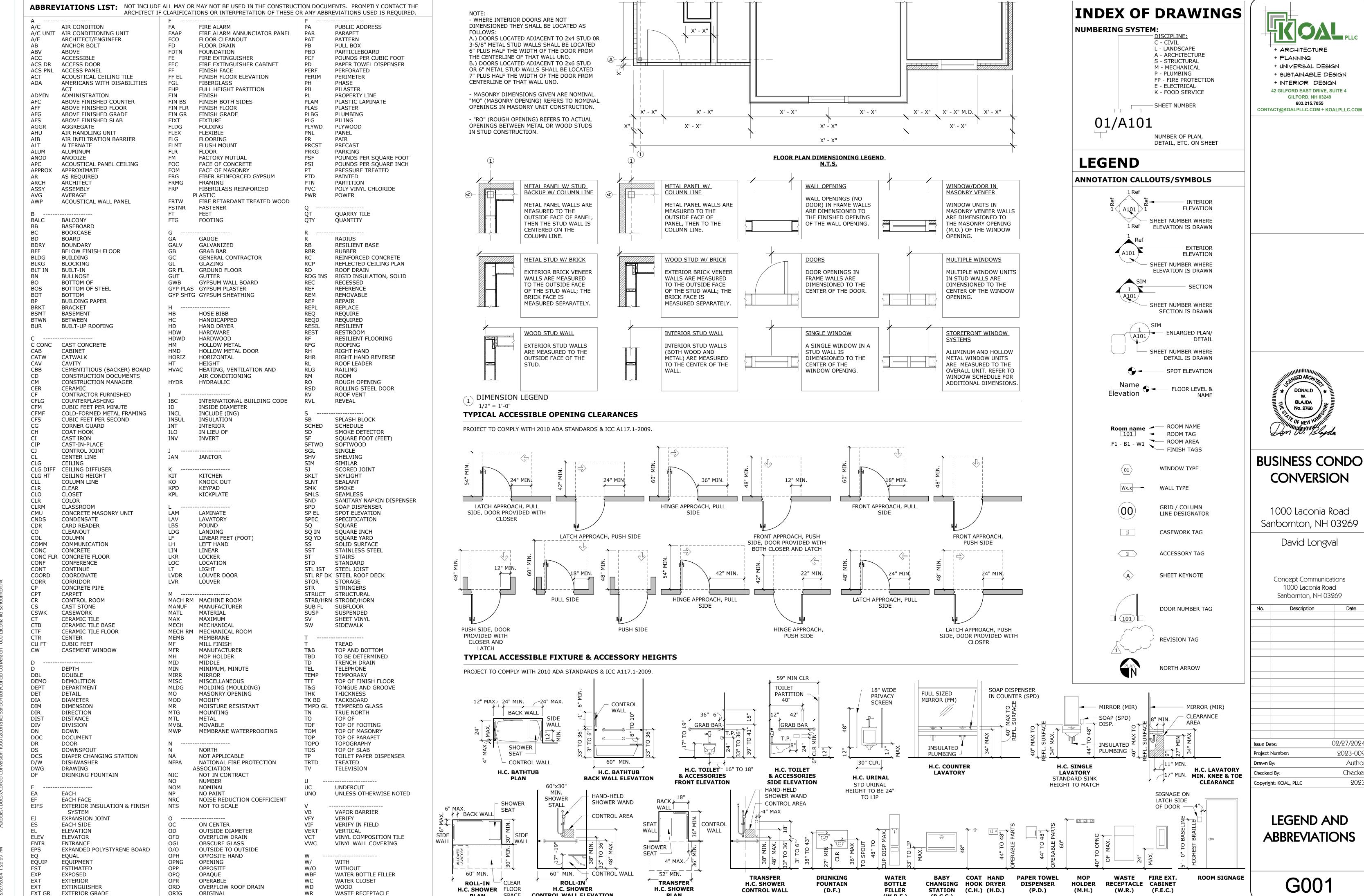
COVERSHEET G001 LEGEND AND ABBREVIATIONS G002 CODE ANALYSIS SUMMARY G003 CODE ANALYSIS SUMMARY CONT. G004 GENERAL NOTES

AD101 1ST & 2ND FLOOR PLANS - DEMO 1ST & 2ND FLOOR PLANS INTERIOR DETAILS INTERIOR DETAILS INTERIOR DETAILS

O F

DRAWING LIST - Architectural





(W.B.F.)

(B.C.S.)

CONTROL WALL ELEVATION

ORIGINAL

BUILDING CODE SUMMARY:

1. APPLICABLE CODES INCLUDING, BUT NOT LIMITED TO:

- INTERNATIONAL BUILDING CODE (IBC) 2018 EDITION WITH NH AMENDMENTS - INTERNATIONAL PLUMBING CODE (IPC) - 2018 EDITION WITH NH AMENDMENTS
- INTERNATIONAL MECHANICAL CODE (IMC) 2018 EDITION WITH NH AMENDMENTS
- INTERNATIONAL ENERGY CONSERVATION CODE (IECC) 2018 EDITION WITH NH AMENDMENTS - NATIONAL ELECTRIC CODE (NFPA 70) - 2020 EDITION WITH NH AMENDMENTS - NEW HAMPSHIRE STATE FIRE CODE (NFPA 1) AS AMENDED BY SAF-C 6000
- LIFE SAFETY CODE (NFPA 101) AS AMENDED BY SAF-C 6000 - ADA STANDARDS FOR ACCESSIBLE DESIGN - 2010 EDITION

2. OCCUPANCY CLASSIFICATION

THE BUILDING IS MIXED OCCUPANCY (508.1) SEPARATED OCCUPANCIES (508.4).

- INCIDENTAL ACCESSORY OCCUPANCIES (509, TABLE 509.1) **ROOM OR AREA SEPARATION AND/OR PROTECTION** - FURNACE ROOM WHERE ANY PIECE OF EQUIPMENT IS OVER 400,000 - 1 HOUR OR PROVIDE AUTOMATIC FIRE-EXTINGUISHING SYSTEM Btu PER HOUR INPUT - ROOMS WITH BOILERS WHERE THE LARGEST PIECE OF EQUIPMENT - 1 HOUR OR PROVIDE AUTOMATIC FIRE-EXTINGUISHING SYSTEM IS OVER 15 PSI AND 10 HORSEPOWER - REFRIGERANT MACHINERY ROOM - 1 HOUR OR PROVIDE AUTOMATIC SPRINKLER SYSTEM - HYDROGEN CUTOFF ROOMS, NOT CLASSIFIED AS GROUP H - 1 HOUR IN GROUP B, F, M, S AND U OCCUPANCIES; 2 HOURS IN GROUP A, E, I AND R OCCUPANCIES

- 2 HOURS AND AUTOMATIC SPRINKLER SYSTEM - INCINERATOR ROOMS - PAINT SHOPS, NOT CLASSIFIED AS GROUP H, LOCATED IN - 2 HOURS; OR 1 HOUR AND PROVIDE AUTOMATIC FIRE-OCCUPANCIES OTHER THAN GROUP F EXTINGUISHING SYSTEM - 1 HOUR OR PROVIDE AUTOMATIC FIRE-EXTINGUISHING SYSTEM - LABORATORIES AND VOCATIONAL SHOPS, NOT CLASSIFIED AS GROUP H, LOCATED IN A GROUP E OR I-2 OCCUPANCY 1 HOUR OR PROVIDE AUTOMATIC FIRE-EXTINGUISHING SYSTEM - LAUNDRY ROOMS OVER 100 SQUARE FEET - GROUP I-3 CELLS EQUIPPED WITH PADDED SURFACES - 1 HOUR - GROUP I-2 WASTE AND LINEN COLLECTION ROOMS - 1 HOUR WASTE AND LINEN COLLECTION ROOMS OVER 100 SQUARE FEET - 1 HOUR OR PROVIDE AUTOMATIC FIRE-EXTINGUISHING SYSTEM - 1 HOUR IN GROUP B, F, M, S AND U OCCUPANCIES; 2 HOURS IN -STATIONARY STORAGE BATTERY SYSTEMS HAVING LIQUID

GROUP A, E, I AND R OCCUPANCIES

- 2 HOURS: OR 1 HOUR AND PROVIDE AUTOMATIC SPRINKLER

SYSTEM THROUGHOUT THE BUILDING N/A - ROOMS CONTAINING FIRE PUMPS IN HIGH-RISE BUILDINGS - 2 HOURS

ELECTROLYTE CAPACITY OF MORE THAN 50 GALLONS, OR A LITHIUM-

POWER, EMERGENCY POWER OR UNINTERRUPTED POWER SUPPLIES.

- ROOMS CONTAINING FIRE PUMPS IN NONHIGH-RISE BUILDINGS

ION CAPACITY OF 1,000 POUNDS USED FOR FACILITY STANDBY

3. BUILDING AREA AND HEIGHT:

FRONTAGE (506.3): NORTH: 100 FT EAST: 0 FT SOUTH: 100 FT WEST: 60 FT TOTAL FRONTAGE (F): 260 FT PERIMETER (P): 320 FT

WIDTH OF OPEN SPACE (W): = 30 AREA INCREASE FACTOR DUE TO FRONTAGE, Lf (506.3) = 56%

ACTUAL BUILDING AREA: 11,952 SF

ACTUAL BUILDING HEIGHT: 30 FT 2 STORIES

TYPE OF CONSTRUCTION ASSUMED FOR REVIEW (602.1): VB

INDIVIDUAL UNIT

Story Group	floor area	allowance area (A _t)	area for nonsprinklered buildings (NS)	floor area*	Area ratio**	Actual	neight	Allowat	ole neight
1 B	268 ft ²	9,000 ft ²	9000 ft ²	14040 ft ²	0.02	30 ft	2 stories	40 ft	2 stories
1 R2	1,140 ft ²	7,000 ft ²		10920 ft ²	0.10	30 ft	2 stories	40 ft	2 stories
1 S-1	147 ft²	9,000 ft²	9000 ft²	14040 ft²	0.01	10 ft	1 stories	40 ft	1 stories
				Sum of ratios =	0.13	≤ 1.0 OK			

					Sulli of factor =	0.13	3 1.0 OK			
Story	Group	Actual floor area	Tabular allowance area (A _t)	Tabular allowance area for nonsprinklered buildings (NS)	Allowable floor area*	Area ratio**	Actual height		Allowat	ole height
1	R2	1,555 ft ²	9,000 ft	9000 ft ²	14040 ft ²	0.11	30 ft	stories	40 ft	2 stories
			ft	ft²	0 ft ²	-	ft	stories	ft	stories

*Allowable floor area = $At + (NS \times If)$ $I_f = 0.56$

**Area ratio = Actual floor area Allowable floor area*

4. OCCUPANCY/USE GROUPS:

NON-BEARING:

B, R-2 AND S-1 OCCUPANCY SPECIAL REQUIREMENTS AS REQUIRED PER IBC SECTION 420

5. FIRE RESISTIVE RATING REQUIREMENTS:

ELEMENT	RATING (HOL	JRS)	
STRUCTURAL FRAME:	0	-	
BEARING WALLS - EXTERIOR:	0		
BEARING WALLS - INTERIOR:	0		
NON-BEARING WALLS - EXTERIOR:	SEE BELOW		
NON-BEARING WALLS - INTERIOR:	0		
FLOOR CONSTRUCTION:	0		
ROOF CONSTRUCTION:	0		
FIRE WALLS:	N/A		
FIRE BARRIERS (BETWEEN FIRE AREAS):	2		
SHAFT ENCLOSURE:	N/A		
> 4 STORIES			
< 3 STORIES			
EXIT ENCLOSURE/EXIT PASSAGEWAY:	N/A		
> 4 STORIES			
≤ 3 STORIES			
SLEEPING UNIT SEPARATION:	1		
FIRE PARTITIONS			
HORIZONTAL ASSEMBLIES	1		
FIRE PARTITION:			
CORRIDOR	0 (OCCUPANT	LOAD NOT GREATE	ER THAN 10 / 30 FOR R-2 AND B RESPECTIVELY)
SMOKE BARRIER:	1		,
SMOKE PARTITION:	1		
HORIZONTAL ASSEMBLIES	1		
COMBUSTABILITY (602.2, 602.3, 602.4, 602.5, 60	3) - NC (NONCOM	BUSTIBLE CONSTR	RUCTION REQUIRED) NR (NOT REQUIRED)
NR EXTERIOR WALLS NR INTERIOR ELEMENT	TS NR ROOF		
EXTERIOR WALLS (507, TABLE 602, 705, 707.4)			
EXTERIOR WALLS (507, TABLE 602, 705, 707.4) FIRE SEPERATION DISTANCE: NORTH: $X \ge 30$	EAST: X ≥ 30	SOUTH: X ≥ 30	WEST: X ≥ 30

SOUTH: 0

WEST: 0

EAST: 0

NORTH: 0

6. INTERIOR FINISHES

INTERIOR FINISH REQUIREMENTS (TABLE 803.11)							
USE GROUP	VERTICAL EXITS AND EXIT PASSAGEWAYS	EXIT ACCESS CORRIDORS AND OTHER EXITWAYS	ROOMS AND ENCLOSED SPACE				
R2	В	С	С				

WALL AND CEILING FINISHES SHALL BE CLASSIFIED IN ACCORDANCE WITH ASTM E 84 OR UL 723. INTERIOR WALL OR CEILING FINISHES, OTHER THAN TEXTILES AND EXPANDED VINYL, SHALL BE PERMITTED TO BE TESTED IN ACCORDANCE WITH METHOD B PROTOCOL OF NFPA 265. (803.1.1, 803.11, TABLE 803.11)

CLASS A: FLAME SPREAD 0-25; SMOKE-DEVELOPMENT 0-450

CLASS B: FLAME SPREAD 26-75; SMOKE-DEVELOPMENT 0-450 CLASS C: FLAME SPREAD 76-200; SMOKE-DEVELOPMENT 0-450

AREA IN WHICH IT IS ATTACHED. (806.7)

NOTE: INTERIOR FLOOR FINISH AND FLOOR COVERING MATERIALS IN EXIT ENCLOSURES, EXIT PASSAGEWAYS AND CORRIDORS SHALL NOT BE LESS THAN CLASS II AND COMPLY WITH THE DOC FF-1 "PILL TEST" (CPSC 16 CFR, PART 1630). (804.4.1)

DECORATIVE MATERIALS SHALL MEET THE FLAME PROPAGATION PERFORMANCE CRITERIA OF NFPA 701 IN ACCORDANCE WITH SECTION 806.3 OR BE NONCOMBUSTIBLE. (806.2)

INTERIOR TRIM, OTHER THAN FOAM PLASTIC, SHALL HAVE A MINIMUM CLASS C FLAME SPREAD AND SMOKE-DEVELOPMENT. COMBUSTIBLE TRIM, EXCLUDING HANDRAILS AND GUARDRAILS, SHALL NOT EXCEED 10% OF THE SPECIFIC WALL OR CEILING

INTERIOR FLOOR-WALL BASE THAT IS 6" OR LESS IN HEIGHT SHALL BE TESTED IN ACCORDANCE WITH SECTION 804.2 AND NOT BE LESS THAN CLASS II, OR CLASS I WHERE CLASS I FLOOR FINISH IS REQUIRED. (806.8)

7. ACCESSIBILITY:

THE COMMON AREAS OF THE PROPOSED RENOVATIONS ARE DESIGNED TO BE ACCESSIBLE TO PERSONS WITH PHYSICAL DISABILITIES.

DWELLING UNITS ARE DESIGNED IN ACCORDANCE WITH SECTION 1107.6.2. INDIVIDUAL DWELLING UNITS ON THE FIRST FLOOR ARE DESIGNED TO BE TYPE B PER 2017 ICC A117.1. INDIVIDUAL DWELLING UNITS ON THE SECOND FLOOR ARE NOT REQUIRED TO BE TYPE B PER SECTION 1107.7.1.

ACCESSIBLE SIGNAGE REQUIRED IS TO BE PROVIDED BY OWNER.

8. FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS (TABLE 716.5):

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (HOURS)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (HOURS)
	4 HOURS	3 HOURS
FIRE WALLS AND FIRE BARRIERS HAVING A REQ'D FIRE-	3 HOURS	3ª HOURS
RESISTANCE RATING GREATER THAN 1 HOUR	2 HOURS	1-1/2 HOURS
	1-1/2 HOURS	1-1/2 HOURS
FIRE BARRIERS HAVING A REQ'D FIRE-RESISTANCE RATING OF 1 HOUR:	·	
SHAFT, EXIT ENCLOSURE AND EXIT PASSAGEWAY WALLS	1 HOUR	1 HOUR
OTHER FIRE BARRIERS	1 HOUR	3/4 HOUR
FIRE PARTITIONS:		
CORRIDOR WALLS	1 HOUR	1/3 ^b HOUR
CONTRIBUTE	1/2 HOUR	1/3 ^b HOUR
OTHER FIRE PARTITIONS	1 HOUR	3/4 HOUR
OTHER TIRE PARTITIONS	1/2 HOUR	1/3 HOUR
	3 HOUR	1-1/2 HOUR
EXTERIOR WALLS	2 HOUR	1-1/2 HOUR
	1 HOUR	3/4 HOUR
SMOKE BARRIERS	1 HOUR	1/3 ^b HOUR
a. TWO DOORS, EACH WITH A FIRE PROTECTION RATING OF 1-1/2 HOUR	•	E SIDES OF THE SAME OPENING IN A FIRE

WALL, SHALL BE DEEMED EQUIVALENT IN FIRE PROTECTION RATING TO ONE 3-HOUR FIRE DOOR. b. FOR TESTING REQUIREMENTS, SEE SECTION 715.4.3

9. FIRE PROTECTION:

A FULLY AUTOMATIC SPRINKLER SYSTEMS SHALL BE PROVIDED IN ACCORANCE WITH NFPA 13R.

PORTABLE FIRE EXTINGUISHERS SHALL BE SELECTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH NFPA 10. CLASS A MAXIMUM TRAVEL DISTANCE TO EXTINGUISHER SHALL BE 75

CLASS B MAXIMUM TRAVEL DISTANCE TO EXTINGUISHER SHALL BE PER IBC TABEL 906.3(2).

FIRE ALARM AND DETECTION SYSTEMS SHALL BE PROVIDE IN ACCORDANCE WITH THE MOST RESTRICTIVE REQUIREMENTS IBC 907 FOR —EACH INDIVIDUAL USE GROUP.—



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January 23, 2024

KOAL, pllc 42 Gilford East Dr. Suite 4 Gilford, NH 03249

Mr. Donald Blajda, AIA, LEED AP BD+C

RE: Engineering Judgment - Evaluation and Upgrade of Existing Interior Walls **Business Condominium Building Conversion** 1000 Laconia Road Sanbornton, Belknap County, New Hampshire

Dear Mr. Blajda:

Intertek¹ Building Science Solutions has been requested to provide a project-specific Engineering Judgment (EJ) opining on the minimum fire resistance rating (FRR) of an existing wall system(s) where additional materials (predominantly gypsum board) will be provided to increase the fire resistance of the existing wall system. A minimum 2-hour fire resistance rating (FRR) is required. Documents we reviewed included the Progress Set from KOAL, pllc dated 09/29/2027. In particular were select details on Sheets AD101, A101, A501, and A502.

Our study and recommendations are not intended as a comprehensive code analysis for the project and is from a fire protection perspective only. Although not speaking for the Association or Committees, I was the Director of Code & Technical Services for the Gypsum Association for almost seven years and has/had membership on ASTM Committee E-05, Fire Standards, and the NFPA Technical Committee on Fire Tests.

We will use a variety of technical resources in our analysis including, but not limited to, Intertek's <u>Directory</u> of Building Products; the UL Fire Resistance Directory (FRD); and the Gypsum Association's Fire Resistance Design Manual (FRDM).

The EJ is project-specific, applies only to particular systems and assemblies, and is from a fire protection perspective only. This Engineering Judgment does not constitute a Listing as shown in a fire resistance directory or similar document. The Engineering Judgment is subject to review and approval by the local Authority Having Jurisdiction (AHJ). As a result of our investigation, we have the following comments:

PROJECT UNDERSTANDING:

An existing business occupancy is being modified to a mixed-use facility (residential and business/offices). The local code official has directed that separation walls between the residential use(s) and the business use(s) be provided with a 2-hour fire separation. There are feasibility issues with adding gypsum board

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symmetrically to both sides of the wall systems to achieve the fire resistance rating (FRR) in some areas. The details show a typical 2-hour wood-framed wall in the attic space (similar to UL Design No. U306 and UL Design No. U338). In areas with existing walls, it is proposed to add additional layers of gypsum board to the accessible side of the wall and noncombustible cavity insulation to upgrade the FRR. Sketches of the proposed design have been provided for Intertek's review and analysis. Figure 1 shows a typical proposed detail (Sheet A502) integrating existing conditions with improvements to obtain a 2-hour FRR. Similar conditions occur at various elevations within the building.

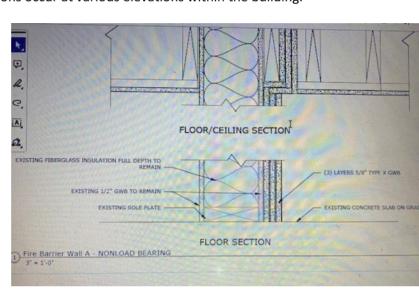


FIGURE 1 - Typical Proposed 2-Hour Wall Detail

TECHNICAL ANALYSIS:

DESIGNING FOR FIRE RESISTANCE -

Designing a building for code-mandated fire resistance ratings (FRR) is the embodiment of the concept of the "art and science" of engineering and architecture. One must not only design a system that meets the code objectives for that element (i.e., fire resistance and, for fire walls, structural independence) but assure that the systems are buildable. A major reason that we discuss fire-rated designs in these terms is that there are physical limitations in the test furnaces described in ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, used to obtain fire resistance ratings of assemblies and, in some cases, individual materials. It is simply impossible to model in a laboratory every configuration of materials constructed in the field. By skill, knowledge, and application of the Code and sound fire protection principles we can be assured that a building does indeed "meet code" and the fire safety objectives the Code represents.

APPLICATION OF SECTION 703.3, IBC: METHODS OF DETERMINING FIRE RESISTANCE -

We understand that the limitations regarding the use of the "Time Assigned Ratings" of Section 722.6, IBC for wood assemblies to applications where the FRR is greater than 1-hour. We concur with this determination. *Direct* (Author's emphasis) application of this Section is limited to a FRR of no more than 1-hour per Section 722.6.1.1, CBC.

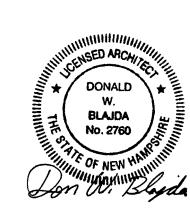


+ ARCHITECTURE + PLANNING

+ UNIVERSAL DESIGN + SUSTAINABLE DESIGN

+ INTERIOR DESIGN 42 GILFORD EAST DRIVE, SUITE 4 GILFORD, NH 03249

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BUSINESS CONDO CONVERSION

1000 Laconia Road Sanbornton, NH 03269

David Longval

Concept Communications 1000 Laconia Road Sanbornton, NH 03269

Description

sue Date:		C)2/27/2024
oject Number:			2023-009
awn By:			Author
ecke	d By:		Checker
nvrig	eht: KOAL, PLLC		9093

CODE ANALYSIS SUMMARY

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However, Section 703.3, IBC, Methods of Determining Fire Resistance, has no such restrictions. This section outlines some six methodologies to establish a fire resistance rating (and its associated elements like continuity) of one or more systems. These implicitly include the American Wood Council's (AWC) 2018 National Design Specification® (NDS®) for Wood Construction. This document is referenced in Chapter 35, IBC directly for the determination of (1-hour) Time Assigned Ratings. The NDS now also has state-of-the-art data for the fire resistance of solid wood members up to 2-hours. As mentioned below, this newer data was mainly generated to support the use of cross-laminated timbers and other related heavy timber materials.

The proposed details show existing and proposed wood framing. The framing is typically 2x6 studs/plates, 2 by floor joists, and structural wood floor sheathing. The structural wood floor sheathing is essentially encapsulated at its intersection with the 2-hour wall by GWB and solid lumber.

ANALYSIS OF THE BURN-THROUGH TIME OF DIMENSIONAL WOOD LUMBER -

Dr. Robert H. White, USDA - Forest Service, Forest Products laboratory was among others who have studied the fire resistance and fire response of "unprotected" wood members. By "unprotected" we mean the wood tested was without any membrane or other material protecting the wood from direct flame impingement or heat build-up.

Dr. White's results and commentary have been published in many journals. He authored Section 4, Chapter 11, Analytical Methods for Determining Fire Resistance of Timer Members, in The SFPE Handbook of Fire Protection Engineering. In summary, Dr. White's data indicates a constant char rate of 0.6 mm/min. (1-1/2-in/hr) based on an ASTM E119 1-hour fire exposure. The second hour rate is actually decreased slightly due to the insulation effect of char build-up even as the furnace temperature rises to 1850°F at the end of the 2-hour test period. This trend has been investigated and published in the NDS as outlined below. Until it literally falls-off, char provides insulating value to the underlying, fresh wood.

Although focusing on columns, beams, and engineered wood products, the American Wood Council has published <u>Technical Report No. 10</u>, *Calculating the Fire Resistance of Exposed Wood Members*. In addition to presenting research and commentary, this publication built upon the research of Mr. T.T. Lie of the National Research Council of Canada (NRCC). Mr. Lie's assumed char rate was 1.42 in/hr correlating well with Dr. White's work up to 1-hour.

ADDITIONAL DATA ON THE BURN-THROUGH TIME OF DIMENSIONAL WOOD LUMBER –

Much of the latest burn-through data building on previous scientific work was investigated, accumulated, and published to support the introduction of mass timber construction and cross-laminated timber (CLT) construction into the IBC/CBC.

From the NDS®, "...the design professional must size the section in question to account for wood charring. The charring rate of wood is non-linear, but the char depth, a_{char}, can be easily quantified using procedures from Chapter 16 of the American Wood Council's (AWC) 2018 National Design Specification® (NDS®) for Wood Construction, which is referenced in the IBC [CBC]. Further details about the Chapter 16 provisions of the NDS can be found in AWC's Technical Report 10 (TR-10): Calculating the Fire Resistance of Wood Members and Assemblies, which is referenced in the NDS Commentary to Chapter 16."

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nearest the fire. A finish rating is not intended to represent a rating for a membrane ceiling. The requirements for finish ratings are not included in [ASTM E119] ANSI/UL 263.

However, the finish rating has been found to be an excellent measure of heat transmission through a gypsum board or similar membrane directly attached to a wood-based sub-framing system. It has been observed that the finish rating time is consistently reached prior to board fall-off.

EXAMPLES OF FINISH RATINGS –

Some published finish ratings include UL Design No. L511 – 71 minutes (a floor-ceiling system) and UL Design No. L532 – 63 minutes (a floor-ceiling system). Both of these systems utilize two layers of Type C ("improved Type X") gypsum board. There is little heat transfer difference between Type X and Type C GWB except based on the density of the core. UL Design No. L538 is also a multi-layer floor-ceiling system with a finish rating "more than 90 minutes". This system utilizes three layers of 5/8" Type C ("improved Type X") gypsum board, resilient channels (RC) or hat channels.

UL DESIGN NO. W415 AND RELATED DATA FOR A 2-HOUR FIRE RESISTANCE RATING –

We concur with KOAL, pllc that UL Design No. W415 (GA File No. WP1713) garners important data on the performance of multilayer gypsum board systems. In UL W415, three layers of 5/8" Type X GWB applied as shown in the UL Design obtained a 1-hour FRR. A fourth layer raised the overall FRR to 2-hours. UL Design No. V497 showed that **just two layers** of 5/8" Type X GWB (adhered with gypsumbased laminating compound and screws) achieved a minimum 1-hour fire resistance rating. GA File No. WP 1715, like UL 415 showed that four layers of 5/8" Type X GWB obtained a minimum 2-hour FRR.

For the above cited designs, they were tested or evaluated in "both directions." The "opposite side" to the GWB side was **a bare steel stud**. We therefore predict that UL Design No. W415 (three layers of GWB) went some time beyond 1-hour (as a two layer system, UL V497) achieved 1-hour.

PROPOSED DESIGN AND EXISTING CONDITIONS FOR A 2-HOUR FIRE RESISTANCE RATING –

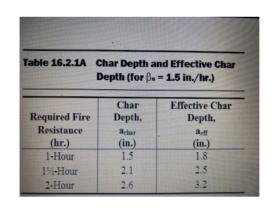
The existing base wall is a thermally insulated, non-load bearing, 2x6 wall system (or floor joists). We would estimate the fire resistance of the existing wall at 45 minutes minimum. We would estimate the three layers of gypsum board added to the existing condition as having a minimum 75-minute FRR. Therefore, in our professional opinion, the required 2-hour FRR will be achieved with the design as proposed by KOAL pllc.

CONCLUSIONS:

In our professional opinion, the existing wall system can be upgraded to a minimum 2-hour fire resistance rating by the addition of three layers of 5/8" Type X gypsum board. The installation details found in UL Design No. W415/GA File No. WP 1713 should be followed. These details include, but may not be limited to Board orientation, horizontal and vertical joint staggering, fastener length, and fastener spacing.

This concludes our comments from a fire resistance perspective only. Our opinions expressed in this Engineering Judgment are subject to review and approval by the local Authority Having Jurisdiction (AHJ).

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Effective char depth, a_{eff}, from 2018 NDS Chapter 16

For structural calculations, the effective char depth, $a_{\rm eff}$, is estimated to be 20% deeper than $a_{\rm char}$. This accounts for reduced strength and stiffness in the elevated temperature zone in the wood behind the char layer that has not charred yet but has been heated due to the fire. Table 16.2.1 from the NDS provide $a_{\rm eff}$ values for use in fire resistance calculations of exposed wood members for fire exposure durations of **up to 2 hours.**

The proposed design uses 2x6's and 2x joists which contribute to the overall fire resistance of the system. Unlike the described scientific work, the wood framing is not directly exposed to the fire source upon ignition. Further, the use of cavity insulation (glass fiber or mineral fiber) will retard heat transfer through the stud cavity and protect the sides of the studs from heat transfer for some period of time adding to the proposed system's fire resistance.

DISCUSSION OF ACCEPTANCE OR "END POINT" CRITERIA FOR FIRE TESTED WALL SYSTEMS -

The acceptance criteria in ASTM E119 (or UL 263), Standard Test Methods for Fire Tests of Building Construction and Materials, for wall systems is based on several factors. These are:

(1) the ability to sustain or carry the applied load for the duration of the test. This is typically 78% of the NDS value (upwards of 2,000 pounds per stud)

(2) resisting a temperature in excess of 250°F above ambient on the non-fire (lab) side of the specimen,

(3) resisting the ignition of cotton waste applied to the non-fire (lab) side of the specimen, and,

(4) withstanding the hose stream test protocol. For a 2-hour specimen, the hose stream re-test would have a maximum fire exposure of 1-hour. Based on the mass of the proposed system composed of the existing wall and new layers, on our opinion, failure of the hose stream test is remote at best.

Wood-framed systems are usually fire tested as load-bearing systems. As described above, they are loaded to 100% of their fire-rated design or some reduced percentage ("limited load-bearing"). In our experience, the most frequent method of reaching an endpoint of the fire test for a fully-loaded wood-framed system is by loss of load-bearing capacity; not temperature transmission or open flaming to the

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Although perhaps appearing similar, the conclusions of this Engineering Judgment should not be applied to other projects. Should you have any questions or require additional information, please contact me at your convenience.

For Intertek: Kal D. Haw

Karl D. Houser, P.E.
Senior Fire Protection Engineer
Building Science Solutions

KDH:wam

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lab side of the system. Hence, when the load is lessened or removed (i.e., non-load bearing) the system's intrinsic fire resistance is increased significantly.

It is worth noting that, per the definitions in Section 202 of the *International Building Code*, a **load-bearing** wall is any wall meeting either of the following classifications:

Load Bearing (Wall) –

- 1. Any metal or wood stud wall that *supports more than 100 pounds per linear foot of vertical load* in addition to its own weight.
- 2. Any masonry or concrete wall that supports more than 200 pounds per linear foot of vertical load in addition to its own weight.

and, "A non-load bearing wall is any wall that is not a load-bearing wall."

In summary, a limited load-bearing system or a non-load bearing system will show a greater inherent fire resistance than a load-bearing system.

FIRE PERFORMANCE OF MINERAL ("SLAG") WOOL BATTS -

The fire-resistant characteristics of rockwool or slag wool (Thermafiber, Roxul Rock Wool, or approved equivalents) are well-documented. The material is effectively noncombustible with, perhaps, the exception of some bonding agents. "Rock wool" (a slag or melted rock-based product) is a sub-type of "mineral wool" products. Mineral wool also includes glass fiber insulation which, too, is a very fine fire resistive material. One significant difference (besides thermal insulation values at elevated temperatures) is the material melting points.

Glass fiber tends to melt at approximately 700°F - 1000°F whereas rock wool shows structural continuity to approximately 2150°F and higher. It should be noted that the insulation is in a stud cavity space and protected from direct heat exposure by the gypsum board membrane(s). As discussed, you are recommending the use of rock wool materials if and when newly installed insulation is being provided.

GENERAL ANALYSIS OF THE USE OF THE BURN-THROUGH TIME OF TYPE X GYPSUM BOARD –

Quantifying the "burn-through time" of a gypsum board ceiling can be difficult. There can be some variations in the formulations of various gypsum boards (Type X and Type C) that can vary from manufacturer-to-manufacturer. Type X GWB is considered a "generic" product among all gypsum board manufacturers. However, some trends are worth noting – one is the **Finish Rating** of the membrane (walls and ceilings on wood studs).

In the UL FRD, 2015 edition, Category BXUV, <u>Design Information Section</u>, Part II, <u>General</u>, finish ratings are defined as follows:

A finish rating is established for assemblies containing combustible (wood) supports. The finish rating is defined as the time at which the wood stud or wood joist reaches an average temperature rise of 250°F or an individual temperature rise of 325°F as measured on the plane of the wood

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BUSINESS CONDO CONVERSION

1000 Laconia Road Sanbornton, NH 03269

David Longval

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Description

ue Da	ate: ()2/27/2024		
oject	Number:	2023-009		
awn I	Ву:	Author		
ecke	d By:	Checker		
pyrig	ht: Koal, Pllc	2023		

CODE ANALYSIS
SUMMARY CONT.

- 2. ATTENTION ALL USERS OF THESE DRAWINGS,
 GENERAL CONTRACTORS, SUB CONTRACTORS,
 MANUFACTURERS, SUPPLIERS: CAREFULLY AND
 THOROUGHLY REVIEW THESE GENERAL NOTES. IT IS
 YOUR RESPONSIBILITY TO KNOW AND ADHERE TO
 THESE REQUIREMENTS. REPETITIVE FEATURES ARE
 NOT DRAWN IN THEIR ENTIRETY AND SHALL BE
 COMPLETELY PROVIDED AS FOR ANY MODIFIELD.
- 3. DO PRESUME THAT YOUR SCOPE OF WORK IS SINGULARLY DEFINED THROUGHOUT THE ENTIRE SET OF DRAWINGS AND SPECIFICATIONS AND IS NOT CONTAINED IN JUST ONE SERIES OF DRAWINGS OR DIVISION OF SPECIFICATIONS. YOU MUST REVIEW THE ENTIRE SET OF CONTRACT DOCUMENTS TO DETERMINE YOUR SCOPE OF WORK.
- 4. MECHANICAL AND ELECTRICAL DESIGN ARE BY OTHERS. THE GENERAL CONTRACTOR IS TO COORDINATE THE LOCATIONS OF ALL MECHANICAL AND ELECTRICAL EQUIPMENT WITH RESPECT TO THE ARCHITECTURAL AND STRUCTURAL DETAILING OF SHAFTS, CHASES, AND SUCH. COORDINATE WITH OWNER.
- 5. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH SITE CONDITIONS AS THEY MAY AFFECT CARRYING OUT THE WORK AS DESCRIBED IN THESE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INVESTIGATE, VERIFY, AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT, AND NOTIFY THE ARCHITECT OF ANY CONDITIONS THAT REQUIRE MODIFICATION BEFORE PROCEEDING WITH THE WORK.
- 6. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR, AND SERVICES NECESSARY TO COMPLETE THE WORK.
- 7. ALL PERSONS DIRECTLY OR INDIRECTLY ASSOCIATED WITH THE PROJECT SHALL BE FAMILIAR WITH THE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT, AND IMPLEMENT THOSE RULES AS THEY APPLY TO THIS PROJECT.
- 8. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE BUILDING CODES AS NOTED ON CODE SHEETS.
- 9. ALL SUBCONTRACTORS SHALL SUBMIT SHOP DRAWINGS AS REQUIRED FOR APPROVAL PRIOR TO COMMENCING ANY WORK.
- 10. FIELD VERIFY ALL DIMENSIONS PRIOR TO CASEWORK FABRICATION.
- 11. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND THE PREVENTION OF CONFLICT BETWEEN ALL TRADES.

 12. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE
- FOR LOCATING AND PROTECTING ALL UTILITY LINES.
 LOCATIONS SHOWN ARE APPROXIMATE. REPAIR ALL
 DAMAGE TO UTILITY LINES, EXISTING PAVEMENT,
 FENCE, AND LANDSCAPE CAUSED BY CONSTRUCTION
 OPERATIONS AT NO COST TO THE OWNER.
- 13. PRIOR TO BEGINNING ANY WORK, THE CONTRACTOR SHALL CONDUCT A WALK THROUGH INSPECTION WITH THE OWNER AND THE ARCHITECT AND ENGINEER DETERMINE IN WRITING THE CONDITION OF THE WORK ALREADY IN PLACE. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING OR REPLACING EQUIPMENT PRESENTLY IN PLACE THAT IS DAMAGED DURING CONSTRUCTION.
- 14. THE GENERAL CONTRACTOR SHALL FIELD VERIFY
 ALL PATCH AND REPAIR REQUIREMENTS OF EXISTING
 SURFACES TO RECEIVE NEW FINISHES. THE COST FOR
 ALL SUCH WORK IS TO BE COVERED BY THE BID.

DRAWINGS AND DIMENSIONS

15. THE TERM "ALIGN" REFERS TO LOCATING DIFFERENT

16. CONTRACTOR SHALL LAY OUT ALL PARTITIONS PER

THE DIMENSIONS SHOWN ON THE PLAN. VERIFY

PARTITION LAYOUT WITH STRUCTURAL, WINDOW

OPENINGS, COLUMNS, DOORS, EQUIPMENT AND

CEILING SYSTEMS. NOTIFY THE OWNER OF ANY

DISCREPANCIES PRIOR TO STARTING

COMPONENTS OF CONSTRUCTION TO PROVIDE A

FLUSH FINISH SURFACE.

CONSTRUCTION.

- 1. THE CONTRACT DOCUMENT DRAWINGS HAVE BEEN PREPARED USING REVIT SOFTWARE IN A MICROSOFT WINDOWS ENVIRONMENT. A BUILDING INFORMATION MODEL (BIM) WAS DEVELOPED SOLELY TO COMMUNICATE THE DESIGN TO THE OWNER AND IS NOT SUITABLE FOR ANY OTHER PURPOSE. FOR EXAMPLE THE REVIT MODEL IS NOT SUITABLE FOR COST ESTIMATING, SYSTEMS PERFORMANCE, COORDINATION, SCHEDULING, OR FACILITIES MANAGEMENT.
- 2. THESE DOCUMENTS WERE PRODUCED USING THE CONSTRUCTION SPECIFICATIONS INSTITUTE'S UNIFORM DRAWING SYSTEM AND THE NATIONAL CAD STANDARD AS GUIDES.
- 3. ANY INDICATION OF PROJECT LIMITS OR LINES OF DEMARCATION ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, AND ARE NOT TO BE TAKEN LITERALLY. ACTUAL CONTRACT LIMITS ARE TO BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE OWNER BEFORE ACTUAL CONSTRUCTION WORK BEGINS.
- 4. DRAWINGS ARE PREPARED USING DIMENSIONS AND PRODUCT CONFIGURATIONS OR DETAILS OF SPECIFIC MANUFACTURERS. DIMENSIONS AND DETAILS FOR SPECIFIC PRODUCTS MAY CHANGE BEFORE THEY ARE ACTUALLY INCORPORATED INTO THE WORK, AND PRODUCTS BY OTHER MANUFACTURERS MAY ALSO BE ACCEPTABLE, THEREFORE, ACTUAL INSTALLATION DETAILS AND DIMENSIONS MAY DIFFER FROM THOSE SHOWN. CONTRACTOR SHALL VERIFY INSTALLATION REQUIREMENTS FOR ALL PRODUCTS TO BE INCORPORATED IN THE WORK (INCLUDING PARTITION THICKNESS FOR RECESSED OR SEMI-RECESSED PRODUCTS), AND IS RESPONSIBLE FOR ACCOMMODATING AND COORDINATING CHANGES TO OTHER MATERIALS OR PRODUCTS THAT ARE NECESSARY BECAUSE OF THESE DIFFERENCES.
- 5. THE DRAWINGS AND SPECIFICATIONS ARE SEPARATED INTO DISCIPLINES FOR THE CONVENIENCE OF THE CONTRACT ADMINISTRATOR AND THE CONTRACTOR. THE SEPARATIONS USED HEREIN ARE USED ONLY FOR THE PURPOSES OF CONVENIENCE AND REFERENCE AND IN NO WAY DO THEY DEFINE OR LIMIT THE SCOPE OR INTENT OF ANY PART OF THE DRAWINGS, OR OF THE DRAWINGS AND SPECIFICATIONS AS A WHOLE. THE FACT THAT THE DRAWINGS ARE SEPARATED IN NO WAY SUGGESTS THAT THE WORK IS NOT TO BE CONSTRUCTED AS A COMPLETE, INTEGRATED AND UNIFIED WHOLE.
- 6. THE DRAWINGS AND SPECIFICATIONS, INCLUDING DRAWINGS PREPARED BY SPECIFIC ENGINEERING DISCIPLINES (SUCH AS CIVIL, STRUCTURAL, MECHANICAL, ELECTRICAL, ETC.) ARE COMPLEMENTARY; ITEMS SHOWN IN ANY ONE LOCATION IN THE DRAWINGS SHALL BE CONSIDERED TO BE REQUIREMENTS OF THE CONTRACT FOR CONSTRUCTION. IN THE EVENT OF AN INCONSISTENCY BETWEEN THE DRAWINGS AND SPECIFICATIONS, OR WITHIN EITHER DOCUMENT, THE CONTRACTOR SHALL SEEK CLARIFICATION OR INTERPRETATION FROM THE CONTRACT ADMINISTRATOR PRIOR TO BIDDING, AND WHERE THE ACTUAL SOLUTION OR INTENT CANNOT BE REASONABLY INFERRED, THE CONTRACTOR SHALL PROVIDE THE BETTER QUALITY OR GREATER
- 7. USE OF THE WORD "VERIFY" POINTS OUT A
 SITUATION WHICH MUST BE CONFIRMED PRIOR TO
 PROCEEDING WITH THE WORK, FABRICATION OF
 EQUIPMENT, OR ORDERING MATERIAL. NOTIFY THE
 CONTRACT ADMINISTRATOR OF ANY DISCREPANCY.
- 8. THE FIRE SPRINKLER SYSTEM WILL BE DESIGNED BY OTHERS. COORDINATE WTIH THE OWNER. THE GENERAL CONTRACTOR SHALL COORDINATE LAYOUT, CLEARANCES, AND LOCATION OF HEAD HEIGHTS WITH THE STRUCTURE, MECHANICAL DUCTWORK, ELECTRICAL LIGHTING, DRAINAGE PIPING, AND THE ARCHITECTURAL REFLECTED CEILING PLANS. THE SPRINKLER DESIGN MUST BE COORDINATED WITH THE PROVISIONS OF ALL ENGINEERING AND ARCHITECTURAL DOCUMENTS AND SHOULD NOT RELY SOLELY ON ONE SERIES OF DRAWINGS OR ONE DISCIPLINE. CORING STRUCTURAL BEAMS MAY BE NECESSARY TO ACHIEVE MAXIMUM HEAD CLEARANCE OR TO PROVIDE ADEQUATE SPACE FOR INSTALLATION OF OTHER TRADES EQUIPMENT OF DUCTWORK. CORING SHALL BE INCLUDED IN THE BASE BID.
- 9. THE GENERAL CONTRACTOR SHALL COORDINATE THE WORK OF ALL TRADES INSTALLING THEIR RESPECTIVE EQUIPMENT IN THE CEILING PLENUMS. MECHANICAL, ELECTRICAL, STRUCTURAL, AND FIRE SPRINKLER SYSTEMS ALL SHARE THIS SAME SPACE. EACH SUB CONTRACTOR IS TO REVIEW THE REQUIREMENTS OF THEIR WORK WITH THE AWARENESS OF THE OTHER TRADES THAT NEED TO SHARE THESE SPACES AND MUST NOT ASSUME THAT THEIR INSTALLATION HAS BEEN CONSIDERED IN THE DESIGN AND SHOP DRAWINGS OF THE OTHER TRADES.
- 10. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER IMMEDIATELY SHOULD ANY DISCREPANCIES BE FOUND IN THE DRAWINGS AND SPECIFICATIONS.
- 11. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL FIELD CONDITIONS AND DIMENSIONS AS THEY RELATE TO THIS PROJECT. SHOULD DISCREPANCIES EXIST BETWEEN THE WORK INDICATED AND ACTUAL FIELD CONDITIONS NOTIFY THE CONTRACT ADMINISTRATOR PRIOR TO PROCEEDING WITH THE WORK
- PROCEEDING WITH THE WORK.

 12. DO NOT SCALE THE DRAWINGS. DRAWING SCALES
 AS INDICATED ARE FOR REFERENCE ONLY AND ARE
 NOT INTENDED TO ACCURATELY DEPICT ACTUAL OR
 DESIGNATED CONDITIONS. WRITTEN DIMENSIONS
 SHALL GOVERN.

CONSTRUCTION NOTES

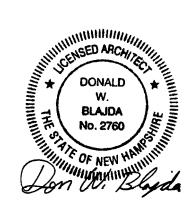
- 1. ALL VERTICAL AND HORIZONTAL PIPES, CONDUITS, DUCTS, ETC. IN FINISHED ROOMS OR AREAS THROUGHOUT THE BUILDING SHALL BE FURRED IN TO MATCH THE ROOM FINISH, UNLESS NOTED OTHERWISE.
- 2. PROVIDE 24" X 24" ACCESS PANELS IN PARTITIONS WHERE REQUIRED FOR MECHANICAL AND PLUMBING ACCESS EXCEPT WHERE SIZES ARE OTHERWISE
- 3. PROVIDE BLOCKING WITHIN PARTITIONS AT ALL LOCATIONS WHERE ITEMS WILL BE MOUNTED ON PARTITIONS.
- 4. WALL, CEILING, BASE, AND FLOOR FINISHES ARE TO BE PROVIDED IN EVERY ROOM AND TO BE SELECTED BY OWNER. COORDINATE WITH OWNER.
- 5. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS. IF IT IS NOT CLEAR WHETHER DUCTWORK PENETRATES A PORTION OF THE RATED ASSEMBLY, OBTAIN CLARIFICATION FROM THE ARCHITECT PRIOR TO
- 6. PROVIDE SEALANT AT ALL JOINTS OR CRACKS WHICH OCCUR WHERE DISSIMILAR MATERIALS INTERSECT PERPENDICULAR TO EACH OTHER, AND THE INTERSECTION IS EXPOSED TO VIEW, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- 7. PROVIDE CONTINUOUS PERIMETER BUILDING
 WEATHER BARRIER AND INSULATION AT ALL
 EXTERIOR WALLS AND ROOFS.
- 8. ALL MATERIAL COLORS TO BE SELECTED BY OWNER, UNLESS NOTED OTHERWISE.



- + ARCHITECTURE
- + PLANNING + UNIVERSAL DESIGN
- + SUSTAINABLE DESIGN + INTERIOR DESIGN

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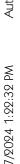
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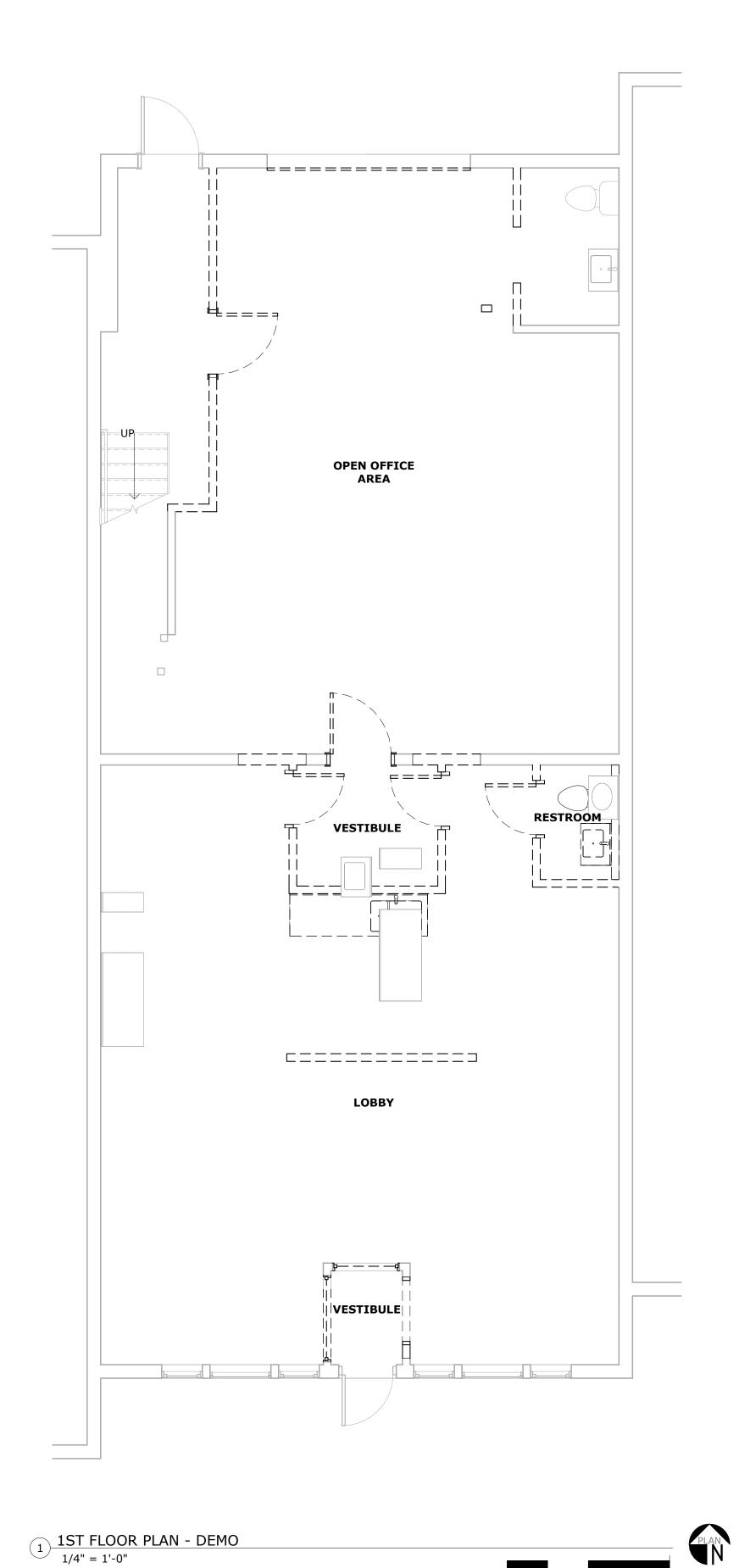
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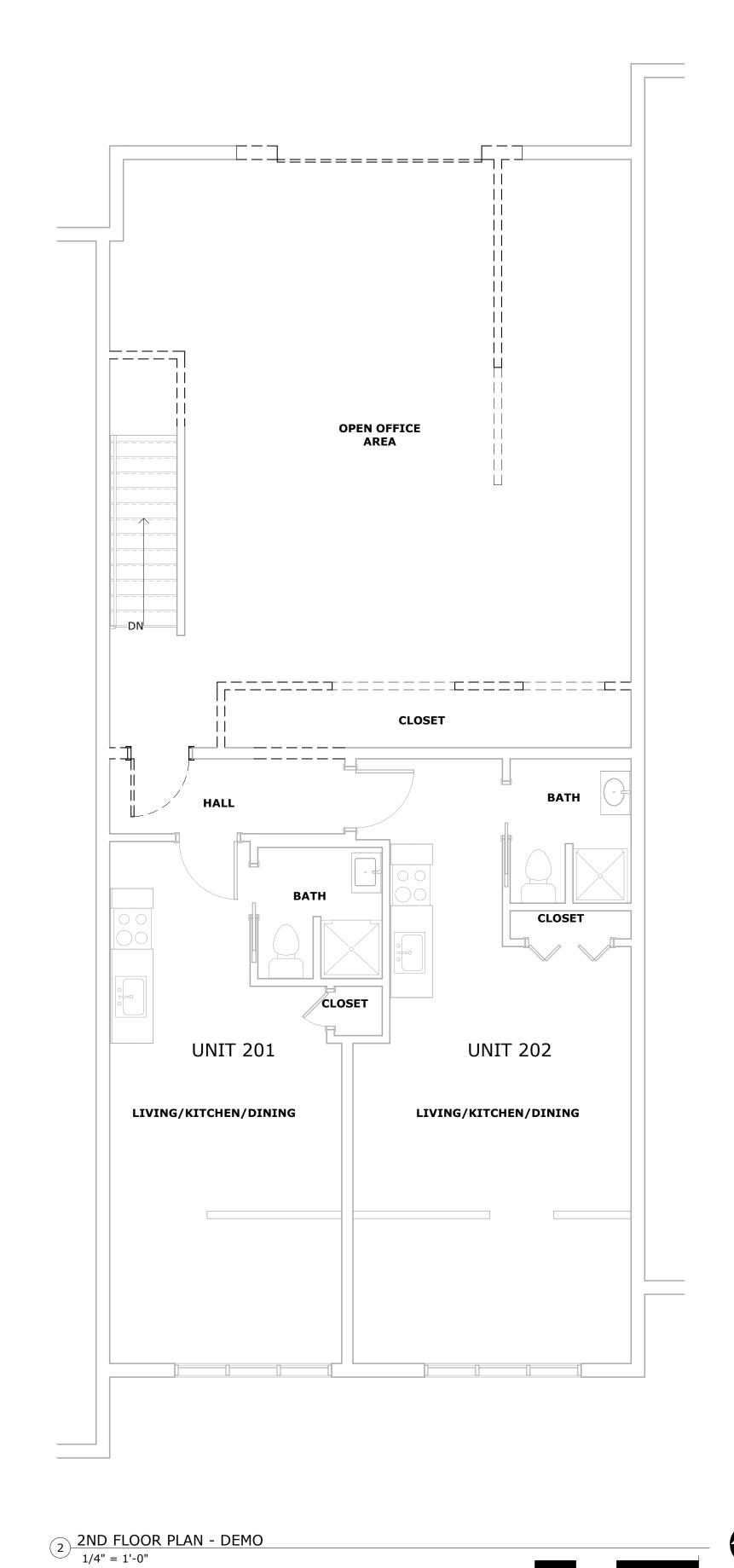
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Drawn By:			Author
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GENERAL NOTES





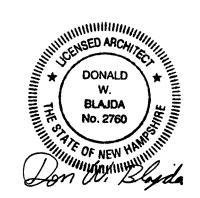




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- + PLANNING + UNIVERSAL DESIGN
- + SUSTAINABLE DESIGN + INTERIOR DESIGN

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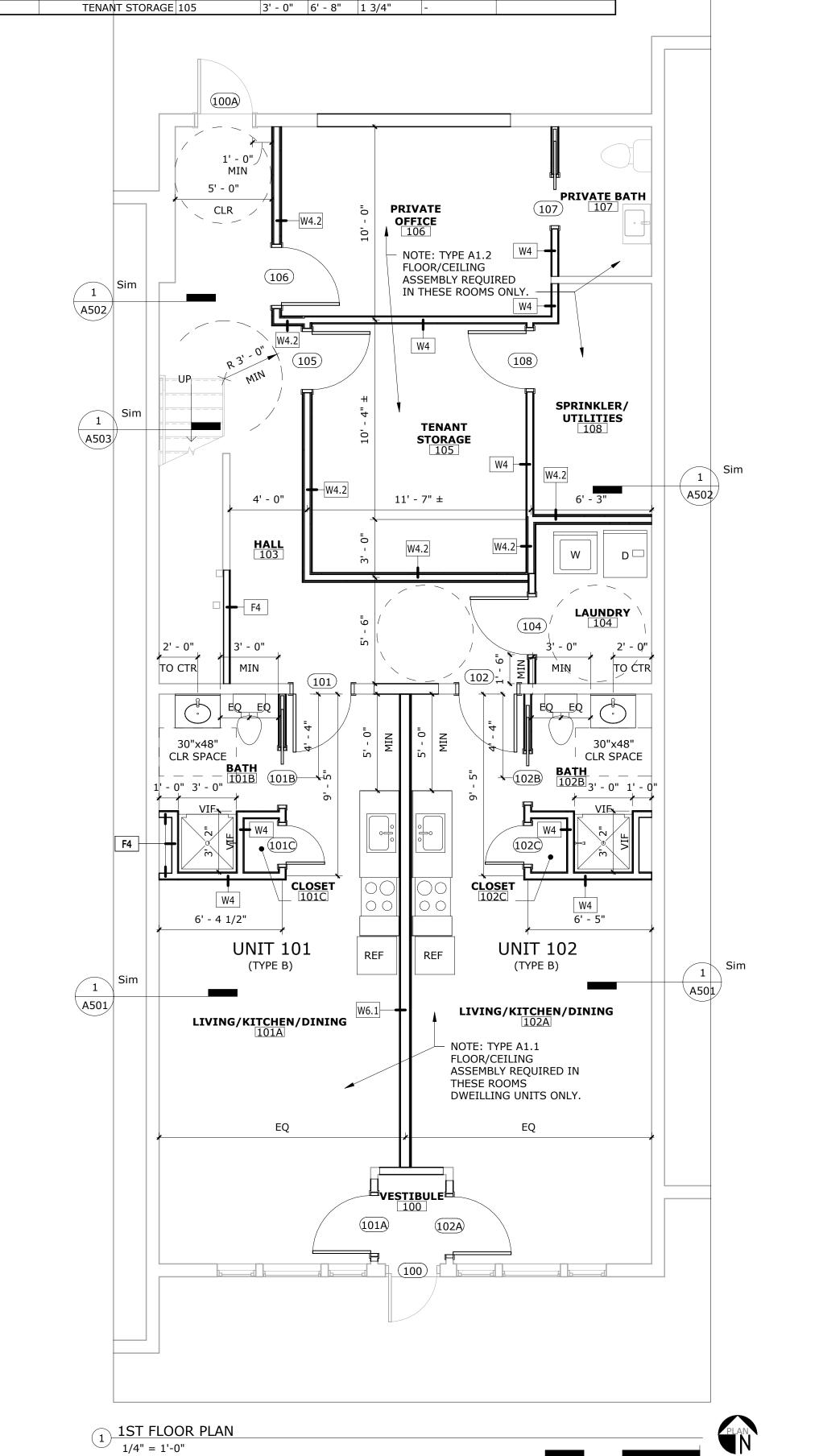
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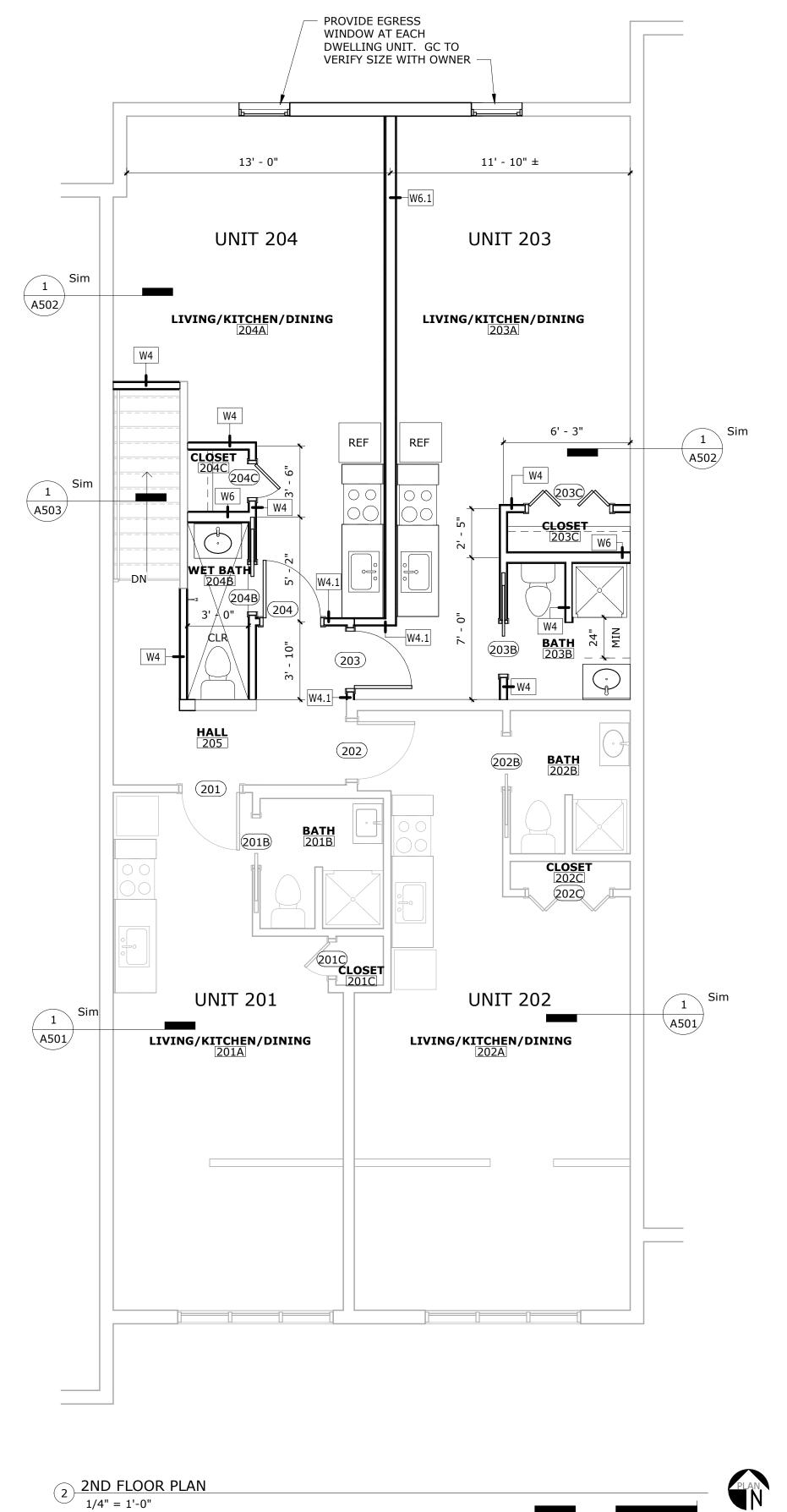
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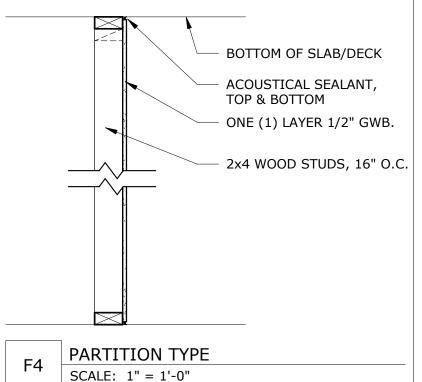
1ST & 2ND FLOOR PLANS - DEMO

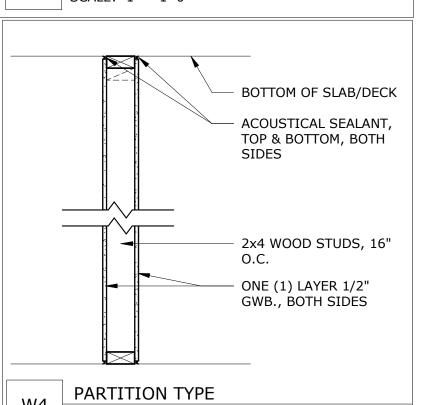
AD101

Door and Frame Schedule							
	OPENING			DOORS	6		
OPENING NUMBER	ROOM NAME	ROOM NUMBER	WIDTH	HEIGHT	THICKNESS	FIRE RATING	COMMENTS
LEVEL 2							
201	LIVING/KITCHEN/DINING	201A	2' - 10"	6' - 8"	1 3/4"	-	EXISTING TO REMAIN
201B	BATH	201B	2' - 4"	6' - 8"	1 3/4"	-	EXISTING TO REMAIN
201C	LIVING/KITCHEN/DINING	201A	1' - 8"	6' - 8"	1 3/8"	_	EXISTING TO REMAIN
202	LIVING/KITCHEN/DINING	202A	2' - 10"	6' - 8"	1 3/4"	_	
202B	BATH	202B	2' - 6"	6' - 8"	1 3/8"	_	EXISTING TO REMAIN
202C	LIVING/KITCHEN/DINING	202A	4' - 0"	6' - 8"	1 3/8"	-	EXISTING TO REMAIN
203	HALL	205	2' - 10"	6' - 8"	1 3/4"	45	
203B	LIVING/KITCHEN/DINING	203A	2' - 6"	6' - 8"	1 3/8"	_	
203C	CLOSET	203C	4' - 0"	6' - 8"	1 3/8"	_	
204	LIVING/KITCHEN/DINING	204A	2' - 10"	6' - 8"	1 3/4"	45	
204B	WET BATH	204B	2' - 4"	6' - 8"	1 3/4"	-	
204C	LIVING/KITCHEN/DINING	204A	1' - 8"	6' - 8"	1 3/8"	-	









SCALE: 1" = 1'-0"

PARTITION TYPE

3 1/2"-

3 1/2"-

PARTITION TYPE NOTES 1. REFER TO G101 FOR DIMENSION LEGEND. 2. PARTITION TYPES ARE INDICATED ON THE FLOOR 3. ALL PARTITIONS ASSEMBLIES SHALL EXTEND 4. CONSTRUCTION OF FIRE-RATED PARTITIONS, 5. PARTITIONS TYPES DESCRIBE THE PRIMARY 6. PROVIDE MOISTURE/MOLD RESISTANT GYPSUM

ROOMS, SHOWER ROOMS, ETC. 7. PROVIDE TILE BACKER BOARD AT ALL WALLS SCHEDULED TO RECEIVE TILE. 8. ALL WALLS TO RECEIVE WALL COVERINGS SHALL

BOTTOM OF SLAB/DECK

ACOUSTICAL SEALANT,

3 1/2" ACOUSTICAL BATT INSULATION

2x4 WOOD STUDS @ 16" OR 24" OC

- ONE (1) LAYER 5/8"

TYPE X GWB EA SIDE

UP TO 1-HR RATED: UL ASSEMBLY U-309

BOTTOM OF SLAB/DECK

ACOUSTICAL SEALANT, TOP & BOTTOM EA SIDE

3 1/2" ACOUSTICAL BATT INSULATION

2x4 WOOD STUDS @ 16" OR 24" OC

- TWO (2) LAYERS 5/8" TYPE X GWB EA SIDE

TOP & BOTTOM EA SIDE

BE PRIME PAINTED. 9. PROVIDE WOOD BLOCKING AT ALL EQUIPMENT, CASEWORK, ETC. INCLUDING ITEMS NOTED AS "N.I.C." OR "FUTURE". 10. THE GENERAL CONTRACTOR IS RESPONSIBLE

STRUCTURE TO STRUCTURE UNLESS NOTED

SHALL BE IN ACCORDANCE WITH THE UL

DIRECTIONS TO ACHIEVE THE RATING

INCLUDING TAPING AND FINISHING OF GYPSUM

BOARD FOR FULL HEIGHT OF STRUCTURE ABOVE,

ASSEMBLY LISTED AND THE MANUFACTURER'S

MEMBER AND SHEATHING. FINISHES TO BE

BOARD IN ALL WET AREAS SUCH AS TOILET

OTHERWISE.

INDICATED.

DETERMINED BY OWNER.

FOR VERIFYING ALL DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCY BETWEEN CONSTRUCTION DOCUMENTS AND FIELD CONDITIONS IS TO BE PROMPTLY COMMUNICATED TO THE ARCHITECT FOR CLARIFICATION. 11. THE GENERAL CONTRACTOR SHALL SELECT A

TESTED FIRESTOPPING SYSTEM FOR EACH SITUATION BASED ON WALL/FLOOR FIRE RATINGS INDICATED ON THE DRAWINGS OR OTHER PROJECT CONDITIONS.

FLOOR FINISH AS SELECTED BY OWNER

EXISTING GYPSUM BOARD (OPTIONAL)

FLOOR TYPE

WOOD FLOOR JOISTS -

SCALE: 1" = 1'-0"

FLOOR FINISH AS SELECTED BY OWNER

PARTITION TYPE

3/4" T&G EDGE WOOD FLOOR SHEATHING -

A1.1

EXISTING WOOD FLOOR SHEATHING

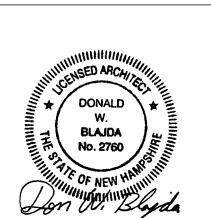
EXISTING WOOD FLOOR JOISTS



- + ARCHITECTURE + PLANNING
- + UNIVERSAL DESIGN
- + SUSTAINABLE DESIGN + INTERIOR DESIGN 42 GILFORD EAST DRIVE, SUITE 4

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BUSINESS CONDO CONVERSION

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Description

RATED:	
ICAL SEALANT, OTTOM EA SIDE ICAL BATT TON SILIENT L @ 24" OC DD STUDS @ 24" OC LAYER 5/8" Issue Date: Project Number: Checked By: Checked By: Copyright: KOAL, Pl	
	I OF SLAB/DECK ICAL SEALANT, OTTOM EA SIDE ICAL BATT TION SILIENT I OF SLAB/DECK Issue Date: Project Number: Drawn By: Checked By:

UP TO 1-HR RATED:

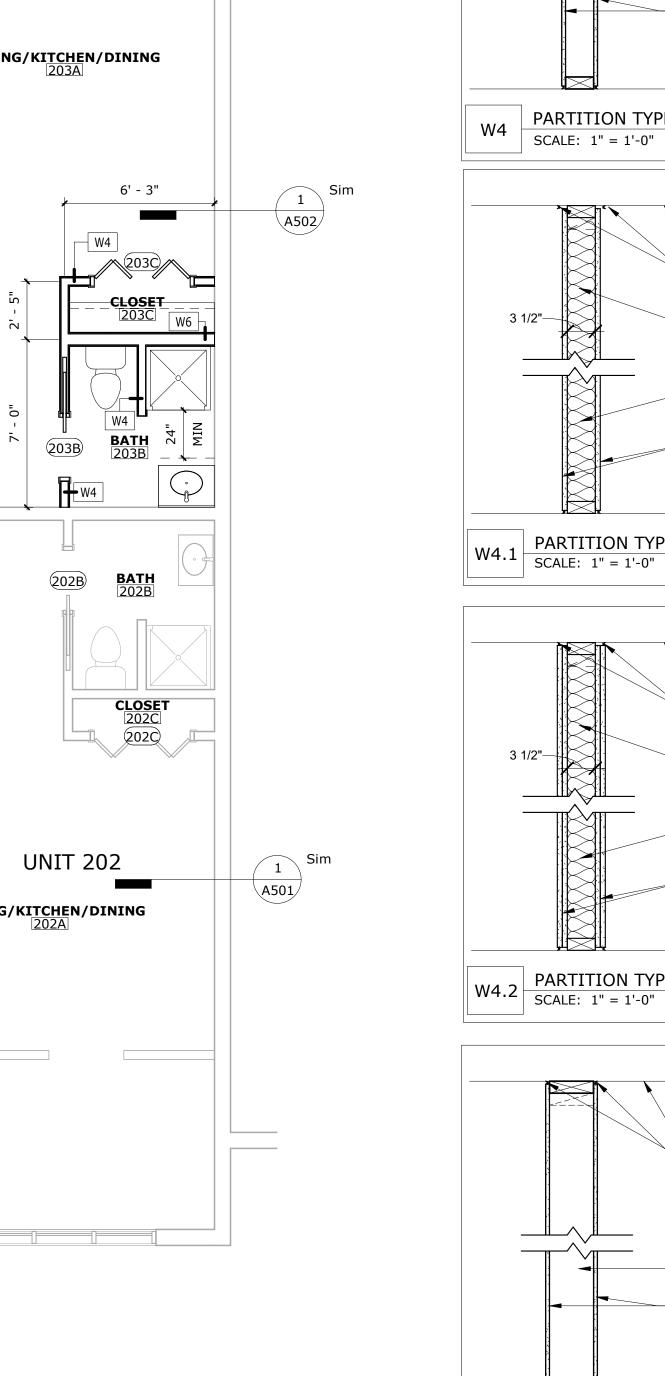
UL ASSEMBLY U-309

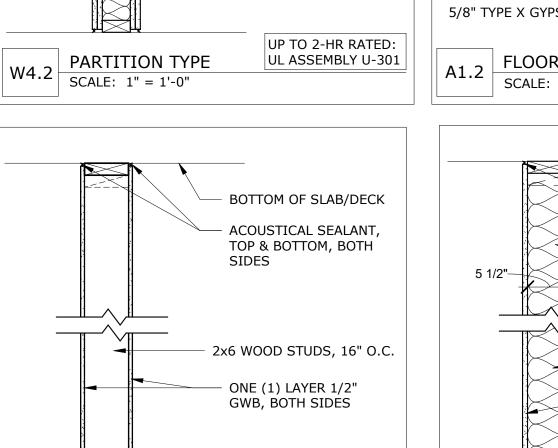
SCALE: 1" = 1'-0" TL-93-116 STC = 50-54

1-HOUR RATED: UL ASSEMBLY L507

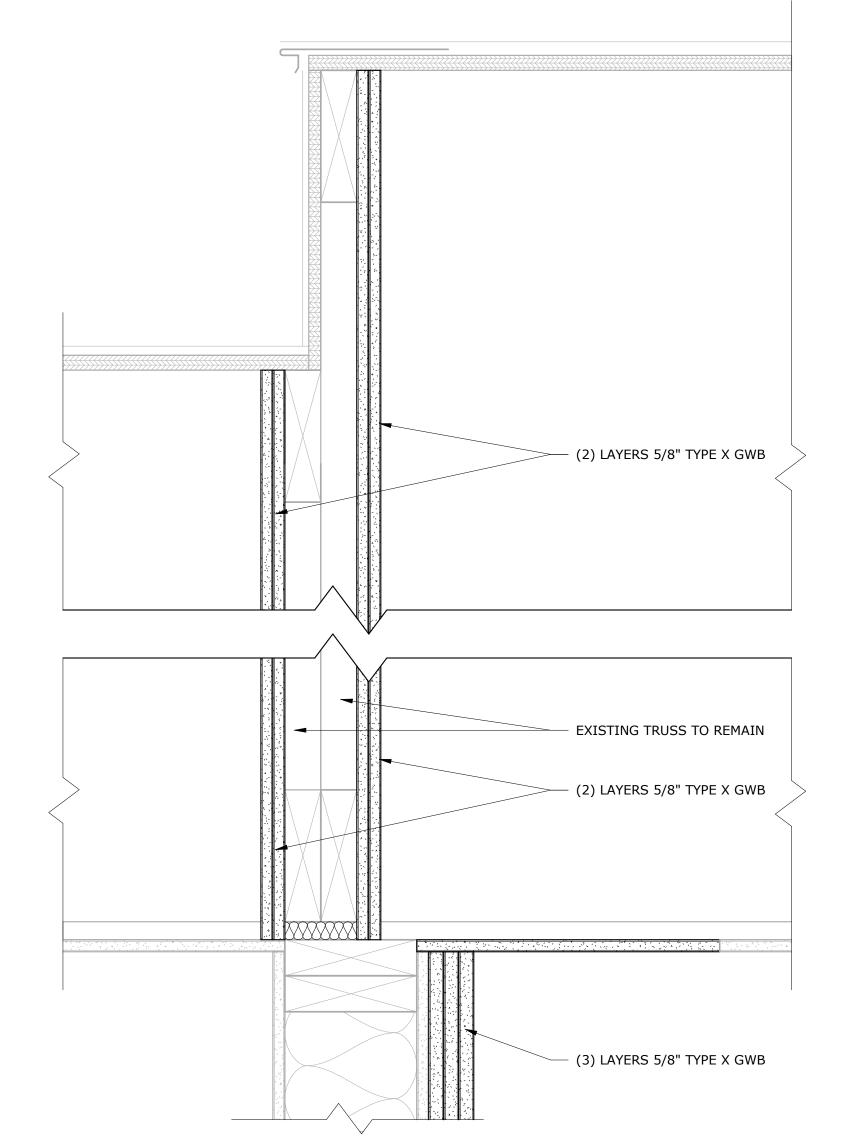
1ST & 2ND FLOOR **PLANS**

A101

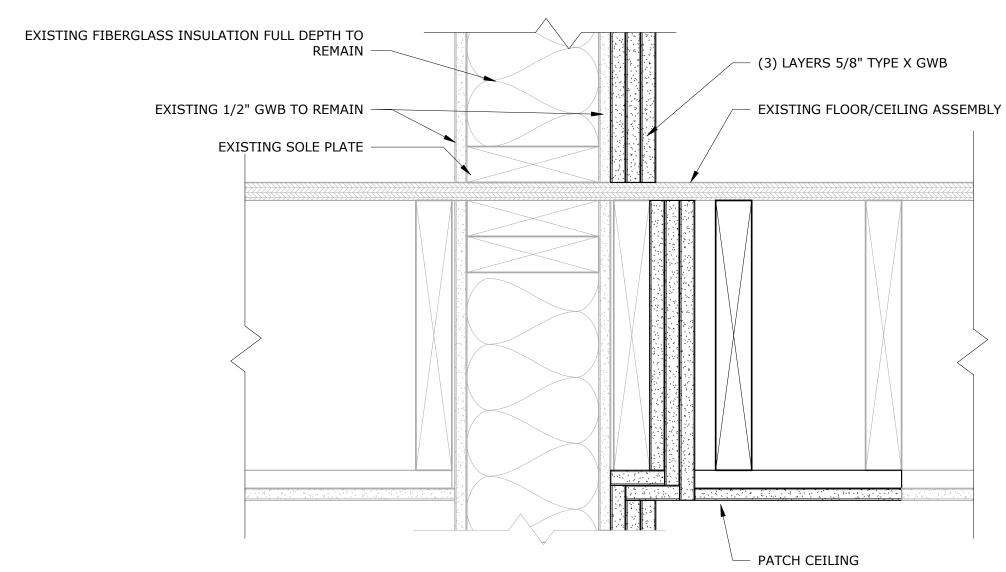




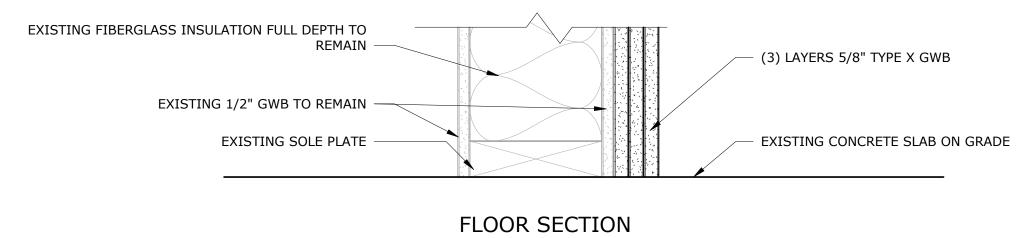
PARTITION TYPE W6 | SCALE: 1" = 1'-0"



ROOF/CEILING SECTION



FLOOR/CEILING SECTION



1 Fire Barrier Wall A - NONLOAD BEARING
3" = 1'-0"

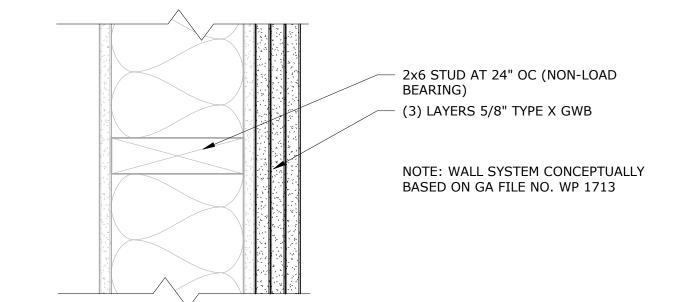
FIRE BARRIER FIRE RESISTANCE DESIGN APPROACH

SECTION 722.6 WOOD ASSEMBLIES CONTAINS PROCEDURES BY WHICH THE FIRE-RESISTANCE RATINGS OF WOOD ASSEMBLIES MAY BE ESTABLISHED BY CALCULATION. HOWEVER, THE MAXIMUM FIRE-RESISTANCE RATING CALCULATED USING THIS METHOD IS LIMITED TO NOT MORE THAN 1 HOUR. IT IS PROPOSED THAT AN ENGINEERING JUDGEMENT BASED ON THE FOLLOWING TIME ASSIGNED RATINGS SHOWN BELOW AND THE TESTED ASSEMBLY GA NO WP 1713 IT CAN BE SHOWN THAT THE ADDITION OF THREE LAYERS OF 5/8" TYPE X GYPSUM WALLBOARD TO THE EXISTING WALL ASSEMBLY WOULD PROVIDE A FIRE BARRIER WITH A MINIMUM FIRE-RESISTANCE RATING OF 120 MINUTES TO COMPLY WITH TABLE 508.4 REQUIRED SEPARATION OF OCCUPANCIES .

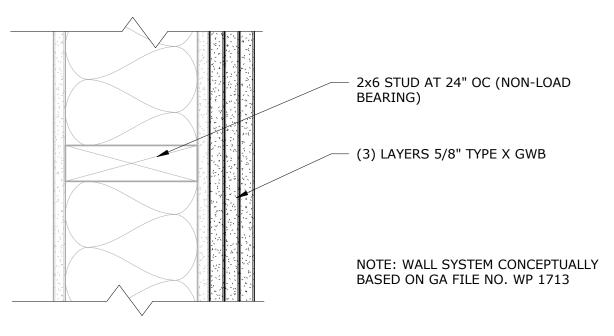
TABLE 722.6.2(1) TIME ASSIGNED TO WALLBOARD MEMBRANES 1/2 INCH GYPSUM WALLBOARD 15 MINUTES

5/8 INCH GYPSUM WALLBOARD 40 MINTUES

WALLS AND INTERIOR PARTITIONS, NONCOMBUSTIBLE 2 HOUR 40 to 44 STC GA FILE NO. WP 1713 PROPRIETARY* SOUND GYPSUM WALLBOARD, STEEL STUDS Fire Design: Base layer 5/8" proprietary type X gypsum wallboard applied parallel or at right angles to ONE SIDE of a 2-1/2", 18 mil steel studs 24" o.c. with 1" Type S screws 24" o.c. Second layer 5/8" proprietary type X gypsum wallboard applied parallel or at right angles with 1-5/8" Type S screws 24" o.c. **Third** layer 5/8" proprietary type X gypsum wallboard applied parallel or at right angles with 2-1/4" Type S screws 12" o.c. Face layer 5/8" proprietary type X gypsum wallboard applied parallel or at right angle to studs with 2-7/8" Type S screws 12" o.c. Thickness: 5" (Fire and Sound) Vertical joints offset 24" between layers; horizontal joints offset 16" between layers. Approx. Weight: 10 psf (Fire and Sound) UL R14196, 12CA52786, Sound Design: UL Design W415 Sound Test: RAL TL14-260, 7-17-14 Sound tested with 3-5/8" glass fiber insulation in the cavity. PROPRIETARY GYPSUM BOARD ... 5/8" FireBloc® Type X Gypsum Board American Gypsum Company LLC



STUD SECTION (PLAN VIEW)



STUD SECTION (PLAN VIEW)

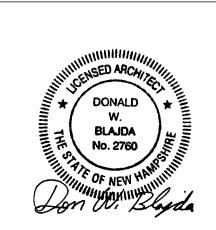


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- + UNIVERSAL DESIGN + SUSTAINABLE DESIGN

+ INTERIOR DESIGN 42 GILFORD EAST DRIVE, SUITE 4

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David Longval

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Description

		00/07/0004
sue Da	ate: (02/27/2024
roject Number:		2023-009
Prawn By:		dwb
Thecked By:		dwb
opyrig	ht: Koal, Pllc	2023

INTERIOR DETAILS

A501

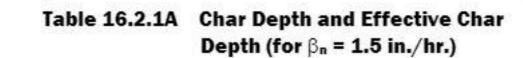
FIRE BARRIER FIRE RESISTANCE DESIGN APPROACH

SECTION 722.6 WOOD ASSEMBLIES CONTAINS PROCEDURES BY WHICH THE FIRE-RESISTANCE RATINGS OF WOOD ASSEMBLIES MAY BE ESTABLISHED BY CALCULATION. HOWEVER, THE MAXIMUM FIRE-RESISTANCE RATING CALCULATED USING THIS METHOD IS LIMITED TO NOT MORE THAN 1 HOUR. IT IS PROPOSED THAT AN ENGINEERING JUDGEMENT BASED ON THE FOLLOWING TIME ASSIGNED RATINGS SHOWN BELOW AND THE TESTED ASSEMBLY GA NO WP 1713 IT CAN BE SHOWN THAT THE ADDITION OF THREE LAYERS OF 5/8" TYPE X GYPSUM WALLBOARD TO THE EXISTING WALL ASSEMBLY WOULD PROVIDE A FIRE BARRIER WITH A MINIMUM FIRE-RESISTANCE RATING OF 120 MINUTES TO COMPLY WITH TABLE 508.4 REQUIRED SEPARATION OF OCCUPANCIES.

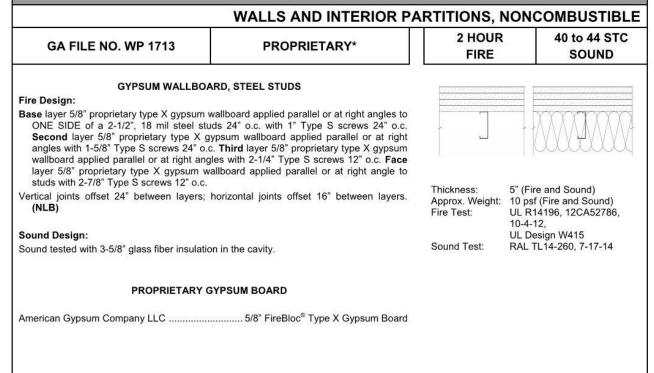
TABLE 722.6.2(1) TIME ASSIGNED TO WALLBOARD MEMBRANES 1/2 INCH GYPSUM WALLBOARD 15 MINUTES 5/8 INCH GYPSUM WALLBOARD 40 MINTUES

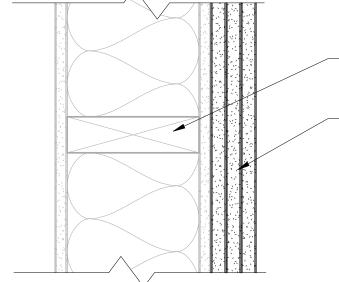
FIRE BARRIER FIRE RESISTANCE DESIGN APPROACH (LOAD BEARING)

THE DESIGN APPROACH IS TO UTILIZE 1" GYPSUM PANELS AND MINIERAL WOOL TO PROTECT THE EXISITING STUDS FOR THE MINIMUM FIRE RESISTANCE REQUIRED BASED ON ASSEMBLY GA WP 7053. THE 2x6 STUD WILL PROVIDE THE MINIMUM DEPTH OF 2.6 INCHES AS INDICATED IN TABLE 16.2.1A TO ACHIEVE 2 HOUR FIRE RESISTANCE.



Required Fire Resistance (hr.)	Char Depth, a _{char} (in.)	Effective Char Depth, a _{eff} (in.)
1-Hour	1.5	1.8
1½-Hour	2.1	2.5
2-Hour	2.6	3.2



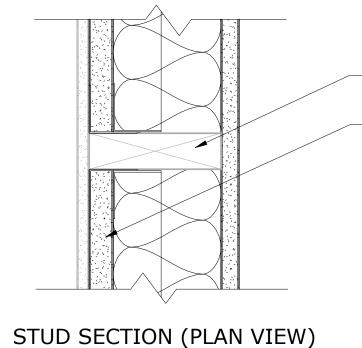


STUD SECTION (PLAN VIEW)

- 2x6 STUD 24" OC (NON-LOAD BEARING) (3) LAYERS 5/8" TYPE X GWB

NOTE: WALL SYSTEM CONCEPTUALLY BASED ON GA FILE NO. WP 1713

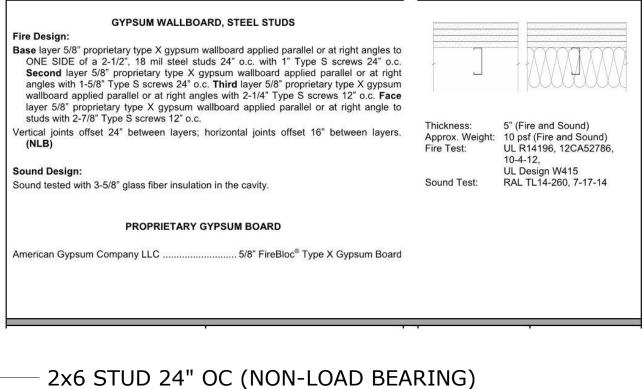
PROPRIETARY*	2 HOUR FIRE	50 to 54 FSTC SOUND
m liner panels inserted between 4" floor and proprietary vented C-H steel studs between ulation, 2.0 pcf, in stud space. When wall banels are butted to extend to the full height backed by steel framing.	Thiskness	2/4" (Fire and Saund)
OPPOSITE SIDE: One layer 3/4" proprietary type X gypsum panel applied parallel or at right angles to studs with 1-1/4" Type S screws 8" o.c. at vertical edges and 12" o.c. at intermediate studs when installed parallel to studs or 8" o.c. at vertical end joints and intermediate studs when applied at right angles to studs. Horizontal joints need not be backed by steel framing. (NLB)		I-3/4" (Fire and Sound) B psf (Fire and Sound) JL R1319, 97NK33240, 1-20-97, JL Design U415, System C SA-910913, 9-12-91
GYPSUM PANEL		
	un liner panels inserted between 4" floor and proprietary vented C-H steel studs between ulation, 2.0 pcf, in stud space. When wall panels are butted to extend to the full height backed by steel framing. Ty type X gypsum panel applied parallel or at screws 8" o.c. at vertical edges and 12" o.c. rallel to studs or 8" o.c. at vertical end joints right angles to studs. The framing of the following strength	PROPRIETARY* FIRE UDS, MINERAL FIBER INSULATION Im liner panels inserted between 4" floor and proprietary vented C-H steel studs between ulation, 2.0 pcf, in stud space. When wall backed by steel framing. Ty type X gypsum panel applied parallel or at screws 8" o.c. at vertical edges and 12" o.c. rallel to studs or 8" o.c. at vertical end joints right angles to studs. el framing. (NLB) GYPSUM PANEL GYPSUM PANEL GYPSUM PANEL Core Gypsum Panels



2x6 STUD 24" OC (LOAD BEARING)

1" GYPSUM PANEL

NOTE: WALL SYSTEM CONCEPTUALLY BASED ON GA FILE NO. WP 7053



BUSINESS CONDO CONVERSION

+ ARCHITECTURE

+ UNIVERSAL DESIGN

+ INTERIOR DESIGN

+ SUSTAINABLE DESIGN

42 GILFORD EAST DRIVE, SUITE 4

GILFORD, NH 03249

603.215.7055

CONTACT@KOALPLLC.COM + KOALPLLC.COM

+ PLANNING

1000 Laconia Road Sanbornton, NH 03269

David Longval

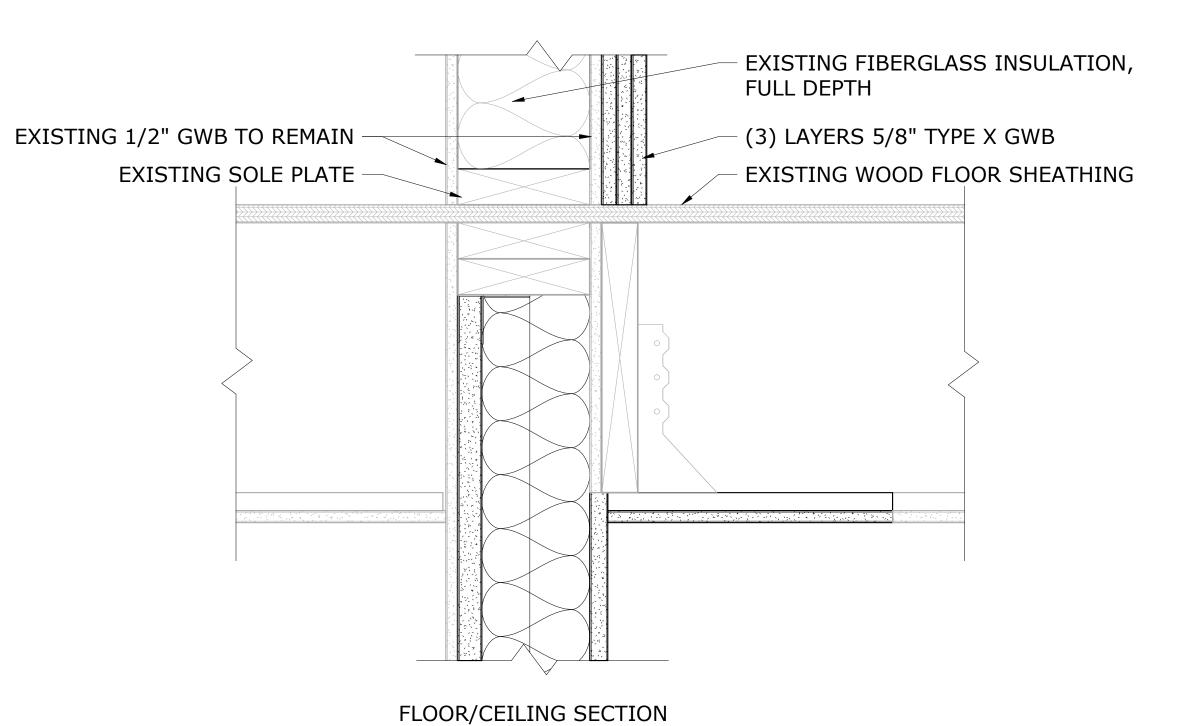
Concept Communications 1000 Laconia Road Sanbornton, NH 03269

Description

Issue Da	ate: ()2/27/2024
Project	Number:	2023-009
Drawn By:		dwt
Checked By:		dwt
Copyright: KOAL, PLLC		2023

INTERIOR DETAILS

A502



ROOF/CEILING SECTION

FLOOR SECTION

1" GYPSUM PANEL

CONT LT GA 2x2 ANGLE

EXISTING SOLE PLATE

Fire Barrier Wall B - LOAD BEARING & NONLOAD BEARING

3" = 1'-0"

EXISTING 1/2" GWB TO REMAIN

- (2) LAYERS 5/8" TYPE X GWB

- EXISTING TRUSS TO REMAIN

- (2) LAYERS 5/8" TYPE X GWB

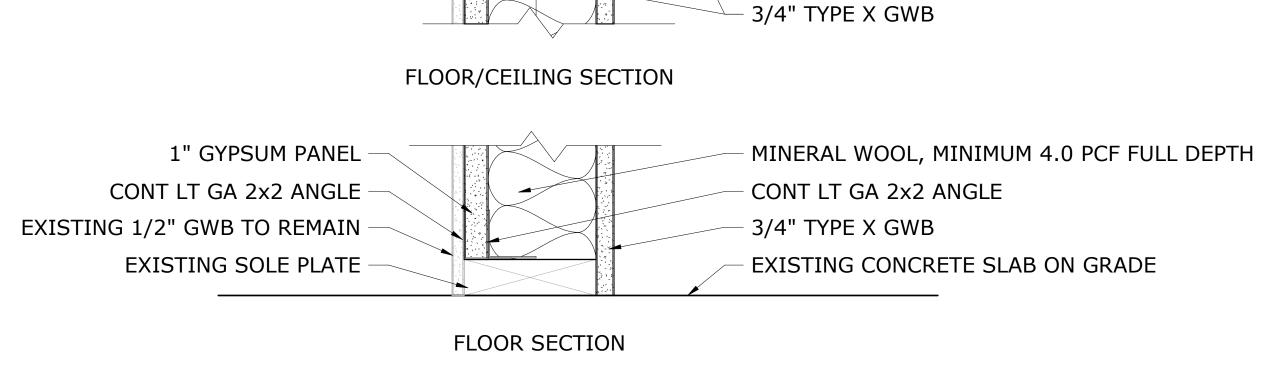
MINERAL WOOL, MINIMUM 4.0 PCF FULL DEPTH

EXISTING CONCRETE SLAB ON GRADE

CONT LT GA 2x2 ANGLE

3/4" TYPE X GWB





ROOF/CEILING SECTION

EXISTING 1/2" GWB TO REMAIN

EXISTING SOLE PLATE

- (2) LAYERS 5/8" TYPE X GWB

- EXISTING TRUSS TO REMAIN

- (2) LAYERS 5/8" TYPE X GWB

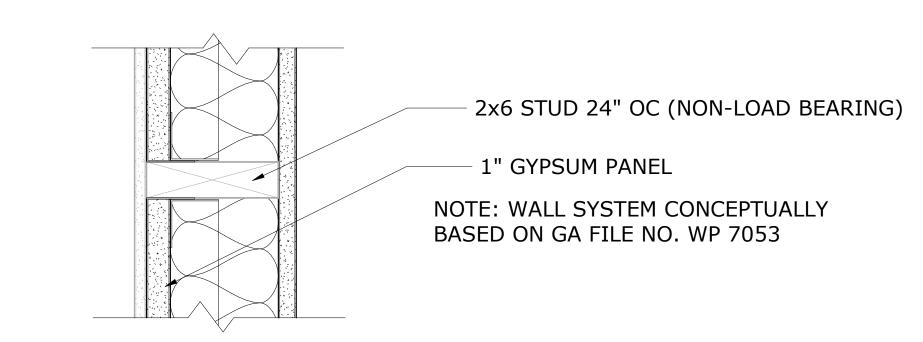
3/4" TYPE X GWB

EXISTING 1/2" GWB TO REMAIN

MINERAL WOOL, MINIMUM 4.0 PCF FULL DEPTH

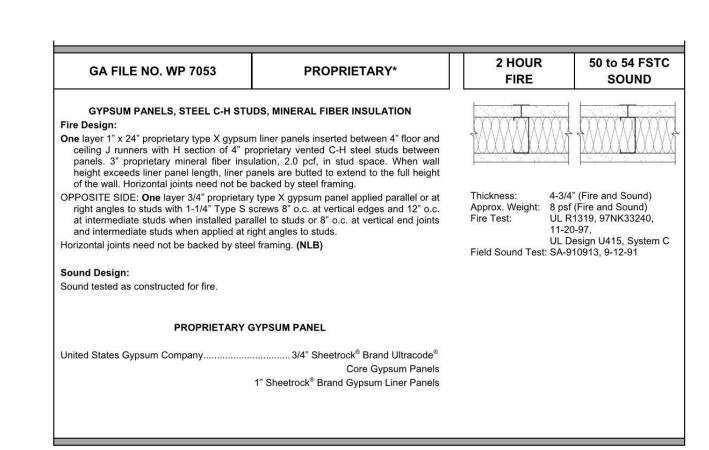
EXISTING WOOD STAIR FRAMING TO REMAIN

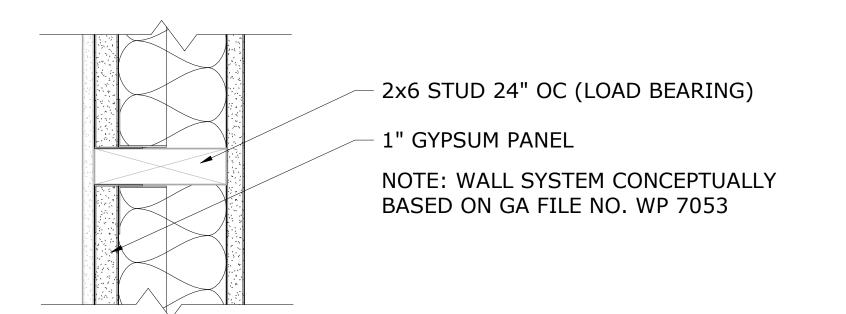
MINERAL WOOL, MINIMUM 4.0 PCF FULL DEPTH



STUD SECTION (PLAN VIEW)

STUD SECTION (PLAN VIEW)







+ PLANNING

+ UNIVERSAL DESIGN

+ SUSTAINABLE DESIGN + INTERIOR DESIGN 42 GILFORD EAST DRIVE, SUITE 4

GILFORD, NH 03249 603.215.7055 CONTACT@KOALPLLC.COM + KOALPLLC.COM

BUSINESS CONDO CONVERSION

1000 Laconia Road Sanbornton, NH 03269

David Longval

Concept Communications 1000 Laconia Road Sanbornton, NH 03269

Description

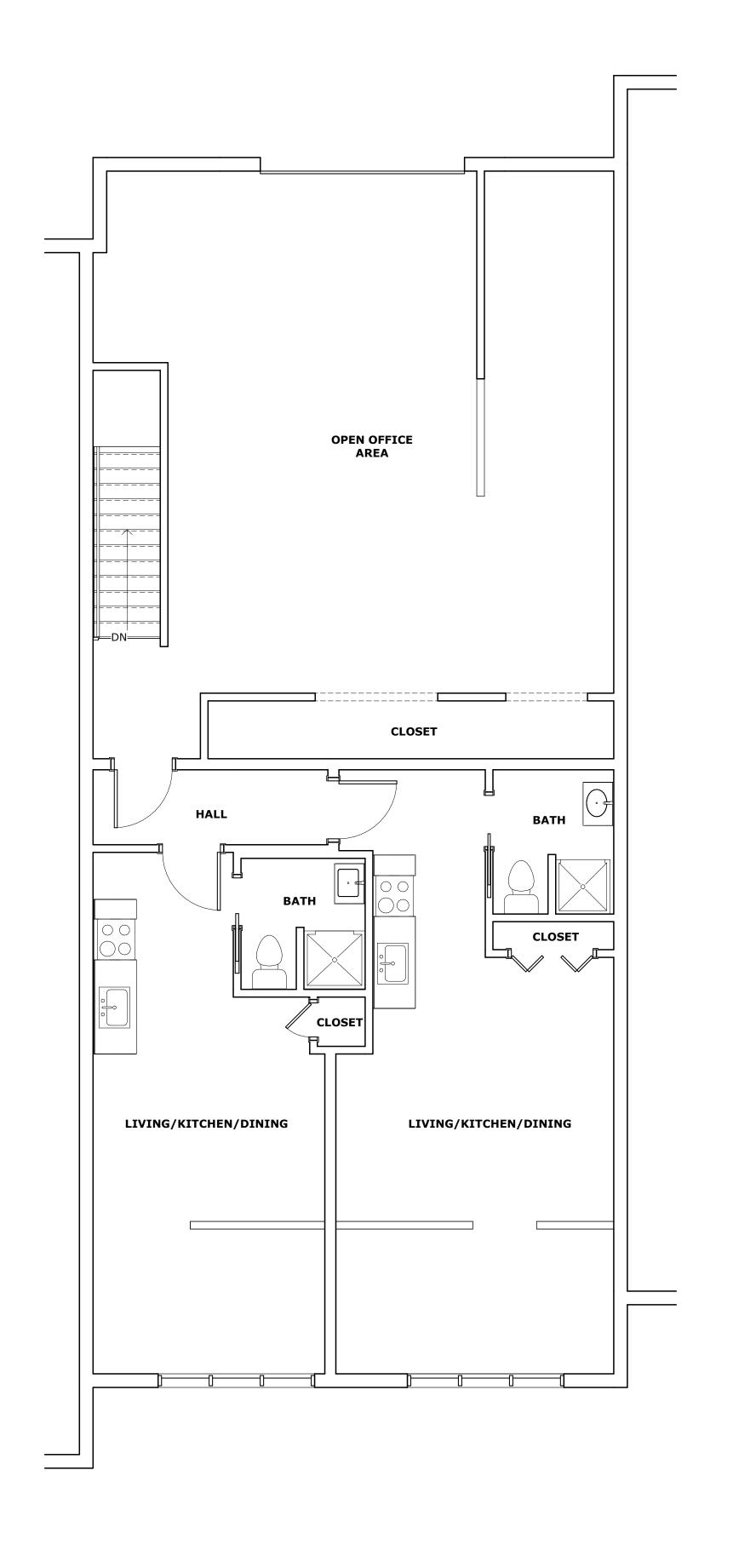
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Project Number:			2023-00	
Drawn I	Ву:		dw	
Checked By:			dw	
Copyright: KOAL, PLLC			202	
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INTERIOR DETAILS

A503



OPEN OFFICE AREA







+ ARCHITECTURE + PLANNING

+ UNIVERSAL DESIGN

+ SUSTAINABLE DESIGN + INTERIOR DESIGN

42 GILFORD EAST DRIVE, SUITE 4
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603.215.7055
CONTACT@KOALPLLC.COM + KOALPLLC.COM

BUSINESS CONDO CONVERSION

1000 Laconia Road Sanbornton, NH 03269

David Longval

Concept Communications 1000 Laconia Road Sanbornton, NH 03269

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pyright: KOAL, PLLC 20)23

EXISTING FLOOR **PLANS**

RA101