

BOUTON'S HALL CONDITIONS ASSESSMENT
FOR THE TOWN OF VIENNA



GAUTHIER
ALVARADO
ASSOCIATES

06.28.2018

Bouton's Hall Conditions Assessment

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Introduction

Bouton's Hall is located at 146 Church Street, NE in Vienna, Virginia. It is our understanding that the building is over 100 years old. Despite its age, we have not been able to locate the building on any local, state or federal historic registers. Without an official historic designation, it is our understanding that this building will not be required to comply with renovation standards specifically associated with historic significance. Rather, it is our recommendation that the owner preserve as much of the building's historic character as determined to be feasible. Historic components provide a great deal of character, charm and ground the building in a rich local history.



Bouton's Hall is a two-story building with a gable roof and a basement. The foundation is built of both stone and brick. Above the foundation the building is wood construction with wooden double-hung windows. The exterior of the building is finished with vinyl siding and an asphalt shingle roof. A portion of the second floor overhangs the porch on the first floor of the building.



Gauthier, Alvarado & Associates performed a visual conditions assessment of the existing building. This visual assessment included only exposed finishes and no finishes were tested or removed to determine the condition of substrates during the assessment. We recommend that hazardous material testing for asbestos, lead, mold and PCBs be performed, as well as pest intrusion detection for potential termite activity.

It is our understanding that the Town of Vienna may renovate and build an addition onto the existing building in order to address the deficiencies identified in this report, which may include a potential change in building use. We have made some possible recommendations for some issues that don't meet code; however, they are not intended to solve any of the code deficiencies in this report. That task should be addressed in future phases of this project, including a detailed feasibility study.

Architectural Assessment

Building Envelope



In general, the building envelope appears to be well maintained. There is evidence on the Northwestern elevation that the brick foundation was recently repointed, as there are mortar joints with a different coloration than the original mortar joints as shown above.



The current owner believes the vinyl siding is thirty years old. There are locations, as shown above, where the vinyl siding has been damaged. Since the vinyl siding is installed over the original exterior finish, we were unable to assess the condition of the original finish.



There are also several locations on the exterior where trim covering is missing, as shown above.



In other areas, the trim finish is failing, as shown in the upper right-hand corner and on the sill of the window to the left.

Storm windows were installed over the existing wooden double-hung windows, so these windows are protected from weathering. Though protected from the weather, the double-hung windows will need to be repainted for aesthetic appeal and maintenance concerns, as the paint is chipping and there are areas where the original wood is exposed. We have been told that the wooden windows were also painted shut and are thus inoperable.

The existing wooden double-hung windows are single pane glass, which means they have little insular value and are not energy efficient.

In regards to the energy efficiency of the entire building envelope, we were unable to verify if there was insulation in the wall cavities since this was simply a visual assessment. Given that there was no insulation installed above the ceiling in the attic space (see below), we are under the impression that the building is not insulated based on its age. There are both gable vents and roof vents provided in the attic.

Furthermore, we were not able to verify if there is a vapor and/or air barrier provided in the existing walls. Depending on the level of alterations, one or both may be required.

From the ground level, the roof does not appear to be in good condition. Though difficult to see in the image provided on the next page, the asphalt



shingles appear to be separating from the roof assembly. The rafters are also telegraphing through the roof assembly, which suggests the roof sheathing may need to be replaced in addition to the asphalt shingle roofing. If the current roof assembly is thirty years old as suggested by the current owner, it has surpassed its anticipated life span.



We noted four roof penetrations as indicated in the image below: three vents and one roof access hatch. The condition of these roof penetrations will need to be assessed prior to reroofing, as they may need to be replaced as well.



Life Safety

As part of our life safety assessment, we reviewed the quantity and quality of existing exits, the pathways to these exits and elements incorporated along the egress paths.

Beginning at the front porch, the main entry stair does not meet building code for several reasons, including the inconsistency of the riser height in the stair flight and the inadequate distance between the verticals in the metal handrails, the railing does not prevent the passage of a four-inch sphere, and there is no guardrail. The wooden railing on the adjacent front porch is not the appropriate height for a guardrail. In order to meet code, the main entry stair and railings at the front porch would need to be replaced.

It is our understanding that the main level of the building may be used as an assembly space in the future. In accordance with this use, two exits would be required from the space. The existing second exit from the main level retail space may be too close to the first exit; the distance

between the two exits needs to be verified against the distance of the maximum overall diagonal of the building area to be served.



In addition, the exterior landing for the second exit from the main level (shown to the left) is not appropriately sized.

Both the front entry and exit from the existing retail space have door thresholds that exceed the maximum height per code.

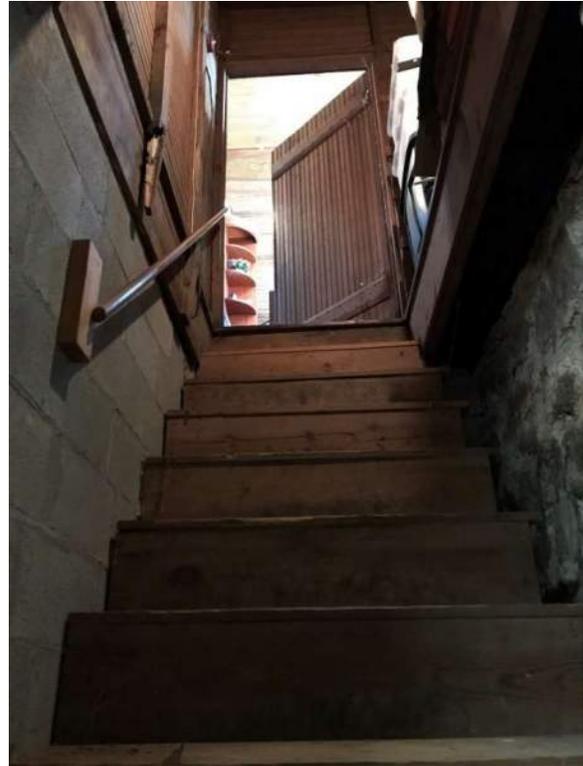


The double door exit in the basement does not currently meet code due to several deficiencies, including the door hardware, minimum door height and minimum door width of one of the door leaves. However, with an existing ceiling height of 6'-11", the basement does not meet the current minimum ceiling height for occupiable space. We believe the space could meet the minimum ceiling height if the ceiling finish were removed.

The slope of the ramp on the exterior of the double door needs to be evaluated during a feasibility study, as the ramp appears to exceed the maximum allowable slope for a means of egress. This ramp would require handrails on both sides.

On the opposite side of the building, the main exterior door with access to the second floor does not meet accessibility requirements. One of the deficiencies is that the door threshold exceeds the maximum height per code.

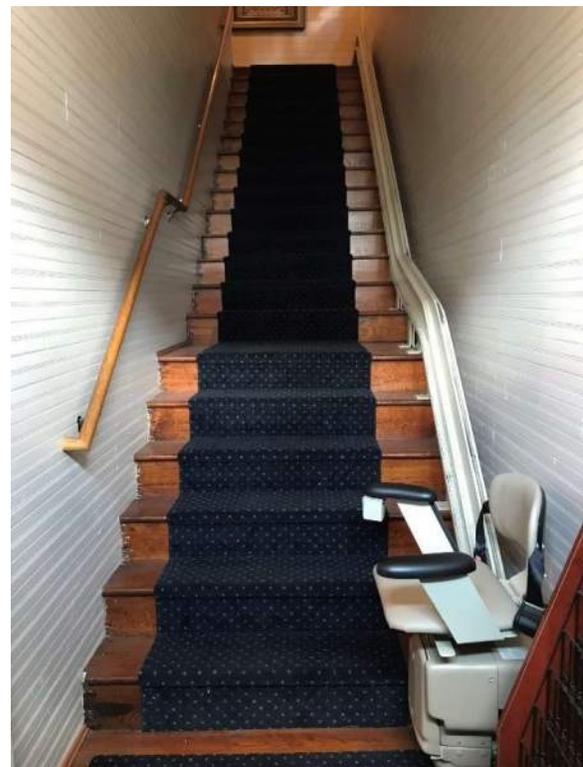
The stair to the basement on the North side of the building (shown to the right) is lacking several elements required by code, including a landing on the inside of the door at the top of the stair, handrail extensions, a proper number of brackets, a continuous handrail, there are risers that exceed the maximum height allowed and the riser height is not consistent across the entire flight of the stair, to name a few.



Continuing onto the main stair on the North side of building (shown to the right), there are several deficiencies, including: the lack of handrail extensions, and risers that exceed the maximum height allowed per code.

Similar to the main space on the first floor, the second floor would require two exits for the proposed assembly use. The Virginia Rehabilitation Code (VRC) does allow for the use of a fire escape as the second exit. The existing fire escape would need to be evaluated in a feasibility study to ensure that it meets the requirements per code. If not, the VRC does allow for new fire escapes to be installed and to be used as a second exit.

All interior stairs will be required to be enclosed with a fire rated assembly per code.



Accessibility

Accessible Route

Accessibility begins when a handicapped individual approaches the building, whether that be from their parked vehicle or from the public way. This approach to and through the building is entitled the accessible route. Since an individual may be parking, an accessible parking space with the correct sizing, signage, adjacent aisle, pavement stripping and slope at grade are required. The existing site does not currently provide an accessible parking space.

When approaching the building from an accessible parking space, an accessible slope at grade must be continuously maintained along a route to a building entry. There are currently no accessible routes to any of the existing building entries. As indicated in the images below, there is an abrupt edge at the existing concrete parking pad and at the edge of the existing brick sidewalk. There should be a continuous firm surface which is slip-resistant and where there are no gaps or holes along the accessible route to the building entry.



With the absence of an elevator, there is currently no accessible means to access the second floor or the basement

Along the accessible route, specific clearances and door hardware must be present and maintained. The majority of the existing doors, both exterior and interior, do not have accessible door hardware. Many of the existing doors do not have the proper clearances at the approach to the door from one or both sides in order to maintain accessibility.

The existing corridor and door at the end of this existing corridor on the northern end of the building are currently too narrow per accessibility requirements to allow access to the library on the first floor.

Restrooms

Bouton Hall has four existing single use restrooms. One is located in the basement. Two are located on the first floor and one is located on the second floor. Currently none of the restrooms are accessible for multiple reasons. If the building remains multi-tenant, we would recommend that the two restrooms on the first floor, currently one in each tenants' space, be reviewed for accessibility upgrades.



The basement restroom, tucked in the corner behind the stairs, does not have the proper clear entrance opening, does not have the proper clearance at the fixtures, accessories are either not there or at the wrong heights and piping is not protected. If the basement is to become accessible in the future, this restroom would need to be completely renovated.



On the first floor at the North end of the building, the door is too narrow for a proper clear opening, the fixtures do not have the proper clearances, accessories are either not there or at the wrong heights and the faucet controls are not accessible.

The first floor restroom in the current retail space is too narrow to allow for proper clearances at the fixtures. The door is too narrow for a proper clear opening, and accessories are either not there or at the wrong heights.



The second floor, similar to the first floor, has a door too narrow for a proper clear opening, the fixtures do not have the proper clearances, accessories are either not there or at the wrong heights and the faucet controls are not accessible.



Kitchen



The existing kitchen does not meet accessibility requirements in its current configuration.

The existing base cabinets in the kitchen exceed the maximum allowable height.

The kitchen sink should allow for a forward approach since cooktops are provided. The ovens will require a work surface for forward approach adjacent to one side of the oven door.

The refrigerator may need to be replaced to meet accessibility.

Interior Finishes

In general, it appears that the interior finishes are in relatively good condition and have been well maintained. In fact, the current owner noted that he believes the painted wallboard on the first floor and portions of the second floor to be original to the building. We have noted a few areas of concern in regards to the interior finishes on the subsequent pages.

Ceilings



The picture above shows the ceiling at the work area beyond the retail space on the first floor. There appears to be a certain degree of water damage on the ceiling panels.



The picture above shows the kitchen ceiling on the second floor. It is evident that there is water damage.



The picture above shows a portion of the ceiling in the assembly space on the second floor. This portion of the ceiling is on the Southeastern Elevation adjacent to the kitchen area. It is evident that there is water damage.

An additional area of concern in regards to the ceiling is in the basement. The portion of the basement that is accessible from the retail area has a ceiling height of 6'-11", which is below the minimum ceiling height required by the Virginia Rehabilitation Code (VRC). We believe the ceiling would meet the minimum ceiling height if the existing ceiling finish is removed.

Flooring



It appears that some of the structure beneath the floor finish and subfloor is telegraphing through. This is evident in the image to the left where the existing floor finish is slightly raised and is rubbing against the bottom of the door leaf, causing the floor finish to crack. This may be alleviated by increasing the number of floor joists or replacing the subfloor.

The door pictured on the left is located at the entry to the assembly space on the second floor.

Windows



Most of the double-hung windows on the second floor show evidence of water damage. This particular window is located on the Northwestern elevation near the entry to the assembly space on the second floor. It has not been determined if this water damage is recent or has been repaired with existing finishes.

Walls

There is evidence of water damage on a wall in the second floor assembly area, as shown in the image to the right. This wall is located adjacent to the kitchen area. Due to its proximity to an air intake vent, it is possible that water could have penetrated the wall finish from the vent directly above.



Structural Assessment

Description of Structure

Bouton's Hall is a two-story wood structure with a basement. The foundation walls are constructed of stone walls, approximately five feet above the basement slab, and brick extending to the first floor. There is a line of four brick piers that are spaced down the center of the basement. It appears that 2 three-inch diameter steel columns supported by concrete piers were added to provide additional support. A porch is located adjacent to the retail space on the first floor.



The first floor is wood framing with a main wood beam running down the center of the building supported by the brick piers. There are two bays of wood floor joists that span from the foundation wall to the center wood beam. Only a portion of the framing is visible at the Northeast end of the basement. The first few floor joists are 2x10's at 24 inches on center and they transition to 2x12's at 24 inches on center before they are covered by finishes.



The porch on the first floor appears to have been reconstructed fairly recently. The framing is constructed of more modern nominal framing, the floor joists are supported by galvanized joist hangers and the porch floor appears to be a composite decking material.



The second floor is wood framing. The layout of the framing appears to be similar to the first-floor framing, however, none of the second-floor framing is visible. The framing is covered by finishes and trim.

The roof is framed with wood trusses spanning exterior wall to exterior wall, spaced at 24 inches on center, supporting 1x wood decking.

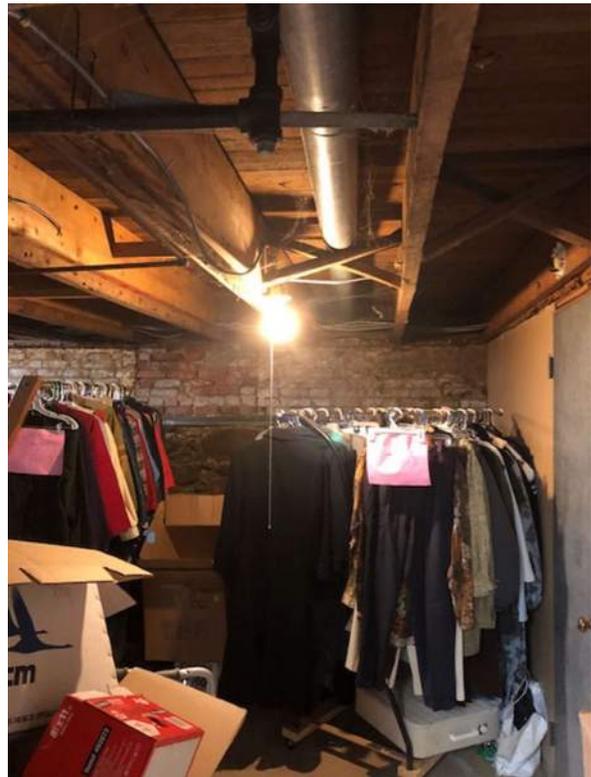
Condition of Structure

In general, the structure appears to be in good shape. The walls are plumb, there is no noticeable sagging or sloping of the floors or roof. We were unable to get up into the attic to walk the trusses from one end to the other end. The wood roof trusses visible from the opening in the ceiling above the kitchen appear in good condition.



There is visible evidence that some of the floor joists have been damaged by termites. These have been reinforced by sistering joists on each side of the damaged joists. We are unable to determine if the termites are still active. The majority of the floor framing for the first and second floor are covered. We recommend that a pest control service be employed to do a thorough pest inspection.

It was brought to our attention that there is a foundation leak at the Northeast end of the building. We noticed some evidence of moisture entering the building during our site visit, but, did not notice any active foundation leaks. An evaluation was performed and three recommendations were made to remedy the problem. We recommend that these options be evaluated during the next phase of this project.



Floor Loading

The building was constructed over 100 years ago and there are no drawings indicating the live loads used to design the structure. The existing use for each floor are: Storage in the basement, Retail on the first floor and an Assembly area on the second floor. The current 2012 Virginia Construction Code requires 125 pounds per square feet (psf) live load for the basement (light storage); 100 psf live load for the First Floor (retail); and 100 psf live load for the Second Floor (assembly) (see appendix). The required live load for the porch adjacent to the retail is the same as the retail, 100 psf.

The concrete slab-on-grade in the basement is adequate to support the code required live load. Based on our assumption that the framing covered is the same as the existing framing that is exposed, the existing floor framing for both the first and second floors are only capable of supporting a 30 psf live load (see appendix). The first and second floors will require modifications in order to support the code required live loads. The porch is capable of supporting a 60 psf live load (see appendix).



Roof Loading

The roof is framed with wood trusses spanning the width of the building and spaced at 24 inches on center. The live load capacity of the trusses can be determined after the dimensions of the trusses and truss members have been collected.

Mechanical Systems Assessment

Heating is provided by two central heating systems. One system is dedicated to the upper floor, Masonic Meeting Space and the other system serves the retail space on the main level and basement level. Each system is comprised of a fan, filters and condensing type furnace. Air is supplied to the spaces via ductwork run in bulkheads to the Masonic Meeting Space and a bulkhead in the basement ceiling spaces to floor registers on the main floor retail and registers in the bulkhead in the basement.



The furnace serving the Masonic Meeting Space is located on the upper floor in an elevated closet. Access to this unit for servicing is cumbersome. The furnace serving retail space is located in the basement and access is adequate.





The Masonic Meeting space is also air conditioned by a 5-ton split DX system with remote air cooled condensing unit located at the rear of the building. The indoor fan and coil is located in mezzanine like space above the kitchen. Access to this unit for service requires a ladder and somewhat difficult. There is also one window type A/C unit in the meeting room, one window type A/C unit in the kitchen and one mini split DX A/C unit in the office. If an addition goes out the back, this condensing unit would need to be replaced.



Air conditioning for the retail space is by a window type A/C unit. We observed no other source of cooling for this space, but the one unit seemed to maintain the space reasonably cool.

The central systems heating and cooling systems appear to be fairly new, well maintained and appear to be in good condition. The heating systems were installed in the summer of 2015.

The Masonic Meeting Space was maintaining adequate cooling on the day of our site visit which was considered a design cooling day. We were unable to confirm if the units provide any outside air for ventilation and given the expected high occupancy associated with the Masonic Meeting Room, this could be in non-compliance with the building code. Likewise, the potential change of use for the main level will likely result in increased occupancy and higher ventilation rates.



The Masonic Meeting Space includes a kitchen with two combination gas range top and ovens. There is no exhaust provided for these appliances, which is also a code violation.

The bathroom also does not appear to have any exhaust, which does not comply with code. Corrective action will be required as part of the renovation.

The attic is vented by two gravity vents in the roof and louvers at each end of the building.

It is understood that the Town intends to renovate the building, including an addition with commercial kitchen and new accessible bathroom facilities. It is anticipated that the HVAC systems would be replaced or upgraded with additional systems to correct the ventilation issues and provide more cooling, which will likely be required if occupancy is increased. The extent of upgrades should be addressed in the future feasibility study.

Plumbing Systems Assessment

Domestic water enters the building from the Church Street side via a one-inch service line with the meter located just outside the building. The service is equipped with a shutoff valve, but there is no backflow preventer. The water service is likely inadequate and will need to be upgraded to provide the water requirements of a renovated facility.

Domestic hot water is provided by an electric water heater located in the basement on the Masonic side. The water heater appears to be fairly new and in good condition.

There is an electric water cooler drinking fountain located on the second floor. The water cooler is not handicap accessible and is currently not operational.

There are four bathrooms in the building and none of them are handicap accessible. Toilets are flush tank type. The feasibility study will need to address corrective action for code compliance.

There are two gas service meters located at the back of the building. Presumably one meter serves the Masonic Meeting Space and the other serves the retail space. If the addition goes out the back of the building, these meters would need to be replaced or relocated.





In the basement, next to the stairs, there is a two-foot diameter concrete pit that is approximately six feet deep. The pit includes a steel plate cover and is partially full of what appears to be clean water. The bottom of the pit is gravel. We were unable to determine what the pit is for. Possibly a sump pit, but there is no permanent pump. It was also suggested that it was once a well and has since been abandoned and filled with gravel. In any case, the Town should have this pit

explored in more detail and have it filled or locked shut if it serves no purpose. It is currently considered a safety hazard as the steel top is equipped with a handle and can be easily removed. At a minimum, the top should be secured.

Electrical Systems Assessment

The primary electrical service is a 200A, 3-phase, 4 wire 120/240v delta service, however the existing panelboards are 120/240v, 1-phase panels. It appears the existing panels in the building do not use the high-leg (Phase B). There is one main 200A service disconnect in the basement which serves the main panels. One 100A panel is located in the basement which serves the front retail space and the second 100A panel is in the back corridor to serve the second floor. The existing electrical equipment is approximately 50+ years old. Typically, panelboards and circuit breakers have a life span of 30 years. The circuit breakers appear to be in okay condition, the breakers don't appear to be loose, however due to the age of the existing equipment it should be replaced within the next 5 years.

Additionally, there is a sub-panel on the second floor which is a 60A fuse panel. Fuses verse circuit breaker panels aren't inherently unsafe, the fuse just requires replacing if overloaded as opposed to breakers can be reset. The availability of these types of fuses may be difficult to find it needing replaced. As well as, many times fuse panels have been modified over the years to accommodate today's energy demands, i.e. placing too many loads on a single circuit (since fuse boxes have fewer circuits), replacing fuses with a larger fuse without increasing wire size, or replacing fuses with something metal. All of these modifications could overload the circuit and start a fire, which is why it is recommended the fuse panel be replaced with a circuit breaker panel.

If an addition is put on the building, the existing incoming electrical service will need to be relocated and the building electrical system should be upgraded at this time. The existing 200A is adequately sized to serve the current square footage and use of the building, however depending on the size of the addition and new use this service may need to be increased or a 3-phase service utilized.



For code compliance, 3 feet of clearance shall be provided in front of any/all electrical equipment. Currently, the main service disconnect and panel in the basement is blocked by storage. There are also a number of junction boxes throughout the space that require covers.

Throughout the building, there is a mix of wire types used from metal-clad cable (MC), non-metallic sheathed cable (NM) and cloth insulated. Cloth insulated wire does not run with a ground wire, therefore would need replaced if a ground wire is required. Appliances that are not properly grounded could cause an electrical shock. Additionally, the cloth insulation can become brittle over time exposing the bare wires. This could lead to a fire if they come in contact with each other and spark, as well as if a person touches the bare wire they are at risk for being shocked. It is not required by code to replace cloth wiring, however it should be considered for safety and to reduce the risk of fire caused by faulty wiring.

Per code, receptacles in restrooms and kitchens are required to be GFCI protected. The existing receptacles at the kitchen counter were not GFCI protected and there were a few receptacles in the restrooms also not GFCI. These should be replaced for code compliance.

At any heating, air-conditioning or refrigeration (HVAC) equipment it is required by code to have a 125-volt, single-phase 15 or 20 amp receptacle installed at an accessible location for servicing the equipment. There were (2) units located on the exterior of the building that did not have a receptacle within 25 feet for servicing.

The lighting throughout the building is all controlled via manual on/off toggle switches. All light switches were not handicap accessible since located higher than 48" above finish floor. There were a few emergency light fixtures throughout the building, however adequate egress/emergency lighting was not provided. There are no emergency light fixtures on the first floor of the building, (2) on the second floor and (1) in the basement. Adequate egress lighting shall be provided throughout the space for code compliance. Emergency lighting is also required at exterior doors of designated exits. There are light fixtures located at all exterior doors, however none of them are battery back-up for emergency. Additionally, illuminated exit signs are required by code and must be visible from any/all locations along the path of egress leading to designated exits. There are only (3) exit signs in the building and none of them are illuminated.

There is an existing security/fire panel installed in the space. The security panel is NOVA security panel. This system is tied to the smoke detectors located throughout the building, however majority of the smoke detectors have been disconnected or removed due to false alarms. This system should be reconnected for life safety.



APPENDIX

Architectural Field Notes

Structural Field Notes

Structural Minimum Live Load Tables
from the Virginia Building Code

Structural Calculations

Mechanical & Plumbing Field Notes

35" RIM;
CONTROLS
NOT
ACCESSIBLE

- HANDRAIL
DOES NOT
MAINTAIN
1.5" FROM
WALL
- HANDRAIL
NOT
CONTINUOUS
OR ADEQUATE
SUPPORTED

← RISERS
EXCEED
MAX 7" (1 1/2")
HEIGHT;
BOT RISER
DIFFERENT
HEIGHT

HARDWARE
ON DOOR
NOT
ACCESSIBLE

2'-0" DOOR NOT
ACCESSIBLE
- DOOR CATCHES
FLOOR

2'-0" DOORS
6 1/2" STEP

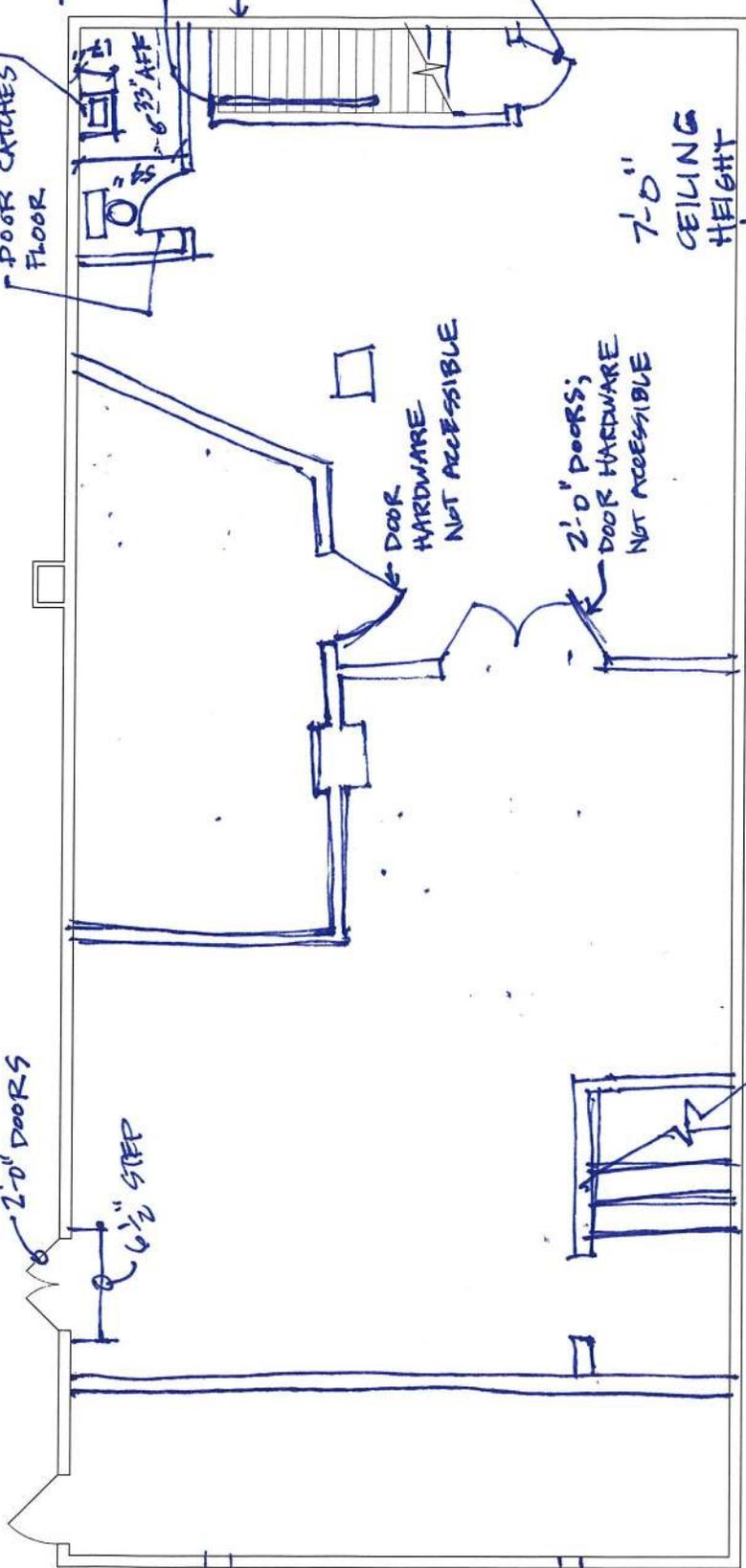
← DOOR
HARDWARE
NOT ACCESSIBLE

2'-0" DOORS;
DOOR HARDWARE
NOT ACCESSIBLE

RAILING
DOES NOT
EXTEND
PAST BOT
TREAD

7'-0"
CEILING
HEIGHT

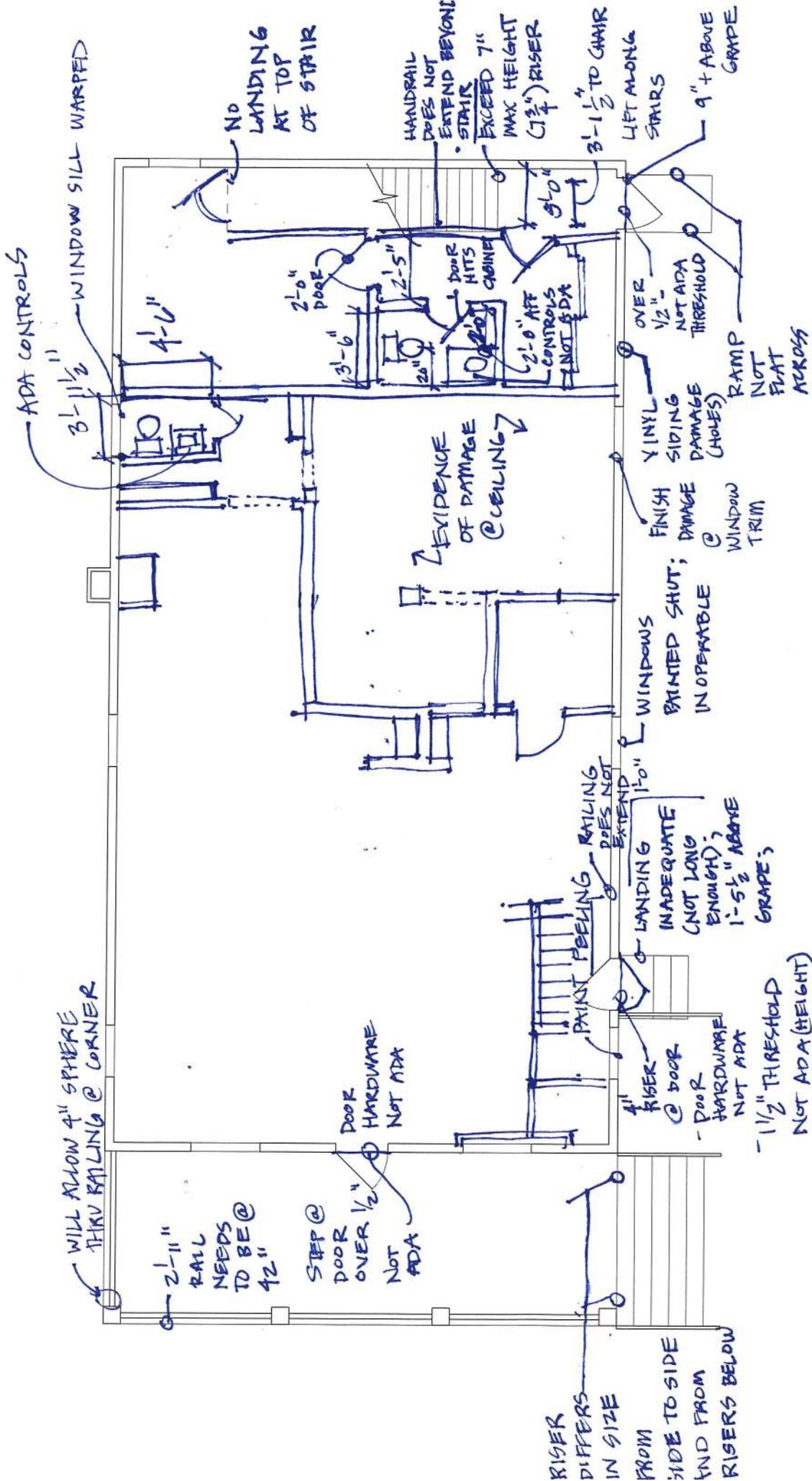
LOOK FOR STORAGE,
NOT OCCURABLE SPACE
PER VCC, ACCEPTABLE
PER VRC



Project		BOUTON'S HALL CONDITIONS ASSESSMENT	
Title		BASEMENT FLOOR PLAN FIELD SURVEY	
Date	Scale	Project No.	Sketch No.
06.19.18	1/8" = 1'-0"	73301	SK-01

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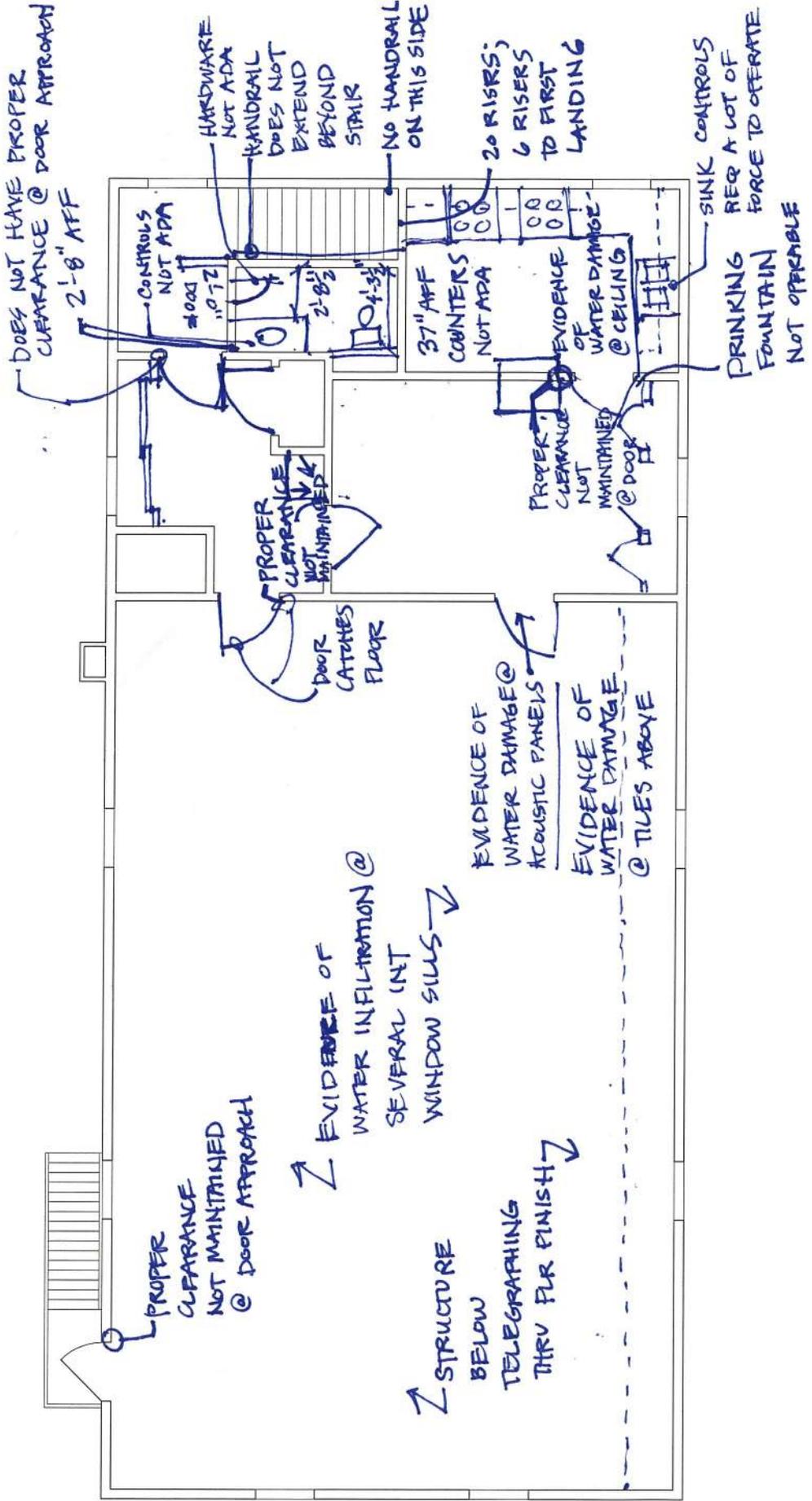
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703-241-2202 WWW.GAA-AL.COM



Date	Scale 1/8" = 1'-0"
Project No. T3301	Sketch No. SK-02

Project BOUTON'S HALL CONDITIONS ASSESSMENT
Title FIRST FLOOR PLAN FIELD SURVEY

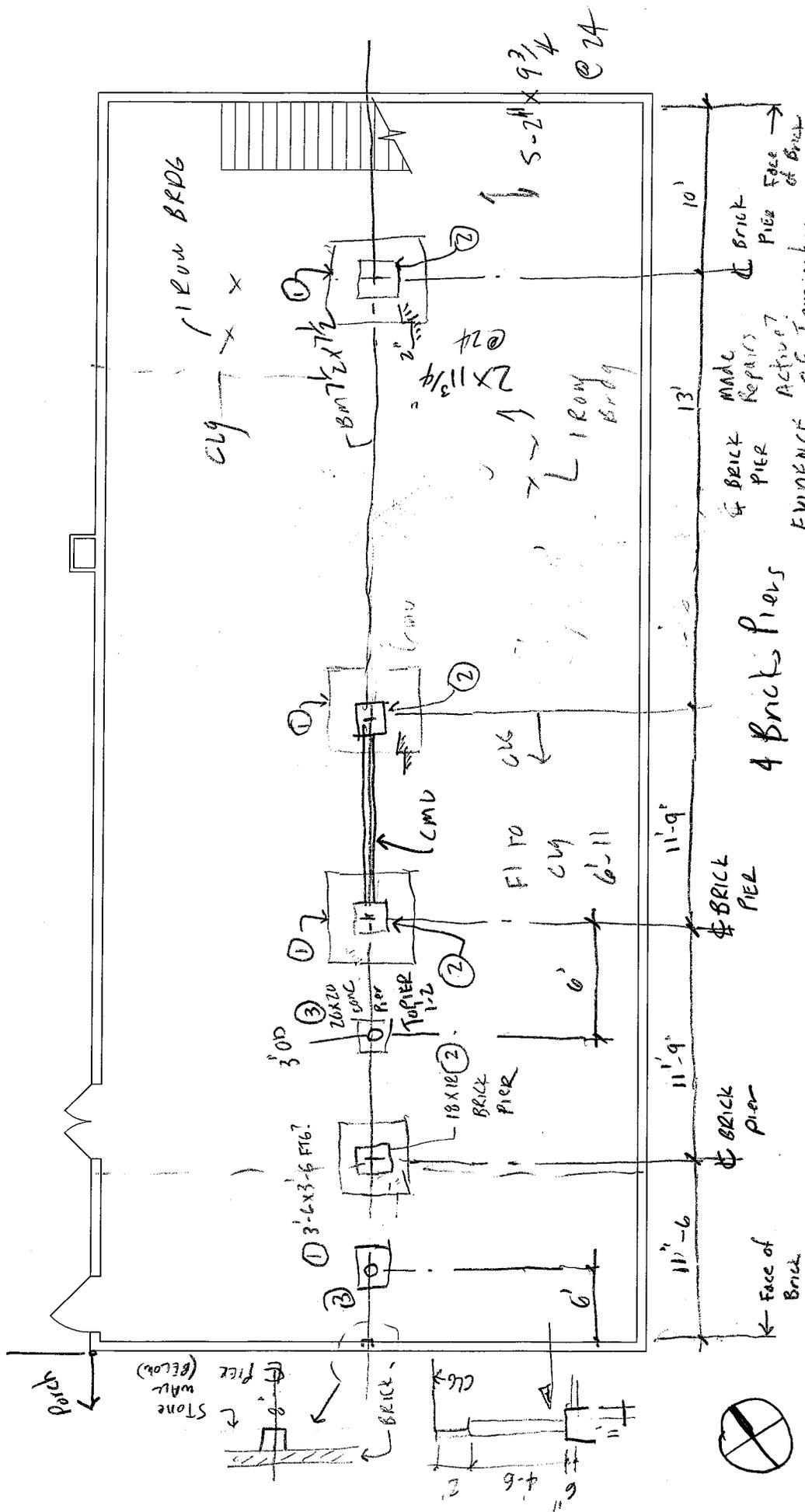
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Date	Scale 1/8" = 1'-0"
Project No. 73301	Sketch No. SK-03

Project **BOUTON'S HALL CONDITIONS ASSESSMENT**
 Title **SECOND FLOOR PLAN FIELD SURVEY**

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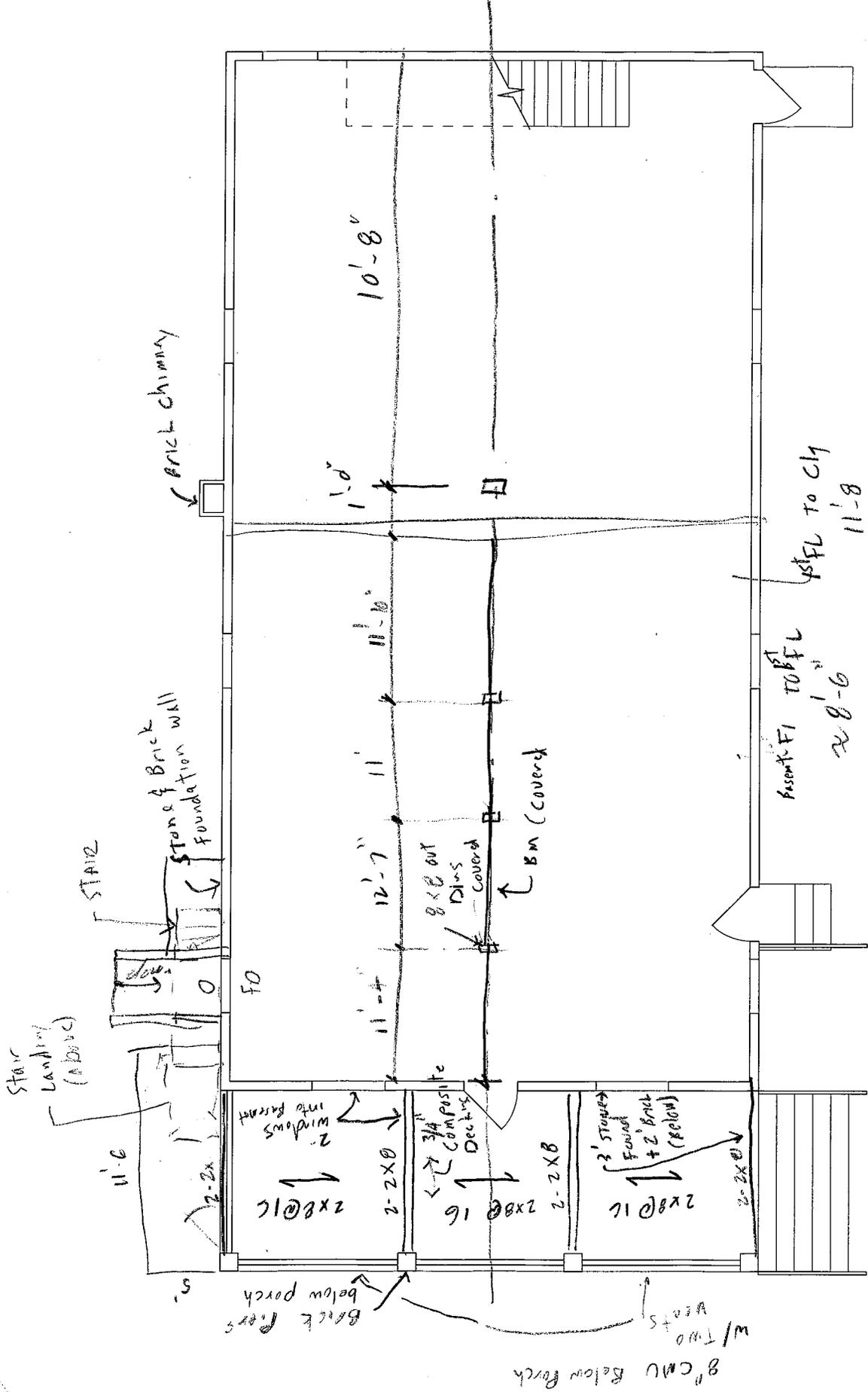
Date	6/19/18	Scale	1/8" = 1'-0"
Project No.	73301	Sketch No.	SK-01

Project **BOUTTON'S HALL CONDITIONS ASSESSMENT**

Title **BASEMENT FLOOR PLAN FIELD SURVEY**
1st Floor

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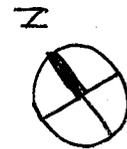
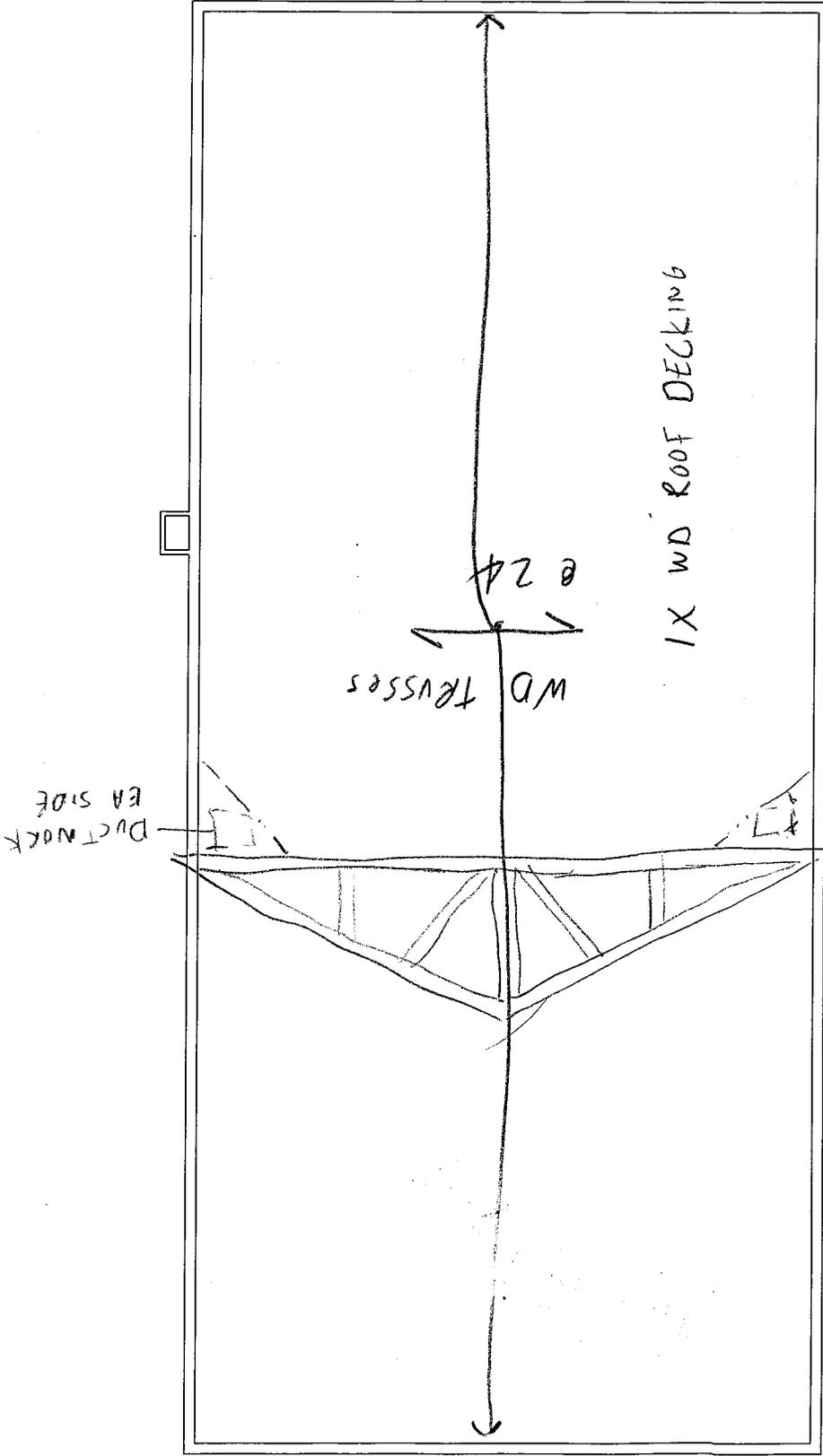


Date	6/19/18	Scale	1/8" = 1'-0"
Project No.	73301	Sketch No.	SK-02

Project	BOUTON'S HALL CONDITIONS ASSESSMENT
Title	2 nd FLOOR PLAN FIELD SURVEY C. Freeman

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Date	6/19/18	Scale	1/8" = 1'-0"
Project No.	73301	Sketch No.	SK-04

Project	BOUTON'S HALL CONDITIONS ASSESSMENT
Title	ATTIC FLOOR PLAN FIELD SURVEY


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the numeral "3" (kips) located in the bottom right corner of the landing area as viewed from the primary approach path. The indication for the landing area weight limitation shall be a minimum 5 feet (1524 mm) in height.

1607.7 Heavy vehicle loads. Floors and other surfaces that are intended to support vehicle loads greater than a 10,000 pound (4536 kg) gross vehicle weight rating shall comply with Sections 1607.7.1 through 1607.7.5.

1607.7.1 Loads. Where any structure does not restrict access for vehicles that exceed a 10,000-pound (4536 kg) gross vehicle weight rating, those portions of the structure subject to such loads shall be designed using the vehicular live loads, including consideration of impact and fatigue, in accordance with the codes and specifications required by the jurisdiction having authority for the design and construction of the roadways and bridges in the same location of the structure.

1607.7.2 Fire truck and emergency vehicles. Where a structure or portions of a structure are accessed and loaded by fire department access vehicles and other similar emergency vehicles, the structure shall be designed for the greater of the following loads:

1. The actual operational loads, including outrigger reactions and contact areas of the vehicles as stipulated and approved by the building official; or
2. The live loading specified in Section 1607.7.1.

1607.7.3 Heavy vehicle garages. Garages designed to accommodate vehicles that exceed a 10,000 pound (4536 kg) gross vehicle weight rating, shall be designed using the live loading specified by Section 1607.7.1. For garages the design for impact and fatigue is not required.

Exception: The vehicular live loads and load placement are allowed to be determined using the actual vehicle weights for the vehicles allowed onto the garage floors, provided such loads and placement are based on rational engineering principles and are approved by the building official, but shall not be less than 50 psf (2.9 kN/m²). This live load shall not be reduced.

1607.7.4 Forklifts and movable equipment. Where a structure is intended to have forklifts or other movable equipment present, the structure shall be designed for the total vehicle or equipment load and the individual wheel loads for the anticipated vehicles as specified by the owner of the facility. These loads shall be posted per Section 1607.7.5.

1607.7.4.1 Impact and fatigue. Impact loads and fatigue loading shall be considered in the design of the supporting structure. For the purposes of design, the vehicle and wheel loads shall be increased by 30 percent to account for impact.

1607.7.5 Posting. The maximum weight of the vehicles allowed into or on a garage or other structure shall be posted by the owner in accordance with Section 106.1.

**TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o , AND
MINIMUM CONCENTRATED LIVE LOADS^a**

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
1. Apartments (see residential)	—	—
2. Access floor systems		
Office use	50	2,000
Computer use	100	2,000
3. Armories and drill rooms	150 ^m	—
4. Assembly areas		
Fixed seats (fastened to floor)	60 ^m	—
Follow spot, projections and control rooms	50	—
Lobbies	100 ^m	—
Movable seats	100 ^m	—
Stage floors	150 ^m	—
Platforms (assembly)	100 ^m	—
Other assembly areas	100 ^m	—
5. Balconies and decks ^h	Same as occupancy served	—
6. Catwalks	40	300
7. Cornices	60	—
8. Corridors		
First floor	100	—
Other floors	Same as occupancy served except as indicated	—
9. Dining rooms and restaurants	100 ^m	—
10. Dwellings (see residential)	—	—
11. Elevator machine room grating (on area of 2 inches by 2 inches)	—	300
12. Finish light floor plate construction (on area of 1 inch by 1 inch)	—	200
13. Fire escapes	100	—
On single-family dwellings only	40	—
14. Garages (passenger vehicles only)	40 ^m	Note a
Trucks and buses	See Section 1607.7	
15. Handrails, guards and grab bars	See Section 1607.8	
16. Helipads	See Section 1607.6	
17. Hospitals		
Corridors above first floor	80	1,000
Operating rooms, laboratories	60	1,000
Patient rooms	40	1,000
18. Hotels (see residential)	—	—
19. Libraries		
Corridors above first floor	80	1,000
Reading rooms	60	1,000
Stack rooms	150 ^{b,m}	1,000
20. Manufacturing		
Heavy	250 ^m	3,000
Light	125 ^m	2,000
21. Marquees	75	—
22. Office buildings		
Corridors above first floor	80	2,000
File and computer rooms shall be designed for heavier loads based on anticipated occupancy	—	—
Lobbies and first-floor corridors	100	2,000
Offices	50	2,000

(continued)

TABLE 1607.1—continued
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o ^a
AND MINIMUM CONCENTRATED LIVE LOADS^a

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
23. Penal institutions Cell blocks Corridors	40 100	—
24. Recreational uses: Bowling alleys, poolrooms and similar uses Dance halls and ballrooms Gymnasiums Reviewing stands, grandstands and bleachers Stadiums and arenas with fixed seats (fastened to floor)	75 ^m 100 ^m 100 ^m 100 ^{c,m} 60 ^{c,m}	—
25. Residential One- and two-family dwellings Uninhabitable attics without storage ^l Uninhabitable attics with storage ^{i,j,k} Habitable attics and sleeping areas ^k All other areas Hotels and multifamily dwellings Private rooms and corridors serving them Public rooms ^m and corridors serving them	10 20 30 40 40 100	—
26. Roofs All roof surfaces subject to maintenance workers Awnings and canopies: Fabric construction supported by a skeleton structure All other construction Ordinary flat, pitched, and curved roofs (that are not occupiable) Primary roof members exposed to a work floor. Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages All other primary roof members Occupiable roofs: Roof gardens Assembly areas All other similar areas	5 nonreducible 20 20 100 100 ^m Note 1	300 2,000 300 Note 1
27. Schools Classrooms Corridors above first floor First-floor corridors	40 80 100	1,000 1,000 1,000
28. Scuttles, skylight ribs and accessible ceilings	—	200
29. Sidewalks, vehicular drive ways and yards, subject to trucking	250 ^{d,m}	8,000 ^e

(continued)

TABLE 1607.1—continued
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o ^a
AND MINIMUM CONCENTRATED LIVE LOADS^a

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
30. Stairs and exits One- and two-family dwellings All other	40 100	300 ^f 300 ^f
31. Storage warehouses (shall be designed for heavier loads if required for anticipated storage) Heavy Light	250 ^m 125 ^m	—
32. Stores Retail First floor Upper floors Wholesale, all floors	100 75 125 ^m	1,000 1,000 1,000
33. Vehicle barriers	See Section 1607.8.3	
34. Walkways and elevated platforms (other than exitways)	60	—
35. Yards and terraces, pedestrians	100 ^m	—

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm²,

1 square foot = 0.0929 m²,

1 pound per square foot = 0.0479 kN/m², 1 pound = 0.004448 kN,

1 pound per cubic foot = 16 kg/m³.

- a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 1607.1 or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of 4.5 inches by 4.5 inches; (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds per wheel.
- b. The loading applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations:
 1. The nominal bookstack unit height shall not exceed 90 inches;
 2. The nominal shelf depth shall not exceed 12 inches for each face; and
 3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches wide.
- c. Design in accordance with ICC 300.
- d. Other uniform loads in accordance with an approved method containing provisions for truck loadings shall also be considered where appropriate.
- e. The concentrated wheel load shall be applied on an area of 4.5 inches by 4.5 inches.
- f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.
- g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608).
- h. See Section 1604.8.3 for decks attached to exterior walls.
- i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

(continued)



GAUTHIER
ALVARADO
ASSOCIATES

SUBJECT Existing Wd Framing

PROJECT Bouton's Hall

NUMBER 733 E1

BY JAS

CHECKED AO

DATE 6/18

SHEET

____ OF ____

PRELIMINARY

FINAL

ASSUMED FRAMING BASED ON SMALL NUMBER OF FLOOR JOISTS
VISIBLE IN BASEMENT.

2X12 @ 24

LL 100PSF (PER CODE)

DL 10PSF

TL 110PSF

SPAN 14'

$$w = 2(110) = 220 \text{ PLF}$$

2X12 1 1/2 X 11 1/4

$$S_x = 31.64 \text{ in}^3 \quad I_x = 170 \text{ in}^4$$

NO 2 MIXED OAK $F_b = 800 \text{ PSI}$

$$M = \frac{wl^2}{8} = \frac{220(14)^2}{8} = 5390 \text{ LB-FT}$$

$$S_{reqd} = \frac{5390(12)}{800} = 80.9 \text{ in}^3 > 31.64 \text{ in}^3 \text{ NG}$$

EXISTING FIRST & SECOND FLOOR LIVE LOADS BASED ON ASSUMED
FRAMING

$$31.64 \text{ in}^3 = \frac{M(12)}{800}$$

$$M = \frac{31.64(800)}{12} = 2109 \text{ LB-FT}$$

$$w = \frac{8M}{l^2}$$

$$w = \frac{8(2109)}{(14)^2} = 86 \text{ PLF}$$

$$LL = \left(\frac{86}{2} \right) - 10 = 33 \text{ PSF}$$

NOTE: THE ACTUAL LL OF 33PSF DOES NOT MEET THE
LIVE LOAD REQ'D BY CODE OF 100PSF

The calculations are based on rough dimensions. The
final calculations should be based on a more extensive
and detailed site investigation.



GAUTHIER
ALVARADO
ASSOCIATES

SUBJECT Existing Porch Framing

PROJECT Bouton's Hall

NUMBER 733 E1

BY JAS

CHECKED AO

DATE 6/18

SHEET

OF

PRELIMINARY

FINAL

Porch Framing

Span 10' 2x8 @ 16

$$W = 1.33(110) = 146 \text{ PLF}$$

$$M = \frac{146(10)^2}{8} = 1825 \text{ LB-FT}$$

$$S_{reqd} = \frac{1825(12)}{1100} = 19.9 \text{ in}^3 > 13.14 \text{ in}^3 \text{ NG}$$

$$S_x = 13.14 \text{ in}^3 \quad I_x = 47.63 \text{ in}^4$$

LL = 100PSF (PER CODE)

DL = 10PSF

TL = 110PSF

$$F_b = 1100 \text{ psi}$$

No 2 Southern pine

LL Capacity

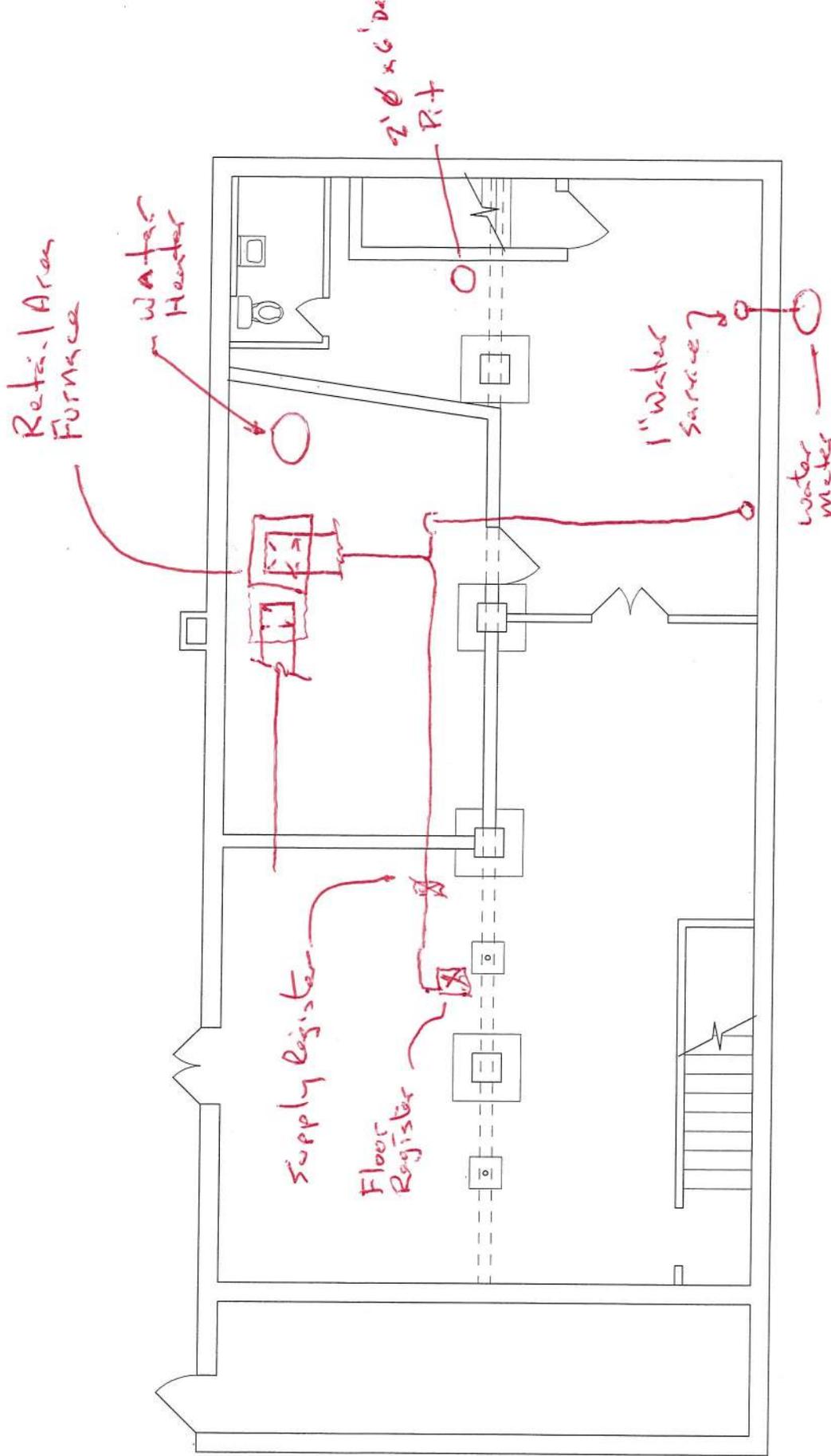
$$M = \frac{13.14(1100)}{12} = 1205 \text{ LB-FT}$$

$$W = \frac{8(1205)}{(10)^2} = 96.4 \text{ PLF}$$

$$LL = \left(\frac{96.4}{1.33} \right) - 10 = 62 \text{ PSF}$$

NOTE: THE ACTUAL LL OF 62 PSF DOES NOT MEET THE LIVE LOAD REQD BY CODE OF 100PSF

The calculations are based on rough dimensions. The final calculations should be based on a more extensive and detailed site investigation.



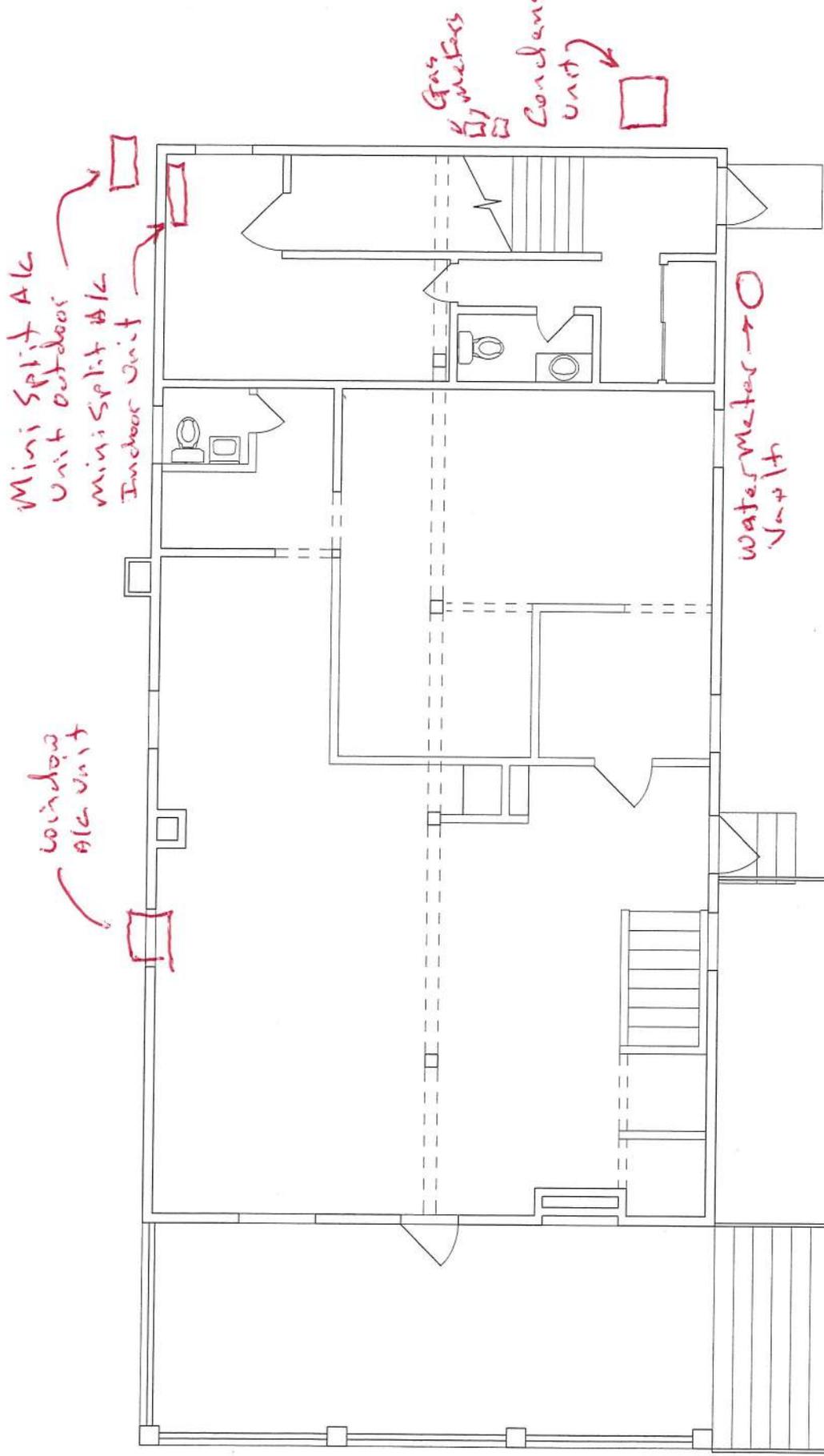
Mechanical / Plumbing

Project	BOUTON'S HALL CONDITIONS ASSESSMENT	
Title	BASEMENT FLOOR PLAN FIELD SURVEY	
Date	6/19/18	Scale 1/8" = 1'-0"
Project No.	13301	Sketch No. SK-01



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Project **BOUTON'S HALL CONDITIONS ASSESSMENT**

Title **FIRST FLOOR PLAN FIELD SURVEY**

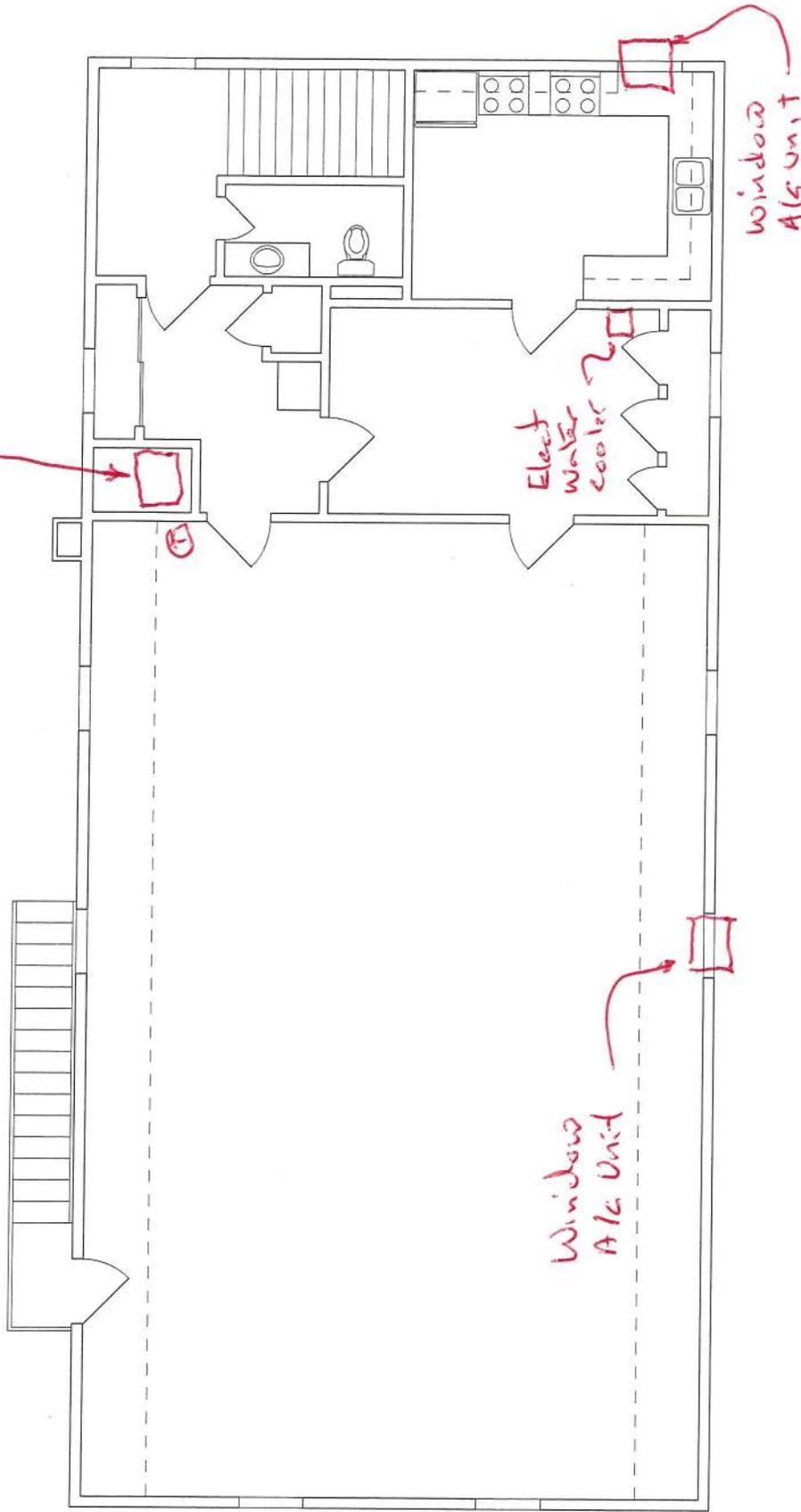
Date **6/19/18**

Scale **1/8" = 1'-0"**

Project No. **73301**

Sketch No. **SK-02**

Masonic Space
Furnace



Elect
Water
cooler

Window
A/C Unit

Window
A/C Unit

Mechanical / Plumblings

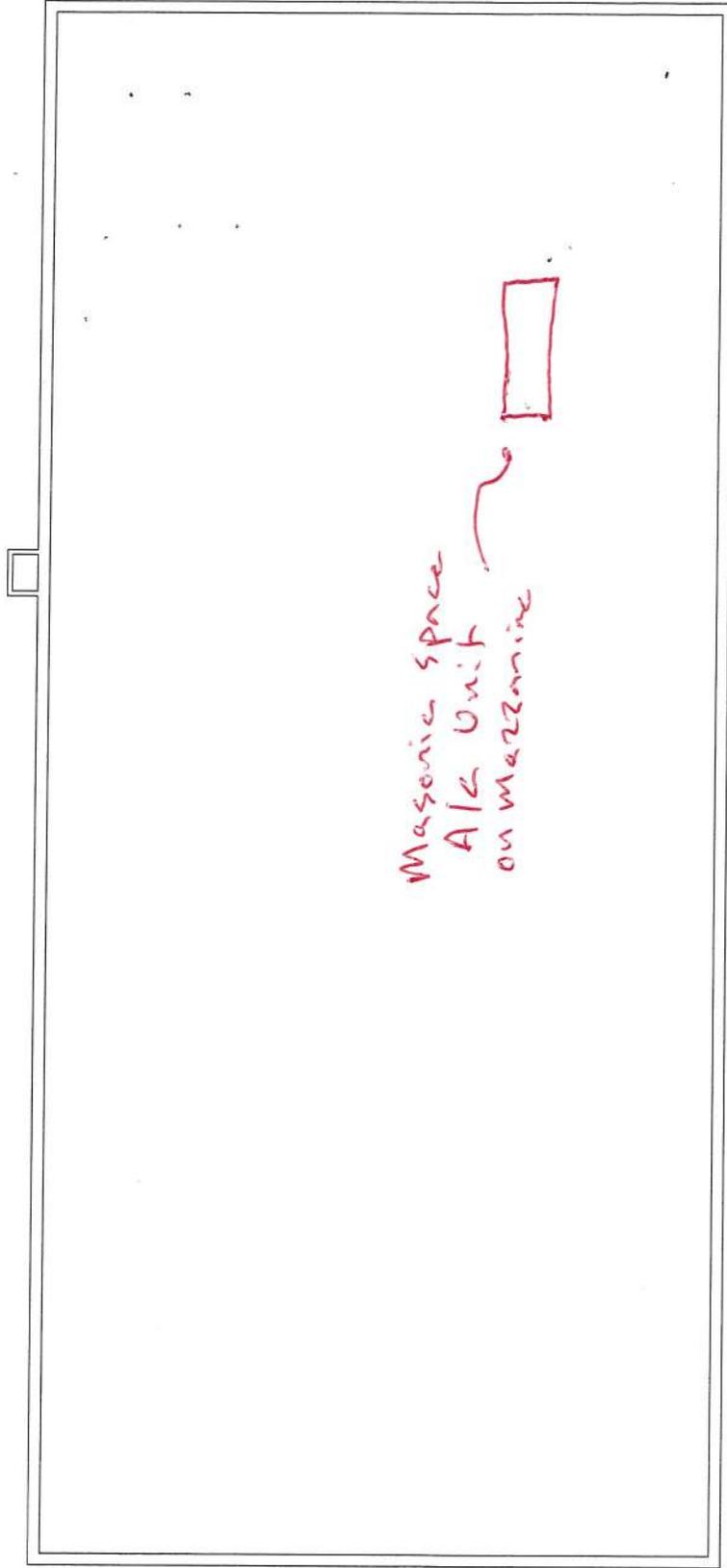


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A **S** **S** **O** **C** **I** **A** **T** **E** **S**

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Project **BOUTON'S HALL CONDITIONS ASSESSMENT**
Title **SECOND FLOOR PLAN FIELD SURVEY**

Date **6/19/18** Scale **1/8"=1'-0"**
Project No. **T3301** Sketch No. **SK-03**



Mechanical / Plumbing



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Project **BOUTON'S HALL CONDITIONS ASSESSMENT**

Title **ATTIC FLOOR PLAN FIELD SURVEY**

Date **6/19/18** Scale **1/8" = 1'-0"**

Project No. **73301** Sketch No. **SK-04**