FGMARCHITECTS

WELDON SPRING, MO

CITY HALL

Facility Condition Needs Assessment

SUBMITTED TO:
City of Weldon Spring
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Weldon Spring, MO 63304

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TABLE OF CONTENTS

SECTION 1 EXECUTIVE SUMMARY AND GOALS

Introduction

The City of Weldon Spring commissioned FGM Architects and SSC Engineering to prepare a Facility Condition Needs Assessment for the existing City Hall.

During the course of this study, it became evident the existing City Hall is outdated and does not meet current building codes or ADA. Not only is the forty-four-year-old building undersized relative to what would be practical for the current staff, but the lay-out and allocation of space in the building is not conducive to today's style of work and interaction with residents.

Explicit observations and assessment of space and operations deficiencies in City Hall are discussed further in this document.

Project Goals

The primary focus of this study was to provide a facility condition needs assessment of the existing City Hall.

Goals established for the study included:

1. Identify and document current conditions of the existing City Hall, including structural integrity, physical state, and compliance with current St. Charles County building codes including Americans with Disabilities Act (ADA).
2. Assess and identify whether the building is serving its intended role, and if it is under or over-utilized in its current capacity.
3. Assess the ability of the building to serve current needs, including the ability to accommodate the number of employees currently and identify if the building meets the overall needs of the City and community.
4. Identify the benefits and drawbacks when considering replacement, renovation, and/or expansion of the building and make recommendation(s) whether the building should be renovated, expanded, relocated, etc. based upon the analysis and findings.
5. Identify all interior and exterior building deficiencies and recommend corrective actions for each.
6. Provide construction cost estimates for corrections, expansion, replacement, and/or renovation work for the building.
7. Provide a logical priority list and timeline for accommodating the recommended replacement expansion, and/or renovation work.

SECTION 2
PROJECT UNDERSTANDING AND METHODOLOGY

Overview of Study Process

For nearly three decades, FGM Architects (FGMA) has provided consulting and architectural design services to municipalities. FGMA brings a vast amount of knowledge and understanding to this project through previous assessment, planning, design, and construction administration experience.

Nonetheless, we understand each City has its own unique culture, history, challenges, and goals. Therefore, there is no cookie-cutter project or client. Rather, we acknowledge we must work with City staff members to understand operational issues and objectives, pain points, items of local pride, and to apply the wants, wishes, and dreams for the future of the community to the project at hand.

The goal of this study was to provide the City with information on how to best serve the residents of Weldon Spring, as well as provide a safe, efficient, and effective City Hall for staff and visitors.

Weldon Spring, MO was incorporated as a city in 1984 and currently has a population of 5,326 residents based on the 2020 census. The City has a total area of 7.64 miles, which 7.51 miles is land and 0.13 miles is water.

The zip code of 63304, which includes all of Weldon Spring, portions of Cottleville, and portions of unincorporated St. Charles County, is the 20th richest zip code in the St. Louis Metropolitan area as disclosed in the 2021 American Community Survey and published by the St. Louis Business Journal in their December 1, 2023 issue.

Weldon Spring City Hall has been located in its current location since 1999. It is one-story with a full basement, consisting of wood framing with brick veneer, residential windows and doors, wood floor joists, wood roof trusses, and asphalt shingles. The First Floor is 3,324 gross square feet while the Basement is 2,250 gross square feet. City Hall was originally a residence that was built in 1980. When this residence was converted to City Hall, an inground swimming pool was in place and filled with dirt. City Hall sits within Weldon Spring City Park and there are 40 parking spaces that support the park and City Hall. Within the park there are two ballfields, a playground, a lake, two pavilions, the Parks building, and under construction are an amphitheater, restrooms, and another pavilion.

Currently there are eleven employees who work in City Hall, including the mayor.

Analysis of Space Needs

FGMA and SSC obtained information for this study through data and documents provided by the City and through a series of interviews and discussions with staff. Information reviewed included:

General Information

- Existing Building Drawings created using laser scanning
- Indoor Air Quality Assessment by Trane dated 11/9/2020

Interviews

FGMA conducted interviews with City Hall staff, which consisted of individual meetings. A survey, which the results are included in this report, was also completed by staff.

Existing Conditions Report

FGMA and SSC's team, including architects, structural, mechanical, electrical, and plumbing engineers, reviewed the drawings created by FGMA's laser scanning technology and conducted field surveys of City Hall to determine the overall general condition of the facility and its systems.

All information was then gathered, digested, and synthesized to derive a recommendation for City Hall.

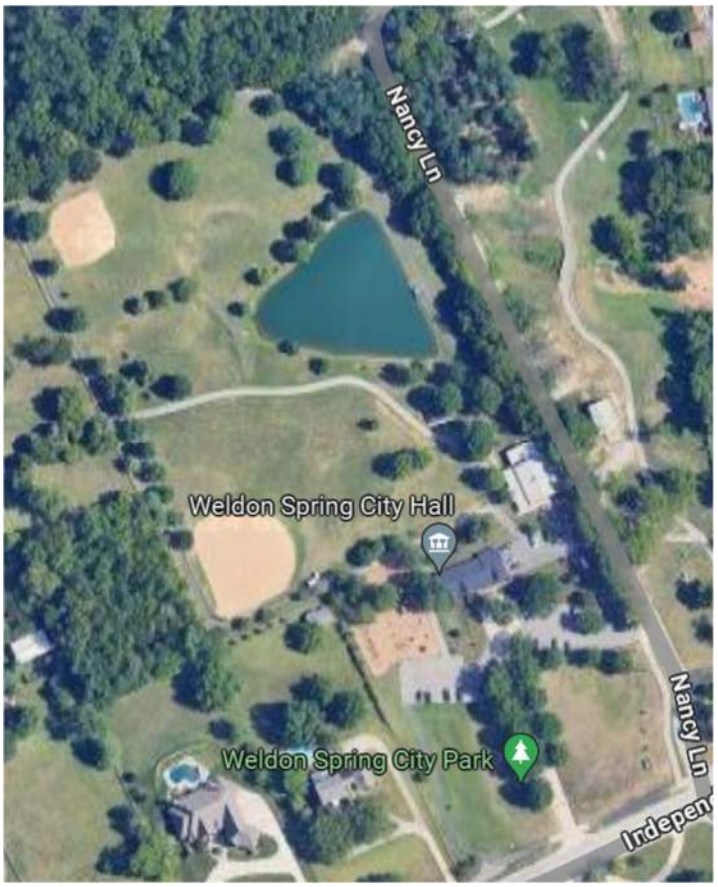
SECTION 3
EXISTING CONDITIONS REPORT

Introduction

One of the impetuses behind this study is the fact City Hall is aging. In many cases, the engineering systems, finish materials, exterior envelope, built-in equipment, and fixtures are nearing their end of serviceable life and beginning to fail, or are from an era of construction which does not fully align with today's standards for energy consumption, efficient operation, or other code-driven safety standards.

As part of this study, a review of City Hall provided an analysis of engineering and architectural systems' current conditions and identified many specific issues that the City should consider for address and / or modification.

EXISTING SITE



Aerial Photograph of City Park & City Hall

General Space Assessment

The Lobby size is inadequate as there is barely room for one chair.

A more secure window between the Lobby and Receptionist is desired since the Receptionist sometimes handles checks, credit cards, and cash.

There is a need for a Conference Room that seats 12 people so that all City Hall staff can meet. Currently everyone meets in the Board Room or squeeze into the Mayor's Office. This Conference Room should have a large monitor in order to share information.

The City Clerk needs their own Office as they currently share an Office with the Treasurer.

The Office currently shared by the City Engineer, the City Planner, and Code Enforcement is not large enough. Also, they need more counter space to roll out and review drawings.

The Board Room technology could be better – need a projection screen / large monitor that can be seen by the board and the audience.

The Board Room could use a podium in the middle of the room and a table for staff. Staff currently sit in the audience.

The Kitchen is not screened from visitors but should be.

The Hallway is only 36" wide but should be 60" to 72" wide per typical commercial building design.

Building security needs attention, especially in the Lobby. There are 13 security cameras inside and outside (including the Parks building) and a security alarm system. Half of the cameras are old analog cameras, and the night vision cameras are not of good quality.

The I.T. Server Room should be larger and have dedicated air conditioning.

Accessibility

Since the building was constructed, accessibility requirements have changed with the Americans with Disabilities Act. The accessibility guidelines mandate that all public facilities are to be designed, constructed, or altered to assure equal accessibility to all members of society. If any type of building renovation were to occur, multiple accessibility violations would need to be addressed. The violations range from minor issues to larger problems that would require significant renovation work. Below is a summary of violations reviewed during the building assessment:

No elevator to the Basement.

There is no accessible route from the parking lot to the Lobby – the accessible route is through a side door into the Board Room and based on current ADA guidelines, there are portions of this route that are still deficient, such as ramp landings (60" x 60" minimum).

Doors into three of the Offices and two of the Restrooms do not meet the 32" minimum clear width requirement.

The approach to most doors do not meet ADA guidelines (clear dimensions for either side or front approach).

Some of the doors have knobs in lieu of levers and therefore cannot be operated with a closed fist or a loose grip as is required by ADA.

The three Restrooms on the First Floor and the Restroom in the Basement are lacking all of the required grab bars, they are too small as they do not allow clear floor space for the required 5'-0" turning radius, and the toilets do not meet the ADA height requirements of 18" from the floor to the seat. In order to make the restrooms accessible, they would need to be fully renovated and expanded.

The transaction window between the Lobby and Receptionist, and the Kitchen counter, do not meet ADA guidelines (34" above finished floor).

The Kitchen sink depth does not meet ADA guidelines (6 ½" deep maximum).

Mechanical Assessment

The building is conditioned by two residential split system air-handling units (AHU's). The AHU's are located in the Basement. Their associated condensing units are exterior of the building on grade.

The Bryant AHU is in the East mechanical room in the Basement with the condensing unit located behind the building. The AHU has a DX cooling coil and electric heating coil. Both the AHU and condensing unit were manufactured in 2013. The unit appears in average condition. No operational issues were reported by the Owner. This unit serves the Meeting Room and the east half of the building.

The Comfortmaker AHU is in the west mechanical room in the Basement with the condensing unit located on the west end of the building. The AHU has a DX cooling coil and electric heating coil. Both the AHU and condensing unit were manufactured in 2013. The unit appears in average condition. No operational issues were reported by the Owner. This unit serves the west half of the building.

Both AHU's have outside air ducted with a motorized damper to the return duct of each AHU. Each AHU also has a needlepoint bipolar ionization air cleaner. These upgrades were added per the recommendations of the Trane IAQ report from 2020.

The users noted humidity control issues – mainly in the Basement.

The ductwork is routed in the Basement ceiling to floor grilles on the First Floor. The ductwork appeared to be un-insulated. The floor joists supporting the First Floor were ~11" deep with most branch ducts running in the joist space. In Basement areas where the ceiling is lowered, there is ~7" clear below the joist and above the gypsum board ceiling framing.

The majority of the Basement has no heating or cooling. The File Storage Room has a supply grille from the Comfortmaker AHU duct exposed in that room.

The Restroom in the Basement does not have an exhaust fan.

There is a portable dehumidifier in the main Basement space and a second unit in the File Storage Room.

The Kitchen on the First Floor does not have a range and thus no range hood.

The three Restrooms on the First Floor each have an exhaust fan. Two fans are controlled by wall switches; the third exhaust fan was running but no switch observed.

The Server Room on the First Floor has a wall exhaust fan controlled by a thermostat. The backdraft damper at the exhaust fan does not seal and daylight can be seen through the damper blades. There is a fan in the doorway to the Server Room and a sign to not close the door.

Mechanical Recommendations

We recommend replacing both residential split system units based on age. Typical useful life for these type of units is 10 - 15 years.

The addition of outside air is supported by code and Trane's recommendation to improve indoor air quality. An un-intended consequence can be poor space humidity control if not addressed. We recommend installing energy recovery units to precondition the outside air to assist in improving space humidity control.

We recommend installing a new split system to serve the Basement or a dedicated dehumidifier.

For the Server Room, we recommend installing a wall mounted, cooling only mini-split; remove the wall exhaust fan and seal the opening.

HVAC Option – Installing a VRF system with individual fan coils in each room would be an upgrade over the current HVAC system. The VRF system would improve individual room temperature control and increase system efficiency.

Electrical Assessment

The building is served by a Cuivre River Electric Coop pad mounted exterior transformer to an exterior 120/240/1/3, inline meter then to two (2) loads. The first is through a 200A enclosed circuit breaker. This breaker feeds a normal power interior panelboard. The 2nd load feeds the source 1 input of a manual transfer switch. Source 2 is from a portable generator connection box with both cam lock connectors and an L14-30R receptacle. The MTS has an interlock that allows only a single source to feed the standby interior panelboard and Is protected on both sides by 200A circuit breakers. The two panelboards are in the Basement Electrical Room.
The portable generator is a 13kW (10.5kw continuous),

120/240V, 1Ph, 3W, gasoline fueled Northstar 13000 with receptacle for an L14-30P plug. The generator was not observed in operation at this time. The generator feeds the single exterior MTS via an extension cord. It is unknown if the generator has been load bank tested or if it has been properly maintained. The condition of the extension cord is unknown or if it is properly sized. As there is only the MTS that feeds the building, the generator is classified as standby and the building should utilize battery powered lighting fixtures as the means of emergency egress.

The building is served by two (2) 120/240V/1Ph/3W, 200A MCB panelboards. These panels are manufactured by Eaton and appear to be in fair condition. The left-hand panel when viewing from the panel front will be called NORMAL panel as it is fed only by the utility power. The right-hand panel is labeled as GENERATOR panel. Both panels are located in the Basement near the midpoint along the rear of the building. These panels feed the building loads and distribute power to the HVAC and plumbing equipment. The Normal panel feeds the dryer, oven, furnace, water heater, Basement receptacles, Playground flood lighting, and potentially other non-specified loads. The Generator panel feeds the Air Conditioners, general purpose loads, receptacles, Reception desk, furnace, well pump, Board Room, Kitchen and server receptacles. The panels feed the loads primarily via NM cable run open along the walls and overhead in the Basement.

The low voltage systems are generally located in the Server Room on the upper level off the City Engineer, City Planner, and Code Enforcement Open Office space. Utility phone and CATV services were noted. These systems include voice/ data, CATV, video surveillance, and access control. The equipment was loosely supported by closet shelves with little cable management and labeling. Also noted were Ademco intrusion detection/alarm, a music/intercom system, and single station smoke alarms in the Basement. There appeared to be fire alarm system detectors but it did not appear operational. Voice/Data cabling is open run and is not supported per EIA/TIA recommendations and bundled with zip ties. Some cables in the Board Room were run through HVAC ducts. Smoke alarms do not appear to be interconnected. The Server Room appears to not have sufficient cooling as the door was left open and multiple floor fans were running.

The lighting is generally residential grade medium based socket fixtures in operable condition. Some fixtures have been modified to suit their current purpose for lighting shelves of file storage. Some fixtures in the Basement are medium base porcelain keyed sockets. Fixtures in upper level consisted of incandescent recessed downlights, surface mounted fixtures, wall sconces, and ceiling fans with light kits. Exit signs were generally noted as required on the First Floor, but are at the end of their useful life. The Basement area did not appear to have any exit signs or egress lighting. All lighting controls were manual switches, some with dimmers.

Exterior site lighting was observed during the daytime and the light fixtures were not illuminated. Fixtures appear to be operational and were of varying ages. Near the front there were LED uplights highlighting the building façade and landscaping. Exterior emergency egress lights did not appear to fully light the path of egress to the public way.

The Basement houses a sump pit with pump, de-humidifier draining condensate to sump pit, central vacuum, aerator control panel, water softener, furnaces, water heater, and well pump buffer tank/disconnect/controller,

Electrical Recommendations

The electrical panelboards are still in operable condition and replacement parts and breakers are still available. Generator, MTS breakers, and switches are recommended to be exercised, load banked, and load values recorded to validate operation at rated load. Feeder terminations are recommended to be checked for proper torque.

We recommend updating panel schedules to more accurately specify the loads served by circuit breakers per NEC 408.4(A).

Certain spaces in the Basement that are currently exposed in walls and ceilings where gypsum board has been removed or where access panels have been added shall be concealed by material with a minimum 15-minute finish rating per NEC 334.10(3) and 334.12(A)(2).

The building is recommended to have lighting fixtures replaced along with new controls. New battery powered exit signs and egress lights are recommended. The lighting should be replaced for increased safety, efficiency, longevity, and potential utility incentives.

The lighting controls are anticipated to be wall box and ceiling mounted occupancy sensors with local overrides per IECC. This will allow for increased efficiency and potential utility incentives.

The Server Room is recommended to be reconfigured to include a wall mounted rack with split system cooling and functional labeling in a properly sized room. New cabling run in appropriate pathways and j-hooks with 5' maximum spacing is recommended.

A fire alarm system is not required for this occupancy, however single and multiple-station smoke alarms may be installed and if so, are recommended to be interconnected so all alarm when one alarms.

Demolition of non-functional or abandoned equipment, devices and cabling is recommended. Accessible abandoned cables shall be removed per NEC 725.25 and 800.25.

Plumbing Assessment

Building domestic water service is from a 2 HP well pump that enters into the east Mechanical Room in the Basement. There is building isolation, pump disconnect, and bladder tank in the Mechanical Room. Water service does not have a backflow preventer. Cold water piping is uninsulated copper.

The water from the well system is piped through a single inline filter, but the filter is missing. There is a functional water softener to address water hardness. No further water treatment for disinfection was observed.

Original valves would not be of lead-free construction.

Water heater; Bradford White; 50-gallon, 4.5 kW electric, manufactured in 2016.

Domestic hot water piping is copper and uninsulated.

Sanitary sewer piping for the First Floor fixtures runs in the Basement ceiling. It appears that most of the original sanitary piping was cast iron. Multiple areas of the Basement ceiling have been removed and existing sanitary p-traps and piping has been replaced with Schedule 40 PVC and black ABS piping. Numerous pipes have been capped from fixtures no longer in use.

There is a sump pump in the west Mechanical Room in the Basement that pumps to daylight. The sump pump appears to have been replaced in 2000.

Plumbing fixtures appear to be in average condition.

Lavatories are counter mounted, white china, with two handle faucets.
Floor mounted, flush tank water closets.
One tub has been removed/capped.
Shower in back Restroom is still in place.
Kitchen has a two compartment sink without a garbage disposal.
There is a bottled water dispenser in the Kitchen.

Plumbing Recommendations

If there is a desire to use the well water for cleaning dishes or for drinking water, then we would recommend having the well water tested. Per water test recommendations, add filtration and ozone or UV disinfection to the system.

Domestic cold piping should be insulated where possible to minimize condensation. Domestic hot water piping should be insulated where possible to conserve energy.

The water heater is only eight years old and should have over 5 years service life remaining. The water heater can remain unless a renovation changes the hot water demand load.

Recommend installing a thermostatic mixing valve at the water heater to reduce scalding risk.

Recommend installing an expansion tank at the water heater.

Investigate sewer pipe leaks and replace any failing piping with cast iron or Schedule 40 PVC.

Recommend replacing well pump and sump pump based on age.

Recommend replacing all non-lead-free valves.

Recommend replacing all plumbing fixtures. Lavatories should have touch-free faucets.

Fire Protection

The existing building is not served by a fire protection system.

Structural Assessment

Based on visual observation only, the building does not appear to meet the current International Building Codes. This building was previously a residential style home before being converted into City Hall. Therefore, it does not meet current seismic design requirements.

In the Basement, there are locations indicating water damage has occurred to the ceiling. This appears to be from a leak at plumbing fixtures above. The wood floor joists in these areas are still in adequate condition. The plywood flooring is showing signs of moisture damage.

In the Basement, there are multiple cracks in the exterior concrete retaining wall. Near the sump pump, there has been a crack that was previously repaired. There is another large crack near the furnace. This crack does not appear to be repaired.

In the Basement, near the window with the vacuum system, there are signs of water infiltration. This Basement window appears to have been leaking during weather/rain events.

In the Storage Area in the Basement, adjustable steel pipe columns were added underneath the floor joists. We believe this was added after the fact due to the nature of the construction. These appear to be added due to increased deflection of the floor joist.

The exterior entry patio has settled over time. Also, the caulking at the face of the building has failed over time. There is also significant cracking of the patio near the far east pillar.

On the east side of the building, there are signs the mortar between the bricks has deteriorated.

On the north side of the building, near the exterior hose bib, the brick has been cracked and damaged.

The joint between the asphalt parking lot and the building has recessed and water can collect between the concrete Basement wall and the Parking Lot.

Structural Recommendations

If the building was required to meet the current International Building Codes, it would require large-scale investigation and possible large-scale modifications.

At this time, the damaged plywood should be monitored to ensure mold does not grow due to the moisture damage.

The Basement concrete wall cracks should be monitored to ensure water intrusion does not occur over time. If there are signs of water intrusion, repairs would be required. The crack near the furnace needs to be repaired to ensure further water intrusion does not occur. This can be done similar to the area near the sump pump.

At the window near the vacuum system, this window needs to be replaced to ensure no further water intrusion can occur. The egress pit should be investigated to review if a drain is clogged causing the water to back-up against the window.

The temporary steel pipe columns should be properly anchored to the concrete floor and floor structure. The other option would be to remove the heavy load from above that was causing the additional deflection that made the adjustable pipe columns required.

The patio needs to be monitored to ensure no further settlement will occur. If further settlement occurs, concrete slab jacking may be required. The caulking near the building needs to be removed and replaced. The concrete crack, on the east side, needs to be patched to ensure no further water intrusion can occur.

The brick missing the mortar needs to be tuck-pointed to ensure no further damage will occur over time due to water intrusion.

The area of brick damage should be monitored over time to ensure no further damage occurs. Patching of this area may be required to ensure water cannot enter the building through the damaged bricks. This damage may have occurred during lawn maintenance or other activity near the landscaping of the building.

This joint should be investigated and replaced as required to ensure water cannot get between the concrete wall and the asphalt parking lot.

SECTION 4
RECOMMENDATION, COST, AND SCHEDULE

Recommendation

Based on our analysis of the existing City Hall, it is our recommendation that the City of Weldon Spring construct a new City Hall within Weldon Spring City Park. This new City Hall would address the current space, building code, ADA, and system deficiencies currently found in the existing City Hall. Construction of a new City Hall could occur while occupying the existing City Hall. Further studies, including the site placement of the new City Hall, as well as environmental and geological surveys would need to occur before embarking on full building design and eventual construction.

The new City Hall should be approximately 50% larger than the First Floor of the existing City Hall – 3,324 gross square feet currently and 5,000 gross square feet in the new building. This extra square footage would allow for the addition of a 12 person Conference Room; a separate Office for the City Clerk; a larger Open Office for the City Engineer, City Planner, and Code Enforcement; a larger Lobby; a larger I.T. Server Room; ADA compliant Restrooms; a wider Hallway; and some additional Storage space as there is no need for a Basement in the new building.

Cost

Based on bids being taken in March 2025, it is anticipated that construction costs for a new City Hall in Weldon Spring, MO would be in the range of approximately $470 to $575 per gross square foot. With the new City Hall being 5,000 gross square feet, the total construction cost would be approximately $2,350,000 to $2,875,000. In addition to the cost of construction, the City would need to set aside an additional approximately $650,000 for architecture and engineering documents, furniture, and technology. For every year that construction of a new City Hall is pushed out, the City should add at least 4% to the costs outlined above.

Schedule

If the City were to decide to move forward with a new City Hall, below is an approximate project schedule, independent of the internal approval process required by the City to start the process.

02 Months – Environmental and Geological Surveys
06 Months – Programming, Design, & Documentation
02 Months – Bidding / Negotiating Construction Contract
09 Months – Construction

FGMARCHITECTS

EMPLOYEE SURVEY – WELDON SPRING CITY HALL

Date:	December 22, 2023 Updated January 5, 2024 with Survey Results
Project:	Weldon Spring FCNA 2023
Project Number:	23-3875.01

Ranking Key:

1 = Unacceptable, very unsatisfactory, strongly disagree
2 = Below average, unsatisfactory, disagree
3 = Acceptable, average, neutral
4 = Above average, satisfactory, agree
5 = Outstanding, very satisfactory, strongly agree

1. Overall perception of the City Hall facility?

1 2 3 4 5 -50 Acceptable to Below Average

2. Overall quality/functionality of the internal building layout?

1 2 3 4 5 -100 Below Average

3. Overall quality of the physical work environment?

1 2 3 4 5 -55 Acceptable to Below Average

4. Overall quality/functionality of entrance lobby/waiting room space?

1 2 3 4 5 -105 Below Average

5. Building external entrance accessibility?

1 2 3 4 5 -60 Acceptable to Below Average

6. Internal building accessibility?

1 2 3 4 5 -85 Below Average

7. Quality/functionality of meeting room space?

1 2 3 4 5 -45 Acceptable to Below Average

8. Meeting space provides adequate privacy/minimizes interruptions?

1 2 3 4 5 -115 Below Average

9. **Availability/access for/to meeting room space?**

1 2 3 4 5 -40 Acceptable to Below Average

10. **Quality/functionality of your immediate workspace?**

1 2 3 4 5 0 Acceptable

11. **Overall quality/functionality of your individual office space?**

1 2 3 4 5 -30 Acceptable to Below Average

12. **Workspace/office area minimizes interruptions and allows employee to concentrate on tasks?**

1 2 3 4 5 -80 Below Average

13. **Overall quality/functionality of the internal building amenities (restrooms, break area, copy room)?**

1 2 3 4 5 -80 Below Average

14. **Overall accessibility/functionality of your active files' storage?**

1 2 3 4 5 -20 Acceptable

15. **Overall accessibility/functionality of your archived files' storage?**

1 2 3 4 5 -65 Acceptable to Below Average

16. **Overall perception of building security?**

1 2 3 4 5 -25 Acceptable

17. **Overall quality/functionality of building security features?**

1 2 3 4 5 -35 Acceptable to Below Average

18. **Overall reliability of building plumbing, electrical, and/or HVAC systems?**

1 2 3 4 5 -70 Acceptable to Below Average

19. **Reliability of IT hardware, network, internet, and phones?**

1 2 3 4 5 25 Acceptable

20. **Availability/access for/to employee parking?**

1 2 3 4 5 15 Acceptable

Indoor Air Quality Assessment

City of Weldon Spring, MO

Contents

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The Trane Indoor Air Quality Assessment was conducted in October and November 2020 and provides guidance based on your overall system performance. Suggestions herein help you identify areas for improvement in order to meet industry guidelines and optimize indoor air quality. Where possible conducted the assessment remotely through your building automation system (BAS). All on-site assessments of the physical environment were performed following all recommended safety guidelines.

The transmission of Covid-19 may occur in a variety of ways and circumstances, many of the aspects of which are currently not known. HVAC systems, products, services and other offerings have not been tested for their effectiveness in reducing the spread of Covid-19, including through the air in closed environments.

Assessment Overview

The U.S. Centers of Disease Control and Prevention (CDC) and World Health Organization (WHO) both published recommendations for occupying workplaces in areas with a COVID-19 outbreak[1][2]. In addition, two leading industry trade associations, ASHRAE and REHVA, published guidance for operating building HVAC systems under these circumstances.[3][4]

	ASHRAE Guideline
DILUTE	Proper ventilation ensures that plenty of fresh, outdoor air comes into the building to dilute the buildup of indoor contaminants. Adjusting building ventilation is one tool that can influence indoor air quality.
EXHAUST	Getting exhaust air out efficiently is equally important – including recirculated air from kitchens, restrooms and combustion systems.
CONTAIN	Maintaining indoor humidity levels within the ASHRAE recommended range maximizes the comfort of building occupants while avoiding the likelihood of harmful microbial growth in the building.
CLEAN	Of increasing concern is the HVAC system's ability to reduce micro-organisms, such as mold, bacteria and viruses.

[1] Interim Guidance for Businesses and Employers to Plan and Respond to COVID-19, CDC
[2] Getting your workplace ready for COVID-19, WHO, dated 3 March 2020
[3] ASHRAE Position Document on Infectious Aerosols, dated 14 April 2020
[4] REHVA COVID-19 guidance document, dated 3 April 2020

At a Glance

The following equipment and systems were included in your review

Buildings	HVAC	BAS
• City Hall	• Air Handling Units • Split Systems	• N/A

	Observations	*Reccomended Action*	*Impact*
 **DILUTE**	Your HVAC systems currently do not have the ability to bring in outside air to the facility. Ductwork modifications are needed properly and safely ventilate building.	Add minimum outdoor air to ventilate building through ductwork modifications with 2 position dampers.	Meet minimum ventilation requirements. Opening the OA dampers on hot/humid or cold days will have some impact on energy use and possibly comfort. Improved IAQ.
 **EXHAUST**	The building currently exhausts through the bathroom(s). An attic fan was also noted on the walkthru	Staff verified that attic fan is operational. Recommendation that building air is “flushed” through attic fan periodically.	Exhausting the building is just as important as ventilating in maintaining a good IAQ
 **CONTAIN**	Some of the spaces not properly ventilated and exhausted experience high humidity – notably the basement. Several dehumidifiers were noted in the basement storage area of City Hall. Past mold remediation was also noted in the basement.	ASHRAE’s most recent recommendation is to “purge” the buildings prior to re-occupancy. Modify schedules for the HVAC systems to start up 2 hours prior to occupancy. Install new ductwork to address ventilation needs.	Improved IAQ. Running the HVAC system prior to occupancy will allow the system to circulate air through the filters, ventilate the spaces, and maintain the recommended temperature and humidity levels reducing indoor air contaminates.
 **CLEAN**	All HVAC systems have filters. However, these filters were noted to be the removable/washable type and not effective at filtering out contaminates.	Installation of MERV 13 filters is highly recommended to increase filtration level. Add air cleaning devices to each system and space.	Improved IAQ. Higher filtration will capture more particles before they reach the spaces. Air cleaning devices assist in destroying viruses, bacteria, mold, and eliminate odors.

	Top Recommendations	Price	Next Steps
1	**Provide and Install Outdoor Air Ductwork w/2 position Dampers (Qty. 1 per Unit – 2 total)**	**$1,589**	Finalize SOW. Authorize Trane to proceed with Contract as presented in proposal 11/9.
2	**Turn on attic fan periodically. Expand equipment runtime to 2 hours prior to building occupancy.**	**Low cost**	Owner to run attic fan as needed/desired to exhaust building fully.
3	**Install higher efficiency filters and replace them more frequently – MERV 13 Recommended**	**Low cost**	Owner to purchase and install filters that are more efficient.
4	**Install Bipolar Ionization air cleaning devices at each HVAC unit to clean recirculated air (Qty. 2)** **Bi-Polar Ionization has been around for decades. The older style of generators used perishable gas tubes and would also create potentially harmful ozone during the process. However, new technology developed in the mid-2000's does not create harmful ozone. All units proposed have been tested to UL 867 which allows 0.05 parts per million or less of Ozone.*	**$7,414**	Finalize SOW. Authorize Trane to proceed with Contract as presented in proposal 11/9.
5	**Install Synexis® – Dry Hydrogen Peroxide Spheres for air and surface cleaning (Qty. 4)** Synexis® uses naturally occurring humidity and oxygen - taken from the air to create DHPTM, which reduces the presence of unwanted microbes that may be present in the air and on surfaces, continuously improving indoor air quality and surface cleanliness. This solution can be integrated into an existing HVAC system or used as a portable, standalone unit in any room to treat the air and any surface the air touches, making it an ideal application for public spaces/high traffic areas. Hydrogen Peroxide is a natural component of human lung chemistry. The DHP that is produced in this product exists at concentrations well below those naturally maintained inside the lungs. *Portable Sphere can be set on a flat surface or mounted virtually anywhere, requires only a standard 120VAC outlet	**$10,369** Includes 1 YR Consumables for all devices shipped directly to City	Finalize SOW. Authorize Trane to proceed with Contract as presented in proposal 11/9.
	Total Cost	**$19,372**	

Key Findings

1. Outside Air Ventilation

What We Learned
Your HVAC systems currently do not have the ability to bring in outside air to the facility.
What You Can Do
Add minimum outdoor air to ventilate building through ductwork modifications with 2 position dampers to automatically run when furnace is turned on.
What You Can Gain
• *Improved ventilation will help dilute indoor contaminants and improve the indoor air quality.*

2. Exhaust

What We Learned
The only building exhaust noted was the bathroom(s) exhaust. *Existing attic fan is operational.*
What You Can Do
Periodically turn attic fan on to help flush building of re-circulated air.
What You Can Gain
Exhausting the air from you building, esp. restrooms, kitchens, and mechanical spaces is equally as important as introducing outside air for maintaining good indoor air quality.

3. Extend HVAC Operation

What We Learned
There is no building automation system in place.
What You Can Do
ASHRAE's current recommendation for system start up is to begin 2 hours prior to occupancy. • *Adjust system schedules to start the HVAC system 2 hours prior to building occupancy (pre-occupancy purge sequence).*   ○ *Note: New outside air dampers will open during this time to ventilate the building.*
What You Can Gain
Increasing the runtime of the HVAC system will allow the system to circulate air through the filters and ventilate the spaces prior to occupancy to help dilute and filter out any contaminates.

4. Filtration

What You Can Do

- *Increase HVAC system filter efficiencies as high as recommended for the equipment, up to MERV-13*
    - Removable and MERV 1-8 Filters offer very low airside pressure drops but are ineffective at capturing micro-biologicals unless they are attached to large particulate particles.
    - A MERV-13 filter will typical have a slightly higher pressure drop than the lower efficiency filters. However, for most systems the added pressure drop is not too substantial and will result about a 5% reduction in airflow.
- *Upgrade and replace the filters more frequently.*

What You Can Gain

High efficiency filters will capture additional indoor contaminants and improve indoor air quality.

5. Air Cleaners

What We Learned

Filtration is currently the only cleaning device in the existing HVAC units. The current filtration (removable/washable) is very low and ineffective at capturing micro-biologicals unless they are attached to large particulate particles.

What You Can Do

Install an air cleaning device at each HVAC unit or in select spaces. There are several choices of air cleaning devices such as UV lights, air ionizers, dry hydrogen peroxide systems, and photo catalytic oxidization.

See below for a comparison matrix of the different air cleaner technologies.

Bipolar ionization air cleaners, as well as Synexis Products are a good balance of performance, maintenance requirements, and cost.

PRODUCT	TECHNOLOGY	TESTED TO KILL VIRUSES	TREATS VOCS, ODORS, BACTERIA	TREATS ENTIRE BREATHING AREA	TREATS SURFACES	APPLICATIONS					Maintenance
						ROOM DIRECT	HEAT PUMPS	SMALL RTUS	LARGE RTUS (IPAK)	AHUS	
Genesis/TCAC	Filter, UV, PCO	YES	YES	NO	NO		X	X	X	X	Filter, UV lamps
UV - coil cleaning	UV	NO	NO	NO	NO		X	X	X	X	UV lamps
UV - air disinfection	UV	YES	NO	NO	NO		X	X	X	X	UV lamps
UV - Upper Air	UV	YES	NO	NO	NO	X					UV lamps
Phenomenal Aire	Bipolar ionization	YES	YES	YES	NO		X	X	X	X	clean device
Global Plasma	Bipolar ionization	YES	YES	YES	NO		X	X	X	X	clean device
RGF Enviromental	UV, PHI	YES	YES	YES	NO	X	X	X	X	X	UV, replace catalyst
Synexis	Dry Hydrogen Peroxide	YES	YES	YES	YES	X	X	X			Replace sail, monthly

PCO - Photo Catalytic Oxidation
PHI - Photohyrdoionization

ROOM DIRECT - CONSOLE UNIT PLACED IN ROOM

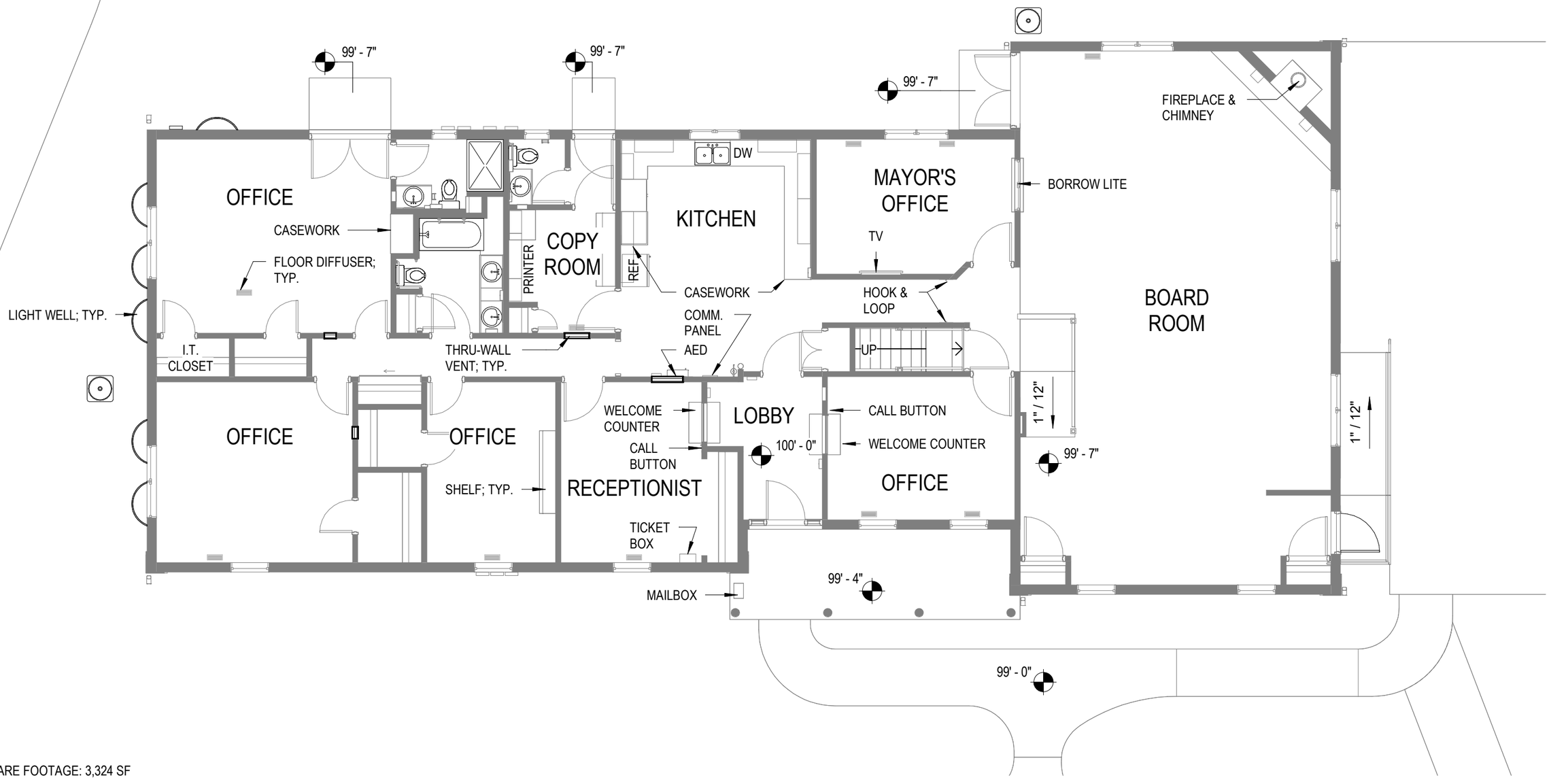
FOR ALL AIR CLEANERS, PAY ATTENTION TO THE MANUFACTURE TESTING DATA. NOT ALL PRODUCTS ARE TESTED.

What You Can Gain

Improved indoor air quality, staff and public confidence in occupying building.

CITY HALL

5401 Independence Rd.
Weldon Spring, MO 63304



GROSS SQUARE FOOTAGE: 3,324 SF

EXISTING FIRST FLOOR PLAN

CITY OF WELDON SPRING
Job No. 23-3875.01

Published 03/26/2024

fgma

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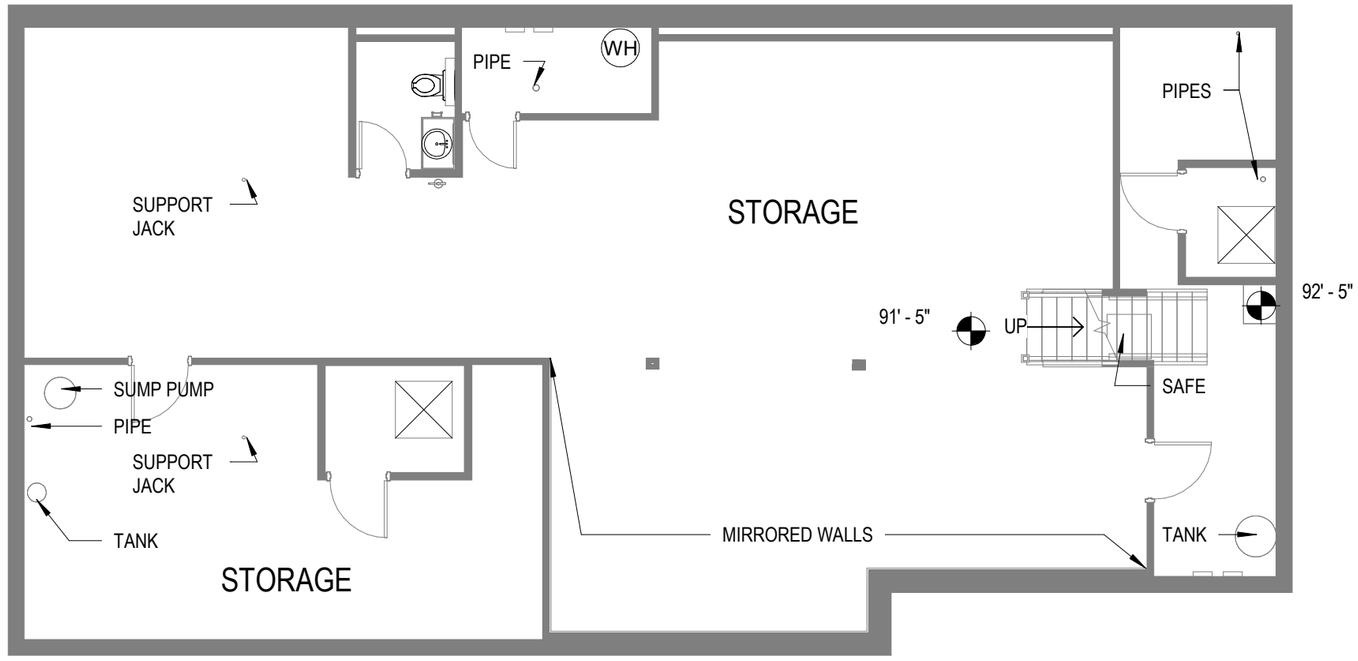
5401 Independence Rd.
Weldon Spring, MO 63304



GROSS SQUARE FOOTAGE: 2,250 SF

EXISTING BASEMENT PLAN

CITY OF WELDON SPRING
Job No. 23-3875.01

Published 03/26/2024

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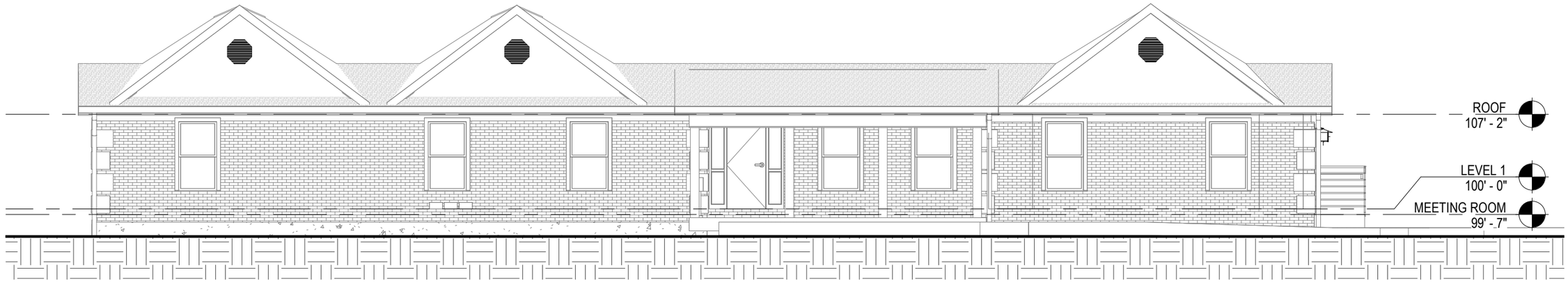
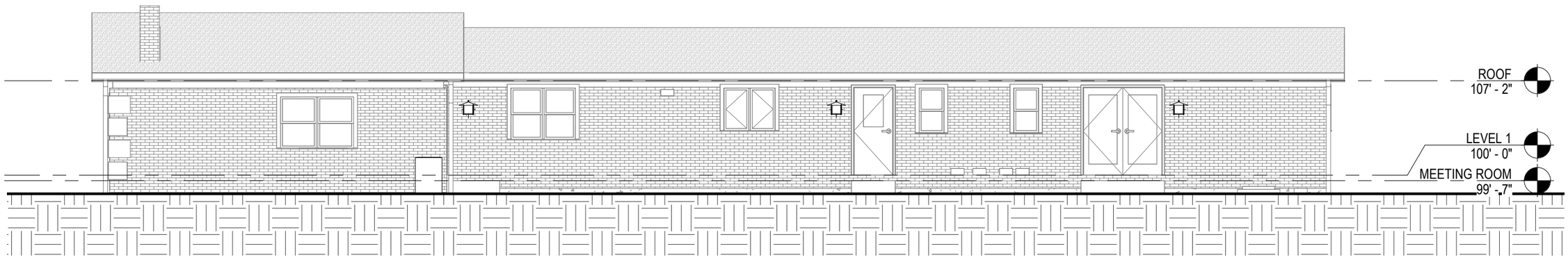


2 SOUTHERN EXTERIOR ELEVATION

1/8" = 1'-0"



1 NORTHERN EXTERIOR ELEVATION

1/8" = 1'-0"

EXISTING ELEVATIONS

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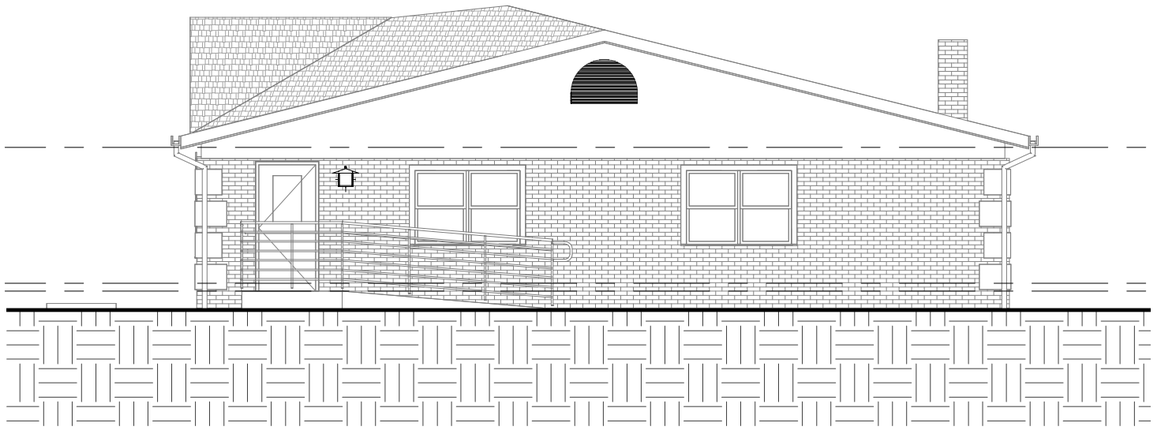

1 EASTERN EXTERIOR ELEVATION

1/8" = 1'-0"

2 WESTERN EXTERIOR ELEVATION

1/8" = 1'-0"

EXISTING ELEVATIONS

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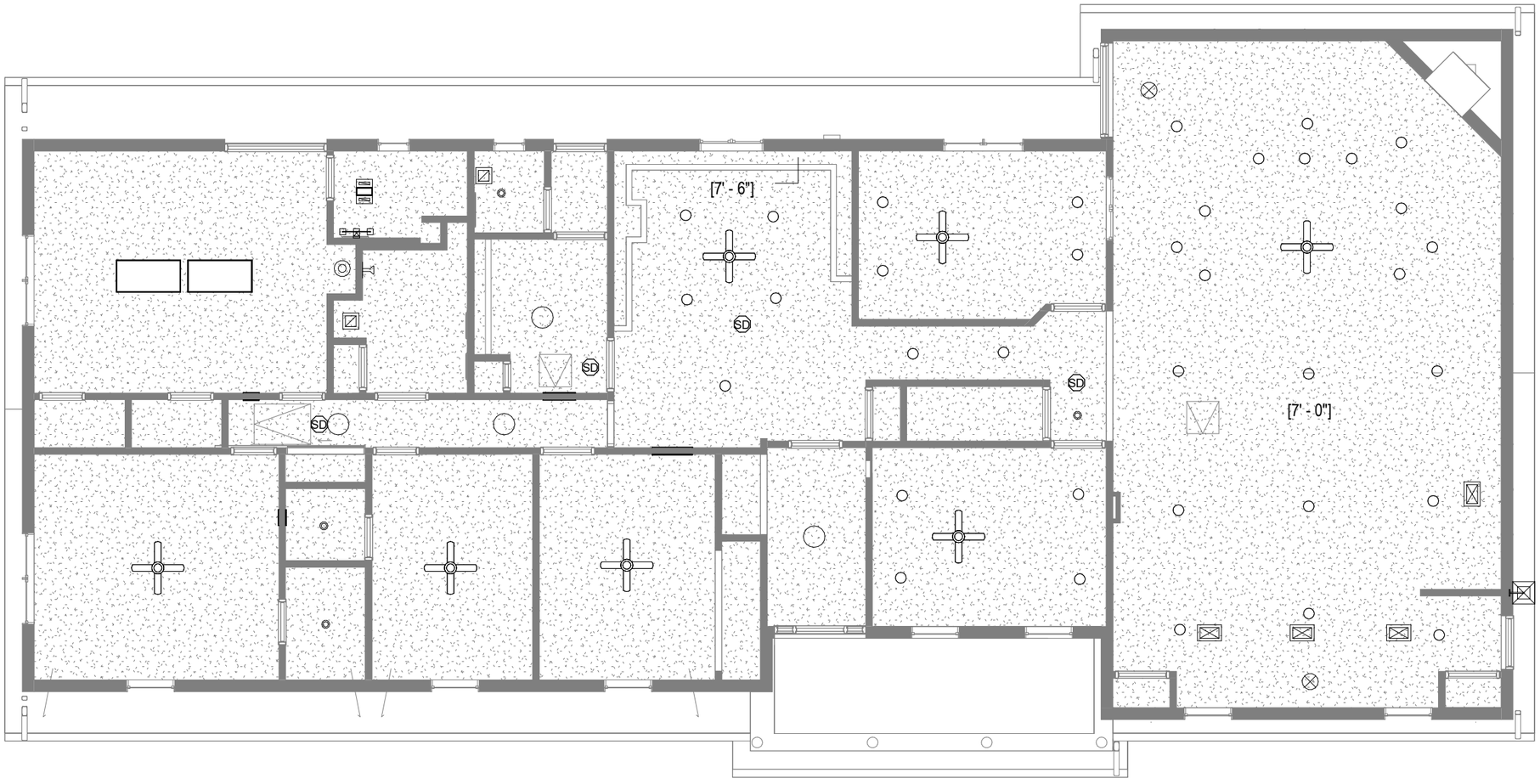

CEILING HEIGHT @ 8'-0" UNLESS NOTED OTHERWISE

FIRST FLOOR CEILING PLAN

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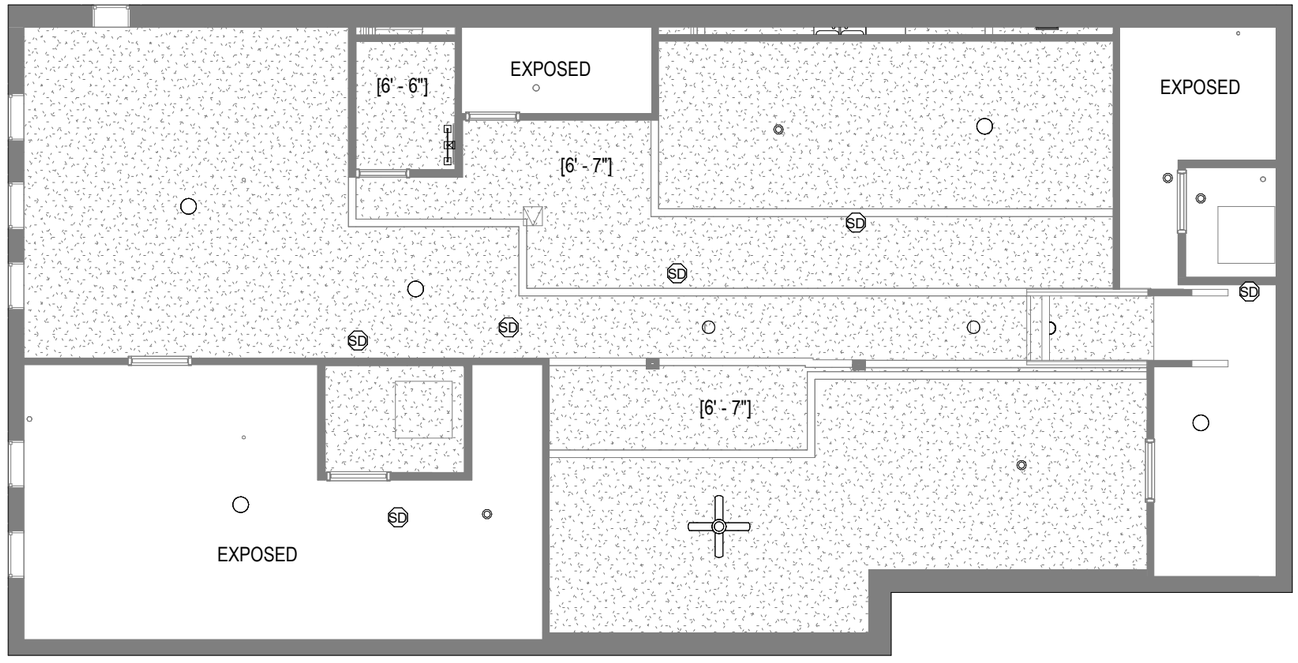

CEILING HEIGHT @ 7'-6" UNLESS NOTED OTHERWISE

BASEMENT CEILING PLAN

CITY OF WELDON SPRING
Job No. 23-3875.01

Published 03/26/2024

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