LEE'S SUMMIT FIRE STATION 1

FEASIBILITY STUDY

Lee's Summit, MO
May 2024

WSKF ARCHITECTS
110 Armour Road
North Kansas City, MO
816.300.4001
www.wskfarch.com

Table of Contents

Acknowledgements

WSKF Architects would like to thank the City of Lee's Summit and the Lee's Summit Fire Department for their help with this feasibility study. Their knowledge of the building and site and the time they spent during the study preparation is invaluable to the work WSKF Architects and our consultants have completed.

Fire Chief, Mike Snider
Deputy Chief, Brian Austerman
Assistant Chief, Kevin McCaw
Assistant Chief, Arby Todd

Project Manager - CBS, Sharon Bloom
Facilities Manager, Brian Page

Feasibility Study Team Members

The following companies provided their expertise in the feasibility study through assessment of the existing building, review of testing and reports, and understanding the space programming needs of the Fire Department for the future use of Fire Station #1. The information they provided is included in this study.

McClure
Civil Engineering

Leigh + O'Kane
Structural Engineering

PKMR Engineers
Mechanical, Electrical, and Plumbing Engineering

Newkirk Novak Construction Partners
Construction Manager at Risk
contracted directly through the City of Lee's Summit

Executive Summary

WSKF, Inc. (dba WSKF Architects) was requested to complete a Feasibility Study of Fire Station 1 for the Lee's Summit Fire Department. The goal of the Study is to assess the existing facility conditions of the station and offer recommendations for remodel or rebuild by determining which option made the most sense financially as well as operationally.

With fire administration moving into a new facility and the station having not been renovated since the early 2000's the state of the building came into question. The City of Lee's Summit and the Lee's Summit Fire Department determined a Feasibility Study would provide the best path forward.

While feasibility is easy for people to understand when it comes to the building's physical condition, it is not so easy to determine how the station functions operationally for the fire department. Throughout the Study WSKF and our consultants will be thinking about best practices for fire station design while reviewing the existing fire station. The following areas are all part of how the fire station functions operationally and were assessed as part of the Study; 1) Safety, Health & Wellness, 2) Code Compliance, and 3) Operational Deficiencies (building conditions that affect fire service performance; short-term and long-term).

Space programming was completed through discussions with the City and Fire Department on needs for the future facility and an on-site conditions assessment of the existing facility was completed as well. The conditions assessment involved architectural and engineering review with in-depth investigation of existing building systems. Drawing review of the existing building plans from the original build and renovation work that occurred in the early 2000's was also part of the study process.

Additionally, WSKF retained Terracon to provide a Phase 1 Environmental Study, Hazardous Materials Testing (asbestos and lead), UST Removal Oversight & Sampling (not completed yet) and a Geotechnical Report. WSKF was instructed by the city to hold off on the UST Removal Oversight & Sampling until we understand the plan moving forward. McClure provided surveying services for the site and Coffelt Land Title Inc. provided a title report for the property.

As with any such study the conditions assessed and the recommendations offered are greatly dependent upon the firm and individuals completing this work. WSKF Architects is a company that was founded in 1968 and just completed our 55th year of business operations. While our history of services includes a wide range of facility types, one of our focuses over the last 30 years has been public safety; fire, police, EMS and Dispatch. WSKF currently is working from South Dakota to Oklahoma and into Illinois and Georgia on fire station projects. We recently reached $180 million in project facility delivery and we are currently contracted for over $50 million in future facility services.

After the space programming and conditions assessments were complete WSKF created conceptual design options for renovation and new construction. After review and discussions with the City and Fire Department, revisions were made to the options. WSKF then met with Newkirk Novak, the City's selected Construction Manager at Risk to walk through the conceptual design options and what each would include. Construction costs and materials of Stations 3, 4, & 5 were discussed for comparison purposes.

Once all of this information was gathered from the previous steps, our goal was to create an easy to digest summary document, this Study, to help the City and Fire Department make an informed decision on which path forward would make the most sense for both the City and the Fire Department.

To this end and through our professional support, the City will determine which option makes sense; 1) remain in the current building and renovate, 2) complete a full demolition of the existing building and rebuild on the current site, or 3) complete a full demolition of the existing building, acquire the two properties to the north of the station, and rebuild the fire station on the three combined sites. Note: It is understood that the third option noted may not be feasible but WSKF was tasked to look at the site and surrounding area to determine the possibilities for a future fire station on the existing site.

Station 1 was constructed in 1974, approximately 50 years ago. Station 1 has served as the fire headquarters for the majority of its life. Station 1 was originally built to serve as a civil defense facility. Generally, fire stations are constructed in specific locations; locations to strategically serve the geographic area of the station. As city's develop, the station location requirements can sometime change. With Station 1 being located downtown there is minimal concern with its current location. When Station 1 was constructed, the population of Lee's Summit was approximately 16,000[1]. The current population of Lee's Summit is approximately 106,031[2]. Lee's Summit has been one of the fastest growing communities in Missouri.

A brief overview of the station and site are as follows:

- Site Area – 40,946 SF or 0.94 acres
- Building Area – 25,170 SF
- Building Construction – Precast elements for the walls, floors, and roof structure. The precast elements are composed of double tee sections, inverted tee beam girders, precast panels, and precast columns
- Current Design – 4 drive-thru apparatus bays, 11 bunks, dayroom, kitchen, dining room, 8 offices, reception, conference room, training room, fire dispatch and storage/support space

This study goes into detail to provide the City of Lee's Summit and Lee's Summit Fire Department with the knowledge to make an informed decision about the future of Station 1. Below is a brief overview of the study, our findings, and the design teams views on how we'd suggest the City and Fire Department proceed.

The existing structure does not meet the building code seismic requirements for essential facilities. The structure would need to be greatly modified to bring it up to code including replacing all exterior concrete walls as well as the demising wall between the Apparatus Bays and Living Quarters/Office and replace them with shear walls as required by code. This would require all of the brick and cast stone exterior finishes to also be removed. The Apparatus Bays slab would need to be removed due to its poor condition but also to properly connect the foundation with tie-beams between all columns that are current on drilled piers to meet building code requirements.

The mechanical, plumbing, and electrical systems in the building are also extremely worn and past their useful life. All MEP systems should be completely removed and replaced. A few VRF heat pumps can be salvaged as they are only a few years old. Many of these MEP systems are costing the City a great deal in maintenance and repair costs to keep the systems in working condition every month due to their age and poor condition.

[1] https://mcdc.missouri.edu/population-estimates/historical/cities1900-1990.pdf
[2] https://cityofls.net/city-of-lees-summit/demographics-stats

While all of the physical attributes of the existing station are important we must not forget that the building design should not hinder the overall functionality of the fire station. Fire stations have changed immensely over the past 50 years and this is something that also must be considered. To that end, the Fire Department's future space requirements for the building (Living Quarters/Offices) will require the entire interior to be demolished or taken down to the concrete structure as the new space requirements are very different from the existing building's layout. Currently the entire first floor is administration offices, and conference rooms while the second floor is Living Quarters. With the relocation of administration to another location, the first floor will now be dedicated to Living Quarters including Kitchen, Dayroom, Dining, etc. while the second floor will be primarily bunk rooms and restrooms for the crews.

Individual restrooms for each bunk are now standard practice for the Lee's Summit Fire Department as provided in the two most recently constructed stations; 4 and 5. The entire layout of the second floor will need to be redesigned to accommodate this requirement. Locating plumbing for each new bunk restroom is also a concern for the design team. It will be extremely challenging to locate plumbing piping without hitting one of the structural concrete tees since individual restrooms will be located over the entirety of the second floor.

Selective demolition would be required if renovation as noted was desired. This type of building demolition is not inexpensive and is very time intensive. Due to the age of the building both asbestos and lead have been found in the facility so these hazardous materials need to be properly remediated and disposed of or handled appropriately prior to any other work occurring. Due to this, not only is renovation more expensive in this instance but it will also require a longer construction schedule to complete all of the necessary steps of demolition and renovation.

While it is possible to repair and update the existing facilities, there is the question; is it prudent? In order to answer this question, it is necessary to consider a variety of items. Can the existing facility be modified to support the needs of the Lee's Summit Fire Department for the next 50 years as it has over the past 50 years? Can the existing facility structure withstand the requirements of today's building codes for essential facilities? Fire stations have changed immensely over the past 50 years and this is something that must be considered. While all of the physical attributes of the existing station are important we must not forget that the building design should not hinder the operations or overall functionality of the fire station.

The physical building deficiencies, code non-compliance, and operational deficiencies are well-documented in the following narratives and concept budgets. As noted above, the question of prudent investment in facility renovations is an overarching consideration; should the City continue to invest in the existing Station 1 building or would it be best use of taxpayer dollars to replace the station?

While Station 1 has some inherent deficiencies that can be resolved, there are many deficiencies that cannot be resolved through renovation of the existing facility. Functionality and operations of the station will be forfeited if the deficiencies are not remediated appropriately. Given all of the research, discussions, and observations throughout this Study, we do not believe it is prudent or feasible to continue investing in Station 1 through renovation and the City of Lee's Summit and Lee's Summit Fire Department should plan on constructing a new facility to replace it. The following sections within this study break down all of the areas that were reviewed and provide additional information as to the reasoning of our recommendation for replacement in lieu of renovation.

Study Process

The Study was completed over a 4-month time period. The Study "kickoff" began in late January 2024 and was completed in April 2024. During the study of Station 1, WSKF completed both on-site survey work and collaboration with the Fire Department to both confirm survey extent and detail as well as confirm identified deficiencies.

The study process began with discussions with Fire Administration and City staff. Additionally, some discussions were completed with on-duty crew members as they were available. To confirm the future needs for the Fire Department a space programming exercise took place prior to the on-site conditions assessment so that the design team understood the requirements for the new fire station prior to observing the facility.

The on-site survey work was completed with photographs of interior and exterior conditions, field measurements as well as some internet investigation. The purpose of the photographs was to document general conditions as well document specific conditions that were observed as deficient.

As it is difficult to fully understand each facility's operations, there were subsequent meetings to discuss operations and potential areas of improvement. While operations do slightly vary from department to department, daily fire operations are generally the same. The number of pieces of apparatus and crew will vary, but the daily tasks to be completed by each department are typically comparable. However, there are variables between departments that range from training to fitness to decontamination protocols, for example, depending on the department's facilities, operations, and resources.

It is important to benchmark facility requirements based on both experience and standards. For experience, facility requirement considerations would include such things as; 1) apparatus turning radii, 2) adequate space requirements for Living Quarters, and 3) equipment needs. For standards, references to National Fire Protection Association (NFPA), International Building Code (IBC), and American Society of Civil Engineers (ASCE) are used. There are also voluntary benchmarks for fire department performance that are available from Center for Public Safety Excellence (CPSE).

Additionally, there are emerging practices and protocols for fire departments that are, generally, in response to trends in the fire service industry regarding health and wellness. These practices and protocols center on firefighter health and wellness. National Institute of Occupational Safety and Health (NIOSH) recently completed two studies focused on firefighter cancer and concluded that firefighters face a 9 percent increase in cancer diagnoses, and a 14 percent increase in cancer-related deaths compared to the general population in the United States[3]. As a result of this Study, the National Firefighter Registry (NFR) for Cancer was set up for firefighters that will track links between their workplace exposure and cancer[4]. Per the registry's website, "this registry is the largest effort ever undertaken to understand and reduce risk of cancer among U.S. firefighters."

Given these emerging trends and the results from the studies, it seems only prudent that design in response to such should be considered for this study. Generally, the study incorporates current best practice recommendations that are aimed at reducing or mitigating risks to firefighter health and

[3] Findings from a Study of Cancer among U.S. Fire Fighter, CDC Workplace Safety & Health, NIOSH
[4] H.R. 931. Firefighter Cancer Registry Act of 2018

wellness. As the study of firefighter health and wellness continues to develop there will likely be other recommendations for addressing risks. The current efforts to reduce risks range from the design of firefighter gear to fire apparatus to fire stations. There is no one component to address all risks as all elements need to be considered as a collaborative effort to address risks.

Sleep deprivation and overall mental health have come into the spotlight recently for firefighters as well. These two health issues can greatly affect a firefighter's overall health and their ability to provide the best possible service at events. If a firefighter is sleep deprived he or she is not going to be as effective and clear minded as one who has had an adequate amount of sleep. Science Alliance and the National Development & Research Institutes, Inc. (NDRI-USA) are two resources that provide great information on firefighter health and are constantly looking at ways to improve firefighter health and wellness.

Along the same lines, the Missouri Senate passed SB 57 which requires mental health screenings every three to five years for all public safety personnel. This bill also includes "988 Public Safety Fund" to be used for the "purposes of providing services for peace officers to assist in coping with stress and potential psychological trauma resulting from a response to a critical incident or emotionally difficult event." This shows the State of Missouri understands the importance of first responders' mental health in our state.

WSKF Architects is on the forefront of these new health and wellness topics and it is our intent to keep all building occupants as healthy as possible. Everyone knows a firefighter has an extremely hazardous job but we as designers are doing everything we can through fire station design to keep the firefighters as healthy as possible while they are on duty through good building design.

Space Programming

Prior to the conditions assessment of the existing structure a space programming exercise occurred to determine the fire department's future needs for the facility with the relocation of fire administration off-site. The required space requirements need to be studied to confirm if the existing building is adequate to serve the future needs of the fire department. This exercise will also determine if the existing building layout can effectively meet the future needs of the fire department.

WSKF Architects assessed the Fire Department's space needs for the future based on best practices, national standards, and interviews with department leadership and staff.

The space programming is broken down into five sections. The five sections include:

A. Lobby, Administration, & Support Services
B. Living Quarters
C. Apparatus Bays
D. Decontamination Protocol
E. Site

Each section is then broken down into the individual spaces or rooms that are needed for a well-functioning fire station. WSKF brings their knowledge of past fire station design work to further discussions with thoughts that the fire department may not have even considered. This includes a list of all of the different types of spaces or rooms that WSKF has seen in other fire stations that they have designed for other departments around the nation. Many times, this list can spark discussion within a fire department to determine if there is an improved and more efficient way for their station to function operationally.

The discussion that leads the design committee through the space programming exercise is best led by a design team that has an expertise in designing fire stations so that the correct questions are asked of the design committee to help the committee think outside the box on how the new station should be organized and how it should meet their specific needs. The design team gathers information from the design committee including staff and crew goals and needs.

Each room that the design committee wants to include in their future station is then discussed in deeper detail so that the design team can determine what size the room needs to be related to use, number of occupants, and equipment for the space to function appropriately. Square footage of each room is determined by WSKF based on design best practices and meeting the needs of the crews.

Each section (A – D noted above) is then totaled and a grossing factor is added to the total to account for exterior and interior walls, corridors, etc. The future space needs for Station 1 include 24,984 SF.

For comparison purposes, the existing Station #1 is approximately:

Lower Level:	5,677 SF
First Floor:	13,229 SF
Second Floor:	6,263 SF
TOTAL:	**25,169 SF**

Here are the square footage results of the space programming exercise:

Lower Level:	3,100 SF
First Floor:	16,465 SF
Second Floor:	5,419 SF
TOTAL:	**24,984 SF**

While it may seem as though the new spaces will fit nicely in the existing facility that isn't the case here. More space is shown in the future needs on the first floor than what is currently available in the existing building. As part of the space programming exercise WSKF located each room on the correct floor (lower level, first, or second) where it should be placed using input from the design committee as well as fire station design standards. Some spaces were moved to the lower level although they wanted to reside on the first floor to help reduce the amount of square footage on the first floor due to the overall size of the existing site. Spaces that require less natural light or that were noisy spaces such as fitness were moved to the lower level.

As noted, when comparing where the existing square footage lies vs. where we need the square footage for the future station there are some misalignments. We need less space on the Lower Level, more space on the First Floor, and less on the Second Floor. This shows us that additions to the existing building, if the existing building is to remain, would be needed to meet the needs of the future crews. The biggest driver of this is the number of apparatus planned to be housed at the new facility. To provide enough bay space a smaller Auxiliary Bay has been proposed to house Chief and Shift Inspector vehicles. Providing a smaller bay for these vehicles makes more financial sense than adding a fifth full size bay to the building.

Another concern is that there are a lot of apparatus bay support spaces that need to be added to the facility that were not part of a fire station 50 years ago. Much this function occurs in the Apparatus Bays currently but this does not align with best practices in fire station design. The Apparatus Bays should be clear and free of all equipment so the crews can get to events as quickly as possible. Removing some of these pieces of equipment from the bays is also due to the health and wellness requirements of locating equipment out of the highest hazard spaces of the fire station.

The layout of the current station is not conducive to these new apparatus bay support spaces. Fire Administration staff told us that they recently completed a study to determine if an extractor could be installed on the existing First Floor of the station. As there wasn't space the Apparatus Bay floor they looked at locating the unit adjacent to the bays in the Living Quarters/Office portion of the building adjacent to the Apparatus Bays. They were told through the study that this wasn't viable as the building structure was not capable of supporting the extractor. An addition would need to be added onto the south side of the building to house the extractor as well as many other apparatus bay support needs. All of these support spaces are required spaces in today's fire stations although they were not common practice in the early 1970's.

For the full Space Programming Document refer to Appendix A.

Conditions Assessment

The purpose of this section of the Feasibility Study is to document the physical condition and performance of existing Fire Station 1. This information provides necessary data to allow the City of Lee's Summit and Lee's Summit Fire Department to understand concerns as determined by the design team. While there are sometimes options to resolve deficiencies, the Study attempts to look at these items as a whole since the goal is to determine if renovation or new construction is the best option for Station 1. Not all deficiencies are able to be resolved with the current Fire Station 1. Additionally, there has been no attempt to prioritize deficiencies at this time.

There are two components to the assessment in this Study:

An on-site Physical Conditions Assessment of the building and site was performed on Wednesday, February 7, 2024. This assessment was performed to determine safety concerns, code issues, deficiencies in building systems, structure and components.

Some of the key ways the facility's physical condition will be assessed include:

1) Identifying Deficiencies: The condition assessment will help identify any existing or potential deficiencies in the building's structure, systems (HVAC, plumbing, electrical, etc.), and components such as the roof, walls, floors, etc.
2) Compliance & Risk Management: There are specific standards that must be followed in fire station design such as NFPA standards. This study elaborates on some of those standards which the current station is deficient.

A Functional Conditions Assessment of the building and site was performed following the on-site assessment through visual observations and discussions with key city and fire personnel. The purpose of this portion of the assessment is to determine how the existing building conditions affect staff operations and the ability to appropriately serve the community. This assessment also examined how the current operations and workflows compare to current recommended best practices in the fire industry.

Some of the key ways the facility's functional condition will be assessed include:

1) Best Practices in Fire Station Design
2) Discussions with Fire Department Staff
3) Discussions with City Maintenance Staff

Understanding the condition of the building will help the City to evaluate it for the purposes of determining if the building should be renovated or replaced as we move into the design and construction of Fire Station 1. Overall, building condition assessments play a crucial role in ensuring the safety, longevity, and efficient operation of buildings while supporting informed decision-making by stakeholders.

Building Description

1. History: The building was built in 1974 using precast double tee construction.
    a. The exterior of the building was remodeled in 2004/2005 adding brick and cast stone to the exterior facades.

2. Use History
    a. Past Use: Civil Defense Facility
    b. Current Use: Fire Station, Fire Headquarters, and FD Dispatch (secondary PSAP)
    c. Future Use: Stand-alone Fire Station
3. Location: 207 SE Douglas St, Lee's Summit, MO 64063
4. Size: 25,170 SF
    a. Due to the exterior façade reskinning work in 2004/2005 the exterior wall takes up a lot of square footage. The above noted square footage is a gross square foot total which includes the entire building to the face of the exterior wall.
    b. Floors: There are three levels: a lower level, first floor, and second floor; each level is approximately 5,500 sf. The Apparatus Bays, also on the first-floor account for approximately 7,000 sf.
        i. Lower Level: This level houses E911 facilities, a large meeting space, and various mechanical/building support spaces.
        ii. First Floor (ground floor): This level comprises of fire department offices with both administrative and station functionality, a conference room, and various storage spaces for FD gear, EMS supplies, technology etc.
        iii. Second Floor: This level houses the on-duty station crews, with some crew offices, dayroom, kitchen, dining, laundry, fitness and individual sleeping bunks. Restrooms for crews on this level are shared occupancy men's and women's style restrooms that accommodate multiple users at one time with toilets, sinks, and showers.
5. Building Orientation: The building is oriented southwest towards Douglas Street with apparatus returning to the station at the rear alley or through the City Hall parking lot. The rear ramp of the Apparatus Bays is very steep at 8° or 14%, more than twice the recommended slope for large apparatus.
6. Site Area: 40,946 SF or 0.94 acres

Building Exterior

1. Exterior Walls

a. The exterior walls are loadbearing concrete double tee structure with a metal stud infill walls with a brick and cast stone facade added during renovation in the early 2000's.
b. Generally, the brick appears to be in good condition, however some localized brick spalling was observed in the exterior lower level stairwell as well as at grade along the southeast corner of the building. One possible cause could be the use of salt or ice melt in these areas.
c. Some cracking of the brick mortar was observed on the southwest corner of the vestibule.
d. The cast stone sills, lintels, and fascia trim show abundant cracking, with more severe cracking as well as some spalling observed on the fascia trim.
e. There is very little exterior insulation in the building walls, and staff noted that the temperatures in the building were very low during a recent cold spell, with the new mechanical system unable to maintain normal temperatures. Space heaters were used in bunk rooms.

f. The paint on the concrete fascia is in poor condition and is peeling with large areas without paint on the south side of the building.

2. Windows & Doors
    a. Windows, storefront, and exterior doors all seem to be in good condition.
    b. There is damage to one of the overhead doors on the front of the station.
3. Roof
    a. The roof is in poor condition overall.
    b. The TPO membrane is approximately 23 years old and is past it's useful life.
        i. The City of Lee's Summit was quoted $450K to replace the roof and cap flashing Summer of 2022, with price escalation this replacement cost is likely over $500K in today's costs.
    b. There are ongoing issues with the lightweight concrete underneath the roofing membrane per City staff.
        i. When walking on the roof it was apparent that the roof system is failing. While not visible, the roof appeared to have structure below the membrane with different rates of deterioration as some of members when stepped on crush with the weight of a person while others remained intact.
    c. There are large areas of ponding water on the roof, many patches and repairs to the roof, and areas of pitting/erosion on the roof.
    d. The roof membrane extends up onto the parapet and is held by a termination bar mounted to the top surface of the parapet. This is not a recommended installation, as this joint should be covered by a counterflashing or cap flashing.

Building Interior

1. Due to the fact that this building could potentially be renovated from a headquarters station to a standalone fire station and due to the age of the building and date of the last interior renovation in the early 2000's, it is our intent for all new finishes to be used in the facility. The majority of the interior finishes are past their useful life and should be replaced.
2. Very few, if any, interior walls will be able to be salvaged during the renovation work due the differences between the existing building needs and the future needs as a standalone fire station. None of the interior walls are loadbearing with the nature of the building's concrete structure.
3. The concrete floor in the Apparatus Bay is in poor condition and should be replaced due to the cracking, spalling, and deterioration around the trench drains.
4. Many surfaces in the Apparatus Bay have paint peeling. The ceiling, walls, and roof drain piping all have some level of peeling paint. The ceiling has some areas of darker peeling paint from where old heaters used to be located prior to the radiant tube heaters currently in the bays.

Vertical Circulation

1. Stairs
    a. The interior stair that connects all three levels of the station does not meet current code. The stair does not exit directly to the exterior; exiting occurs through intervening spaces some of which are of a higher hazard.

   b. The exterior stair from the lower level to the parking lot is in poor condition and is a slipping hazard due to ice in the winter and a water intrusion issue year-round.

2. Elevator
   a. There is no elevator in the building as elevators were not required in 1974 because there were no ADA standards at the time of construction.

HVAC

1. A new VRF system, installed in 2021, serves the Living Quarters and Office area. The VRF system was noted to not keep up with all the heating needs in the winter.
2. A dedicated outside air rooftop unit provides ventilation for the building.
3. Individual furnaces serve as backup.
4. The Apparatus Bays are heated with radiant gas-fired heaters. No code required ventilation or indoor parking exhaust is provided. An exhaust fume detection system for carbon monoxide or Nitrous dioxide is not installed.
5. An AirVac911 engine exhaust removal system is provided in the Apparatus Bay for air filtration.

Plumbing

1. The existing building has a 2-1/2" domestic water service in a closet in the basement at the front of the building. No backflow preventer was observed.
2. Two domestic water heaters are located in the basement mechanical room. One water heater is an AO Smith natural gas fired storage tank of an unknown age and appears to beyond its expected useful life. The other is a State Water Heater, 40 Gallon, natural gas fired, 40,000 Btuh input, 40.9 gph recovery, was installed 2011, and is nearing the end of its expected useful life.
3. The domestic hot water system includes a recirculating pump to ensure hot water is provided to all fixtures in a timely manner. The pumps appear to be of an older unknown age and beyond their expected useful life.
4. The gas utility service is located on the east side of the building. The outlet pressure appears to be 5-9 inches of water column per the nameplate on the utility regulator. Insufficient gas flow was noted for the second floor preventing the installation of a gas kitchen range.
5. The 4" sanitary leaves the back of the building toward the alley. Existing drawings show an interceptor for the Apparatus Bays but one was not observed. The facility has had multiple issues with the sanitary lines backing up in the basement and have suggested some of the sanitary lines have collapsed.
6. The roof drains are piped to the south side of the Apparatus Bays.

Fire Protection

1. Fire Sprinklers
   a. The Living Quarters, Dispatch, and Office area are sprinkled.
   b. The Apparatus Bays are not sprinkled.
   c. The fire sprinkler service entrance is located in a basement closet off the Dispatch room.
2. Fire Alarm System
   a. The building does not have a fire alarm system.
   b. 120V smoke alarms are installed in the bunk area.

Electrical

1. Service
    c. Electrical service to the building is underground from pole-mounted utility transformers on the east side of the building.
    d. Service is 120/208V, 3-phase, 4-wire, 600 amps.
    e. The main distribution panel is located in the basement equipment room adjacent to the conference/training room. The distribution panel is a Federal Pacific panel with fused switches, it is manufactured by AC Controls.
2. Power
    a. Power is distributed from the main distribution panel to panelboards throughout the building.
    b. The panelboards serving emergency loads appear to be newer Square D panels in good condition.
    c. Most of the remaining panelboards appear to be original to the building.
    d. The original panelboards appear to be full with no available space for additional breakers to serve additional loads.
3. Emergency Power
    a. A single 100kW/125/kVA natural gas-powered emergency generator provides backup power to the building. The generator is a Kohler Model KG100 with a weatherproof enclosure.
    b. The generator is located in the fenced in equipment yard on the east side of the building adjacent to the communications tower. The generator feed is to an automatic transfer switch in the basement equipment room. The normal power feed to the automatic transfer switch is from the main distribution panel.
    c. The load side of the transfer switch feeds an adjacent panel which in turn feeds emergency loads throughout the building.
4. Lighting
    a. The existing lighting is a combination of high bay fixtures, recessed troffers, and downlights.
    b. Site lighting is fairly minimal consisting mostly of wall mounted lights at the building exits. Light source is compact fluorescent lamps.
    c. Several pole lights and street lights provide lighting in the parking lot and around the building perimeter.
5. Telecommunications
    a. The main telecommunications room for the building is in a basement equipment room off the Dispatch area.
6. Lightning Protection
    a. The building does not appear to have lightning protection. No air terminals were observed on the roof or along the parapet.

Safety & Security

1. Currently there is not an outdoor space that can be used by firefighters that is only accessible by the crews. With this station being downtown safety and security are a concern.

2. Apparatus Bay doors are generally left in closed position unless crews are actively working in the Apparatus Bays or on the front apron.
3. Access control devices are provided on doors between the Apparatus Bays and the Offices.

Code Compliance

1. Limited compliance with NFPA 1851, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting; This standard is used, hand-in-hand, with NFPS 1500 for the purchasing, cleaning, care and repair of fire gear. This limited space for such work and the existing space does not allow for the isolation of clean gear from soiled gear.
2. Non-compliance with NFPA 13, Standard for the Installation of Sprinkler Systems; The existing station does not have a fire protection (fire sprinkler) system throughout the entire facility. While the requirement for a fire protection system was not required at the time the original station was constructed, the current code (IBC 2018) would require fire protection. Additionally, it is difficult for the Fire Department to advocate and require fire protection for current buildings when this not provided for within their own place of business.
3. Lack of compliance with the American Disabilities Act (ADA); The original requirement for accessibility was mandated by the Federal Government. Today, many cities, including Lee's Summit, now review and enforce requirements for accessibility. Chapter 11 of the 2018 IBC covers the requirements for accessibility.
4. Lack of compliance with National Electric Code; The City of Lee's Summit enforces the use of the 2017 National Electric Code. The Code requires that adequate space be provided in front of the electrical panels within the building to both access and service devices. There is insufficient space in the electrical rooms for space to access and service the electrical panels.
5. Non-compliant exit from the lower level; The exit door to the exterior of the building has a step immediately outside the door and a flight of stairs. The building codes requires a level surface landing. Also, there is no Area of Refuge provided at either stair for those handicapped persons who can't climb the stairs.
6. Lack of compliance with IBC 2018, Chapter 4, Section 420.2, Separation Walls; The bunkroom occupancy is classified as an R-2 Occupancy. Based on the R-2 Occupancy, the sleeping units are to be separated from one another and adjacent spaces with 1-HR. fire rated construction. The existing bunkrooms do not have fire-rated construction surrounding the rooms.
7. Lack of compliance with International Plumbing Code (IPC) 2018; Building uses that are subject to the discharge of oil, grease, sand and other substances harmful or hazardous to the public sewer are to be provided with grease, oil and sander traps or interceptors. The original drawings showed an interceptor but our team was unable to locate it during our site visit.

Health & Wellness

1. Lack of environmental separation between Living Quarters/Offices & Apparatus Bays; All openings between the Apparatus Bays and adjacent bunkrooms should be tight-fitting openings with gasketing. Ideally, the mechanical system should provide for positive air pressure on the Living Quarters/Office side of the opening such that when the door is opened to access the Apparatus Bays, the air should flow from the Living Quarters/Office side to the Apparatus Bays.

Furthermore, vestibule spaces are now common practice between Apparatus Bays and Living Quarters/Offices as additional protection from contaminants in the Apparatus Bays.

2. Lack of Exhaust Air & Floor Drains for Gear Storage; Best design practices include both exhaust air and floor drains in the gear storage room. The exhaust air removes emissions from fire gear stored in the room and floor drains are needed to capture water from gear.
    a. The door to the current room is left open and allows emissions and particulate to contaminate the Living Quarters/Offices areas with no separation provided.
3. Table with eight chairs & three refrigerators are located in the Apparatus Bays and are being exposed to products of combustion.
    a. The Apparatus Bays should not be used as a place to spend extended amounts of time.
    b. Refrigerators and ice makers should not be placed in the Apparatus Bays as the contents will be exposed to the same products of combustion.
4. Lack of compliance with NFPA 1500, Standard on Fire Department Safety, Health, and Wellness Program; There is insufficient space for the Fire Department to comply with requirements to inspect, care and maintain protective gear. The Fire Department does not have a gear extractor or washer at the station as there is insufficient space to comply with this requirement.
5. The only exterior space available to firefighters' use is in the communications tower/mechanical yard, surrounded by mechanical equipment, electrical equipment, and generators. The firefighters use this space for outdoor cooking despite this as it is the only area available. This area was not designed for occupancy and in addition to lacking adequate space for the firefighters to congregate, it is not level with many tripping hazards.
6. Daylight: The windows are in serviceable condition; however, they are poorly located for the current functions of the building which has many dark areas not reached by daylight. Conversely there are many areas where FD staff has hung blankets, added window film, or painted the windows black due to unwanted/uncontrolled daylight.

Functionality Issues / Operational Deficiencies

1. Inadequate space for fire apparatus; The existing Apparatus Bays width are 15'-4". Given that more modern-day apparatus is approximately 14 feet wide (with mirrors) this is insufficient space for safe apparatus maneuvering. Additionally, the noted width includes also space for personnel. Understanding that the side walls of the Apparatus Bays include both storage and out-swinging doors, the inadequate width is compounded. NOTE: The overhead door width is 14 feet which is ideal; there is just a lack of circulation space between apparatus and on each side of the bay. In an ideal world the bay width would be no less than 16'-0" wide for adequate maneuvering around the apparatus. Best practices provide 18'-0" wide bays with 3'-0" walking area parallel to the apparatus on both sides of the bay.
2. Inadequate space for storage, equipment, records, supplies, etc.; The inadequacy of storage is evident throughout the station including the use of the Apparatus Bays for storage. This deficiency results in available space being used for storage which hampers the intended use of spaces.
3. Lack of sound control between Offices and Fitness; The is no isolation between offices on the first floor and the fitness room on the second floor. Firefighters use the Fitness room at all hours including 8am to 5pm when office staff are below them working. This condition impacts the "business" uses of the facility in reduced productivity and it can in turn impact the "living" uses

of the facility if the office staff need to ask crews to not work out during business hours. Fitness spaces should not be located above spaces that require a separation of sound. Lowest floors of a building or locating the fitness space on a noisy side of the building is best.

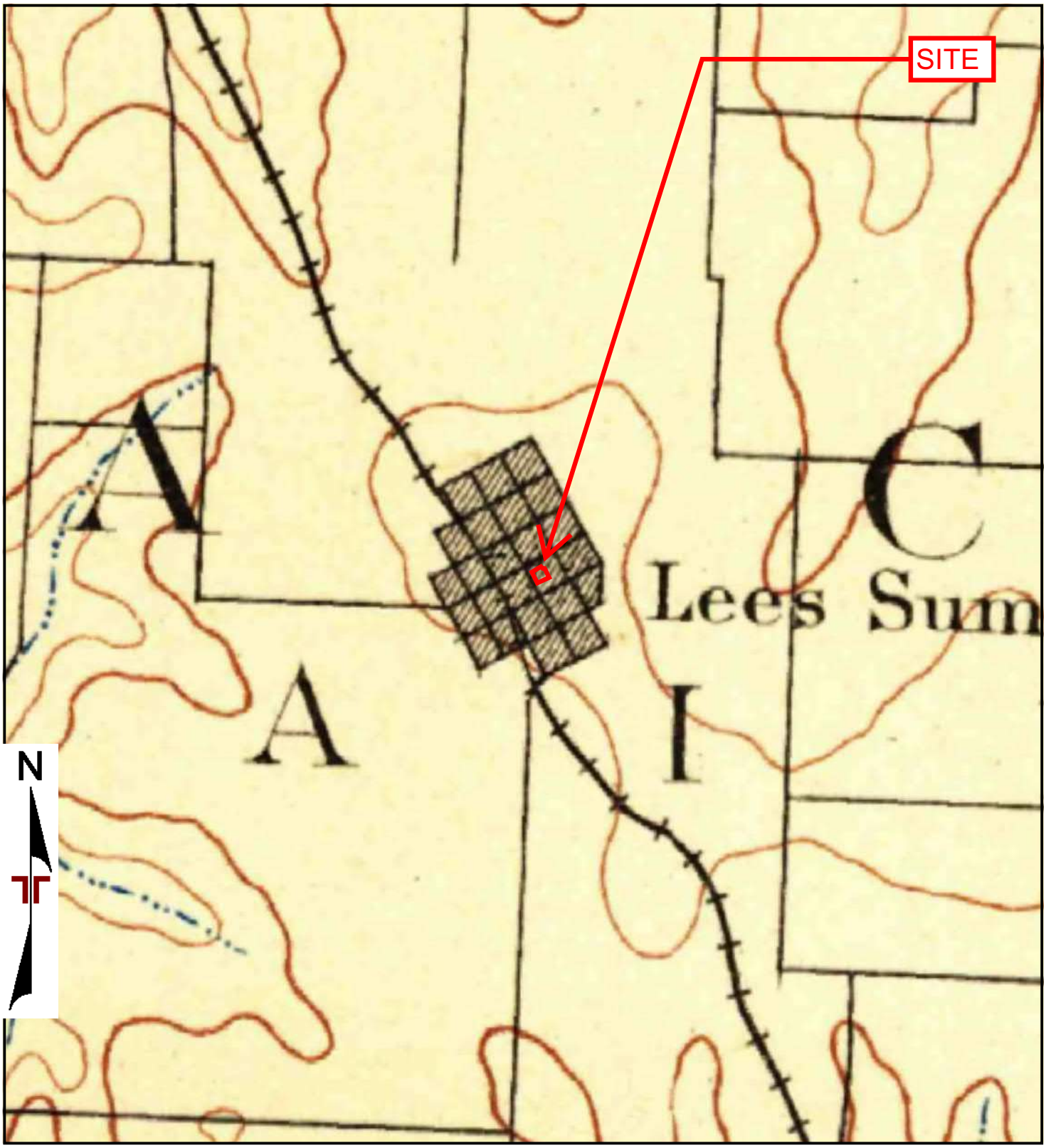
4. Lack of gender-neutral space (toilets & showers); The fire service industry is one that involves all genders of firefighters. The uncertainty of the gender makeup of the department suggests that toilet and shower facilities should be single-use, single-occupant use to assure maximum access to qualified personnel. Given the challenges the fire industry faces with attracting qualified personnel, the department should implement facility accommodation that ensures access to as many personnel as possible. Gender neutral facilities encourages personnel access.
5. Deteriorating construction; The existing station exhibits some deteriorating conditions which are to be expected due to the age of the facility and the fact that it hasn't had any renovation work done since 2004/2005.
6. Lack of separation between Living Quarters/Offices & Gear Storage; Emissions/particles of combustion coming from the firefighting gear are not being exhausted out of the building and are contaminating Living Quarters/Offices environment. Best design practices include locating personnel gear in a room separate from the Living Quarters/Offices as well as the Apparatus Bays. Exhaust air within this room removes emissions from stored fire gear. Floor drains are needed to capture water from gear as well.

Mechanical, Plumbing, and Electrical Assessment

Generally speaking, the existing MEP systems are at the end of their useful life and would need to be replaced in their entirety if the building were renovated. The only mechanical equipment worth salvaging is the VRF heat pumps serving the Living Quarters and Office area. The dedicated outside air rooftop unit is also in decent condition. The condition of the plumbing systems, piping and underground sanitary piping is unknown but likely in poor condition considering their age. The electrical service is likely undersized to support a major renovation and the electrical equipment needs replaced. A new electrical service would need to be provided as the existing CT cabinet and metering do not meet current utility standards. There is a lot of wiring and cabling no longer in use that has been abandoned over the years. New efficient LED lighting would need to be provided. The existing Kohler generator is in good condition but likely undersized to serve a renovated station. A larger generator would be required to support the additional loads connected to standby power desired for the renovation.

The communications tower on the east side of the building is to remain. Separate electrical services serve the tower and associated loads. There is a separate natural-gas power generator providing back-up power to the tower. It appears services to the tower are separated from the building services. Final review and confirmation will be needed prior to renovation or demolition of existing building systems.

Station 1 has been in service for approximately 50 years. This age of use and service life is past the point of needing major systems replacement or updating. Fire stations, like other facilities that are in use 24/7/365, do become worn and fatigued. As anyone can image, over the life of such facilities, not only to facilities become worn, but they are also not current with today's industry standards.



TP, Harrisonville, 1887, 30-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1887 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 1887			

Structural Building Assessments

Refer to Appendix C for the Structural Engineering Assessment Report and Appendix D the Seismic Evaluation Report regarding the existing facility.

Adjacent Off-Site Buildings / Structures Conditions Assessment

Refer to Appendix E for photos of adjacent buildings and structures for reference.

City of Lee's Summit and Lee's Summit Fire Department Deficiency List

Refer to Appendix F for documents provided to the design team at the building of this work which includes items that the city and fire department are aware are items of concern.

Testing & Reports

While our team's assessment of the building and the space programming exercise provide a significant amount of information to aid in the process of determining if renovation or a new building is the best path forward there is also some testing that can be done to help dig deeper. The following tests are provided in Appendix G for reference. The overview of those results is provided below.

Phase One Environmental Assessment

The conclusions from the Phase 1 Environmental Assessment concluded, "Collectively, based on proximity to the site, apparent topographic gradient, and length of operations, the historical gasoline tanks, oil tanks, and filling station historically located south and southeast of the site represent a REC (recognized environmental concern) to the site due to likely unknown releases which may have resulted in migration of contaminants onto the site."

The recommendations from the assessment noted, "Terracon recommends conducting additional investigation to evaluate subsurface conditions associated with the identified RECs. Additionally, if site use changes from non-residential to residential, additional evaluation of subsurface conditions concerning the former use of the onsite USTs may be necessitated."

UST Removal Oversight & Sampling was included in the fees for Phase 1 work under WSKF Architects. The City of Lee's Summit has opted to hold on these tests until the future of the site is determined and if the tanks are going to be in areas of new construction.

Hazardous Materials Testing

Both lead and asbestos were found in various materials throughout the facility. Timothy Easley of Terracon provided this feedback on the report findings, "All of the materials containing greater than 1% asbestos would have to be properly removed prior to any renovation or demolition activity. The gypsum wallboard with joint compound wall system contains less than 1% asbestos and would not require removal prior to demolition as long as there are no visible emissions during demolition (i.e. the material is kept wet during demolition). The demolition contractor must be made aware of the material. In the case of renovation, OSHA regulations pertaining to worker protection apply. The joint compound applied to the wallboard contains asbestos, and removal of this material is regulated as class II asbestos work by OSHA. It is recommended that, in the case of renovation, the gypsum wallboard be removed by a licensed asbestos abatement contractor using proper methods."

Timothy also noted, "There is no requirement to remove lead containing paint prior to demolition. Lead containing paint could be left in place during renovation as long as the materials is not subject to sanding, abrading or welding (any activity that would create dust or fumes)."

Due to these comments most of the asbestos materials found in the building will need to be properly removed prior to any demolition work; selective demolition or complete demolition.

Geotechnical

The full geotechnical report notes, "Based on the anticipated basement floor elevation of the proposed building, and the depth to shale bedrock encountered in our exploratory borings, it appears feasible to support the building on footing foundations that bear on suitable shale bedrock."

Site Survey

The site survey has been provided to the city and a reduced copy has been included in this Study.

Title Report

The title report was completed by Coffelt Land Title, Inc. and included for reference.

UST Removal Oversight & Sampling

As noted above in the Phase 1 Environmental Assessment text above, the UST Removal Oversight & Sampling has not occurred yet. The City of Lee's Summit has requested that this item be held until we can determine if the scope of work will disturb the existing tanks.

Conceptual Design

After the space programming and conditions assessment the next step was to provide conceptual design options for the design committee's review. These concepts are high level, not showing individual room locations but overall building area and locations of floors above and below grade. Refer to Appendix H for the conceptual design options.

Site Analysis – Proposed Conditions

Three proposed site plans have been prepared for the Station 1 property. Discussion of each option is below.

In general, with all the options, grading and drainage will be designed so that existing drainage patterns remain similar to existing conditions. Earth moving will be required but we don't anticipate extraordinary cuts and fills. The most significant grading would be required with Option P3A due to the expanded site and the relocation of the building.

Surface runoff from the western edge of the site can drain onto SE Douglas Street, but the majority of site runoff will drain to the southeast corner of the site where an existing inlet is located in the alley. Downspouts and roof drain pipes will be directed to the south and east. In confined areas where screen walls/retaining walls are proposed, surface and subsurface drainage facilities may be required. Buried pipes could possibly daylight, but more likely, the pipes will need to be connected to the existing inlet.

The existing underground fuel storage tank is in the vicinity of the generator(s) in Options P1A and P2A, and in the vicinity of a proposed retaining wall in Option P3A. Given the potential conflicts, we recommend that the budget include costs to remove the underground fuel storage tank. There is also an underground water storage tank and an underground waste oil tank. These will likely need to be relocated and reconnected if the City and Fire Department determine they want to continue with their use.

We recommend that all pavement be removed and replaced per the proposed site layouts. All the options result in a loss of on-site parking stalls. We believe this is acceptable given the availability of parking on the street, across Douglas, and in the adjacent city parking garage. Also, with all the options, the existing communications tower, transformer, city payment drop box, and memorial at the southwest corner of the site will remain.

Option P1A

This option is for the renovation of the existing building plus two additions.

1. The existing bays will be reduced in length by approximately 20'-0", allowing for an extension of the rear concrete apron. This will reduce the slope of the rear apron from approximately 14% to approximately 11% but even this slope is steeper than what is considered design best practices.
2. An addition on the south side of the building will eliminate parking on the south side of the site. The south wall of the addition will serve as a retaining wall adjacent to the existing alley.
3. An auxiliary bay will be added on the north side of the building. To accommodate this, some of the parking will be flipped to the south side of the north parking lot, and the remainder of the north parking area will be utilized as a driveway for both emergency vehicles and passenger

cars. This will require the reconstruction of the public entrances on both the east and west sides of the north parking area.
4. It is anticipated that utility services will be similar to existing although some or all utilities may need to be reconstructed to accommodate the proposed construction. Consideration may also be given to placing overhead service to the building underground.
5. A new screen wall/retaining wall will be constructed in the area of the communications tower and a new outdoor patio/fitness area will be added on the east side of the communications tower.
6. Generator(s) with a masonry screen wall will be constructed at the southeast corner of the building to provide space behind the building for an outdoor patio and fitness area for the crews.
7. The site will contain 8 parking spaces and a total of 25 parking spaces will be eliminated.
8. The lower level will be approximately half of the first floor.
9. The apparatus support addition on the south side of the existing building is very narrow which will make it challenging to layout with rooms.

Option P2A

This option is for a new building with a site layout somewhat similar to Option P1A.

1. The building is shifted slightly to the north compared to Option P1A and the front and rear concrete aprons will shift along with the building.
2. The bays will be reduced in length, allowing for an extension of the rear concrete apron. This will reduce the slope of the rear apron from approximately 14% to approximately 11%.
3. The south wall of the building encroaches on the existing parking. Some of the lost parking can be reclaimed by utilizing parallel parking along the alley. All of the onsite parking will be lost except any parallel parking stalls that are added on the south side of the building.
4. An auxiliary bay is proposed on the north side of the building. To accommodate this, the area of the existing north parking lot will be reconfigured to only serve as a drive for emergency vehicles. This will require the reconstruction of the public entrances on both the east and west sides of the north parking area.
5. It is anticipated that utility services will be similar to existing although some or all utilities may need to be reconstructed to accommodate the proposed construction. Consideration may also be given to placing overhead service to the building underground.
6. A new screen wall/retaining wall will be constructed in the area of the communications tower and a new outdoor patio/fitness area will be added on the west side of the communications tower.
7. Generator(s) with a masonry screen wall will be constructed at the southeast corner of the building.
8. The main entrance is generally in the same location it is now, facing Douglas.
9. The lower level will be approximately half of the first floor.

Option P3A

This option is for an expanded site with property acquired on the north side of the fire station. A survey will need to be prepared for the expanded area as the survey that was part of this study only includes the existing property. This option is a complete site reconstruction. The proposed Apparatus Bays will be turned 90 degrees compared to the existing building although the main entrance to the station would remain on Douglas.

1. The bays will face north and south instead of east and west. If the FF elevation is at approximately 1028, same as the existing building, the slope of the rear (south) apron will be approximately 2.5% at the center and the slope of the front (north) apron will be approximately 10% at the center. The aprons will also have some slope from south to north. The opportunity to lower the building for the purpose of reducing the slope of the north apron is limited by the need to maintain positive drainage from the west side of the building onto SE Douglas Street.
2. Demolition of the expanded property will need to occur including two existing buildings and an existing parking lot.
3. The main entrance to the fire station is located on Douglas.
4. A parking area bisected by a retaining wall is proposed for the southeast portion of the property. The upper parking area will be accessed from the rear apron and the lower parking area will be accessed from the east alley. Approximately 16 +/- parking spaces can be provided in this area.
5. Auxiliary bays will be constructed at the southwest portion of the building with a drive connection to SE Douglas Street.
6. Utility services will need to be re-routed/reconstructed as necessary to accommodate the new building location.
7. A new screen wall/retaining wall will be constructed in the area of the communications tower that will also contain the generator(s).
8. An outdoor fitness area will be provided in the southwest corner of the property.
9. The outdoor patio space would be located in the northwest corner of the Living Quarters/Office area underneath the second floor.
10. The lower level will be approximately half of the first floor.
11. Fitness is separated from the rest of the station due to the noise created by the space.

Note on Option P3A: While we understand that negotiations will need to occur with property owners and the City of Lee's Summit for this option to be a possibility we were tasked with the responsibility of reviewing all potential options for the future fire station. When we think of designing a station to last another 50 years we look at how best to accommodate that need by designing with best practices in fire station design

Concept Budgets

As part of the Feasibility Study Newkirk Novak Construction Partners has performed a series of cost analyses using cost history from local and non-local fire station projects along with conceptual budgets for 3 different design options for Fire Station #1. The following data shows the results from those cost analyses. Newkirk Novak appreicates the opportunity to provide support for this feasibility study.

The chart on page 6 in Appendix I is a cost analysis between Lee's Summit Fire Station #3, a fire station in the Des Moines area, and Lee's Summit Fire Stations 4 & 5, and Newkirk Novak Conceptual Estimates for Fire Station #1 Options 2 & 3.

In the chart on page 6 in Appendix I, Lee's Summit Fire Station #3 is the left two columns. The first column is the original costs and second column is the project cost escalated to today's dollar. Columns labled "Des Moines" and "Fire Station 4 & 5" are costs from a fire station project in the Des Moines area and Lee's Summit Fire Stations 4 & 5. The costs listed for the Des Moines project are budget costs from another construction manager at risk and the budget was based on 65% construction documents. The costs listed for Fire Stations 4 & 5 are subcontractor contract hard costs for 100% construction documents. Columns labeled "FS 1 Option 2" and "FS 1 Option 3" are taking the cost per square foot from Lee's Summit Fire Stations 4 & 5 for each trade and applying that to the total square footage for Fire Station #1 Options 2 & 3. Columns labeled "FS 1 Option 2" and "FS 1 Option 3" have been escalated and that escalation is reflected in the costs shown.

Newkirk Novak provided conceptual budgets based off WSKF conceptual designs for Fire Station #1. The chart on page 4 in Appendix I shows the summaries from those budgets. Option #1 consists of renovating the current building with two small additions. Option #2 consists of demolishing the existing building and constructing a new building in the same location. Option #3 includes demolishing the existing building and constructing a new building but extending the property boundaries of the site to the north which would include the demolition of adjacent buildings.

Appendix A – Space Programming

A. LOBBY, ADMINISTRATION & SUPPORT SERVICES

RM. NO.	ROOM NAME	DESIGN REQUIREMENTS	RM. SIZE (L)	RM. SIZE (W)	PROPOSED AREA	LEVEL	NOTES
A-1	Vestibule	safe haven (locking after entry, if needed), baby box, open 24/7	8	8	64	G	call system to dispatch, door bell system thru station alerting, video sur., facing Douglas Street, what are the design implications of "safe havens"?
		Area above is accessible by the public 24/7					
A-2	Lobby	open area for circulation	8	14	112	G	
A-3	Flex Space/Meeting Room	12 people, movable tables and chairs, large monitor, wireless & HDMI connection, sink, plumbed water for coffee, lower cabinetry	13	25	325	LL	near the front door, meeting space to host downtown meetings, facing Douglas Street
A-4	Public Restroom	accessible, unisex	7	8	56	G	not for general public use due to location downtown and potential for overuse
		Area above is accessible by the public when allowed					
A-5	Watch Room	Small space overlooking lobby, include bullet resistant walls/glass, pass-thru window	7	7	49	G	this space is not planned to be staffed but meant to welcome people to the station safely
A-6	Training Classroom	20 people (24), movable tables and chairs, large monitor, wireless & HDMI connection	25	32	800	LL	near Dayroom/Living Space, doesn't need to be near the front door
A-7	Training Storage	cabinets (upper/lowers), space for training props on shelving	8	10	80	LL	do not need space to store tables and chairs, can push tables and chairs to one side of the Training Classroom
A-8	Crew Office/Report	2 workstations for report writing, HIPAA concerns so privacy needed	7	9	63	G	near dayroom, similar to LS #3
A-9	~~Common Area/ Public Shelter~~	~~need to determine if this space is part of the project or not (currently sized as a 40 person training room) should this be hardened or ICC 500 rated?~~					~~this has been the large training room in the lower level of the existing fire station and serves the people of downtown Lee's Summit, if renovation or a new facility will this feature remain?~~
A-10	Company Officer 1	desk, guest chair, small table with 3-4 chairs	11	17	187	G	similar to LS #3
A-11	Company Officer 2	desk, guest chair, small table with 3-4 chairs	11	17	187	G	similar to LS #3
A-12	**Operations Chief** Office	desk w/ credenza, 2 guest chairs, 4 person table & chairs	12	22	264	G	part of a suite with bunk/restroom, similar to chief suite in LS #3
A-13	Bunk	bed, recliner, tv, 4 lockers, no ceiling fans	12	16	192	2	*look at ways to place lockers for all three together in one area outside of the bunks*
A-14	Bunk Restroom	sink, toilet, shower (easy access controls), shelving, robe hooks	7	11	77	2	
A-15	**Safety Officer** Office	desk w/ credenza, 2 guest chairs, 4 person table & chairs	12	22	264	G	part of a suite with bunk/restroom, similar to chief suite in LS #3, captain level position
A-16	Bunk	bed, recliner, tv, 4 lockers, no ceiling fans	12	16	192	2	
A-17	Bunk Restroom	sink, toilet, shower (easy access controls), shelving, robe hooks	7	11	77	2	
A-18	**Shift Inspector** Office	desk w/ credenza, 2 guest chairs, 4 person table & chairs	12	22	264	G	part of a suite with bunk/restroom, similar to chief suite in LS #3
A-19	Bunk	bed, recliner, tv, 4 lockers, no ceiling fans	12	16	192	2	
A-20	Bunk Restroom	sink, toilet, shower (easy access controls), shelving, robe hooks	7	11	77	2	
A-21	Suite Kitchenette	small kitchenette space that would serve the three office suites above, include table for 4 people	12	12	144	G	
A-22	Ice Machine	commercial size with water connection and floor drain	5	7	35	G	locate near the bays
A-23	General Storage	small space for office supplies	3	7	21	LL	near offices
A-24	Janitor 1	first floor - mop sink, shelving, mop hooks	5	7	35	G	located as req'd per building layout

A-25	Janitor 2	lower level - mop sink, shelving, mop hooks	5	7	35	LL	located as req'd per building layout
A-26	Water/Sprinkler		10	11	110	LL	
A-27	Electrical		10	11	110	LL	
A-28	Mechanical		10	11	110	LL	
A-29	Technology	2 server racks, provide air conditioning to the space	7	9	63	LL	
				Lobby, Admin., & Support Serv. Subtotal	**4,185**		
				Grossing Factor (33%)	**1,381**		
				Lobby, Admin, Support Services Total	**5,566**		

B. LIVING QUARTERS

RM. NO.	ROOM NAME	DESIGN REQUIREMENTS	RM. SIZE (L)	RM. SIZE (W)	PROPOSED AREA	LEVEL	NOTES
B-1	Kitchen	(2) 46" heavy-duty residential gas ranges w/ hoods, 2 dishwashers, sink with single, deep bowl, hand/bar sink next to plumbed coffee, 5-6 bar stools at the island, undercounter ice machine, 3 pantries, 2 microwaves, electric skillets, 3 refrigerators, undercounter trash with no top opening, plyboo	20	30	600	G	operable windows, lots of power (including in the island), ADA counter height at coffee bar only *NOTE: 2 cooktops needed as 1 was not enough at LS #3, larger burners needed for large pots, WSKF concern on if this could trigger concerns with codes dept. although we will plan on separate hoods for the ranges*
B-2	Dining	size for 18 people (future), table for 14 needed at move-in	16	34	544	G	
B-3	Day Room (1)	**provide space for 14 recliners**, provide in-floor power that then powers tables for ease	32	38	1,216	G	tables need power, usb/usc
B-3a	**Day Room (2)**	**does it make sense to include a second Day Room due to the number of staff in this station?**	16	38			**the design committee was split on if a second dayroom was desired**
B-4	Unisex Restroom	accessible, unisex	7	7	49	G	
B-5	Captain Bunk (2)	bunk, night stand, small desk for computer, no ceiling fans	9	13	234	2	*LSFS#3 captain's have a bunk/ nightstand/recliner/tv but no desk* *LSFS#4/5 show a bunk/nightstand/ recliner/tv with desk*
B-6	Locker Alcove	4 lockers per bunk room	8	16	256	2	just outside of bunk, noise control will be a concern for all locker alcoves
B-7	Bunk Restroom (2)	sink, toilet, shower (easy access controls), shelving, robe hooks	9	9	162	2	adaptable showers important
B-8	Standard Bunk (12)	space only for bunk and night stand, no ceiling fans	9	9	972	2	
B-9	Locker Alcove	3 lockers per bunk	7	11	448	2	just outside of bunk, noise control will be a concern for all locker alcoves
B-10	Bunk Restroom (12)	sink, toilet, shower (easy access controls), shelving, robe hooks	7	11	924	2	adaptable showers important
B-11	Personnel Laundry	washer/dryer, counterspace to fold clothes, cabinetry for storage, sink	7	13	91	2	need to determine if utility sink or standard/in-counter sink
B-12	Wellness Room	destress and lactation space with chair, lower cabinets, small undercounter refrigerator,	9	10	90	G	
B-13	Fitness	equipment list to be provided by the health & wellness committee - **WSKF to plan for double the equipment at Stations 4 & 5, McCaw to provide equipment list.**	**20**	**32**	**640**	**LL**	no occupied spaces below, access to outdoors desired, **size is larger than LS #4 & 5 (320 SF)**
B-14	General Supply Storage	space for wire shelving	7	13	91	2	similar to LS #3
B-15	Janitor's Closet	mop sink, shelving, mop hooks	5	7	35	2	
				Living Quarters Subtotal	**6,352**		
				Grossing Factor (33%)	**2,096**		
				Living Quarters Total	**8,448**		

C. APPARATUS BAYS

RM. NO.	ROOM NAME	DESIGN REQUIREMENTS	RM. SIZE (L)	RM. SIZE (W)	PROPOSED AREA	LEVEL	NOTES
C-1	Apparatus Bays	bifold doors (out) at front, standard ovhd doors at rear, 4 drive through bays, approx. 70-75 ft in depth, radiant heat floor/aprons (full length)/site sidewalks, hvls fans, airvac 911, electrical/air/water drops, undercarriage wash (front & back of bays), boot wash w/ dryer and sink just inside apparatus bay	75	78	5,850	A	ceiling height is important (lower is better for a more traditional-old feel), if fire poles are used: 4 bunks/pole
C-2	Auxiliary Bay	requirements align with Apparatus Bays above, for Chief & Shift Inspector vehicles	24	31	744	A	near Offices for quick response times
C-2	Radio/Battery Alcove	off apparatus bay floor in alcove with lower cabinetry for storage, power strip along wall				A	
C-3	Hose Storage Alcove	off apparatus bay floor in alcove, space for 2 rolling racks	4	14	56	A	racks dimensioned as 2' x 6'
C-4	Hose Dry *(Potential Tower?)*	winch system from apparatus bay ceiling	10	10	100	A	could a tower be incorporated into design for the iconic look, hose drying and/or the elevator shaft?
C-5	Compressor Room	space needed for a vertical air compressor, SCBA, and cascade system	12	12	144	A	located on the south side of bay for dirty/decon uses
C-6	SCBA Fill Room	space outside of the Compressor Room to fill tanks, provide storage space	3	12	36	A	in the Workshop along one wall, adjacent to Compressor Room
C-7	Workshop	WSKF standard workbench, pegboard	11	12	132	A	size similar to LS #3
C-8	General Bay Storage	6' x 8' coiling door	10	12	120	A	
				Apparatus Bays Subtotal	**7,182**		
				Grossing Factor (24%)	**1,724**		
				Apparatus Bays Total	**8,906**		

D. DECONTAMINATION PROTOCOL

RM. NO.	ROOM NAME	DESIGN REQUIREMENTS	RM. SIZE (L)	RM. SIZE (W)	PROPOSED AREA		NOTES
D-1	Gear Storage / ICC-500 Storm Shelter	radiant heat floor (may opt to use a different heat source due to coordination issues during construction for this space and other apparatus bay support spaces), 2 sets of gear + wildland set = 3 sets, tote/gear bay storage on one wall, provide dehumidifier	21	38	798	A	similar to LS #3 **count: 17 x 3 shifts = 51 sets (second set of gear & wildland gear will be located in tupperware bin under gear grid lockers so gear grid lockers need to be mounted higher than standard to accommodate this request, TOTAL COUNT: 51 lockers**
D-2	Decon Restroom 1 / ICC-500 Storm Shelter	unisex restroom - sink, gross decon shower, toilet, clothing cubbies	6	9	54	A	adjacent to gear wash & gear storage
D-3	Decon Restroom 2/ ICC-500 Storm Shelter	unisex restroom - sink, gross decon shower, toilet, clothing cubbies	6	9	54	A	adjacent to gear wash & gear storage
D-4	Gear Wash	extractor, washer, & dryer on housekeeping pads, radiant floor heat, scba/ppe cleaning process - (2 or 3 compartment sink with drain boards, meiko washer, 1 compartment sink, stainless steel table, gear hang dry system (sim. to LS #3), open to bay, mop sink	14	25	350	A	need to discuss how scba and ppe equipment will be dried, arrange so front of extractor aligns with washer/dryer
D-5	Decon Wash Area	similar to stations 4/5, stainless steel 2 basin w/ drainboard on one side, wash off large areas	3	8	24	A	could be part of the Gear Wash room as part of scba/ppe wash process
D-6	Medical Storage	wire racks	12	12	144	A	directly off bays, pressurized space like vestibules
D-7	(2) Bay Vestibules	pressurized space between green and red zones; tack mats for boot contaminants	8	8	128	A	
				Decontamination Protocol Subtotal	**1,552**		
				Grossing Factor (33%)	**512**		
				Decontamination Protocol Total	**2,064**		

E. SITE

RM. NO.	ROOM NAME	DESIGN REQUIREMENTS	RM. SIZE (L)	RM. SIZE (W)	PROPOSED AREA	LEVEL	NOTES
E-1	Staff Parking	17 people/34-36 spots for shift change, currently use South alley for FD, some off site in adjacent city garage	SF as required to fit site plan				
E-2	Memorial Monument	to take the place of the city artwork area	SF as required to fit site plan				located where the tree was, sw corner
E-3	Apparatus Bay Aprons	radiant heat, reduce rear apron slope	SF as required to fit site plan				amount of radiant heat area to be determined by budget
E-4	Grilling Area	may be separate from the Outdoor Patio space if Outdoor Patio moves to the 2nd floor, provide gas and power	SF as required to fit site plan			G	adjacent to kitchen
E-5	Outdoor Patio	possible rooftop outdoor area to separate from downtown activities	SF as required to fit site plan			1 or 2	if located on the NW side, views of downtown/parades could be provided
E-6	Outdoor Fitness Space	desired	SF as required to fit site plan			G	adjacent to fitness room
E-7	Emergency Generator	new or existing to be determined through preliminary design, natural gas to run the full building	determined by load/need				if existing isn't large enough to serve the entire building it could be used as a back-up unit to power necessities.
E-8	Site Drives/Paving		SF as required to fit site plan				
E-9	Lawn/Green Space	low maintenance, turf, rock, native plants	SF as required to fit site plan				
E-10	Trash Enclosure	not needed, FD uses the City Hall dumpster					
E-11	Flagpole(s)	1 pole					WSKF to confirm if existing pole can be reused
E-12	Communications Tower	to remain as is, power/to tower may need to be rerouted depending on scope of work decided on as some power comes from the building	existing space to be planned around				tower is mainly a cellular tower that the city does not use, radio/communications for dispatch are located on water towers
E-13	Hydrant	existing, up front at the sw corner					use for tank refill
E-14	Signage	signage similar to stations 4 & 5 with the large number					

DESIGN / SPACE NEEDS SUMMARY

A. LOBBY, ADMINISTRATION & SUPPORT SERVICES	**5,566**
B. LIVING QUARTERS	**8,448**
C. APPARATUS BAYS	**8,906**
D. DECONTAMINATION PROTOCOL	**2,064**
Building Total	**24,984** *~25,000 Target*

Space Allocation

			ACTUAL SF w/ GROSSING FACTOR
LL	**Lower Level**	**2,294 SF**	***3,051***
A	**App Bay**	**8,734 SF**	***10,830***
G	**Ground Floor**	**4,223 SF**	***5,617***
2	**Second Floor**	**4,020 SF**	***5,346***

APPARATUS LIST

NO.	APPARATUS	DESCRIPTION	L	W	H	RADIUS	NOTES
A1	Pumper	first out vehicle	35'				
A2	Truck	first out vehicle	45'				
A3	Ambulance 1	first out vehicle	26'				
A4	Ambulance 2	first out vehicle	26'				
A5	Reserve Ambulance		26'				
A6	Reserve Pumper		35'				
A7	Small Boat/Trailer	**FD to determine if this can be parked at another location**	25'				length is trailer tongue to boat motor
A8	Response Chief Vehicle	Tahoe	18'				**could be located in a separate bay space with the Shift Inspector vehicle**
A9	Utility Truck	F150 (4 door cab) **FD to determine if this can be parked at another location**	20'				
A10	Shift Inspector	F150 (4 door cab)	20'				**could be located in a separate bay space with the Response Chief**

ADDITIONAL BUILDING DESIGN REQUIREMENTS

1) access control; compatible with existing facilities
2) video surveillance; compatible with existing facilities
3) other special systems; compatible with existing facilities
4) fire sprinkler
5) irrigation system
6) green building strategy, use affordable LEED Principles, not seeking LEED certification
7) building codes
   - when will 2024 be adopted?
   - 2018 International Building Code
   - 2018 International Plumbing Code
   - 2018 International Mechanical Code
   - 2018 International Fuel Gas Code
   - 2018 International Residential Code
   - 2018 International Fire Code
   - 2017 National Electrical Code
   - ICC/ANSI A117.1-2009, Accessible and Usable Buildings and Facilities
8) multi-story station: vertical circulation needed (stairs, elevator, fire poles)
9) if possible, would like to use the space under stairs for storage, provide sprinkler head here
10) confirm ADA requirements for the new station including accessible/adaptable bunk restrooms with bldg. codes/Sharon
11) confirm if air quality monitoring in the living/office/green zone is important to the city
12) **Mail comes to a centralized location, not to each station.**
13) **Drinking fountain w/ bottle fill at public restrooms and fitness**
14) **No receptionist will be needed at this downtown station.**
15) **A small kitchenette space is not needed in the training room.**
16) **No uniform storage is needed.**
17) **The design committee was divided on if two dayrooms vs. one was a good idea.**
18) **The City does not wish to think about electric vehicles when designing this station as they have their apparatus for the next 13 years already planned out. The City will figure it out if/when the time comes.**
19) **Architectural Style - keep in line with the architectural style that is common in the old downtown area. The desire would be for the new building to have a very old feel.**

Appendix B – Conditions Assessment Report & Photos

EXISTING FACILITY ASSESSMENT SURVEY

FACILITY NAME:	Lee's Summit Fire Station #1
ADDRESS/LOCATON:	207 SE Douglas St, Lee's Summit, MO 64063

*Original building was constructed in **1974**, Building has undergone renovations throughout its **50** year lifespan. A brick façade was added to the structure in **2005** and some minor interior renovation work was completed that same year.*

STRUCTURE

Date of Construction	**1974**
Date(s) of Renovation/Expansion	**2005** - Brick Skin was added to the building with some minor interior reconfigurations
Building Age	**50 years**
Construction Type	*IIB, but has had many renovations throughout the years and may include wood framing in various locations which make it Type VB.*
Building Construction	Precast double-tee structure & exterior with additional brick façade. Interior metal stud, cmu or cast in place concrete. *Areas of non rated wood construction.*
Building Area *(SF)*:	Rentable Area Lower Level – 5,404SF First Floor – 5,579 SF Apparatus Bay – 7,012 SF Second Floor – 5,477SF **23,472 SF Total** Gross Area (including exterior walls) Lower Level – 5,677 SF First Floor – 13,229 SF Second Floor – 6,263 SF **25,169 SF Total**
Number of Stories:	Two levels above grade, one level below grade
Legal Description:	See title report for more details: HOWARDS 1ST ADD TO L S; S1/2 OF LT 7 AND ALL OF LTS 8 AND 9 BLK 17 AND ALL VAC ALLEY; LY ADJ TO LOTS 8, 9, AND 4 BLK 17

Site Area *(SF & Acres):*	SF:	**41,095**		Acres:	**0.94**		
Generator	**X**	Yes		No			
Auxiliary Power	**X**	Full Facility		Partial Fac.	**Natural Gas**	Fuel Source	

General Condition	*Fair condition overall; the size of the generator will need to be compared to what will be needed for the future building*
Maximum Station Staffing Capability	8 Squad, 17 Administration, 5 Dispatch
Seismic Protection *(if required)*	No known seismic protection provided
Category IV Conformance *(if required)*	Passes Category IV requirements per original drawing notes
ICC-500 Conformance *(if applicable)*	No; this standard was created as part of the 2015 IBC

Hardened Space / Storm Shelter	**X**	Yes	**X**	No	
Special Considerations	All of the requirements listed above will need to be met if the building renovation is valued at 50% or more of the building's value which is extremely likely.				

HEALTH / WELLNESS & SAFETY / SECURITY

Sprinklers / Smoke Detection	**X**	Sprinklers	**X**	Smoke Detection	*NOTE: no sprinklers in the apparatus bays*

Haz. Bldg Materials *(lead/asbestos/etc.*	Testing by Terracon as part of Facility Assessment, results show lead and asbestos are both present in the building
Entry Flooring/Trip Hazards	Porcelain tile w/ removable mat; WSKF advises against using movable rugs at entryways as they can create tripping hazards.
Mechanical System Type/Age	Various ages, see MEP report

Natural Light in Spaces	Lower Level - no natural light, First Floor - natural light in most spaces minus a few offices and breakroom, Second Floor - natural light in most living spaces (dayroom has minimal natural light) minus the majority of the sleeping bunks and the womens restroom.					
Security	X	Access Ctrl		Fencing	X	Video Surveillance
Other Security Measures	None, although the building should have one to meet ADA					
Fire Extinguishers	Unknown locations at this time					

BUILDING ASSESSMENT

Building Envelope / Exterior Finishes	Precast double-tee structure with brick and cast stone exterior façade
Foundation System	Cast-in-place concrete grade beams and formed Lower Level walls, Apparatus Bay is on piers
Floor System(s)	Slab on grade concrete at Lower Level and Apparatus Bays
Window Material	Aluminum frame, insulated glass.
Roof Construction	Precast double-tee structure with lightweight concrete above
Roof Covering	TPO Membrane roof, roof is approximately 23 years old There are ongoing issues with the roof including issues with the lightweight concrete under the membrane. The City of Lee's Summit was quoted $450K to replace the roof and over the wall flashing Summer of 2022 so replacement is well over $500K now.
Exterior Doors	Storefront and hollow metal man doors, overhead sectional apparatus bay doors
Interior Partitions	Mostly stud framing with a concrete demising wall between the living/offices and the apparatus bays
Interior Flooring	Sealed concrete, VCT, carpet tile, epoxy, porcelain tile, athletic rubber flooring, the fitness room is mostly carpet with a few fitness mats
Ceilings	Mostly drop acoustical tile ceilings, apparatus bays are open to exposed concrete structure
Other (Casework, special features)	Plastic laminate casework
Elevator(s) ***(quantity/type)***	None, although the building should have one to meet ADA

SITE ASSESSMENT

Topography	Site slopes so that Douglas Street is higher than the alley behind the fire station creating a very steep slope at the rear apparatus bay approach.					
Landscaping Quality	Landscaping is rock, grass, and plantings.					
Site Lighting	Pole security lighting at rear apron and NW and SE parking.					
Storm Water Drainage	No requirements when constructed, site is almost 100% impervious materials					
Downspouts Below Grade	X	Yes		No		N/A
Sustainability	Not a consideration in 1974					
Paving & Concrete	Pavement:	Concrete paving at apparatus drives alley and sidewalks. Parking is asphalt. Brick pavers at front curb (parking strip). Asphalt and concrete drives and parking are in poor condition.				
	Curbs:	Concrete curbs throughout site				
	Joints:					
Parking Counts	32	Staff	0	Visitor	1	ADA (short one van accessible parking space
Other Parking ***(count/type)***	n/a					
Sidewalk ***(ROW connect, condition, accessibility)***	Sidewalk from building to public right of way					
Front Door Visible	X	Yes		No	Building entry is controlled and is visible from front desk, front desk position is moving off-site when Fire Administrative functions move to Operations Center	
Private vs. Public Space Separation	X	Yes		No		
Street Access Vertical Elevation	Slight slope up from the street to the front apparatus apron.					
Access & Egress To/From Site	Site is located in the center of downtown Lee's Summit and has good egress for fire apparatus from the site but the return access is less than ideal.					
Access & Egress To/From Site - Staff	Staff vehicles and personnel personal vehicles have adequate access to and from the site. Parking located to the north of the building in a parking lot and on the south side of the building off the alley.					
Access & Egress To / From Site - Visitors	Access is controlled at the main entrance vestibule for visitors. Reception responds to request to enter.					
Flagpole	X	Yes		No	1	Qty.
Other Site Structures ***(type/function)***	Property has communication tower, generators with a brick wall enclosure, and an outdoor artwork display area at the SW corner of the site.					
Site Risks/Other Observations	All storm water is surface drained.					

INTERIOR ACCESSIBILITY / ADA

Int./Ext. Doors ***(access clearance/threshold)***	X	Yes		No	Majority of doors meet ADA requirements but not all. This is to be expected due to the age of the facility.
Doors ***(handles/opening pressure)***	X	Yes	X	No	A few doors throughout the building have knobs vs. levers in the accessible route of travel. Knobs do not meet ADA.
Water Fountain ***(height/accessibility)***	X	Yes		No	Provided throughout
Signage ***(height / braille)***	X	Yes		No	Braille is provide on restroom signage
Elevator		Yes	X	No	

Floor Transitions ***(interior/exterior)***	X	Yes		No	Transitions appear to be flush
Floor Slopes ***(interior ramps, etc.)***		Yes	X	No	

PUBLIC ACCESSIBLE AREAS

Sinks ***(height, pipe wrap)***	X	Yes		No	
Dispensers/Accessory ***(mounting height)***	X	Yes		No	
Countertops ***(heights)***	X	Yes		No	
Grab Bars	X	Yes		No	
Protruding Objects - Accessible Route(s)		Yes	X	No	None observed
Public Access Rooms ***(toilets/training/etc.)***	X	Yes		No	Provided but location is not ideal for security reasons

EXTERIOR ACCESSIBILITY / ADA

ADA Parking Striping/Signage	X	Yes		No	
Access between ADA Parking & Building	X	Yes		No	
Other Access to Building		Yes	X	No	Not all entrances to the building meet ADA, exits along the north side of the building require stairs
Slopes of Accessible Access Pathways	X	Yes		No	Accessible route to the building appears to meet ADA

GENERAL BUILDING OBSERVATIONS

1. Building contains many layers of abandoned systems, cabling, plumbing etc.
2. Water pools at the exterior stair to the lower level
3. Major cracking above basement egress stair, repaired at least once in the past.
4. Brick along the basement egress stair has considerable salt damage.
5. Many cast stone pieces around the building have hairline fractures in them, some have cracking more severe.
6. Refer to MEP and Structural Assessments for additional information.

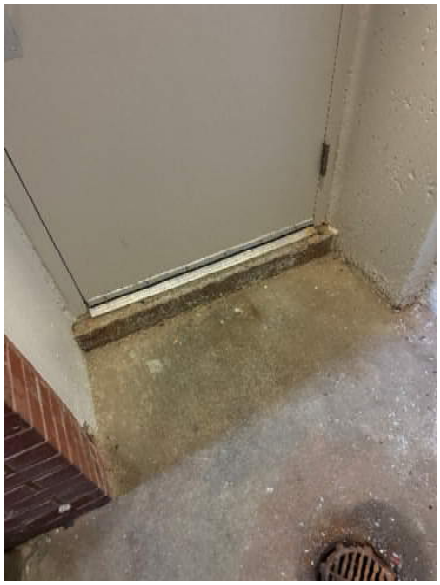
GENERAL SITE OBSERVATIONS

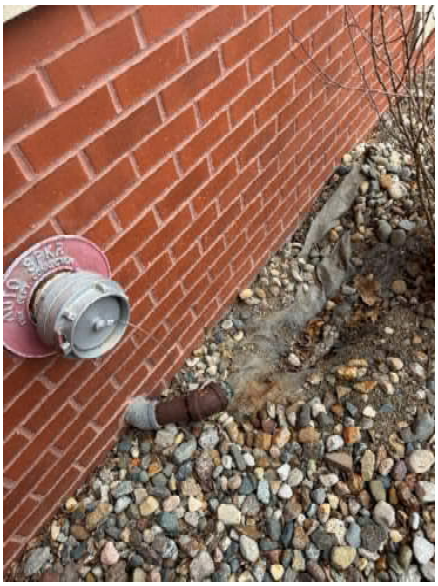
1. Front apparatus bay apron is not long enough to do engine checks without being in the street.
2. Rear apparatus bay apron is too steep and should be reduced to a more manageable slope for large apparatus.
3. Refer to Civil Assessment for additional information.





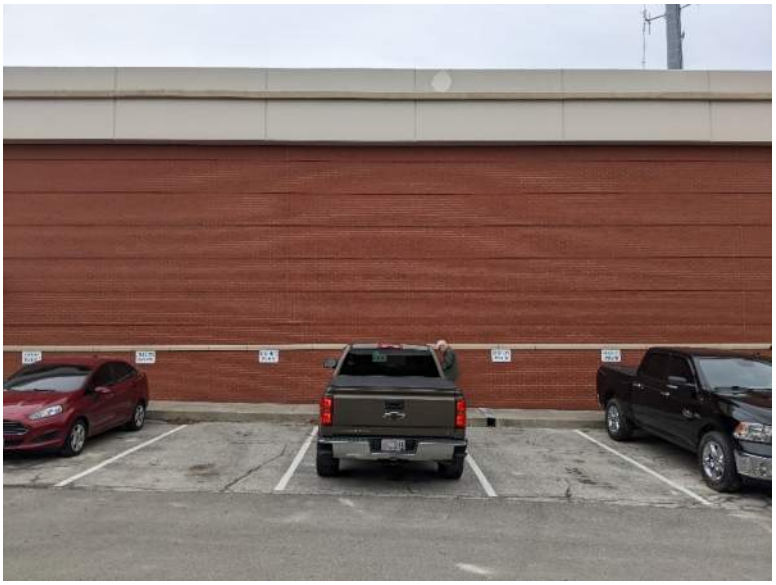


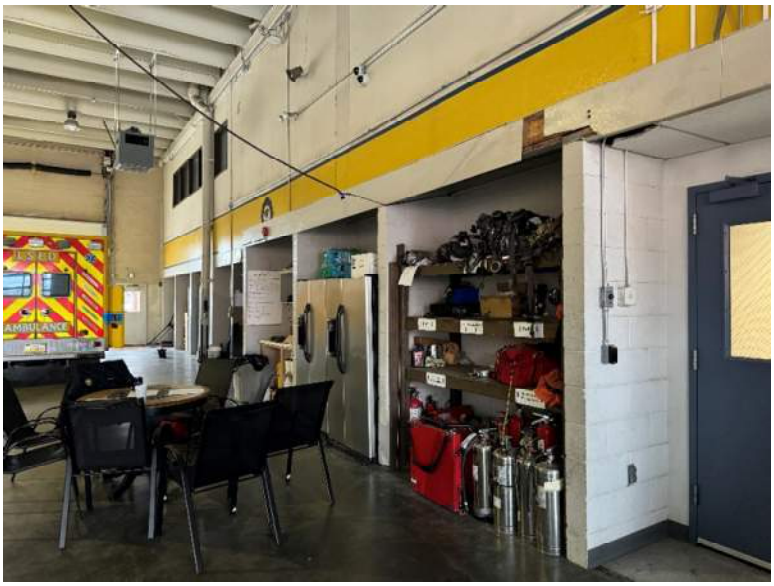



TO
6:00 PM

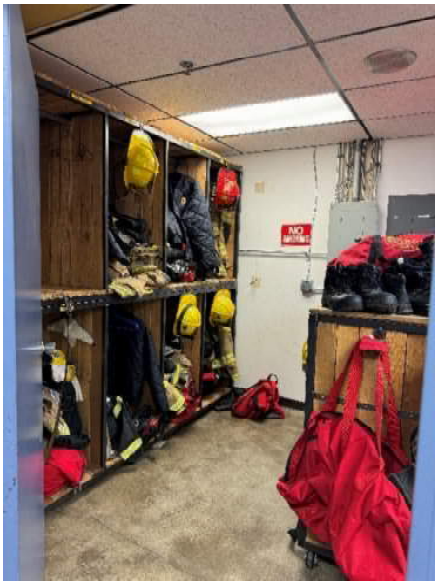

KOHLER

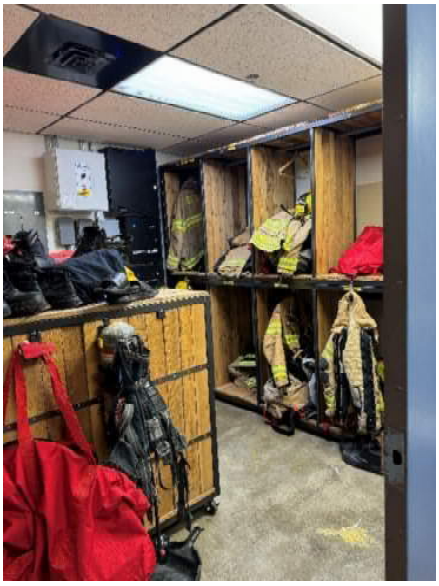


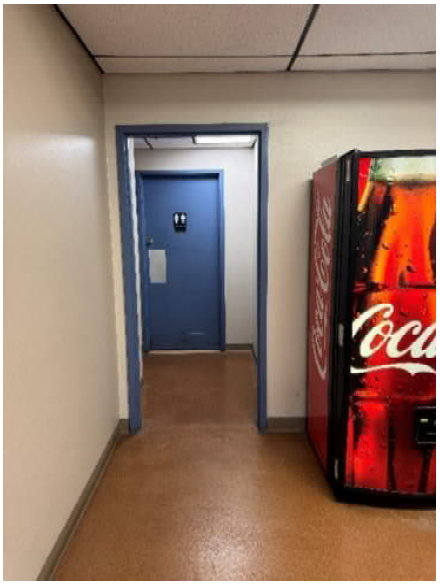

CRAFTSMAN



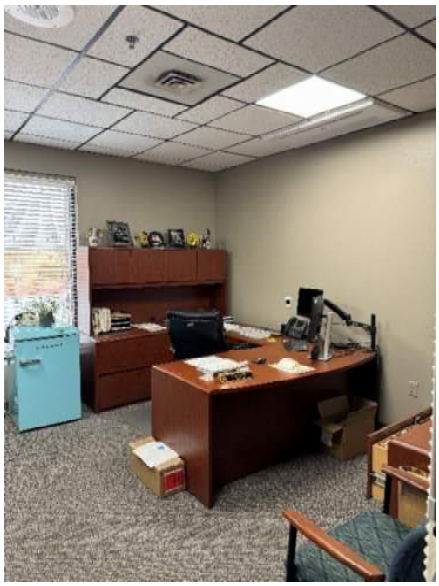

FLAMMABLE
FLAMABLE
INFLAMMABLE
CRAFTSMAN

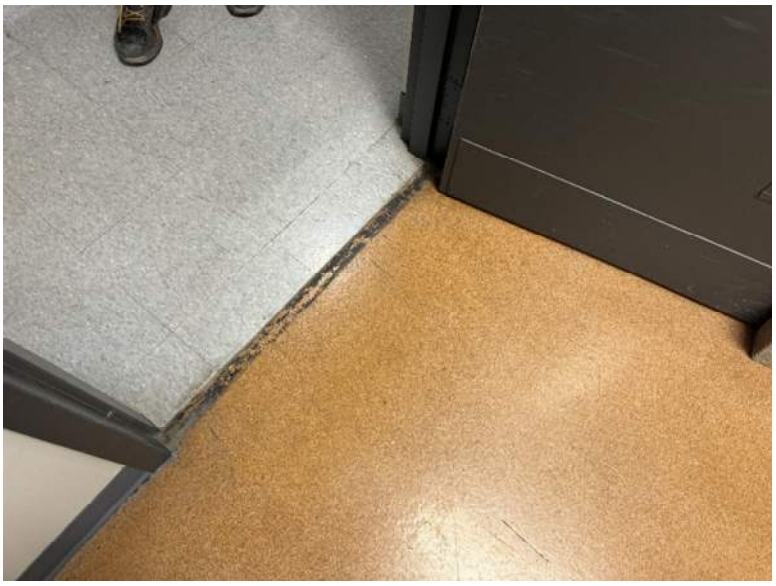


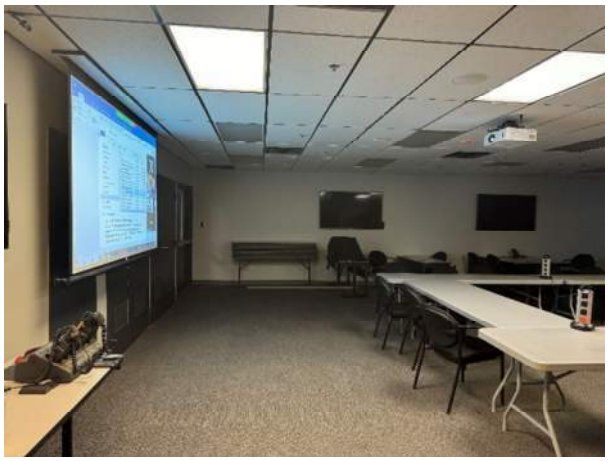


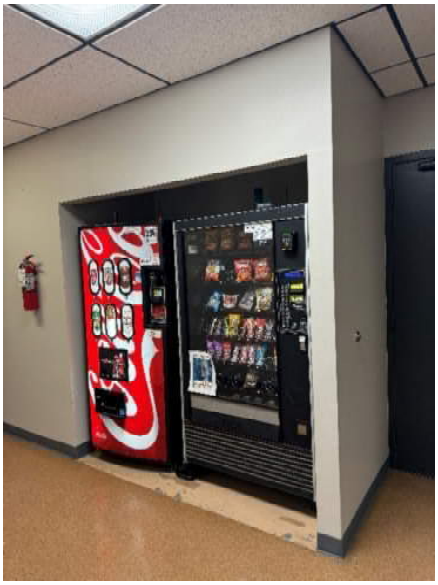


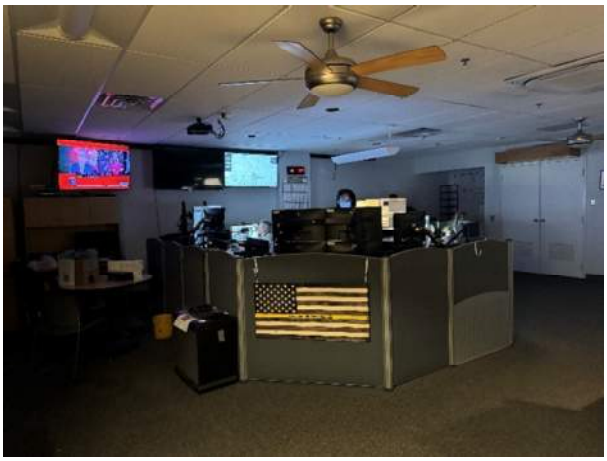
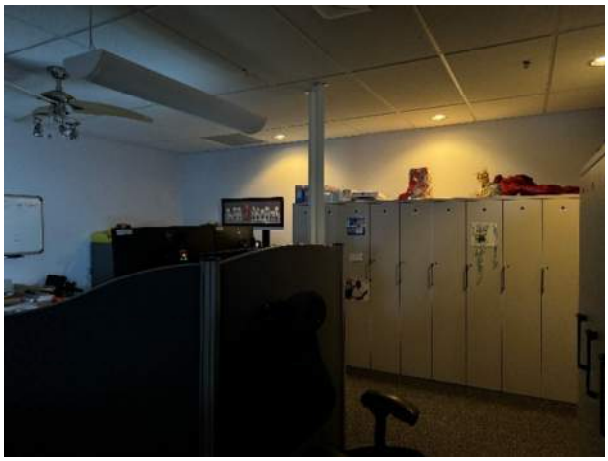

EXIT

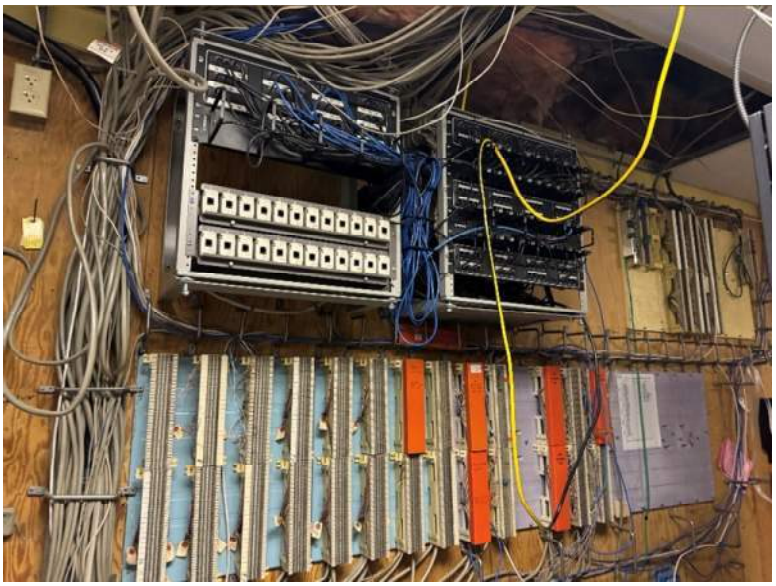
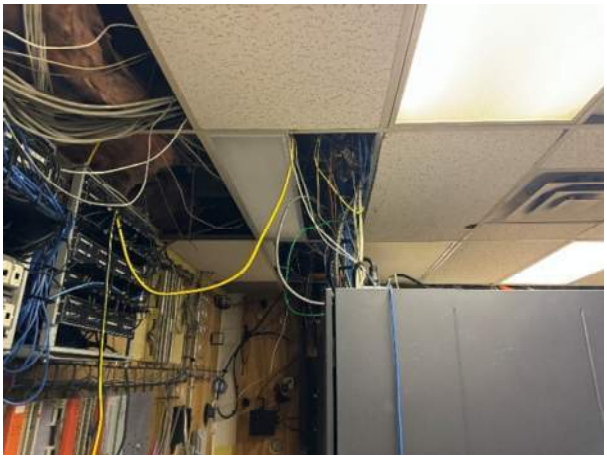


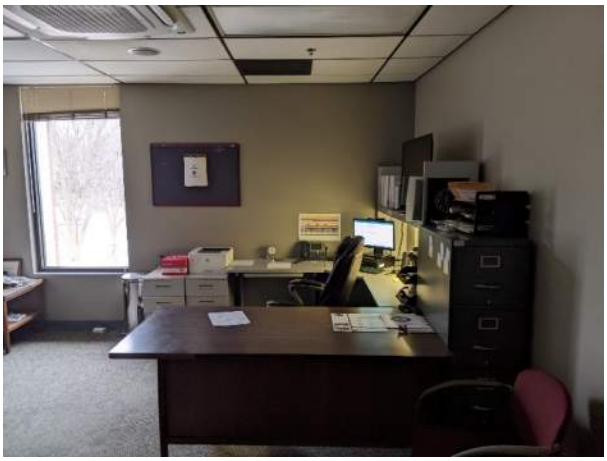


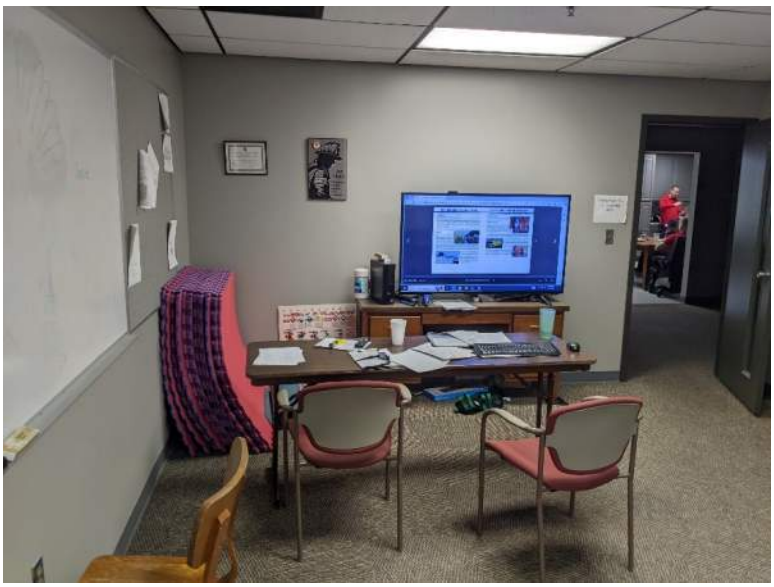


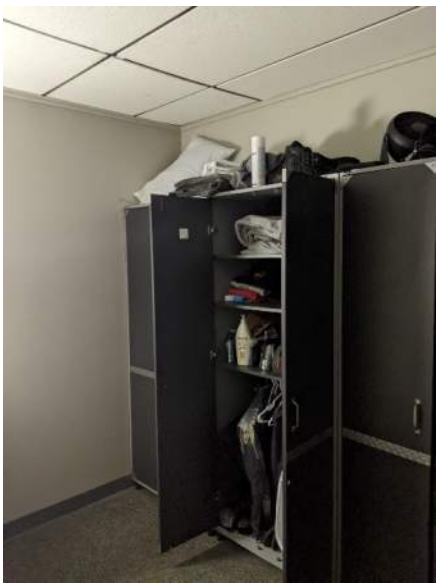


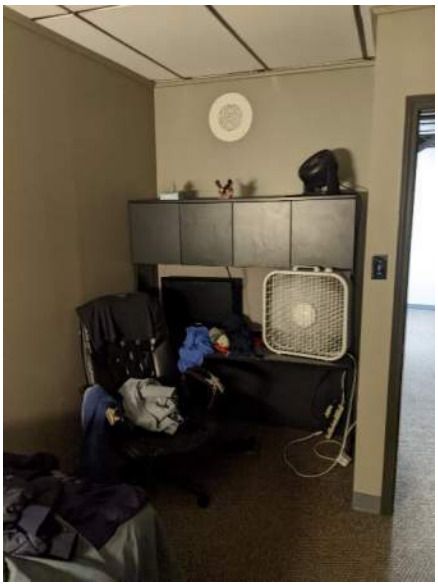



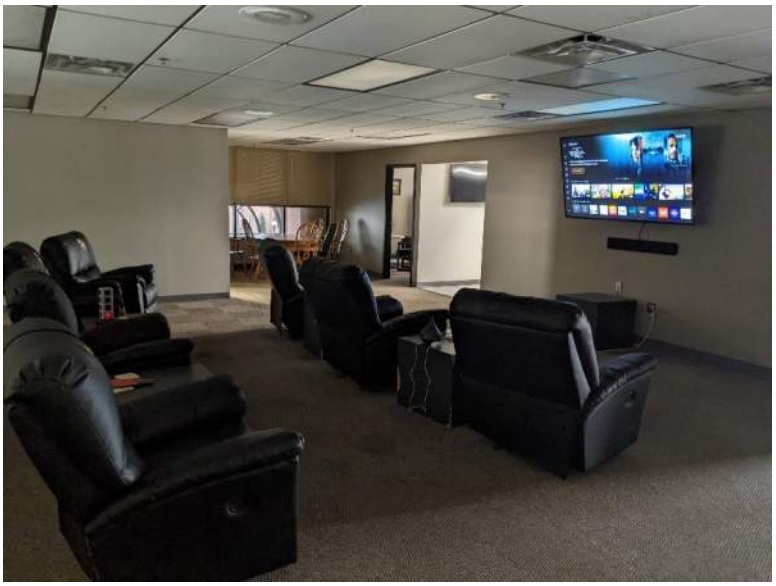



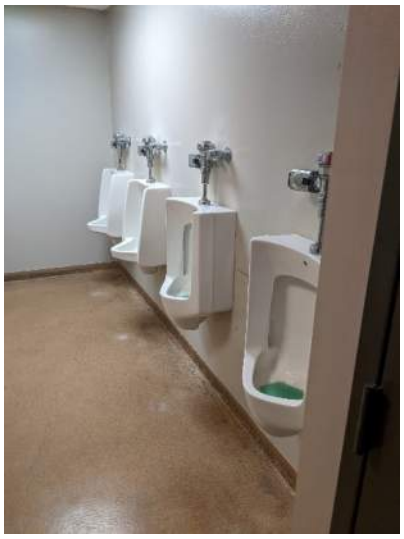
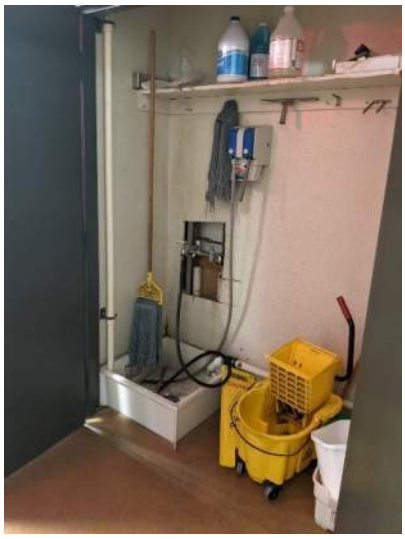
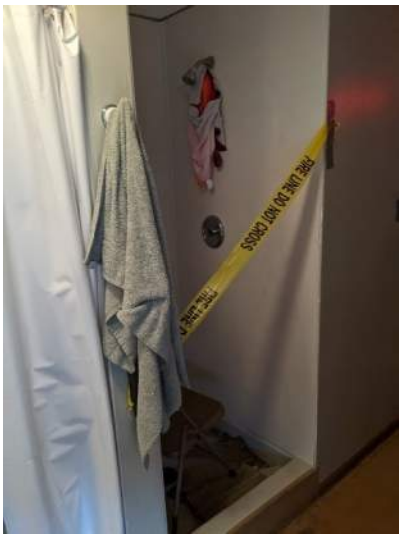
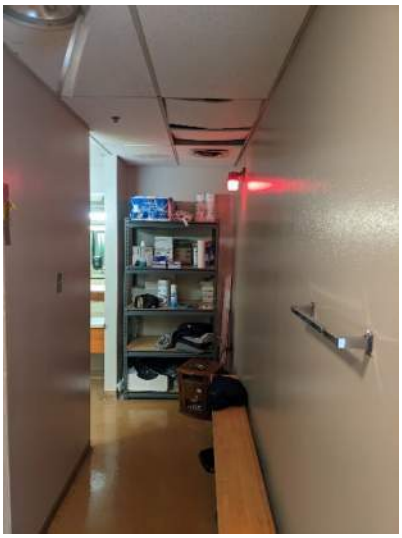














FIRE LINE DO NOT CROSS



Appendix C – Structural Engineering Assessment Report

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

ENGINEERING ASSESSMENT REPORT

Introduction

The design code used for the existing Fire Station #1 is not listed in the construction documents. The current design code for the City of Lee's Summit is IBC 2018. Below is a comparison of the design loads shown on the existing construction documents versus the design loads that would be required for the current building code using Risk Category IV.

Existing Structure Type

The existing structure is comprised of precast elements for the walls, floors, and roof structure. The precast elements are composed of double tee sections, inverted tee beam girders, and precast columns. The wall dividing the apparatus bay and the living quarters is a precast shear wall. The exterior of the building is load bearing double tee members.

Gravity Loading

1. Roof Loading
    a. Loads Listed on Existing Drawings
        i. Design Live Load — 30 psf
        ii. Superimposed Dead Load — 10 psf
    b. Current Code Load
        i. Live Load — 20 psf
        ii. Balanced Snow Load — 24 psf
2. Second Floor Framing Loading
    a. Loads Listed on Existing Drawings
        i. Design Live Load — 50 psf
            1. Partitions @ Office & Dorm — +20 psf
    b. Current Code Load
        i. The current IBC does not have prescriptive live loading specific to fire stations. This creates some ambiguity in the code regarding which live loading should be used for this type of facility. The generally accepted practice is to design fire facilities for office building live loading and/or design them for hotels and multifamily live loading. These assumptions would result in the following live load requirements for floors above the first level:
            1. Office buildings, corridors above first floor – 80 psf
            2. Office buildings, offices 50 psf + 15 psf
            3. Hotels, private rooms and corridors serving them – 40 psf
            4. Hotels, public rooms and corridors serving them – 100 psf

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

3. First Floor Framing Loading
    a. Loads Listed on Existing Drawings
        i. Design Live Load 50 psf
            1. Partitions @ Office & Dorm +20 psf
            2. Vestibule & Waiting Room 100 psf
    b. Current Code Load
        i. Design Live Load 100 psf
            1. This live load can be conservatively used for all the floor space. Corridors and Lobbies must be 100 psf, and corridors on the second floor must be 80 psf. Some of the designated rooms may be able to be justified as 50 psf + partition loads.

Lateral Loading on Main Lateral Force Resisting System

1. Wind Loading on Walls
    a. Load Listed on Existing Drawings
        i. Design Wind Load 25 psf
    b. Current Code Load
        i. Wind Load Peak Velocity Pressure 21.12 psf

2. Seismic demand
    a. The existing building was designed and constructed during the mid-1970's. Seismic design criteria were not implemented in the Midwest for the most part till the mid to late 1980s. Therefore, it is our assumption that no seismic design considerations were considered for the design of this structure. Nothing on the existing documents addresses seismic design criteria for the building. A separate seismic specific report will be included. Our findings will be listed in that report for all possible options regarding seismic analysis of the existing building.

Existing Structure Evaluation

A site visit was conducted to review the condition of the existing structure. The structure was found to be in acceptable condition given the age and construction type. Our review is limited to site observations only, and portions of the structure that are visible. Most of the structure is not visible due to architectural finishes. The exterior of the building underwent a remodel that added brick veneer to the exterior. The brick façade appears to be in general good condition with no significant signs of settlement or mortar cracking. Two items were identified in our site visit as areas of possible structural concern. Those items will be documented below.

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

Locations identified in site visit.

1. Double Tee roof beam at northwest corner of apparatus bay. It appears the double tee member might have been cast short and does not have full bearing on the precast wall corbel. There is a minor crack propagating from the double tee web at 45 degrees in the flange. We cannot determine with certainty why this double tee appears to be short. It is our opinion that this member was likely cast short and determined at the time of erecting to still be within acceptable tolerance for the precaster. While we cannot rule out movement of the structure which has caused this double tee member to shift, we would anticipate other signs of movement which were not perceived at the time of our visit. Therefore, we would conclude this was a precast fabrication error.
2. Spalling of precast concrete stairs at north exterior on grade exit. The bottom of the precast stair that leads to the basement level has a significant spalled piece of concrete at the stair to landing transition. This spall has comprised the concrete cover on the reinforcement and with repeated freeze thaw cycles and exposure to de-icing chemicals will lead to corrosion of the reinforcement. Removal of the spall and patching of the precast member is recommended.

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

Figure 1: North exit stair concrete spall.

Figure 2: Precast double tee bearing on precast corbel.

Appendix D – Seismic Evaluation Report

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

Seismic Evaluation Report Lee's Summit Fire Station #1

207 SE Douglas

Prepared for: City of Lee's Summit, MO

April 17, 2024

Table of Contents

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

Improving Lee's Summit Fire Station 1: Assessing Seismic Retrofit Possibilities

Background

Lee's Summit Fire Station 1, a cornerstone of downtown Lee's Summit, Missouri, has stood since the 1970s. In response to a request from the City of Lee's Summit, Missouri, Leigh + O'Kane conducted a seismic assessment of the building. This voluntary review aims to explore the potential for retrofitting and remodeling the facility to meet contemporary industry standards for fire safety facilities. It's important to note that this assessment isn't intended to bring the structure up to current building code standards. Instead, it follows the guidelines outlined in the ASCE 41 document, allowing facility owners to establish performance objectives and determine if they can be achieved.

Purpose

The city has expressed a desire to explore the feasibility of renovating the existing facility. As part of this process, a seismic evaluation is necessary to assess whether structural retrofitting of the existing lateral load resisting system is needed, feasible, and economically viable.

Methodology

The assessment began with a Tier 1 screening, a checklist-based procedure that identifies potential deficiencies based on the performance of similar buildings in past earthquakes. No nondestructive testing was conducted during this phase, and observations were limited to visual inspections using the original construction drawings provided by the City of Lee's Summit.

Key Information

Subject Property	Fire Station #1
Address	207 SE Douglas Lee's Summit, MO
Latitude and Longitude	38.913654, -94.376582
Risk Category	IV
Basic Performance Objective for Existing Buildings (BPOE)	Life Safey Structural Performance at BSE-2E Immediate Occupancy Structural Performance at BSE-1E

Understanding the Performance Objectives

The BSE-1E and BSE-2E represent earthquake hazards with a 20% and 5% probability of exceedance in 50 years, respectively. For comparison, new buildings are typically designed to withstand the Maximum Considered Earthquake (MCE), which has a 2% probability of exceedance in 50 years. A longer return period signifies a rarer, more severe earthquake event.

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

Analytical Approach

The ASCE 41 Tier 1 procedure involves a series of checklists to identify deficiencies quickly. Following the Tier 1 screening, a Tier 2 analysis is conducted to more accurately assess element demands and capacities identified as deficiencies in Tier 1.

Site Information

General

The building is in the downtown area of Lee's Summit Missouri.

Geotechnical and Seismic Hazard Information

Site-specific geotechnical report provided by Terracon was conducted on the property. The seismic site classification Class C.

Building Information

The building per the provided record drawings appears to have been constructed in the 1970s. Structure is precast concrete members comprised of double tee's, inverted tee girders, columns, and shear walls. 2 ½" topping slabs used on level 1 and level 2. The building is a 2-story structure with a below grade basement level under half of the building. Based upon review of the existing documents lateral loads in the building are assumed to be transfer to the foundations through precast wall separating the apparatus bay from the operations side of the building and through the double tee exterior load bearing walls. The double tee exterior load bearing walls are assumed to be connected to one another to create shear walls with aspect ratios that meet the ASCE 41 standards. Due to the nature of precast concrete design and construction the record drawings do not indicate the reinforcement and all connections of the precast members to one another. This design of the precast members is typically handled by the precast fabricator. The fabricator is responsible for creating shop drawings showing all reinforcement and connection details that the engineer of record reviews during the submittal phase of the project. Those shop drawings were not provided for our review of the building, therefore certain assumptions and/ or unknown status has been determined where that information is necessary for our evaluation. The building is an ASCE 41 type PC2 structure. Level of seismicity as defined per ASCE 41 table 2-6 is Low. This classification represents that this area of the county experiences low seismicity.

Tier 1 Structural Deficiencies

The following items were deficiencies identified as part of the Tier 1 assessment.

1. Topping slab: at precast concrete diaphragm elements not provided at all levels. The roof level diaphragm does not appear to have a topping slab poured.
2. Transfer to shear walls: diaphragms are connected for transfer of seismic forces to the shear walls. Per the construction documents no connection of topping slab was shown to the wall.

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

3. Topping slab to walls or frame: reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall. Construction documents do not indicate connection.
4. Foundation dowels: wall reinforcement is doweled into the foundation. No dowels indicated on 1/S-2.
5. Reinforcing steel: the ratio of the reinforcing steel area to gross concrete area is not less than 0.0012 in vertical and 0.002 in horizontal. Spacing of steel is equal or less than 18 in. reinforcing of the precast elements is not provided in the construction documents therefore unknown.
6. Precast connections: buildings with concrete shear walls, the connection between precast frame elements and the seismic-force-resisting system develops the capacity of the connected members. No connection details shown in construction documents therefore unknown.
7. Confinement reinforcing: for shear walls with aspect ratios greater than 2 to 1, the boundary elements are confined with spirals or ties with spacing less than 8db. No reinforcement of precast elements shown in construction documents therefore unknown.

Tier 2 Analysis

The ASCE 41 Tier 1 procedure consists of a series of checklists that quickly identify deficiencies. Based on the Tier 1 results, a Tier 2 analysis is performed to more accurately analyze element demands and capacities.

Missing building elements causing a Tier 1 deficiencies (such as topping slab, transfer to shear walls, and foundation dowels) were not required to be analyzed under the Tier 2 procedure. These elements are required to meet the BPOE and need to be installed as part of any seismic rehabilitation.

Other items identified in the Tier 1 analysis cannot be further invested without precast shop drawings and or further non-destructive testing to determine reinforcement.

Additions and Alterations to Existing

Introduction

If alterations or additions are made to the existing building the following section would be applicable and needs to be met in addition to the ASCE 41 findings. Per the ASCE 7 if certain thresholds are exceeded in modifying the existing structure and / or additions made to an existing building then the entire structure must be brought up to current building code.

Appendix 11 B Existing Building Provisions

The provisions shall apply to the design and construction of alterations and additions to existing structures.

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

Structurally Independent Additions

An addition that is structurally independent from an existing structure shall be designed and constructed in accordance with the seismic requirements for a new structure. This can be an option for any proposed additions to the existing site assuming no modifications to the existing building are required.

Structurally Dependent Additions

Where an addition is not structurally independent from an existing structure, the addition and alterations to the existing structure shall be designed and constructed such that the entire structure conforms to the seismic force-resistance requirements for new structures.

Exceptions: The entire structure shall not be required to comply where all the following conditions are met:

1. The addition complies with the requirements for new structures.
2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 10% unless the capacity of the element subject to the increased forces is still in compliance with this standard.
3. The addition does not decrease the seismic resistance of any structural element of the existing structure unless the reduced resistance is equal to or greater than that required for new structures.

Alterations

Alterations that increase the seismic force in any existing structural element by more than 10% or decrease the design strength of any existing structural element to resist seismic forces by more than 10% shall not be permitted unless the entire structure is determined to comply with provisions for a new structure.

Deficiencies

Elements of the building that do not meet current standards for new buildings that would require replacement or modifications to meet new building standards are as follows:

1. Ordinary precast shear walls are not permitted to be used in the seismic force resisting system for seismic design category C. Based upon the intended usage and site-specific data this building is a seismic design category C building. Intermediate precast shear walls are permitted to be used. Design requirements for intermediate precast shear walls are greater than ordinary precast shear walls. It is our judgment that the existing precast shear walls will not meet the requirements of intermediate precast shear walls and therefore will have to be replaced with new walls. This will require removal of all precast exterior walls and the separation wall between the apparatus bay and the living quarters. The replacement walls can be any of the following: cast-in-place concrete, precast concrete, or masonry.
2. Foundation Ties. Individual pile caps, drilled piers, shall be interconnected by ties. Currently the apparatus bay is on drilled piers and does not have interconnected ties in both directions. These tie elements would need to be added to the foundation system to meet the requirements for new buildings. This will require removal of the existing slab in the

209 SE Douglas St.
Lee's Summit, MO 64063
816.444.3144
www.leok.com

apparatus bay and excavation and placement of new concrete tie-beams between all columns that are currently on drilled piers.

Conclusions

Seismic demands have increased, and detailing demands have become more stringent since the original construction of the building. Some construction methods which were acceptable at the time of construction would not be acceptable by current building standards for new construction. The purpose of an ASCE 41 assessment is not to assess the building to current building code standards for new buildings but to identify deficiencies of the building construction which may keep them from meeting the desired structural performance levels. The specific deficiencies and mitigation recommendations are described in the sections. If a seismic strengthening for a building is desired, more detailed seismic analysis and construction documents can be prepared for permit submission and construction.

If the desire or need for alterations and additions is determined to be the path for the design team, then provisions in the ASCE 7 will need to be followed. The specific thresholds for those alterations and additions are described in the section Additions and Alterations.

The above conclusions represent two possible paths for structural scope of work on this facility. The appropriate path will be determined once the conceptual design for the overall project is determined. Consideration for architectural, mechanical, plumbing, and electrical work will need to be considered to determine if retrofit of the existing structure or holistic structural system replacement of required elements will be necessary.

Thank you for the opportunity to be of service. Please do not hesitate to call with any questions regarding the analysis.

Leigh + O'Kane, L.L.C.
Adam C. O'Kane, P.E.
Principal

Appendix E – Adjacent Off-Site Buildings / Structures Photos


Edward Jones

Appendix F – City / Fire Deficiency List

Fire Station 1 Deficiency List

- Not sure how to replace/repair the north lot entrance step.
- Roof is in poor condition
- All breaker panels/switchboards in the entire building. Difficult to keep up with electrical demands in apparatus bay, continually damaging equipment from low voltage.
- Multiple areas not on generator power.
- Automatic transfer switch for generator.
- Plumbing, collapsed lines under the building. Frequent pluming backups and failures.
- Drain in north stairwell will not drain (it has collapsed), creating ice/water hazard for employees.
- Parking areas on north and south of building are in poor condition.
- Drainage system in the apparatus bay does not meet capacity.
- Water heaters are in poor condition.
- Grade of back ramp is not conducive (too steep) for all apparatus.
- Exterior lighting needs replacement.
- Not ADA compliant.
- Unable to totally stop leak that goes into our server room in the Communications Center.
- Wi-Fi locks intermittent and challenging for employees. Would like to see hard wired.
- No gear extractor capabilities or decontamination shower or washer and dryer areas for crews before entering cold zone.
- Concrete in apparatus bay is deteriorating.
- Due to building restraints, no good location for washer and dryer in living areas (had to be put in a closet).
- No good area for crews to grill/cook outside.
- Floor loading limitations on the first and second floors - limits potential uses.
- Multiple post-occupancy penetrations through floors and walls throughout the years
- Continued bubbling/failure of paint on the upper portion of building
- Deteriorating utility mains coming into the building
- Minimal natural gas pressure availability throughout building, especially the second floor

Appendix G – Testing & Reports

Phase One Environmental Assessment

Hazardous Materials Testing

Geotechnical Report

Survey

Title Report

Phase I Environmental Site Assessment

Fire Station #1

207 SE Douglas St

Lee's Summit, Jackson County, MO

February 12, 2024 | Terracon Project No. 02237353

Prepared for:

WSKF Architects
110 Armour Rd
North Kansas City, MO

Prepared by:

Terracon Consultants, Inc.
Lenexa, Kansas

Terracon

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

15620 W 113th St
Lenexa, KS 66219-5102
P 913-492-7777
F 913-492-7443
Terracon.com

February 12, 2024

WSKF Architects
110 Armour Rd
North Kansas City, MO 64116-3503

Attn: Dalyn Novak
P: (816) 300-4101
E: dnovak@wskfarch.com

Re: Phase I Environmental Site Assessment
Fire Station #1
207 SE Douglas St
Lee's Summit, Jackson County, Missouri
Terracon Project No. 02237353

Dear Ms. Novak:

Terracon Consultants, Inc. (Terracon) is pleased to submit the enclosed Phase I Environmental Site Assessment (ESA) report for the above-referenced subject property (hereinafter known as the 'site'). This assessment was performed in accordance with Terracon Proposal No. P02237353 dated November 7, 2023.

We appreciate the opportunity to be of service to you on this project. In addition to Phase I services, our professionals provide other environmental, geotechnical, construction materials, and facilities services on a wide variety of projects locally, regionally, and nationally. For more detailed information on all of Terracon's services please visit our website at www.terracon.com. If there are any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

Terracon Consultants, Inc.

For:

Madeleine Quick
Assistant Scientist

Tracie A. Ragland
Senior Scientist

Attachments

Table of Contents

APPENDICES

APPENDIX A Exhibit 1: Topographic Map, Exhibit 2: Site Diagram

APPENDIX B Site Photographs

APPENDIX C Historical Documentation and User Questionnaire

APPENDIX D Environmental Database Information

APPENDIX E Credentials

APPENDIX F Description of Terms and Acronyms

EXECUTIVE SUMMARY

This Phase I Environmental Site Assessment (ESA) was performed in accordance with Terracon Proposal No. P02237353 dated November 7, 2023 and was conducted consistent with the procedures included in ASTM E1527-21, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. The purpose of this ESA was to assist the client in developing information to identify Recognized Environmental Conditions (RECs) in connection with the site as reflected by the scope of this report. The ESA was conducted under the supervision or responsible charge of Tracie A. Ragland, Environmental Professional. Madeleine M. Quick and Tracie A. Ragland performed the site reconnaissance on February 7, 2024.

Findings and Opinions

A summary of findings is provided below. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

Site Description and Use

The site is located at 207 SE Douglas St in Lee's Summit, Jackson County, Missouri and currently contains Lee's Summit Fire Station #1 which was built in the 1970's. The building contains approximately 14,275 square feet of space on the ground floor (offices and equipment bay), an approximate 6,800-square foot second floor (living quarters), and an approximate 6,800-square foot basement (meeting rooms and dispatch). The first floor offices, second floor, and basement are located in the northwest portion of the building while the four-bay equipment area is located on the southeast portion of the building. The remainder of the site consists of a cell tower and associated compound, parking areas, and minimal landscaping.

Historical Information

Based on a review of the historical information, the site has primarily consisted of two dwellings from approximately 1927 until the mid-1960's when one dwelling was replaced with one commercial building and remained until the early 1970's when Fire Station #1 was built on the site. The surrounding properties have largely consisted of dwellings and related structures from approximately the mid-1890's until a filling station was built to the southeast of the site in approximately 1940 until it was replaced by commercial structures in approximately 1990. In the early 1950's, dwellings to the southwest were replaced with commercial buildings. Dwellings to the northwest were replaced by commercial buildings in the mid 1960's. Dwellings to the northeast were removed and the land was graded in approximately 1969, a commercial building was built in 1975, and in 2006, the present-day parking garage replaced the commercial building.

The 1918 fire insurance map depicts a 50 or 550-gallon buried gasoline tank in Douglas St approximately 140 feet south of the site, in an apparent topographic up to cross-gradient position from the site. The capacity of the tank is not clearly readable on the fire insurance map. From 1927 to 1945, two gasoline tanks, capacity not noted, were depicted in Douglas St approximately 130 feet south of the site at a garage, in an apparent topographic up to cross-gradient position from the site. The 1945 fire insurance map depicts a filling station and three oil tanks, capacity not noted, on the southeast-adjoining property, in an apparent topographic up to cross-gradient position from the site. Summit Oil Co was identified on the southeast-adjoining property in city directories at 211 SE Douglas St in an apparent topographic up to cross-gradient position from the site from approximately 1962 to 1987. Collectively, based on proximity to the site, apparent topographic gradient, and length of operations, the historical gasoline tanks, oil tanks, and filling station represent a REC to the site due to likely unknown releases which may have resulted in migration of contaminants onto the site.

Records Review

Selected federal and state environmental regulatory databases as well as responses from state and local regulatory agencies were reviewed. Several facilities were identified within the specified search distances of the site. The site, Lee's Summit Fire Department, was identified on the Leaking Underground Storage Tank (LUST), Facility Index System (FINDS), Recovered Government Archive (RGA) LUST, Emergency Response Notification System (ERNS), SPILLS, and Underground Storage Tank (UST) databases. According to the 2020 MDNR No Further Action letter, "The closure report indicates SCS Engineers adequately evaluated these risks and the closure requirements for the tank listed above, using MRBCA non-residential target levels." Based on No Further Remediation letters these listings do not represent a REC to the site at this time.

Based on facility information, distance, and/or topographic gradient relative to the site, the remaining listed facilities do not constitute RECs associated with the site.

Site Reconnaissance

The following features were observed at the site during site reconnaissance: four pole-mounted transformers and one pad-mounted transformer, several interior floor drains and janitors basins, two trench drains, a sump, multiple 5-gallon containers of alcohol-resistant aqueous film-forming foam (AR-AFFF), four ~3-5 gallon gas/diesel cans, two natural gas-powered emergency generators, one air compressor, and one RevolveAir fill station with multiple ~425 to ~680-liter canisters filled with breathing air.

RECs were not observed on site at the time of the site reconnaissance.

Adjoining Properties

The current day adjoining properties were observed to be the following:

- To the northeast: A parking garage and Lee's Summit City Hall
- To the southeast: A vacant commercial building
- To the southwest: Edward Jones and a personal training studio
- To the northwest: State Farm and Realty One Group

RECs were not observed with the current day adjoining properties.

Significant Data Gaps

No Significant Data Gaps were identified.

Conclusions

We have performed a Phase I ESA consistent with the procedures included in ASTM Practice E1527-21 at 207 SE Douglas St, in Lee's Summit, Jackson County, Missouri, the site. The following Recognized Environmental Conditions (RECs) were identified in connection with the site:

- Collectively, based on proximity to the site, apparent topographic gradient, and length of operations, the historical gasoline tanks, oil tanks, and filling station historically located south and southeast of the site represent a REC to the site due to likely unknown releases which may have resulted in migration of contaminants onto the site.

Recommendations

Based on the scope of services, limitations, and conclusions of this assessment, Terracon recommends the following additional actions:

- Terracon recommends conducting additional investigation to evaluate subsurface conditions associated with the identified RECs.

Additionally, if site use changes from non-residential to residential, additional evaluation of subsurface conditions concerning the former use of the onsite USTs may be necessitated.

1.0 INTRODUCTION

1.1 Site Description

Site Name	Fire Station #1
Site Location / Address	207 SE Douglas St, Lee's Summit, Jackson County, Missouri
Land Area	Approximately 0.94 acres
Site Improvements	The site is developed with a building which contains approximately 14,275 square feet of space on the ground floor (offices and equipment bay), an approximate 6,800-square foot second floor (living quarters), and an approximate 6,800-square foot basement (meeting rooms and dispatch). The first floor offices, second floor, and basement are located in the northwest portion of the building while the four-bay equipment area is located on the southeast portion of the building. The remainder of the site consists of a cell tower and associated compound, parking areas, and minimal landscaping.
Anticipated Future Site Use	Similar to current use
Reason for the ESA	Demolition or renovation

The location of the site is depicted on Exhibit 1 of Appendix A, which was reproduced from a portion of the USGS 7.5-minute series topographic map. The site and adjoining properties are depicted on the Site Diagram, which is included as Exhibit 2 of Appendix A. Acronyms and terms used in this report are described in Appendix F.

1.2 Scope of Services

This Phase I ESA was performed in accordance with Terracon Proposal No. P02237353 dated November 7, 2023 and was conducted consistent with the procedures included in ASTM E1527-21, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. The purpose of this ESA was to assist the client in developing information to identify RECs in connection with the site as reflected by the scope of this report. Recognized environmental conditions are defined by ASTM E1527-21 as "(1) the presence of hazardous substances or petroleum products in, on, or at the subject property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment." A de minimis condition is not a recognized environmental condition.

This purpose was undertaken through user-provided information, a regulatory database review, historical and physical records review, interviews (including local government inquiries, as applicable), and a visual noninvasive reconnaissance of the site and adjoining properties. Limitations, ASTM deviations, and significant data gaps (if identified) are noted in the applicable sections of the report.

1.3 Standard of Care

This ESA was performed in accordance with generally accepted practices of this profession, undertaken in similar studies at the same time and in the same geographical area. We have endeavored to meet this standard of care, but may be limited by conditions encountered during performance, a client-driven scope of work, or inability to review information not received by the report date. Where appropriate, these limitations are discussed in the text of the report, and an evaluation of their significance with respect to our findings has been conducted.

Phase I ESAs, such as the one performed at this site, are of limited scope, are noninvasive, and cannot eliminate the potential that hazardous, toxic, or petroleum substances are present or have been released at the site beyond what is identified by the limited scope of this ESA. In conducting the limited scope of services described herein, certain sources of information and public records were not reviewed. It should be recognized that environmental concerns may be documented in public records that were not reviewed. No ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. Performance of this practice is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs. No warranties, expressed or implied, are intended or made. The limitations herein must be considered when the user of this report formulates opinions as to risks associated with the site or otherwise uses the report for any other purpose. These risks may be further evaluated – but not eliminated – through additional research or assessment. We will, upon request, advise you of additional research or assessment options that may be available and associated costs.

1.4 Additional Scope Limitations, ASTM Deviations, and Data Gaps

Based upon the agreed-on scope of services, this ESA did not include subsurface or other invasive assessments, vapor intrusion assessments or indoor air quality assessments (i.e., evaluation of the presence of vapors within a building structure), business environmental risk evaluations, or other services not particularly identified and discussed herein. Credentials of the company (Statement of Qualifications) have not been included in this report but are available upon request. Pertinent documents are referred to in the text of this report, and a separate reference section has not been included. Reasonable attempts were made to obtain information within the scope and time constraints set forth by the client; however, in some instances, information

requested is not, or was not, received by the issuance date of the report. Information obtained for this ESA was received from several sources that we believe to be reliable; nonetheless, the authenticity or reliability of these sources cannot and is not warranted hereunder. This ESA was further limited by the following:

- Due to vehicular obstructions, surface conditions could not be observed on portions of the site. However, based on observations of the remaining portions of the site and review of historical maps in Section 3.1 of this report, this limitation is not anticipated to alter the conclusions of this report, or prevent the Environmental Professional's (EP's) ability to identify RECs, and is therefore not significant.
- A response has yet to be received from the City of Lee's Summit Codes Administration and Fire Department. However, based on the available information (database reviews and online resources), and an in person interview with the onsite Fire Captain, this limitation is not anticipated to alter the conclusions of this report, or prevent the EP's ability to identify RECs, and is therefore not significant.
- The client did not provide the requested User's information as of the issuance date of the report, which represents a data gap. Terracon assumes the client is evaluating the questionnaire information outside the context of Terracon's Phase I ESA scope of work and report. However, based on the available information utilized in the preparation of this report, this limitation is not anticipated to alter the conclusions of this report, or prevent the EP's ability to identify RECs, and is therefore not significant.

An evaluation of the significance of limitations and missing information with respect to our findings has been conducted, and where appropriate, significant data gaps are identified and discussed in the text of the report. However, it should be recognized that an evaluation of significant data gaps is based on the information available at the time of report issuance, and an evaluation of information received after the report issuance date may result in an alteration of our conclusions, recommendations, or opinions. We have no obligation to provide information obtained or discovered by us after the issuance date of the report, or to perform any additional services, regardless of whether the information would affect any conclusions, recommendations, or opinions in the report. This disclaimer specifically applies to any information that has not been provided by the client.

This report represents our service to you as of the report date and constitutes our final document; its text may not be altered after final issuance. Findings in this report are based upon the site's current utilization, information derived from the most recent reconnaissance and from other activities described herein; such information is subject to change. Certain indicators of the presence of hazardous substances, petroleum products

or PFAS compounds may have been latent, inaccessible, unobservable, or not present during the most recent reconnaissance and may subsequently become observable (such as after site renovation or development). Further, these services are not to be construed as legal interpretation or advice.

1.5 Reliance

This ESA report is prepared for the exclusive use and reliance of WSKF Architects Inc. Use or reliance by any other party is prohibited without the written authorization of WSKF Architects Inc and Terracon Consultants, Inc. (Terracon).

Reliance on the ESA by the client and all authorized parties will be subject to the terms, conditions and limitations stated in the proposal, ESA report, and Terracon's Agreement for Services. The limitation of liability defined in the Agreement for Services is the aggregate limit of Terracon's liability to the client and all relying parties.

Continued viability of this report is subject to ASTM E1527-21 Section 4.6. If the ESA will be used by a different user (third party) than the user for whom the ESA was originally prepared, the third party must also satisfy the user's responsibilities in Section 6 of ASTM E1527-21.

1.6 Client Provided Information

Prior to the site visit, Dalyn Novak, client's representative, was asked to provide the following user questionnaire information as described in ASTM E1527-21 Section 6.

Client Questionnaire Responses

Client Questionnaire Item	Client Did Not Respond	Client's Response	
		Yes	No
Specialized Knowledge or Experience that is material to a REC in connection with the site.	X		
Actual Knowledge of Environmental Liens or Activity Use Limitations (AULs) that may encumber the site.	X		
Actual Knowledge of a Lower Purchase Price because contamination is known or believed to be present at the site.	X		
Commonly Known or Reasonably Ascertainable Information that is material to a REC in connection with the site.	X		
Obvious Indicators of Releases at the site.	X		

The client did not provide the requested User's information as of the issuance date of the report, which represents a data gap. Terracon assumes the client is evaluating the

questionnaire information outside the context of Terracon's Phase I ESA scope of work and report.

2.0 PHYSICAL SETTING

Physical Setting Information		Source
Topography		
Site Elevation	Approximately 1,020-1,030 feet above sea level	USGS Topographic Map, Lee's Summit and Lake Jacomo, Missouri Quadrangles, 1996 (Appendix A)
Topographic Gradient	Sloping towards the northeast	
Closest Surface Water	Pond, approximately 5,120 feet northeast of the site.	
Soil Characteristics		
Soil Type	Urban land, upland, 5 to 9 percent slopes	Jackson County, MO USDA-NRCS Web Soil Survey viewed January 31, 2024
Description	The Urban land (upland) is found on 5 to 9 percent slopes. Generally, more than 85% of the surface is covered by asphalt, concrete, buildings or other impervious material. Examples include the following: parking lots, shopping and business centers, railroad yards, and industrial areas. The largest portion of this unit is the Kansas City central business district. They are on the bluffs adjacent to the Missouri River flood plain. These areas are on upland landscapes, the majority of which have undergone cut and fill excavating to reshape the landforms. Identification of the soil types is not practical because of the lack of accessibility and the extreme variability of the soils.	
Geology/Hydrogeology		
Formation	Kansas City Group and Pleasanton Group	State of Missouri, Division of

Physical Setting Information		Source
Description	Jackson County is located near the middle of an approximate 150-mile wide, north-south trending band of Pennsylvanian Age rocks that is located in western Missouri and eastern Kansas. Generally, the rock beds exhibit a subtle prevailing dip to the west-northwest. A prominent section of Pennsylvanian rock strata is well-exposed in Kansas City, Missouri, in the bluffs along the Missouri River. According to The Stratigraphic Succession in Missouri, Missouri Department of Natural Resources (revised in 1995), the region is underlain by rock units of the Pennsylvanian System and the Missourian Series (Kansas City Group and Pleasanton Group) in the Time Stratigraphic Unit age classification. Alternating layers of shales and limestone, with an occasional sandstone layer, are common in the Kansas City Group. Alternating layers of shale and sandstone, with an occasional coal seam and limestone layer, are present in the Pleasanton Group.	Geological Survey and Water Resources, Guidebook Field Trip Geology of the Kansas City Group at Kansas City, RI 31, November 1965 Geological Map of Missouri, Missouri Geological Survey, Missouri Department of Natural Resources (MDNR), 1979
Estimated Depth to First Occurrence of Groundwater	Approximately 10-20 feet below ground surface	*MDNR Missouri Geological Survey GeoSTRAT Online Map
**Hydrogeologic Gradient	Not known - may be inferred to be parallel to topographic gradient (primarily to the northeast).	

*https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=3ac3a61da4af4834811503a24a3cb935

**The groundwater flow direction and the depth to shallow, unconfined groundwater, if present, would likely vary depending upon seasonal variations in rainfall and other hydrogeological features. Without the benefit of on-site groundwater monitoring wells surveyed to a datum, groundwater depth and flow direction beneath the site cannot be directly ascertained.

3.0 HISTORICAL USE INFORMATION

Terracon reviewed the following historical sources to develop a history of the previous uses of the site and surrounding area, in order to help identify RECs associated with past uses. Copies of selected historical documents are included in Appendix C.

3.1 Historical Topographic Maps, Aerial Photographs, and Sanborn Maps

Readily available historical USGS topographic maps, selected historical aerial photographs (at approximately 10-to-15-year intervals), and historical fire insurance maps produced by the Sanborn Map Company were reviewed to evaluate land development and obtain information concerning the history of development on and near the site. Reviewed historical topographic maps, aerial photographs, and Sanborn maps are summarized below.

Historical fire insurance maps produced by the Sanborn Map Company were requested from EDR to evaluate past uses and relevant characteristics of the site and surrounding properties. EDR provided Sanborn maps as reviewed below.

- Topographic maps: EDR, Lee's Summit, 2021, 2017, 2015, 1996, 1995, 1975, 1971, 1970, 1964, 1957, 1949, and 1934 (1:24,000); Lee's Summit, 1939 (1:31,680); Harrisonville, 1894, 1892, and 1887 (1:125,000)
- Aerial photographs: EDR, USDA/NAIP, 2020, 2016, 2012, 2009, and 2006 (1"=500'); USGS/DOQQ, 1996 and 1990 (1"=500'); NHAP, 1985 and 1981 (1"=500'); USDA, 1979, 1976, 1969, 1957, 1952, 1940, and 1936 (1"=500')
- Sanborn Fire Insurance Maps: 1893*, 1898*, 1909*, 1918*, 1927, 1935, and 1945 (scale on maps)

Historical Maps and Aerial Photographs

Direction	Description
Site	1894-1887: The site and surrounding properties are located in an urban developed area of Lee's Summit. 1927-1964: Two apparent dwellings 1969-1970: One apparent commercial building and parking areas 1975-2021: Lee's Summit Fire Station

Direction	Description
Northeast	1894-1887: The site and surrounding properties are located in an urban developed area of Lee's Summit. 1927-1964: One dwelling and two small sheds 1969: Vacant, graded land 1975-1996: One apparent commercial building and parking lot 2006-2021: One apparent parking garage
Southeast	1894-1887: The site and surrounding properties are located in an urban developed area of Lee's Summit. 1909-1935: An alley, followed by two dwellings and one garage. The 1918 fire insurance map depicts a 50 or 550-gallon buried gasoline tank in Douglas St approximately 140 feet south of the site. The capacity of the tank is not clearly readable on the fire insurance map. From 1927 to 1945, two gasoline tanks, capacity not noted, were depicted in Douglas St approximately 130 feet south of the site at a garage. 1940-1985: The 1945 fire insurance map depicts a filling station and three oil tanks, capacity not noted, on the southeast-adjoining property. 1990: One commercial building 1995-2021: Two commercial buildings
Southwest	1893-1898: Four dwellings and several small sheds 1909-1918: Five dwellings and several small sheds 1927: Six dwellings and several small sheds 1934-1936: Five dwellings and several small sheds 1939-1949: Four dwellings and several small sheds 1952-1976: One commercial building 1979-2021: Two commercial buildings
Northwest	1894-1887: The site and surrounding properties are located in an urban developed area of Lee's Summit. 1927: One dwelling followed by SE 2nd Street 1934-1957: One dwelling and a garage followed by SE 2nd Street 1964-1971: One commercial building followed by SE 2nd Street 1975-2021: Two commercial buildings followed by SE 2nd Street

*Site features and portions of the surrounding properties are not visible on maps.

The 1918 fire insurance map depicts a 50 or 550-gallon buried gasoline tank in Douglas St approximately 140 feet south of the site, in an apparent topographic up to cross-gradient position from the site. The capacity of the tank is not clearly readable on the fire insurance map. From 1927 to 1945, two gasoline tanks, capacity not noted, were depicted in Douglas St approximately 130 feet south of the site at a garage, in an apparent topographic up to cross-gradient position from the site. The 1945 fire insurance map depicts a filling station and three oil tanks, capacity not noted, on the southeast-adjoining property, in an apparent topographic up to cross-gradient position

from the site. Collectively, based on proximity to the site, apparent topographic gradient, and length of operations, the historical gasoline tanks, oil tanks, and filling station represent a REC to the site due to likely unknown releases which may have resulted in migration of contaminants onto the site.

3.2 Historical City Directories

The EDR Digital Archive, Cole Information, and Cole Criss-Cross Directory city directories used in this study were made available through EDR (selected years reviewed: 1954-2020) and were reviewed at approximate five-year intervals, if readily available. The current street address for the site was identified as 207 SE Douglas Street. Additional historical street addresses for the site were identified as 203 SE Douglas St and 205 SE Douglas St.

Historical City Directories

Direction	Description
Site	203-207 SE Douglas St 1962: Residential 1967: McQueens Country Kitchen; Residence 1972: McQueens Country Kitchen 1977-2020: Lee's Summit Fire Dept
Northeast	200 SE Green St No City Directory information
Southeast	209 SE Douglas St 2005-2017: Data Processing Sciences 2020: Ask Cathy Marketing Group LLC 211 SE Douglas St 1962: Century Finance Co, Decker & Associates, Summit Oil Co 1967-1987: Summit Oil Co 220 SE Douglas St 1962-1967: Willey Chevrolet 1972: Rogers Auto Service 1977: Marine World 1987: G&L Auto Parts/Repair 1992-1995: Antiques, Games & Hobbies 2000: Games & Hobbies 2005: American Heritage Antique Mall, Heart Of America Dance Center 2010-2020: Gary's Ballroom & Western Dance, Heart Of America Dance Ctr
Southwest	200 SE Douglas St 1992-2020: Office Building

Direction	Description
	206 SE Douglas St 1992: Eu Daly & Eu Daly Optometrists 1995: Eu Daly & Eu Daly Optometrists, International Mortgage Corp, Silver Dollar Mortgage 2000: Eu Daly, Lon S OD; Eye Care Incorporated Kansas City 2005: Gary W McEwen Md, Lee's Summit Dermatology Associates, Slater Insurance Agency 2010: Crantz Development LLC 2014: Turn the Page 210 SE Douglas St 1992: Clippers Station and Petro-Site Assmnt 1995: American Family Insurance and Clippers Station 2005: Biggs Pest Control Inc 2010: All About Hair & More Inc 2014: Bout Thyme Deli 2017: Good Life Yoga & Tea 212 SE Douglas St No City Directory information
Northwest	101 SE 2nd St 1992: Amer Red Cross 1995-2010: Binder Graphics Inc 2014: Binder Graphics Inc; Drayton Riley State Farm Insurance; Riley Drayton W State Farm Insurance 2017: Binder Graphics Inc and State Farm Insurance 2020: Drayton Riley-State Farm Ins 111 SE 2nd St 1992-1995: State Farm Ins 2000: Riley Drayton W Ins and State Farm Insurance 2010-2020: Grace Jewelry Loan Ltd 115 SE Main St No City Directory information 201 SE Douglas St 1987: Insurance Agency 2010: Kelley Bond

Summit Oil Co was identified on the southeast-adjoining property at 211 SE Douglas St in an apparent topographic up to cross-gradient position from the site from approximately 1962 to 1987. Based on proximity to the site, apparent topographic gradient, and length of operations, the historical filling station represents a REC to the site due to likely unknown releases which may have resulted in migration of contaminants onto the site.

3.3 Site Ownership

Based on a review of information obtained from the Jackson County, Missouri Parcel Viewer website, the current site owner is City of Lee's Summit.

3.4 Title Search

At the direction of the client, a title search was not included as part of the scope of services. Unless notified otherwise, we assume that the client is evaluating this information outside the scope of this report.

3.5 Environmental Liens and Activity and Use Limitations

Environmental lien and activity and use limitation (AUL) records recorded against the site were not provided by the client. At the direction of the client, performance of a review of these records was not included as part of the scope of services and unless notified otherwise, we assume that the client is evaluating this information outside the scope of this report.

However, the EDR regulatory database report included a review of both Federal and State Engineering Control (EC) and Institutional Control (IC) databases. Based on a review of the database report, the site was not listed on the EC or IC databases. Please note that in addition to these federal and state listings, AULs can be recorded at the county and municipal level that may not be listed in the regulatory database report.

3.6 Interviews Regarding Current and Historical Site Uses

The following individuals were interviewed regarding the current and historical use of the site.

Interviews

Interviewer	Name / Phone #	Title	Date/Time
Madeleine Quick	Jim Eaton / 816-969-7360	Fire Captain	2/7/24 / 10am

Terracon interviewed Mr. Jim Eaton, Fire Captain, during the site reconnaissance. Mr. Eaton indicated that he has worked at the site for 36 years. Mr. Eaton noted that the building was built in approximately 1973 and has gone through minor renovations and renovations to the exterior in prior decades. The basement of the building contains the dispatch room and a large conference room, the first floor contains offices as well as the Bay, and the second floor contains the crew's quarters. Oil/water separators, and sediment traps are not present on the site, and all floor drains drain directly to the city sewer system. The site previously contained a diesel UST and a gasoline UST with a connected gas pump, as well as an AST for the previous emergency generator. The USTs

were closed in place in 2020 and associated piping was removed. The current two emergency generators are natural gas-powered—one is used for the fire station and the other is for the east-adjacent Lee's Summit City Hall building. Mr. Eaton noted there have been no spills in regards to the USTs or previous AST except for some minor surface spills near the UST's pump which had been properly cleaned up in accordance with the fire station's safety plans and spill prevention plans. Mr. Eaton noted no hazardous waste streams were generated by the fire station, and no hazardous waste is handled on-site. He noted the site does not contain a decontamination area. Minor truck maintenance used to be performed on-site from the 1970's until the mid-1990's, however no truck maintenance has been performed on-site since. He noted he is not aware of any spills or releases of hazardous substances at the time the site performed vehicle maintenance. According to Mr. Eaton, the site has had no violations of environmental laws, environmental liens, or activity and use limitations recorded against the site.

3.7 Prior Report Review

The following previous reports concerning the site were reviewed:

Underground Storage Tank (UST) Closure Report, Fire Station #1, 207 SE Douglas Street, Lee's Summit, Missouri, dated May 19, 2020, prepared by SCS Engineers (SCS), prepared for Mr. Mark Stinson, City of Lee's Summit Fleet Manager.

According to the SCS May 19, 2020 UST Closure Report, two 4,000-gallon fiberglass USTs and associated piping were installed in 1974 near the southeast corner of Fire Station #1, west of the northwest corner of the Lee's Summit City Hall in downtown Lee's Summit. The report states the 4,000-gallon diesel UST (Tank #1) and 4,000-gallon gasoline UST (Tank #2) were cleaned, inspected, and filled with concrete. The dispenser, product lines, and associated UST equipment were removed and properly recycled or disposed off site in general accordance with the Missouri Risk Based Corrective Action (MRBCA) Process for Petroleum Storage Tanks, UST Closure Guidance. Soil and water samples were taken during the in-place closure of the USTs and associated equipment removal.

According to the SCS report, "The water sample collected from the temporary well installed in boring T-3 contained a total lead concentration of 15.6 micrograms per liter (ug/L), slightly above the Default Target Level (DTL) of 15 ug/L. However, dissolved lead was not detected above laboratory reporting limits. The total lead concentration is below applicable Tier 1 Risk-Based Target Levels (RBTLs). Diesel range organics (DRO) and oil range organics (ORO) concentrations were detected in the water sample, at concentrations below DTLs. No other chemicals of concern (COCs) were detected above laboratory reporting limits in the water sample."

According to the SCS report, "Based on closure soil sample analytical results, DTLs were exceeded in 11 of the 13 soil samples for lead, and four of the 13 soil samples for other

COCs. None of the concentrations exceeded non-residential Tier 1 RBTLs. Lead soil concentrations are below the anticipated background concentration for lead cited by a USACE study specific to the area. Maximum detected soil concentrations did not exceed minimum concentrations requiring a groundwater evaluation."

The report concluded that based on the observations during the closure activities and analytical results, additional site characterization activities are not warranted. SCS requested MDNR issue a No Further Action (NFA) determination for the UST closure. The No Further Action letter was issued by the MDNR in July 2020 and is included in Appendix C. According to the 2020 MDNR NFA letter, "The closure report indicates SCS Engineers adequately evaluated these risks and the closure requirements for the tank listed above, using MRBCA non-residential target levels."

Limited Environmental Site Assessment, KCYC Lee's Summit DT (02237067), 207 SE Douglas Street, Lee's Summit, Missouri, dated March 22, 2023, prepared by Terracon Consultants, Inc., prepared for Cellco Partnership d/b/a Verizon Wireless.

According to the March 22, 2023 Terracon Phase I ESA report for the existing on-site telecommunications tower and compound, the site consisted of an approximate 1,200 square foot fenced area of land to the northeast of the Fire Station #1 building which was covered by concrete pads and gravel, containing an approximate 180-foot monopole tower, back up-generators and equipment cabinets. RECs were not identified in regard to this site, and Terracon did not recommend any additional environmental investigations.

4.0 RECORDS REVIEW

Regulatory database information was provided by EDR, a contract information services company in a report dated January 30, 2024. The purpose of the records review was to identify RECs in connection with the site. Information in this section is subject to the accuracy of the data provided by the information services company and the date at which the information is updated. The scope herein did not include confirmation of facilities listed as "unmappable" by regulatory databases.

In some of the following subsections, the words up-gradient, cross-gradient, and down-gradient refer to the topographic gradient in relation to the site. As stated previously, the groundwater flow direction and the depth to shallow groundwater, if present, would likely vary depending upon seasonal variations in rainfall and the depth to the soil/bedrock interface. Without the benefit of on-site groundwater monitoring wells surveyed to a datum, groundwater depth and flow direction beneath the site cannot be directly ascertained.

4.1 Federal and State/Tribal Databases

Listed below are the facility listings identified on federal and state/tribal databases within the ASTM-required search distances from the approximate site boundaries. Database definition, descriptions, and the database search report are included in Appendix D.

Federal Databases

Database	Description	Distance (miles)	Listings
CERCLIS (SEMS)	Comprehensive Environmental Response, Compensation, & Liability Information System	0.5	0
CERCLIS / NFRAP (SEMS-ARCHIVE)	Comprehensive Environmental Response, Compensation, & Liability Information System/No Further Remedial Action Planned	0.5	0
ERNS	Emergency Response Notification System	Site	1
IC / EC	Institutional Control/Engineering Control	Site	0
NPL	National Priorities List	1	0
NPL (Delisted)	National Priorities Delisted List	0.5	0
RCRA CORRACTS/ TSD	RCRA Corrective Action Activity	1	0
RCRA Generators	Resource Conservation and Recovery Act	Site and adjoining properties	0
RCRA Non-CORRACTS/ TSD	RCRA Non-Corrective Action Activity	0.5	0

State/Tribal Databases

Database	Description	Distance (miles)	Listings
AUL	Activity and Use Limitations	Site	0
Brownfields	Listing of Brownfields Sites	0.5	1
LUST	Leaking Underground Storage Tanks	0.5	6
SHWS	State Hazardous Waste Site	0.5	0
SWF/LF	Solid Waste Facilities/Landfills	0.5	0

Database	Description	Distance (miles)	Listings
UST	Underground Storage Tanks	Site and adjoining properties	1
VCP	Voluntary Cleanup Program Sites	0.5	0

In addition to the above ASTM-required listings, Terracon reviewed other federal, state, local, and proprietary databases provided by the database firm. A list of the additional reviewed databases is included in the regulatory database report in Appendix D.

The following table summarizes the site-specific information provided by the database and/or gathered by this office for identified facilities within approximately 1,000 feet of the site. Facilities are listed in order of proximity to the site. Additional discussion for selected facilities follows the summary table.

Listed Facilities

Facility Name and Location	Estimated Distance / Direction/Gradient	Database Listings	Findings Summary
City Of Lee's Summit Fire Dept 207 SE Douglas	Site	RGA LUST, UST FINDER, UST FINDER RELEASE, ERNS, SPILLS, LUST, UST, FINDS	Not a REC, Discussed below
Essex Waste Management Services Inc 226 SE Douglas St	Approximately 220 feet S / up-gradient	RCRA NonGen / NLR, ECHO, FINDS	Not a REC, Discussed below
FPC Co 100 SE 3rd St	Approximately 245 feet SSE / up-gradient	RCRA NonGen / NLR	Not a REC, Discussed below
Lee's Summit City of Central Vehicle Dept/Central Vehicle Maintenance 126 SE 3rd St	Approximately 290 feet SE / up to cross-gradient	UST FINDER, UST FINDER RELEASE, MANIFEST, RCRA NonGen / NLR, ECHO, FINDS, LUST, UST	Not a REC, Discussed below
Green Street Villas 201-203 SE Green Street; 205-209 SE Green St	Approximately 335 feet NE / down-gradient	US BROWNFIELDS	Not a REC, based on distance and gradient
Herrington Automotive 201 SE Green St	Approximately 335 feet NE / down-gradient	EDR Hist Auto	Not a REC, based on distance and gradient

Facility Name and Location	Estimated Distance / Direction/Gradient	Database Listings	Findings Summary
Essex Waste Management Svcs 300 SE Douglas	Approximately 375 feet S / up-gradient	RCRA NonGen / NLR, ECHO, FINDS	Not a REC, based on distance
Pickens Printing Co Inc 21 SE 3Rd St	Approximately 390 feet S / up-gradient	RCRA NonGen / NLR, ECHO, FINDS	Not a REC, based on distance
Southwestern Bell 202 SE 3Rd St	Approximately 515 feet E / cross-gradient	RCRA NonGen / NLR	Not a REC, based on distance
Lee's Summit Cleaners Inc 316 SE Douglas	Approximately 570 feet S / up-gradient	DRYCLEANERS, EDR Hist Cleaner, RCRA-VSQG	Not a REC, based on distance
Coopers Auto Service 323 SE Douglas St	Approximately 640 feet SSE / up-gradient	EDR Hist Auto	Not a REC, based on distance
Lee's Summit Cleaners 311 SE Third St #B	Approximately 850 feet E / cross-gradient	DRYCLEANERS	Not a REC, based on distance
Pickens Printing Co Inc	Approximately 905 feet SW / up-gradient	PFAS ECHO	Not a REC, based on distance
Conoco Convenience Plus 351 SE 3Rd Street	Approximately 930 feet E / cross-gradient	UST FINDER, UST FINDER RELEASE	Not a REC, based on distance
Quiktrip Store #162 351 E 3Rd St	Approximately 930 feet E / cross-gradient	RCRA NonGen / NLR, ECHO, FINDS, LUST, UST	Not a REC, based on distance
Service Station 101 W 3Rd St	Approximately 985 feet SW / up-gradient	RCRA NonGen / NLR, ECHO, FINDS	Not a REC, based on distance

City Of Lee's Summit Fire Dept (Site)

The City of Lee's Summit Fire Department is listed on the RGA LUST, UST FINDER, UST FINDER RELEASE, ERNS, SPILLS, LUST, UST, and FINDS databases.

City of Lee's Summit Fire Department and Lee's Summit Fire Department located at 207 Southeast Douglas Street was identified on the Leaking Underground Storage Tank (LUST), Facility Index System (FINDS), Recovered Government Archive (RGA) LUST, Emergency Response Notification System (ERNS), SPILLS, and Underground Storage Tank (UST) databases. The FINDS and one SPILLs database listings are in reference to the 1997 LUST incident. The remaining SPILLS incident references a private citizen dropping off small vials of mercury at the Fire Station. The Fire Chief was able to safety

store it until The Department's State On-Scene Coordinator (SOSC) picked up the vials by April 2020. No release was detected.

LUST: In 1997 a diesel tank and piping failed a tightness test and during the piping replacement contaminated soil was discovered. Groundwater monitoring and vacuum testing of the tanks and piping were conducted. A temporary well indicated one hot spot was detected, however based on the information provided to the MDNR in a Site Check and Preliminary Site Investigation Report dated February 22, 2000, by Burns & McDonnell, no additional investigation or remedial action was currently required and an NFA letter dated June 13, 2000 was issued. Based on the NFA status, and review of the site UST closure report in Section 3.7 of this report, this LUST listing does not represent a REC at this time.

In January 2020 another release was reported. This release was due to the closure of the two onsite USTs. During the removal, contamination above the DTLs was encountered. A Missouri Risk-Based Corrective Action Closure Report dated May 20, 2020, prepared by SCS Engineers, was reviewed in Section 3.7. Based on the closure report and site information, the MDNR issued a No Further Action letter on June 10, 2020. Based on the NFA status, this LUST listing does not represent a REC at this time.

USTs: Two 4,000-gallon USTs, one gasoline and one diesel fuel are associated with the site. The tanks were installed in 1974 and were permanently closed in place in March 2020. Based on the site closure and NFA status, these USTs do not represent a REC at this time as reviewed in Section 3.7 of this report.

ERNS: In 1994 an unknown sheen located within a creek was detected in an approximately 5ft by 5ft radius. The sheen appeared to be from an above ground pipeline. According to AT&T it is believed to be a sheen of a previous spill. The fire department placed booms in the creek to remediate the water. Based on the nearest creek, approximately 1,300 feet northeast, this description does not appear to be the site and is not a REC to the site.

<u>Essex Waste Management Services Inc (226 SE Douglas St)</u>

Essex Waste Management Services Inc is listed on the RCRA NonGen/NLR, ECHO, and FINDS databases. These listings are due to this facility being a hazardous waste treatment, transfer, and recycling facility. According to this facility's description on the website, EnviroSource, "many waste types accepted at the facility are transferred to other facilities for treatment and final disposal. Waste treatment processes offered on-site include fuel blending, neutralization and solidification." This facility has received no violations and is therefore not a REC to the site.

FPC Co (100 SE 3rd St)

FPC Co is listed on the RCRA NonGen/NLR database as this facility is permitted to handle ignitable waste and benzene. This facility has received no violations and is therefore not a REC to the site.

Lee's Summit City of Central Vehicle Dept/Central Vehicle Maintenance (126 SE 3rd St)

Lee's Summit City of Central Vehicle Dept/Maintenance is listed on the UST FINDER, UST FINDER RELEASE, MANIFEST, RCRA NonGen / NLR, ECHO, FINDS, LUST, and UST databases.

The MANIFEST, RCRA NonGen / NLR, ECHO, and FINDS listings are due to the facility being a small quality generator for the following waste codes: D001 (Ignitable Waste), D002 (Corrosive Waste), F002 (Spent Halogenated Solvents), and F004 (Spent Nonhalogenated Solvents). This facility has received no violations and therefore these listings are not a REC to the site.

The remaining listings are due to the LUST reported on 6-11-1992. Clean-up for this facility began on the date of the report and was completed on 11-19-1992, and a No Further Action Letter was received from MDNR on 11-23-1992. Due to this facility's No Further Action Letter following clean-up, this does not represent a REC to the site.

The remaining regulatory facilities listed in the database report do not appear to represent RECs to the site at this time based upon regulatory status, apparent topographic gradient, and/or distance from the site.

Unmapped facilities are those that do not contain sufficient address or location information to evaluate the facility listing locations relative to the site. The report did not list facilities in the unmapped section.

4.2 Local Agency Inquiries

Agency Contacted / Contact Method	Response
City of Lee's Summit, MO Codes Administration and Fire Department Trisha.FowlerArcuri@cityofls.net	At the issuance of this report, a response had not been received from Codes Administration or Fire Department. However, an interview with the onsite Fire Captain was conducted during the site visit and is further discussed in Section 3.6 of this report.
National Pipeline Mapping System (NPMS) / Online map*	According to the NPMS, there are no gas transmission pipelines, hazardous liquid pipelines, hazardous liquid accidents or gas incidents near the site.
MDNR Missouri Geological Survey GeoSTRAT Online Map**	According to GeoSTRAT, there are no monitoring wells, oil and gas wells, or other wells at the site.

Agency Contacted / Contact Method	Response
MDNR Environmental Site Tracking and Research Tool (E-START) / Online map***	According to E-START, there are no hazardous substance investigation and cleanup sites or on or near the subject site. The site does have two No Further Action Letters due to the UST closures conducted in 2020 as well as the Site Check and Preliminary Investigation report submitted in 2000. Both No Further Action Letters are included in Appendix C.

*https://pvnpms.phmsa.dot.gov/PublicViewer/
**https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=3ac3a61da4af4834811503a24a3cb935
***https://apps5.mo.gov/ESTARTMAP/map/init_map.action

5.0 SITE RECONNAISSANCE

5.1 General Site Information

Information contained in this section is based on a visual reconnaissance conducted while walking through the site and the accessible interior areas of structures, if any, located on the site. The site and adjoining properties are depicted on the Site Diagram, which is included in Exhibit 2 of Appendix A. Photo documentation of the site at the time of the visual reconnaissance is provided in Appendix B. Credentials of the individuals planning and conducting the site visit are included in Appendix E.

General Site Information

Site Reconnaissance				
Field Personnel	Madeleine Quick and Tracie Ragland			
Reconnaissance Date	February 7, 2024			
Weather Conditions	50°F, clear skies			
Site Contact/Title	Jim Eaton / Site Fire Captain			
Building Description				
Building Identification	Building Use	Approx. Construction Date	Number of Stories	Approx. Size (ft²)
Main Building	65% Office, 35% Bay	1974	3	27,875
Site Utilities				
Drinking Water	City of Lee's Summit			
Wastewater	City of Lee's Summit			
Electric	Evergy			
Natural Gas	Spire			

5.2 Overview of Current Site Occupants

The site is located at 207 SE Douglas St in Lee's Summit, Jackson County, Missouri and currently contains Lee's Summit Fire Station #1 which was built in the 1970's. The building contains approximately 14,275 square feet of space on the ground floor (offices and equipment bay), an approximate 6,800-square foot second floor (living quarters), and an approximate 6,800-square foot basement (meeting rooms and dispatch). The first floor offices, second floor, and basement are located in the northwest portion of the building while the four-bay equipment area is located on the southeast portion of the building. The remainder of the site consists of a cell tower and associated compound, parking areas, and minimal landscaping.

5.3 Overview of Current Site Operations

The site is currently operating as Lee's Summit Fire Station #1.

5.4 Site Observations

The following table summarizes site observations and interviews. Affirmative responses (designated by an "X") are discussed in more detail following the table.

Site Characteristics

Category	Item or Feature	Observed or Identified
Site Operations, Processes, and Equipment	Emergency generators	X
	Elevators	
	Air compressors	X
	Hydraulic lifts	
	Dry cleaning	
	Photo processing	
	Ventilation hoods and/or incinerators	
	Waste treatment systems and/or water treatment systems	
	Heating and/or cooling systems	X
	Paint booths	
	Sub-grade mechanic pits	
	Wash-down areas or carwashes	
	Pesticide/herbicide production or storage	
	Printing operations	

Category	Item or Feature	Observed or Identified
	Metal finishing (electroplating, chrome plating, galvanizing, etc.)	
	Salvage operations	
	Oil, gas, or mineral production	
	Other processes or equipment	
Aboveground Chemical or Waste Storage	Aboveground storage tanks	
	Drums, barrels, and/or containers ≥ 5 gallons	X
	MSDS or SDS	
Underground Chemical or Waste Storage, Drainage or Collection Systems	Underground storage tanks or ancillary UST equipment	
	Sumps, cisterns, French drains, catch basins, and/or dry wells	X
	Grease traps	
	Septic tanks and/or leach fields	
	Oil/water separators, clarifiers, sand traps, triple traps, interceptors	
	Pipeline markers	
	Interior floor drains	X
Electrical Transformers/ PCBs	Transformers and/or capacitors	X
	Other equipment	
Releases or Potential Releases	Stressed vegetation	
	Stained soil	
	Stained pavement or similar surface	
	Leachate and/or waste seeps	
	Trash, debris, and/or other waste materials	
	Dumping or disposal areas	
	Construction/demolition debris and/or dumped fill dirt	
	Surface water discoloration, odor, sheen, and/or free-floating product	
	Strong, pungent, or noxious odors	
	Exterior pipe discharges and/or other effluent discharges	
Other Notable Site Features	Surface water bodies	
	Quarries or pits	
	Wastewater lagoons	

Category	Item or Feature	Observed or Identified
	Wells	

Site Operations, Processes, and Equipment

Emergency generators

Two natural gas-powered emergency generators were observed at the site. No staining or evidence of leaks was observed in their vicinity.

Air compressors

One air compressor was observed at the site. Additionally, a RevolveAir fill station with multiple ~425 to ~680-liter canisters filled with breathing air were observed. No staining or evidence of leaks was observed in their vicinity.

Heating and/or cooling systems

The building is heated through natural gas heaters and uses electric A/C. No staining or evidence of leaks was observed with the natural gas heating components.

Aboveground Chemical or Waste Storage

Drums, barrels, and/or containers ≥ 5 gallons

Multiple 5-gallon containers of alcohol-resistant aqueous film-forming foam (AR-AFFF) and four ~3-5 gallon gas/diesel cans were observed at the site. No staining or evidence of leaks, or floor drains, was observed in their vicinity.

Underground Chemical or Waste Storage, Drainage or Collection Systems

Sumps, cisterns, French drains, catch basins, and/or dry wells

A sump was observed in the basement of the on-site building. No staining or evidence of leaks was observed in its vicinity. Fire Captain Eaton believed the sump discharged to the sanitary sewer system.

Interior floor drains

Interior floor drains were observed in bathrooms as well as some closets, several janitor's basins were observed in janitor's closets, and two trench drains were observed in the Bay. All floor drains discharge to the city sewer system. No staining was observed in the vicinity of the floor drains, and hazardous substances or petroleum products were not stored in the vicinity of the drains.

Electrical Transformers/ PCBs

Transformers and/or capacitors

Four pole-mounted transformers and one pad-mounted transformer were observed at the site. One pole-mounted transformer displayed a non-PCB sticker; however, the remaining transformers were unmarked. Some transformers contain mineral oil which may contain PCBs.

Evergy maintains responsibility for the transformers, and if the transformers were "PCB contaminated," Evergy is not required to replace the transformer fluids until a release is identified. However, evidence of current or prior release was not observed in the vicinity of the electrical equipment during the site reconnaissance.

6.0 ADJOINING PROPERTY RECONNAISSANCE

Visual observations of adjoining properties (from site boundaries) are summarized below.

Adjoining Properties

Direction	Description
Northeast	A parking garage and Lee's Summit City Hall
Southeast	A vacant commercial building
Southwest	Edward Jones and a personal training studio
Northwest	State Farm and Realty One Group

RECs were not observed with the current day adjoining properties.

7.0 ADDITIONAL SERVICES

Per the agreed scope of services specified in the proposal, an asbestos survey and a lead-based paint inspection were conducted at the site concurrently with the Phase I ESA. The results of these additional services are discussed under separate cover.

8.0 DECLARATION

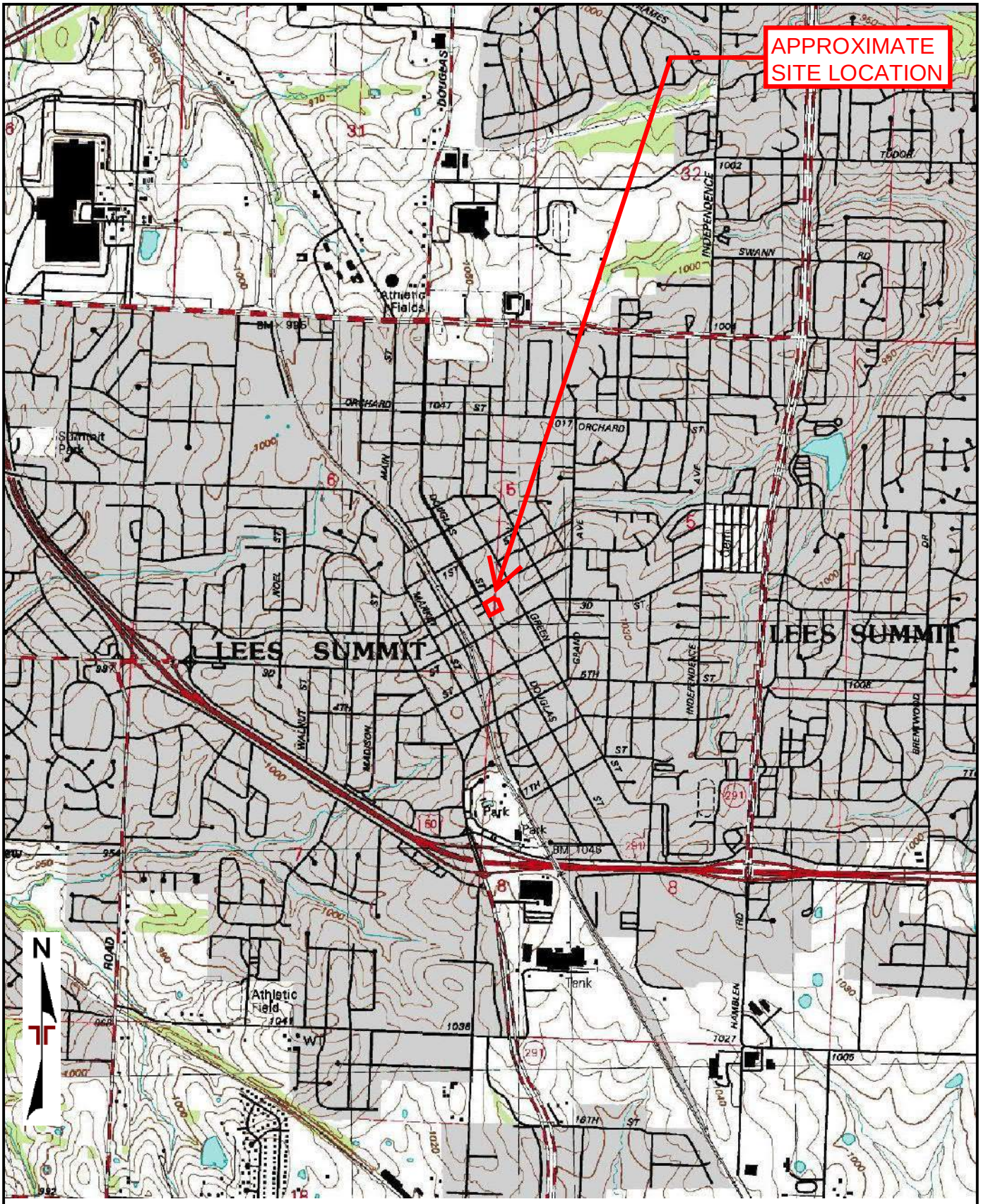
I, Tracie A. Ragland, declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312; and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the site. I have developed and performed the All Appropriate Inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Tracie A. Ragland
Senior Scientist

APPENDIX A

EXHIBIT 1: TOPOGRAPHIC MAP

EXHIBIT 2: SITE DIAGRAM



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: LEES SUMMIT, MO (1/1/1996) and LAKE JACOMO, MO (1/1/1996).

Project Manager: MAD	Project No. 02237353	Terracon	TOPOGRAPHIC MAP	Exhibit
Drawn by: MMQ	Scale: 1"=2,000'	15620 W 113th St Lenexa, KS 66219-5102	Fire Station #1 207 SE Douglas St Lees Summit, MO	1
Checked by: TAR	File Name:			
Approved by: TAR	Date: 2/6/2024			

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: MAD	Project No. 02237353	Terracon 15620 W 113th St Lenexa, KS 66219-5102	SITE DIAGRAM	Exhibit
Drawn by: MMQ	Scale: AS SHOWN		Fire Station #1 207 SE Douglas St Lees Summit, MO	2
Checked by: TAR	File Name:			
Approved by: TAR	Date: 2/6/2024			

APPENDIX B

SITE PHOTOGRAPHS

Photo #1 Facing E: Overview of site from W corner

Photo #2 Facing S: Overview of site from N corner

Photo #3 Facing W: Overview of site from E corner

Photo #4 Facing N: Overview of site from S corner

Photo #5 Facing SSE: Overview of Bay

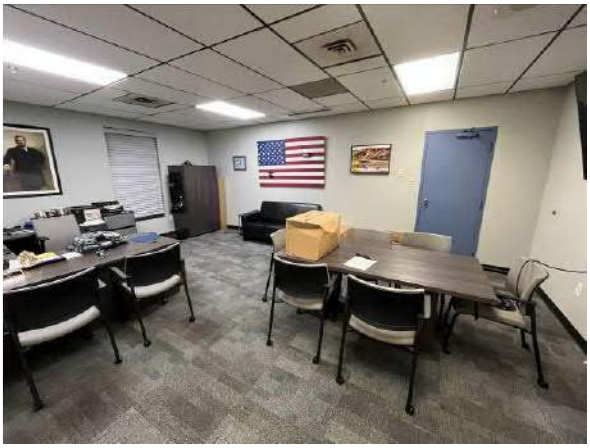


Photo #6 Typical on-site office

Photo #7 Typical on-site kitchen

Photo #8 View of conference room

Photo #9 Typical on-site bathroom with floor drain

Photo #10 View of dispatch room

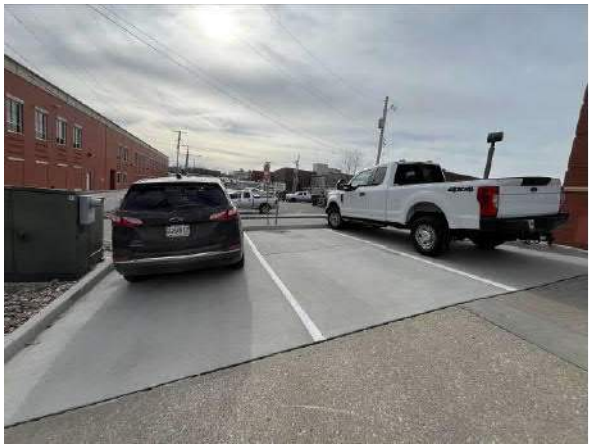


Photo #11 Facing SE: View of location of closed former USTs

Photo #12 View of natural gas emergency generator

Photo #13 View of natural gas emergency generator

Photo #14 View of on-site pole-mounted transformers

Photo #15 View of on-site pad-mounted transformer

Photo #16 View of air compressor and four ~3-5 gallon gas/diesel cans

Photo #17 View of oxygen tank storage in Bay

Photo #18 View of 5-gallon containers of alcohol-resistant aqueous film-forming foam (AR-AFFF)

Photo #19 View of WSW-adjacent Edward Jones

Photo #20 View of SW-adjacent personal training studio

Photo #21 View of NW-adjacent State Farm

Photo #22 View of NE-adjacent parking garage

Photo #23 View of E-adjacent City Hall

Photo #24 View of SE-adjacent vacant commercial building

APPENDIX C

HISTORICAL DOCUMENTATION AND USER QUESTIONNAIRE

Fire Station #1

207 SE Douglas

Lees Summit, MO 64063

Inquiry Number: 7554931.4

January 30, 2024

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

01/30/24

Site Name:	Client Name:
Fire Station #1	Terracon
207 SE Douglas	15620 W. 113th Street
Lees Summit, MO 64063	Lenexa, KS 66219
EDR Inquiry # 7554931.4	Contact: Marci Brockett

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Terracon were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	38.913711 38° 54' 49" North
Project:	02237353	**Longitude:**	-94.376508 -94° 22' 35" West
		UTM Zone:	Zone 15 North
		UTM X Meters:	380658.67
		UTM Y Meters:	4308101.66
		Elevation:	1021.29' above sea level

Maps Provided:

2021	1963, 1964
2017	1957
2015	1949
1996	1939
1995	1934
1975	1894
1971	1892
1970	1887

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2021 Source Sheets

Lees Summit
2021
7.5-minute, 24000

Lake Jacomo
2021
7.5-minute, 24000

2017 Source Sheets

Lees Summit
2017
7.5-minute, 24000

Lake Jacomo
2017
7.5-minute, 24000

2015 Source Sheets

Lees Summit
2015
7.5-minute, 24000

Lake Jacomo
2015
7.5-minute, 24000

1996 Source Sheets

Lees Summit
1996
7.5-minute, 24000
Aerial Photo Revised 1996

Lake Jacomo
1996
7.5-minute, 24000
Aerial Photo Revised 1996

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1995 Source Sheets

Lees Summit
1995
7.5-minute, 24000
Aerial Photo Revised 1990

Lake Jacomo
1995
7.5-minute, 24000
Aerial Photo Revised 1990

1975 Source Sheets

Lake Jacomo
1975
7.5-minute, 24000
Aerial Photo Revised 1975

Lees Summit
1975
7.5-minute, 24000
Aerial Photo Revised 1975

1971 Source Sheets

Lees Summit
1971
7.5-minute, 24000
Aerial Photo Revised 1970

1970 Source Sheets

Lake Jacomo
1970
7.5-minute, 24000
Aerial Photo Revised 1970

Lees Summit
1970
7.5-minute, 24000
Aerial Photo Revised 1970

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1963, 1964 Source Sheets

Lake Jacomo
1963
7.5-minute, 24000
Aerial Photo Revised 1955

Lees Summit
1964
7.5-minute, 24000
Aerial Photo Revised 1962

1957 Source Sheets

Woods Chapel
1957
7.5-minute, 24000
Aerial Photo Revised 1955

Lees Summit
1957
7.5-minute, 24000
Aerial Photo Revised 1955

1949 Source Sheets

Lees Summit
1949
7.5-minute, 24000

1939 Source Sheets

Lees Summit
1939
7.5-minute, 31680

Topo Sheet Key

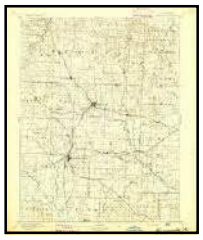
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1934 Source Sheets

Lees Summit
1934
7.5-minute, 24000

Woods Chapel
1934
7.5-minute, 24000

1894 Source Sheets

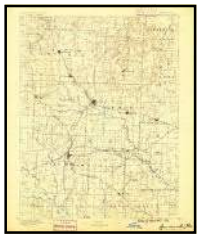


Harrisonville
1894
30-minute, 125000

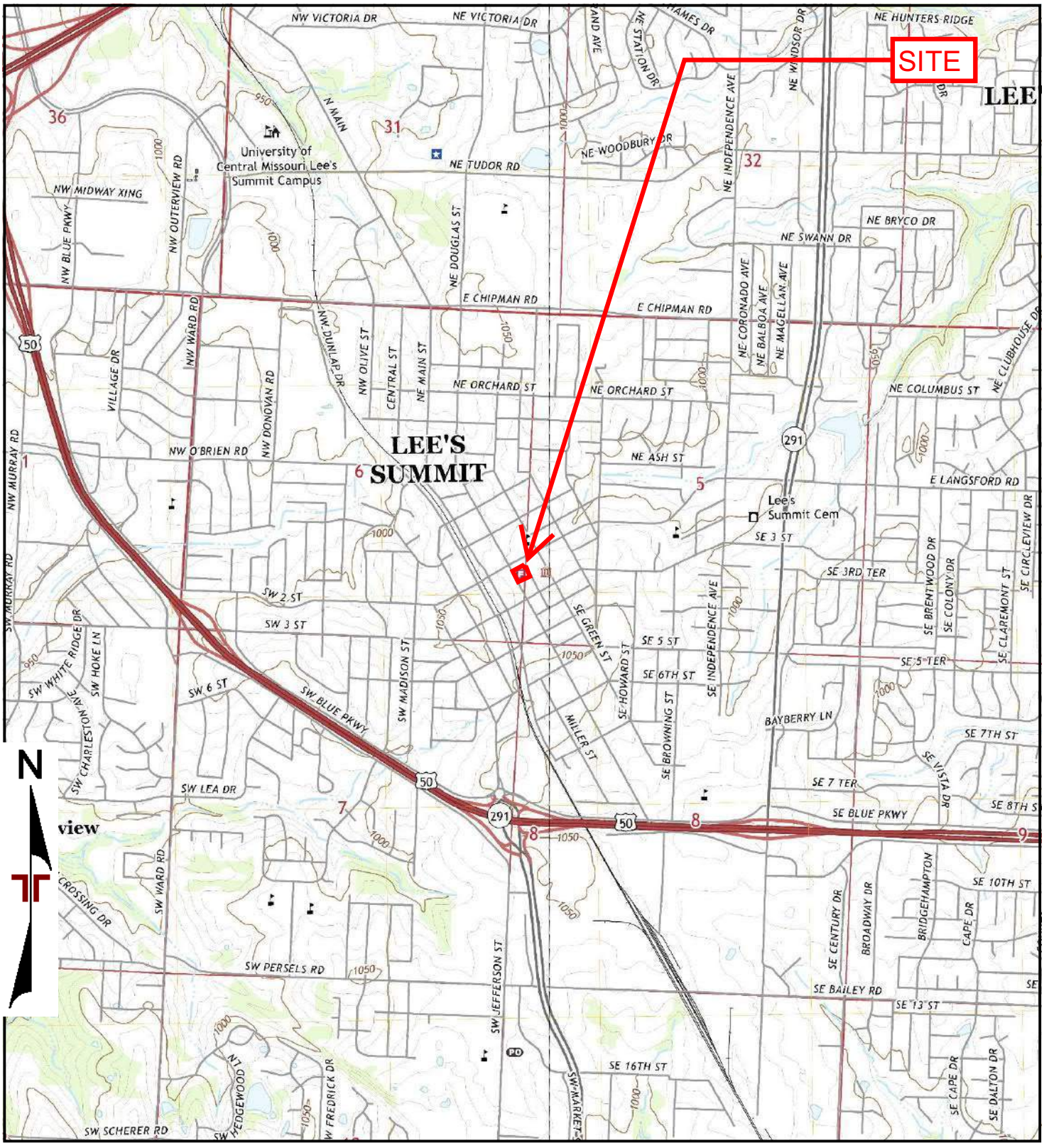
1892 Source Sheets

Harrisonville
1892
30-minute, 125000

1887 Source Sheets



Harrisonville
1887
30-minute, 125000



N

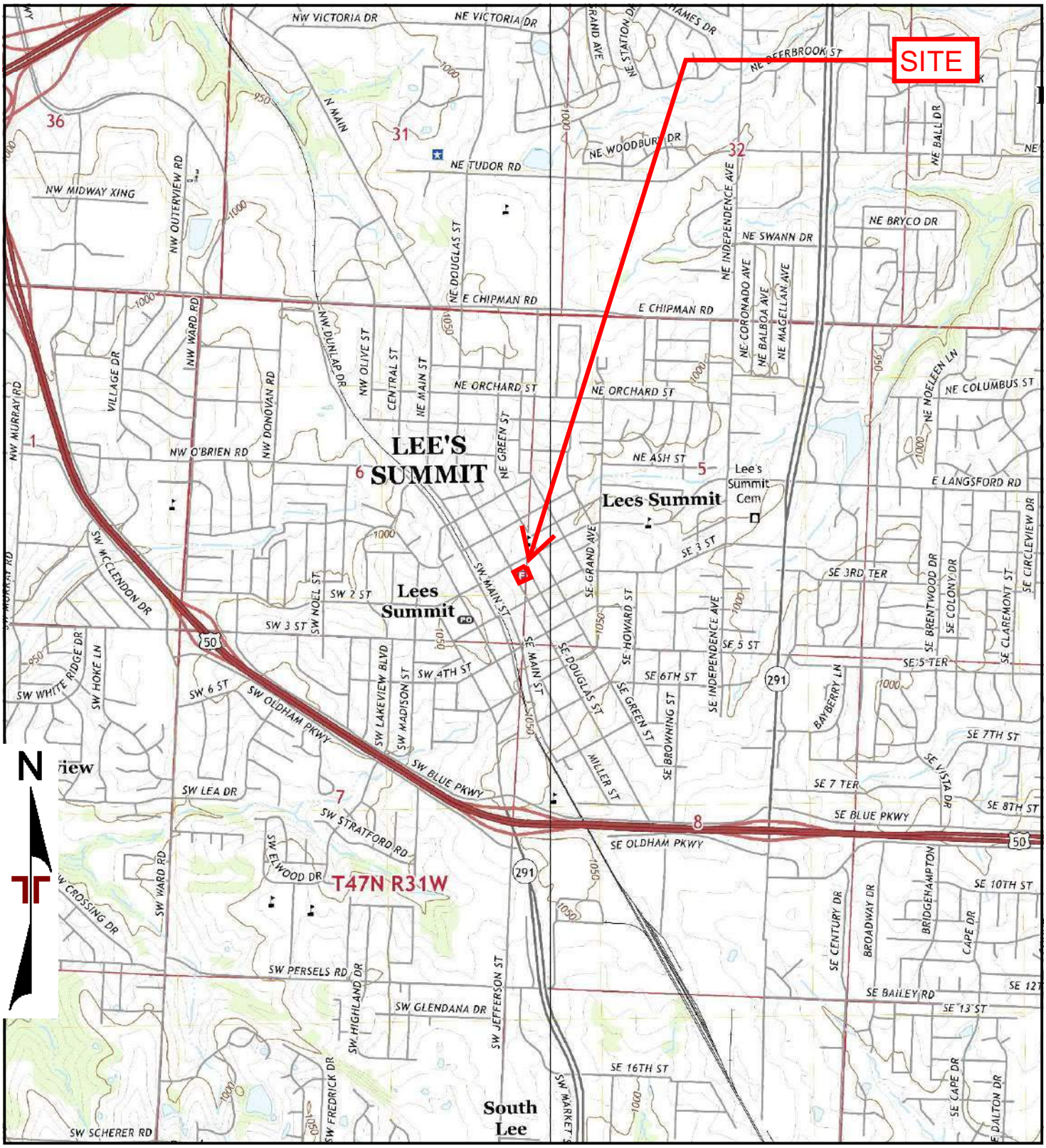
TP, Lees Summit, 2021, 7.5-minute
NE, Lake Jacomo, 2021, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	2021 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 2021			

Topographic Map

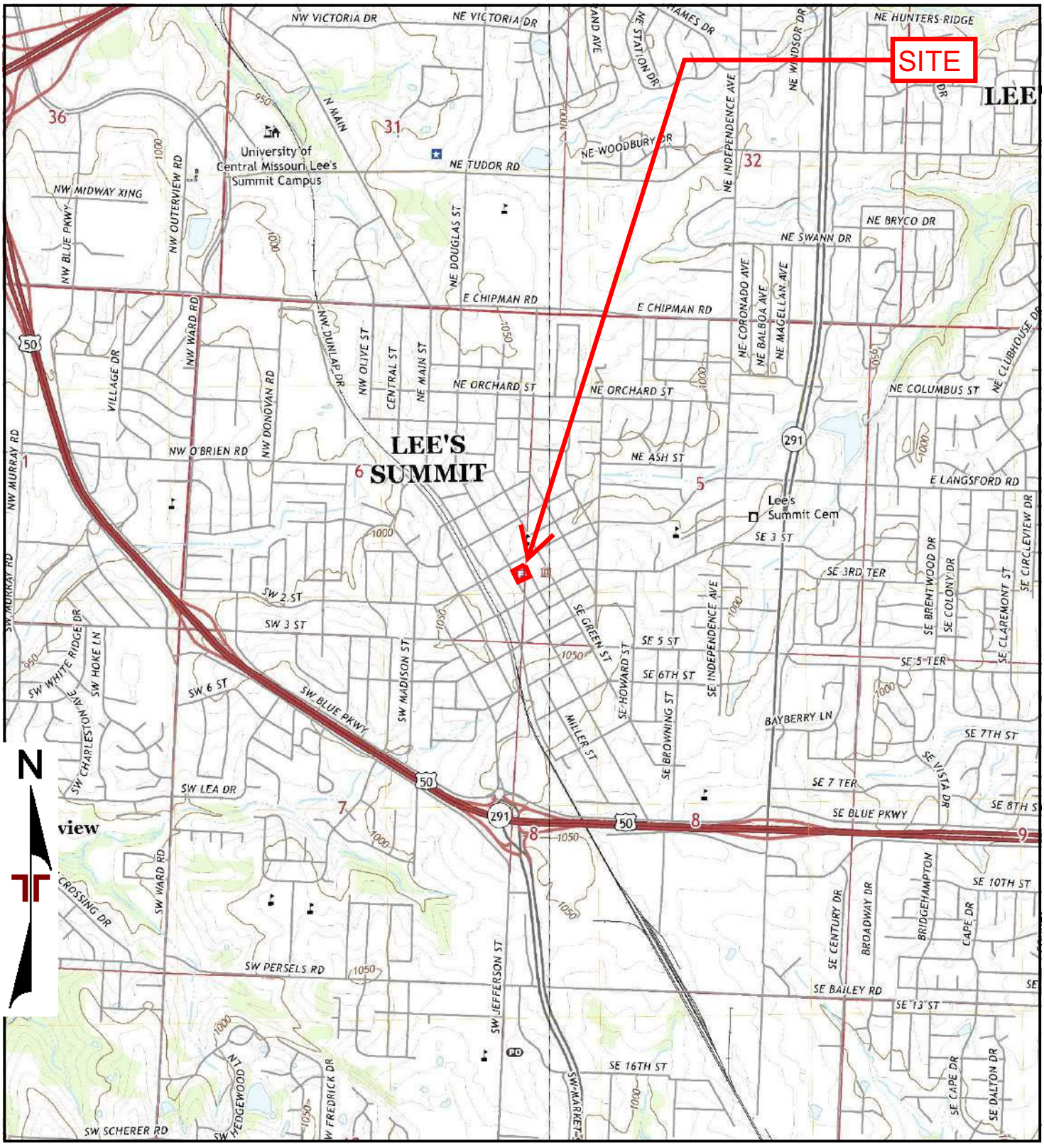
2017



TP, Lees Summit, 2017, 7.5-minute
NE, Lake Jacomo, 2017, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	2017 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		
Checked by:	File Name:		
Approved by:	Date: 2017		Appendix C

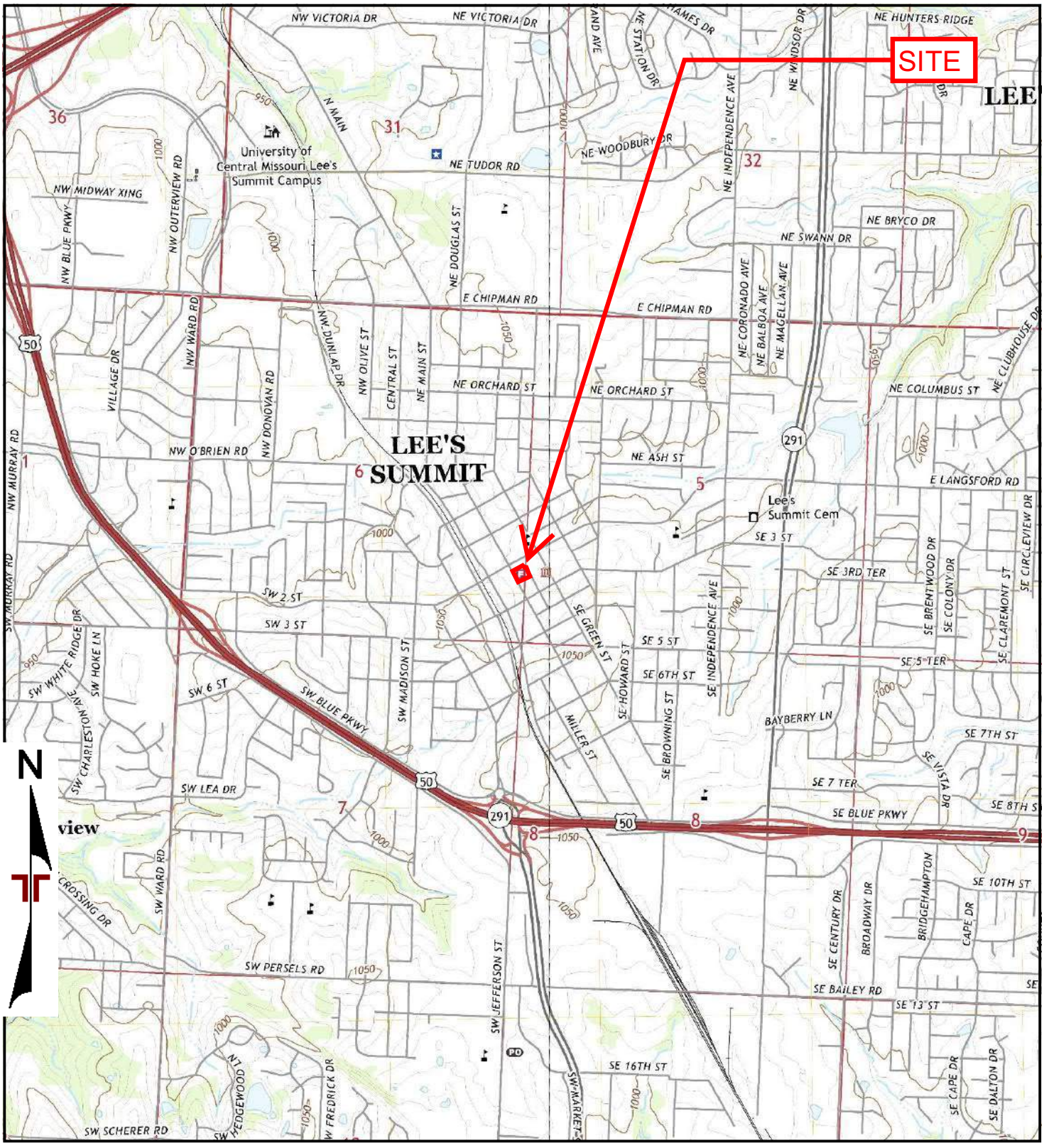


N

TP, Lees Summit, 2021, 7.5-minute
NE, Lake Jacomo, 2021, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	2021 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 2021			

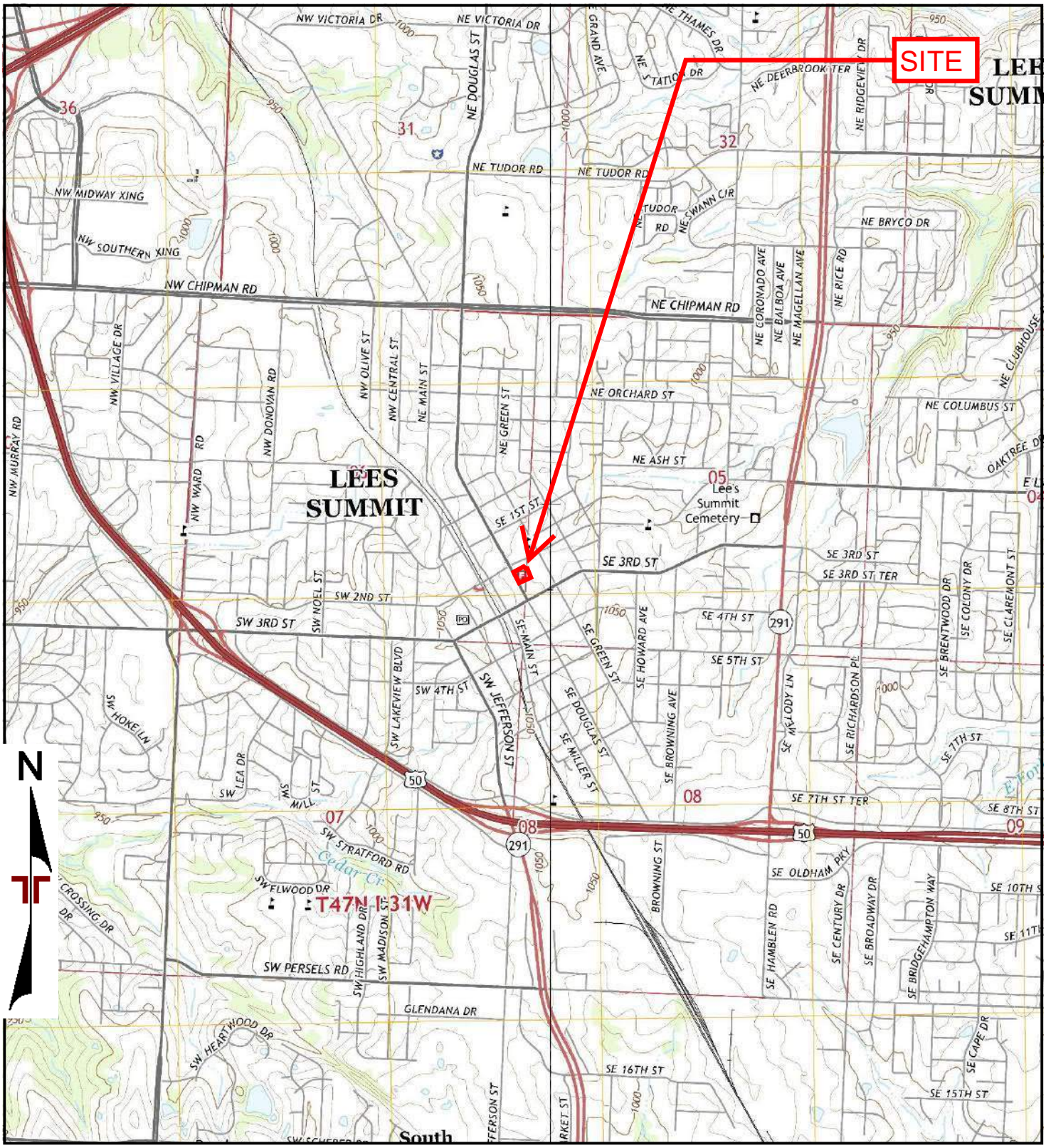


N

TP, Lees Summit, 2021, 7.5-minute
NE, Lake Jacomo, 2021, 7.5-minute

0 Miles 0.25 0.5 1 1.5

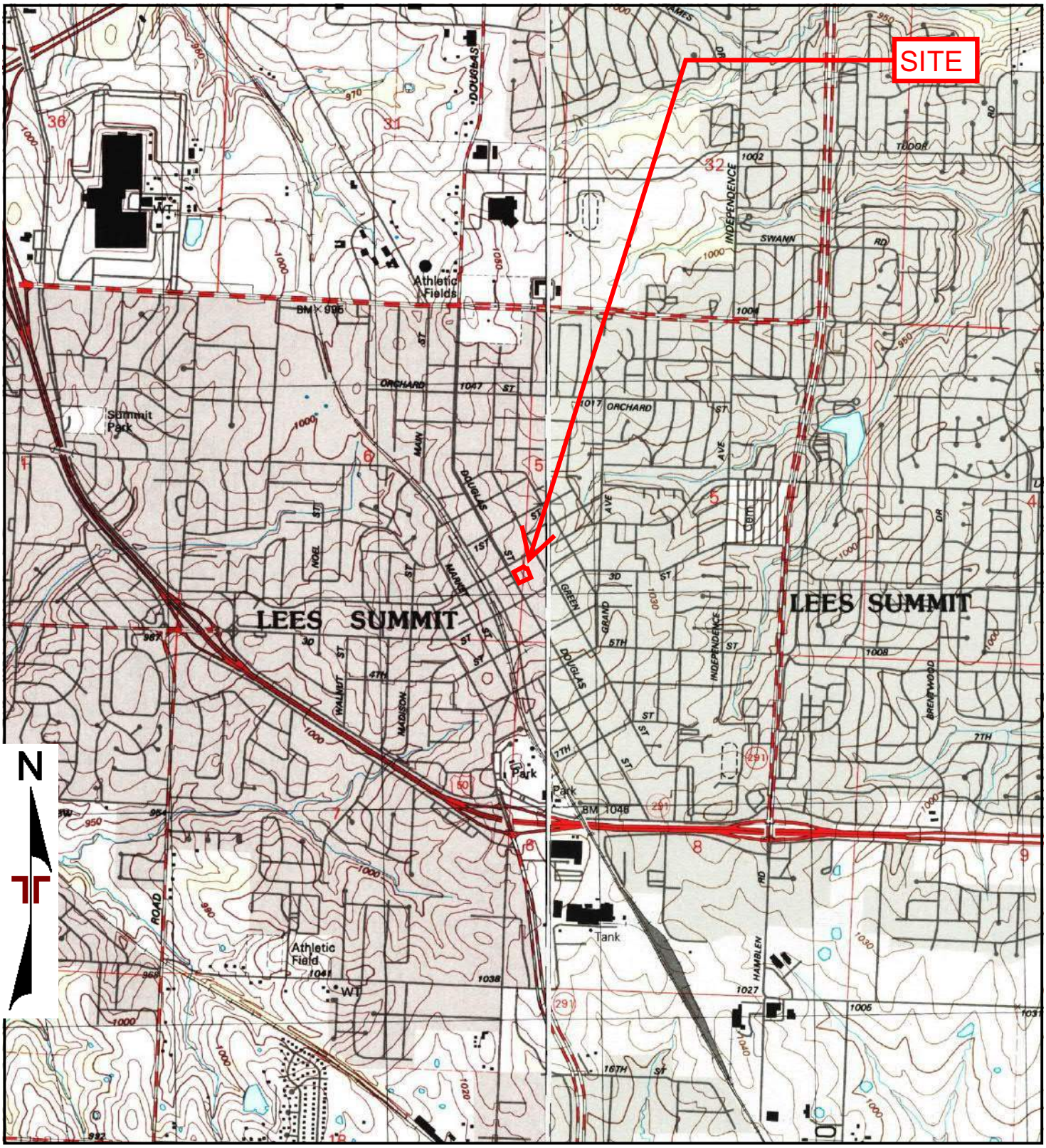
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	2021 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 2021			



TP, Lees Summit, 2015, 7.5-minute
NE, Lake Jacomo, 2015, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	2015 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 2015			



TP, Lees Summit, 1996, 7.5-minute
NE, Lake Jacomo, 1996, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	
Drawn by:	
Checked by:	
Approved by:	

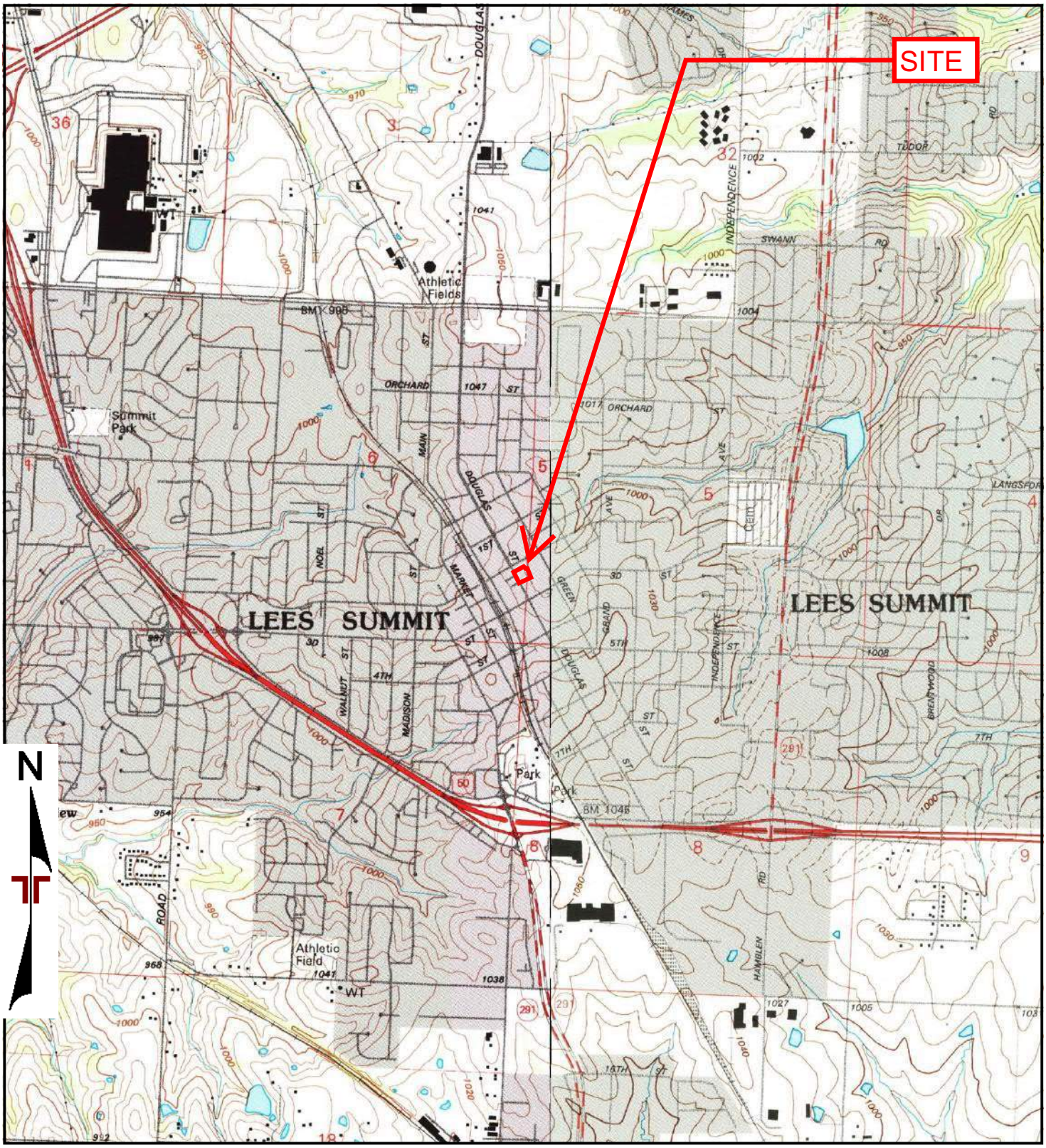
Project No.	02237353
Scale:	As Shown
File Name:	
Date:	1996

Terracon
15620 W. 113th Street
Lenexa, KS 66219

1996 TOPOGRAPHIC MAP

Fire Station #1
207 SE Douglas
Lees Summit, MO 64063

Appendix
C

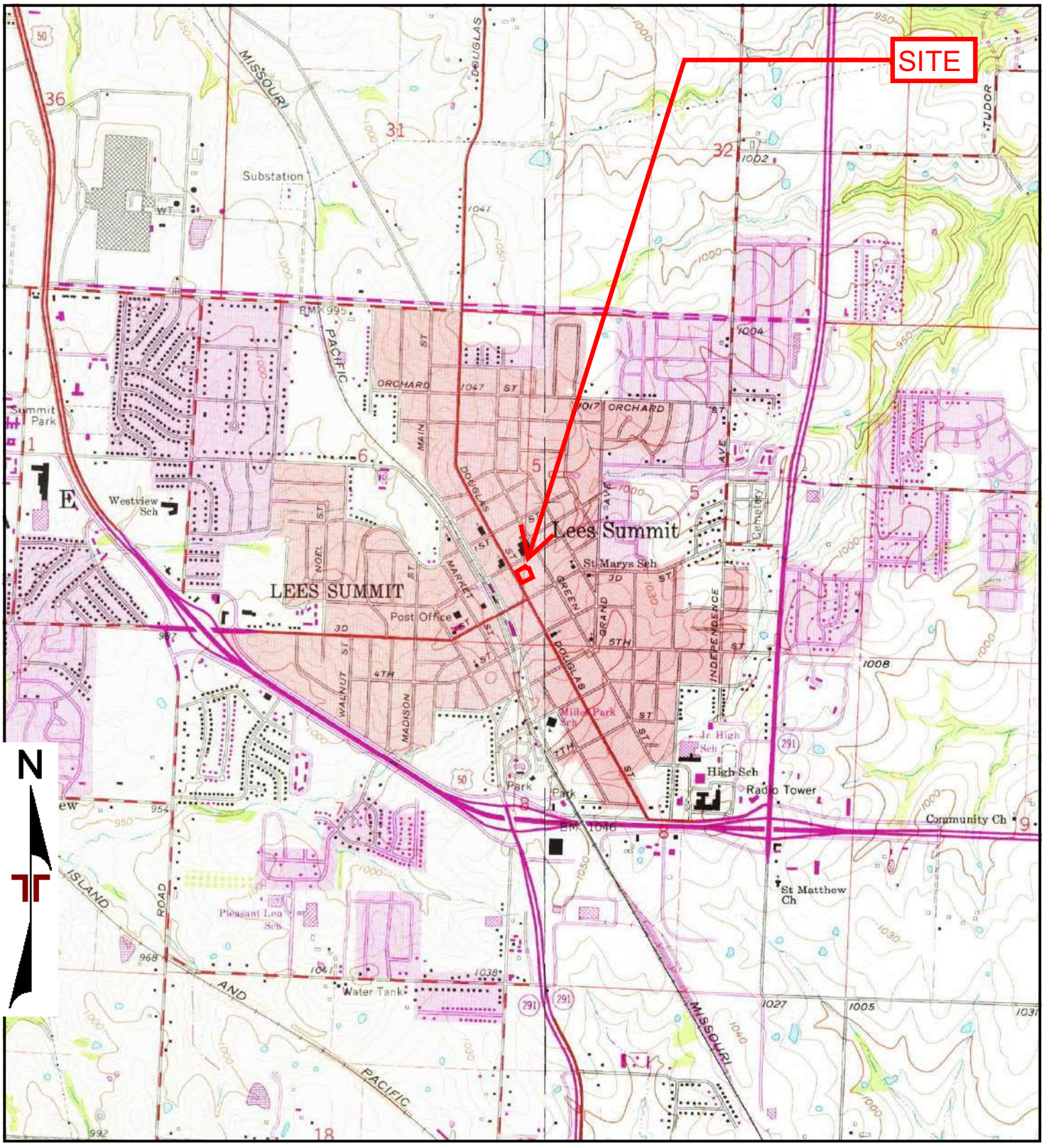


TP, Lees Summit, 1995, 7.5-minute
NE, Lake Jacomo, 1995, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1995 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		
Checked by:	File Name:		
Approved by:	Date: 1995		

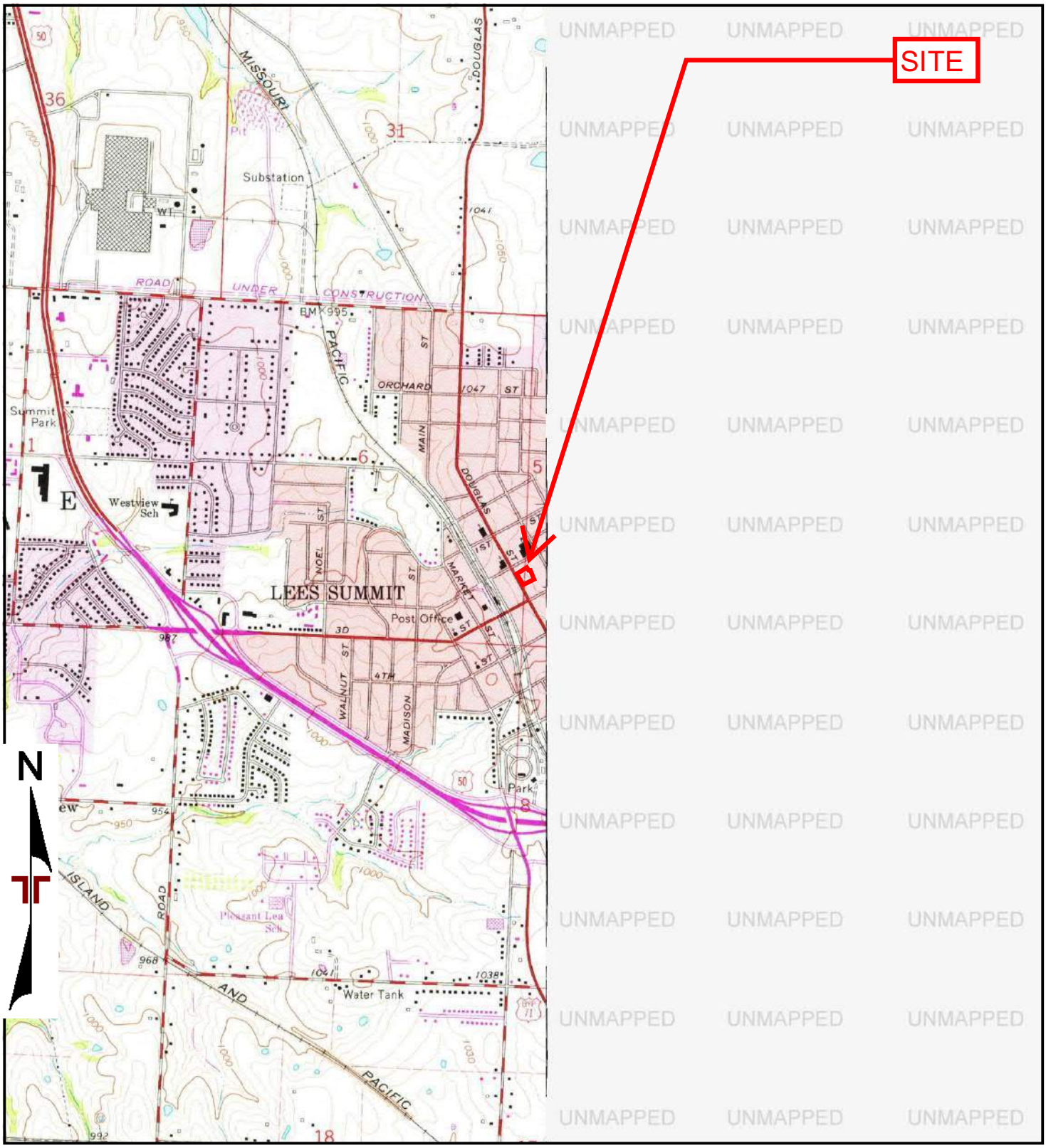
Appendix C



TP, Lees Summit, 1975, 7.5-minute
NE, Lake Jacomo, 1975, 7.5-minute

0 Miles 0.25 0.5 1 1.5

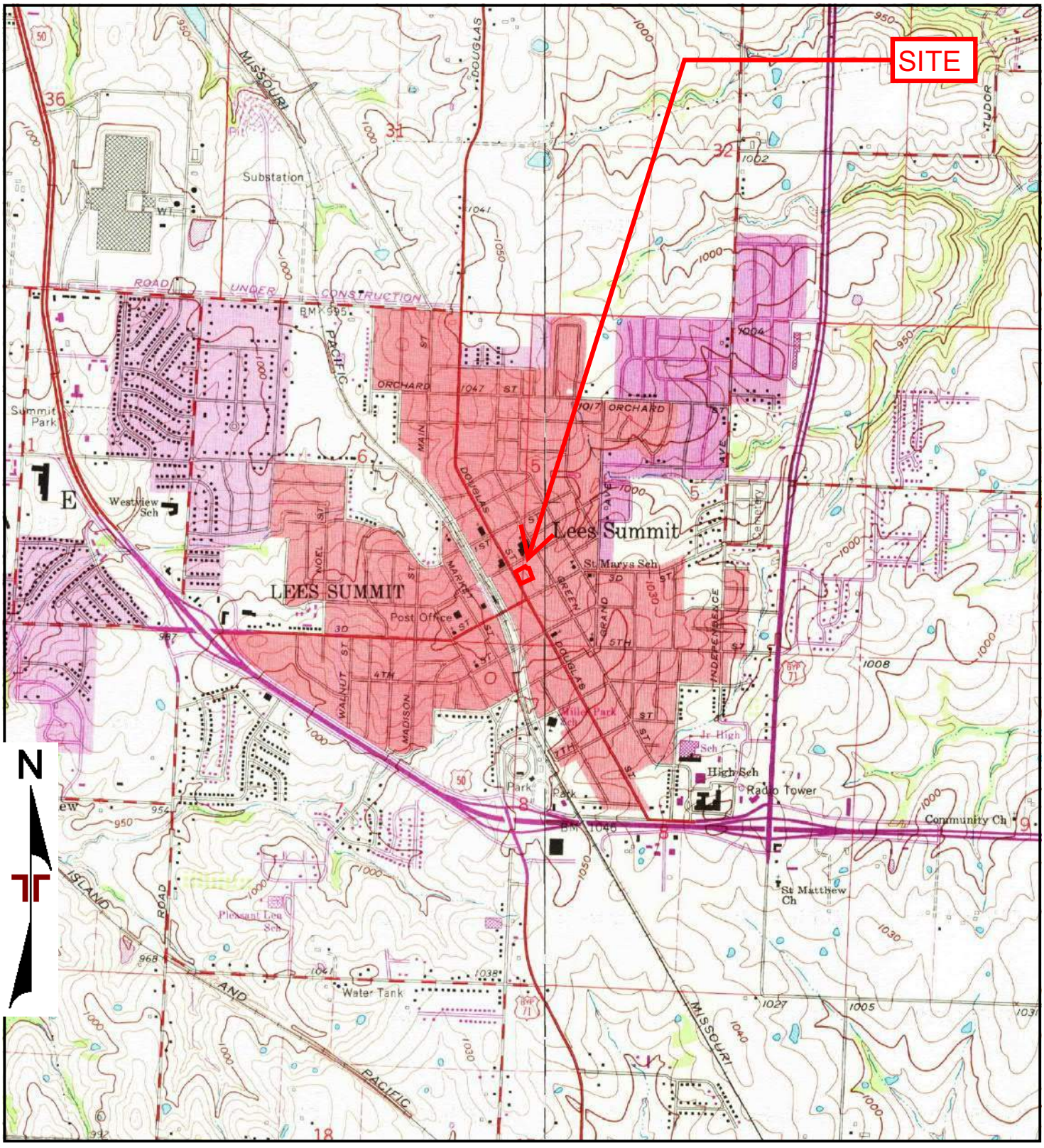
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1975 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		
Checked by:	File Name:		
Approved by:	Date: 1975		Appendix C



TP, Lees Summit, 1971, 7.5-minute

0 Miles 0.25 0.5 1 1.5

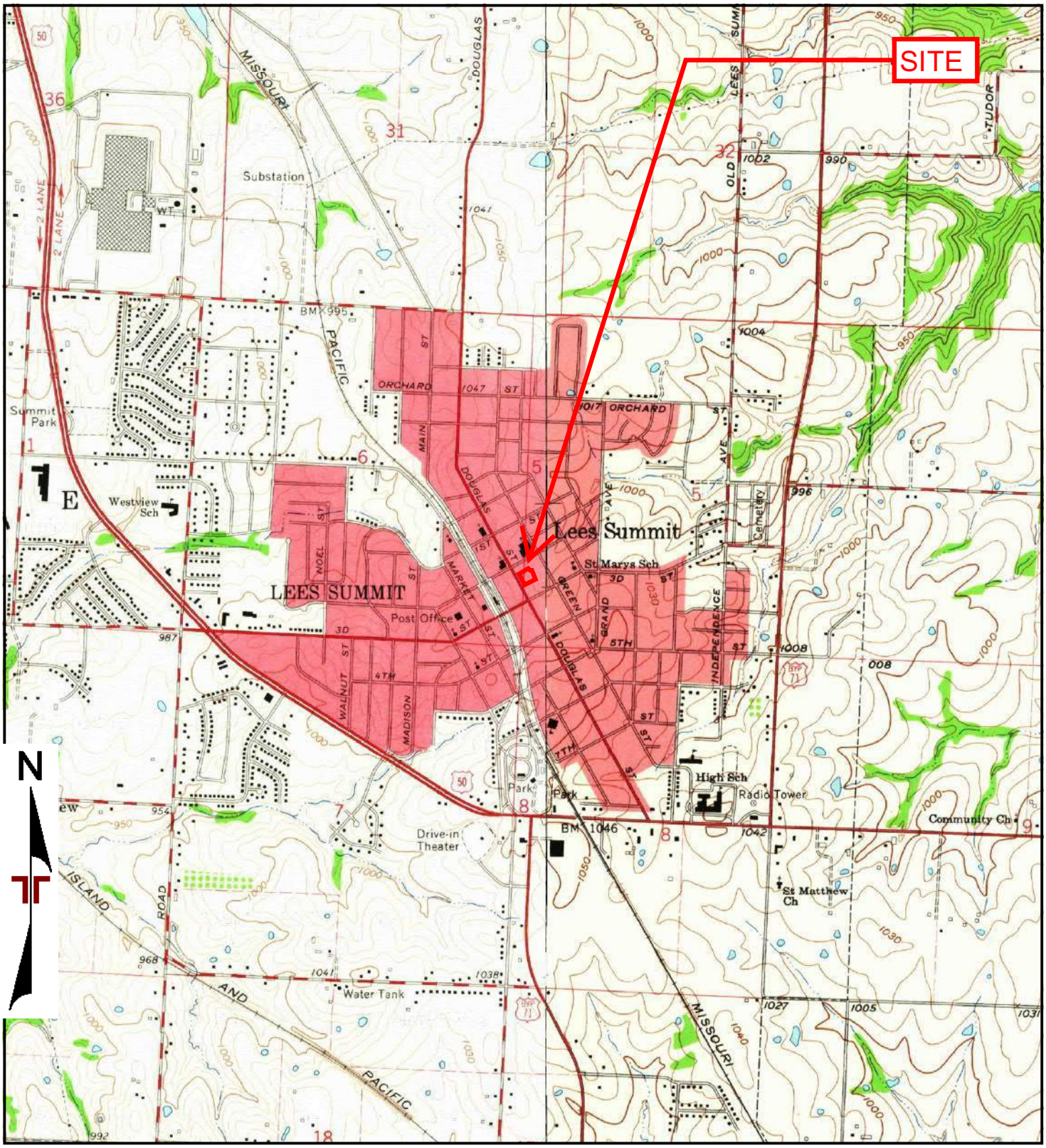
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1971 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		
Checked by:	File Name:		
Approved by:	Date: 1971		Appendix C



TP, Lees Summit, 1970, 7.5-minute
NE, Lake Jacomo, 1970, 7.5-minute

0 Miles 0.25 0.5 1 1.5

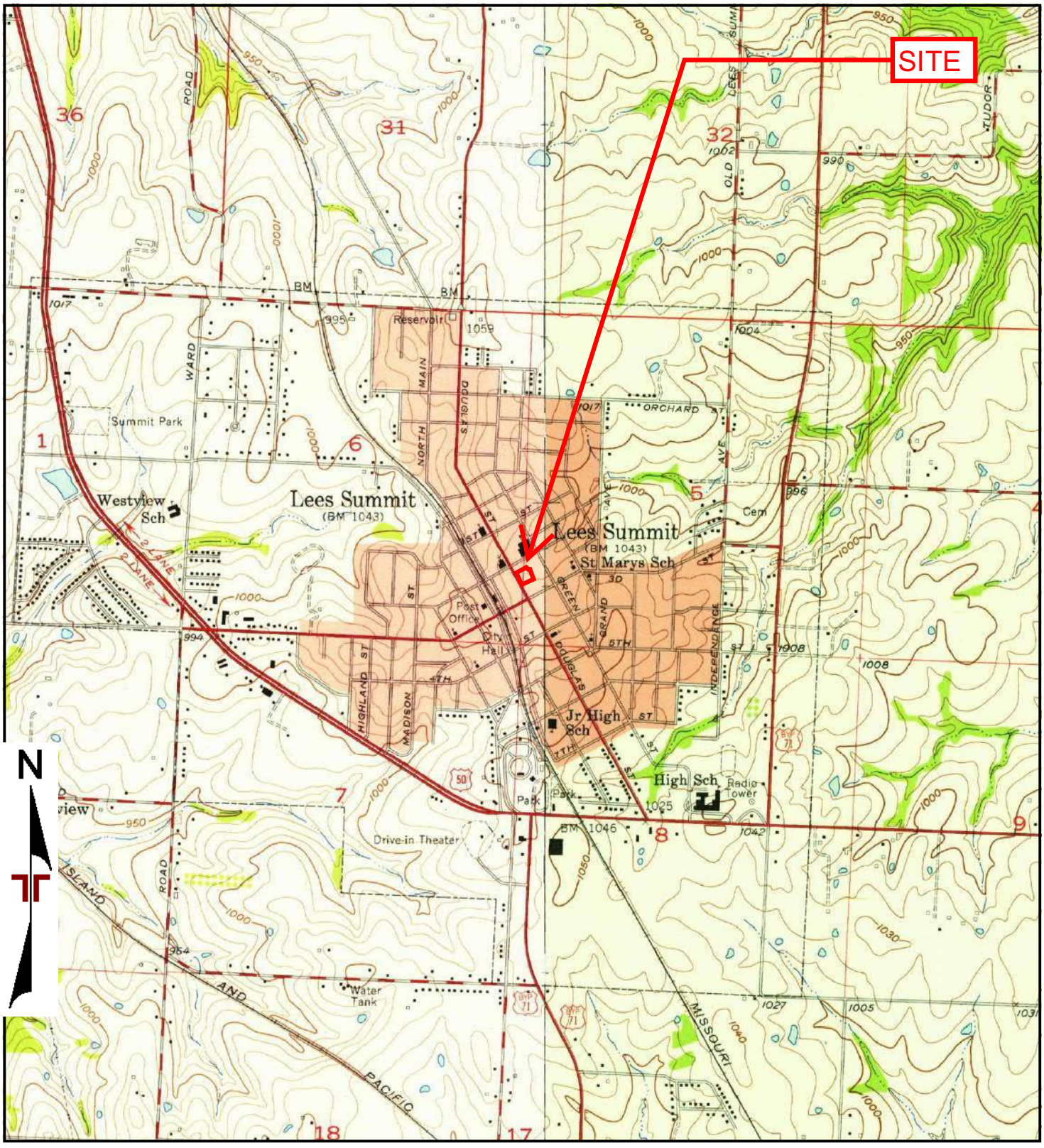
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1970 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		
Checked by:	File Name:		
Approved by:	Date: 1970		Appendix C



TP, Lees Summit, 1964, 7.5-minute
NE, Lake Jacomo, 1963, 7.5-minute

0 Miles 0.25 0.5 1 1.5

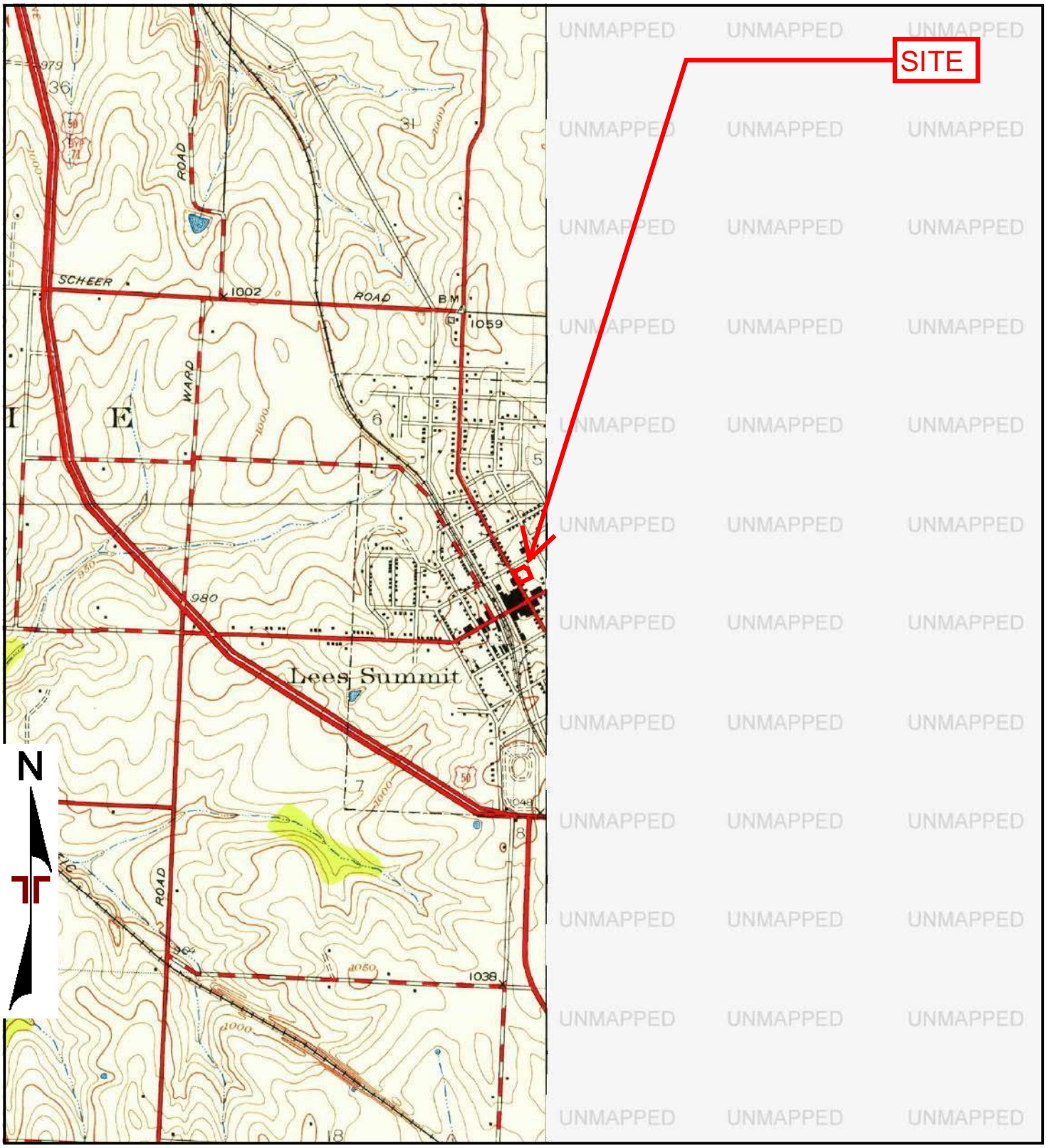
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1963, 1964 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		Appendix C
Checked by:	File Name:		
Approved by:	Date: 1963, 1964		



TP, Lees Summit, 1957, 7.5-minute
NE, Woods Chapel, 1957, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1957 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 1957			



TP, Lees Summit, 1949, 7.5-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	
Drawn by:	
Checked by:	
Approved by:	

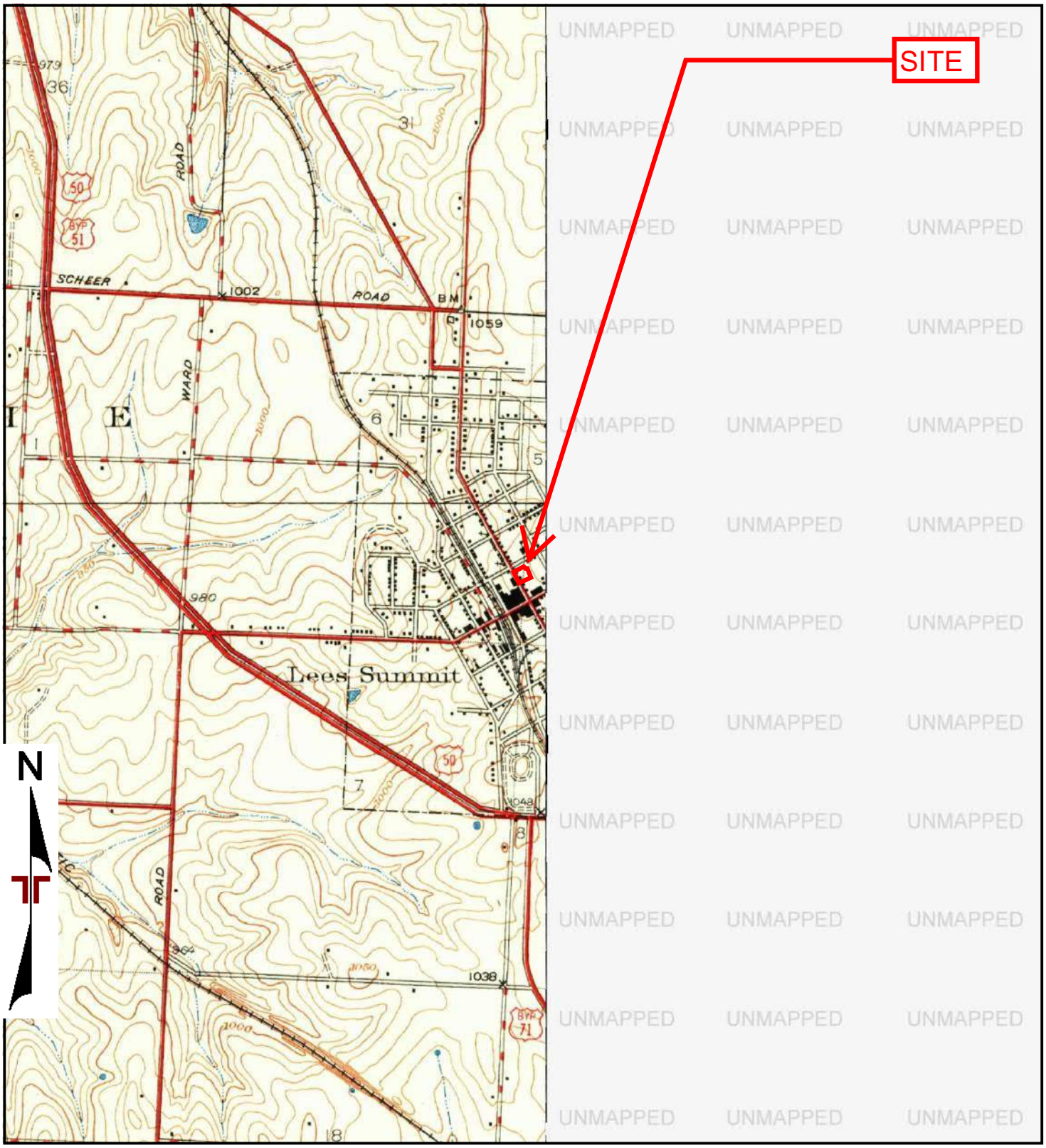
Project No.	02237353
Scale:	As Shown
File Name:	
Date:	1949

Terracon
15620 W. 113th Street
Lenexa, KS 66219

1949 TOPOGRAPHIC MAP

Fire Station #1
207 SE Douglas
Lees Summit, MO 64063

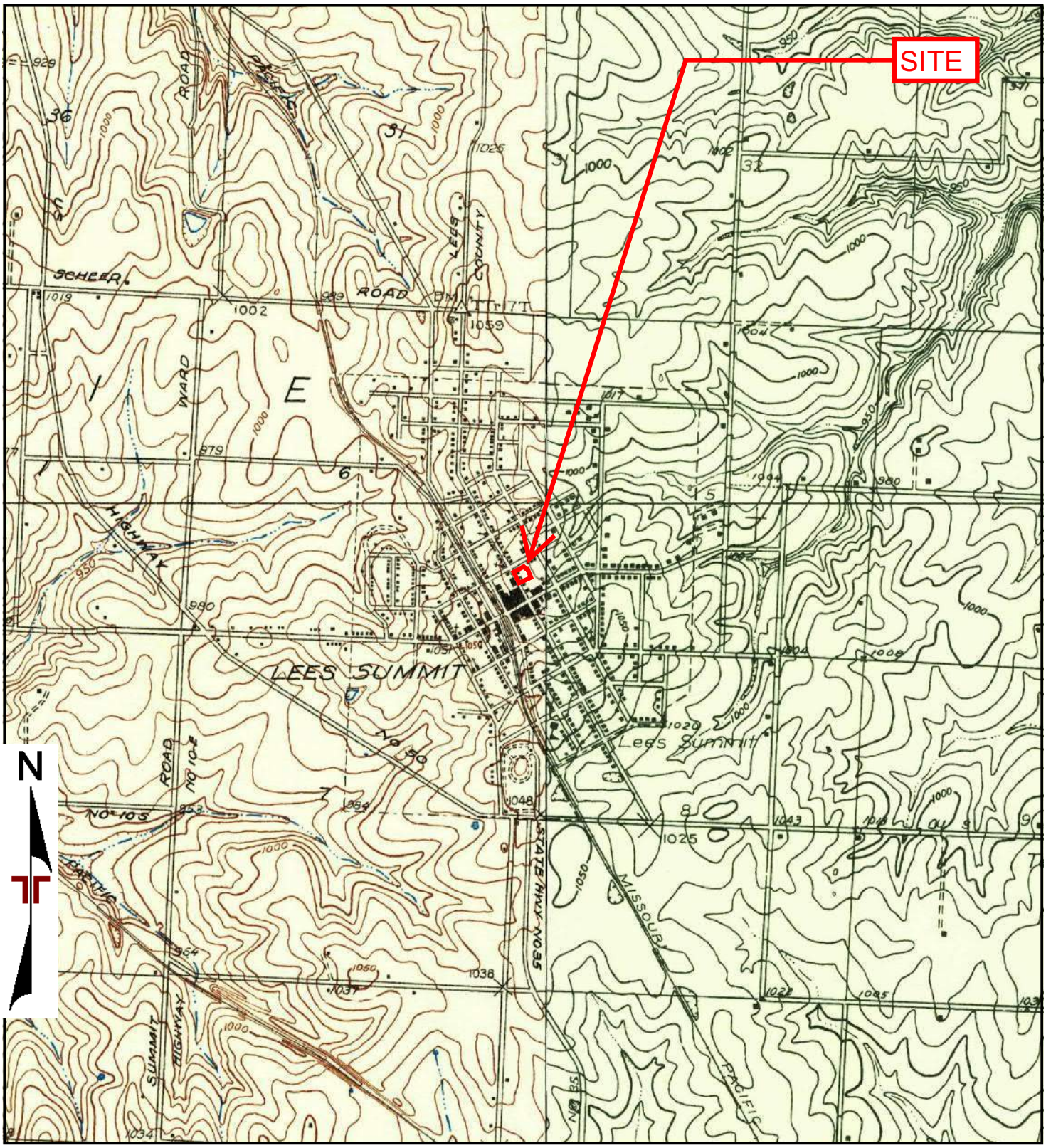
Appendix
C



TP, Lees Summit, 1939, 7.5-minute

0 Miles 0.25 0.5 1 1.5

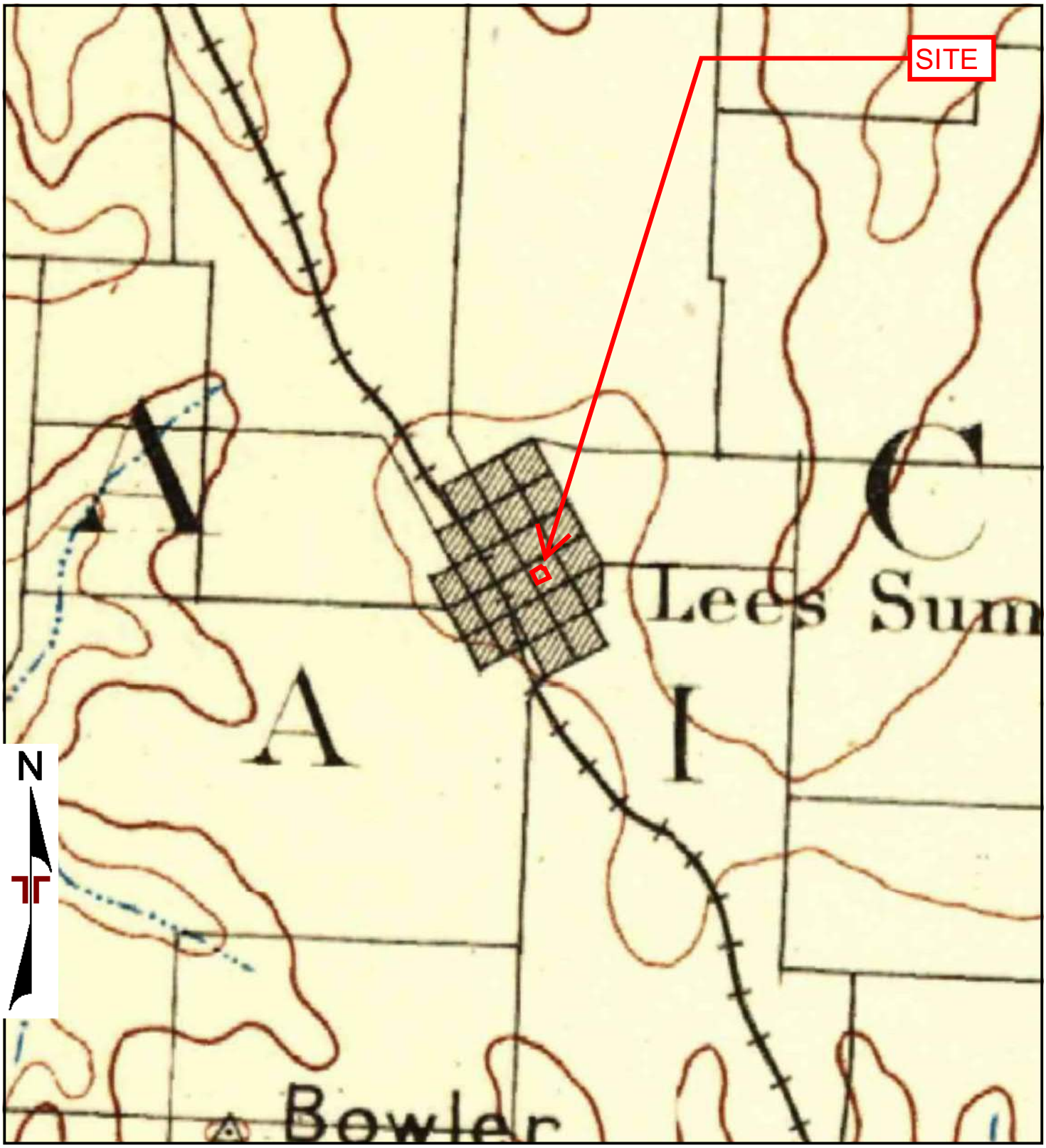
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1939 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063
Drawn by:	Scale: As Shown		
Checked by:	File Name:		
Approved by:	Date: 1939		Appendix C



TP, Lees Summit, 1934, 7.5-minute
NE, Woods Chapel, 1934, 7.5-minute

0 Miles 0.25 0.5 1 1.5

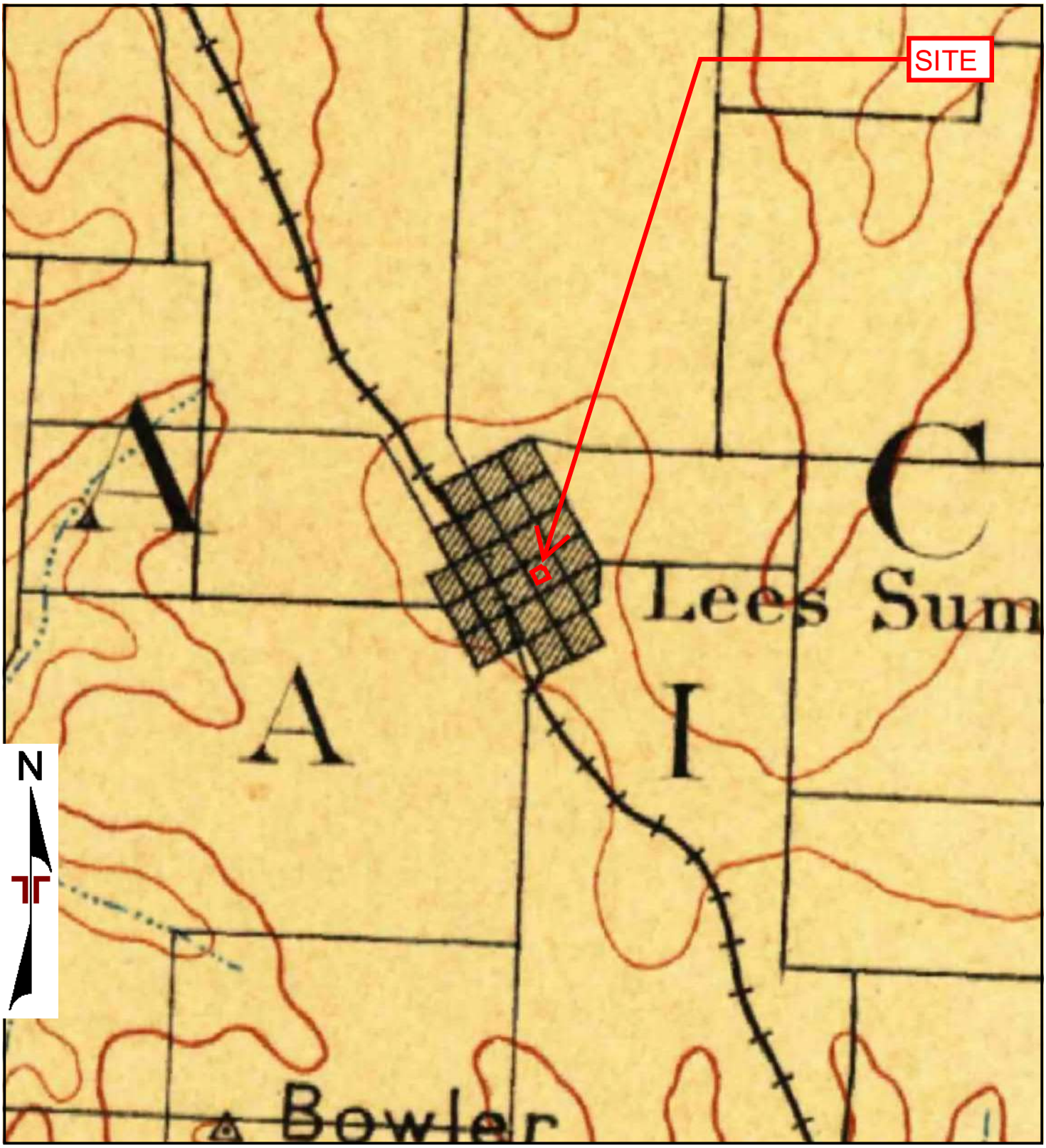
Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1934 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 1934			



TP, Harrisonville, 1894, 30-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	Project No. 02237353	Terracon 15620 W. 113th Street Lenexa, KS 66219	1894 TOPOGRAPHIC MAP Fire Station #1 207 SE Douglas Lees Summit, MO 64063	Appendix C
Drawn by:	Scale: As Shown			
Checked by:	File Name:			
Approved by:	Date: 1894			



TP, Harrisonville, 1892, 30-minute

0 Miles 0.25 0.5 1 1.5

Project Manager:	
Drawn by:	
Checked by:	
Approved by:	
Project No.	02237353
Scale:	As Shown
File Name:	
Date:	1892

Terracon
15620 W. 113th Street
Lenexa, KS 66219

1892 TOPOGRAPHIC MAP

Fire Station #1
207 SE Douglas
Lees Summit, MO 64063

Appendix
C