APPENDIX J – SUPPORT FACILITIES

General Description

Support facilities are an integral element of MOT. These facilities enable the airport to safely serve certain sizes of aircraft, types of service (e.g. passenger airlines), and do so in various weather conditions. These are not necessarily connected directly to the airfield, but must be located appropriately to meet the needs they are intended to fill. For example, the airport offices will need vehicle access for the general public while firefighting will need to have quick access to the airfield. The following support facilities and their status at MOT are outlined in this appendix. **Exhibit J-1 Landside Facilities** provides the location of facilities discussed in this appendix.

- Aircraft Rescue and Firefighting (ARFF)
- Snow and Ice Control
- Airport Maintenance & Operations
- Other Buildings (Electrical Vault)
- Airport Traffic Control Tower
- Fueling
- Ground Access
- Fencing
- Utilities

Aircraft Rescue and Firefighting (ARFF)

The Aircraft Rescue and Firefighting (ARFF) services at MOT are provided by the City of Minot Fire Department. Airports provide ARFF as required by the FAA based upon accommodating passenger service airlines with seating of at least 10 passengers. In accordance with Federal Aviation Regulation (FAR) Part 139 *Certification of Airports*, an acceptable ARFF response time requires the airport to have sufficient apparatus meeting the applicable index proceed to the mid-point of the furthest runway and begin delivering an extinguishing agent in no more than 3 minutes from the time of the call for the first responding vehicle, and 4 minutes for the second vehicle (if applicable). The ARFF index is based upon having 5 or more average daily departures of aircraft with a certain fuselage length. These indices are as follows (refer to CFR Part 139.315-317 for details):

- **Index A:** Aircraft less than 90 feet (Beech 1900, Embraer 120, Bombardier CRJ200, etc.) Extinguishing Agent Requirements: 450 pounds of Class BC Agent and 100 gallons of Water mixed with Aqueous Film Forming Foam (AFFF) carried on 1 vehicle.

- **Index B:** Aircraft at least 90 feet but less than 126 feet (Bombardier Q400, CRJ-700, CRJ-900, Embraer 145, 175, 190/195, DC-9, Airbus A319, Boeing 737-700, etc.) Extinguishing Agent Requirements: 450 pounds of Class BC Agent and 1,500 gallons of water with commensurate quantity of AFFF carried on 1 or 2 vehicles.

- **Index C:** Aircraft at least 126 feet but less than 159 feet (Boeing 737-800, 757-200, Embraer 195, MD-80, Airbus A321, etc.) Extinguishing Agent Requirements: 450 pounds of Class BC Agent and 3,000 gallons of water with commensurate quantity of AFFF carried on 2 or 3 vehicles.

- **Index D**: Aircraft at least 159 feet but less than 200 feet (Airbus A330, Boeing 757-300, 767-300, 787, etc.) Extinguishing Agent Requirements: 450 pounds of Class BC Agent and 4,000 gallons of water with commensurate quantity of AFFF carried on 3 vehicles.

- **Index E**: Aircraft at least 200 feet (Airbus A340, Boeing 747, 777, etc.) Extinguishing Agent Requirements: 450 pounds of Class BC Agent and 6,000 gallons of water with commensurate quantity of AFFF carried on 3 vehicles.

MOT regularly maintains an Index B level but is capable of Index C with prior notification for additional staffing with the equipment listed in **Table J-1**.

Table J-1 – ARFF Equipment

ID	Year	Make/Model	Water (gallons)	AFFF (gallons)	Dry Chemical (pounds)	Condition
301	1992	E-One	1500	205	700	Fair
302	2012	Oshkosh Striker	1500	210	500	Good

Source: Minot International Airport (2015)

The ARFF equipment is located in the City of Minot Fire Station Number 3 which houses structural and ARFF equipment in this joint use station. The station is situated in the west general aviation area on the aircraft apron with access to the airfield by Taxiways C3 and B2. The City of Minot operates three battalions with a total of 45 firefighters all training and rotated into ARFF duty. The airport pays for three dedicated personnel on this rotating shift who are also supported in the same station from other City of Minot Fire Department staff. In order to meet the requirements of the airline schedules, the ARFF staff is on duty 24 hours per day. The staff maintains training through onsite training and on-site live fire training with a mobile training facility from Duluth, MN in order to maintain compliance with FAR Part 139. In addition, the airport has an emergency plan referred to as the Airport Emergency Plan (AEP) which serves as a guiding tool for the airport to outline how it will respond to different types of emergencies and what support entities exist at the airport and in the community to support these responses.

MOT has the same mutual aid agreements with each of the entities as the City of Minot. The typical responding agencies are City of Minot Fire Department, Minot Rural Fire Department, Minot Air Force Base which provide personnel, engines and additional support equipment. In cooperation with the mutual aid agencies and Trinity Hospital, MOT conducts table top exercises each year. These are in accordance with the requirements of FAR Part 139. Every 36 months, also in accordance with FAR Part 139, the airport conducts a live drill involving the mutual aid agencies and Trinity Hospital.

Additional information regarding ARFF can be found in the current version of the following advisory circulars:

- 150/5200-31, *Airport Emergency Plan*
- 150/5210-15A, *Aircraft Rescue and Firefighting Station Building Design*
- 150/5220-10, *Guide Specification for Aircraft Rescue and Fire Fighting (ARFF) Vehicles*

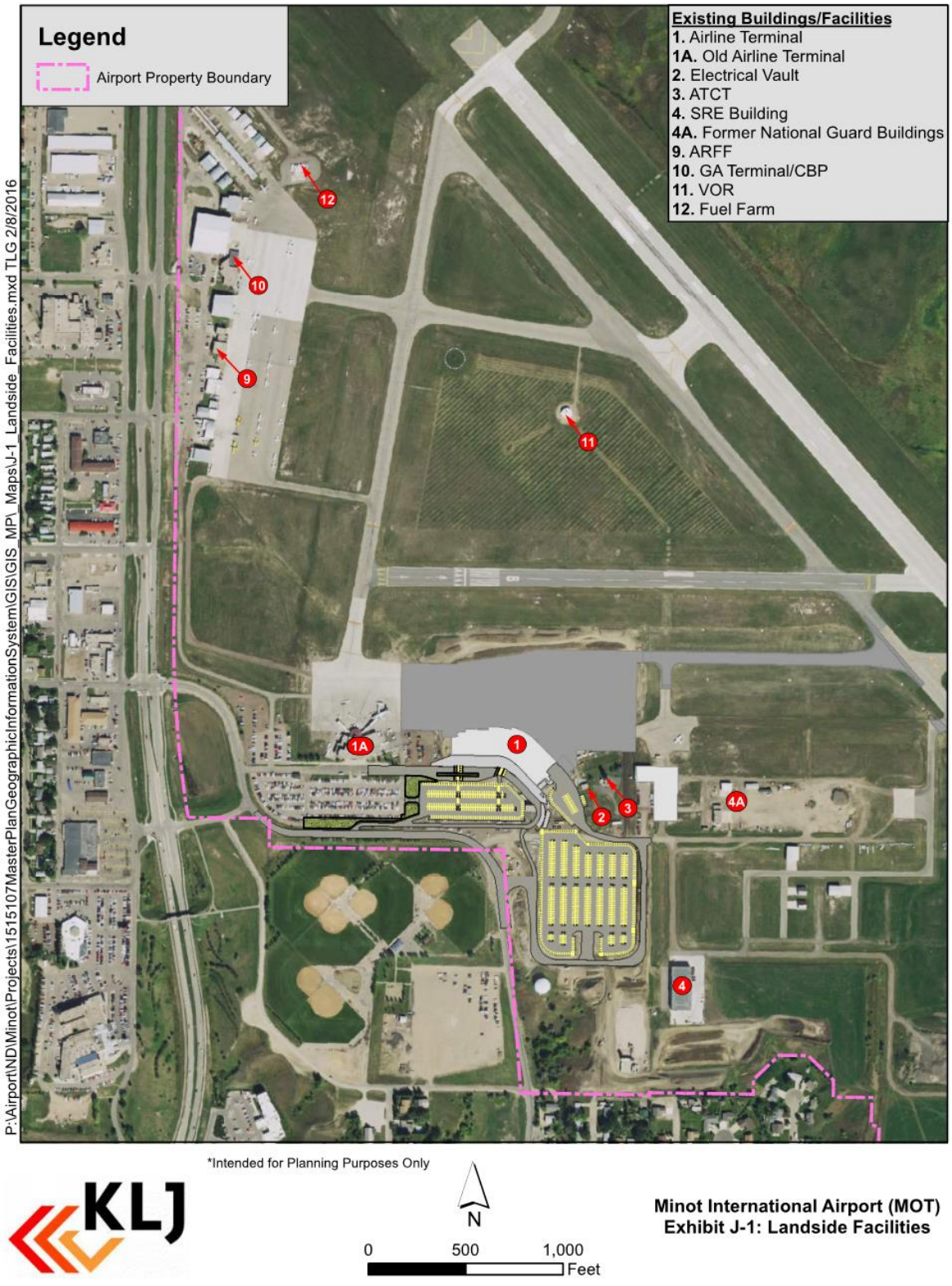
ARFF Needs: During the time the Master Plan was being developed it was determined that there were significant deficiencies in the ARFF facility. These deficiencies are noted in detail in an attached

report, City of Minot Fire Department Fire Station No. 3 Building Assessment from June 2016. The deficiencies are summarized as follows:

- Quarters and Office Areas occupy a narrow area between ARFF Apparatus Bays and Structural Apparatus Bays leaving little space for expansion (less than 2,000 sf currently and approximately 4,000 sf needed)
- Building was constructed close to existing grade and has several ongoing drainage issues with storm water and ground water
- Building is poorly insulated
- Building originally used an under-slab ventilation system that filled with ground water, was filled with concrete, but still presents air quality issues into the building
- Current Code requires automatic sprinklers
- Current Code requires egress windows from sleeping areas
- 8" steps between quarters/offices to apparatus bays does not meet ADA
- Doorways do not meet ADA
- Dormitory area is very small and does not provide gender equity with separation by plywood partitions and curtains
- The one bathroom for the crew quarters serves as toilet and shower room for all staff
- Mechanical and Electrical systems are inadequate

As a result of this report, the Master Plan is recommending the renovation or replacement of this facility and has therefore identified several optional locations that meet the needs of the Airport and City of Minot. The optional locations are discussed in the Alternatives Chapter within the Terminal and West General Aviation areas where locations were identified.

Exhibit J-1 Landside Facilities



Snow and Ice Control

Snow and ice control for an airport is one of the most critical components to ensure airport access to a community during wintry conditions. The FAA provides guidance for airports in determining the amount of equipment an airport needs and the size and layout of buildings to house the equipment. This guidance is found the current version of three Advisory Circulars:

- 150/5200-30C, *Airport Winter Safety and Operations*
- 150/5220-18A, *Buildings for Snow and Ice Control Equipment*
- 150/5220-20A, *Airport Snow and Ice Control Equipment*

An airport can determine the amount of equipment needed using the tables and information in AC 150/5220-20 and determine the size of building(s) using AC 150/5220-18A.

PRIORITY 1 AREA

The FAA emphasizes the clearance of Priority 1 areas as defined by AC 150/5200-30C. The Priority 1 areas include the primary runway(s), taxiways and aprons serving commercial service aircraft, as well as ARFF station(s), mutual aid access points and emergency service roads. MOT has approximately 300,000 square yards of Priority 1 surface area for snow and ice control including:

- Runway 13/31 (129,000 SY)
- Terminal Apron (50,000 SY)
- Taxiways (105,000 SY)
- ARFF and Apron (16,000 SY)

Please note the Priority 1 areas for FAA calculation purposes do not include entrance roads, parking, and other landside needs in the airline terminal or general aviation areas. To meet the needs of passengers, there are 'landside' areas that the airport prioritizes and it is necessary to have sufficient equipment and personnel to clear these areas as well in a timely manner.

The last areas, referred to as Priority 2, 3 and 4 at MOT, are the other areas on the airfield such as crosswind runways, general aviation areas, additional taxiways, and the remaining landside areas. The same staff and equipment used on the Priority 1 areas will redirect their efforts to the remaining priority areas as soon as they are able. However, as indicated previously, only airside Priority 1 areas are used in the FAA prescribed calculations for equipment.

CLEARANCE REQUIREMENTS

Once the amount of Priority 1 areas is determined, the airport uses the guidance for clearance times found in AC 150/5200-30C, summarized in **Table J-2** and equipment calculations in AC 150/5220-20 to determine the amount of equipment needed. For MOT the clearance standard is currently ½ hour for the Priority 1 areas.

Table J-2 – Clearance Times for Commercial Service Airports

Annual Airplane Operations (includes cargo operations)	Clearance Time (hours)
40,000 or more	½
10,000 but less than 40,000	1
6,000 but less than 10,000	1 ½
Less than 6,000	2
General: Commercial Service Airport means a public-use airport that has at least 2,500 passenger boardings each year and that receives scheduled passenger airplane service. These airports should have sufficient equipment to clear 1 inch of falling snow weighing up to 25 lb/ft^3 from Priority 1 areas within the recommended clearance times.	

Source: FAA AC 150/5200-30C Table 1-1

SNOW REMOVAL EQUIPMENT (SRE)

MOT has the following SRE equipment listed in **Table J-3** to handle snow and ice control including the runways, taxiways and terminal apron. The parking operator, Republic Parking, provides snow removal for the revenue-generating parking area. The airport maintenance staff provides snow removal for all other parking and roads out to Airport Road. The City of Minot conducts snow removal on Airport Road and 3rd Street.

Table J-3 – Snow and Ice Control Equipment

Make/Model	Unit No.	Plow Size (feet)	Broom Size (feet)	Blower (tons/hour)	Year
Runway/Taxiway Plows					
Oshkosh Snowplow	314	19	-	-	1989
FWD Snowplow	325	20 & 24	-	-	2009
Oshkosh Snowplow HB 2723	326	20 & 24	-	-	2014
Sterling Sand Truck w/Epoke (Unit 3120)	312	-	-	-	2005
International 5 Ton Sand Truck	316	-	-	-	1975
Tractor/Apron Plows					
Fiat Allis Loader	311	bucket	-	-	1977
John Deer Road Grader	315	16 plus 10.5 wing	-	-	1977
Caterpillar Loader 972G	317	16 & 23	-	-	2005
Bobcat 5600 Toolcat	318	buckets	7	7 ft	2009
Bobcat S300 Skidsteer	330	buckets	7	7 ft	2009
Chevy ¾ T Pickup w/ Boss Plow	304	7.5	-	-	1989
Brooms/Blowers/Other					
Kubota Tractor w/ Schulte Blower (Unit 3030)	303	-	-	8 ft	2003
Idaho Norland Snow Blower	313	-	-	8 ft	1986
Oshkosh Snow Blower	322	-	-	8 ft	1994
Oshkosh Sweepster	323	-	18	-	1996
MB Broom	327	-	22	-	2013
Chevy Pickup - Vericom Friction Tester	306	-	-	-	2006
Dodge Pickup - Vericom 3000-Friction Tester	339	-	-	-	2000
Ford F150 Pickup - Vericom Friction Tester	340	-	-	-	2014

Source: Minot International Airport Snow and Ice Control Plan (7/22/2015)

The FAA allows federal funding to be used to acquire SRE based on the Priority 1 Areas and Clearance Times. Any SRE acquired with federal funding must principally be used for snow and ice control. Any other use must be in non-compliance with FAA policy.

MOT initiates snow removal/ice control operations at the discretion of Operations personnel in conjunction with the senior personnel on duty. The airport uses plows, brooms and blowers depending on depth, consistency of snow, wind direction, runway surface temperatures, speed of accumulation and other factors which vary with the event. The airport maintains five different overlapping shifts for maintenance staff and when snow/ice control action is required, additional personnel are called in early or from those on days-off to provide sufficient staffing.

SNOW AND ICE CONTROL PLAN AND REPORTING

MOT has a Snow and Ice Control Plan that includes information on all equipment, staff, and procedures the airport follows to handle snow and ice events. The airport is also required to consistently report the current airfield conditions to the FAA so that pilots can make informed decisions in using the airport. This is done by the airport's operations staff who provides Notices to Airmen (NOTAMs) through the FAA as to field conditions.

The airport uses decelerometers to assess the field conditions, carry out snow/ice control, and accurately report current conditions. The decelerometer is a device used in a vehicle to measure the rate of deceleration. It is used to determine the current braking action conditions. These conditions are then reported through the NOTAM system as Mu readings. The decelerometer can only be used in snow and ice conditions and does not provide information regarding contaminants such as rubber deposits. The airport has three Vericom Runway Friction Measuring devices mounted on vehicles.

The Mu that is noted above is the measure of friction and ranges from 0 to 100 with 0 equating to no traction. When the Mu measures less than 40 then commercial service airports are required to report this through a NOTAM. When the Mu measures less than 26, corrective action must be taken which is usually prescribed in the airport's Snow and Ice Control Plan. Treatment can include clearing, chemicals, sand (meeting FAA size requirements), etc.

MOT maintains a supply of sand and deicing chemicals. Deicing chemicals are only used sparingly only when brooms, plows, and sanding are not effective.

SRE STORAGE BUILDINGS

MOT stores and maintains the snow and ice control equipment and material in one building which is 21,500 square feet in size. The building is located on the south portion of the airfield near the south general aviation hangar area. All of the airport's SRE and maintenance equipment are stored and maintained in this building. The building was constructed in 2013 and generally sufficient to meet existing needs. This SRE building replaced the existing 6,400 square foot building located near where the new terminal was constructed.

Snow and Ice Control Needs: No substantive improvements or changes were identified through the master plan study. The size of the area and location of the facilities is expected to be sufficient through the planning period. Facilities should be maintained, and improvements should be made as demand dictates.

Airport Maintenance & Operations

Whether operating as a general aviation airport or as a commercial service airport licensed by FAR Part 139, each airport is a conglomeration of infrastructure, buildings, property, and services that are used daily by the flying public. There is a mixture of staff, contractors, and tenants who keep the airport running. The focus of this section is on the behind-the-scenes support for facilities that the airport maintains, not including tenant-maintained facilities. MOT operates in accordance with FAR Part 139 and as such is regulated in regards to maintaining an airport safe for the flying public.

STAFFING

MOT has a staff of 22 full-time employees excluding ARFF staff. The full-time staff includes 6 management/administrative and 16 operations and maintenance. All maintenance and custodial services for the airport are provided by airport staff. The airport also pays for 3 full-time ARFF staff which are assigned from three battalions to cover shifts at the airport.

The portion of the management team that directs the maintenance and operations of the airport includes an Operations Manager, Operations Foreman and Facilities Foreman.

FACILITIES

The airport staff occupies three different building areas including the maintenance facility for operations and maintenance staff, the ARFF station for ARFF staff, the terminal for operations, administrative and office staff.

Airport Operations Needs: No substantive improvements or changes were identified through the master plan study. The size of the area and location of the facilities is expected to be sufficient through the planning period. Facilities should be maintained, and improvements should be made as demand dictates.

Other Buildings

The airport contains a variety of buildings which have been described in different sections. There are several remaining buildings which are described in this section primarily because of their location within close proximity to the general aviation area and thus the area that is likely to see redevelopment to maximize space for general aviation use.

ELECTRICAL VAULT

This small building exists in obscurity but is critically important. The electrical vault is the building where the airport receives power from commercial providers and distributes that power through regulators, controls and wiring to light the airfield. Other buildings at the airport are typically not powered through the electrical vault as it is typically used only for airfield lighting. The building also has the emergency generator for the airfield in the event of a power failure. As it relates to an area that requires redevelopment, the electrical vault is fixed in its location due to the cost of relocating all the electrical service and distribution lines that proceed to and from the vault to the airfield. The MOT electrical vault was constructed in 1993 and is located immediately west of the ATCT.

FORMER ARMY NATIONAL GUARD FACILITIES

Prior to 2009, the Army National Guard was located immediately east of the FedEx Cargo facility. There are three buildings owned by the airport which are associated with this former complex. The buildings are currently used by airlines for Ground Service Equipment (GSE) maintenance. The buildings are located in an area noted on previous master plans for hangar development. The former

guard facilities are recommended to be removed to allow for cargo and hangar expansion as demand dictates.

Airport Traffic Control Tower (ATCT)

ATCT facilities exist at over 500 airports in the United States. These facilities fall into two main categories which are FAA Control Towers and FAA Contract Towers. There are 251 FAA Control Towers which are typically the busiest towers in the system and are owned and operated fully by FAA staff. There are 253 FAA Contract Towers. The FAA Contract tower program is overseen by the FAA with contracts executed by the FAA to select companies to operate the towers at particular airports. The tower facilities are owned and maintained by the local airports often with some assistance from the FAA in tower construction. The FAA also often provides and maintains equipment for these contract towers. There are several different contractors across the country who operate these contract towers.

Since ATCT facilities are primarily responsible for the safe movement of aircraft on the airfield, visibility of all aircraft movement areas from the tower is a primary concern. Towers are sited using the guidance from **FAA Order 6480-4a Airport Traffic Control Tower Siting Process**.

The Minot International Airport Air Traffic Control Tower is operated as a contract tower by Midwest Air Traffic Control. The tower operates daily from 7:00 am until 10:00 pm. The tower is located immediately southeast of the new passenger terminal. With the construction of the new terminal, the western portion of the terminal apron and a portion of Taxiway B is not visible from the tower cab. In addition, hangar development in the south area is limited in height so that the tower can continue to see aircraft on the full length of Taxiway C.

ATCT Needs: Because of the line of site limitations, a new location for the ATCT facility was identified in the northeast portion of the airport. The location should be preserved for this use and no construction should be allowed that would impede the line of sight for the new location. Current facilities should be maintained, and improvements should be made as demand dictates.

Fueling Operations

In order to support the activities at the airport, there is a need to store and deliver fuel to aircraft and ground vehicles. These facilities can be owned by the airport or private entities. Even if the facility is owned by the airport, it is common for the airport to lease the fuel facilities to an FBO.

AIRCRAFT FUELING/STORAGE

MOT has three fuel tanks with a total storage capacity of 20,000 gallons of 100LL and 40,000 gallons of Jet-A. These airport-owned, above-ground fuel tanks are located in a common location known as a "fuel farm" which has a spill containment area. **Table J-4** provides a detailed listing of fuel storage facilities at the airport.

There are no self-fueling stations at the airport so no self-fueling tanks are included in the list. Self-fueling stations are publically or privately owned allowing individuals to fuel their own aircraft. Public-use facilities commonly can be used 24-hour a day with a credit card reader. The fuel farm tanks are double-walled providing self-contained spill prevention. Should there be a need to relocate the fuel tanks, there is minimal permanent infrastructure in place that would impede relocation. In addition to fuel storage tanks, fuel trucks are required to dispense fuel around the airport where aircraft are parked. **Table J-5** provides a listing of fuel trucks at the airport for servicing aircraft.

Table J-4 – Aircraft Fuel Storage Facilities

Location	Fuel Type	Capacity (gallons)	Above /Under Ground	Self-Fueling Pump	Use / Condition	Owner	Year
Fuel Farm	Jet A	20,000	Above	N	FBO	Airport	2006
Fuel Farm	Jet A	20,000	Above	N	FBO	Airport	2006
Fuel Farm	100LL	10,000	Above	N	FBO	Airport	2006

Source: Minot Aero Center

Table J-5 – Aircraft Fuel Trucks

Location	Fuel Type	Capacity (gallons)	Use	Owner
Minot Aero Center	100LL	750	FBO	Minot Aero Center
Minot Aero Center	100LL	750	FBO	Minot Aero Center
Minot Aero Center	Jet A	3,000	FBO	Minot Aero Center
Minot Aero Center	Jet A	5,000	FBO	Minot Aero Center
Minot Aero Center	Jet A	5,000	FBO	Minot Aero Center
Minot Aero Center	Jet A	5,000	FBO	Minot Aero Center

Source: Minot Aero Center

GROUND VEHICLE/OTHER FUELING

MOT has two fuel tanks dedicated for ground vehicles. There is a total capacity of 2,000 gallons of diesel and 1,000 gallons of unleaded for use at the airport. **Table J-6** provides a detailed listing of fueling storage at the airport. These fuel farms include those used to support airport operations and others. Each of the above ground fuel tanks are double walled providing self-contained spill prevention. Should there be a need to relocate the above ground tanks, there is minimal permanent infrastructure in place to impede them being relocated.

Table J-6 – Ground Vehicle/Other Fueling Facilities

Location	Fuel Type	Capacity (gallons)	Ground Location	Self-Fueling Pump	Use / Condition	Owner	Year
SRE	Unleaded	1,000	Above	Y	Airport	Airport	2015
SRE	Diesel	2,000	Above	Y	Airport	Airport	2015

Source: Minot International Airport

Fueling Needs: No substantive improvements or changes were identified through the master plan study. The size of the area and location of the facilities is expected to be sufficient through the planning period. Facilities should be maintained, and improvements should be made as demand dictates.

Ground Access

The airport provides the air accessibility for the community but once an aircraft arrives, its passengers and cargo rely upon the airport's connectivity to the road network to get to their final destination. MOT is connected to Minot by U.S. Highway 83 (North Broadway). This provides north south access from the airport and joins U.S. Highway 2 located 3 miles south for east-west connectivity. See **Exhibit J-2 Area Roads**.

The City of Minot operates a City Transit System. The nearest stops to the airport include a stop at 20th Avenue NW and North Broadway and a stop at 20th Avenue NW and 3rd Street NW. However, the

schedules are only Monday through Friday during the day with some additional transit routes on School days. Most flight schedules would not be accommodated by this current transit system schedule.

On-Airport Public Roads

People conducting business at the airport often will need to go from one business to another at the airport and therefore need an efficient route to travel by vehicle without entering or crossing the airfield. This need is met currently for vehicles to travel around the landside of the airport by using North Broadway. See **Exhibit J-3 Roads on Airport Property**.

On Airport Non-Public (Interior) Roads

Inside of the airfield, there is a need for vehicles to move around without impeding aircraft movements. This includes ARFF, FBO, FAA NAVAID maintenance, airport maintenance, airport operations and others. Airport perimeter roads provide a means for vehicles to move around the airport in all weather conditions and not impede aircraft movement or landings and takeoffs. Depending upon the amount of use, these perimeter roads may be paved or unpaved and may be needed to support equipment such as large fuel trucks, ARFF and SRE equipment. When an unpaved surface is used, it is recommended a 'lead-in' portion of pavement be constructed within 300 feet of any taxiways, aprons, or runways to eliminate any debris from being tracked onto the aircraft movement areas.

Since the airport perimeter road is inside the airfield, it is imperative that appropriate security measures such as gates and limited access points be established to restrict access to only those persons with a need and sufficient training to be inside the airfield. See **Exhibit J-3 Roads on Airport Property**.

Ground Access Needs: No substantive improvements or changes were identified through the master plan study. Roads should be maintained, and improvements should be made as demand dictates.

Fencing/Security

MOT has a perimeter fence to meet the needs of the airport. This fence provides both wildlife control and a security perimeter to keep the airfield safe and limit access to only those who have need or permission to use the airfield. The fencing and gate access is maintained and operated by the airport staff in accordance with Transportation Security Administration (TSA) and FAA requirements. The air operations area at MOT is encompassed by a security fence to prevent unauthorized access to the active airport environment. The fence is an eight (8) foot high chain link with barbed wire security top. There is approximately 43,000 linear feet around the airport.

Fencing/Security Needs: A wildlife hazard fence is recommended and should be installed during the planning period.

Exhibit J-2 Minot Major Road Network

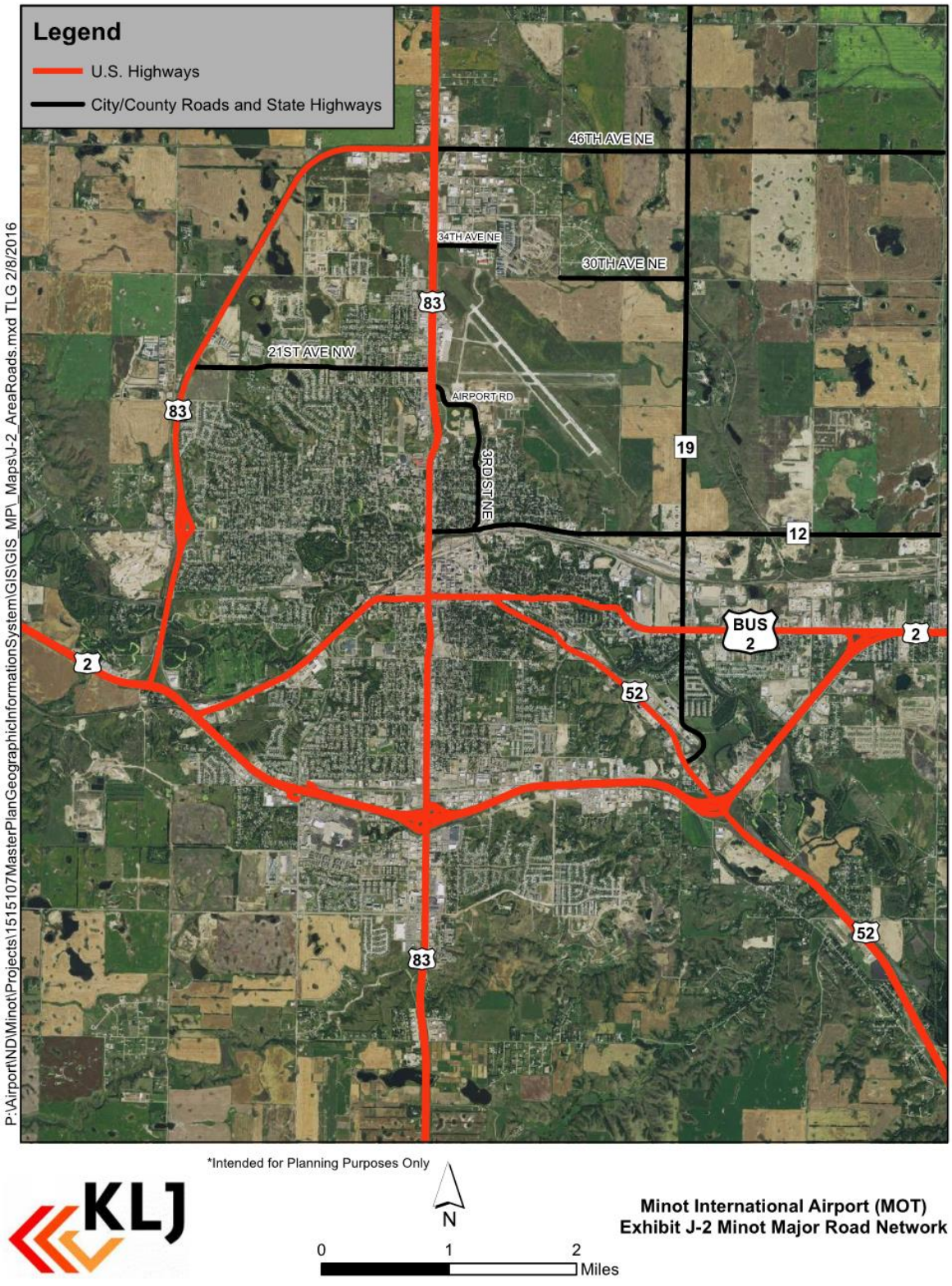
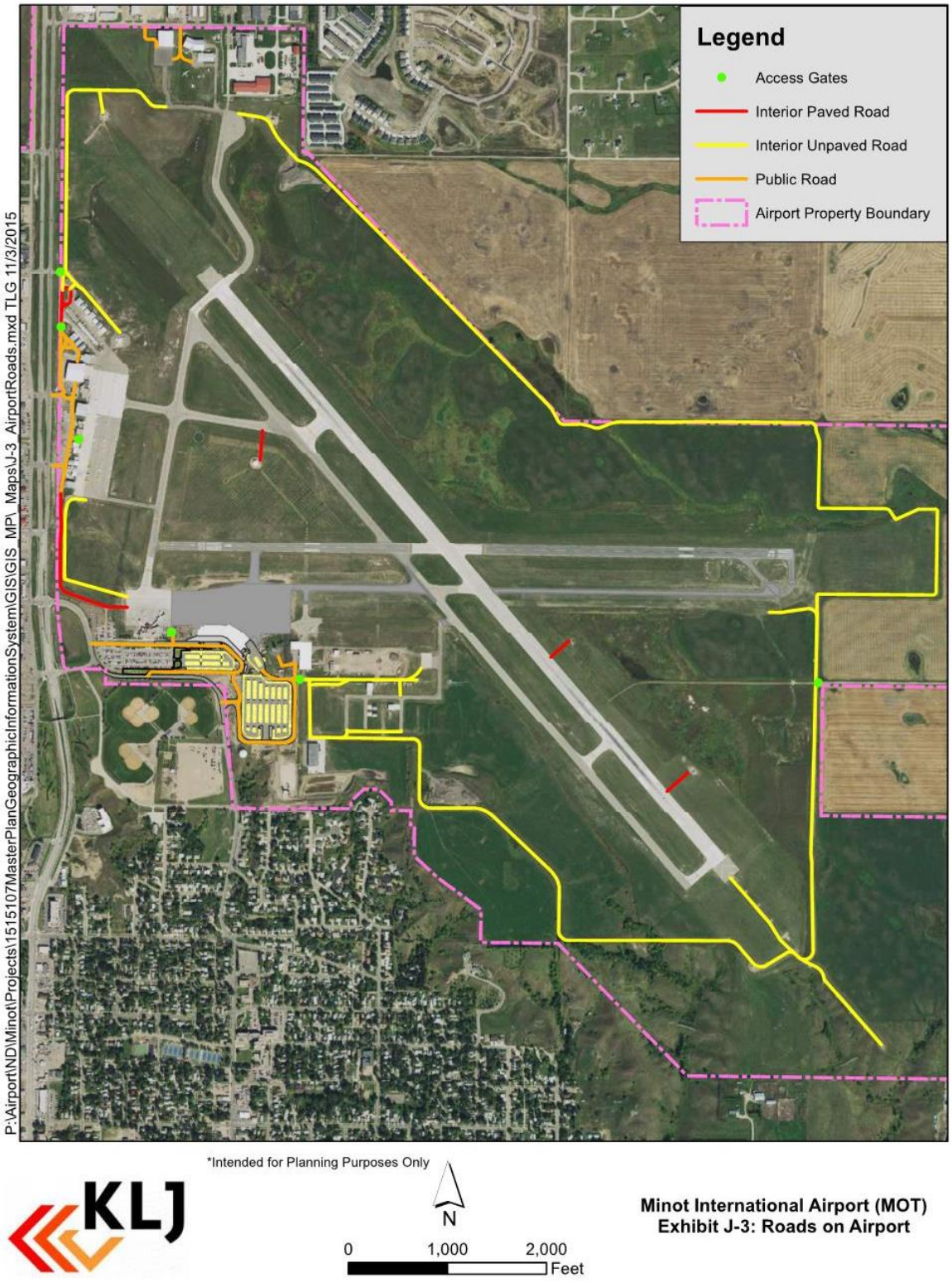


Exhibit J-3 Roads on Airport Property



Utilities

MOT has utility services provided from a number of entities. These are listed in **Table J-7**.

Table J-7 – Utility Services

Utility	Provider
Electricity	Xcel Energy
Natural Gas	Montana-Dakota Utilities (MDU)
Communications	SRT Communications
Water	City of Minot
Sanitary Sewer	City of Minot
Storm Sewer	City of Minot

Source: Minot International Airport

The existing utility infrastructure is sufficient to meet current needs. Most improvements to utilities will occur at the expense of the utility provider unless there is a determination that it will be paid by the airport as a user.

Utility Needs: No substantive improvements or changes were identified through the master plan study. Facilities should be maintained, and improvements should be made as demand dictates.

Attached as follows is the

City of Minot Fire Department

Fire Station No. 3

Building Assessment

completed by JLG Architects in June 2016

CITY OF MINOT FIRE DEPARTMENT
FIRE STATION NO. 3
BUILDING ASSESSMENT

MINOT, ND

JLG
DESIGN FOR LIFE

INDEX

JLG
DESIGN FOR LIFE

FIRM INFORMATION

JLG Architects

Year Firm Established: 1989

WE DESIGN FOR LIFE

We know that it takes more than just bricks and mortar to build a community. It takes passionate local stewardship, progressive leaders, and designers who understand how to turn a small idea into a big future. For over 26 years, our 100 JLGers have raised the bar on what is expected from architecture in Minnesota, North Dakota, and South Dakota so that we can continuously improve the quality of life of our clients, our neighbors, and our families, while remaining dedicated to our clients' bottom lines, today, tomorrow and for the next generation to come. We are inspired by the future, and work passionately to make our impact go beyond a building. As a result, JLG has been identified as one of the hottest architecture firms in the United States by Inc., Architectural Record, the Zweig Group, and the Minneapolis-St. Paul Business Journal and is a "Best Place to Work" according to Prairie Business magazine, the Zweig Group, GGF Young Professionals and the National American Institute of Architects Intern Development Program.

WE MIX GOOD DESIGN AND GOOD SENSE

At our heart, JLG lives and breathes design excellence; it counts – at every level and for every position. We balance innovative design with borderline-obsessive budget control to generate solutions that are as creative as they are practical. Function is the baseline; form is what lifts up the spirit; and innovation elevates the experience for our clients, their visitors, and the region as a whole. JLG has over 100 design awards in our portfolio because we are committed to elevating expectations for our clients and our communities.

WE ARE HOME

We believe it takes people who are an active, engaged part of a community to truly understand what matters to the people living there. We have a lifetime of vested interest in the communities in which we work. Our children attend the same schools, we use the same libraries and drive the same roads. While our vision and impact goes beyond, our roots are firmly planted.

Conservation: We design for the conservation of our client's and our Earths' resources

At JLG, Sustainable Design means creating high performance solutions that meet our clients' present profitability goals without compromising the ability of future generations to meet their own. We do that by designing to a LEED Certified minimum on all of our projects to lower long-term maintenance costs and, since the most sustainable thing you can do is reuse your building, we design to last – creating flexible and organic solutions that are nimble and able to adapt to new parameters.

LOWERED LONG-TERM COSTS

At JLG, our clients' budgets are as intertwined in our design solutions as the architecture itself, and so it stands to reason this concern would carry on throughout the project's lifespan. To that end, we design to align to today's bottom line while remaining cost-effective to maintain, especially in the areas of energy and water savings.

> JLG's green buildings reduce energy use on average by 23%

IMPROVED HEALTH

We live in a region in which 90% of our time is spent indoors. Study after study has shown the effects of indoor air quality, daylighting and other environmental factors as they relate to the health and well-being of a building's occupants. JLG maximizes indoor design opportunities to increase attention spans, lower sick days and raise productivity.

JLG
DESIGN FOR LIFE

2300 NORTH BROADWAY, MINOT, ND 58702

INTRODUCTION

The following document represents a review of the existing building located at 2300 North Broadway, Minot, North Dakota. The primary driver of the review was to complete a general condition assessment of this facility. This effort required input not only from JLG Architects, but from their assembled team of Structural, Mechanical and Electrical Engineers.

Analysis of Existing Facilities:

A. Site and Building Assessments:

Delineate deficiencies of the existing site and building systems. The findings are the result of on-site observations by the Architects and Engineers.

B. Life Safety Analysis:

Evaluate the facility based on current building codes (2012 International Building Code), ADA requirements, and other governing agency requirements adopted by the City of Minot and State of North Dakota. Delineate non-compliant issues.

C. Zoning Analysis:

Investigate the current zoning of the property, address and legal description and include the applicable zoning classification requirements for the City of Minot to review.

EXECUTIVE SUMMARY

Introduction:

The following document represents an assessment of existing Fire Station No. 3 to assist the City of Minot and the Minot Fire Department in determining whether or not it is possible to make adequate improvements to the facility, at a cost which is justifiable, for this fire station to provide modern fire and rescue service to both the Minot International Airport and the NW quadrant of the City of Minot for the next fifty to seventy-five years. The costs of remodeling the existing facility will be compared to the costs of providing a new Fire Station on a site to be determined at a future date. A model Program of Required Spaces for either potential project was jointly established between JLG Architects and the Minot Fire Department to define the parameters for the estimating.

This document will also provide initial budgeting data for potential construction costs, including anticipated Architectural and Engineering Fees the City of Minot / Minot Fire Department is likely to incur if a construction project proceeds.

Analysis of the Existing Facility:

This analysis involves three critical, interrelated perspectives: Site and Building Assessments, Life Safety Analysis, and Facility Adequacy Analysis (Gender, Handicap Accessibility and General Building Systems).

1. Site and Building Assessment:
   Delineate the deficiencies of the existing site and building systems and other facility components. These findings are the result of on-site observation by architects and engineers, and input from Fire Department staff.

   Summary:
   - Core facilities (Day Room, Kitchen, Sleeping, Etc.) for staff were originally designed to be centered between the City Fire Station function and the ARFF function of this Fire Station. As such, the space under consideration for renovation and expansion is wedged between the City and Airport Apparatus Bays. This limits available space and creates less than ideal compromises to achieve the minimum acceptable solutions for this Fire Station.
   - Site Drainage is an issue. Water runs back toward this facility on the south side of the building. A sump pit was added to collect this water (and ground water) and currently pumps the excess water to the west parking lot. Site grading needs significant alterations to help alleviate this problem.
   - Portions of the existing building are minimally insulated. Water and frost penetration at the north Apparatus Bays is a constant issue.
   - An original under-slab ventilation system has filled with ground water, was no longer usable and had to be filled in with concrete. As the underground duct system could not be completely

sealed with the concrete, there are still air quality issues in this facility. (Damp, musty air. Bug and insect infestations)

2. Life Safety Analysis:
   Evaluate facility based on current building codes and other governing agency requirements adopted by the City of Minot and State of North Dakota. Delineate noncompliant issues.

   Summary:
   - The existing Fire Station No. 3 has a Residential Group R-2 Occupancy component where the occupants are primarily permanent in nature (Dormitory or Live/Work Units). The 2012 International Building Code (IBC), Section 903.2.8 states: 'An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area. The existing building has no automatic fire sprinkler system.
   - There are no egress windows in the individual sleeping compartments as required by current building code for a non-fire sprinkled building.
   - Significant remodeling of an existing structure may require that to comply with current Energy Codes. Large portions of exterior walls on this existing structure have minimal (insulated masonry core) insulation, making compliance a challenge.

3. Facility Adequacy Analysis:
   Evaluate current facility adequacy based on ADA Requirements, Gender Equity Issues and minimum program requirements of new Facilities of similar function to determine space deficiencies and needs.

   Summary:
   - ADA Requirements:
     - Restroom and Office Doors are 2'6" wide and do not meet ADA requirements for door width.
     - Door Hardware is not ADA Compliant.
     - Staff Living Quarters are 8" above the finish floor of the Apparatus Bays. With no ramps or lifts available, the Living Quarters are not handicap accessible.
   - Gender Equity Issues:
     - Captain's Office is also the Captain's Dorm Room. This is a privacy and gender issue for a professional work environment.
     - Dormitory area is one large area separated by partial height plywood partitions and privacy curtains.
     - There is one Bathroom which serves the facility as both a toilet room and shower room.
   - General Facility Systems:
     - Heating and ventilation in the North Apparatus Bays is inadequate.
     - Current electrical service in the existing facility is not adequate to support anticipated additions necessary to make this facility minimally acceptable to continue as a Fire and Rescue Facility.

Recommendations:

The City of Minot will need to decide if the cost of making the existing facility minimally acceptable is a wise investment for a facility which should have useful life of 50 to 75 years after all construction and improvements have been completed.

The existing building has had three additions to the original structure which was completed in 1973-74 as follows:

1974: Original Structure for Airport Fire and Rescue with the South Apparatus Bays and Staff Working & Living Quarters, are constructed.

1979: North Apparatus Bay (City Fire Department) Addition is completed adding City of Minot Fire and Rescue component to the existing ARFF.

1985 (Estimated): An addition and remodeling project is complete to expand the existing Staff Living Areas and remodel existing areas as necessary to complete the tie-in between the addition and existing areas.

2012: Additional Apparatus Bay is added to the ARFF portion of this facility, along with an addition expanding the existing Apparatus Bay to accommodate the increasing size of modern firefighting equipment.

The original facility built in completed in 1974 and the 1979 addition are already near the end of their useful life of nearly 40 years. Nearly a third of the existing structure will need to be completely demolished and re-built to provide adequate facilities for the staff, with only the Apparatus bays being salvaged for re-use. Once the cost of remodeling exceeds 50% of the cost of new construction, we generally advise an Owner to be cautious in additional investments in a facility. Also, because this facility has already seen three additions to the original layout, with only one being part of the original master plan, future additions are becoming impossible to accomplish without total disruption to the ongoing operations of the facility. Temporary housing facilities would be necessary to keep this station operating during any construction period.

We are presenting two (2) options, with anticipated costs for consideration by the City of Minot. Option 1 is remodeling and continued use of the existing Fire Station No. 3. Option 2 is the comparative cost of a new Fire Station on an alternate airport site, to be determined at a later date. A summary of those costs is listed below;

Option 1: Remodel and Additions to Existing Fire Station No. 3

Estimated Construction Costs:	$2,257,400.00	
Estimated A/E Fees:		$ 255,700.00
Total Estimated Construction Costs:		$2,513,100.00

Option 2: New Fire Station Facility at New Site

Estimated Construction Costs:	$3,616,865.00	
Estimated A/E Fees:		$ 315,700.00
Total Estimated Construction Costs:		$3,932,565.00

We recommend Option 2 for the following reasons:

The cost of remodeling is 64% of the cost of building new. We generally take a serious look at recommending new over remodeling once the cost of the remodel exceeds 50% of the cost of new construction and the structure has not been master planned for logical expansion or is not historically significant.

We could only recommend the additional investments required to improve the existing Fire Station Facility at its current site if there is no possible way to fund a new facility.

EXECUTIVE SUMMARY

OPTION 1 - BUILDING AREA PROGRAM

Fire Station #3/Minot International Airport ARFF

Area Name		Area (SF)	
Equipment & Equipment Storage			
City Apparatus Bays - 2 vehicles		1700	existing
ARFF Apparatus Bays - 2 vehicles		3770	existing
Equipment Storage		180	existing
Hose Drying		incl in bay	existing
Workshop		incl in bay	existing
Chemical Storage		incl in bay	existing
Storage		incl in bay	existing
	Subtotal	5,650	
Administrative			
Day Room		400	new
Dining		200	new
Kitchen		220	remodel
Sleeping Rooms - 4		800	new
Sleeping Room Bathrooms - 4		320	new
Captain's Sleeping Room		200	new
Captain's Bathroom		80	new
Captain's Office		150	remodel
Exercise		230	remodel
Training		225	remodel
	Subtotal	2,825	
Support			
Mechanical/Electrical		130	existing
Electrical/IT		50	remodel
Supplies		100	remodel
Janitor		50	remodel
Laundry		75	remodel
ADA compliant "public" toilets - men & women		110	remodel
Vestibule		90	remodel
Circulation		1260	remodel/new
	Subtotal	1,865	

OPTION 1 Site Plan

MINOT FIRE STATION NO. 3 - OPTION 1

JUNE 17, 2016 |

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Floor Plan Color Key

- Equipment/Equipment Storage Areas
- Administration Areas
- Support Areas
- Circulation Areas

10,361 Square Feet

6,156 Square Feet - Existing to Remain
4,745 Square Feet - Demolish, Remodel, and Addition
10,361 Square Feet Total Facility

OPTION 1 Addition and Renovation

MINOT FIRE STATION NO. 3

JUNE 17, 2016 |

0 10 20 40

Printed Scale: 1/16"= 1'-0"

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EXECUTIVE SUMMARY
OPTION 1 COST ESTIMATE

Option 1 – Remodel /Expansion of Existing Fire Station No.3:

Construction Costs:		
Building Demolition	$150,000.00	
Building Construction	$1,492,400.00	
Hazardous Material Abatement:	$40,000.00	
Civil Construction:	$300,000.00	
Contingencies (15%)	$275,000.00	
Total Budgeted Construction Costs:		$2,257,400.00
Architectural and Engineering Fees:		
Building A/E Fees (9% of Bldg. Constr. Costs)	$172,200.00	
Civil Engineering Fees:	$68,500.00	
FAA Eligibility Coordination:	$15,000.00	
Total Budgeted A/E Fees:	$255,700.00	
Option 1 - Total Estimated Budget:		$2,513,100.00

EXECUTIVE SUMMARY

OPTION 2 - BUILDING AREA PROGRAM

Fire Station #3/Minot International Airport ARFF

Area Name		Area (SF)
Equipment & Equipment Storage		
Apparatus Bays - 4 vehicles		6475
Equipment Storage		250
Hose Drying		250
Workshop		250
Chemical Storage		250
Storage		60
	Subtotal	7,535
Administrative		
Day Room		400
Dining		200
Kitchen		220
Sleeping Rooms - 4		800
Sleeping Room Bathrooms - 4		320
Captain's Sleeping Room		200
Captain's Bathroom		80
Captain's Office		150
Exercise		275
Training		400
	Subtotal	3,045
Support		
Mechanical/Electrical		500
Electrical/IT		75
Supplies		75
Janitor		50
Laundry		115
ADA compliant "public" toilet		70
Vestibule		100
Circulation		500
	Subtotal	1,485
Grand Total		12,065

OPTION 2 Site Plan

MINOT FIRE STATION NO. 3 - OPTION 2

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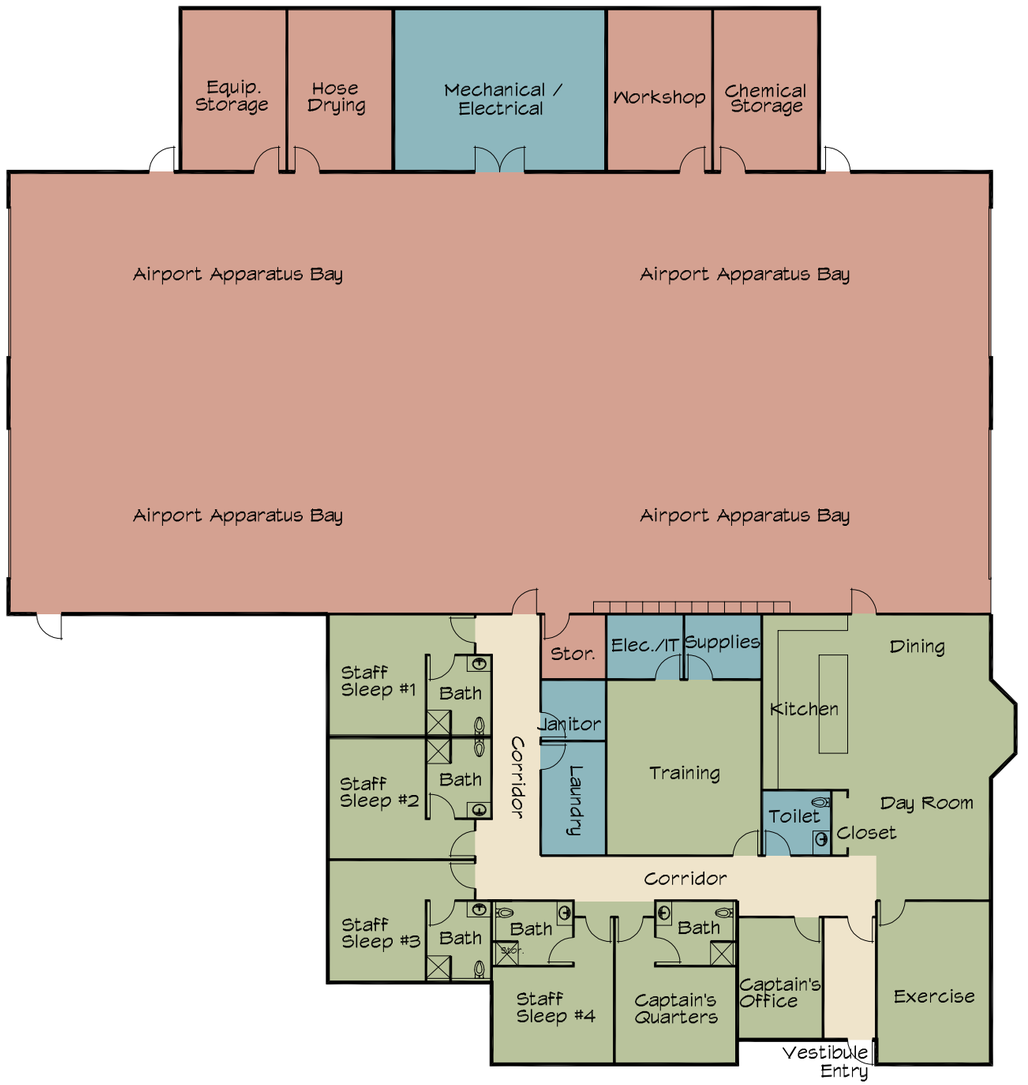

Floor Plan Color Key

- Equipment/Equipment Storage Areas
- Administration Areas
- Support Areas
- Circulation Areas

12,275 Square Feet

OPTION 2 New Building

MINOT FIRE STATION NO. 3

JUNE 17, 2016 |

0 10 20 40

Printed Scale: 1/16"= 1'-0"

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EXECUTIVE SUMMARY

OPTION 2 - COST ESTIMATE

New Facility for Fire Station No.3:

Construction Costs:		
General Construction:	$1,855,500.00	
Mechanical Construction:	$ 556,650.00	
Electrical Construction:	$ 432,950.00	
Civil Construction Costs:	$ 300,000.00	
Contingencies: (15%)	$ 471,765.00	
Total Budgeted Construction Costs:		$3,616,865.00
Architectural and Engineering Fees:		
A/E Fees – Building (7% of Bdlg. Constr. Costs)	$232,200.00	
Civil Engineering Fees:	$68,500.00	
FAA Eligibility Coordination:	$15,000.00	
Total Budgeted A/E Fees:	$315,700.00	
Option 2 – Total Estimated Budget:		$3,932,565.00

BUILDING ASSESSMENT

General Building Condition Assessment

Originally Built in 1973; Additions Added in 1978, 2011, & Living Room Addition (Between 1978-2011).

Exterior Envelope:

Exterior Walls:

The Original 1973 building exterior walls are constructed of face brick, 2" of rigid insulation & 8" cmu block in the north, east & west occupied spaces: Good Condition. Patching is needed at the west entrance for a removed roof drain spout. The east, west, & south Apparatus bay walls are constructed of face brick & 8" cmu block, with no insulation: Good Condition.

The 1978 Addition exterior walls are constructed of face brick, 8" cmu block, with no insulation. The exterior brick finish is in good condition. The north interior cmu block wall of the north Apparatus bay showing signs of efflorescence at the open cells of the cmu blocks. The paint on the north wall was breaking away at the areas of efflorescence.

The 2010 Addition exterior walls are constructed of face brick, 2" rigid insulation, air space, & 8" cmu block: Good Condition.

The east Living Room Addition exterior walls are constructed of face brick, 8" cmu block: Good Condition. There is no information available regarding rigid insulation inside the exterior wall.

Roof:

The Original 1973 roof is a ballasted built up roof, which looks like it has been replaced. The original drawings indicate 2" of rigid insulation beneath the built-up roofing: Good Condition.

- The roof appears to have no slope to the two roof drains.
- The east roof drain downspout was moved to drain to the east of the building, since it would freeze solid in the winter on the west side. There is a hole in the exterior masonry wall, where the existing west downspout was located. The remaining hole in the west exterior wall will need to be patched with face brick.
- There are 6 skylights in the higher Apparatus bay roof, which appear to be in good condition.
- One mechanical roof-top unit is mounted on the lower roof.
- Roof Edge: Pre-Finished Aluminum Parapet Cap: Good Condition.

The 1978 Addition roof is a ballasted built up roof, which looks like it has been replaced. The drawings indicate 2" of rigid insulation beneath the built-up roofing: Good Condition.

- The roof appears to have no slope to the two roof drains.
- There are 6 skylights which appear to be in good condition.
- Roof Edge: Pre-Finished Aluminum Parapet Cap: Good Condition.

The 2011 Addition roof is a ballasted built up roof: Good Condition.

- The roof appears to have no slope to the one roof drain.
- Roof Edge: Pre-Finished Aluminum Parapet Cap: Good Condition.

The East Living Room Addition roof is a ballasted built up roof, which looks like it has been replaced: Good Condition.

The roof appears to have no slope to the one roof drain.

One mechanical roof top unit and a satellite dish are mounted on the roof.

Roof Edge: Pre-Finished Aluminum Parapet Cap: Good Condition.

Roof Access: Extension ladders were need for access to the lower 1973 building and additional extension ladders were needed to reach the higher bay roofs.

Exterior Windows:

The Original 1973 building exterior windows are 4-1/2" Aluminum Window units with 1" Insulated Glass: Fair Condition.

Dark Bronze Anodized.

Fixed window unit in Office Dining area: Good Condition.

Dormitory window unit has two fixed panes & one operable pane. This window unit is covered with gypsum board sheathing, because of the cold air drafts: Poor Condition.

The 1978 Addition exterior windows are 4-1/2" Aluminum Window units with 1" Insulated Glass: Fair Condition.

Dark Bronze Anodized.

Each window unit has two fixed panes & one operable pane.

Water staining on north window frame and on upper glazing.

The 2011 Addition exterior windows are 4-1/2" Aluminum Window units with 1" Insulated Glass: Good Condition.

Dark Bronze Anodized.

Each window unit has two fixed panes & one operable pane.

Broken lower glazing in SW window unit.

The East Living Room exterior windows are 4-1/2" Aluminum Window units with 1" Insulated Glass: Good Condition.

Dark Bronze Anodized.

Each window unit has one fixed pane & one sliding pane with insect screen.

Exterior Doors:

Main Entry (1978 Addition):

Aluminum Entrance System, Dark Bronze Anodized finish.

Door: ¼" tempered glazing; operable side window: 1" insulated glazing.

No ADA Electric Operator at main entrance.

Missing door sweep at threshold.

Secondary Exit Door (North Vestibule & South Living Room)

Aluminum Entrances

Aluminum Doors / Full Insulated Temp. Glass

East Exit Door:

Steel Doors and Frames – Painted

Insulated Steel Doors / Half insulated Temp. Glass

Apparatus Bay Doors:

Insulated overhead garage doors: Good Condition.

Vision windows in door panels.

Building Interior:

Interior Floor Slabs:

The Original 1973 Building: 4" slab on grade at the living quarters portion of the building, which is 8" higher in elevation to the Apparatus Bay portion. The Apparatus Bay floor is a 5" slab on grade, which consists of a trench drain and sand/oil interceptor.

The Living Quarters portion of the building has an underground mechanical duct work system. The underground ductwork has been filled with concrete, because of the high water table on site.

There is a mezzanine floor above the west portion of the Apparatus Bay. The floor for the mezzanine is a 4" elevated concrete slab: Good Condition.

Condition of concrete is good.

The 1978 Addition: 5" slab on grade, which consists of a trench drain and a sand/oil interceptor. The floor slab is 8" lower than the adjacent Original 1973 Living Quarters.

Condition of concrete is good.

The 2011 Addition: 5" slab on grade, which consists of a trench drain and a sand/oil interceptor. The floor slab is at the same floor elevation as the adjacent Original 1973 Apparatus bay.

There was a 16'-0" addition added to the east of the Original 1973 Apparatus bay to accommodate a larger fire vehicle in the future.

A new 8" high concrete stoop was poured for the exit door from the East Living Room Addition.

The East Living Room Addition: No information found on this addition. The main living room addition is at the Living Quarter floor elevation. There is a recessed slab area at the Vestibule in the SW corner of the room for access from the north Apparatus bay to the exterior.

Interior Floor Finishes:

West Entrance, Apparatus Bays, & Mezzanine: sealed concrete; some hair-line cracks, surface wear, & vehicle fluid stains in bay floors, Rubber exercise mats in Bay #3; overall in good condition.

Kitchen, Dining Area, & Small Toilet Room: Vinyl tile & wood base; Shows signs of wear, some water damage in Kitchen.

Living Room Area & Dormitory: Carpet & carpet base (wood base at dormitory); Shows signs of wear.

Toilet /Shower Room: 1" x 1" Quarry Tile & 4" x 4" Ceramic cover base; shows sign of wear at grout joints. Concrete infill at underground duct opening; Good condition.

Captain Office: Carpet and carpet base; Good Condition.

Mechanical Room & Storage Room: Sealed concrete; Good Condition.

Interior Ceiling Finishes:

West Entrance Corridor: 2' X 2' Acoustical Suspended Ceiling Tile & Grid System; some tile missing and stained: Fair Condition.

Apparatus Bays: Expose structure painted; Good Condition.

Kitchen, Dining Area, Living Room Area: 2' x 2' Acoustical Suspended Ceiling Tile & Grid System; Dirt on tiles adjacent to mechanical diffuser in Kitchen. Water stains in tiles at Living Room Area; Fair Condition.

Toilet/Shower Room: 2' x 2' Acoustical Suspended Ceiling Tile & Grid System; Dirt on tiles adjacent to mechanical diffuser; Fair Condition.

Dormitory: 2' x 2' Acoustical Suspended Ceiling Tile & Grid System; Good Condition.

Captain Office: 2' x 2' Acoustical Suspended Ceiling Tile & Grid System; Good Condition.

Mechanical Room & Storage Room: Painted concrete; Good Condition.

Interior Wall Finishes:

West Entrance Corridor: Painted CMU & face brick; Good Condition.

Apparatus Bay #1: Painted CMU; Efflorescence on north wall & some spalling of CMU block, dirt/dust on CMU walls; Fair Condition.

Apparatus Bays #2 & #3: Painted CMU & painted face brick; Good Condition.

Kitchen: Painted CMU, painted gypsum board & tile backsplash; Water damage in gypsum board wall in NW corner, adjacent to shower; Good Condition.

Dining Area: Painted CMU & painted gypsum board; Good Condition.

Living Room Area: Painted CMU & Face brick; Good Condition.

Toilet/Shower Area: 4" x 4" Ceramic tile & painted gypsum board; Good Condition.

Dormitory: Painted gypsum board & painted plaster over CMU; Good Condition.

Captain Office: Painted CMU; Good Condition.

Mechanical Room & Storage Room; Painted CMU; Good Condition.

Building Structure:

The structure for the Original 1973 building consists of 8" CMU bearing wall, which runs the perimeter and 12" CMU bearing wall at the lower roof.

Steel Roof Trusses are 18" & 16" deep and run north / south at approximately 2'-0" O.C.

The structure for the 1978 building addition consists of 8" CMU bearing wall, which runs the perimeter of the addition. There are two 4" steel tube columns and beam at the lower roof addition.

Steel Roof Trusses are 18" deep and run north / south at approximately 2'-0" O.C. Steel roof trusses are 8" deep and run north/south at the low roof addition.

The structure for the 2011 building addition consists of 8" CMU bearing wall, which runs the perimeter of the addition and two steel columns/beams at the perimeter of the existing building structure.

Steel Roof trusses are 18" deep and run north/south at approximately 2'-0" O.C. at the south addition. Steel Roof trusses are 10" deep and run east/west at the east addition.

The structure for the East Living Room Addition consists of 8" CMU bearing wall, which runs the perimeter of the addition.

Steel Roof trusses run east/west from the 8" CMU bearing wall to the 8" CMU of the existing wall construction.

Site:

- Drainage concerns at south of the building.
  - The adjacent lot slopes to the north towards the building.
  - A sump pit was placed south of the building to pump water to the west parking lot.
  - The on-duty captain stated that the water table is very high in this area.
- New concrete sidewalk to the west entrance.
- The existing west roof downspout was removed and relocated to the east Living room Addition, because of the high water table on the west and the constant freezing of the west downspout.

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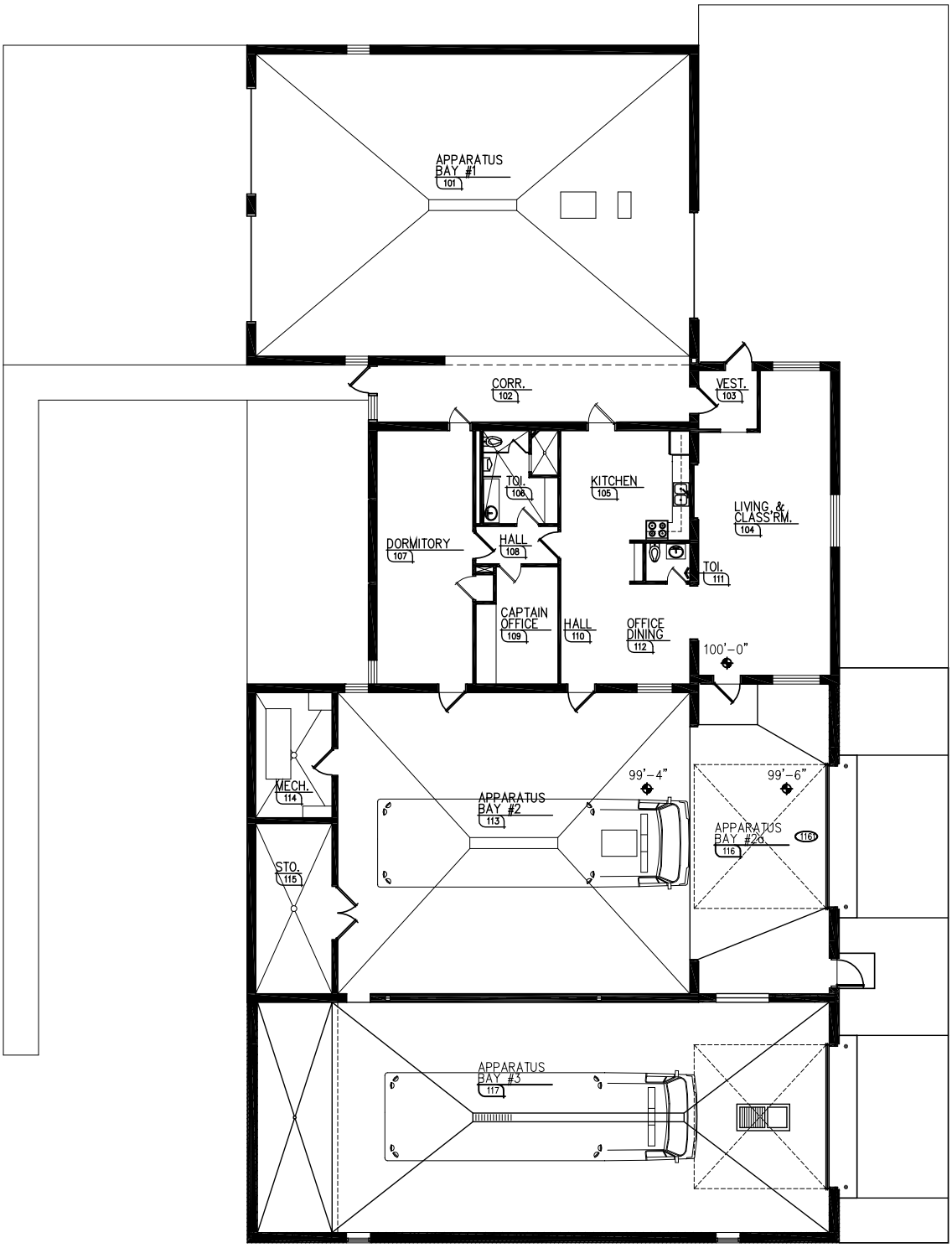
BUILDING PLAN

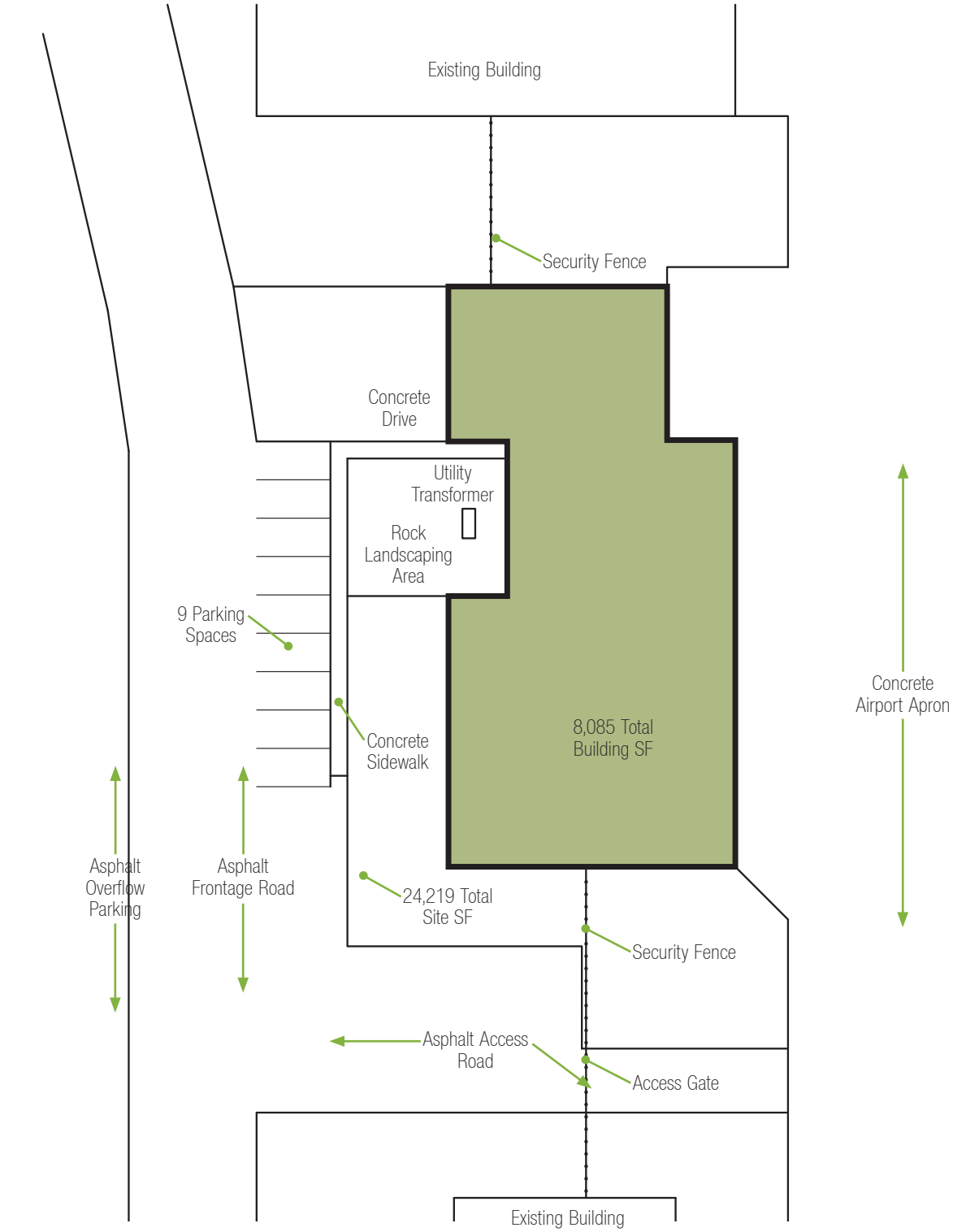


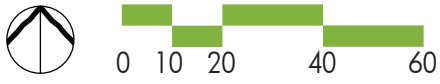
Floor Plan

2300 NORTH BROADWAY

0 5 10 20 30

SITE PLAN





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CODE COMPLIANCE

Preliminary Building Code Analysis: 2012 IBC

Construction Type: Type II-B
Non-Fire Sprinkled

Occupancy Group: Mixed Use: Group B (Business), Group S-1 (Garage), & Group R-2 (Dormitory)

Total Allowable Area: 23,000 s.f. (Table 503)

Total Allowable Area:	40,250 s.f. (Section 506.1)
Sprinkler Increase:	- s.f (Section 506.3)
Frontage Increase:	17,250 s.f. (Section 506.2)

Actual Area: 8,085 s.f.

Allowable Height: 3 Stories / 55'-0" (Table 503)

Occupant Load (Estimate):

B Occupancy:	9 Occupants (890 s.f. / 100 s.f per occupant)
S-1 Occupancy:	26 Occupants (5,072 s.f. / 200 s.f per occupant)
R-2 Occupancy:	2 Occupants (314 s.f. / 200 s.f per occupant)
Total Occupancy:	37 Occupants

Sprinkler System:
Group R Occupancies shall be equipped throughout with an Automatic Sprinkler System (Section 420.4).

Building Separation:
In Group R Occupancies, walls separating sleeping units from other occupancies in the same building shall be constructed as Fire Partitions (Section 420.2).

Occupancy Separations (Table 508.4):
Group R-2 / Group B: 1 Hour separation with Sprinkler system.
Group R-2 / Group S-1: 1 Hour separation with Sprinkler system.

Exits:
Required Exit Width:
37 Occupants x .2 = 7.4" (Section 1005.3.2)
Actual Exit Width Available:
3 Doors at 33" each = 99"

Plumbing Fixture Count:
Total Occupants: 37

Fixture Type:	Required	Provided
Lavatory (1 per 40)	1	2
Water Closet (1 per 25)	2	3
Drinking Fountain (1 per 100)	1	0
Service Sink	1	1

CITY OF MINOT ZONING

City of Minot Zoning Ordinances:

Address:	2300 N. Broadway Minot, North Dakota 58702
Legal Description:	Minot International Airport Second Addition, Lot 1 Block 2
Lot Area:	24,219 Square Feet
Zoning:	P (Public Zone) Chapter 16 – City of Minot Zoning Ordinance
Building/site Design:	Section 16-11:

Any Building constructed or remodeled in Public Zoning District shall meet the Building Design & Material requirements of the C2 Zoning District (Section 11-8).

Off-Street Parking and Loading Requirements:

Chapter 23 – City of Minot Zoning Ordinance

Office Building Use: Minimum of 3 Spaces per 1,000 square feet of floor area.

8,085 s.f. / 1,000 s.f. x 1 =	8 parking spaces required. (1 Handicap Parking Space required) 2012 IBC Table 1106.1 – Accessible Parking Spaces
Actual Parking Available:	11 Total Parking Spaces Available (0 Handicap Parking Spaces Included)

Loading Dock: None.

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CHAPTER 16 - "P" PUBLIC ZONE

Section 16-1. Regulations:

The regulations set forth in this chapter or set forth elsewhere in this ordinance when referred to in this chapter are the regulations in the P (Public Zone). Property zoned Public Zone falls within the Public/Semi-Public Land Use designation on the Future Land Use Plan.

Section 16-2. Approvals:

As these uses are utilized by and provided for the public, any proposed use or change in use of land or building shall be reviewed and approved by the Planning Commission, during a public hearing, prior to issuance of any permits as stated in Section 16-4 through 16-7 of this Chapter.

Section 16-3. General Description:

The "P" (Public Zone) district is designed to retain and provide land areas owned by the utility companies, private organizations, federal, state, and local governments for public use.

Section 16-4. Uses Permitted:

a. Civic centers
b. Public libraries
c. Fire stations
d. Auditorium
e. Armories
f. Other government offices
g. Sewage lift stations and water pump houses
h. Sewage and water treatment plants
i. Court houses
j. Jails
k. Municipal landfills
l. Municipal parking lots
m. Commercial recreation group occupying publicly owned lands
n. Community Center
o. Golf course
p. Municipal water storage tank
q. Museum
r. Park
s. Playground or athletic field
t. Swimming pool
u. Ice arena
v. Zoo
w. Airport
x. Cemetery

y. Substations
z. Public parking structure

Section 16-5 Conditional Uses:

Within any Public District, no structure or land shall be used for the following uses expect by a conditional use permit:
a) Universities, colleges, junior colleges and associated uses
b) Elementary, middle and high schools (public and private)

Section 16-6. Interim Uses:

Within any Public District, no structure or land shall be used for the following uses expect by an interim use permit:
a) Modular classrooms on school property with a principle building

Section 16-7. Review Required:

Any proposed use or change of use of land or building by any public agency, or others on public land shall be submitted to the Planning Commission for review and approval. The Planning Commission review shall concern itself with the proposed uses relative to the comprehensive plan, lot area, lot dimensions, lot coverage, and floor area ratio, building height, building setbacks, parking and loading spaces, traffic flow and other similar requirements governing the use of public property. Alterations or additions equaling not more than twenty percent (20%) of the gross floor area of an existing building are exempt from this review.

A processing fee as determined by city fee schedule shall be paid at the time of plan review application. (Ord. 3853)

Section 16-8. Application:

This district shall apply to property under the ownership of local governmental bodies or agencies, except those held by agencies for private redevelopment purposes.

Section 16-9. Parking Regulations:

Each facility located in this district shall be provided with sufficient off-street parking spaces to satisfy the entire parking demand created by such facility. All necessary buffer and screening shall be provided as required in Chapter 24.

Section 16-10. Site Plan and Drainage Required:

a) As part of the application for plan approval the applicant shall submit a site plan and drainage study and/or plan to include:
    1) Site plan drawn to scale indicating property lines, proposed building limits, setbacks, parking lot area and dimensions and total proposed parking spaces, total building

coverage and impervious surface percentages, setbacks, landscaping, screening and other requirements as applicable to this ordinance.

2) On-site storm management facilities necessary to drain the project.
3) Inclusion of storm-water detention/retention methods available to reduce the runoff impact from his properties.
4) Statement of impacts, if any, on other properties within the same drainage basin or sub-basin as the proposed project.
5) Drainage calculations using accepted engineering standards and formulas to substantiate the drainage plan and impacts.
6) A recommendation from a registered civil engineer in the State of North Dakota as to the storm drainage management method used.
7) A schedule of implementation of the storm water management project or projects necessitated by the plan, and a statement of the financing method intended to be used.
8) A preliminary grading plan showing how the property will be graded relative to potential drainage impact on adjacent lots.
9) If proposed storm water detention/retention facilities are to be operated and maintained by the City, the applicant shall deed the land necessary for the facilities to the city and provide a dedicated and improved access road to the facilities from a public street. The nature of access road improvements shall be determined on a case by case basis.

Section 16-11. Building and Site Design:

a) Any building constructed or remodeled the Public Zoning District shall meet the building design and material requirements of the C2 zoning district as required in Sec. 11-8 of this ordinance and the C2 landscaping requirements as required in Chapter 24.

parking requirements.

c) Minimum yards are as follows:
   1) Front – twenty -five (25) feet. If located on a platted or proposed collector or arterial street – forty (40) feet.
   2) Side – street side (corner) and double fronted street side lots twenty-five (25) feet on each street side. If located on a platted or proposed collector or arterial street – forty (40) feet.
   3) Side – interior side – zero (0) except where the side of the lot adjoins the "AG" district or any "R" district in which case the minimum side yard shall be fifteen (15) feet.
   4) Parking lot – ten (10) feet along all public streets.
   5) Rear – zero except where the rear of the lot adjoins the "AG" district or any "R" district in which case the minimum rear yard shall be twenty-five (25) feet.
   6) All yards are subject to the limitations, exceptions and other modifications set forth in Chapter 21.
d) Minimum lot area – ten thousand (10,000) square feet
e) Minimum lot width – one hundred (100) feet
f) Buffer strips will be required along lot lines adjacent to a more restrictive zoning district according to Chapter 24.

Section 11-8. Building Design and Materials C2 Districts~~:~~

All buildings shall be designed to accomplish the goals and policies of the comprehensive plan. Building materials shall be attractive in appearance, of a durable finish, and be of a quality that is compatible and harmonious with adjacent structures. All buildings shall be of good aesthetic and architectural quality to ensure they will maintain and enhance the property values of neighboring properties and not adversely impact the community's public health, safety and general welfare.

a) Design Elements: All new building fronts and refacing of existing buildings shall include a minimum of three (3) of the following elements:
   1) Accent materials that are different from exterior building finishes;
   2) A visually pleasing front entry that, in addition to doors, shall be accented a minimum of one hundred-fifty (150) square feet around the door entrance for single occupancy buildings and a minimum of three hundred (300) square feet total for the front of multi-tenant buildings (this area shall be counted as one (1) element);
   3) Twenty-five percent (25%) window coverage on each front that faces a street;
   4) Contrasting yet complementary, material colors;
   5) A combination of horizontal and vertical design features;
   6) Irregular building shapes; or
   7) Other architectural features in the overall architectural concept including such things as awnings, eaves, overhangs, various roof lines/profiles, use of columns or posts, enhanced windows or door detail, etc.
b) Accent Materials: Accent materials shall be wrapped around walls visible from public view. Painting shall not be substituted for visual relief, accenting, or a required element. No wall shall exceed one hundred (100) feet in length without visual relief. "Visual relief" may be defined as the incorporation of design features such as windows, horizontal and vertical patterns, contrasting material colors, or varying wall depths. Use of fiber cement trim, soffit and fascia shall be allowed as accent materials.
c) Exterior Building Finishes.

1) The exterior building façade finishes of any façade viewable from a street or parking lot shall consist of materials comparable in grade and quality to the following list. A minimum of two (2) materials shall be used:
    a. Brick.
    b. Natural stone.
    c. Integral colored split face (rock face) concrete block.
    d. Cast in place concrete or pre-cast concrete panels (not to include raked or plain finish).
    e. Wood, provided the surfaces are finished for exterior use or wood of proven exterior durability is used, such as cedar, redwood, or cypress.
    f. Architectural metal (limited to 35% of the surface of any building wall) with semi or fully concealed fasteners provided such panels are factory fabricated and finished with a durable non-fade surface and their fasteners are of a corrosion resistant design.
    g. Glass curtain wall panels.
    h. Stucco, EFIS (Engineered Finishing Insulation System).
    i. Other materials determined as acceptable by the City Planner.
2) Side and rear elevations not viewable from a street or parking lot shall be permitted to use one material within this façade(s) provided no wall shall exceed one hundred (100) feet in length without visual relief.
3) Any exposed metal or fiberglass finish shall be limited to thirty-five percent (35%) of the surface of any building wall. Any metal finish utilized in the building shall be a minimum of twenty-six (26) gauge steel. All sides of the principal and accessory structures are to have essentially the same or coordinated, harmonious exterior finish materials and treatment.

d) Building and Roofing Materials: All building and roofing materials shall meet current accepted industry standards, and tolerances, and shall be subject to review and approval by the City Planner for quality, durability, and aesthetic appeal.

e) Trash and Recyclable Materials: All trash and recyclable materials and handling equipment shall be stored within the principle structure or stored within an accessory structure constructed of building materials compatible with the principal structure, maintenance free or composite materials or a steel sub-structure wrapped with composite material that matches the principal building. Wood or Chain link fencing with and/or without slats is not a permitted enclosure material. The structure shall have a swinging doors or an overhead door on tracks with a person door provided.

f) Utilities: The view of all rooftop equipment and related piping, ducting, electrical and mechanical utilities shall be camouflaged through placement on the roof; or screened from the ground level view. Screening may include parapet walls, penthouses, or other architecturally integrated elements. Wood fencing or chain-link with slats shall not be used for screening.

The term "ground level view" for this provision shall be defined as the view of the front entrance from the property line from the main floor elevation. If abutting perimeter property lines are higher than ten (10) feet above the finished floor elevation of the building, rooftop screening is not required. A ground level view perspective plan shall be provide demonstrating how rooftop units will be screened from view.

g) External Loading and Service Areas: External loading and service areas must be one hundred percent (100%) screened from the ground level view from contiguous residential or commercial properties and adjacent streets, except at access points.

h) Additions, Alterations to existing Buildings:
   1) A one-time building addition of twenty-five percent (25%) or less of the existing floor area does not have to comply with the standards of this Section after adoption of the ordinance. For any building addition of more than twenty-five percent (25%) of the existing floor area, but less than fifty percent (50%) of the area, the addition shall comply with the standards of this Section.
   2) When an existing building is expanded over fifty percent (50%) but below seventy-five percent (75%) of the existing square footage the building addition plus the existing building area shall meet the standards of this Section with an enhanced entry or building accenting added to the existing portion to bring the existing building closer to conformance.
   3) When an existing building is completely refaced or building remodeled over seventy-five percent (75%) of the existing square footage the building, the addition plus the existing building area shall meet the standards of this Section.

CHAPTER 23 - OFF-STREET PARKING AND LOADING REQUIREMENTS

Section 23-1. Off-Street Parking Requirements:

In all districts off-street parking shall be provided and thereafter maintained at any time any building or structure is erected or structurally altered, except as provided in Section 23-2, in accordance with the following formula, provided, however, this chapter does not apply to the C3 district. All off-street parking spaces and all driveways on private property leading to such parking areas shall be all-weather hard surface material. Acceptable surfacing materials include asphalt, concrete, brick, cement pavers or similar materials installed and maintained according to industry standards. All parking areas containing four (4) or more spaces or containing angled parking shall have the parking spaces and aisles clearly marked on the pavement. The number of off-street parking spaces shall be provided on the basis of the following minimum requirements listed in the table below. If a specific use is not listed the City shall use the ITE Parking Generation Manual to determine minimum parking requirements.

Minimum Required Parking Spaces for Residential Uses	
Use	**Minimum Number of Spaces Required**
a) Bed and breakfast establishments and boarding and rooming houses	2 spaces for the principal residential dwelling unit plus 1 space for each rental room
b) Assisted Living and Memory Care Units	0.5 spaces for each unit
a) Nursing Home	1 space per 6 patient beds, plus one space per employee on the largest work shift.
b) Daycare facilities	No additional spaces required if located in a single dwelling or one unit in a multiple dwelling structure
c) Dwellings, attached or detached townhouses	2 spaces per unit, plus 0.25 space for each unit for guest parking.
d) Dwellings, single-family detached and two-family attached and residential facilities (licensed for 6 or fewer persons)	2 spaces per unit
e) Dwellings, multiple dwelling structures	2 spaces per unit plus 0.25 spaces for each unit for guest parking
f) Dwellings, Senior Independent Living	1 space per unit, plus 0.25 space for each unit for guest parking and an additional 0.5 spaces for demonstrated parking to be paved in the event the development is converted to regular occupancy.
g) Mobile home parks	2 space per unit, plus 3 per each 6 units as guest parking.

h) Fraternity or sorority	1 space for every 200 square feet of floor area of the fraternity or sorority house, including livable areas of the basement.
Minimum Required Parking Spaces for Assembly, Institutional and Community Uses	
Use	**Minimum Number of Spaces Required**
i) Sports Arenas, Amphitheaters, Stadiums, gymnasium	1 space for each 4 seats of design capacity and/or 10 seats for each field and/or 20 seats for each ball diamond. A percentage of the parking may be provided in grass lots provided those lots are used not more than 5 times per year.
j) Cemeteries	1 space for each full-time employee
k) Places of public assembly, clubs, lodges, funeral home/mortuaries, and banquet, or convention halls	1 space for each 3 seats (one seat equals 22 inches of pew or bench space) based on the design capacity in the main assembly area, plus parking figured separately for additional gymnasiums, banquet rooms, meeting rooms, offices, and other multi-use spaces
l) Schools – Elementary and Middle School	1 space for each classroom plus 1 for each 100 students of design capacity
m) Schools – High School, College, Trade, etc.	1 space per staff member on the largest shift, plus 1 space per 2 students of the largest class attendance period.
n) Community Center, library, museum or art gallery	1 space per 250 square feet of floor area, or 1 space per 4 patrons at the maximum occupancy load, whichever is greater, plus 1 space per employee on the largest work shift
o) County Club or Golf Course	5 spaces per green, plus 1 space per employee on the largest shift, plus 50 percent of the spaces otherwise required for any accessory uses (e.g., bars, restaurants)
p) Hospital	2 spaces for each patient bed.
s) Commercial airport	8.5 spaces per daily airplane movement or 0.85 spaces per enplaning passenger per day, whichever is greater.
Minimum Required Parking Spaces for Commercial Uses	
Use	**Minimum Number of Spaces Required**
t) Bank (customer service areas and offices).	4 spaces per 1,000 gross square feet of building area plus 4 off-street stacking spaces per drive-

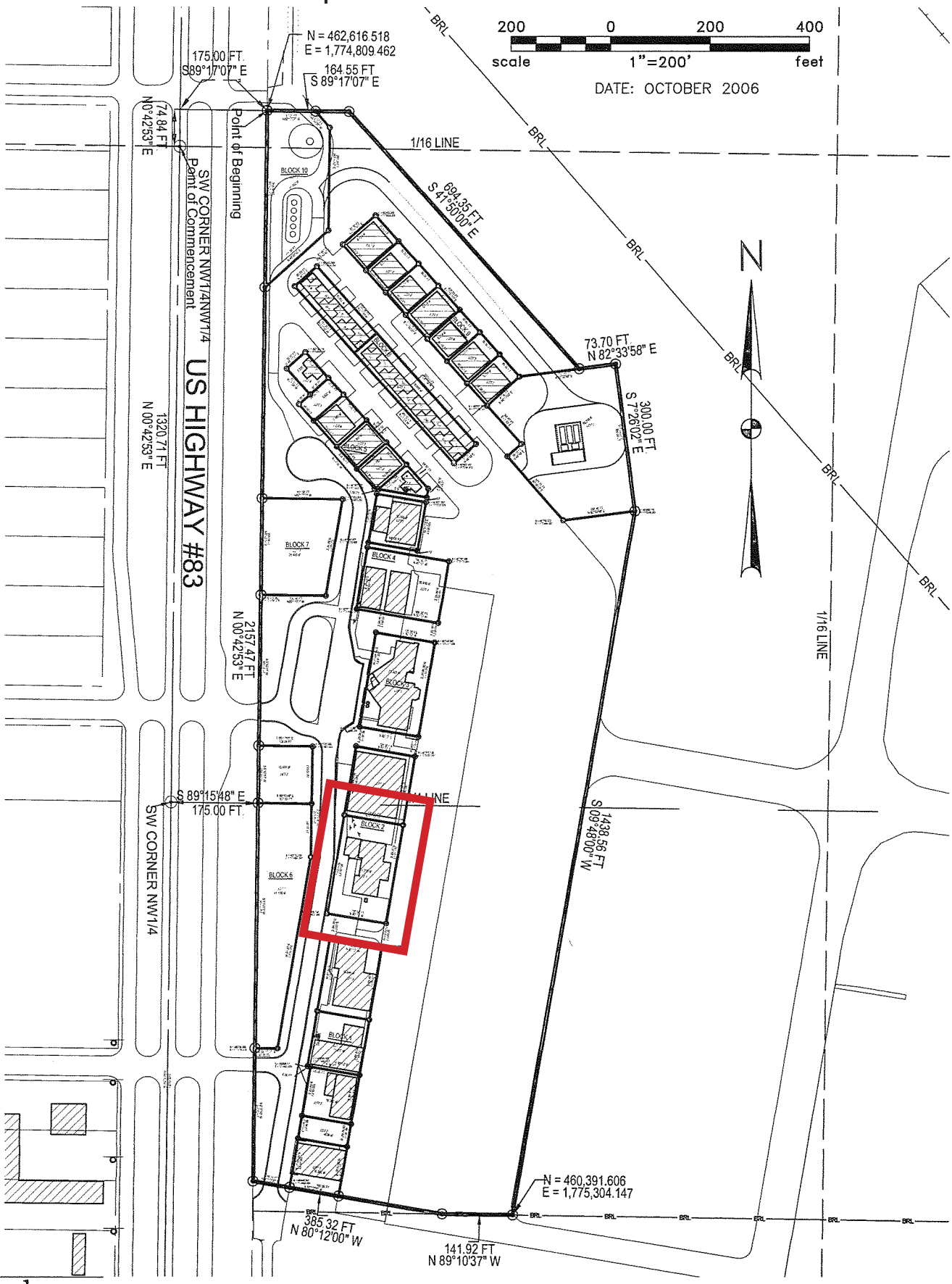
	through lane.
u) Boat and other recreational equipment and vehicle sales	4 spaces plus 1 additional space for each 500 square feet of gross floor area over the first 1,000 square feet
v) Bowling alley	5 spaces per alley, plus additional parking calculated separately for restaurants and other related uses
w) Clinics-medical, dental, chiropractic, etc.	4 spaces per 1,000 gross square feet of building area.
x) Daycare, preschools, except residential	1 space per employee plus one space per 6 children of licensed capacity of the facility
y) Convenience store, Fuel or service stations	4 spaces plus 3 spaces for each auto repair service stall plus parking figured separately for retail or office space.
z) Hotel, motel	1 space per room or suite, plus 1 space per employee on the largest work shift, plus 1 space per 3 persons to the maximum occupancy load of each public meeting and/or assembly room, plus 50 percent of the spaces otherwise required for accessory uses (e.g., restaurants and bars)
aa) Manufacturing, fabricating or processing of a product or material	1.6 spaces per 1,000 gross square feet or 0.73 spaces per employee whichever is greater.
bb)Theatres	1 space for each 4 seats of design capacity
cc) Offices, including government buildings and other professional offices	Minimum of 3 spaces per 1,000 square feet of floor area.
dd) Open sales lots	1 space for each 2,000 square feet of land up to the first 8,000 square feet, plus 1 space for each 4,000 square feet up to a parcel of 24,000 square feet, plus 1 space for each 6,000 square feet over 24,000.
ee) Restaurants, delicatessens, bars, taverns	1 space per 3 patron seats or 1 space per 100 square feet of floor area, whichever is greater, plus 1 space per employee on the largest work shift
ff) Restaurants, fast food	1 space per 3 patron seats, plus 1 space per employee on the largest work shift, plus 6 off street stacking spaces per drive-through lane.
gg) Restaurants where no interior serving	1 space for each 15 square feet of building

areas are present, such as a drive-in or take out business	dedicated to patron service and 5 spaces for employees
hh) Restaurant, sit down	12 spaces for each 1,000 gross square feet of leasable area or one parking space for each two seats, whichever is greater.
ii) Restaurant, high turnover sit down	12 spaces for each 1,000 gross square feet of leasable area.
jj) Shopping center, retail store or personal service establishment, except as otherwise specified herein	1 space for each 200 gross square feet of leasable area.
kk) Self-service storage facility	Drive aisles between and around storage buildings must be 30 feet to accommodate through traffic and parking outside individual storage units plus parking figured separately for office and/or on-site security personnel residences, etc.
ll)Discount Store/ Big-Box retailers	Maximum of 4 spaces per 1,000 square feet of floor area
mm)Showrooms for display or sales including furniture stores, carpet stores, etc.	1 space per 400 square feet for first 25,000 square feet, plus 1 space per 600 square feet thereafter.
nn) Showrooms for sale of automobiles	5 spaces for customer parking for every acre of total site area, plus 5 spaces for customer service parking for every acre of total site area, plus 1 space for each 400 square feet of gross floor area for employees.
oo) Skating rinks (indoor), dance halls, miniature golf, ice arenas (indoor), health and fitness clubs etc.	1 space per 300 square feet of floor area, plus 1 space per employee on the largest work shift.
pp) Supermarket/Grocery Store	1 space for each 250 gross square feet of leasable area.
qq) Warehousing (and storage) in structures	1 space for each 2,000 square feet of gross floor area, or one space per employee, whichever is greater.

Section 23-2. Licensed Motorized Vehicle and Equipment Parking in Residential Districts:

a) Purpose: To permit the parking of personal vehicles on a single lot in a residential district subject to specific conditions. Personal vehicles defined as Class D or M include: passenger cars, motorcycles, vans, pick-up trucks, campers, toppers and other similar appurtenances

Minot International Airport Second Addition



Kadrmas Lee & Jackson
Engineers Surveyors Planners

PLAT LEGEND

- ⊙ DENOTES MONUMENT FOUND
- ◎ DENOTES MONUMENTED LOT CORNERS

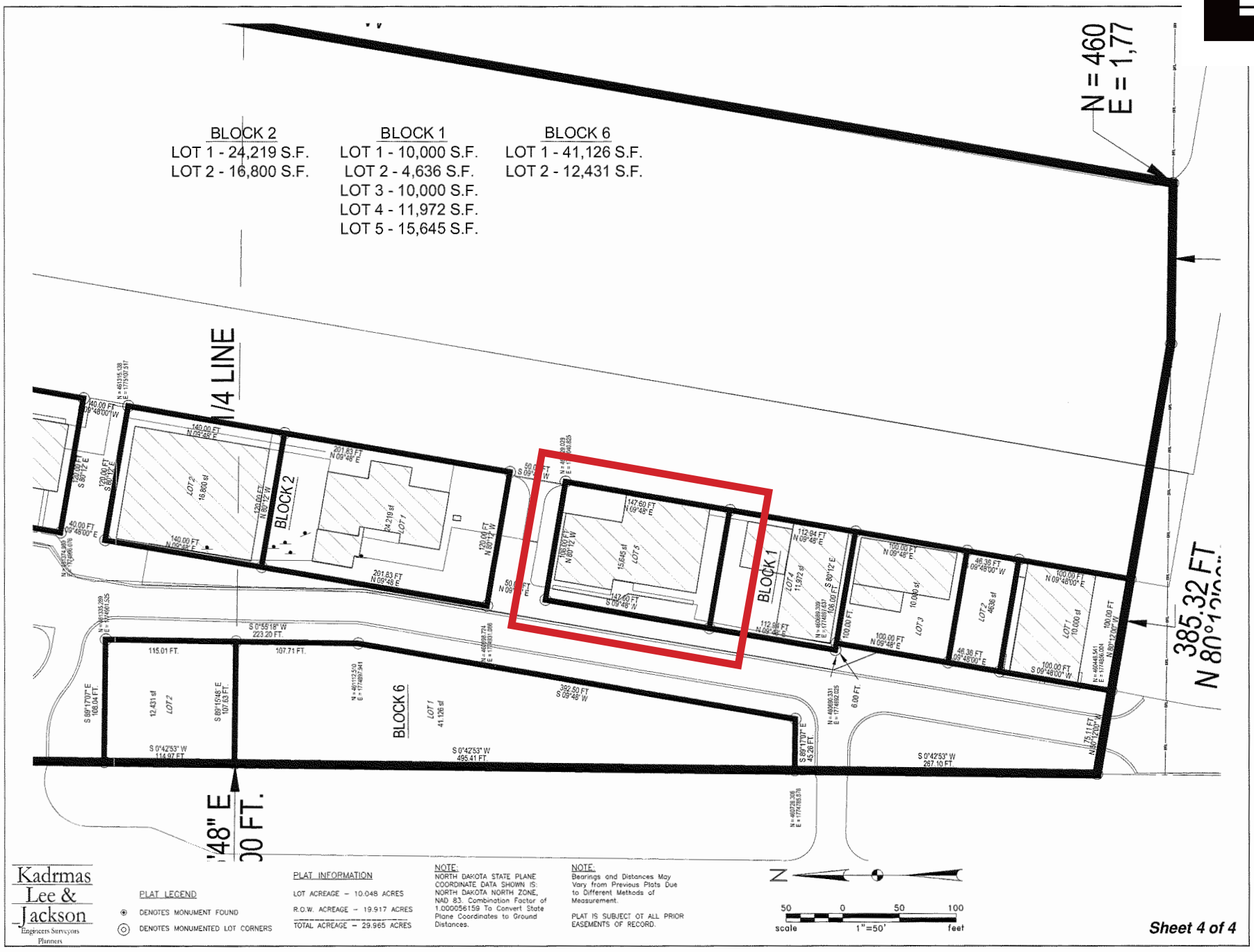
PLAT INFORMATION

LOT ACREAGE – 10.048 ACRES

R.O.W. ACREAGE – 19.917 ACRES

TOTAL ACREAGE – 29.965 ACRES

NOTE:
NORTH DAKOTA STATE PLANE COORDINATE DATA SHOWN IS: NORTH DAKOTA NORTH ZONE, NAD 83. Combination Factor of 1.000056159 Convert State Plane Coordinates to Ground Distances.


BLOCK 2
LOT 1 - 24,219 S.F.
LOT 2 - 16,800 S.F.
BLOCK 1
LOT 1 - 10,000 S.F.
LOT 2 - 4,636 S.F.
LOT 3 - 10,000 S.F.
LOT 4 - 11,972 S.F.
LOT 5 - 15,645 S.F.
BLOCK 6
LOT 1 - 41,126 S.F.
LOT 2 - 12,431 S.F.
N = 460
E = 1,77
/4 LINE
385.32 FT
N 80°12'
BLOCK 2
BLOCK 1
BLOCK 6
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
16,800 sf
24,219 sf
15,645 sf
11,972 sf
10,000 sf
4636 sf
41,126 sf
12,431 sf
140.00 FT N 09°48' E
120.00 FT N 80°12' W
201.63 FT N 09°48' E
147.60 FT N 09°48' E
112.94 FT N 09°48' E
100.00 FT N 09°48' E
46.36 FT 09°48'00" W
100.00 FT N 09°48'00" E
100.00 FT S 09°48'00" W
S 0°55'18" W 223.20 FT.
115.01 FT.
107.71 FT.
S 89°17'07" E 108.04 FT.
S 89°15'48" E 107.63 FT.
S 0°42'53" W 114.97 FT.
S 0°42'53" W 495.41 FT
392.50 FT S 09°48' W
S 89°17'07" E 45.26 FT
S 0°42'53" W 267.10 FT
6.00 FT.
75.11 FT.
'48" E
00 FT.
Kadrmas Lee & Jackson
Engineers Surveyors Planners
PLAT LEGEND
DENOTES MONUMENT FOUND
DENOTES MONUMENTED LOT CORNERS
PLAT INFORMATION
LOT ACREAGE – 10.048 ACRES
R.O.W. ACREAGE – 19.917 ACRES
TOTAL ACREAGE – 29.965 ACRES
NOTE:
NORTH DAKOTA STATE PLANE COORDINATE DATA SHOWN IS: NORTH DAKOTA NORTH ZONE, NAD 83. Combination Factor of 1.000056159 To Convert State Plane Coordinates to Ground Distances.
NOTE:
Bearings and Distances May Vary from Previous Plats Due to Different Methods of Measurement.
PLAT IS SUBJECT OT ALL PRIOR EASEMENTS OF RECORD.
N
50 0 50 100
scale 1"=50' feet
Sheet 4 of 4

PHOTOS
Building Elevations

SW Building Elevation


NE Building Elevation

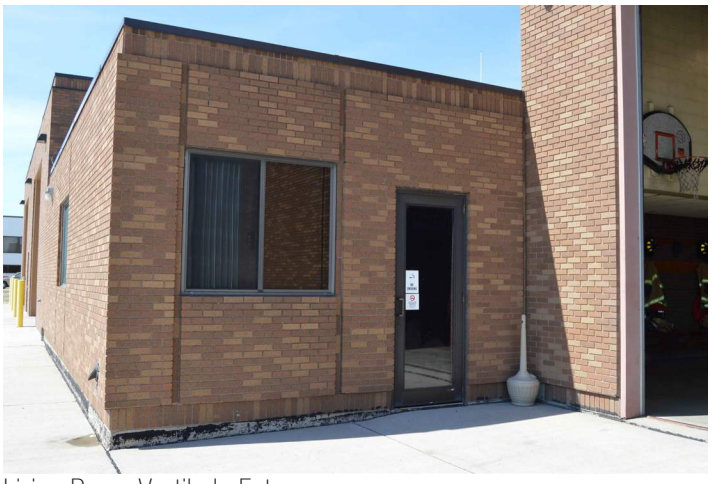

SE Building Elevation


NW Building Elevation

PHOTOS
Building Elevations


Front Entrance - West Elevation


Front Elevation - Looking SW


Living Room Vestibule Entrance


North Building Elevation

JLG
DESIGN FOR LIFE

PHOTOS
Roof


Lower Living Quarters Roof Looking Southwest


Lower Livign Quarters Roof Looking Northwest


Lower Living Quarters Roof Looking East


Lower Living Quarters Roof Looking Southeast

PHOTOS
Roof


North Apparatus Roof Looking East


North and South Apparatus Roof Looking Southeast

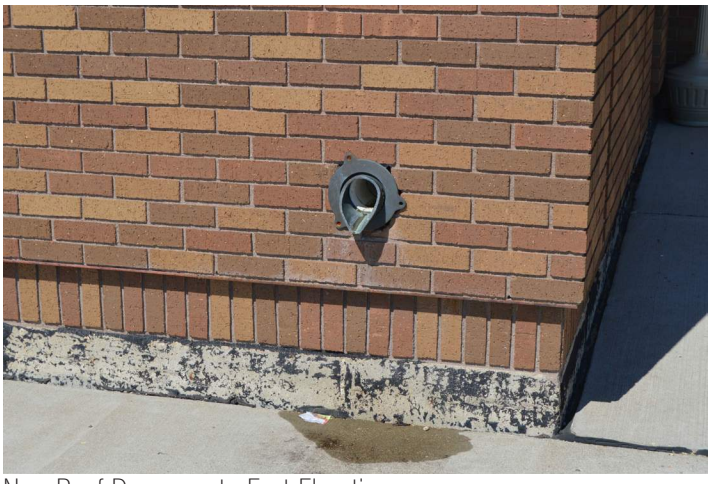

North and South Apparatus Roof - Looking South


Lower Living Quarters Roof - Looking SE

PHOTOS
Roof


South Apparatus Roof - Looking South

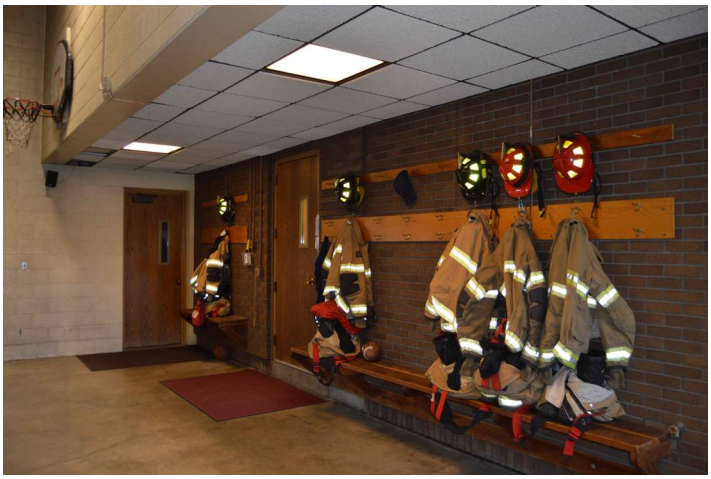

South Apparatus Roof - Looking Southeast


New Roof Downspout - East Elevation

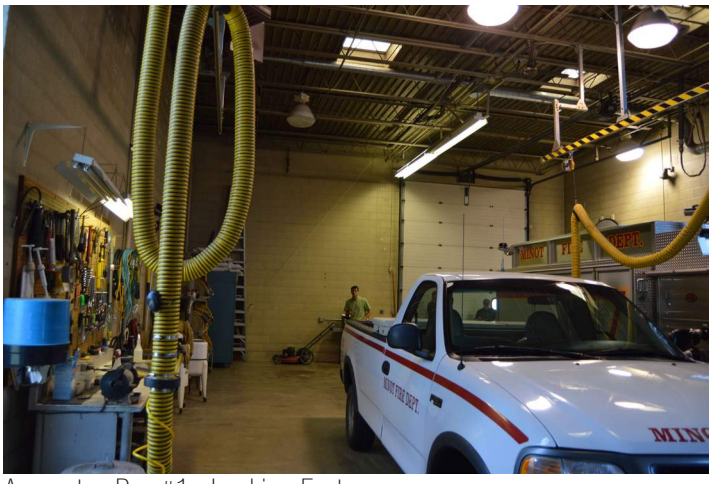

Existing Downspout Location - West Entrance Elevation

PHOTOS
Interior

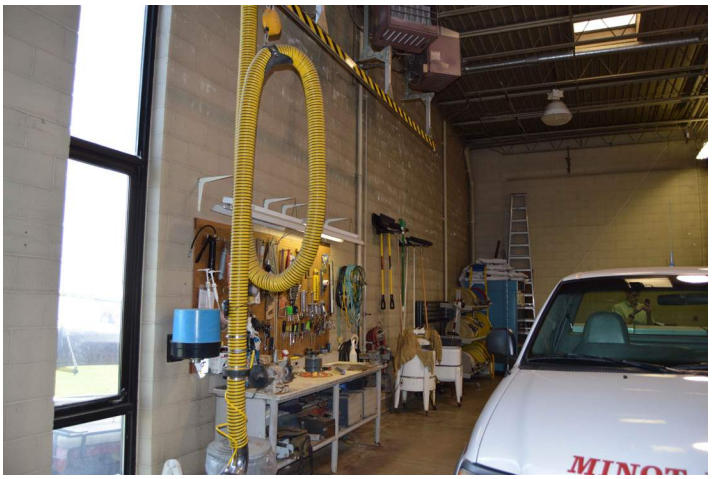
Apparatus Bay #1 - Corridor/Vestibule


Apparatus Bay #1 - Corridor

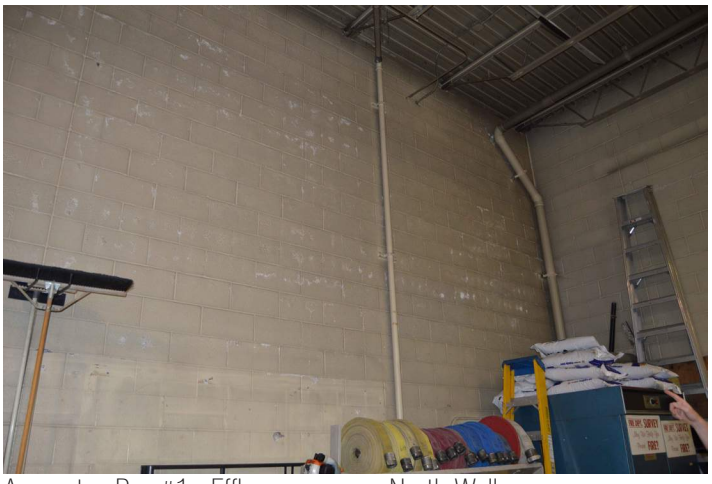
Apparatus Bay #1 - Looking Southwest


Apparatus Bay #1 - Looking East

PHOTOS
Interior


Apparatus Bay #1 - Looking Southeast

Apparatus Bay #1 - Looking North


Apparatus Bay #1 - Efflorescence on North Wall


Apparatus Bay #1 - Efflorescence on North Wall

PHOTOS
Interior


Kitchen - Looking Southeast


Kitchen - Looking Northeast


Kitchen - Water Leak on West Wall


Kitchen - Looking North

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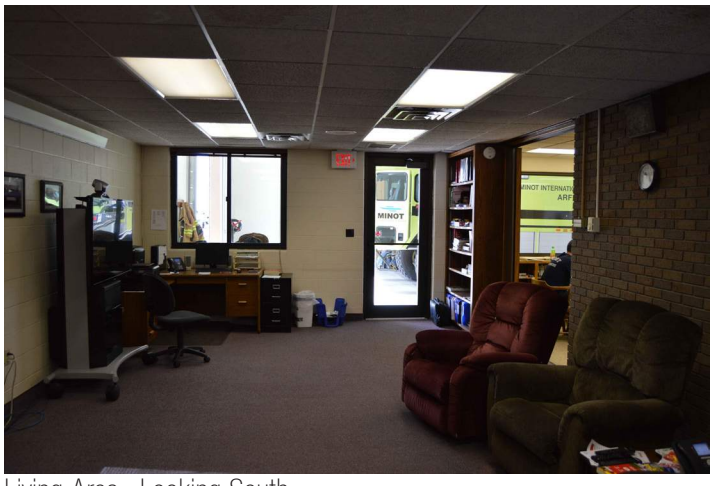
DESIGN FOR LIFE

PHOTOS
Kitchen

Living Area - Looking Northeast

Living Area - Looking Northwest


Living Area - Looking Northeast at Roof Drain Piping



Living Area - Looking South

PHOTOS
Toilet Rooms


Office/Dining - Toilet Room


Office/Dining - Looking Southeast


Toilet/Shower - Looking North


Captain Office - Looking South

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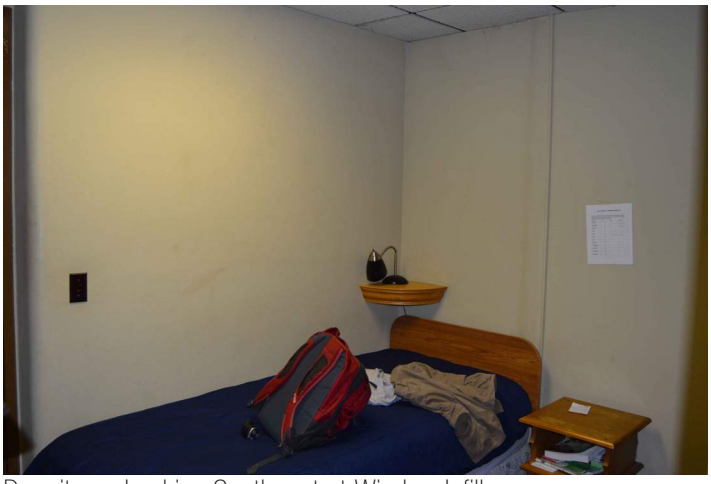
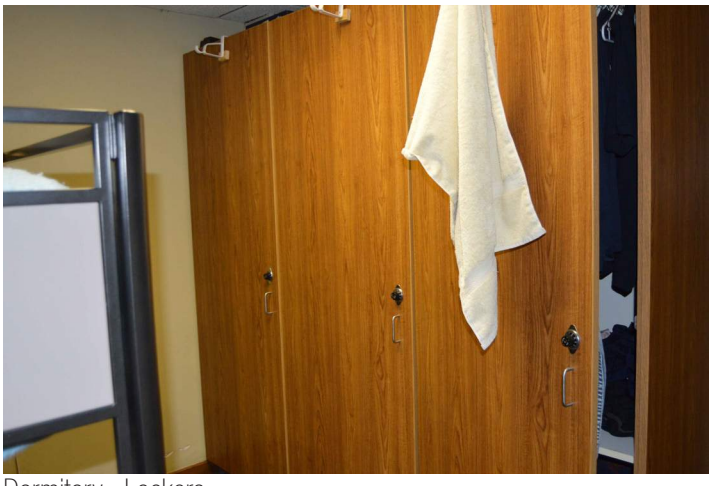
DESIGN FOR LIFE

PHOTOS
Interior

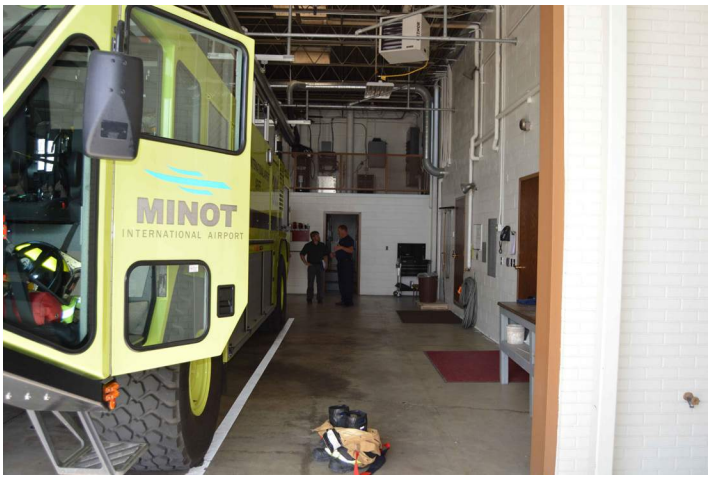

Dormitory - Looking South


Dormitory - Looking Southwest at Window Infill

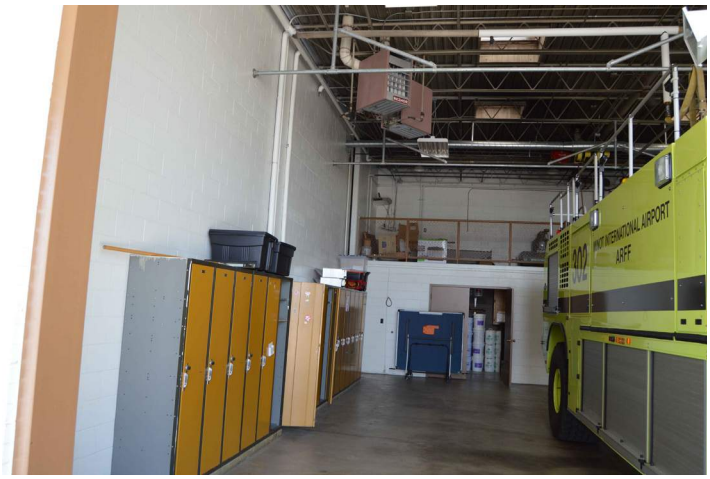

Dormitory - Looking Northwest

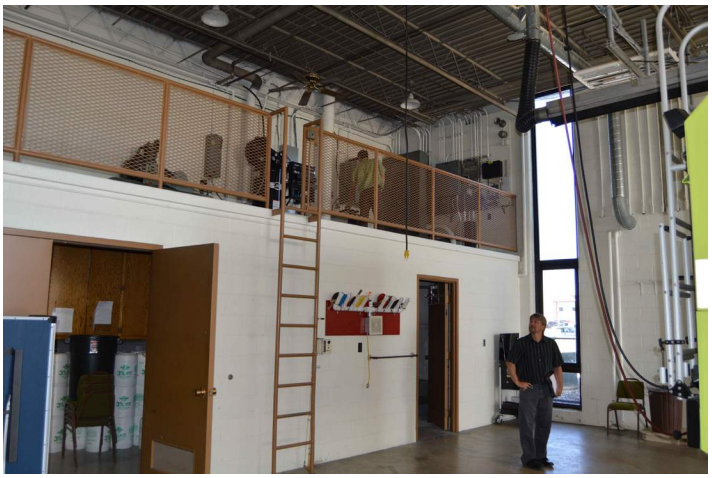

Dormitory - Lockers

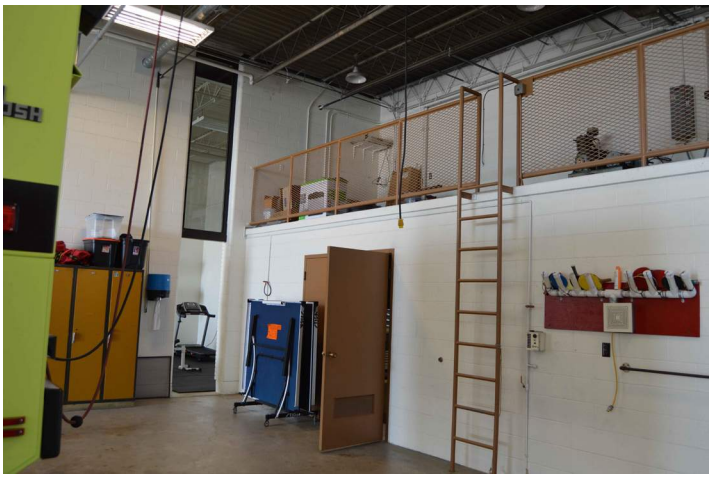
PHOTOS
Interior



Apparatus Bay #2 - Looking West

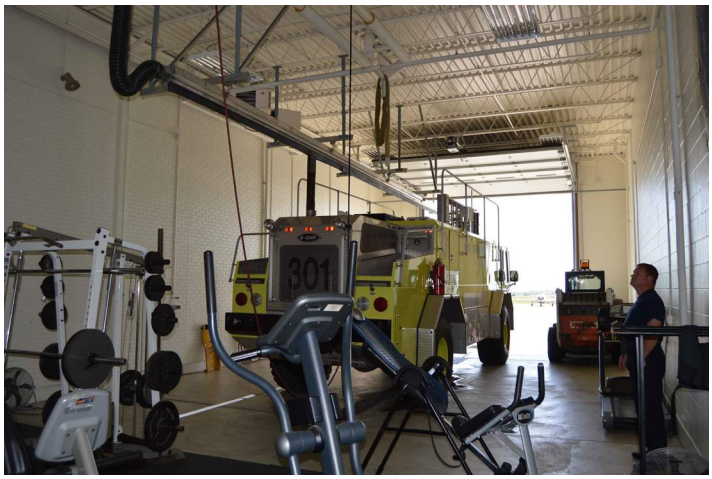

Apparatus Bay #2 - Looking West


Apparatus Bay #2 - Mezzanine Looking Northwest

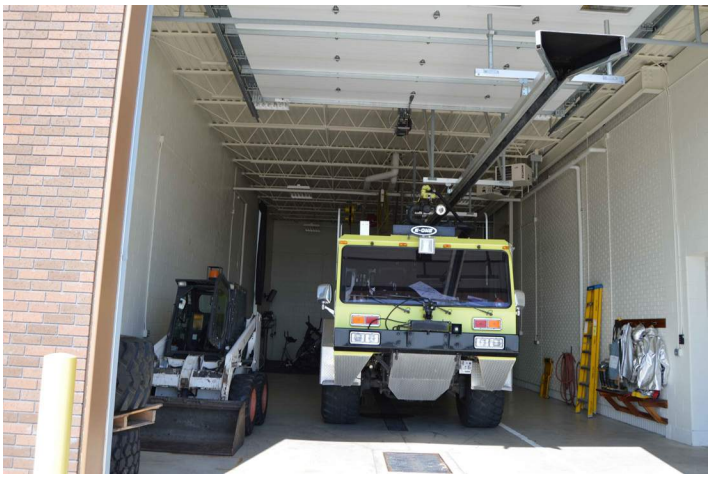

Apparatus Bay #2 - Mezzanine Looking Southwest

PHOTOS
Toilet Rooms


Apparatus Bay #3 - Weight Room, Looking Southwest



Apparatus Bay #3 - Looking East


Apparatus Bay #3 - Looking West


Apparatus Bay #3 - Washer/Dryer under Mezzanine

1000 East Calgary Ave. Suite 2
Bismarck, North Dakota 58503
Office | 701.221.3286
cwstructural.net

CWSTRUCTURAL
ENGINEERS

June 17, 2016

Doug Larson
JLG Architects
2705 4th Ave. NW
Minot, ND 58703

RE: Fire Station #3 – Minot Airport
2510 N. Broadway-Minot, ND 58703

Dear Doug;

Thank you for allowing CWSTRUCTURAL Engineers to assist with the building evaluation and inspection at the Minot. We were asked to walk through the Fire Station #3 building located at 2510 N. Broadway in Minot, ND and perform a structural inspection of the building and note any observed structural related deficiencies that were visible.

General Building Construction & Layout

Original 1973Building – Per structural drawings that were provide, the original building was constructed in 1973 and consisted of one south apparatus bay having two overhead doors with airport access, and a mezzanine located at the back of the bay (See Photos #16 & #17). North of this bay was and a single story living quarters that was built in 1973. The original building appears to have been constructed using concrete foundations walls and footing with lightweight concrete block bearing walls. The exterior walls appear to be 8" unreinforced lightweight CMU with exterior brick veneer. Below the interior roof step between the apparatus bay and the living quarters 12" unreinforced lightweight CMU block is provided. The roof construction consists of 18" steel bar joists spanning north-south over the apparatus bay and 16" steel bar joists spanning north-south over the living quarters, both supporting metal roof decking. A mezzanine consisting of 4" concrete structural slab was provided at the back (west) end of the apparatus bay. This slab bears on the exterior CMU wall and an interior 8" lightweight CMU block wall supported on a thickened slab footing.

1978 Addition – Another apparatus bay was later added on the north side of the original living quarters in 1978 (See Photos #8 & #10). This apparatus bay had two overhead doors each side of the bay to have both city and airport access from the apparatus bay. A short, low roof corridor was also provided on the south side of the addition to provide standoff from the original building. The 1978 addition consisted of concrete foundation walls and footings supporting 8" unreinforced lightweight CMU with brick veneer at exterior bearing walls and 12" lightweight interior CMU bearing wall at the roof step. The high roof framing over the apparatus bay consists of 18" deep steel bar joists spanning north & south and 8" steel bar joists spanning north-south, both supporting metal roof decking. The northern overhead door

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opening on the east side of the 1978 apparatus bay appears to have been infilled with CMU and brick veneer at some point after the construction of the addition.

Living Quarters Addition (Date Unknown): Sometime after 1978 and before 2011, there appears to have been an addition to the living quarters done on the east side of the building (See Photos #11 through #15). The construction is assumed to be concrete foundation walls and footings and CMU bearing walls to match the rest of the building. The roof structure appears to be framed with steel bar joists spanning east-west and bearing on the east wall of the original building.

2011 Addition – A third apparatus bay was added south of the original apparatus bay in 2011 (See Photos #17, #19 through #21). The original apparatus bas was also extended approximately 16'-0" to the east at this time. The addition was constructed with concrete foundation walls and footings supporting 8" regular weight CMU bearing walls with brick veneer at exterior walls and a 12" CMU bearing wall between the third bay and the original bay extension. Steel column & beam lines were provided along the south and east walls of the original bay to support the new roof addition framing. These columns were supported on isolated pad footings underpinned along the existing construction. The roof framing of the addition consists of 10" steel bar joists spanning east-west at the original bay extension and 18" steel bar joists spanning north-south at the third bay addition, both supporting metal roof decking.

Observed Structure Deficiencies

In walking around the outside perimeter of the building (See Photos #1 through #7), the brick veneer appeared to be in good condition with no signs of cracking that would indicated foundation movement. Drainage around the exterior of the site was poor. This was especially apparent at the west side of the building where there is an electrical courtyard with large rock bed landscaping. It is difficult to tell how well the grading provides drainage at this courtyard since the drainage depends on the actual grade of the soil below the rock. However, it is our opinion that the courtyard drainage is extremely poor and may be draining back toward the building as it appears to have nowhere to go and a low spot seemed to be present directly adjacent to the living quarters at the west wall. Another grading low spot was observed at the north side of the building directly adjacent to the foundation that may not allow proper drainage away from the building. Additionally, the general drainage at the south side of the building was extremely poor as well.

No concrete splash blocks were provided at downspouts/drain exits. A long PVC downspout extension was provided extending to the west of the southernmost truck bay addition. There did not appear to be any type of extension at what appeared to be the original building drain on the west side of the building, however. Additionally, what is believed to be the north addition roof drain appears to exit directly next to the foundation on the north side of the building. This drain exit occurs near the grading low spot that was present on the north side of the building. Please note, however, that we are unsure of the roof drain system and how it functions overall as it appears some drains may have been modified or abandoned with each addition.

Within the living quarters, the roof structure was covered by acoustical ceiling tile, though the CMU block bearing walls were exposed at many locations. No structural deficiencies were observed at the roof framing or the CMU bearing walls that were visible.

The roof structure and CMU bearing walls were visible at all three apparatus bays. No structural deficiencies were observed at the steel roof framing. There did appear to be a thermal/moisture issue of some kind occurring at the inside face of the CMU walls located at the north wall and the east wall of the northern apparatus bay. (See Photos #8 & #9) The inside surface of the CMU was painted and there were areas were large bubbles were present beneath the surface of the paint. At some locations, these bubbles had opened up and small surface spalls have occurred on the inside surface of the CMU block. At these exposed spalls, there was a white efflorescence discoloration visible. It is believed that condensation may be occurring within the wall due to a warmer interior surface meeting a colder wall surface. When this condensation freezes during cold weather temperatures, it may be causing the spalling on the inside surface of the wall. This surface spalling was also visible on the inside face of the north wall of the laundry room area, which is located below the mezzanine of the original building.

Conclusion

Overall, the structure was found to be in very good condition. Our main structural concerns would be the surface spalling at the interior of the CMU walls and the general drainage around the building exterior and at the downspouts. It is recommended that the drainage around the building be evaluated and improved to avoid potential structural problems that could occur due to increased moisture around the foundation. These potential problems may depend on the type of soil present at the site and can include excessive settlement, excessive freeze-thaw movement and cracking of exterior flatwork, or heaving and cracking of interior slabs on grade if expansive soils are present.

While the surface spalling of the CMU walls at some areas is removing some structural material from the block, it does not currently pose a significant structural concern as this spalling does not appear to extend more than ¼" into the concrete. However the condition of the other block surfaces, at the exterior face and within the cores, are unknown as this is not exposed to view. The thermal condition of this wall should be reviewed to prevent additional moisture/condensation issues from occurring. With a plan to handler these thermal issues and prevent further spalling, further remedies could then be explored to determined what type of options there are to potentially patch these small spalls if desired.

Thank you again for allowing CWSTRUCTURAL Engineers to assist you with this structural building inspection and evaluation. Should have you any questions or concerns about this report, please do not hesitate to contact our office.

Sincerely,

Derek Kost

Derek Kost, P.E.
CWSTRUCTURAL Engineers

Enc.: Photos #1 through #21

PHOTOS – TAKEN 6/8/2016

Photo #1 : West side of 2011 addition

Photo #4: Southeast corner of 2011 addition.

Photo #2:West side of Original 1973 Building showing Rock Courtyard.

Photo #5: East side of 2011 addition.

Photo #3: West side of 1978 apparatus bay.

Photo #6 East side of building showing 2011 addition, original 1973 building & 1978 addition.

Photo #7: Northeast corner of 1978 addition.

Photo #9: close up of spalling and white Efflorescence at north wall of 1978 addition.

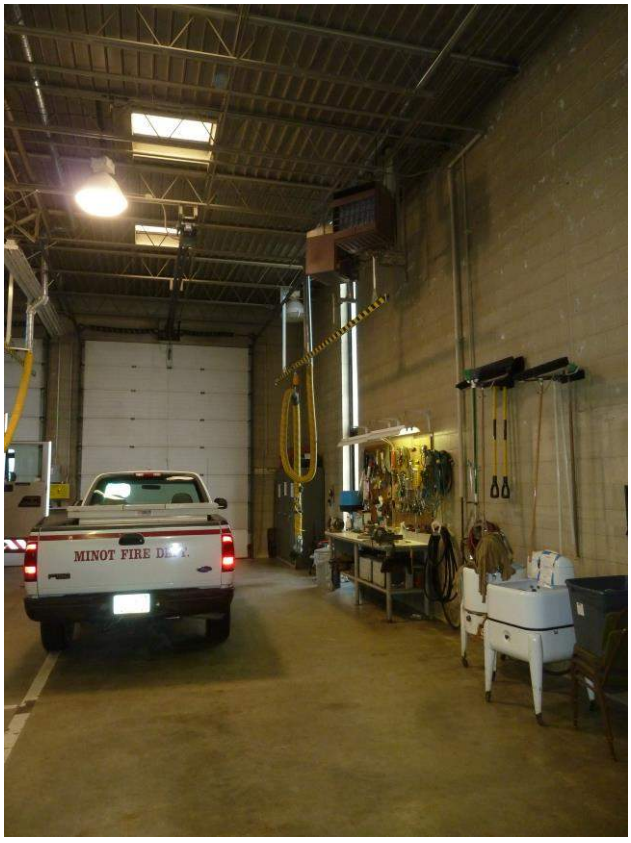

Photo #8: Viewing NW corner of 1978 addition. Note the white efflorescence and spalling on north wall.

Photo #10: SE corner of 1978 addition.

Photo #11: North wall of living quarters (East end).

Photo #12: South wall of living quarters (East End)

Photo #13: East wall of living quarters.

Photo #14: East living quarters addition – roof joists bearing on east wall of original building.

Photo #15: Wall between living quarters addition and 2011 addition extended apparatus bay.

Photo #16: South end of original building apparatus bay and mezzanine beyond (looking west).

Photo #17: NE corner of original building apparatus bay, viewing 2011 steel column and beam line at west side of bay extension addition (Looking West)

Photo #18: North end of original building apparatus bay and mezzanine beyond (looking west).

Photo #19: 2011 apparatus bay addition (looking west)

Photo #20: South wall of original building apparatus bay, viewing the column and beam line for the 2011 addition.

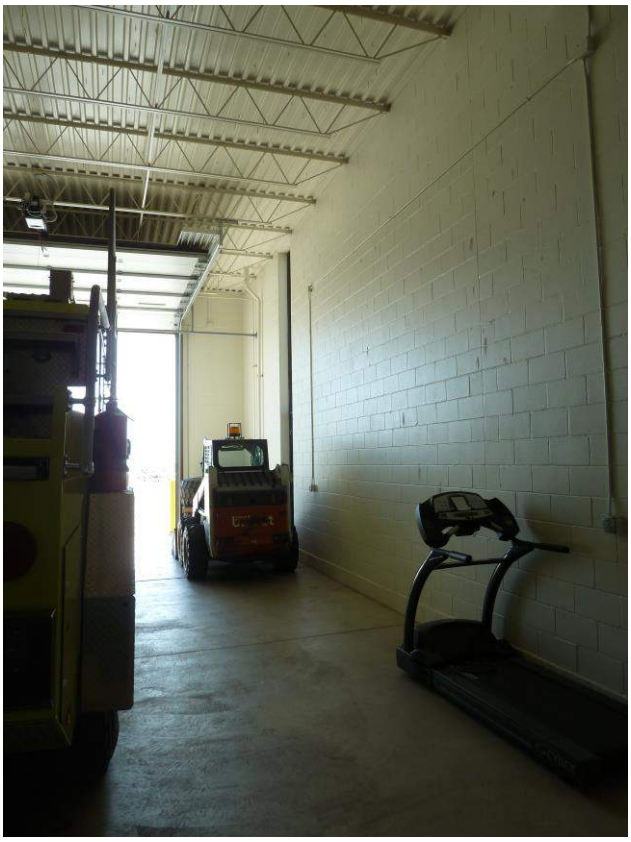

Photo #21: South wall of 2011 addition (looking East)

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MINOT AIRPORT FIRE STATION MECHANICAL ANALYSIS

Date Performed: June 8, 2016

Report Date: June 20, 2016

Project No. 16040

Fire Suppression

1. No fire suppression in facility.

Plumbing

1. Vitreous china, commercial grade lavatories, toilets, and urinals are installed throughout the toilet rooms. Manual operation is at all fixtures
    a. Plumbing is in good condition.
2. Vehicle bays have floor drains with oil interceptors.
    a. Oil interceptor in the north bay is reported to have venting issues with odors of sewer gases occurring within the bay.

Climate Control

1. Climate control in the fire truck bays is accomplished by sealed combustion, natural gas fired unit heaters. Mixture of new and older units.
    a. Heating on the North bay is reported to be inadequate. Lack of insulation is likely the culprit, since it is reported that frost builds up on the inside surface of exterior wall.
    b. Units appear to be functional; older units may require increasing amount of maintenance.
2. Climate control in the housing area is accomplished through natural gas fired, packaged rooftop units (RTU's). The east room has electric radiant cove heaters for additional heat.
    a. Cooling is adequate.
    b. Humidity control is reported to be inadequate. Air intakes at the RTU's should be evaluated for excessive ventilation.
    c. Heating on east room was inadequate until additional electric heat was added.
    d. The RTU's are newer and appear to be in good condition.

Temperature Controls

1. Temperature control consists of low voltage thermostats. No central control is available.

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MINOT AIRPORT FIRE STATION ELECTRICAL ANALYSIS

Date Performed: June 8, 2016

Project No. 16040

Lighting

1. Most of the light fixtures in the building are original.
    a. The light fixtures in the central living area are fluorescent type that utilize T12 lamps which are obsolete.
    b. Fixtures in the north bay are a combination of metal halide low bay and some T12 fluorescent. The lamps/ballasts for the metal halide are still available.
    c. The lighting in the two south bays incorporates energy efficient T5 fluorescent lamps with electronic ballasts. This is a modern, viable system.
2. Exterior lighting is accomplished with metal halide light fixtures mounted to the walls of the building.
3. Overall assessment of the lighting is that older T12 fixtures should be replaced in the near future. Everything else is adequate.

Electrical Service/Distribution

1. The building is served with a 400 Amp 120/240 Volt 3 Phase Service. Distribution equipment is manufactured by Square D. Replacement equipment is readily available.
    a. There is a branch panel in the north bay that has space for adding circuits.
    b. There is a branch panel in the south bay that is full.
    c. The main service panel does not have space or spares for adding additional distribution.
2. The electrical system also includes a 14kW natural gas generator that provides backup power for critical lighting and power within the building. This generator is adequate for its intended use.
3. Overall assessment is that the distribution system is adequate for the existing building but it likely cannot support a substantial building addition.

Systems

1. The building incorporates stand alone smoke detectors in the sleeping quarters. This level of protection is minimal, but it is code compliant.
2. There is adequate network cabling in the facility.
3. The main entrance is controlled by a mechanical keypad lock. For security purposes, this should be upgraded to a card access system with individual cards for each personnel.

ELECTRICAL COSTS

1. Update interior lighting – $26,000.
2. Card access system – $9,000.

These opinions of probable costs represent our best judgment as design professionals familiar with the local construction industry. It must be recognized, however, that we have no control over the cost of labor, material or equipment, over Contractor's method of determining bid prices, or over competitive bidding market conditions. Accordingly, we cannot, and do not represent that bids will exactly match this opinion of probable costs.