APPENDIX L – INSTRUMENT PROCEDURES & AIRSPACE

Introduction

This appendix discusses the existing and recommended instrument procedures and airspace at the Minot International Airport (MOT). Instrument procedures allow aircraft to operate by reference to flight instrument under Instrument Flight Rules (IFR). Airspace is an irreplaceable resource around the airport necessary for the safe and orderly operation of aircraft.

The appendix will review the existing and recommended instrument procedures necessary for the airport including:

- Standard Instrument Approach Procedures
- Departure Procedures
- Taxiway Procedures

A copy of the published instrument procedures for the airport is included at the end of this appendix. This document will also review the existing and recommended airspace standards necessary for the airport including:

- Airspace Classification
- Part 77 Civil Airport Imaginary Surfaces
- Runway Approach/Departure Surfaces
- Terminal Instrument Procedures (TERPS)
- One Engine Inoperative (OEI) Surfaces
- Other Airport Design Surfaces

The type of instrument procedures and airspace required on an airport are determined by FAA guidance from on the airport's design standards. Available FAA guidance can be found by reviewing the latest Advisory Circulars, Handbooks and Orders.

Instrument Procedures

Standard Instrument Approach Procedures

Standard Instrument Approach Procedures (SIAP) are used by landing aircraft to navigate to the airport during IFR weather conditions: periods of lower flight visibility and/or lower cloud ceilings. FAA publishes SIAPs defining the horizontal and vertical flight path to land at an airport. Each procedure has varying flight visibility and cloud ceiling weather "minimums" published defining the minimum conditions where a legal approach can be made. Weather minimums established for each SIAP based on the approach type, airport/runway design, navigational aids, airspace obstructions, aircraft equipment and flight crew certification.

The flight visibility minimums are one factor to determine what FAA design standards apply to the airport or a particular runway. As a general rule, instrument approaches that provide procedures for aircraft to land in lower visibility and lower ceilings require additional protection space and have "flatter" approach paths to airports which restrict the height of objects off the ends of the runways.

Although FAA flight rule weather minimums change based on the airspace classification, flights typically must be conducted under IFR if cloud ceilings are less than 1,000 feet above the ground and/or flight visibility less than 3 statute miles. Conditions exceeding this minimum can be conducted

under Visual Flight Rules (VFR). Visual approaches to a runway require no published SIAP and can be conducted when the weather is acceptable for VFR flights.

FAA defines the types of SIAPs:

- **Non-Precision Approach (NPA):** A standard instrument approach procedure with horizontal course and no electronic vertical descent guidance. These approaches utilize satellite-based or ground-based navigational aids such as GPS, VOR or NDB.

- **Approach with Vertical Guidance (APV):** An instrument approach procedure providing electronic course and vertical descent electronic guidance. These approaches utilize ground-based Glideslope (GS) navigational aids or satellite-based navigational aids such as a Localizer Performance with Vertical Guidance (LPV).

- **Precision Approach (PA):** An instrument approach procedure with electronic course and vertical descent guidance and visibility minimums of less than ¾ mile visibility (4,000 foot Runway Visual Range - RVR). These approaches utilize ground-based navigational aids as part of an Instrument Landing System (ILS). The three components of an ILS are a Localizer (LOC) antenna for course guidance, a Glideslope (GS) antenna for vertical guidance and an Approach Lighting System (ALS).

See **Appendix K** for discussion of navigational aids.

Approaches may be conducted straight-in to a runway end or allow circling to the landing runway. Typical straight-in instrument approach weather minimums for runways that meet all requirements are outlined in the following table:

Table L-1 – Typical Instrument Approach Minimums

Approach Procedure	Approach Type	Cloud Ceiling Minimum (HAT)	Visibility Minimum RVR, s.m.
ILS - Category III[1]	Precision (PA)	≤ 100 feet	≤ 1200’ RVR
ILS - Category II	Precision (PA)	100 feet	1200’ RVR
ILS – Category I	Precision (PA)	200 feet	2400’/1800’ RVR
LPV	Approach with Vertical Guidance (APV)	250 feet*	1 mile*
LNAV/VNAV	Non-Precision (NPI)	400 feet	1 mile
LNAV	Non-Precision (NPI)	400 feet	1 mile
VOR	Non-Precision (NPI)	400 feet	1 mile
None	Visual	1,000 feet	3 miles

Note: HAT = Height Above Touchdown, RVR = Runway Visual Range, s.m. = statute miles (reported), ILS = Instrument Landing System, LPV = Localizer Performance with Vertical Guidance, LNAV = Lateral Navigation, VNAV = Vertical Navigation, VOR = Very High Frequency Omni-Directional Range
**Lowest LPV minimums published the in United States is 200 feet cloud ceiling and ¾ mile visibility.*
Source: FAA Advisory Circular AC 150/5300-13A, FAA Aeronautical Information Manual, KLJ Analysis

FAA defines the minimum airport infrastructure standards for each type of instrument approach in FAA Advisory Circular 150/5300-13A *Airport Design* as summarized in **Figure L-1**.

[1] There are three different levels of Category III ILS approaches, each requiring a higher category of airborne equipment, crew training and airfield infrastructure requirements. Category A allows for a decision height below 100 feet with 700 feet RVR. Category B allows for a decision height below 50 feet with an RVR as low as 150 feet. Category C allows for zero decision height and zero RVR.

Figure L-1 – Standards for PA and APV with <250 ft. HATh

Table 3-4. Standards for Instrument Approach Procedures

Visibility Minimums [1]	< 3/4 statute mile	3/4 to < 1 statute mile	≥ 1 statute mile straight-in	Circling [2]
HATh [3]	< 250 ft	≥ 250 ft	≥ 250 ft	≥ 350 ft
TERPS GQS [4]	Clear	Clear	Clear	Not applicable
PA final approach surfaces [5]	Clear	Not Required	Not Required	Not applicable
POFZ (PA & APV only)	Required	Not Required	Not Required	Not applicable
TERPS Chapter 3, Section 3	34:1 clear	20:1 clear	20:1 clear [6]	20:1 clear [6]
ALP [7]	Required	Required	Required	Recommended
Minimum Runway Length	4,200 ft (paved)	3,200 ft [8, 9]	3,200 ft [8, 9]	3,200 ft [8, 9]
Runway Markings (See AC 150/5340-1)	Precision	Non-precision [9]	Non-precision [9]	Visual (Basic) [9]
Holding Position Signs & Markings (See AC 150/5340-1, AC 150/5340-18)	Precision	Non-precision [9]	Non-precision [9]	Visual (Basic) [9]
Runway Edge Lights [10]	HIRL / MIRL	HIRL / MIRL	MIRL / LIRL	MIRL / LIRL (Required only for night minimums)
Parallel Taxiway [11]	Required	Recommended	Recommended	Recommended
Approach Lights [12]	MALSR, SSALR, or ALSF	Recommended [13]	Recommended [13]	Not Required
Applicable Runway Design Standards, e.g. OFZ	< 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums	Not Required
Threshold Siting Criteria To Be Met (Reference paragraph 303)	Table 3-2, row 7	Table 3-2, row 6	Table 3-2, rows 1-5	Table 3-2, rows 1-4
Survey Required [14]	VGS	VGS (PA & APV) NVGS	NVGS [15]	NVGS [16]

Notes:

1. Visibility minimums are subject to the application of Order 8260.3 ("TERPS"), and associated orders or this table, whichever is higher. To qualify for each visibility (or circling), all requirements within the same column must be met or exceeded.
2. All runways authorized for circling must meet threshold siting (reference paragraph 303), OFZ (reference paragraph 308), and TERPS Chapter 3, Section 3 criteria.
3. Height Above Airport (HAA) for circling. The HATh/HAA indicated is for planning purposes; actual obtainable HATh/HAA is determined by TERPS and may be higher due to obstacles or other requirements. HATh less than 250 ft must comply with requirements in < 3/4 statute mile column regardless of published visibility.
4. GQS is applicable to PA and APV only. See Table 3-2, row 8.
5. Applicable to PA only, as defined by paragraph 102. If not clear, HATh must be increased to 250 ft or greater (as required by TERPS).
6. If not clear, obstacles must be lighted (see AC 70/7460-1) or procedure/circling runway restricted to day only. In certain circumstance, a VGSI may be used in lieu of obstruction lighting as defined in TERPS.
7. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
8. Runways less than 3,200 ft are protected by Part 77 to a lesser extent. However, runways as short as 2,400 ft could support an instrument approach provided the lowest HATh is based on clearing any 200-ft (61 m) obstacle within the final approach segment.
9. Unpaved runways require case-by-case evaluation by the RAPT.
10. Runway edge lighting is required for night approach minimums. High intensity lights are required for RVR-based minimums.
11. A full-length parallel taxiway must lead to the threshold.
12. To achieve lower visibility minimums based on credit for lighting, a full approach light system (ALSF-1, ALSF-2, SSALR, or MALSR) is required for visibility < 3/4 statute mile. Intermediate (MALSF, MALS, SSALF, SSALS, SALS/SALSF) or Basic (ODALs) systems will result in higher visibility minimums. An ALSF-1 or ALSF-2 is required for CAT II/III ILS.
13. ODALS, MALS, SSALS, and SALS are acceptable.
14. See AC 150/5300-18 for Vertically Guided Survey (VGS) and non-Vertically Guided Survey (NVGS) requirements.
15. For PA and APV only, the NVGS must be supplemented with the first 10,200 ft of the Vertically Guided Approach Surface.
16. Absence of the indicated survey does not preclude authorization to establish circling to a runway but may result in increased HATh and visibility.

Source: FAA Advisory Circular AC 150/5300-13A, Airport Design

EXISTING

Meteorological conditions that affect the facility requirements of an airport include wind coverage and weather condition encountered. True hourly metrological data was reviewed data from the on-airport ASOS facility from 2005-2014 available from the National Climatic Data Center (NCDC). Periodic weather observations within each hour were removed. This method provides a comprehensive look into the true average weather trends at an airport without skewing conditions toward IFR where multiple observations may be taken each hour due to changing conditions.

Weather conditions are evaluated based on the two different flight rules, VFR and IFR. Visual Meteorological Conditions (VMC) are encountered when the visibility is 3 nautical miles or greater, and the cloud ceiling height is 1,000 feet or greater. Conditions less than these weather minimums are considered Instrument Meteorological Conditions (IMC) requiring all flights to be operated under IFR.

When IMC weather conditions occur, aircraft must operate under IFR and utilize instrument approach procedures to the runway. These IMC conditions drive the need to accommodate instrument approach procedures with sufficient weather minimums to enhance airport utilization. IMC conditions occur 9.66 percent of the time at MOT.

Current Category I ILS instrument approach weather minimums are 200-foot cloud celling and ½ mile flight visibility for Runway 31. Weather conditions are broken down into occurrence percentages based on current instrument approach minimums in the following table.

Table L-2 – Meteorological Analysis

Minimum Weather Condition	Cloud Ceiling Minimum	Visibility Minimum	Change	Total Observation Percentage
Above Marginal VFR	3,000 feet	5 miles	-	78.99%
Marginal VFR	1,000 feet	3 miles	11.35%	90.34%
IFR as low as Category I	200 feet	½ mile	8.45%	98.79%
IFR as low as Category II	100 feet	¼ mile	1.08%	99.87%
IFR Category III & Below	0 feet	1/8 mile	0.13%	100.00%

Source: National Climatic Data Center data from Minot International Airport (2005-2014).
VFR = Visual Flight Rules, IFR = Instrument Flight Rules

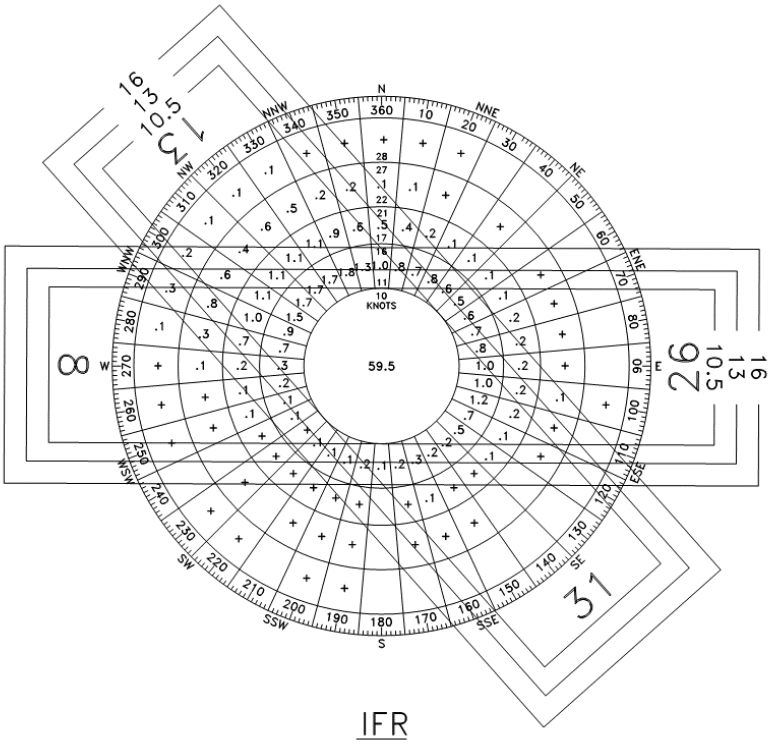
Based on cloud ceiling and visibility observations, MOT can be accessed 98.79% of the time with the current Category I approach. This equates to 106 hours per year or the equivalent of 4.4 days where the airport is inaccessible. An approach procedure with Category II minimums can provide another 95 hours of accessibility per year, or 3.94 days. This could reduce the inaccessibility of the airport by about 89 percent.

The SIAPs should be aligned with the prevailing wind that occurs during IFR conditions. The base information was collected from the windrose file generator on the FAA Airports GIS website. This source collected all observation data for the past 10 years at MOT from the NCDC.

The IFR windrose shown in **Figure L-2** depicts the prevailing wind during IFR weather conditions. The numbers within the compass rose indicates the strength and frequency of wind observations. The wind during IFR is generally from the northwest, favoring the use of Runway 31. This runway provides wind coverage where crosswind component is 10.5 knots or less a total of 56.28 percent of the time. The total wind coverage for Runway 13-31 during IFR conditions is 87.84 percent, as compared to 79.81 percent for Runway 8-26.

MOT has ten (10) different published instrument approaches procedures. The following table has the name of the approach, visibility and ceiling minimums for each approach. Copies of the current published SIAPs are located at the end of this appendix.

Figure L-2 – Instrument Flight Rules (IFR) Wind Rose



Source: FAA Airports GIS Website Data for Minot International Airport (2005-2014), KLJ Analysis

Table L-3 – Instrument Approach Procedures

Approach Procedure	Approach Type	Lowest Cloud Ceiling Minimum (HAT)	Lowest Visibility Minimum RVR, n.m.
ILS or LOC RWY 31	ILS (PA)	1873' (200')	2400' RVR, ½ mile
LOC/DME BC RWY 13	LOC (NPI)	2060' (358')	1 mile
RNAV (GPS) RWY 8	LPV (APV)	1991' (279')	1 mile
RNAV (GPS) RWY 13	LPV (APV)	2021' (319')	1 mile
RNAV (GPS) RWY 26	LPV (APV)	1932' (250')	1 mile
RNAV (GPS) RWY 31	LPV (APV)	1929' (250')	2400' RVR, ½ mile
VOR RWY 8	VOR (NPI)	2760' (1048')	1 ¼ mile
VOR RWY 13	VOR (NPI)	498' (2200')	1 mile
VOR RWY 26	VOR (NPI)	858' (2540')	1 mile
VOR RWY 31	VOR (NPI)	2200' (527')	2400' RVR, ½ mile

Note: HAT = Height Above Touchdown, RVR = Runway Visual Range, n.m. = statute miles (reported), ILS = Instrument Landing System, LOC = Localizer, RNAV = Area Navigation, GPS = Global Positioning System, LPV = Localizer Performance with Vertical Guidance, NPI = Non-Precision Instrument Approach, APV = Approach with Vertical Guidance, PA = Precision Instrument Approach, VOR = Very High Frequency Omni-Directional Range
Source: FAA

The lowest weather minimums that an aircraft can operate are 200 foot ceiling and ½ mile visibility when wind conditions are appropriate for Runway 31. When the winds are appropriate for Runway 13, the lowest weather minimums are a 319 foot ceiling and 1 mile visibility available through an APV

procedure. The airport also has approaches with for Runway 8 and 26 through an APV procedure. The lowest weather minimums are 250 foot ceiling and 1 mile visibility for Runway 26. The nearest public airport with comparable or better instrument approach is the Bismarck Municipal Airport with an ILS approach to Runway 13 and 31.

FUTURE & ULTIMATE

As of September 2015, there are currently two new SIAPs under development for MOT. These appear to be updates to existing procedures. These include the development of an updated LOC/DME BC RWY 13 procedure scheduled to be published on December 10, 2015, and an RNAV (GPS) RWY 8 procedure scheduled to be published on October 15, 2015.

However, since the easterly winds during IFR conditions can favor approaches for Runway 13 it is recommended that lower minimums be pursued. Very few new ILS systems are being installed nationwide. It is recommended the airport pursue lower approach minimums through GPS technology and the establishment of an approach lighting system. GPS currently can provide minimums nearly equivalent to Category I precision approaches. Further coordination with FAA is required to conduct a feasibility study for the lowest weather minimums to Runway 13.

Upgrading approaches to capture lower visibility minimums of ¾ mile and ½ mile requires additional airport design standards to be met (see **Appendix H - Airfield Design Requirements**), including maintaining a compatible FAA Runway Protection Zone beyond the end of the runway. Additional clear airspace surfaces are also required. In the interim, the airport can pursue installation of a MALSR (see **Appendix K - Navigational Aids**) which would improve the visibility minimums for Runway 13 from 1 mile to ¾ mile.

Each runway end was reviewed to quantify the benefit of lower approach minimums. Lower minimums on Runway 13 to ¾ mile would increase utility to this runway end by 16%. The benefit is almost doubled if minimums are reduced to a Category I ILS. Lowering approach minimums to a Category II ILS for Runway 31 would have a benefit of capturing nearly 50% additional utility to this runway end - a significant net benefit to airport users. This would require operational justification and new runway NAVAID infrastructure.

If minimums to Runway 8 are lowered to 200 feet and ¾ mile, a net 39% benefit is realized to that runway end. However, due to land use compatibility constraints from a larger RPZ, upgrading this approach is not recommended. Many of the operations that would benefit from a Runway 8 approach upgrade would be captured with lower weather minimums to Runway 13.

Table L-4 identifies the benefit of lower weather minimums for runway approaches at MOT.

Table L-4 – Additional Capture Meteorological Analysis

Runway End	Approach Type	Proposed Minimums	Additional Capture	Additional Capture Wind Coverage*	Net Additional Capture	Net Additional Utility
13	APV	250 feet, ¾ mile	1.09%	46.85%	0.513%	15.6%
13	CAT-I ILS	200 feet, ½ mile	2.06%	47.58%	0.981%	29.8%
31	CAT-II ILS	100 feet, ¼ mile	1.09%	55.33%	0.605%	49.2%
8	APV	250 feet, ¾ mile	0.34%	41.92%	0.114%	5.7%
8	APV	200 feet, ¾ mile	0.99%	76.90%	0.763%	30.0%
26	APV	250 feet, ¾ mile	0.34%	31.79%	0.109%	4.3%
26	APV	200 feet, ¾ mile	0.99%	40.65%	0.403%	15.9%

Source: FAA Airports GIS Website Data for Minot International Airport (2005-2014), KLJ Analysis
*RVR = Runway Visual Range, ILS = Instrument Landing System; *Wind coverage by runway end only. 10.5 knot crosswind component for Runway 13-31, 13 knot crosswind for Runway 8-26*

Departure Procedures

Departure procedures are established for an airport to allow aircraft to safely depart and climb out from the immediate airport environment to transition to an altitude that ensures required obstacle clearance standards are met. Some airports may have prevailing obstacles in the departure corridor. These may require takeoff weather minimums for commercial flights, and/or an increased rate of climb or special instructions for all flights. A standard climb rate gradient is 200 feet per nautical mile. Obstacles in the departure surface are noted to alert the pilot so they can be avoided.

At MOT, obstacles require a minimum climb rate of 219 feet per nautical miles for departures off Runway 26 to the west in order to meet required obstacle clearance. Required weather minimums are 300-foot cloud ceiling and 1.5 miles of flight visibility. Obstacles are noted in the vicinity of Runway 26 departure zone. Individual obstacles are noted in the Runway 8 and 31 departure zones.

Airspace

Airspace is an important resource around airports that is essential for safe flight operations. There are established standards to identify airspace obstructions around airports. FAA grant assurances (obligations) require the airport sponsor to take appropriate action to assure that airspace is adequately cleared to protect instrument and visual flight operations by removing, lowering, relocating, marking or lighting, or otherwise mitigating existing airport hazards and preventing the establishment or creating of future airport hazards. Examples of obstructions include trees, buildings, poles, towers, terrain, mobile objects and aircraft tails. Sufficiently clear airspace near the approach and departure runway ends are vitally important for safe airport operations. An FAA aeronautical study should be completed to determine the operational impacts and necessary mitigation of obstructions (i.e. lowering, lighting, marking, publish operational restrictions). This section identifies overall airspace standards as well as existing and future standards for MOT.

Airspace Classification

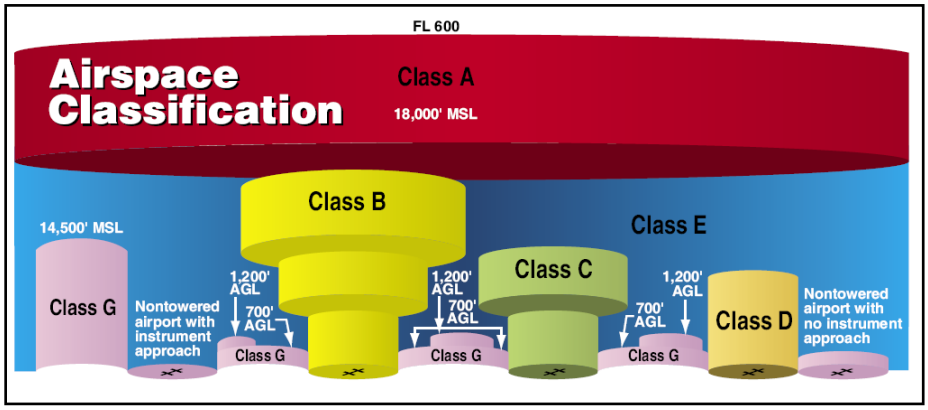
Airspace protection above and around airports is necessary for safe operation of aircraft. Airspace must be protected from obstructions in order to prevent any loss of the airport's ability to handle aircraft. Airspace classes, air traffic operating rules, navigation aids, other airports, obstructions and noise abatement procedures affect airspace.

The Federal Aviation Act of 1958 gave the Federal Aviation Administration (FAA), then known as the Federal Aviation Agency, the responsibility for control of navigable airspace and regulation of aircraft operations within the United States. Federal Aviation Regulations (FAR) Part 91, General Operating and Flight Rules, prescribes rules governing airspace.

The National Airspace System (NAS) consists of various classifications of airspace regulated by the FAA. Airspace classification ensures the safe separation of VFR and IFR aircraft. Airspace is separated into controlled, uncontrolled, special use, or other airspace. Controlled airspace is classified as A, B, C, D, or E. Uncontrolled airspace is classified as G. These classes specify appropriate minimum cloud clearances, visibility requirements, and other operating requirements for aircraft. The major difference between controlled and uncontrolled airspace is that the FAA does not exercise air traffic control over aircraft operating within uncontrolled airspace.

Figure L-3 and **Figure L-4** detail the different classes of airspace and weather minimums. **Appendix K** outlines the navigational aids available to support the airport and airspace classifications.

Figure L-3 – FAA Airspace Classifications



Source: FAA Pilot's Handbook of Aeronautical Knowledge (2008)

Figure L-4 – Visual Flight Rules (VFR) Weather Minimums

Airspace			Flight Visibility	Distance from Clouds
Class A			Not applicable	Not applicable
Class B			3 statute miles	Clear of clouds
Class C			3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class D			3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class E	At or above 10,000 feet MSL		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal
	Less than 10,000 feet MSL		3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class G	1,200 feet or less above the surface (regardless of MSL altitude).	Day, except as provided in section 91.155(b)	1 statute mile	Clear of clouds
		Night, except as provided in section 91.155(b)	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface but less than 10,000 feet MSL.	Day	1 statute mile	1,000 feet above 500 feet below 2,000 feet horizontal
		Night	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface and at or above 10,000 feet MSL.		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal

Source: FAA Pilot's Handbook of Aeronautical Knowledge (2008)

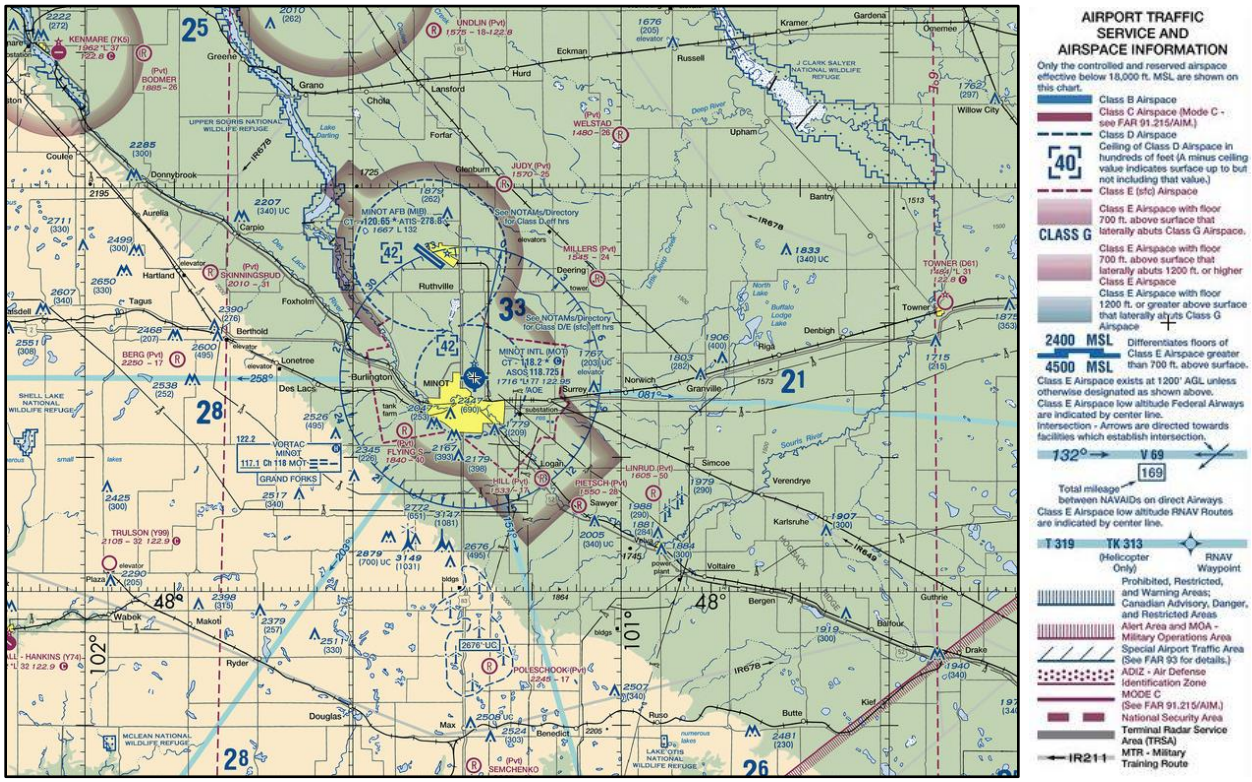
EXISTING, FUTURE & ULTIMATE

Minot International Airport is within Class D controlled airspace served by an Airport Traffic Control Tower (ATCT). The Minot ATCT, referred to by call sign 'Magic City Tower', controls ground traffic within airfield movement areas and in the air within approximately a 5 nautical-mile radius of the Airport up to an elevation of 2,500 feet above ground level. Magic City ATCT normally operates from 7:00 a.m. to 10:00 p.m. daily. When the ATCT is not operating, the airspace becomes uncontrolled Class E.

Approach/Departure radar and communication services provided by Minot Approach Control. The Dakota Air Traffic Control Facility opened in 2008 and is located at Ellsworth Air Force Base in Rapid City, SD. Minot is served by a terminal radar approach control facility (TRACON) known in the U.S. Air Force as a radar approach control (RAPCON). These facilities are typically located at larger airports or in busy traffic areas and are responsible for controlling air traffic within a 30-50 nautical mile radius of the airport between the surface and 18,000 feet. The Minot RAPCON, referred to by call sign 'Minot Approach', controls traffic within approximately a 40 nautical mile radius of the Airport and up to an elevation of 18,000 feet. Minot Approach controls traffic arriving and departing and transitions traffic between the RAPCON airspace and the en-route cruise altitudes. Minot Approach provides this service for both Minot AFB and Minot International Airport and does so also when MOT ATCT is closed. A Remote Communications Outlet (RCO) is available to talk to the Flight Service Station on 122.2 MHz.

Minot Approach operates 24 hours per day. Minot International Airport and Minot Air Force Base have airspace in close proximity to each other as seen in **Exhibit L-1**. The two airports are physically 10 miles apart.

Exhibit L-1 – Surrounding Airspace



Source: [FAA Billings Aeronautical Sectional Chart](#) (September 2015) – NOT FOR NAVIGATION

Part 77 Civil Airport Imaginary Surfaces

Airspace is an important resource around airports that is very essential for safe flight operations. There are established standards to identify airspace obstructions around airports. [14 CFR (Code of Federal Regulations) Part 77 *Safe, Efficient Use, and Preservation of the Navigable Airspace*](#) establishes various airspace surfaces in the vicinity of airports. Federal Aviation Regulation (FAR) Part 77 is used to determine and analyze obstruction data by evaluating objects that penetrate these "imaginary" three-dimensional surfaces.

The FAR Part 77 surfaces are the protective surfaces most often used to provide height restriction zoning protection around an airport. These airspace surfaces include the primary, approach, transitional, horizontal and conical surfaces each with different standards. When evaluating penetrating obstruction, the FAA determines if an object is a hazard to air navigation and if corrective action is needed based on more in-depth minimum airspace standards (i.e. FAA Approach/Departure Surface). FAA notification criteria standards are also established in FAR Part 77. Examples of corrective action include removing, lowering, or obstruction lighting an object. A general diagram of the FAR Part 77 surfaces is shown in **Figure L-5.**

FAR Part 77 surfaces are identified below:

- **Primary Surface:** Imaginary airspace surface centered along the runway centerline, ending at the runway end for non-paved runways, and extending 200 feet beyond the runway ends for hard-surfaced runways. The width is defined as 250 feet for visual runways, 500 feet for non-precision runways greater than ¾ mile, and 1,000 feet for non-precision runways as low as ¾ mile and precision runways.
- **Approach Surface:** A surface centered along runway centerline extending outward and upward from the end of the primary surface. This airspace surface ensures the approach areas to each runway are clear of obstructions. The width and approach slope for the approach surface varies based on the type of runway and approach planned. Typical approach slopes are 20:1 (20 feet horizontal for every 1 vertical foot) for visual and non-precision utility runways, 34:1 for non-precision other-than utility runways, and 50:1 for precision runways out to 10,000 feet then 40:1 out to 50,000 feet.
- **Transitional Surface:** This imaginary surface extends outward and upward at right angles to the runway centerline and extended centerline, from the sides of the Primary Surface and the Approach Surfaces at a 7:1 slope. Precision approaches have defined transitional surfaces near the outer ends of the approach surface.
- **Horizontal Surface:** This airspace surface protects for aircraft operations in the vicinity of each airport. The horizontal surface is an imaginary airspace surface located 150 feet above the established airport elevation, with perimeters calculated from the end of each primary surface for a runway. The radius of the horizontal surface is 5,000 feet for each visual or utility runway, or 10,000 feet for non-precision or precision runways.
- **Conical Surface:** This surface extends upward and outward from the end of the horizontal surface for a distance of 4,000 feet at a 20:1 slope.

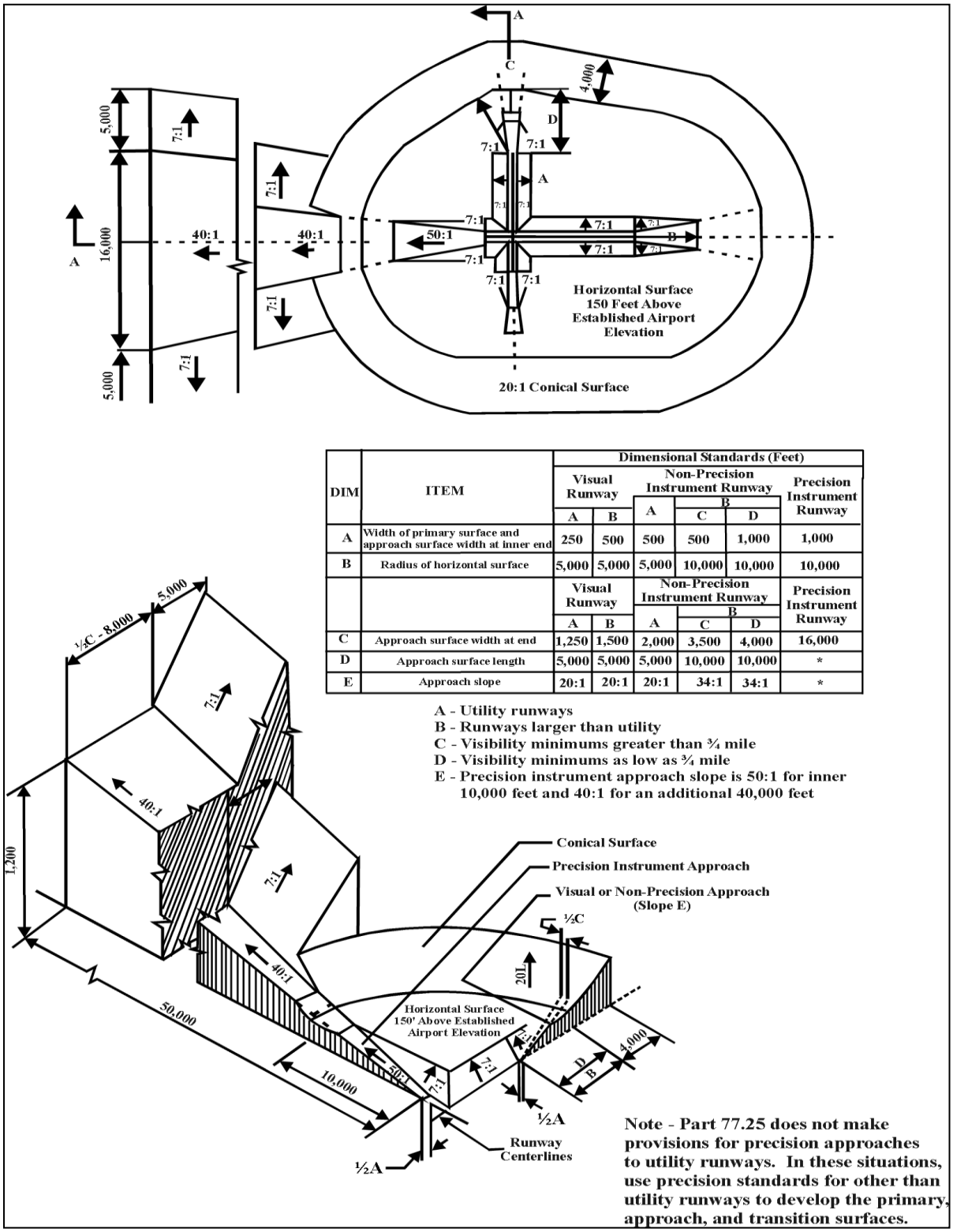
Sufficiently clear airspace is necessary for the safe and efficient use of aircraft arriving and departing an airport. FAR Part 77 airspace standards are defined by the most demanding approach to a runway. These definitions are included in **Table L-5**.

Table L-5 – FAR Part 77 Definitions

Approach Type	
Visual (V)	Runway intended solely for the operation of aircraft using visual approach procedures with no instrument approach designation on an approved FAA Airport Layout Plan.
Non-Precision (NP)	Runway having an existing instrument approach procedure with only horizontal guidance with no precision approach designation on an approved FAA Airport Layout Plan. Visibility minimums are typically 1 mile but as low as ¾ mile.
Precision (PIR)	Runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS) or other system with horizontal and vertical guidance. Visibility minimums are less than ¾ mile.
Runway Classification	
Utility	Runway constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight or less.
Other-Than-Utility	Runway constructed for and intended to be used by turbine aircraft greater than 12,500 pounds.
Part 77 Classifications	
A	Utility Runways
B	Other Than Utility Runways
C	Visibility minimums greater than ¾ mile
D	Visibility minimums as low as ¾ mile
PIR	Precision Instrument Runway

Source: 14 CFR Part 77

Figure L-5 – FAR Part 77 Airspace



DIM	ITEM	Dimensional Standards (Feet)					
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
		A	B	A	B C	B D	
A	Width of primary surface and approach surface width at inner end	250	500	500	500	1,000	1,000
B	Radius of horizontal surface	5,000	5,000	5,000	10,000	10,000	10,000
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
		A	B	A	B C	B D	
C	Approach surface width at end	1,250	1,500	2,000	3,500	4,000	16,000
D	Approach surface length	5,000	5,000	5,000	10,000	10,000	*
E	Approach slope	20:1	20:1	20:1	34:1	34:1	*

A - Utility runways
B - Runways larger than utility
C - Visibility minimums greater than ¾ mile
D - Visibility minimums as low as ¾ mile
E - Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet

Note – Part 77.25 does not make provisions for precision approaches to utility runways. In these situations, use precision standards for other than utility runways to develop the primary, approach, and transition surfaces.

Source: Federal Aviation Administration (FAA)

EXISTING

The combination of the approach type and the runway classification defines the dimensional criteria for each approach. The published Part 77 approach airspace dimensional criteria for MOT are identified in the table below.

Table L-6 – Existing Part 77 Approach Airspace Standards

Runway End	Approach Standards	Part 77 Code	Inner Width*	Outer Width	Length	Slope
13	Non-Precision Other than Utility (> 3/4 mile)	C	500'	3,500'	10,000'	34:1
31	Precision (< 1/2 mile)	PIR	1,000'	16,000'	50,000'	50:1/40:1
8	Non-Precision Other than Utility (> 3/4 mile)	C	500'	3,500'	10,000'	34:1
26	Non-Precision Other than Utility (> 3/4 mile)	C	500'	3,500'	10,000'	34:1

**Inner width is also the Primary Surface width driven by the most demanding approach to a runway.*
Source: 14 CFR Part 77, FAA Form 5010-1 Airport Master Record for MOT

According to the established rules, airspace surfaces must clear public roads by 15 feet, interstate highways by 17 feet, railroads by 23 feet, and private roads by 10 feet or the height of the most critical vehicle.

Table L-7 below lists of the controlling obstacle for each existing runway end as evaluated by FAA during regular airport inspections. Part 77 obstruction mitigation considerations include existing and future airport design standards, other airspace surfaces amount of penetration into the surface and the type of obstacle (natural, natural growth or man-made). A detailed obstruction identification and mitigation disposition is identified in the Airport Layout Plan developed at the end of this planning study and located in **Chapter 8 – Airport Layout Plan**.

Table L-7 – Controlling Part 77 Airspace Obstructions

FAA Form 5010 Airspace Obstructions						
Runway End	Surface	Object Type	Distance from End	Location from Centerline	Penetration	Slope to Clear (Required)
13	Approach	-	-	-	-	N/A (34:1)
31	Approach	-	-	-	-	N/A (50:1)
8	Approach	Trees	1,764'	616' Left	**35'**	**19:1*** (34:1)
26	Approach	-	-	-	-	N/A (34:1)

*Notes: Penetration value estimated based. **RED** indicates does not meet current standards.*
**24:1 slope to clear to Runway 26 displaced landing threshold (393 feet)*
***Obstacle derived from 2012 ALP; not published in Airport Master Record*
Source: MOT Airport Layout Plan (2012), FAA Form 5010-1 Airport Master Record for MOT

The existing FAR Part 77 obstructions to air navigation are discussed below:

- **Primary Surface** – There no obstructions other than those that are fixed-by-function
- **Approach Surface**
  - **Runway 13**: Since the 2012 ALP was published, numerous light poles along U.S. Highway 83 were lowered to an elevation below the existing 34:1 approach surface.

- **Runway 8:** Numerous trees and a light pole penetrate the existing 34:1 approach surface. When the runway end is shifted to the east by 870 feet, one tree will remain an obstruction which will be removed.

- **Transitional Surface** – There are trees that penetrate the existing Runway 8 transitional surface to the north of the approach surface.
- **Horizontal Surface** – According to the 2012 ALP, there are four (4) objects that penetrate the horizontal surface elevation of 1855.80 feet MSL including:
  - Water Tank (obstruction lighted) – 44' penetration
  - Tower (obstruction lighted) – 63' penetration
  - Water Tank (obstruction lighted – 5' penetration
  - Tower (unlighted) – 190' penetration
- **Conical Surface** – There are no existing airspace obstructions to this surface.

FUTURE & ULTIMATE

Each existing runway approach standard is sufficient for the design aircraft and usage forecast to occur within the planning period with the exception of Runway 13. As noted previously, easterly winds during IFR conditions make it a target to establish lower approach minimums to Runway 13. This runway end appears to be capable of accommodating the infrastructure and land use requirements needed for lower approach minimums as compared to Runway 8 or 26. In order to accomplish this there are several obstructions (e.g. light poles, building, road edge) which must be addressed to achieve a clear 50:1 approach surface for Runway 13.

Table L-8 – Future/Ultimate Part 77 Approach Airspace Standards

Runway End	Approach Standards	Part 77 Code	Inner Width*	Outer Width	Length	Slope
Future Airport Configuration						
31	Precision (≤ 1/2 mile)	PIR	1,000'	16,000'	50,000'	50:1/40:1
13	Non-Precision Other than Utility (> 1/2 mile)	D	1,000'	4,000'	10,000'	34:1
8	Non-Precision Other than Utility (> 3/4 mile)	C	500'	3,500'	10,000'	34:1
26	Non-Precision Other than Utility (> 3/4 mile)	C	500'	3,500'	10,000'	34:1
Ultimate Airport Configuration						
13	Precision	PIR	1,000'	16,000'	50,000'	50:1/40:1
31	Precision	PIR	1,000'	16,000'	50,000'	50:1/40:1
8	Non-Precision Other than Utility	C	500'	3,500'	10,000'	34:1
26	Non-Precision Other than Utility	C	500'	3,500'	10,000'	34:1

**Inner width is also the Primary Surface width driven by the most demanding approach to a runway.*
Source: 14 CFR Part 77, FAA Form 5010-1 Airport Master Record for MOT, KLJ Analysis. BLUE text indicates change from existing configuration.

Runway Approach/Departure Surfaces

FAA identifies approach surfaces that must be cleared at an absolute minimum for safety for landing aircraft. These surfaces are identified in **Figure L-6** and **Exhibit L-2** – "Table 3-2" of FAA Advisory Circular 150/5300-13A, *Airport Design*. All objects must clear the surface for the applicable runway operational design standard to meet minimum aviation safety standards for a given runway landing threshold location.

Approach airspace penetrations require mitigation which may include the removal of the object or the runway landing threshold to be shifted or displaced down the runway. Penetrations to the departure surface may simply require the obstacle to be published, or require increasing the minimum aircraft climb rate or runway length operational restrictions. An FAA aeronautical study should be completed to determine the operations impacts and necessary mitigation. When usable landing or takeoff distances do not match the runway length, then a special application of declared distances should be used to meet operational safety requirements. Declared distances can be used to mitigate approach/departure obstructions, land use incompatibilities, or incompatible airport design areas.

Figure L-6 – Approach/Departure Standards Table

Table 3-2. Approach/departure standards table

	Runway Type	DIMENSIONAL STANDARDS* Feet (Meters) A	B	C	D	E	Slope/ OCS
1	Approach end of runways expected to serve small airplanes with approach speeds less than 50 knots. (Visual runways only, day/night)	0 (0)	120 (37)	300 (91)	500 (152)	2,500 (762)	15:1
2	Approach end of runways expected to serve small airplanes with approach speeds of 50 knots or more. (Visual runways only, day/night)	0 (0)	250 (76)	700 (213)	2,250 (686)	2,750 (838)	20:1
3	Approach end of runways expected to serve large airplanes (Visual day/night); or instrument minimums ≥ 1 statute mile (1.6 km) (day only).	0 (0)	400 (122)	1000 (305)	1,500 (457)	8,500 (2591)	20:1
4	Approach end of runways expected to support instrument night operations, serving approach Category A and B aircraft only. [1]	200 (61)	400 (122)	3,800 (1158)	10,000 [2] (3048)	0 (0)	20:1
5	Approach end of runways expected to support instrument night operations serving greater than approach Category B aircraft. [1]	200 (61)	800 (244)	3,800 (1158)	10,000 [2] (3048)	0 (0)	20:1
6	Approach end of runways expected to accommodate instrument approaches having visibility minimums ≥ 3/4 but <1 statute mile (≥ 1.2 km but < 1.6 km), day or night.	200 (61)	800 (244)	3,800 (1158)	10,000 [2] (3048)	0 (0)	20:1
7	Approach end of runways expected to accommodate instrument approaches having visibility minimums < 3/4 statute mile (1.2 km) or precision approach (ILS or GLS), day or night.	200 (61)	800 (244)	3,800 (1158)	10,000 [2] (3048)	0 (0)	34:1
8 [3, 5, 6, 7]	Approach end of runways expected to accommodate approaches with vertical guidance (Glide Path Qualification Surface [GQS]).	0 (0)	Runway width + 200 (61)	1520 (463)	10,000 [2] (3048)	0 (0)	30:1
9	Departure runway ends for all instrument operations.	0 [4] (0)	See Figure 3-4.				40:1

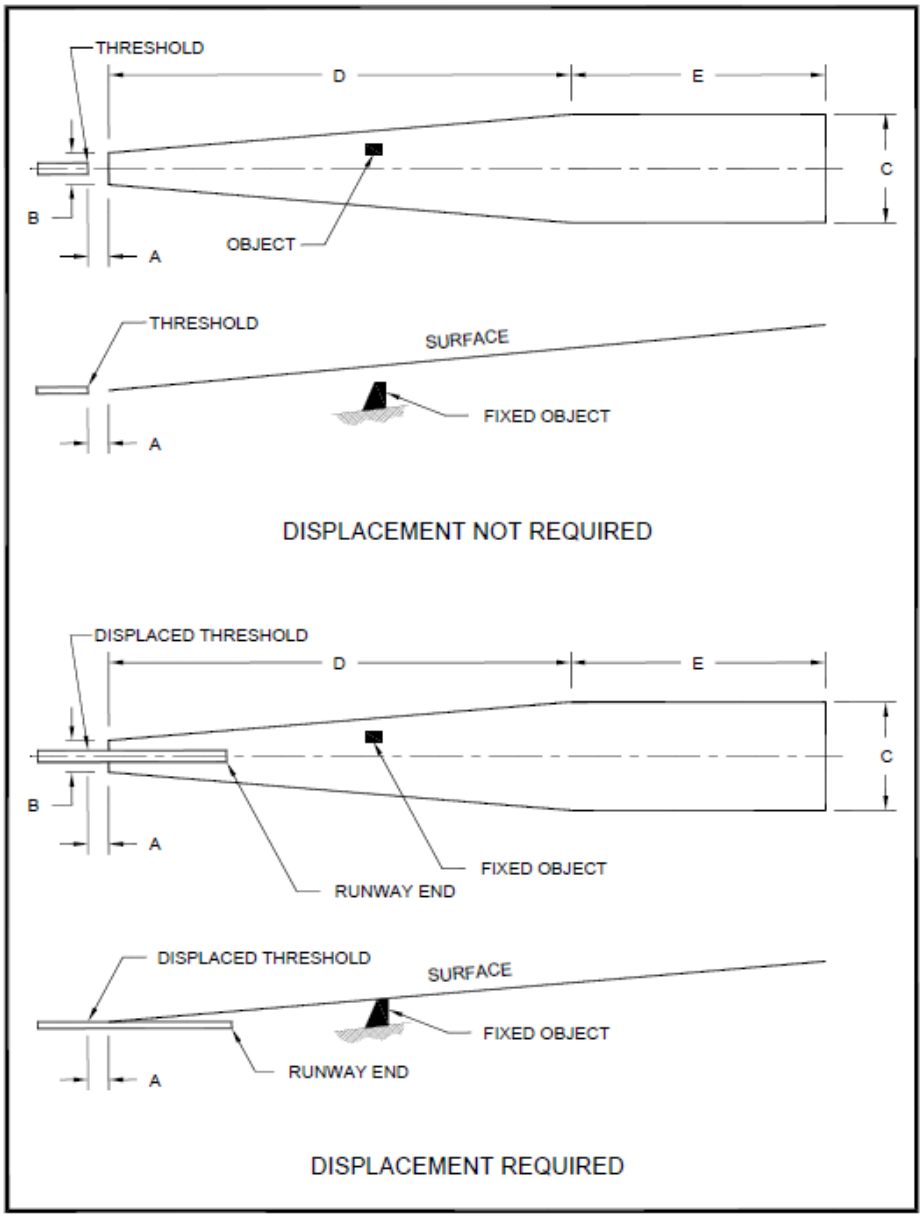
* The letters are keyed to those shown in Figure 3-2.

Notes:

1. Marking and lighting of obstacle penetrations to this surface or the use of a Visual Guidance Slope Indicator (VGSI), as defined by Order 8260.3, may avoid displacing the threshold.
2. 10,000 feet (3048 m) is a nominal value for planning purposes. The actual length of these areas is dependent upon the visual descent point position for 20:1 and 34:1, and DA point for the 30:1.
3. When objects exceed the height of the GQS, an APV (ILS, PAR, LPV, LNAV/VNAV, etc.) is not authorized. Refer to Table 3-4 and its footnote 3 for further information on GQS.
4. Dimension A is measured relative to TODA (to include clearway).
5. Surface dimensions / OCS slope represent a nominal approach with 3 degree Glide Path Angle (GPA), 50 feet (15 m) TCH, < 500 feet (152 m) HATh. For specific cases, refer to Order 8260.3. The OCS slope (30:1) supports a nominal approach of 3 degrees (also known as the GPA). This assumes a TCH of 50 feet (15 m). Three degrees is commonly used for ILS systems and VGSI aiming angles. This approximates a 30:1 approach slope that is between the 34:1 and the 20:1 approach surfaces of Part 77. Surfaces cleared to 34:1 should accommodate a 30:1 approach without any obstacle clearance problems.
6. For runways with vertically guided approaches the criteria in row 8 is in addition to the basic criteria established within the table, to ensure the protection of the GQS.
7. For planning purposes, determine a tentative DA based on a 3 degree GPA and a 50-foot (15 m) TCH.

Source: FAA Advisory Circular AC 150/5300-13A, Airport Design

Exhibit L-2 – Threshold Siting Based on an Approach Slope



Note: See Table 3-2 for dimensional data.

Figure 3-2. Threshold siting based on approach slope

Source: [FAA Advisory Circular AC 150/5300-13A, Airport Design]

EXISTING

MOT currently meets the requirements for the existing approach surfaces for Runway 13, 31, and 26 ends. Runway 8 meets approach surface standards with the 393-foot displaced threshold.

All MOT runway ends have departure surfaces with obstructions to the 40:1 surface, which is not uncommon. Runway 26 has penetrations that require an increased aircraft climb rate for departures. This departure procedure is noted in FAA publications. The existing, future and ultimate approach/departure surface standards are provided in **Table L-9**.

Table L-9 – Approach/Departure Surface Requirements

Runway End(s)	Table 3-2 Row	Description	Slope
Existing			
8, 26, 13	5	Approaches supporting instrument night operations in greater than Category B aircraft	20:1
31	7	Approach end of runways expected to accommodate instrument approaches with minimums <3/4 mile	34:1
8, 26, 13, 31	8	Approach end of runways to accommodate approaches with vertical guidance	30:1
8, 26, 13, 31	9	Departure runway ends for all instrument operations	40:1
Future & Ultimate			
8, 26	5	Approaches supporting instrument night operations in greater than Category B aircraft	20:1
13	**6**	**Instrument approaches having visibility minimums ≥ ¾ but <1 statute mile, day or night**	**20:1**
31	7	Approach end of runways expected to accommodate instrument approaches with minimums <3/4 mile	34:1
8, 26, 13, 31	8	Approach end of runways to accommodate approaches with vertical guidance	30:1
8, 26, 13, 31	9	Departure runway ends for all instrument operations	40:1

Source: FAA Advisory Circular 150/5300-13A, Airport Design
Note: Most critical row(s) shown. ***BLUE*** *text indicates change from existing configuration.*

FUTURE/ULTIMATE

MOT currently meets the requirements for the future and ultimate approach surfaces for Runway 8, 13, 26, and 31. The displacement to Runway 8 was reviewed and is not required for this approach surface.

All MOT runway ends will continue to have departure surfaces with obstructions to the 40:1 surface, which is not uncommon. No development is proposed that would penetrate the departure surfaces.

Terminal Instrument Procedures (TERPS)

The FAA has established standards to develop instrument procedures in the United States. FAA Order 8260.3B, *U.S. Standards for Terminal Instrument Procedures (TERPS)* and related orders outlines these complex standards to develop departure, climb, en-route, approach, missed approach and holding standards for aircraft operating along a published route with different navigational equipment. Some critical obstruction clearance standards are integrated into the approach/departure surfaces identified in Airport Design including many final approach segments and the 40:1 sloped departure surface. Other important obstacle clearance surfaces within the inner airport environment identified in TERPS include the precision obstacle clearance surfaces and the missed approach surfaces. Some TERPS surfaces may even be more restrictive than Part 77 standards. Penetrations to TERPS surfaces results in higher weather minimums or operational restrictions.

One Engine Inoperative (OEI) Surfaces

One Engine Inoperative (OEI) procedures are developed by air carriers to clear obstacles in situations where one engine becomes inoperative. OEI obstacle surfaces have shallow slopes to provide object clearance when aircraft climb performance is reduced as a result of engine power loss. OEI procedures are developed by each airline. Critical obstructions effect the utility of the runway by these aircraft. The FAA had required a clear 62.5:1 sloped surface to be kept clear of obstacles from departure ends. The 62.5:1 OEI surface is no longer required by FAA because of the large area covered, the scope of obstructions found and inability for airport sponsors to clear these areas. FAA is anticipated to publish new guidance by 2016. We recommend this surface be used for future runway, airspace and land use planning.

Other Design Surfaces

Other airport design airspace surfaces considered protect navigational aids and identify airport data to populate FAA databases.

INNER-APPROACH/ TRANSITIONAL OBSTACLE FREE ZONES

If an approach lighting system is installed, a clear inner-approach and inner-transitional Obstacle Free Zone (OFZ) is necessary. The inner-approach OFZ is a 50:1 sloped surface begins 200 feet from the runway threshold and extends 200 feet beyond the last approach light. The inner-transitional OFZ airspace surface is along the sides of the ROFZ. No objects not necessary for airport operations, including aircraft tails can penetrate this surface. For MOT, the inner-transitional OFZ begins at 44.8 feet for a Category I approach and extends upward and outward at a 6:1 slope. There are no current or projected issues which would create an obstruction to the inner-approach or inner-transitional OFZ.

PRECISION OBSTACLE FREE ZONE (POFZ)

If a precision instrument approach is in existence (visibility minimums < ¾ mile) there exists a POFZ which begins at the runway threshold as a flat surface 800 feet wide centered on the runway centerline and extending 200 feet to connect to the inner-approach OFZ. As with the OFZ, no above-ground objects not necessary for airport operations including aircraft or vehicles on the ground can penetrate this surface. For MOT, there are no current or projected issues which would create an obstruction within the POFZ of Runway 31 or Runway 13.

VISUAL AIDS

Visual aids at an airport require clear obstacle clearance surface to provide sufficient guidance for pilots. These include approach lighting systems and visual guidance slope indicators. For a Precision Approach Path Indicator (PAPI) system, this surface begins 300 feet in front of the VGSI system and extends upward and outward at an angle 1 degree less than the lowest on-course aiming angle. This equates to a 32:1 slope for a standard 3-degree PAPI. The specific airspace standards for this and for approach lighting systems are defined in FAA Order 6850.2B.

FAA AERONAUTICAL SURVEYS

The FAA has implemented Aeronautical Survey requirements per FAA Advisory Circular 150/5300-18B *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards.* FAA airport survey requirements require obstruction data for specialized obstruction surfaces to be collected using assembled aerial imagery for the airport. Special obstruction surfaces are used for this effort to provide with FAA sufficient airport and obstacle information. This data is used in aeronautical publications and to develop instrument approach procedures.

This Master Plan project triggers a new aeronautical survey. When safety-critical data changes such as modification to runway ends or instrument approach procedures is proposed then a new aeronautical survey with an airspace analysis is required. Obstructions that have been removed can be deleted from the database by coordinating with FAA Flight Procedures Office. The next trigger for an aeronautical survey will be a change in instrument approach procedures.

Projects that change other airfield geometry require as-built data to be submitted to FAA to the standards outlined in the current version of FAA Advisory Circular 150/5300-18.

The submittal for the Aeronautical Survey conducted as a part of this Airport Master Plan was submitted to the FAA through the FAA's AGIS system. The information submitted is in a Universal Data Delivery Format (UDDF) file located at nfdc.faa.gov/nfdcApps/services/publicData/uddflist.jsp. The contents of the UDDF file are found at the end of this appendix as **Figure L-19 2017 MOT UDDF Text**. Please note that the UDDF text does not include headings for information.

Published Instrument Procedures

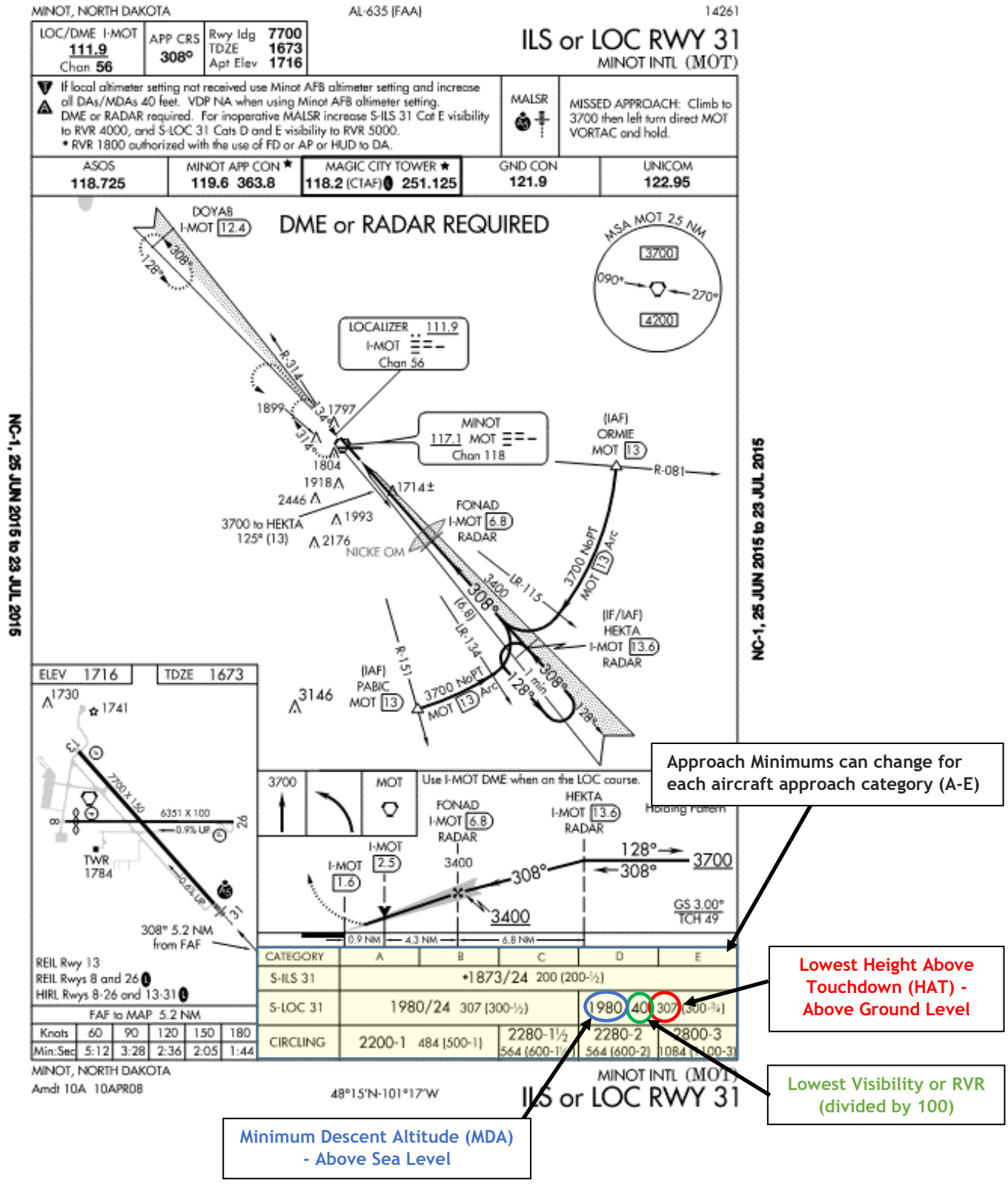
The following **Figures L-7** through **L-18** and **Table L-10** contain all the published instrument procedures for MOT, including approach and departure procedures. **Figure L-7** which is ILS Runway 31, contains notations to understand key elements in the Instrument Approach Procedure. The ILS Runway 31 procedure is repeated without notations in **Figure L-8**.

Table L-10 – Instrument Approach Procedures & Airspace Summary

Type	Standard	Existing	Future	Ultimate
Published IAPs	-	RNAV (GPS) 08, 13, 26 & 31 ILS OR LOC 31 LOC/DME BC 13 VOR 08, 13, 26, 31	RNAV (GPS) 08, 13, 26 & 31 ILS OR LOC 31 VOR 08, 13, 26, 31	RNAV (GPS) 08, 13, 26 & 31 ILS OR LOC 31 VOR 08, 13, 26, 31
Airspace Classification	-	Class D	Class D	Class D
Part 77 Code	*Same as Existing*	RWY 13 - C RWY 31 – PIR RWY 8 - C RWY 26 - C	RWY 13 - D RWY 31 – PIR RWY 8 - C RWY 26 - C	RWY 13 - D RWY 31 – PIR RWY 8 - C RWY 26 - C
Part 77 Obstructions	-	YES	YES	YES
Approach Obstructions	NO	NO	NO	NO
Departure Obstructions	NO	YES	YES	YES
Other Obstructions	NO	NO	NO	NO

Source: FAA Digital Terminal Procedure Publication, KLJ Analysis

Figure L-7 – ILS OR LOC RWY 31 Instrument Approach – With Notations



Approach Minimums can change for each aircraft approach category (A-E)

Lowest Height Above Touchdown (HAT) - Above Ground Level

Lowest Visibility or RVR (divided by 100)

Minimum Descent Altitude (MDA) - Above Sea Level

Figure L-8 – ILS OR LOC RWY 31 Instrument Approach

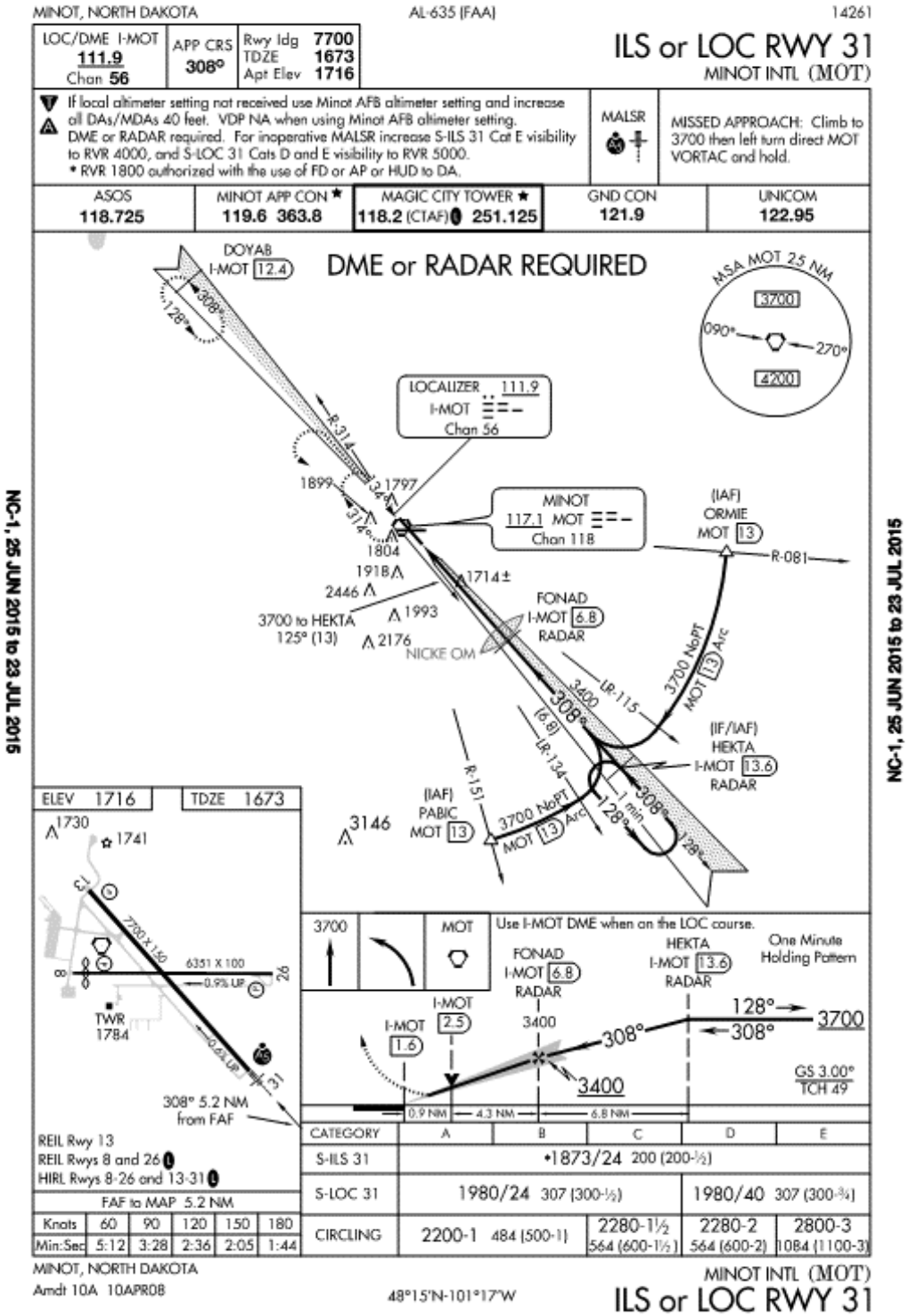


Figure L-9 – LOC / DME BC RWY 13 Instrument Approach

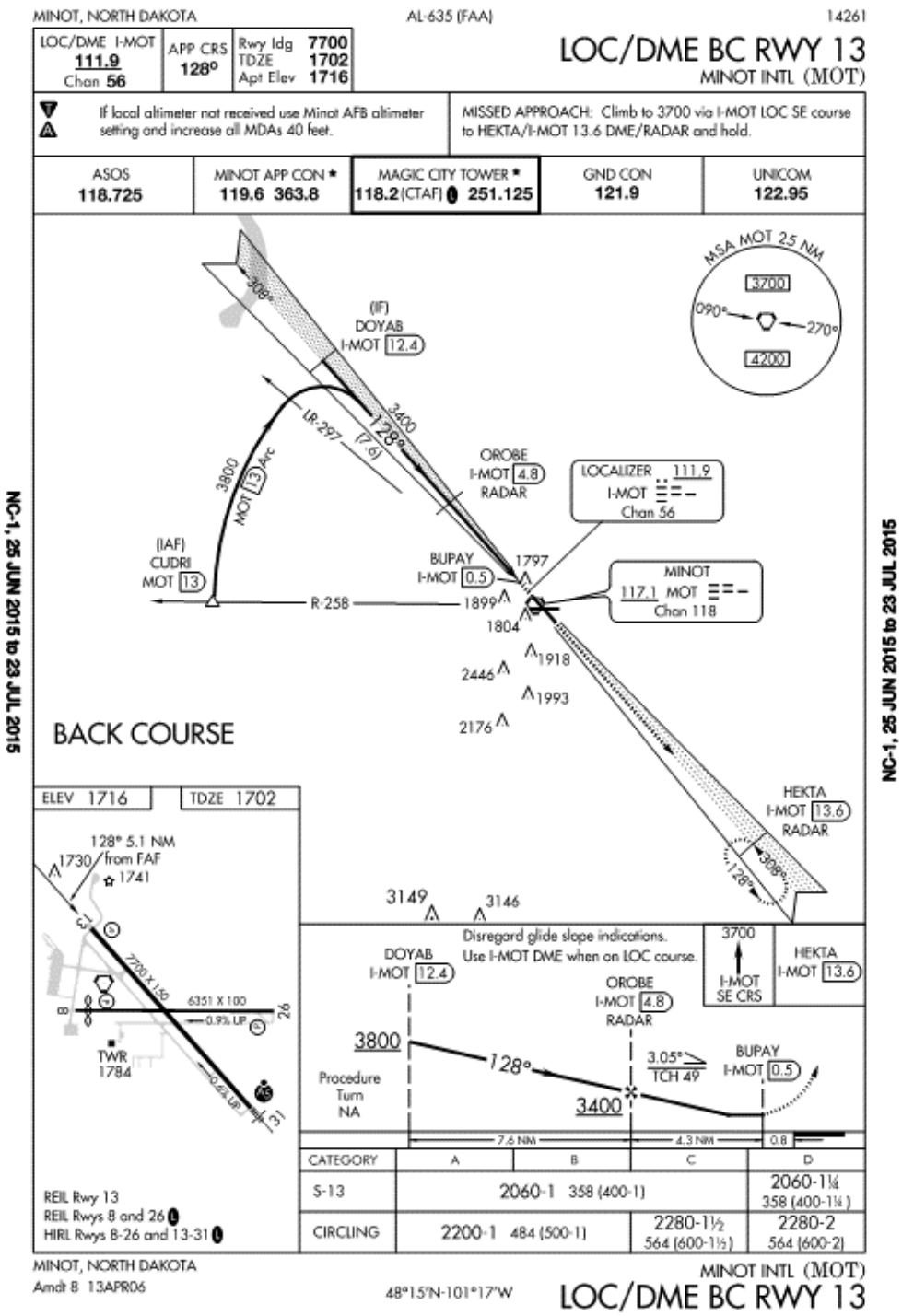


Figure L-10 – RNAV (GPS) RWY 31 Instrument Approach

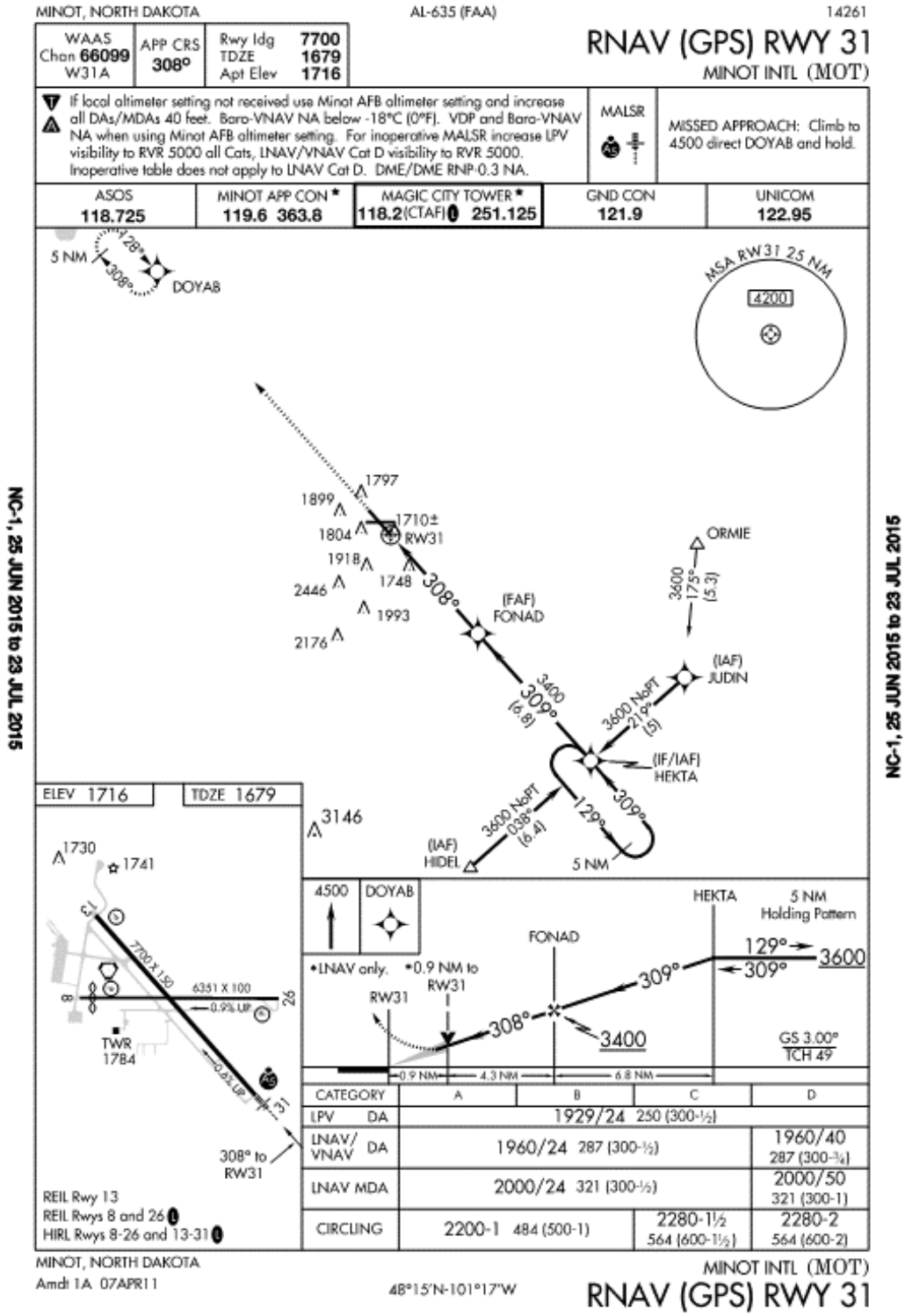


Figure L-11 – RNAV (GPS) RWY 13 Instrument Approach

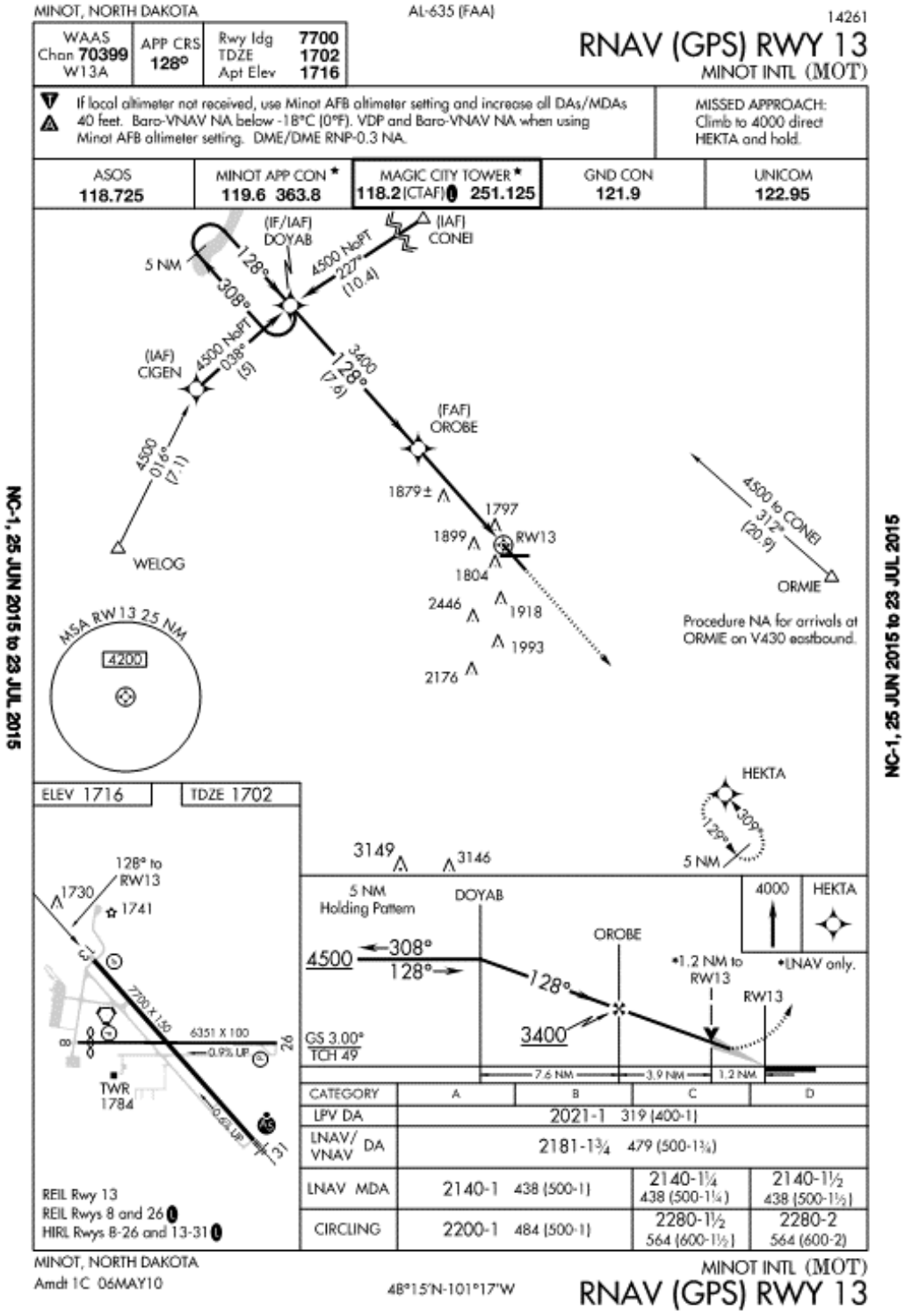


Figure L-12 – RNAV (GPS) RWY 8 Instrument Approach

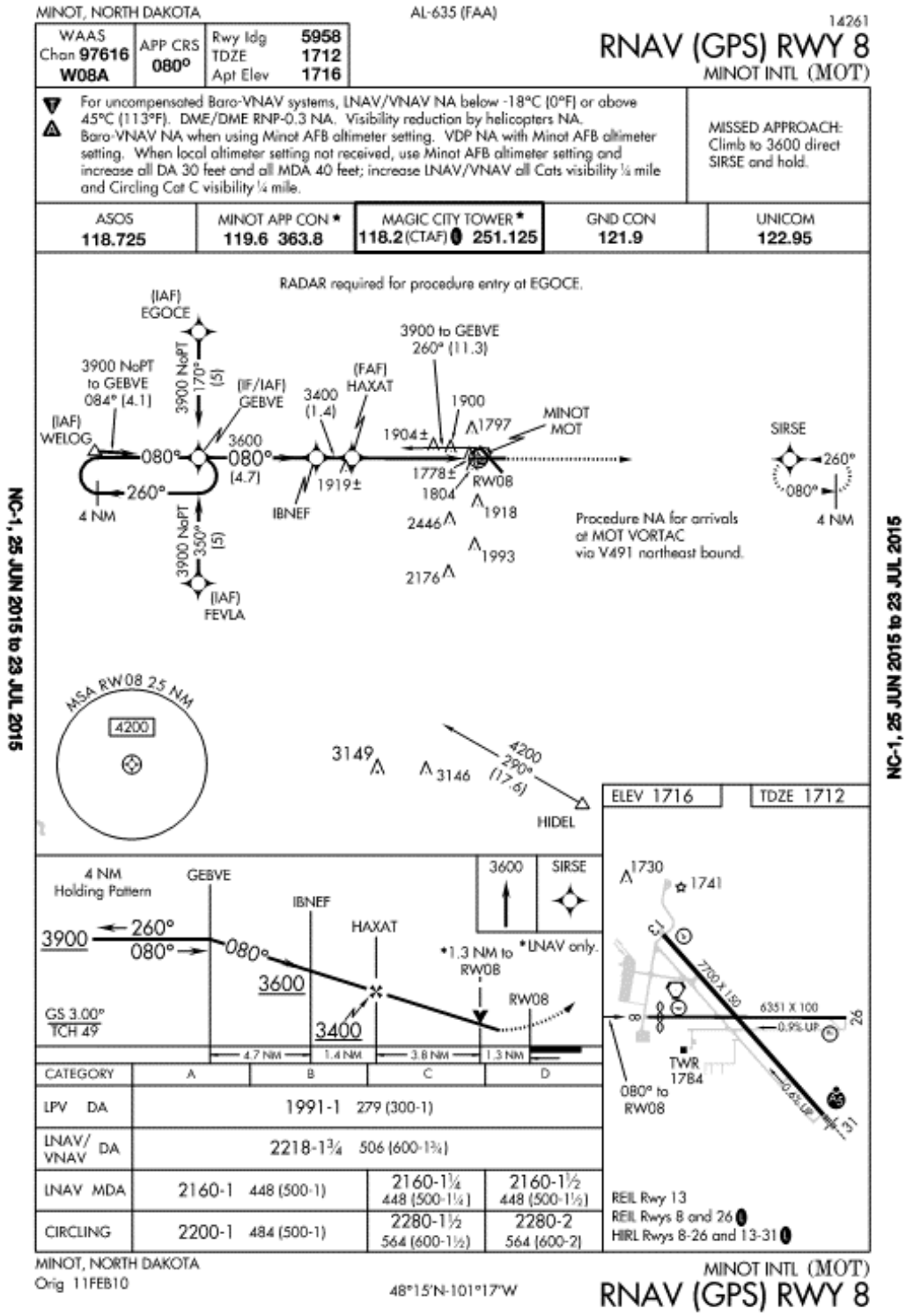


Figure L-13 – RNAV (GPS) RWY 26 Instrument Approach

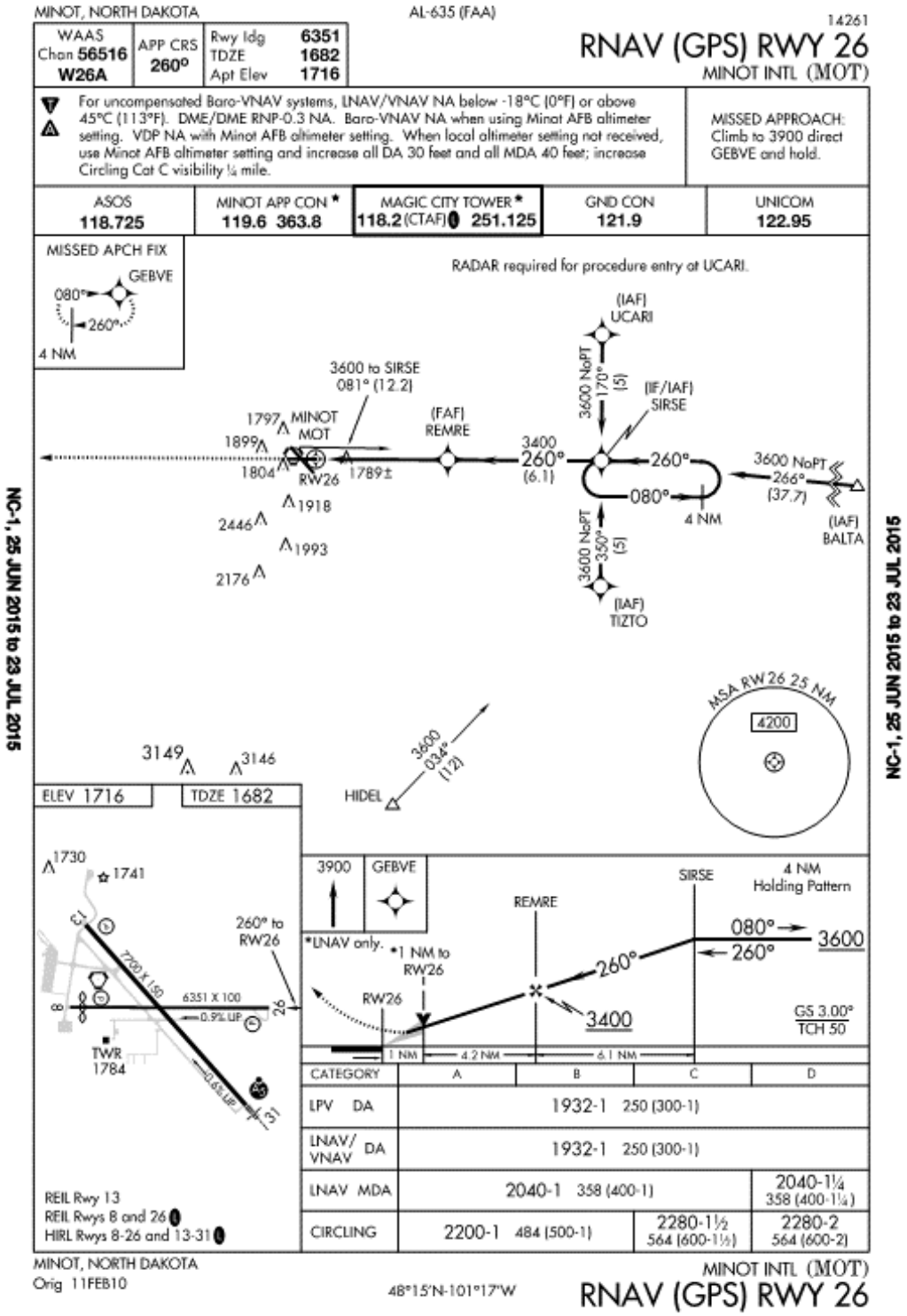


Figure L-14 – VOR RWY 31 Instrument Approach

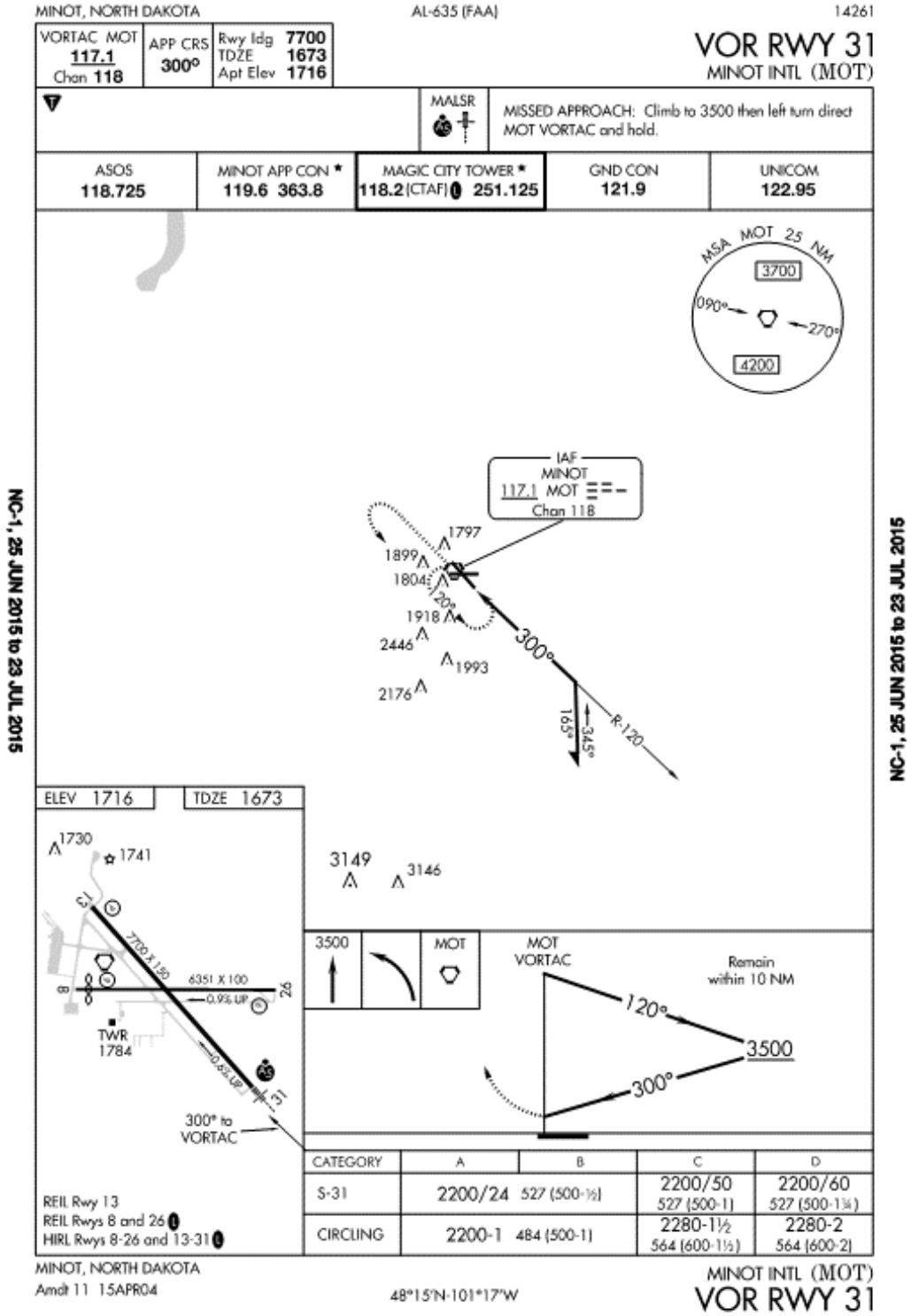


Figure L-15 – VOR RWY 13 Instrument Approach

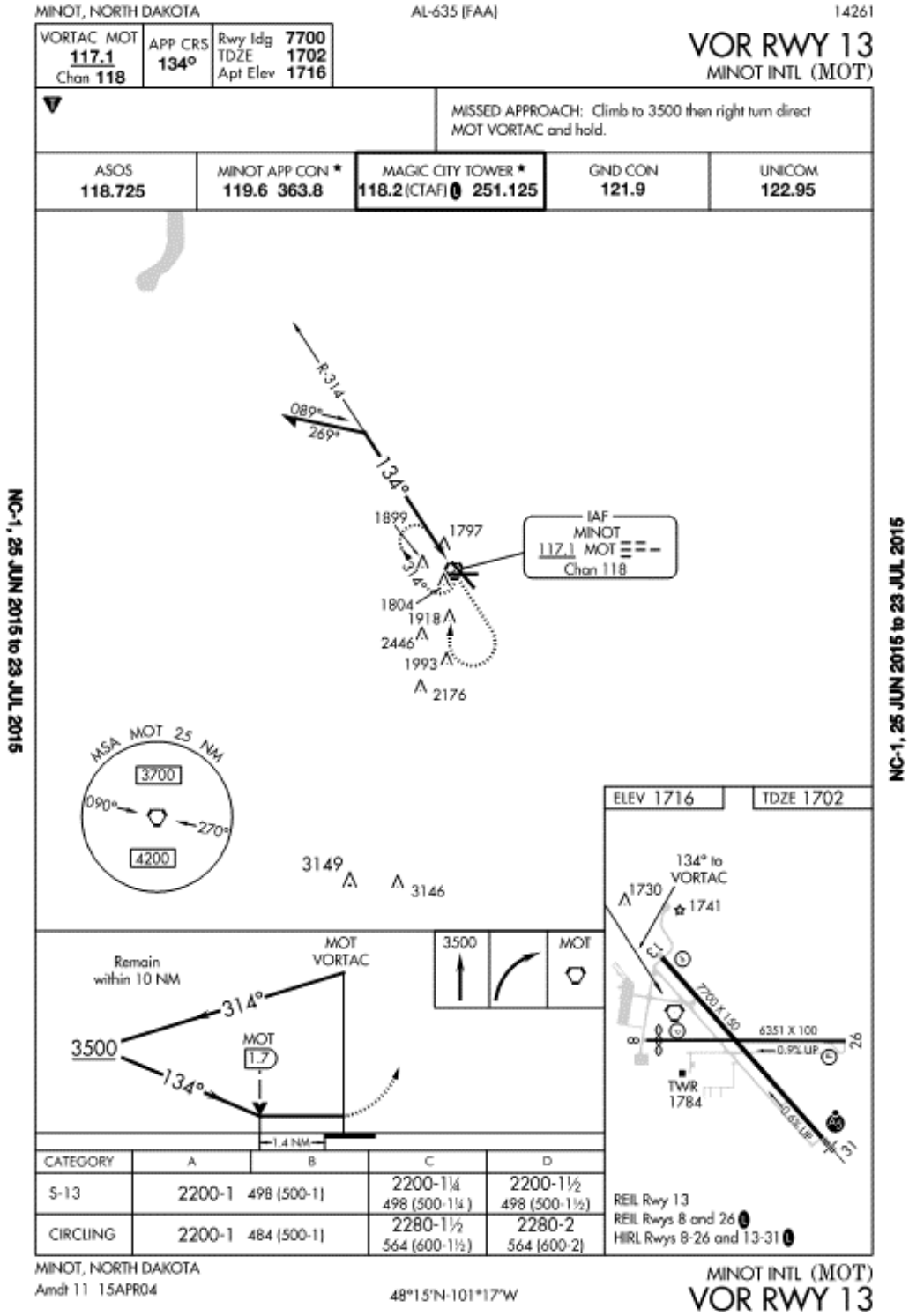


Figure L-16 – VOR RWY 8 Instrument Approach

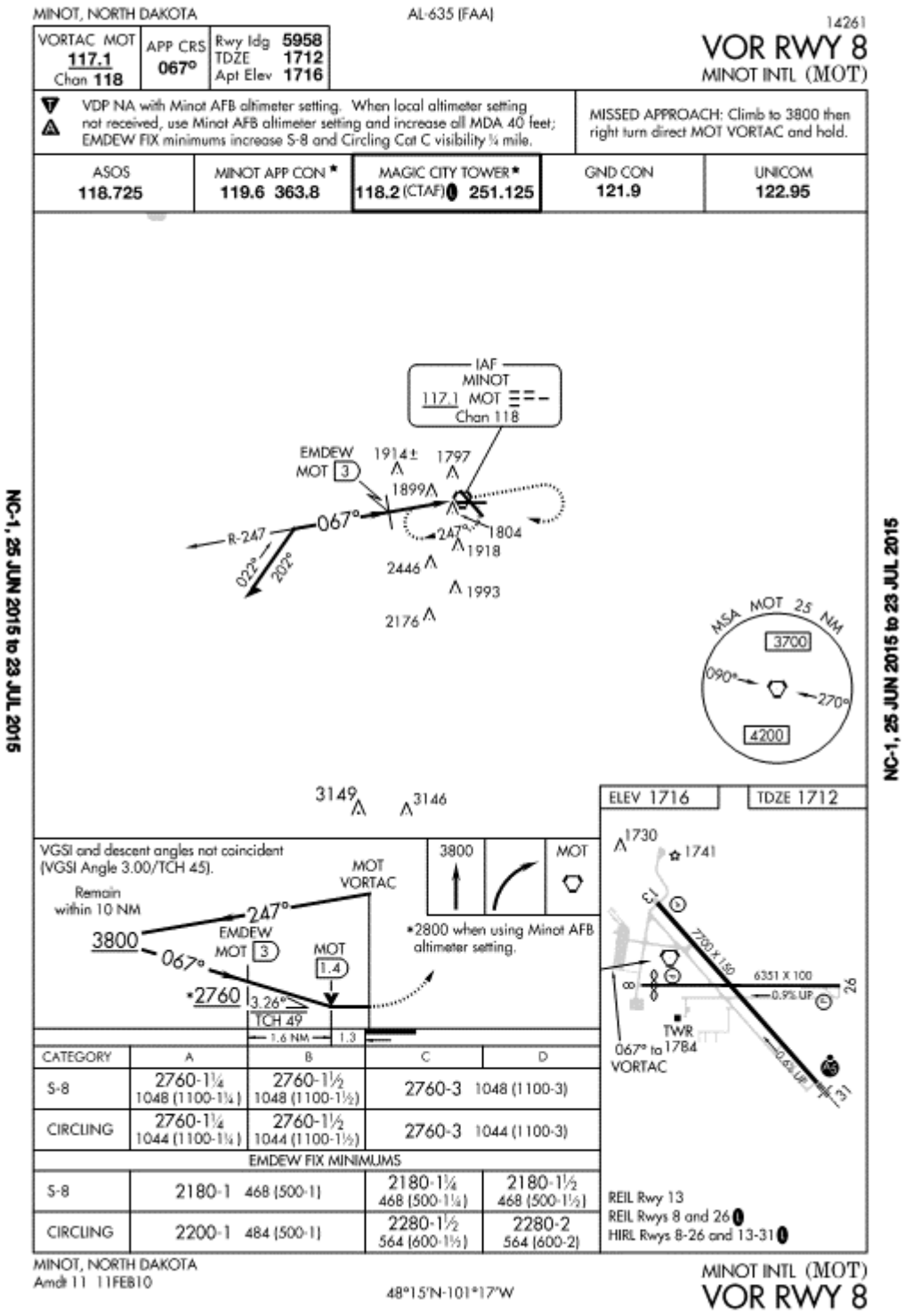


Figure L-17 – VOR RWY 26 Instrument Approach

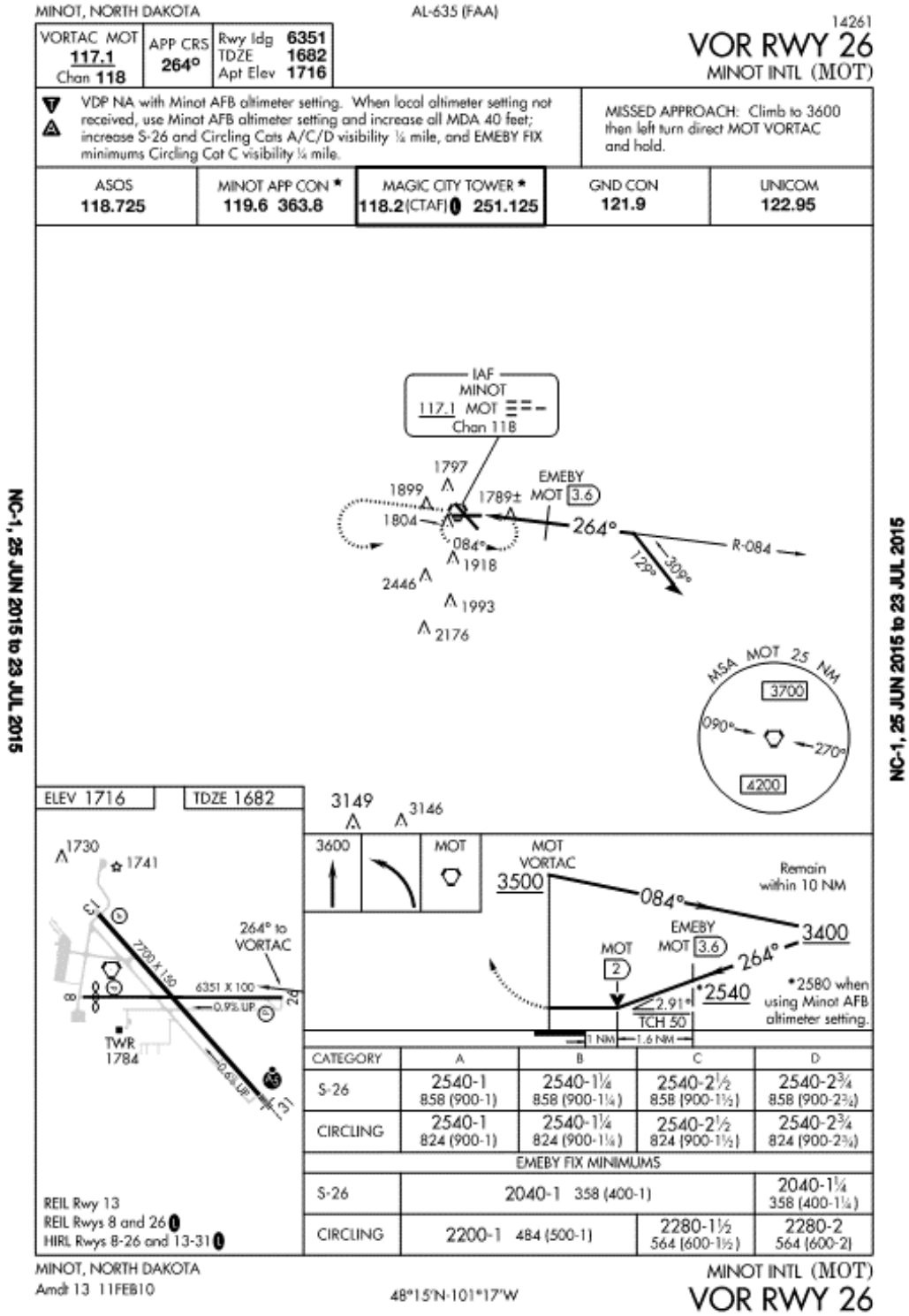


Figure L-18 – Takeoff Minimums

L14

15176 **TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)**

25 JUN 2015 to 23 JUL 2015

MINNEAPOLIS, MN (CON'T)
MINNEAPOLIS-ST. PAUL INTL / WOLD-CHAMBERLAIN (MSP)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 12 13122 (FAA)
TAKEOFF MINIMUMS: **Rwy 12L,** 300-1½ or std. w/min. climb of 207' per NM to 1100, or alternatively, with standard takeoff minimums and a normal 200' per NM climb gradient, takeoff must occur no later than 1300' prior to DER. **Rwy 35,** std. w/ min. climb of 219' per NM to 2100.
DEPARTURE PROCEDURE: **Rwy 4,** climb heading 045° to 2100 before turning left. **Rwys 30L,30R,** climb heading 301° to 2100 before turning right. **Rwy 35,** climb heading 350° to 2100 before proceeding on course
NOTE: **Rwy 4,** trees beginning 800' from DER, 301' left of centerline, up to 75' AGL/925' MSL. Rod on building 2528' from DER, 1174' left of centerline, 78' AGL/922' MSL. Fence beginning 13' from DER, 486' left of centerline, up to 6' AGL/860' MSL. Stack 4535' from DER, 480' left of centerline, 139' AGL/949' MSL. **Rwy 12L,** tree 1.1 NM from DER, 1691' left of centerline, 92' AGL/991' MSL. Light pole and camera on wall beginning 398' from DER, 561' right of centerline, up to 23' AGL/832' MSL. **Rwy 12R,** tree 1479' from DER, 561' left of centerline, 86' AGL/855' MSL. Obstruction light on pole 1002' from DER, 753' left of centerline, 53' AGL/852' MSL. **Rwy 17,** pole 409' from DER, 530' right of centerline, 29' AGL/866' MSL. Building 2619' from DER, 881' left of centerline, 97' AGL/918' MSL. Building 1956' from DER, 904' left of centerline, 61' AGL/866' MSL. Tree 2619' from DER, on centerline, 79' AGL/900' MSL. **Rwy 22,** trees beginning 2659' from DER, 867' right of centerline, 94' AGL/934' MSL. **Rwy 30L,** antenna on tower 3555' from DER, 1334' left of centerline, 116' AGL/935' MSL. **Rwy 30R,** billboard sign 1463' from DER, 848' right of centerline, 31' AGL/880' MSL. **Rwy 35,** trees beginning 2553' from DER, 770' right of centerline, 100' AGL/919' MSL. Trees beginning 1989' from DER, 194' left of centerline, up to 87' AGL/906' MSL. Buildings beginning 5.4 NM from DER, 1781' left of centerline, up to 889' AGL/1743' MSL.

MINOT, ND
MINOT INTL (MOT)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 3A 11097 (FAA)
TAKEOFF MINIMUMS: **Rwy 26,** 300-1½ or std. with a min. climb of 219' per NM to 2000.
DEPARTURE PROCEDURE: **Rwy 13,** climb via heading 128° to 2200 before turning right. **Rwy 26,** climb via heading 260° to 2300 before turning left.
NOTE: **Rwy 8,** fence 261' from DER, 415' right of centerline, 9' AGL/1669' MSL. **Rwy 26,** poles beginning 952' from DER, 523' left of centerline, up to 42' AGL/1761' MSL. Tower 1297' from DER, 405' right of centerline, 29' AGL/1751' MSL. Sign 1372' from DER, 323' left of centerline, 31' AGL/1750' MSL. Sign 1377' from DER, 832' right of centerline, 59' AGL/1778' MSL. Light pole 1419' from DER, 24' right of centerline, 36' AGL/1752' MSL. Trees beginning 1463' from DER, 73' right of centerline, up to 76' AGL/1795' MSL. Building 1432' from DER, 303' right of centerline, 33' AGL/1753' MSL. Tree 2071' from DER, 60' left of centerline, 53' AGL/1772' MSL. Tank 1.1 NM from DER, 1812' right of centerline, 140' AGL/1900' MSL. **Rwy 31,** trees beginning 2908' from DER, 560' left of centerline, up to 64' AGL/1778' MSL.

MITCHELL, SD
MITCHELL MUNI (MHE)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 1 86240 (FAA)
DEPARTURE PROCEDURE: **Rwys 12, 17,** climb to 1800 before turning.

MOBRIDGE, SD
MOBRIDGE MUNI(MBG)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 1 11181 (FAA)
TAKEOFF MINIMUMS: **Rwys 17,35,**NA - environmental
DEPARTURE PROCEDURE: **Rwy 12,** climb heading 118° to 2600 before turning left.
NOTE: **Rwy 12,** tower 2587' from DER, 651' right of centerline, 40' AGL/ 1810' MSL. Pole 3567' from DER, 12' right of centerline, 11' AGL/ 1790' MSL. Tree 1495' from DER, 230' right of centerline, 29' AGL/ 1738' MSL. Trees and poles beginning 1698' from DER, 160' left of centerline, up to 75' AGL/ 1811' MSL. Terrain and road beginning 153 from DER, 307' left of centerline, up to 17' AGL/1749' MSL. **Rwy 30,** terrain and road beginning 36' from DER, left to right across centerline, up to 17' AGL/1710' MSL.

MOHALL, ND
HOHALL MUNI (HBC)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
ORIG 11293 (FAA)
NOTE: **Rwy 13,** vehicles on roadway, 361' from DER, left and right of centerline, up to 15' AGL/1664' MSL.

25 JUN 2015 to 23 JUL 2015

15176 **TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)**

L14 NC-1

Exhibit L-19 – 2017 MOT UDDF Text

```
|MOT   |17418.A   |AGL |1.07|
|MINOT INTL                                                                |0252016|
|MINOT                                  |NORTH DAKOTA                       |
|NAD83     |5 CM      |15 CM     |NAVD88    |25 CM          |
| -6.5|0252016|
| 1715.7| 1648.7|8+0     |0252016|
|       |       |       |
| 481527.5|-1011640.9|
@
|8    |P|0252016|
| |       |
| 481528.9553|-1011726.8167| 901424| 6348|100|0252016|
| 1711.8| 1644.9|0252016|
| 481528.9391|-1011721.0524|    390|0252016|
|    0| 1715.7| 1648.7|0252016|
|  390| 1711.8| 1644.9|0252016|
| 2844| 1686.6| 1619.6|0252016|
| 3174| 1683.2| 1616.2|0252016|
| 5038| 1664.9| 1597.8|0252016|
| 6348| 1658.2| 1591.0|0252016|
#
|26   |P|0252016|
| |       |
| 481528.6812|-1011553.0194|2701538| 6348|100|0252016|
| 1681.8| 1614.7|0252016|
|            |             |       |       |
|    0| 1658.2| 1591.0|0252016|
| 1310| 1664.9| 1597.8|0252016|
| 3174| 1683.2| 1616.2|0252016|
| 3504| 1686.6| 1619.6|0252016|
| 5958| 1711.8| 1644.9|0252016|
| 6348| 1715.7| 1648.7|0252016|
#
|13   |P|0252016|
| |       |
| 481554.8994|-1011719.4618|1382303| 7700|150|0252016|
| 1701.8| 1634.8|0252016|
|            |             |       |       |
|    0| 1701.8| 1634.8|0252016|
| 2590| 1692.3| 1625.2|0252016|
| 3533| 1686.6| 1619.6|0252016|
| 3850| 1684.6| 1617.5|0252016|
```

```
| 5891| 1671.7| 1604.6|0252016|
| 7700| 1657.1| 1590.1|0252016|
#
|31   |P|0252016|
| |       |
| 481458.0879|-1011603.9067|3182359| 7700|150|0252016|
| 1679.1| 1612.1|0252016|
|            |             |       |       |
|    0| 1657.1| 1590.1|0252016|
| 1809| 1671.7| 1604.6|0252016|
| 3850| 1684.6| 1617.5|0252016|
| 4167| 1686.6| 1619.6|0252016|
| 5110| 1692.3| 1625.2|0252016|
| 7700| 1701.8| 1634.8|0252016|
@
|DME    (31_MOT)                  | 481611.5853|-1011736.7392| 1722.1| 1655.1|       |      |0252016|
|GS NR  (31_MOT)                  | 481506.7920|-1011607.5788| 1658.1| 1591.0|       |      |0252016|
|GS NR  (31_MOT)           PP     | 481504.1728|-1011611.9959| 1663.8|       |   400R|   825|0252016|
|LOC    (31_MOT)                  | 481609.3762|-1011738.7092| 1711.7| 1644.7|       |  1962|0252016|
|OM     (31_MOT)                  | 481120.9338|-1011115.6708| 1593.7| 1526.3|       | 29418|0252016|
|OM     (31_MOT)           CLPT   | 481120.9187|-1011115.6962| 1657.1|       |     2R| 29418|0252016|
|VOR/DME(MOT)                     | 481537.2088|-1011713.4559| 1699.2| 1632.2|       |      |0252016|
#
|ALS/MALSR      (31)              | 481439.9959|-1011539.8702| 1633.6| 1566.5|       |      |0252016|
|ALS/MALSR      (31)              | 481456.5320|-1011601.8446| 1655.4| 1588.3|       |      |0252016|
|APBN                             | 481609.7173|-1011711.1338| 1701.8| 1634.8|       |      |0252016|
|PAPI/PAPI4     (8)               | 481530.3448|-1011705.7123| 1698.7| 1631.7|       |      |0252016|
|PAPI/PAPI4     (8)            PP| 481528.8955|-1011705.7216| 1701.0|       |   147L|  1038|0252016|
|PAPI/PAPI4     (13)              | 481548.6496|-1011707.7606| 1695.0| 1628.0|       |      |0252016|
|PAPI/PAPI4     (13)           PP| 481547.5270|-1011709.6533| 1698.1|       |   171L|   999|0252016|
|PAPI/PAPI4     (26)              | 481527.2908|-1011606.0108| 1660.1| 1593.0|       |      |0252016|
|PAPI/PAPI4     (26)           PP| 481528.7204|-1011606.0012| 1661.8|       |   145L|   879|0252016|
|REIL           (8)               | 481527.7055|-1011721.0709| 1713.4| 1646.4|       |      |0252016|
|REIL           (8)               | 481530.1723|-1011721.0644| 1713.1| 1646.1|       |      |0252016|
|REIL           (13)              | 481556.1418|-1011718.1461| 1702.4| 1635.4|       |      |0252016|
|REIL           (13)              | 481554.1751|-1011721.4616| 1702.3| 1635.3|       |      |0252016|
|REIL           (26)              | 481529.9046|-1011552.4308| 1659.3| 1592.2|       |      |0252016|
|REIL           (26)              | 481527.4526|-1011552.4453| 1659.4| 1592.2|       |      |0252016|
#
|ASOS                             | 481507.3153|-1011608.1409| 1657.7| 1590.6|       |      |0252016|
|WIND CONE                        | 481539.8866|-1011721.9209| 1706.1| 1639.1|       |      |0252016|
|WIND CONE                        | 481503.7943|-1011616.5301| 1658.9| 1591.9|       |      |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|WIND CONE                    | 481526.2090|-1011607.7981| 1659.1| 1592.0|       |      |0252016|
@
|8   |VGA    |
#
|26  |VGA    |
#
|13  |VGA    |
#
|31  |VGA    |
#
|ARP |HCT    |
|RWY LT                       | 481528.25|-1011646.22|1A| 1689|     |    2|  -27|     |     |     |0252016|
|TWY LT                       | 481525.41|-1011645.61|1A| 1687|     |    2|  -29|     |     |     |0252016|
|RWY LT                       | 481529.40|-1011634.55|1A| 1681|     |    3|  -35|     |     |     |0252016|
|TWY LT                       | 481525.65|-1011647.54|1A| 1690|     |    3|  -26|     |     |     |0252016|
|TWY LT                       | 481523.23|-1011644.23|1A| 1687|     |    3|  -29|     |     |     |0252016|
|GRD                          | 481529.50|-1011648.15|1A| 1688|     |     |  -28|     |     |     |0252016|
|RWY LT                       | 481528.26|-1011649.15|1A| 1690|     |    2|  -26|     |     |     |0252016|
|TWY LT                       | 481527.01|-1011649.35|1A| 1690|     |    2|  -26|     |     |     |0252016|
|GRD                          | 481522.09|-1011644.25|1A| 1685|     |     |  -31|     |     |     |0252016|
|SIGN                         | 481523.31|-1011647.14|1A| 1689|     |    4|  -27|     |     |     |0252016|
|TWY LT                       | 481521.39|-1011641.90|1A| 1686|     |    3|  -30|     |     |     |0252016|
|SIGN                         | 481525.88|-1011650.58|1A| 1691|     |    4|  -25|     |     |     |0252016|
|TWY LT                       | 481521.68|-1011646.07|1A| 1690|     |    2|  -26|     |     |     |0252016|
|SIGN                         | 481529.82|-1011650.43|1A| 1693|     |    3|  -23|     |     |     |0252016|
|GRD                          | 481523.68|-1011650.08|1A| 1689|     |     |  -27|     |     |     |0252016|
|SIGN                         | 481520.25|-1011642.99|1A| 1685|     |    3|  -31|     |     |     |0252016|
|TWY LT                       | 481527.64|-1011652.07|1A| 1692|     |    2|  -24|     |     |     |0252016|
|TWY LT                       | 481520.37|-1011645.25|1A| 1689|     |    3|  -27|     |     |     |0252016|
|TWY LT                       | 481519.70|-1011639.61|1A| 1683|     |    2|  -33|     |     |     |0252016|
|GRD                          | 481521.38|-1011648.37|1A| 1691|     |     |  -25|     |     |     |0252016|
|TWY LT                       | 481524.52|-1011651.86|1A| 1692|     |    2|  -24|     |     |     |0252016|
|TWY LT                       | 481529.74|-1011652.86|1A| 1694|     |    3|  -22|     |     |     |0252016|
|TWY LT                       | 481528.20|-1011653.38|1A| 1693|     |    2|  -23|     |     |     |0252016|
|TWY LT                       | 481519.07|-1011640.68|1A| 1683|     |    2|  -33|     |     |     |0252016|
|GRD                          | 481525.99|-1011653.91|1A| 1688|     |     |  -28|     |     |     |0252016|
|TWY LT                       | 481519.38|-1011646.08|1A| 1690|     |    3|  -26|     |     |     |0252016|
|GRD                          | 481522.43|-1011652.09|1A| 1693|     |     |  -23|     |     |     |0252016|
|GRD                          | 481518.60|-1011643.68|1A| 1689|     |     |  -27|     |     |     |0252016|
|GRD                          | 481520.83|-1011650.21|1A| 1692|     |     |  -24|     |     |     |0252016|
|SIGN                         | 481527.77|-1011654.74|1A| 1696|     |    5|  -20|     |     |     |0252016|
|GRD                          | 481523.90|-1011653.95|1A| 1692|     |     |  -24|     |     |     |0252016|
```

```
|GRD                          | 481519.21|-1011647.63|1A| 1691|     |     |  -25|     |     |     |0252016|
|TWY LT                       | 481530.92|-1011654.54|1A| 1692|     |    1|  -24|     |     |     |0252016|
|GRD                          | 481528.35|-1011655.51|1A| 1694|     |     |  -22|     |     |     |0252016|
|GRD                          | 481517.84|-1011638.10|1A| 1680|     |     |  -36|     |     |     |0252016|
|GRD                          | 481529.41|-1011655.51|1A| 1693|     |     |  -23|     |     |     |0252016|
|TWY LT                       | 481525.32|-1011655.49|1A| 1695|     |    3|  -21|     |     |     |0252016|
|TWY LT                       | 481517.88|-1011645.26|1A| 1691|     |    2|  -25|     |     |     |0252016|
|GRD                          | 481526.74|-1011656.05|1A| 1691|     |     |  -25|     |     |     |0252016|
|GRD                          | 481519.30|-1011650.06|1A| 1695|     |     |  -21|     |     |     |0252016|
|GRD                          | 481521.16|-1011653.32|1A| 1696|     |     |  -20|     |     |     |0252016|
|GRD                          | 481517.01|-1011641.63|1A| 1684|     |     |  -32|     |     |     |0252016|
|RWY LT                       | 481528.28|-1011656.91|1A| 1696|     |    2|  -20|     |     |     |0252016|
|GRD                          | 481522.80|-1011655.50|1A| 1696|     |     |  -20|     |     |     |0252016|
|TWY LT                       | 481529.47|-1011656.91|1A| 1696|     |    2|  -20|     |     |     |0252016|
|TREE                         | 481537.97|-1011645.96|1A| 1689|     |     |  -27|     |     |     |0252016|
|RWY LT                       | 481535.59|-1011652.11|1A| 1692|     |    2|  -24|     |     |     |0252016|
|GRD                          | 481528.25|-1011624.19|1A| 1672|     |     |  -44|     |     |     |0252016|
|GRD                          | 481517.92|-1011649.70|1A| 1694|     |     |  -22|     |     |     |0252016|
|GRD                          | 481519.08|-1011652.23|1A| 1697|     |     |  -19|     |     |     |0252016|
|GRD                          | 481516.18|-1011643.16|1A| 1691|     |     |  -25|     |     |     |0252016|
|GRD                          | 481521.16|-1011655.60|1A| 1698|     |     |  -18|     |     |     |0252016|
|RWY LT                       | 481528.18|-1011623.34|1A| 1673|     |    3|  -43|     |     |     |0252016|
|TWY LT                       | 481524.53|-1011657.96|1A| 1698|     |    3|  -18|     |     |     |0252016|
|RWY LT                       | 481529.37|-1011623.33|1A| 1673|     |    3|  -43|     |     |     |0252016|
|GRD                          | 481515.58|-1011639.92|1A| 1682|     |     |  -34|     |     |     |0252016|
|GRD                          | 481536.41|-1011653.29|1A| 1691|     |     |  -25|     |     |     |0252016|
|GRD                          | 481515.92|-1011647.26|1A| 1696|     |     |  -20|     |     |     |0252016|
|GRD                          | 481523.08|-1011658.20|1A| 1698|     |     |  -18|     |     |     |0252016|
|RWY LT                       | 481528.29|-1011659.50|1A| 1698|     |    3|  -18|     |     |     |0252016|
|TWY LT                       | 481515.37|-1011645.26|1A| 1695|     |    3|  -21|     |     |     |0252016|
|GRD                          | 481519.25|-1011654.99|1A| 1700|     |     |  -16|     |     |     |0252016|
|TWY LT                       | 481529.47|-1011659.50|1A| 1698|     |    2|  -18|     |     |     |0252016|
|GRD                          | 481526.64|-1011659.89|1A| 1694|     |     |  -22|     |     |     |0252016|
|GRD                          | 481535.69|-1011655.47|1A| 1691|     |     |  -25|     |     |     |0252016|
|GRD                          | 481521.28|-1011658.10|1A| 1700|     |     |  -16|     |     |     |0252016|
|GRD                          | 481514.38|-1011641.31|1A| 1690|     |     |  -26|     |     |     |0252016|
|GRD                          | 481517.43|-1011628.01|1A| 1675|     |     |  -41|     |     |     |0252016|
|GRD                          | 481516.45|-1011629.92|1A| 1675|     |     |  -41|     |     |     |0252016|
|GRD                          | 481531.51|-1011659.97|1A| 1693|     |     |  -23|     |     |     |0252016|
|TWY LT                       | 481524.54|-1011700.45|1A| 1701|     |    3|  -15|     |     |     |0252016|
|TREE                         | 481532.82|-1011622.18|1A| 1681|     |     |  -35|     |     |     |0252016|
|GRD                          | 481513.99|-1011644.02|1A| 1693|     |     |  -23|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|RWY LT                  | 481515.96|-1011629.36|1A| 1677|     |    3|  -39|     |     |     |0252016|
|GRD                     | 481513.66|-1011638.36|1A| 1686|     |     |  -30|     |     |     |0252016|
|GRD                     | 481523.34|-1011700.91|1A| 1699|     |     |  -17|     |     |     |0252016|
|RWY LT                  | 481528.29|-1011702.10|1A| 1700|     |    2|  -16|     |     |     |0252016|
|GRD                     | 481519.26|-1011658.28|1A| 1703|     |     |  -13|     |     |     |0252016|
|RWY LT                  | 481529.48|-1011702.09|1A| 1700|     |    3|  -16|     |     |     |0252016|
|SIGN                    | 481538.46|-1011654.89|1A| 1695|     |    5|  -21|     |     |     |0252016|
|GRD                     | 481521.47|-1011701.08|1A| 1702|     |     |  -14|     |     |     |0252016|
|GRD                     | 481530.97|-1011702.49|1A| 1696|     |     |  -20|     |     |     |0252016|
|TWY LT                  | 481524.55|-1011702.93|1A| 1703|     |    3|  -13|     |     |     |0252016|
|GRD                     | 481512.43|-1011639.55|1A| 1692|     |     |  -24|     |     |     |0252016|
|GRD                     | 481512.04|-1011642.17|1A| 1693|     |     |  -23|     |     |     |0252016|
|POLE                    | 481516.27|-1011657.43|1A| 1741|     |   35|   25|     |     |     |0252016|
|GRD                     | 481519.39|-1011701.24|1A| 1704|     |     |  -12|     |     |     |0252016|
|GRD                     | 481511.89|-1011636.34|1A| 1683|     |     |  -33|     |     |     |0252016|
|GRD                     | 481523.39|-1011704.04|1A| 1702|     |     |  -14|     |     |     |0252016|
|TWY LT                  | 481525.34|-1011704.65|1A| 1704|     |    2|  -12|     |     |     |0252016|
|GRD                     | 481532.62|-1011703.67|1A| 1694|     |     |  -22|     |     |     |0252016|
|GRD                     | 481521.49|-1011704.15|1A| 1704|     |     |  -12|     |     |     |0252016|
|PAPI                    | 481529.90|-1011705.72|1A| 1702|     |    4|  -14|     |     |     |0252016|
|GRD                     | 481510.74|-1011639.80|1A| 1695|     |     |  -21|     |     |     |0252016|
|GRD                     | 481510.80|-1011637.44|1A| 1694|     |     |  -22|     |     |     |0252016|
|EQUIP                   | 481531.37|-1011705.69|1A| 1703|     |    6|  -13|     |     |     |0252016|
|GRD                     | 481519.29|-1011703.64|1A| 1712|     |    5|   -4|     |     |     |0252016|
|TWY LT                  | 481524.44|-1011706.44|1A| 1706|     |    3|  -10|     |     |     |0252016|
|FENCE                   | 481525.52|-1011707.05|1A| 1712|     |    9|   -4|     |     |     |0252016|
|GRD                     | 481534.01|-1011705.49|1A| 1695|     |     |  -21|     |     |     |0252016|
|FENCE                   | 481523.74|-1011706.92|1A| 1710|     |    7|   -6|     |     |     |0252016|
|GRD                     | 481510.12|-1011635.23|1A| 1686|     |     |  -30|     |     |     |0252016|
|GRD                     | 481533.15|-1011707.18|1A| 1697|     |     |  -19|     |     |     |0252016|
|FENCE                   | 481521.66|-1011707.18|1A| 1714|     |    8|   -2|     |     |     |0252016|
|GRD                     | 481508.98|-1011637.80|1A| 1695|     |     |  -21|     |     |     |0252016|
|GRD                     | 481525.87|-1011709.07|1A| 1704|     |     |  -12|     |     |     |0252016|
|BLDG                    | 481519.46|-1011706.51|1A| 1731|     |   22|   15|     |     |     |0252016|
|GRD                     | 481523.48|-1011709.07|1A| 1709|     |     |   -7|     |     |     |0252016|
|GRD                     | 481532.26|-1011708.90|1A| 1699|     |     |  -17|     |     |     |0252016|
|GRD                     | 481535.50|-1011707.65|1A| 1695|     |     |  -21|     |     |     |0252016|
|GRD                     | 481508.46|-1011633.70|1A| 1684|     |     |  -32|     |     |     |0252016|
|GRD                     | 481521.30|-1011709.12|1A| 1711|     |     |   -5|     |     |     |0252016|
|TWY LT                  | 481525.36|-1011710.47|1A| 1709|     |    2|   -7|     |     |     |0252016|
|GRD                     | 481534.75|-1011709.15|1A| 1698|     |     |  -18|     |     |     |0252016|
|GRD                     | 481507.48|-1011635.61|1A| 1687|     |     |  -29|     |     |     |0252016|
```

```
|GRD                     | 481523.48|-1011711.13|1A| 1710|     |     |   -6|     |     |     |0252016|
|TREE                    | 481519.29|-1011709.28|1A| 1741|     |     |   25|     |     |     |0252016|
|GRD                     | 481533.98|-1011710.98|1A| 1699|     |     |  -17|     |     |     |0252016|
|GRD                     | 481521.71|-1011711.47|1A| 1712|     |     |   -4|     |     |     |0252016|
|GRD                     | 481536.84|-1011709.62|1A| 1696|     |     |  -20|     |     |     |0252016|
|CONTROL TWR             | 481518.87|-1011710.27|1A| 1782|     |   72|   66|     |     |     |0252016|
|TWY LT                  | 481525.37|-1011713.04|1A| 1710|     |    3|   -6|     |     |     |0252016|
|GRD                     | 481520.23|-1011711.69|1A| 1713|     |     |   -3|     |     |     |0252016|
|GRD                     | 481506.63|-1011631.36|1A| 1679|     |     |  -37|     |     |     |0252016|
|GRD                     | 481536.10|-1011711.26|1A| 1698|     |     |  -18|     |     |     |0252016|
|GRD                     | 481523.54|-1011713.46|1A| 1711|     |     |   -5|     |     |     |0252016|
|GRD                     | 481505.69|-1011633.37|1A| 1687|     |     |  -29|     |     |     |0252016|
|GRD                     | 481521.74|-1011713.72|1A| 1713|     |     |   -3|     |     |     |0252016|
|TREE                    | 481549.84|-1011634.09|1A| 1732|     |     |   16|     |     |     |0252016|
|GRD                     | 481535.37|-1011713.08|1A| 1700|     |     |  -16|     |     |     |0252016|
|GRD                     | 481538.14|-1011609.94|1A| 1672|     |     |  -44|     |     |     |0252016|
|FENCE                   | 481541.96|-1011613.39|1A| 1679|     |    8|  -37|     |     |     |0252016|
|BLDG                    | 481519.67|-1011713.98|1A| 1758|     |   44|   42|     |     |     |0252016|
|GRD                     | 481538.40|-1011712.09|1A| 1697|     |     |  -19|     |     |     |0252016|
|VOR/DME                 | 481537.20|-1011713.44|1A| 1737|     |   39|   21|     |     |     |0252016|
|TWY LT                  | 481525.23|-1011716.38|1A| 1712|     |    2|   -4|     |     |     |0252016|
|GRD                     | 481521.28|-1011606.34|1A| 1667|     |     |  -49|     |     |     |0252016|
|GRD                     | 481523.65|-1011716.24|1A| 1713|     |     |   -3|     |     |     |0252016|
|GRD                     | 481504.36|-1011631.52|1A| 1673|     |     |  -43|     |     |     |0252016|
|GRD                     | 481522.14|-1011716.94|1A| 1714|     |     |   -2|     |     |     |0252016|
|GRD                     | 481519.26|-1011605.96|1A| 1668|     |     |  -48|     |     |     |0252016|
|GRD                     | 481522.14|-1011604.20|1A| 1667|     |     |  -49|     |     |     |0252016|
|TWY LT                  | 481524.97|-1011718.39|1A| 1714|     |    3|   -2|     |     |     |0252016|
|BLDG                    | 481520.81|-1011717.31|1A| 1767|     |   51|   51|     |     |     |0252016|
|GRD                     | 481539.15|-1011714.49|1A| 1699|     |     |  -17|     |     |     |0252016|
|GRD                     | 481520.42|-1011604.35|1A| 1672|     |     |  -44|     |     |     |0252016|
|GRD                     | 481503.19|-1011629.58|1A| 1671|     |     |  -45|     |     |     |0252016|
|GRD                     | 481537.76|-1011715.97|1A| 1701|     |     |  -15|     |     |     |0252016|
|GRD                     | 481523.80|-1011719.19|1A| 1714|     |     |   -2|     |     |     |0252016|
|GRD                     | 481523.24|-1011602.70|1A| 1667|     |     |  -49|     |     |     |0252016|
|BLDG                    | 481519.40|-1011717.76|1A| 1743|     |   27|   27|     |     |     |0252016|
|TWY LT                  | 481540.66|-1011714.52|1A| 1699|     |    3|  -17|     |     |     |0252016|
|GRD                     | 481522.48|-1011719.80|1A| 1715|     |     |   -1|     |     |     |0252016|
|GRD                     | 481518.85|-1011603.38|1A| 1679|     |     |  -37|     |     |     |0252016|
|GRD                     | 481521.20|-1011602.04|1A| 1668|     |     |  -48|     |     |     |0252016|
|ANT                     | 481506.93|-1011706.47|1A| 1778|     |   64|   62|     |     |     |0252016|
|TWY LT                  | 481524.73|-1011720.87|1A| 1716|     |    2|    0|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|BLDG                | 481521.29|-1011720.34|1A| 1759|     |  43|   43|     |     |     |0252016|
|GRD                 | 481501.62|-1011627.83|1A| 1671|     |    |  -45|     |     |     |0252016|
|GRD                 | 481539.40|-1011717.90|1A| 1702|     |    |  -14|     |     |     |0252016|
|TWY LT              | 481540.90|-1011716.78|1A| 1701|     |   3|  -15|     |     |     |0252016|
|GRD                 | 481523.76|-1011721.89|1A| 1716|     |    |    0|     |     |     |0252016|
|GRD                 | 481522.51|-1011559.93|1A| 1669|     |    |  -47|     |     |     |0252016|
|GRD                 | 481522.32|-1011722.11|1A| 1716|     |    |    0|     |     |     |0252016|
|GRD                 | 481519.47|-1011600.72|1A| 1672|     |    |  -44|     |     |     |0252016|
|BLDG                | 481519.86|-1011721.54|1A| 1738|     |  22|   22|     |     |     |0252016|
|GRD                 | 481543.02|-1011716.33|1A| 1698|     |    |  -18|     |     |     |0252016|
|FENCE               | 481525.04|-1011723.22|1A| 1721|     |   8|    5|     |     |     |0252016|
|GRD                 | 481520.68|-1011559.13|1A| 1667|     |    |  -49|     |     |     |0252016|
|GRD                 | 481500.46|-1011626.26|1A| 1669|     |    |  -47|     |     |     |0252016|
|TWY LT              | 481541.13|-1011719.09|1A| 1702|     |   2|  -14|     |     |     |0252016|
|FENCE               | 481524.99|-1011724.14|1A| 1724|     |   9|    8|     |     |     |0252016|
|FENCE               | 481523.91|-1011724.21|1A| 1725|     |   8|    9|     |     |     |0252016|
|SIGN                | 481542.50|-1011718.67|1A| 1703|     |   4|  -13|     |     |     |0252016|
|FENCE               | 481522.32|-1011724.22|1A| 1726|     |   8|   10|     |     |     |0252016|
|GRD                 | 481522.23|-1011557.30|1A| 1665|     |    |  -51|     |     |     |0252016|
|FENCE               | 481520.83|-1011724.19|1A| 1725|     |   8|    9|     |     |     |0252016|
|GRD                 | 481519.01|-1011557.60|1A| 1668|     |    |  -48|     |     |     |0252016|
|GRD                 | 481544.74|-1011718.09|1A| 1701|     |    |  -15|     |     |     |0252016|
|ANT                 | 481506.81|-1011607.60|1A| 1690|     |  33|  -26|     |     |     |0252016|
|GRD                 | 481459.07|-1011624.39|1A| 1667|     |    |  -49|     |     |     |0252016|
|SIGN                | 481529.90|-1011726.50|1A| 1717|     |   4|    1|     |     |     |0252016|
|GRD                 | 481519.35|-1011724.99|1A| 1721|     |    |    5|     |     |     |0252016|
|GRD                 | 481529.49|-1011726.72|1A| 1715|     |    |   -1|     |     |     |0252016|
|GRD                 | 481520.76|-1011556.06|1A| 1663|     |    |  -53|     |     |     |0252016|
|TWY LT              | 481542.33|-1011721.26|1A| 1705|     |   3|  -11|     |     |     |0252016|
|GRD                 | 481525.17|-1011726.84|1A| 1716|     |    |    0|     |     |     |0252016|
|GRD                 | 481523.72|-1011727.01|1A| 1719|     |    |    3|     |     |     |0252016|
|POLE                | 481520.98|-1011726.50|1A| 1792|     |  72|   76|     |     |     |0252016|
|GRD                 | 481543.93|-1011720.56|1A| 1702|     |    |  -14|     |     |     |0252016|
|GRD                 | 481522.20|-1011726.91|1A| 1719|     |    |    3|     |     |     |0252016|
|GRD                 | 481522.23|-1011554.60|1A| 1660|     |    |  -56|     |     |     |0252016|
|GRD                 | 481534.39|-1011726.73|1A| 1713|     |    |   -3|     |     |     |0252016|
|TREE                | 481519.59|-1011726.74|1A| 1753|     |    |   37|     |     |     |0252016|
|GRD                 | 481519.16|-1011554.96|1A| 1664|     |    |  -52|     |     |     |0252016|
|RWY LT              | 481525.66|-1011728.57|1A| 1719|     |   2|    3|     |     |     |0252016|
|GRD                 | 481528.95|-1011728.64|1A| 1717|     |    |    1|     |     |     |0252016|
|RWY LT              | 481528.39|-1011552.88|1A| 1660|     |   3|  -56|     |     |     |0252016|
|RWY LT              | 481528.98|-1011552.88|1A| 1660|     |   3|  -56|     |     |     |0252016|
```

```
|GRD                 | 481546.50|-1011719.79|1A| 1700|     |    |  -16|     |     |     |0252016|
|GRD                 | 481457.71|-1011622.58|1A| 1665|     |    |  -51|     |     |     |0252016|
|TWY LT              | 481533.97|-1011728.14|1A| 1715|     |   3|   -1|     |     |     |0252016|
|TREE                | 481507.47|-1011603.11|1A| 1666|     |    |  -50|     |     |     |0252016|
|GRD                 | 481520.77|-1011553.60|1A| 1662|     |    |  -54|     |     |     |0252016|
|POLE                | 481520.99|-1011728.27|1A| 1793|     |  73|   77|     |     |     |0252016|
|RWY LT              | 481529.41|-1011729.24|1A| 1718|     |   2|    2|     |     |     |0252016|
|REIL                | 481527.36|-1011552.45|1A| 1660|     |   3|  -56|     |     |     |0252016|
|REIL                | 481527.46|-1011552.45|1A| 1659|     |   3|  -57|     |     |     |0252016|
|RWY LT              | 481528.90|-1011729.36|1A| 1719|     |   3|    3|     |     |     |0252016|
|REIL                | 481529.90|-1011552.43|1A| 1659|     |   5|  -57|     |     |     |0252016|
|RWY LT              | 481527.86|-1011729.61|1A| 1719|     |   2|    3|     |     |     |0252016|
|GRD                 | 481524.24|-1011729.46|1A| 1719|     |    |    3|     |     |     |0252016|
|GRD                 | 481534.07|-1011552.89|1A| 1657|     |    |  -59|     |     |     |0252016|
|GRD                 | 481523.01|-1011552.30|1A| 1661|     |    |  -55|     |     |     |0252016|
|GRD                 | 481522.16|-1011729.34|1A| 1720|     |    |    4|     |     |     |0252016|
|SIGN                | 481543.94|-1011723.43|1A| 1709|     |   4|   -7|     |     |     |0252016|
|GRD                 | 481519.10|-1011552.98|1A| 1664|     |    |  -52|     |     |     |0252016|
|FLGPL               | 481518.76|-1011729.00|1A| 1760|     |  37|   44|     |     |     |0252016|
|BLDG                | 481520.28|-1011729.57|1A| 1773|     |  50|   57|     |     |     |0252016|
|GRD                 | 481545.57|-1011722.81|1A| 1704|     |    |  -12|     |     |     |0252016|
|POLE                | 481521.00|-1011729.94|1A| 1792|     |  73|   76|     |     |     |0252016|
|GRD                 | 481522.08|-1011551.24|1A| 1661|     |    |  -55|     |     |     |0252016|
|GRD                 | 481520.86|-1011551.19|1A| 1660|     |    |  -56|     |     |     |0252016|
|GRD                 | 481523.77|-1011550.51|1A| 1661|     |    |  -55|     |     |     |0252016|
|GRD                 | 481544.29|-1011724.94|1A| 1707|     |    |   -9|     |     |     |0252016|
|POLE                | 481518.76|-1011730.09|1A| 1764|     |  40|   48|     |     |     |0252016|
|GRD                 | 481456.31|-1011620.64|1A| 1663|     |    |  -53|     |     |     |0252016|
|GRD                 | 481547.46|-1011722.32|1A| 1703|     |    |  -13|     |     |     |0252016|
|GRD                 | 481519.12|-1011550.83|1A| 1661|     |    |  -55|     |     |     |0252016|
|POLE                | 481520.99|-1011731.68|1A| 1792|     |  73|   76|     |     |     |0252016|
|TWY LT              | 481545.30|-1011725.42|1A| 1708|     |   3|   -8|     |     |     |0252016|
|FENCE               | 481522.51|-1011549.18|1A| 1668|     |   8|  -48|     |     |     |0252016|
|FENCE               | 481521.38|-1011549.18|1A| 1669|     |   8|  -47|     |     |     |0252016|
|TWY LT              | 481549.19|-1011722.26|1A| 1704|     |   3|  -12|     |     |     |0252016|
|BUSH                | 481554.97|-1011713.72|1A| 1701|     |    |  -15|     |     |     |0252016|
|FENCE               | 481520.28|-1011549.19|1A| 1669|     |   9|  -47|     |     |     |0252016|
|TWY LT              | 481547.11|-1011724.97|1A| 1706|     |   3|  -10|     |     |     |0252016|
|FENCE               | 481519.15|-1011549.19|1A| 1670|     |   8|  -46|     |     |     |0252016|
|GRD                 | 481455.16|-1011618.66|1A| 1665|     |    |  -51|     |     |     |0252016|
|SIGN                | 481554.22|-1011716.19|1A| 1702|     |   3|  -14|     |     |     |0252016|
|SIGN                | 481552.70|-1011718.95|1A| 1703|     |   3|  -13|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|FENCE                | 481518.09|-1011549.18|1A| 1670|     |    9|  -46|     |     |     |0252016|
|TWY LT               | 481548.71|-1011724.59|1A| 1706|     |    3|  -10|     |     |     |0252016|
|FENCE                | 481451.09|-1011639.25|1A| 1705|     |    8|  -11|     |     |     |0252016|
|GRD                  | 481550.57|-1011723.43|1A| 1702|     |     |  -14|     |     |     |0252016|
|GRD                  | 481546.98|-1011727.94|1A| 1703|     |     |  -13|     |     |     |0252016|
|TWY LT               | 481550.63|-1011724.13|1A| 1704|     |    2|  -12|     |     |     |0252016|
|RWY LT               | 481555.30|-1011718.90|1A| 1703|     |    2|  -13|     |     |     |0252016|
|RWY LT               | 481554.57|-1011720.12|1A| 1703|     |    2|  -13|     |     |     |0252016|
|GRD                  | 481558.20|-1011713.82|1A| 1698|     |     |  -18|     |     |     |0252016|
|REIL                 | 481556.14|-1011718.15|1A| 1702|     |    2|  -14|     |     |     |0252016|
|REIL                 | 481554.17|-1011721.46|1A| 1702|     |    3|  -14|     |     |     |0252016|
|TREE                 | 481449.17|-1011637.36|1A| 1730|     |     |   14|     |     |     |0252016|
|RWY LT               | 481458.41|-1011603.25|1A| 1658|     |    2|  -58|     |     |     |0252016|
|RWY LT               | 481457.69|-1011604.47|1A| 1658|     |    2|  -58|     |     |     |0252016|
|TREE                 | 481449.14|-1011635.93|1A| 1727|     |     |   11|     |     |     |0252016|
|TREE                 | 481449.90|-1011627.42|1A| 1728|     |     |   12|     |     |     |0252016|
|GRD                  | 481548.55|-1011729.58|1A| 1703|     |     |  -13|     |     |     |0252016|
|GRD                  | 481504.52|-1011552.92|1A| 1658|     |     |  -58|     |     |     |0252016|
|TWY LT               | 481600.02|-1011714.58|1A| 1701|     |    2|  -15|     |     |     |0252016|
|TREE                 | 481500.78|-1011724.97|1A| 1763|     |     |   47|     |     |     |0252016|
|GRD                  | 481550.29|-1011729.80|1A| 1703|     |     |  -13|     |     |     |0252016|
|GRD                  | 481549.25|-1011730.94|1A| 1704|     |     |  -12|     |     |     |0252016|
|TREE                 | 481451.20|-1011613.49|1A| 1674|     |     |  -42|     |     |     |0252016|
|GRD                  | 481501.88|-1011553.27|1A| 1661|     |     |  -55|     |     |     |0252016|
|GRD                  | 481503.85|-1011550.99|1A| 1663|     |     |  -53|     |     |     |0252016|
|GRD                  | 481549.81|-1011732.34|1A| 1707|     |     |   -9|     |     |     |0252016|
|GRD                  | 481503.19|-1011551.03|1A| 1661|     |     |  -55|     |     |     |0252016|
|TREE                 | 481449.97|-1011613.45|1A| 1679|     |     |  -37|     |     |     |0252016|
|POLE                 | 481527.58|-1011744.29|1A| 1740|     |   20|   24|     |     |     |0252016|
|POLE                 | 481528.46|-1011744.28|1A| 1741|     |   21|   25|     |     |     |0252016|
|POLE                 | 481526.69|-1011744.29|1A| 1740|     |   21|   24|     |     |     |0252016|
|POLE                 | 481529.35|-1011744.28|1A| 1741|     |   20|   25|     |     |     |0252016|
|RD (N)               | 481528.04|-1011744.37|1A| 1735|     |     |   19|     |     |     |0252016|
|POLE                 | 481530.25|-1011744.28|1A| 1742|     |   21|   26|     |     |     |0252016|
|POLE                 | 481531.16|-1011744.21|1A| 1741|     |   21|   25|     |     |     |0252016|
|RD (N)               | 481529.78|-1011744.38|1A| 1735|     |     |   19|     |     |     |0252016|
|RD (N)               | 481528.71|-1011744.46|1A| 1735|     |     |   19|     |     |     |0252016|
|RD (N)               | 481530.77|-1011744.37|1A| 1736|     |     |   20|     |     |     |0252016|
|RD (N)               | 481531.74|-1011744.34|1A| 1736|     |     |   20|     |     |     |0252016|
|TREE                 | 481448.93|-1011612.99|1A| 1685|     |     |  -31|     |     |     |0252016|
|POLE                 | 481528.01|-1011745.39|1A| 1741|     |   21|   25|     |     |     |0252016|
|POLE                 | 481528.91|-1011745.39|1A| 1741|     |   20|   25|     |     |     |0252016|
```

```
|POLE                 | 481527.11|-1011745.47|1A| 1740|     |   21|   24|     |     |     |0252016|
|POLE                 | 481526.25|-1011745.58|1A| 1740|     |   20|   24|     |     |     |0252016|
|POLE                 | 481529.79|-1011745.54|1A| 1741|     |   21|   25|     |     |     |0252016|
|POLE                 | 481530.68|-1011745.63|1A| 1741|     |   20|   25|     |     |     |0252016|
|POLE                 | 481531.57|-1011745.64|1A| 1740|     |   20|   24|     |     |     |0252016|
|BLDG                 | 481551.02|-1011736.62|1A| 1733|     |   24|   17|     |     |     |0252016|
|SIGN                 | 481526.84|-1011747.16|1A| 1742|     |   21|   26|     |     |     |0252016|
|SIGN                 | 481528.09|-1011747.17|1A| 1741|     |   20|   25|     |     |     |0252016|
|SIGN                 | 481531.01|-1011747.18|1A| 1742|     |   20|   26|     |     |     |0252016|
|POLE                 | 481528.61|-1011747.38|1A| 1748|     |   27|   32|     |     |     |0252016|
|TREE                 | 481447.44|-1011611.84|1A| 1671|     |     |  -45|     |     |     |0252016|
|POLE                 | 481529.59|-1011747.50|1A| 1748|     |   27|   32|     |     |     |0252016|
|BLDG                 | 481531.39|-1011747.55|1A| 1742|     |   19|   26|     |     |     |0252016|
|POLE                 | 481531.54|-1011747.95|1A| 1747|     |   24|   31|     |     |     |0252016|
|TREE                 | 481530.95|-1011748.25|1A| 1751|     |     |   35|     |     |     |0252016|
|BLDG                 | 481529.07|-1011748.69|1A| 1753|     |   32|   37|     |     |     |0252016|
|POLE                 | 481529.59|-1011748.89|1A| 1749|     |   29|   33|     |     |     |0252016|
|POLE                 | 481527.47|-1011749.03|1A| 1750|     |   29|   34|     |     |     |0252016|
|POLE                 | 481526.98|-1011749.03|1A| 1749|     |   28|   33|     |     |     |0252016|
|TREE                 | 481530.93|-1011749.60|1A| 1751|     |     |   35|     |     |     |0252016|
|POLE                 | 481529.74|-1011749.97|1A| 1748|     |   28|   32|     |     |     |0252016|
|TREE                 | 481530.99|-1011749.86|1A| 1750|     |     |   34|     |     |     |0252016|
|POLE                 | 481531.54|-1011749.96|1A| 1746|     |   24|   30|     |     |     |0252016|
|BLDG                 | 481527.77|-1011750.58|1A| 1742|     |   20|   26|     |     |     |0252016|
|POLE                 | 481528.65|-1011750.87|1A| 1748|     |   28|   32|     |     |     |0252016|
|POLE                 | 481529.26|-1011750.89|1A| 1748|     |   28|   32|     |     |     |0252016|
|ANT                  | 481609.71|-1011711.14|1A| 1740|     |   38|   24|     |     |     |0252016|
|POLE                 | 481527.78|-1011751.27|1A| 1751|     |   30|   35|     |     |     |0252016|
|POLE                 | 481526.21|-1011751.25|1A| 1756|     |   36|   40|     |     |     |0252016|
|POLE                 | 481528.81|-1011751.26|1A| 1756|     |   36|   40|     |     |     |0252016|
|POLE                 | 481529.81|-1011751.29|1A| 1750|     |   30|   34|     |     |     |0252016|
|POLE                 | 481530.52|-1011751.27|1A| 1754|     |   33|   38|     |     |     |0252016|
|POLE                 | 481531.53|-1011751.25|1A| 1755|     |   33|   39|     |     |     |0252016|
|TREE                 | 481532.01|-1011752.08|1A| 1756|     |     |   40|     |     |     |0252016|
|TREE                 | 481521.92|-1011752.02|1A| 1776|     |     |   60|     |     |     |0252016|
|TREE                 | 481520.28|-1011751.78|1A| 1764|     |     |   48|     |     |     |0252016|
|TREE                 | 481526.04|-1011752.96|1A| 1745|     |     |   29|     |     |     |0252016|
|TREE                 | 481531.50|-1011753.03|1A| 1772|     |     |   56|     |     |     |0252016|
|TREE                 | 481530.64|-1011753.17|1A| 1763|     |     |   47|     |     |     |0252016|
|TREE                 | 481530.93|-1011753.20|1A| 1769|     |     |   53|     |     |     |0252016|
|TREE                 | 481531.82|-1011753.12|1A| 1773|     |     |   57|     |     |     |0252016|
|TREE                 | 481517.31|-1011751.99|1A| 1781|     |     |   65|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|TREE                    | 481522.81|-1011753.32|1A| 1763|     |      |  47|     |     |     |0252016|
|TREE                    | 481526.01|-1011753.63|1A| 1745|     |      |  29|     |     |     |0252016|
|TREE                    | 481526.00|-1011753.91|1A| 1747|     |      |  31|     |     |     |0252016|
|TREE                    | 481531.92|-1011753.73|1A| 1769|     |      |  53|     |     |     |0252016|
|TREE                    | 481530.57|-1011753.97|1A| 1757|     |      |  41|     |     |     |0252016|
|TREE                    | 481521.74|-1011753.67|1A| 1771|     |      |  55|     |     |     |0252016|
|POLE                    | 481527.63|-1011754.28|1A| 1750|     |  28  |  34|     |     |     |0252016|
|TREE                    | 481520.75|-1011753.59|1A| 1772|     |      |  56|     |     |     |0252016|
|POLE                    | 481528.90|-1011754.28|1A| 1753|     |  31  |  37|     |     |     |0252016|
|POLE                    | 481526.65|-1011754.30|1A| 1751|     |  30  |  35|     |     |     |0252016|
|POLE                    | 481529.81|-1011754.26|1A| 1751|     |  30  |  35|     |     |     |0252016|
|TREE                    | 481531.70|-1011754.46|1A| 1766|     |      |  50|     |     |     |0252016|
|TREE                    | 481530.72|-1011754.58|1A| 1759|     |      |  43|     |     |     |0252016|
|TREE                    | 481531.45|-1011754.62|1A| 1761|     |      |  45|     |     |     |0252016|
|TREE                    | 481532.01|-1011754.57|1A| 1759|     |      |  43|     |     |     |0252016|
|TREE                    | 481530.56|-1011755.08|1A| 1754|     |      |  38|     |     |     |0252016|
|TREE                    | 481531.50|-1011755.10|1A| 1752|     |      |  36|     |     |     |0252016|
|TREE                    | 481518.18|-1011754.48|1A| 1770|     |      |  54|     |     |     |0252016|
|TREE                    | 481530.95|-1011755.66|1A| 1763|     |      |  47|     |     |     |0252016|
|TREE                    | 481530.45|-1011755.80|1A| 1758|     |      |  42|     |     |     |0252016|
|TREE                    | 481514.88|-1011753.61|1A| 1765|     |      |  49|     |     |     |0252016|
|TREE                    | 481528.69|-1011756.26|1A| 1757|     |      |  41|     |     |     |0252016|
|TREE                    | 481530.61|-1011756.19|1A| 1760|     |      |  44|     |     |     |0252016|
|POLE                    | 481555.17|-1011743.97|1A| 1753|     |  37  |  37|     |     |     |0252016|
|TREE                    | 481531.99|-1011756.14|1A| 1758|     |      |  42|     |     |     |0252016|
|TREE                    | 481531.14|-1011756.28|1A| 1770|     |      |  54|     |     |     |0252016|
|TREE                    | 481529.17|-1011756.49|1A| 1762|     |      |  46|     |     |     |0252016|
|TREE                    | 481529.50|-1011756.54|1A| 1768|     |      |  52|     |     |     |0252016|
|TREE                    | 481532.04|-1011756.29|1A| 1758|     |      |  42|     |     |     |0252016|
|TREE                    | 481528.93|-1011756.74|1A| 1763|     |      |  47|     |     |     |0252016|
|TREE                    | 481520.39|-1011756.04|1A| 1780|     |      |  64|     |     |     |0252016|
|POLE                    | 481526.46|-1011756.80|1A| 1750|     |  28  |  34|     |     |     |0252016|
|TREE                    | 481528.68|-1011756.88|1A| 1771|     |      |  55|     |     |     |0252016|
|TREE                    | 481531.14|-1011756.76|1A| 1754|     |      |  38|     |     |     |0252016|
|TREE                    | 481530.97|-1011756.82|1A| 1751|     |      |  35|     |     |     |0252016|
|TREE                    | 481532.15|-1011756.71|1A| 1753|     |      |  37|     |     |     |0252016|
|TREE                    | 481516.07|-1011755.37|1A| 1775|     |      |  59|     |     |     |0252016|
|TREE                    | 481530.59|-1011757.23|1A| 1755|     |      |  39|     |     |     |0252016|
|TREE                    | 481531.56|-1011757.23|1A| 1761|     |      |  45|     |     |     |0252016|
|POLE                    | 481556.57|-1011743.96|1A| 1754|     |  39  |  38|     |     |     |0252016|
|TREE                    | 481528.79|-1011757.52|1A| 1760|     |      |  44|     |     |     |0252016|
|TREE                    | 481529.51|-1011757.49|1A| 1762|     |      |  46|     |     |     |0252016|
```

```
|POLE                    | 481529.92|-1011757.56|1A| 1752|     |  30  |  36|     |     |     |0252016|
|POLE                    | 481530.57|-1011757.56|1A| 1751|     |  29  |  35|     |     |     |0252016|
|TREE                    | 481525.89|-1011757.78|1A| 1761|     |      |  45|     |     |     |0252016|
|POLE                    | 481532.04|-1011757.56|1A| 1751|     |  28  |  35|     |     |     |0252016|
|TREE                    | 481529.79|-1011757.88|1A| 1780|     |      |  64|     |     |     |0252016|
|TREE                    | 481531.68|-1011757.72|1A| 1775|     |      |  59|     |     |     |0252016|
|TREE                    | 481529.70|-1011758.07|1A| 1782|     |      |  66|     |     |     |0252016|
|POLE                    | 481555.62|-1011745.84|1A| 1754|     |  40  |  38|     |     |     |0252016|
|TREE                    | 481530.52|-1011758.28|1A| 1764|     |      |  48|     |     |     |0252016|
|TREE                    | 481529.82|-1011758.40|1A| 1777|     |      |  61|     |     |     |0252016|
|TREE                    | 481522.22|-1011758.13|1A| 1779|     |      |  63|     |     |     |0252016|
|TREE                    | 481529.69|-1011758.49|1A| 1777|     |      |  61|     |     |     |0252016|
|TREE                    | 481526.26|-1011758.72|1A| 1765|     |      |  49|     |     |     |0252016|
|TREE                    | 481526.56|-1011758.74|1A| 1758|     |      |  42|     |     |     |0252016|
|TREE                    | 481526.13|-1011758.73|1A| 1764|     |      |  48|     |     |     |0252016|
|TREE                    | 481526.36|-1011758.74|1A| 1760|     |      |  44|     |     |     |0252016|
|TREE                    | 481527.01|-1011758.85|1A| 1756|     |      |  40|     |     |     |0252016|
|TREE                    | 481529.74|-1011758.79|1A| 1772|     |      |  56|     |     |     |0252016|
|TREE                    | 481526.79|-1011758.99|1A| 1759|     |      |  43|     |     |     |0252016|
|TREE                    | 481530.59|-1011758.96|1A| 1759|     |      |  43|     |     |     |0252016|
|TREE                    | 481529.79|-1011759.03|1A| 1775|     |      |  59|     |     |     |0252016|
|TREE                    | 481529.77|-1011759.29|1A| 1776|     |      |  60|     |     |     |0252016|
|TREE                    | 481516.39|-1011757.63|1A| 1781|     |      |  65|     |     |     |0252016|
|TREE                    | 481531.96|-1011759.13|1A| 1769|     |      |  53|     |     |     |0252016|
|TREE                    | 481519.61|-1011758.71|1A| 1783|     |      |  67|     |     |     |0252016|
|TREE                    | 481531.03|-1011759.45|1A| 1763|     |      |  47|     |     |     |0252016|
|TREE                    | 481531.71|-1011759.38|1A| 1765|     |      |  49|     |     |     |0252016|
|TREE                    | 481531.54|-1011759.43|1A| 1769|     |      |  53|     |     |     |0252016|
|POLE                    | 481527.51|-1011759.73|1A| 1753|     |  30  |  37|     |     |     |0252016|
|POLE                    | 481526.05|-1011759.74|1A| 1756|     |  34  |  40|     |     |     |0252016|
|POLE                    | 481528.99|-1011759.74|1A| 1753|     |  30  |  37|     |     |     |0252016|
|POLE                    | 481529.81|-1011759.70|1A| 1753|     |  29  |  37|     |     |     |0252016|
|TREE                    | 481530.63|-1011800.11|1A| 1763|     |      |  47|     |     |     |0252016|
|TREE                    | 481517.15|-1011758.80|1A| 1785|     |      |  69|     |     |     |0252016|
|TREE                    | 481530.82|-1011800.24|1A| 1763|     |      |  47|     |     |     |0252016|
|TREE                    | 481532.24|-1011800.43|1A| 1760|     |      |  44|     |     |     |0252016|
|POLE                    | 481556.87|-1011747.65|1A| 1768|     |  54  |  52|     |     |     |0252016|
|TREE                    | 481530.61|-1011800.77|1A| 1758|     |      |  42|     |     |     |0252016|
|TREE                    | 481531.77|-1011800.77|1A| 1769|     |      |  53|     |     |     |0252016|
|TREE                    | 481531.45|-1011800.98|1A| 1771|     |      |  55|     |     |     |0252016|
|TREE                    | 481514.40|-1011759.07|1A| 1780|     |      |  64|     |     |     |0252016|
|TREE                    | 481532.00|-1011801.27|1A| 1763|     |      |  47|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|TREE                 | 481530.57|-1011801.54|1A| 1763|     |      |   47|     |     |     |0252016|
|TREE                 | 481530.98|-1011801.68|1A| 1778|     |      |   62|     |     |     |0252016|
|TREE                 | 481530.55|-1011801.98|1A| 1757|     |      |   41|     |     |     |0252016|
|TREE                 | 481532.12|-1011801.91|1A| 1758|     |      |   42|     |     |     |0252016|
|TREE                 | 481531.66|-1011801.99|1A| 1761|     |      |   45|     |     |     |0252016|
|TREE                 | 481531.50|-1011802.02|1A| 1759|     |      |   43|     |     |     |0252016|
|TREE                 | 481526.51|-1011802.24|1A| 1768|     |      |   52|     |     |     |0252016|
|TREE                 | 481529.49|-1011802.22|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481525.72|-1011802.24|1A| 1767|     |      |   51|     |     |     |0252016|
|TREE                 | 481526.05|-1011802.28|1A| 1765|     |      |   49|     |     |     |0252016|
|TREE                 | 481531.90|-1011802.09|1A| 1775|     |      |   59|     |     |     |0252016|
|POLE                 | 481530.01|-1011802.33|1A| 1755|     |   32|   39|     |     |     |0252016|
|TREE                 | 481532.42|-1011802.15|1A| 1767|     |      |   51|     |     |     |0252016|
|TREE                 | 481526.46|-1011802.88|1A| 1771|     |      |   55|     |     |     |0252016|
|TREE                 | 481530.84|-1011802.86|1A| 1763|     |      |   47|     |     |     |0252016|
|TREE                 | 481531.05|-1011802.94|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481531.67|-1011802.88|1A| 1767|     |      |   51|     |     |     |0252016|
|TREE                 | 481531.45|-1011802.93|1A| 1762|     |      |   46|     |     |     |0252016|
|TREE                 | 481531.26|-1011802.97|1A| 1762|     |      |   46|     |     |     |0252016|
|TREE                 | 481531.86|-1011802.95|1A| 1778|     |      |   62|     |     |     |0252016|
|TREE                 | 481530.48|-1011803.12|1A| 1765|     |      |   49|     |     |     |0252016|
|TREE                 | 481532.30|-1011802.95|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481530.44|-1011803.45|1A| 1756|     |      |   40|     |     |     |0252016|
|TREE                 | 481542.78|-1011800.39|1A| 1786|     |      |   70|     |     |     |0252016|
|TREE                 | 481530.47|-1011803.75|1A| 1769|     |      |   53|     |     |     |0252016|
|BLDG                 | 481531.92|-1011803.92|1A| 1757|     |   30|   41|     |     |     |0252016|
|TREE                 | 481530.43|-1011804.15|1A| 1766|     |      |   50|     |     |     |0252016|
|COMMUNICATION TWR    | 481501.59|-1011754.80|1A| 1822|     |  126|  106|     |     |     |0252016|
|TREE                 | 481543.96|-1011801.23|1A| 1780|     |      |   64|     |     |     |0252016|
|TREE                 | 481530.46|-1011804.95|1A| 1758|     |      |   42|     |     |     |0252016|
|POLE                 | 481530.63|-1011805.38|1A| 1759|     |   34|   43|     |     |     |0252016|
|POLE                 | 481531.92|-1011805.31|1A| 1760|     |   35|   44|     |     |     |0252016|
|TREE                 | 481526.93|-1011805.63|1A| 1763|     |      |   47|     |     |     |0252016|
|TREE                 | 481527.48|-1011805.64|1A| 1760|     |      |   44|     |     |     |0252016|
|TREE                 | 481527.50|-1011805.84|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481527.48|-1011806.02|1A| 1762|     |      |   46|     |     |     |0252016|
|TREE                 | 481545.63|-1011801.77|1A| 1795|     |      |   79|     |     |     |0252016|
|TREE                 | 481527.47|-1011806.26|1A| 1760|     |      |   44|     |     |     |0252016|
|TREE                 | 481529.69|-1011807.14|1A| 1770|     |      |   54|     |     |     |0252016|
|TREE                 | 481529.34|-1011807.26|1A| 1778|     |      |   62|     |     |     |0252016|
|TREE                 | 481526.73|-1011807.36|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481531.36|-1011807.32|1A| 1760|     |      |   44|     |     |     |0252016|
```

```
|TREE                 | 481545.65|-1011803.38|1A| 1803|     |      |   87|     |     |     |0252016|
|TREE                 | 481529.66|-1011808.70|1A| 1770|     |      |   54|     |     |     |0252016|
|TREE                 | 481526.23|-1011809.50|1A| 1778|     |      |   62|     |     |     |0252016|
|TREE                 | 481529.06|-1011809.90|1A| 1763|     |      |   47|     |     |     |0252016|
|STEEPLE              | 481531.45|-1011809.76|1A| 1768|     |   41|   52|     |     |     |0252016|
|TREE                 | 481529.61|-1011810.40|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481526.87|-1011810.55|1A| 1774|     |      |   58|     |     |     |0252016|
|TREE                 | 481529.05|-1011810.76|1A| 1776|     |      |   60|     |     |     |0252016|
|TREE                 | 481545.19|-1011806.86|1A| 1803|     |      |   87|     |     |     |0252016|
|TREE                 | 481527.12|-1011810.98|1A| 1764|     |      |   48|     |     |     |0252016|
|TREE                 | 481528.15|-1011811.10|1A| 1780|     |      |   64|     |     |     |0252016|
|TREE                 | 481528.54|-1011811.10|1A| 1791|     |      |   75|     |     |     |0252016|
|POLE                 | 481610.77|-1011743.93|1A| 1744|     |   28|   28|     |     |     |0252016|
|TREE                 | 481525.58|-1011811.67|1A| 1782|     |      |   66|     |     |     |0252016|
|TREE                 | 481527.84|-1011812.41|1A| 1778|     |      |   62|     |     |     |0252016|
|POLE                 | 481610.66|-1011745.81|1A| 1744|     |   29|   28|     |     |     |0252016|
|TREE                 | 481529.86|-1011812.64|1A| 1767|     |      |   51|     |     |     |0252016|
|TREE                 | 481528.11|-1011812.72|1A| 1772|     |      |   56|     |     |     |0252016|
|TREE                 | 481527.63|-1011812.73|1A| 1781|     |      |   65|     |     |     |0252016|
|TREE                 | 481526.95|-1011812.77|1A| 1777|     |      |   61|     |     |     |0252016|
|TREE                 | 481528.36|-1011812.81|1A| 1772|     |      |   56|     |     |     |0252016|
|TREE                 | 481529.42|-1011812.92|1A| 1785|     |      |   69|     |     |     |0252016|
|POLE                 | 481612.54|-1011743.92|1A| 1745|     |   28|   29|     |     |     |0252016|
|TREE                 | 481548.05|-1011808.19|1A| 1806|     |      |   90|     |     |     |0252016|
|TREE                 | 481528.80|-1011813.47|1A| 1798|     |      |   82|     |     |     |0252016|
|TREE                 | 481529.74|-1011813.46|1A| 1783|     |      |   67|     |     |     |0252016|
|TREE                 | 481527.05|-1011813.52|1A| 1775|     |      |   59|     |     |     |0252016|
|TREE                 | 481529.10|-1011813.68|1A| 1783|     |      |   67|     |     |     |0252016|
|TREE                 | 481532.10|-1011813.49|1A| 1770|     |      |   54|     |     |     |0252016|
|TREE                 | 481532.24|-1011813.49|1A| 1769|     |      |   53|     |     |     |0252016|
|TREE                 | 481529.92|-1011813.71|1A| 1768|     |      |   52|     |     |     |0252016|
|TREE                 | 481529.10|-1011813.97|1A| 1785|     |      |   69|     |     |     |0252016|
|POLE                 | 481612.13|-1011745.81|1A| 1744|     |   28|   28|     |     |     |0252016|
|TREE                 | 481551.05|-1011807.89|1A| 1810|     |      |   94|     |     |     |0252016|
|TREE                 | 481530.71|-1011814.67|1A| 1770|     |      |   54|     |     |     |0252016|
|TREE                 | 481531.87|-1011814.63|1A| 1789|     |      |   73|     |     |     |0252016|
|TREE                 | 481531.51|-1011814.72|1A| 1797|     |      |   81|     |     |     |0252016|
|TREE                 | 481532.73|-1011814.59|1A| 1776|     |      |   60|     |     |     |0252016|
|TREE                 | 481527.55|-1011814.92|1A| 1775|     |      |   59|     |     |     |0252016|
|TREE                 | 481525.43|-1011814.98|1A| 1774|     |      |   58|     |     |     |0252016|
|TREE                 | 481531.27|-1011814.96|1A| 1788|     |      |   72|     |     |     |0252016|
|POLE                 | 481614.29|-1011743.91|1A| 1746|     |   29|   30|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|TREE                    | 481528.14|-1011815.21|1A| 1769|     |      |   53|     |     |     |0252016|
|TREE                    | 481533.20|-1011814.84|1A| 1782|     |      |   66|     |     |     |0252016|
|TREE                    | 481528.33|-1011815.23|1A| 1783|     |      |   67|     |     |     |0252016|
|TREE                    | 481532.15|-1011815.13|1A| 1798|     |      |   82|     |     |     |0252016|
|TREE                    | 481526.42|-1011815.49|1A| 1773|     |      |   57|     |     |     |0252016|
|TREE                    | 481529.47|-1011815.56|1A| 1775|     |      |   59|     |     |     |0252016|
|TREE                    | 481527.79|-1011815.71|1A| 1784|     |      |   68|     |     |     |0252016|
|TREE                    | 481528.42|-1011815.72|1A| 1775|     |      |   59|     |     |     |0252016|
|POLE                    | 481613.82|-1011745.80|1A| 1745|     |   29|   29|     |     |     |0252016|
|TREE                    | 481531.40|-1011815.84|1A| 1800|     |      |   84|     |     |     |0252016|
|TREE                    | 481525.07|-1011815.97|1A| 1777|     |      |   61|     |     |     |0252016|
|TREE                    | 481525.77|-1011816.10|1A| 1769|     |      |   53|     |     |     |0252016|
|TREE                    | 481527.97|-1011816.87|1A| 1771|     |      |   55|     |     |     |0252016|
|POLE                    | 481616.04|-1011743.91|1A| 1745|     |   29|   29|     |     |     |0252016|
|TREE                    | 481527.49|-1011817.19|1A| 1783|     |      |   67|     |     |     |0252016|
|TREE                    | 481526.73|-1011817.19|1A| 1785|     |      |   69|     |     |     |0252016|
|TREE                    | 481525.91|-1011817.20|1A| 1781|     |      |   65|     |     |     |0252016|
|TREE                    | 481528.66|-1011817.33|1A| 1771|     |      |   55|     |     |     |0252016|
|TREE                    | 481532.75|-1011817.17|1A| 1789|     |      |   73|     |     |     |0252016|
|TREE                    | 481532.35|-1011817.22|1A| 1775|     |      |   59|     |     |     |0252016|
|TREE                    | 481532.98|-1011817.22|1A| 1783|     |      |   67|     |     |     |0252016|
|POLE                    | 481615.50|-1011745.80|1A| 1745|     |   30|   29|     |     |     |0252016|
|TREE                    | 481526.85|-1011817.91|1A| 1809|     |      |   93|     |     |     |0252016|
|TREE                    | 481529.84|-1011818.24|1A| 1787|     |      |   71|     |     |     |0252016|
|TREE                    | 481526.85|-1011818.99|1A| 1777|     |      |   61|     |     |     |0252016|
|POLE                    | 481617.91|-1011743.92|1A| 1756|     |   38|   40|     |     |     |0252016|
|TREE                    | 481525.04|-1011819.23|1A| 1778|     |      |   62|     |     |     |0252016|
|TREE                    | 481528.82|-1011819.31|1A| 1794|     |      |   78|     |     |     |0252016|
|TREE                    | 481529.07|-1011819.48|1A| 1787|     |      |   71|     |     |     |0252016|
|TREE                    | 481527.68|-1011819.59|1A| 1775|     |      |   59|     |     |     |0252016|
|TREE                    | 481528.17|-1011819.63|1A| 1783|     |      |   67|     |     |     |0252016|
|TREE                    | 481532.26|-1011819.39|1A| 1777|     |      |   61|     |     |     |0252016|
|TREE                    | 481527.99|-1011819.66|1A| 1777|     |      |   61|     |     |     |0252016|
|TREE                    | 481526.97|-1011819.66|1A| 1802|     |      |   86|     |     |     |0252016|
|TREE                    | 481528.35|-1011819.69|1A| 1781|     |      |   65|     |     |     |0252016|
|POLE                    | 481617.26|-1011745.80|1A| 1756|     |   38|   40|     |     |     |0252016|
|TREE                    | 481530.72|-1011820.10|1A| 1796|     |      |   80|     |     |     |0252016|
|TREE                    | 481531.15|-1011820.12|1A| 1801|     |      |   85|     |     |     |0252016|
|TREE                    | 481533.27|-1011819.98|1A| 1805|     |      |   89|     |     |     |0252016|
|TREE                    | 481532.96|-1011820.03|1A| 1792|     |      |   76|     |     |     |0252016|
|TREE                    | 481524.79|-1011820.42|1A| 1785|     |      |   69|     |     |     |0252016|
|TREE                    | 481533.31|-1011820.76|1A| 1779|     |      |   63|     |     |     |0252016|
```

```
|TREE                    | 481526.48|-1011821.37|1A| 1775|     |      |   59|     |     |     |0252016|
|TREE                    | 481525.58|-1011821.76|1A| 1776|     |      |   60|     |     |     |0252016|
|POLE                    | 481619.23|-1011745.80|1A| 1756|     |   38|   40|     |     |     |0252016|
|TREE                    | 481525.86|-1011822.64|1A| 1781|     |      |   65|     |     |     |0252016|
|TREE                    | 481529.54|-1011822.71|1A| 1776|     |      |   60|     |     |     |0252016|
|TREE                    | 481526.19|-1011822.77|1A| 1777|     |      |   61|     |     |     |0252016|
|TREE                    | 481532.60|-1011824.17|1A| 1786|     |      |   70|     |     |     |0252016|
|TREE                    | 481532.46|-1011824.21|1A| 1779|     |      |   63|     |     |     |0252016|
|TREE                    | 481532.00|-1011824.78|1A| 1780|     |      |   64|     |     |     |0252016|
|TREE                    | 481532.74|-1011824.89|1A| 1804|     |      |   88|     |     |     |0252016|
|TREE                    | 481533.49|-1011825.03|1A| 1782|     |      |   66|     |     |     |0252016|
|TREE                    | 481525.16|-1011825.54|1A| 1782|     |      |   66|     |     |     |0252016|
|TREE                    | 481526.08|-1011825.73|1A| 1788|     |      |   72|     |     |     |0252016|
|TREE                    | 481533.32|-1011827.57|1A| 1804|     |      |   88|     |     |     |0252016|
|TREE                    | 481533.78|-1011827.82|1A| 1804|     |      |   88|     |     |     |0252016|
|POLE                    | 481448.04|-1011511.10|1A| 1702|     |   34|  -14|     |     |     |0252016|
|TREE                    | 481533.52|-1011828.15|1A| 1806|     |      |   90|     |     |     |0252016|
|TREE                    | 481533.33|-1011828.50|1A| 1800|     |      |   84|     |     |     |0252016|
|TREE                    | 481435.83|-1011525.14|1A| 1697|     |      |  -19|     |     |     |0252016|
|TREE                    | 481435.14|-1011525.29|1A| 1697|     |      |  -19|     |     |     |0252016|
|TREE                    | 481639.93|-1011626.85|1B| 1716|     |      |    0|     |     |     |0252016|
|TREE                    | 481527.13|-1011830.71|1A| 1787|     |      |   71|     |     |     |0252016|
|TREE                    | 481449.28|-1011507.13|1A| 1690|     |      |  -26|     |     |     |0252016|
|TREE                    | 481527.45|-1011830.83|1A| 1789|     |      |   73|     |     |     |0252016|
|TREE                    | 481529.82|-1011830.87|1A| 1786|     |      |   70|     |     |     |0252016|
|TREE                    | 481528.55|-1011831.03|1A| 1790|     |      |   74|     |     |     |0252016|
|TREE                    | 481524.42|-1011831.29|1A| 1814|     |      |   98|     |     |     |0252016|
|TREE                    | 481633.60|-1011730.34|1A| 1759|     |      |   43|     |     |     |0252016|
|TREE                    | 481525.08|-1011831.71|1A| 1785|     |      |   69|     |     |     |0252016|
|TREE                    | 481524.83|-1011832.07|1A| 1794|     |      |   78|     |     |     |0252016|
|TREE                    | 481525.89|-1011832.29|1A| 1790|     |      |   74|     |     |     |0252016|
|TREE                    | 481525.72|-1011448.99|1A| 1687|     |      |  -29|     |     |     |0252016|
|BLDG                    | 481526.80|-1011832.87|1A| 1803|     |   59|   87|     |     |     |0252016|
|TREE                    | 481524.45|-1011832.88|1A| 1791|     |      |   75|     |     |     |0252016|
|TREE                    | 481524.35|-1011833.36|1A| 1794|     |      |   78|     |     |     |0252016|
|TREE                    | 481431.85|-1011525.13|1A| 1696|     |      |  -20|     |     |     |0252016|
|TREE                    | 481524.64|-1011833.54|1A| 1792|     |      |   76|     |     |     |0252016|
|TREE                    | 481533.68|-1011833.89|1A| 1790|     |      |   74|     |     |     |0252016|
|TREE                    | 481530.18|-1011447.27|1A| 1683|     |      |  -33|     |     |     |0252016|
|TREE                    | 481642.71|-1011625.00|1B| 1719|     |      |    3|     |     |     |0252016|
|TREE                    | 481524.47|-1011834.60|1A| 1793|     |      |   77|     |     |     |0252016|
|BLDG                    | 481414.78|-1011715.17|1B| 1744|     |  194|   28|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|TREE                  | 481527.23|-1011446.32|1A| 1696|     |     |  -20|     |     |     |0252016|
|TREE                  | 481526.95|-1011836.55|1A| 1792|     |     |   76|     |     |     |0252016|
|TREE                  | 481527.60|-1011836.55|1A| 1792|     |     |   76|     |     |     |0252016|
|TREE                  | 481527.15|-1011836.56|1A| 1794|     |     |   78|     |     |     |0252016|
|TREE                  | 481525.76|-1011836.53|1A| 1791|     |     |   75|     |     |     |0252016|
|TREE                  | 481525.52|-1011836.53|1A| 1791|     |     |   75|     |     |     |0252016|
|TREE                  | 481525.96|-1011836.56|1A| 1792|     |     |   76|     |     |     |0252016|
|TREE                  | 481528.42|-1011836.58|1A| 1791|     |     |   75|     |     |     |0252016|
|TREE                  | 481526.27|-1011836.57|1A| 1792|     |     |   76|     |     |     |0252016|
|TREE                  | 481528.65|-1011836.59|1A| 1791|     |     |   75|     |     |     |0252016|
|TREE                  | 481428.30|-1011526.43|1A| 1692|     |     |  -24|     |     |     |0252016|
|TREE                  | 481525.26|-1011837.53|1A| 1797|     |     |   81|     |     |     |0252016|
|COMMUNICATION TWR     | 481536.31|-1011836.96|1A| 1841|     |  103|  125|     |     |     |0252016|
|TREE                  | 481550.57|-1011832.55|1A| 1824|     |     |  108|     |     |     |0252016|
|TK                    | 481434.44|-1011515.10|1A| 1701|     |   60|  -15|     |     |     |0252016|
|TREE                  | 481525.27|-1011837.97|1A| 1795|     |     |   79|     |     |     |0252016|
|TREE                  | 481527.35|-1011838.08|1A| 1794|     |     |   78|     |     |     |0252016|
|TREE                  | 481527.19|-1011838.24|1A| 1796|     |     |   80|     |     |     |0252016|
|TREE                  | 481526.63|-1011838.57|1A| 1794|     |     |   78|     |     |     |0252016|
|TREE                  | 481525.37|-1011838.54|1A| 1795|     |     |   79|     |     |     |0252016|
|TREE                  | 481525.06|-1011839.05|1A| 1797|     |     |   81|     |     |     |0252016|
|TREE                  | 481426.79|-1011525.21|1A| 1694|     |     |  -22|     |     |     |0252016|
|TREE                  | 481525.48|-1011839.82|1A| 1800|     |     |   84|     |     |     |0252016|
|BLDG                  | 481525.02|-1011840.24|1A| 1789|     |   32|   73|     |     |     |0252016|
|TREE                  | 481504.17|-1011835.49|1A| 1799|     |     |   83|     |     |     |0252016|
|TREE                  | 481528.74|-1011440.71|1A| 1685|     |     |  -31|     |     |     |0252016|
|TRMSN TWR             | 481425.73|-1011523.64|1A| 1696|     |   70|  -20|     |     |     |0252016|
|TREE                  | 481629.45|-1011758.02|1A| 1775|     |     |   59|     |     |     |0252016|
|TREE                  | 481610.56|-1011823.16|1A| 1798|     |     |   82|     |     |     |0252016|
|TREE                  | 481609.93|-1011823.79|1A| 1808|     |     |   92|     |     |     |0252016|
|TREE                  | 481525.23|-1011842.59|1A| 1798|     |     |   82|     |     |     |0252016|
|TREE                  | 481519.80|-1011842.20|1A| 1832|     |     |  116|     |     |     |0252016|
|TREE                  | 481525.20|-1011842.79|1A| 1800|     |     |   84|     |     |     |0252016|
|TRMSN TWR             | 481424.83|-1011523.01|1A| 1694|     |   68|  -22|     |     |     |0252016|
|TK                    | 481427.75|-1011514.62|1A| 1705|     |   63|  -11|     |     |     |0252016|
|TREE                  | 481649.29|-1011705.71|1B| 1756|     |     |   40|     |     |     |0252016|
|POLE                  | 481522.97|-1011846.05|1A| 1807|     |   39|   91|     |     |     |0252016|
|TREE                  | 481632.29|-1011803.60|1A| 1782|     |     |   66|     |     |     |0252016|
|TREE                  | 481632.28|-1011803.85|1A| 1780|     |     |   64|     |     |     |0252016|
|POLE                  | 481530.98|-1011848.74|1A| 1787|     |   42|   71|     |     |     |0252016|
|TRMSN TWR             | 481425.72|-1011511.45|1A| 1697|     |   62|  -19|     |     |     |0252016|
|TREE                  | 481633.54|-1011803.29|1A| 1786|     |     |   70|     |     |     |0252016|
```

```
|TREE                  | 481633.28|-1011803.85|1A| 1801|     |     |   85|     |     |     |0252016|
|POLE                  | 481634.27|-1011802.53|1A| 1758|     |   30|   42|     |     |     |0252016|
|TREE                  | 481633.22|-1011804.96|1A| 1791|     |     |   75|     |     |     |0252016|
|TREE                  | 481634.04|-1011803.86|1A| 1784|     |     |   68|     |     |     |0252016|
|TREE                  | 481634.63|-1011804.98|1A| 1796|     |     |   80|     |     |     |0252016|
|TREE                  | 481634.60|-1011805.30|1A| 1793|     |     |   77|     |     |     |0252016|
|TREE                  | 481634.54|-1011805.71|1A| 1785|     |     |   69|     |     |     |0252016|
|POLE                  | 481634.28|-1011807.43|1A| 1757|     |   29|   41|     |     |     |0252016|
|POLE                  | 481530.63|-1011853.10|1A| 1790|     |   42|   74|     |     |     |0252016|
|COMMUNICATION TWR     | 481638.94|-1011759.25|1A| 1800|     |   72|   84|     |     |     |0252016|
|FENCE                 | 481528.60|-1011425.62|1A| 1682|     |    4|  -34|     |     |     |0252016|
|FENCE                 | 481530.49|-1011425.67|1A| 1677|     |    4|  -39|     |     |     |0252016|
|FENCE                 | 481528.04|-1011425.59|1A| 1682|     |    4|  -34|     |     |     |0252016|
|FENCE                 | 481526.99|-1011425.54|1A| 1680|     |    4|  -36|     |     |     |0252016|
|TREE                  | 481632.81|-1011814.55|1A| 1786|     |     |   70|     |     |     |0252016|
|BLDG                  | 481358.93|-1011725.11|1B| 1753|     |  159|   37|     |     |     |0252016|
|TREE                  | 481633.73|-1011820.82|1A| 1781|     |     |   65|     |     |     |0252016|
|POLE                  | 481634.20|-1011820.13|1A| 1773|     |   40|   57|     |     |     |0252016|
|BLDG                  | 481605.70|-1011850.52|1A| 1793|     |   49|   77|     |     |     |0252016|
|POLE                  | 481634.50|-1011822.79|1A| 1774|     |   41|   58|     |     |     |0252016|
|BLDG                  | 481629.43|-1011832.79|1A| 1786|     |   49|   70|     |     |     |0252016|
|WATER TWR             | 481547.12|-1011904.58|1A| 1900|     |  144|  184|     |     |     |0252016|
|TREE                  | 481351.41|-1011731.09|1B| 1756|     |     |   40|     |     |     |0252016|
|ANT                   | 481340.09|-1011620.95|1B| 1727|     |  154|   11|     |     |     |0252016|
|SIGN                  | 481705.87|-1011750.15|1A| 1775|     |   50|   59|     |     |     |0252016|
|TREE                  | 481527.28|-1011349.15|1A| 1727|     |     |   11|     |     |     |0252016|
|WATER TWR             | 481335.27|-1011716.72|1B| 1843|     |  109|  127|     |     |     |0252016|
|BLDG                  | 481528.56|-1011348.22|1A| 1708|     |   31|   -8|     |     |     |0252016|
|TREE                  | 481528.75|-1011348.18|1A| 1718|     |     |    2|     |     |     |0252016|
|TREE                  | 481658.74|-1011837.32|1A| 1785|     |     |   69|     |     |     |0252016|
|RIG                   | 481429.84|-1011402.77|1B| 1717|     |  108|    1|     |     |     |0252016|
|POLE                  | 481513.83|-1011340.98|1A| 1697|     |   25|  -19|     |     |     |0252016|
|GRD                   | 481458.99|-1011344.06|1A| 1697|     |   43|  -19|     |     |     |0252016|
|TREE                  | 481324.91|-1011615.53|1B| 1776|     |     |   60|     |     |     |0252016|
|TREE                  | 481322.31|-1011637.02|1B| 1763|     |     |   47|     |     |     |0252016|
|WINDMILL              | 481724.56|-1011755.25|1B| 1755|     |   43|   39|     |     |     |0252016|
|POLE                  | 481607.85|-1011944.27|1A| 1812|     |   44|   96|     |     |     |0252016|
|TREE                  | 481610.21|-1011943.72|1B| 1831|     |     |  115|     |     |     |0252016|
|COMMUNICATION TWR     | 481333.95|-1011458.19|1A| 1714|     |  158|   -2|     |     |     |0252016|
|TREE                  | 481553.32|-1011956.09|1A| 1843|     |     |  127|     |     |     |0252016|
|BLDG                  | 481540.09|-1012001.18|1A| 1833|     |   60|  117|     |     |     |0252016|
|TREE                  | 481558.18|-1011324.28|1A| 1726|     |     |   10|     |     |     |0252016|
```

Exhibit L-19 – 2017 MOT UDDF Text (Cont.)

```
|COMMUNICATION TWR            | 481332.04|-1011455.40|1A| 1714|     |  159|   -2|     |     |     |0252016|
|TREE                         | 481549.39|-1011320.91|1A| 1714|     |     |   -2|     |     |     |0252016|
|TREE                         | 481516.80|-1011315.17|1A| 1714|     |     |   -2|     |     |     |0252016|
|POLE                         | 481526.73|-1012012.23|1A| 1789|     |   53|   73|     |     |     |0252016|
|RIG                          | 481312.52|-1011536.24|1B| 1745|     |  177|   29|     |     |     |0252016|
|BLDG                         | 481312.45|-1011516.05|1B| 1759|     |  209|   43|     |     |     |0252016|
|COMMUNICATION TWR            | 481750.84|-1011732.47|1B| 1795|     |  133|   79|     |     |     |0252016|
|TREE                         | 481559.49|-1012017.94|1A| 1850|     |     |  134|     |     |     |0252016|
|TREE                         | 481258.28|-1011559.52|1B| 1788|     |     |   72|     |     |     |0252016|
|ANT                          | 481306.87|-1011815.38|1B| 1956|     |  180|  240|     |     |     |0252016|
|TREE                         | 481729.32|-1011903.26|1A| 1788|     |     |   72|     |     |     |0252016|
|COMMUNICATION TWR            | 481715.72|-1011353.92|1B| 1824|     |  183|  108|     |     |     |0252016|
|ANT                          | 481338.75|-1011354.54|1A| 1690|     |  101|  -26|     |     |     |0252016|
|TREE                         | 481520.45|-1012035.90|1A| 1786|     |     |   70|     |     |     |0252016|
|COMMUNICATION TWR            | 481430.97|-1012026.75|1B| 1839|     |  190|  123|     |     |     |0252016|
|POLE                         | 481543.60|-1011234.79|1A| 1702|     |   53|  -14|     |     |     |0252016|
|TRMSN TWR                    | 481754.10|-1011904.20|1A| 1774|     |   55|   58|     |     |     |0252016|
|ANT                          | 481255.33|-1011907.65|1B| 2447|     |  690|  731|     |     |     |0252016|
|TREE                         | 481334.51|-1011301.87|1A| 1699|     |     |  -17|     |     |     |0252016|
|RIG                          | 481419.57|-1011216.80|1B| 1776|     |  161|   60|     |     |     |0252016|
|TREE                         | 481302.44|-1011339.09|1A| 1685|     |     |  -31|     |     |     |0252016|
|ANT                          | 481237.63|-1011428.08|1B| 1740|     |  199|   24|     |     |     |0252016|
|COMMUNICATION TWR            | 481213.16|-1011626.18|1B| 1916|     |  185|  200|     |     |     |0252016|
|ANT                          | 481646.93|-1012110.51|1B| 1997|     |  191|  281|     |     |     |0252016|
|TREE                         | 481731.33|-1012045.39|1A| 1822|     |     |  106|     |     |     |0252016|
|TRMSN TWR                    | 481240.55|-1011320.97|1A| 1685|     |   50|  -31|     |     |     |0252016|
|BLDG                         | 481757.43|-1012026.13|1A| 1773|     |   32|   57|     |     |     |0252016|
|TRMSN TWR                    | 481522.23|-1011113.43|1A| 1698|     |   59|  -18|     |     |     |0252016|
@
|Additional Information:
|
|THE NATIONAL GEODETIC SURVEY (NGS) CONDUCTED A VALIDATION REVIEW ON THIS SURVEY.
|
|
|
|THE SOURCE SURVEY DATA WAS RETRIEVED FROM THE FAA AIRPORTS SURVEY-GIS PROGRAM PROJECT MOT-176937.
|
|
|
|THE DATA WAS COLLECTED IN ACCORDANCE WITH FAA ADVISORY CIRCULAR 150/5300-18B SPECIFICATIONS.
|
|
```

```
|
|THE DATA WAS VALIDATED THROUGH A MODIFIED NGS QA REVIEW PROCESS (DID NOT INCLUDE VERIFICATION OF THE DATA RELATIVE TO A
|
|SOURCE OF KNOWN ACCURACY).
|
|
|
|THIS UDDF WAS CREATED BY NGS AND POSTED TO THE FAA THIRD PARTY SURVEY SYSTEM (TPSS) AS REQUESTED BY
|
|FAA AERONAUTICAL INFORMATION SERVICES (AIS).
|
|
|
|ANCILLARY INFORMATION (NOT REPORTED IN THE RETRIEVED FILES) WAS OBTAINED FROM FAA PUBLICATIONS AND ADDED TO THE FILE BY
|
|NGS. COMPUTED DATA VALUES WERE DERIVED BY NGS USING THE SUBMITTED INFORMATION AND ADDED TO THE FILE.
|
|IN ADDITION, THE SUBMITTED DATA WAS CORRECTED WHEN NECESSARY AND PRACTICAL AND/OR DATA WAS ADDED TO THE DATASET
|
|BY NGS.
|
|
|
|Features reported in the third segment of the NAVAID section are not considered "safety critical" per
|
|AC 150/5300-18B and were not reviewed by NGS.
|
|
|
|TO THE BEST OF NGS'S KNOWLEDGE THE AERONAUTICAL DATA IN THIS FILE REPRESENT FEATURES THAT EXISTED AT THE TIME OF
|
|SURVEY.
|
|
|
|
|
|OM (31_MOT) REPORTED AS DECOMMISSIONED ON FAA PUBLICATIONS.
|
|
|
EOF
```