

Department of Transportation & Public Facilities

# RURAL AIRPORT MAINTENANCE MANUAL

## New Contractor Orientation



[Keep Alaska moving through service and infrastructure](#)

# **TABLE OF CONTENTS**

- 1. Introduction**
- 2. Contractor Responsibilities**
- 3. Safety and Security**
- 4. General Airport Knowledge**
- 5. Airfield Marking and Lighting**
- 6. Driving and Radio Communication**
- 7. Snow Removal Equipment Building (SREB)**
- 8. Equipment Maintenance**
- 9. Winter Airfield Maintenance**
- 10. Summary**
- 11. Employee Orientation Checklist**
- 12. Evaluation for Equipment Orientation**
- 13. Operators Daily Inspection Guide**

## 1. INTRODUCTION

Rural Airports provide vital services to our Alaskan communities such as:

- Connecting the local people with the rest of Alaska and the world.
- Supporting Medevac flights and transporting people to medical treatment facilities.
- Transporting goods and services which helps to support local businesses.

As the State Airport Maintenance Contractor, your community will be depending on you to keep the airport open and safe for use so that these necessary services remain available. This manual is intended to help you achieve these goals.

### **Roles and Responsibilities**

It takes many people to keep our airports safe and listed below are key players to ensure this happens.

- **Federal Government** – The Federal Aviation Administration (FAA) publishes laws known as Federal Aviation Regulations (FAR's). These must be followed to stay in compliance.
- **State of Alaska (SOA)** – Alaska Department of Transportation (AKDOT) plans, builds and supports the maintenance of village airports. The state also has guidelines that must be followed.

- **Rural Villages** – A resident of the village steps up to perform the day to day maintenance and operations at the airport under contract with AKDOT.
- **Air Carriers** – They provide safe and reliable service into your communities. They often provide feedback to AKDOT on the airport facilities and services.
- **AKDOT** – In the back of this manual there are some helpful names and numbers when you have questions, need help, or need something fixed.

## **2. CONTRACTOR RESPONSIBILITIES**

As a contractor, you have the very important responsibility to make sure the airport is safe and secure. No two airports are identical, but there are a variety of duties common to all airports. You must perform these duties in a professional manner:

- Never work under the influence of drugs or alcohol and be aware that an illness may affect your work performance and safety.
- Communicate with pilots using “Air to Ground” or “VHF” radios.
- Perform basic maintenance activities.
- Operate equipment properly.
- Keep the inside of buildings clean and safe.
- Help initiate Notices To Airmen (NOTAMs) as required.
- Perform snow removal activities when necessary.
- Protect and care for the tools and equipment.
- Perform routine maintenance on equipment, i.e. oil, greasing, belt and hose replacements.
- Basic runway light and windsock inspections.
- Responding to emergencies such as fuel spills and aircraft accidents.

## **Consequences Of Poor Maintenance**

Poor maintenance of the airport and its associated equipment can lead to the following problems:

- Airplanes can crash and people can die.
- Equipment and property can be damaged or rendered un-usable.
- Food and other essential goods that people rely on may not be able to arrive in your community.
- People cannot travel to receive medical services, attend meetings and sporting events, or go on vacations.
- Mail services may be interrupted.
- Airlines may be restricted to serve your community.

## **NOTAMS**

“Notices To Airmen” (NOTAMs) are issued to let pilots know when the airport is not up to normal safety standards or something is out of the ordinary.

NOTAMs are issued for a number of reasons such as:

- A runway is closed.
- Airfield lighting, navigational aids, and/or radios are inoperable.
- Temporary obstacles are near the airfield (i.e. cranes, containers).
- Flocks of birds are in the vicinity of the airfield.
- Notifications of runway, taxiway, and apron status in respect to snow, ice, and standing water.
- Notifications of frost heaves, potholes, depressions, and soft spots.

When conditions such as these exist, it is your responsibility to issue a NOTAM and to keep it current. Also, contact your supervisor with this information so they are aware of the current conditions.

### **3. SAFETY AND SECURITY**

As a contractor for the State of Alaska you are expected to include SAFETY into everything you do at the airport. YOU MUST:

- Keep the airport safe
- Keep the people safe
- Keep yourself safe

To accomplish these very important goals, ALL of your work must be done in a safe manner.

Security is another important responsibility for you as the contractor. Keeping the State's equipment safe and secure is vital for you to do your job safely and efficiently. You must always remember to:

- Keep the buildings, fuel tanks, and equipment locked when not in use.
- Prevent or report when cargo, fuel barrels, vehicles, or any other material are stored on the apron, taxiways, and especially the runways. These areas must remain clear for safe passage of the aircraft.
- Report vandalism and security infractions immediately to local law enforcement and AKDOT.

#### **People on the Runway**

The runway is not a safe place for people or vehicles, especially snow machines and ATV's. You are expected to ask unauthorized people to leave the restricted areas (runways and taxiways) and to remove their vehicles immediately. If they refuse to do so, again, call the local law enforcement and AKDOT.

## **Aircraft Accidents**

If an aircraft has an incident or accident near your airport, you can use State equipment and buildings to help your community respond to the event. As the State contractor we ask you to do the following:

- Call your local law enforcement and ask for assistance if necessary.
- Call your supervisor and let them know what has happened.
- When possible, take as many pictures as you can. This can be done with phones, digital cameras, film cameras, and even from other people at the scene. Pictures are a critical part in the investigation.

## **Personal Accidents**

If you are injured while working, you must:

- Call for help immediately if required
- Seek first aid or medical attention
- Notify your supervisor

## **Vehicle / Equipment Accidents**

Vehicles and equipment do have accidents at airports and here are some examples of them:

- Hitting the doors of the building with a loader, grader, or dozer
- Backing too far into the building and hitting the wall
- Trucks hitting the outside of the building
- Snow machines or ATV's crashing on the runways, taxiways, or aprons.

If any of these accidents or a similar accident happens at your airport, call your supervisor as soon as possible. If there are any injuries involved in these accidents, always call your local law enforcement first. This will insure that medical assistance will arrive as quickly as possible.

## **Fuel Spills**

If you encounter a fuel spill, the first step is to try to stop the flow if possible. The next step is to try and contain the spill so it will not reach any drains or waterways.

- Less than 5 gallons may be contained and cleaned up locally and you may call your supervisor for help or materials.
- More than 5 gallons MUST be reported to you supervisor.
- Additional training may be required for these types of incidents.

## **4. GENERAL AIRPORT KNOWLEDGE**

### **Airport Terminology**

Most of the following terms are used throughout the world, so they should always have the same meaning for everyone.

### **Runways**

The surface where aircraft land and take off from and are numbered according to the direction they face based on a compass heading.

### **Apron**

These are the areas where the aircraft park and load or unload passengers and freight.



## **Taxiways**

These are the areas that join the runways to the apron and are identified by letters. They are referred to with the phonetic alphabet (i.e. A = Alpha, B = Bravo, C = Charlie...).

## **Threshold Areas**

Generally, this is the first one or two hundred feet of each end of the runway.

## **Over-runs**

These are the developed areas just before each end of the runway. You must keep these areas in the same good condition as the runway itself in case of an aircraft landing short or overshooting a runway.

## **Safety Areas**

These are areas along the edges of the runways. These areas go beyond the runway edge lights, should be clear of obstacles, and should be firm enough to support an aircraft.

## **Common Traffic Advisory Frequency (CTAF)**

This is the radio frequency for your airport. Pilots use this frequency when taking off from, landing at, or in the flight pattern at your airport. You, as the contractor, can communicate with the pilots on this frequency to inform them of runway conditions or any other important information that they may need to know. This frequency may also control the runway lights at your airport.

## **Windssock**

This is an orange fabric cone at the end of a pole that blows like a flag. It shows the pilots which way the wind is blowing and how strong it is blowing at ground level. They need to be changed out when the color fades, they get damaged, or they simply get blown away. It is also the contractor's responsibility to grease the pole two (2) times a year. Most airports have several windsocks in the area.

## **Airport Beacon**

This is a green and white rotating light that signals pilots where the airport is located and what type of airport it is. If this light burns out, the contractor must replace the bulb.

## **5. AIRFIELD MARKING AND LIGHTING**

Airports are standardized in reference to the color of lights and markings they use on the runways and taxiways. This helps the pilots know where they are on the airfield as well as where to taxi.

### **Runways**

White lights and white paint are used to mark the runway edges. There are only paint markings if the surface is paved. Towards the ends of the runways, the lights may be split to show white in one direction and amber in the other direction (split lens light). The amber color is used to show a pilot that they are nearing the end of a runway. On the threshold of the runway, there will be a red and green split lens light located to show the pilot where the beginning and the end of the runway is. *(see figure 1)*

## **Taxiways**

Taxiways are marked with blue lights and yellow paint markings. There are only paint markings if the surface is paved.

## **Apron/Ramp**

Rural airports generally do not have Apron/Ramp lights.

## **Airfield Lighting Repair**

When light bulbs burn out, you are expected to replace them. When you are awarded the maintenance contract, you should have some training on how to perform this task safely. You should avoid hitting or damaging airport lighting while performing maintenance. It will be your responsibility to repair minor damage done to airfield lighting such as broken couplers, lenses, and stems. Parts for fixing the lights can be ordered by calling your supervisor or the electrician.

If your airport is equipped with cones, they should be predominantly orange with reflective bands. Damaged or faded cones should be replaced. Call your supervisor to order new ones.

Signs and threshold markers must remain visible and free of damage. Keep snow, brush, and any other items away from the signs and threshold markers. Call your supervisor if any of these things are damaged.

# LIGHTS ON RUNWAY

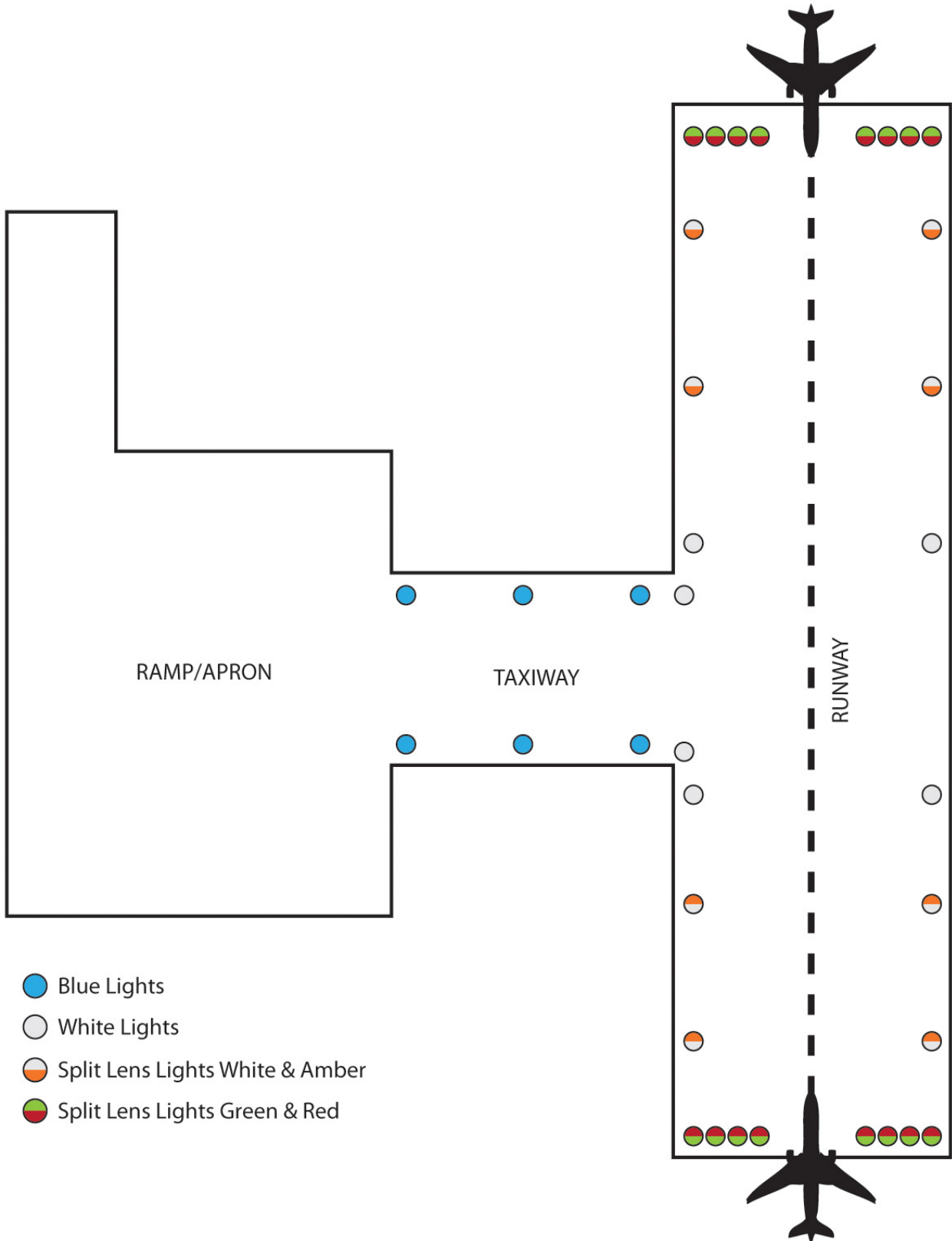


figure 1

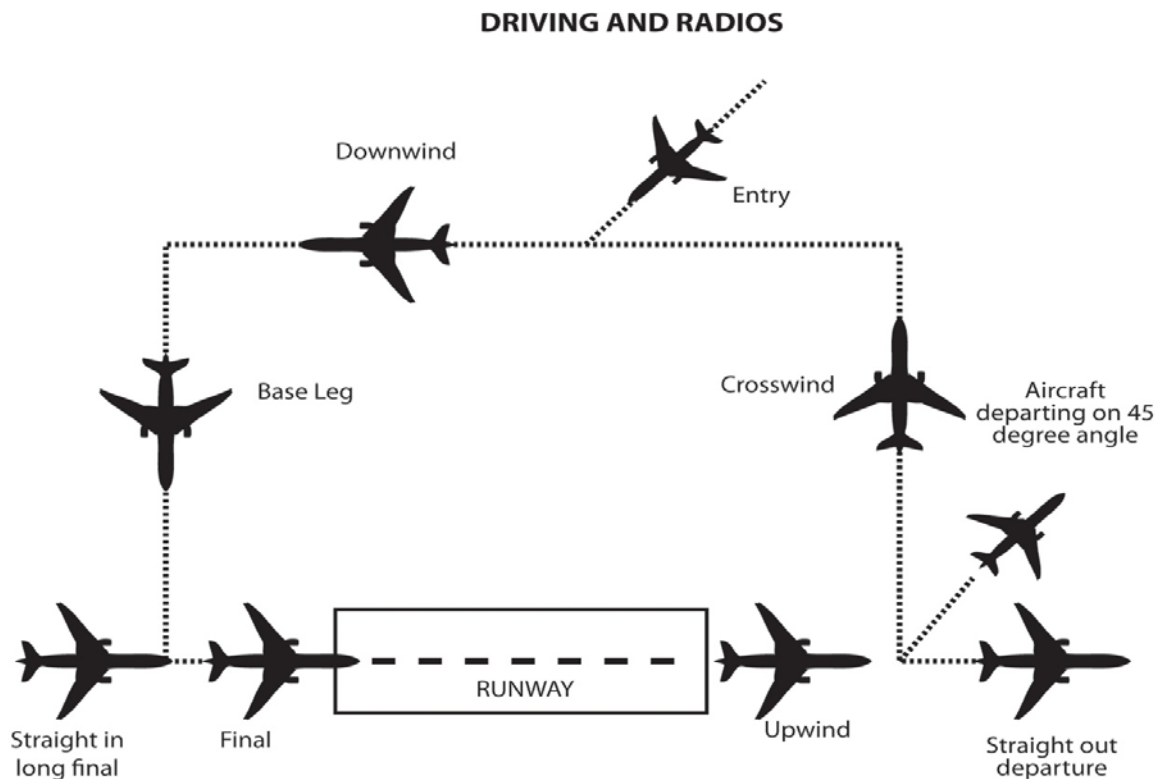
## 6. DRIVING ON THE AIRFIELD AND RADIO COMMUNICATION

Aircraft always have the right-of-way. You should never interfere with an aircraft's intended path unless that path is un-safe. If it is un-safe, you are expected to communicate with the pilot using a radio.

Your equipment will have a two-way radio (ground to air). This enables you to talk with the aircraft that are in the area. The Common Traffic Advisory Frequency (CTAF) is the frequency you will need to tune your radio to so you can talk to the pilots. Depending on what area you are in is what determines what frequency you tune to. The aircraft use CTAF to talk to other planes in the area and to talk to you on the ground. When talking on the radio, always say who you are calling 1<sup>st</sup> and who you are 2<sup>nd</sup>.

Example: "ERA 27M, this is Akiak Maintenance".

Pilots will announce on CTAF when they are coming to your airport. When they do call, they will report their position. These positions are shown below.



Knowing these positions can help you find the plane as it gets near your airport.

## 7. SNOW REMOVAL EQUIPMENT BUILDING (SREB)

These buildings are built by AKDOT to house and protect state equipment at your airport. When the equipment is not being used, it should be locked inside the buildings. Parts and tools for working on the equipment or maintaining the building can also be stored inside. You should keep the inside of the building neat, clean, and not cluttered with items that do not belong to the state.

For example:

- No private snowmachines or ATV's
- No outboard motors or skiffs

It is very important that you keep everything locked up when you are not at the airport. This includes:

- Lock the main doors.
- Lock the equipment doors.
- Lock the fuel tanks and/or the gates to the fuel tanks.
- Lock the lighting and radio building.

### **Equipment Damage**

Use caution when driving equipment into and out of the buildings. It is very difficult to repair the buildings once they have been significantly damaged. These are some of the common accidents:

- Hitting the equipment doors.
- Hitting the building with the wing blade.
- Backing into the back wall of the building.

### **Fuel Tanks**

As a contractor for the State of Alaska, you are expected to protect the fuel supply provided for your equipment and buildings.

THE USE OF STATE FUEL FOR ANYTHING OTHER THAN STATE EQUIPMENT OR STATE BUILDINGS IS A CRIMINAL ACT!

This means:

- Make sure the fuel is locked up.
- Make sure the fuel is protected from the weather.

Fuel tanks should not be left with pumps removed or openings that would allow water to get into the fuel.

## **Vandalism**

Report any vandalism to AKDOT, local law enforcement, the Alaska State Troopers and your supervisor as soon as you notice the damage. Common things to look for are graffiti/spray paint, broken windows, and bullet holes.

## **8. EQUIPMENT MAINTENANCE**

As an operator, you will be required to perform some basic maintenance tasks. This includes things like adding motor oil, changing a tire, greasing the equipment, or changing a cutting edge.

### **Equipment Walk-Arounds**

As a daily routine, you must do a walk-around inspection on the piece of equipment you are about to operate. You will be looking for:

- Leaks or puddles of motor oil, hydraulic fluid, anti-freeze, and diesel fuel.
- Loose nuts and bolts.
- Unusual signs of wear.
- Low or flat tires.

- Low fluid levels (engine oil, hydraulic fluid, transmission fluid, coolant, and fuel).
- Cutting edges on mold boards, plows, and buckets.
- Cleanliness of the windows, lights, and the cab area.

Do not let the cutting edges on graders, buckets, or plows get too low. When they are down to 1" or less they should be changed to prevent permanent damage to the mold board, plow, or bucket.

If you notice anything wrong during the walk-around that you cannot fix yourself, contact your supervisor or mechanic.

You are required to report the equipment hours to your supervisor at the end of each month. This lets the mechanics know when the service is due on each piece of equipment.

## **Pre-Winter Inspection**

During the summer months, you should check to make sure your equipment is ready for the next winter. Here is a list of things to look for:

- Block heaters are working properly.
- Batteries are in good condition (charged and terminals in good shape).
- Anti-freeze at correct strength.
- Winter oils, lubricants, and fluids are installed.
- Cab heaters operational.
- Windshield wiper blades are working and in good condition.
- Tires are in good condition.
- Cutting edges, impeller blades and chutes are in good repair.
- Fuel tanks are checked and free of moisture. You are also required to keep track of your fuel consumption and report this to your supervisor at the end of every month. This helps them order fuel in advance so you will not run out.



**\*IMPORTANT\*** Please call your supervisor or mechanic as soon as possible if there is a problem that you cannot fix.

## 9. WINTER AIRFIELD MAINTENANCE

The key winter maintenance activities are snow removal and ice control.

### **Winter Airport Safety**

- NOTAMS – You must issue a NOTAM if more than 2” of snow is on the runway, if there are berms present, or if you are going to be on the runway plowing snow.
- Contact your supervisor if you are unable to plow the snow or if there are berms you cannot remove. They will assist you as soon as they are able.
- Use your radio to communicate with pilots and answer any questions they may have.
- Snowplowing – Try to keep your blade 1” above the gravel surface. Getting too low causes the gravel to be bladed off the runway creating more work and money to fix.
- Snow Berms and Windrows – Remove snow berms and windrows as quickly as possible. Do not leave them on the runway edges, ends of runways, or across the entrance to a taxi-way.

## **Airport Inspections**

During the winter, it is very important to check your runway conditions during and after snowfall events or during times of high winds. The wind may leave snow drifts on the runway which can be just as dangerous as deep snow.

## **Snow Removal Priorities**

You should inspect the runway to make sure the snow or drifts are no deeper than 2" (two inches). You also need to check that aircraft do not have to taxi through any snow berms. Snow berms on the sides of runways or taxiways cannot be any higher than 12" (twelve inches) high and they should be pushed outside of the lights as soon as possible. High snow berms can cause serious damage to an aircraft if they run into one.

There are three levels of snow removal priorities:

1. Runways
2. Taxiways
3. Ramps/Aprons

## **Snow Plowing Tips**

- Leave 1" (one inch) of snow on the runway. Do not plow the gravel off the runway. Maintain the crown on the runway as best as possible.  
*(see figure 2)*
- Do not plow the snow onto the runway or taxiway lights.
- Leave the windrows or berms 5' (five feet) inside the lights. As soon as possible, these berms should be carefully pushed outside of the lights

without damaging any lights. Push this berm as far off the shoulder as possible. This gives you more room for snow later in the season and it will help with break-up in spring. The longer you wait, the harder the berms become making them much harder to move.

- Do not leave snow berms across any taxiways or the ends of the runways because this may cause damage to aircraft.

## **Snow Removal**

Plowing the runway is the first priority and there are two acceptable methods for removing snow.

- 1. Split the Runway** – This is the fastest, safest, and preferred method for removing the snow on the runway. Plowing lengthwise, you start in the middle of the runway and move the snow to the right towards the edge lights. (*see figure 3*) (Plowing to the right is helpful because many of the graders have a wing blade on the right side allowing you to make use of this attachment). Once you reach the end of the runway, lift your blade and turn around. Still plowing to the right, proceed down the opposite side of the centerline moving the snow towards the edge lights. Continue doing circles moving the snow from the center of the runway to the edges of the runway.

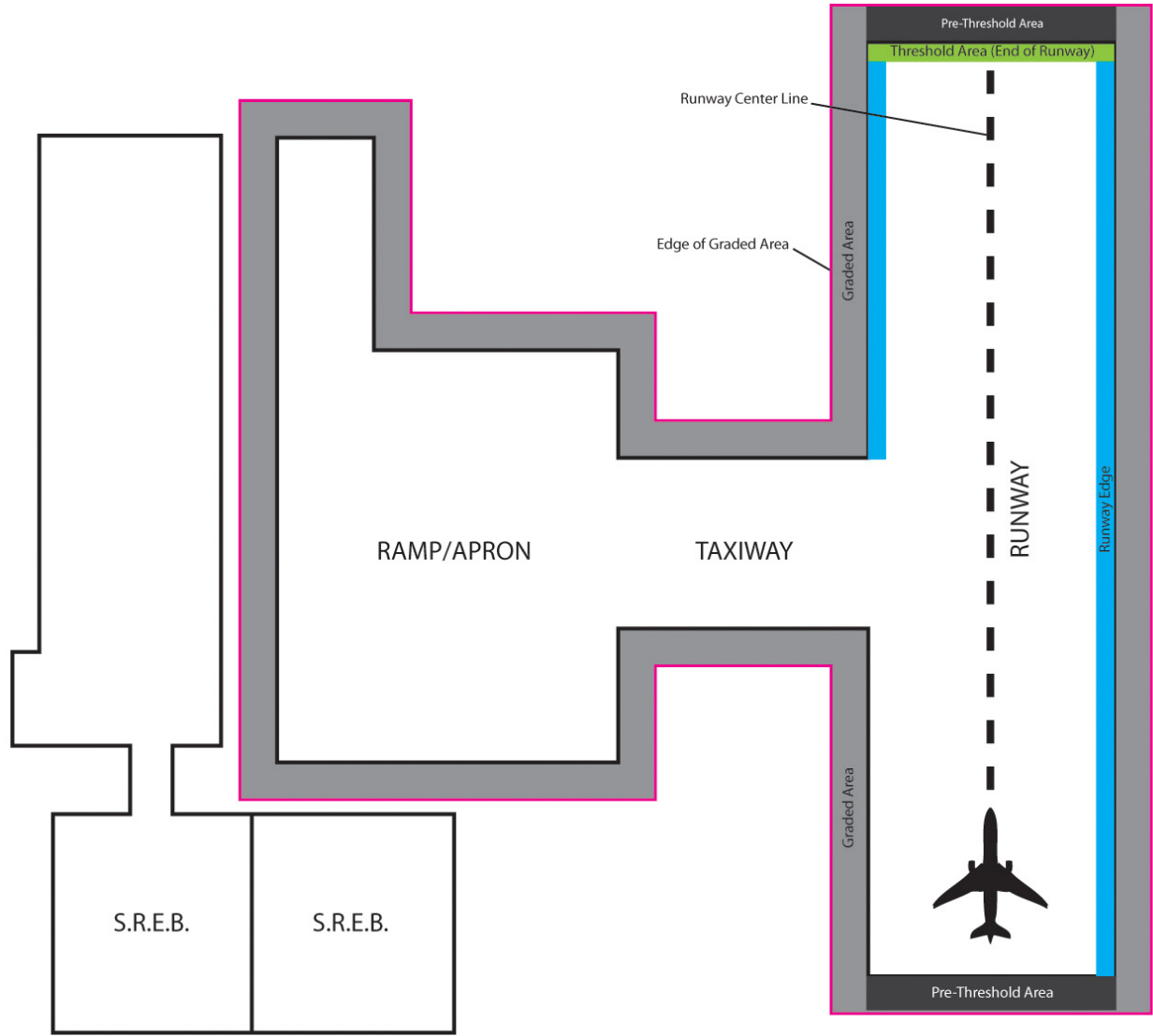
Use this method when there is little or no wind or if the wind is strong but blowing down the length of the runway. Leave your windrows/berms 5' (five feet) inside of the edge lights. You can now carefully push this berm outside the lights and off the edge of the runway as soon as possible. Remember to be careful not to damage any of the runway or taxiway lights.

- 2. Plow across the runway** – This method can be used when there is a strong crosswind. Starting at one edge of the runway and plowing lengthwise, begin moving the snow across the entire width of the runway. Plow in the direction the wind is blowing so it helps you and not hurts you. Your first pass should be 5' (five feet) inside the lights to avoid damaging them. You must also be careful with the threshold lights or cones when you are turning around. Once you reach the end of the runway lift your blade,

turn around, and change the direction of your blade to the opposite side (*see figure 4*) (If you were plowing to the right, rotate your blade so you are plowing to the left for the next pass down the runway).

This technique makes the runway unsafe and unusable until you are finished plowing the runway. This is because you are moving the berm across the entire width of the runway. This technique also creates a much larger berm so clearing it off the runway as soon as possible is crucial. If you have a berm on the edge of the runway and a pilot wants to land, you must let them know the location and the height of the berm.

# DEFINITIONS



- Pre-Threshold Area
- Threshold Area (End of Runway)
- Runway Center Line
- Runway Edge
- Graded Area
- Edge of Graded Area

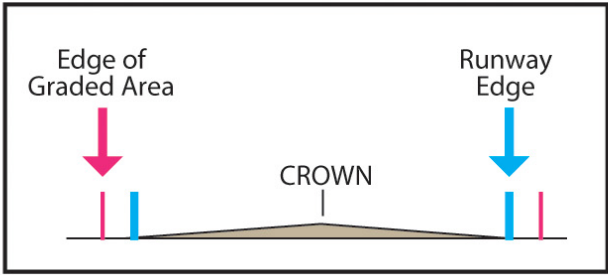


Figure 2

### SNOW REMOVAL: SPLIT THE RUNWAY

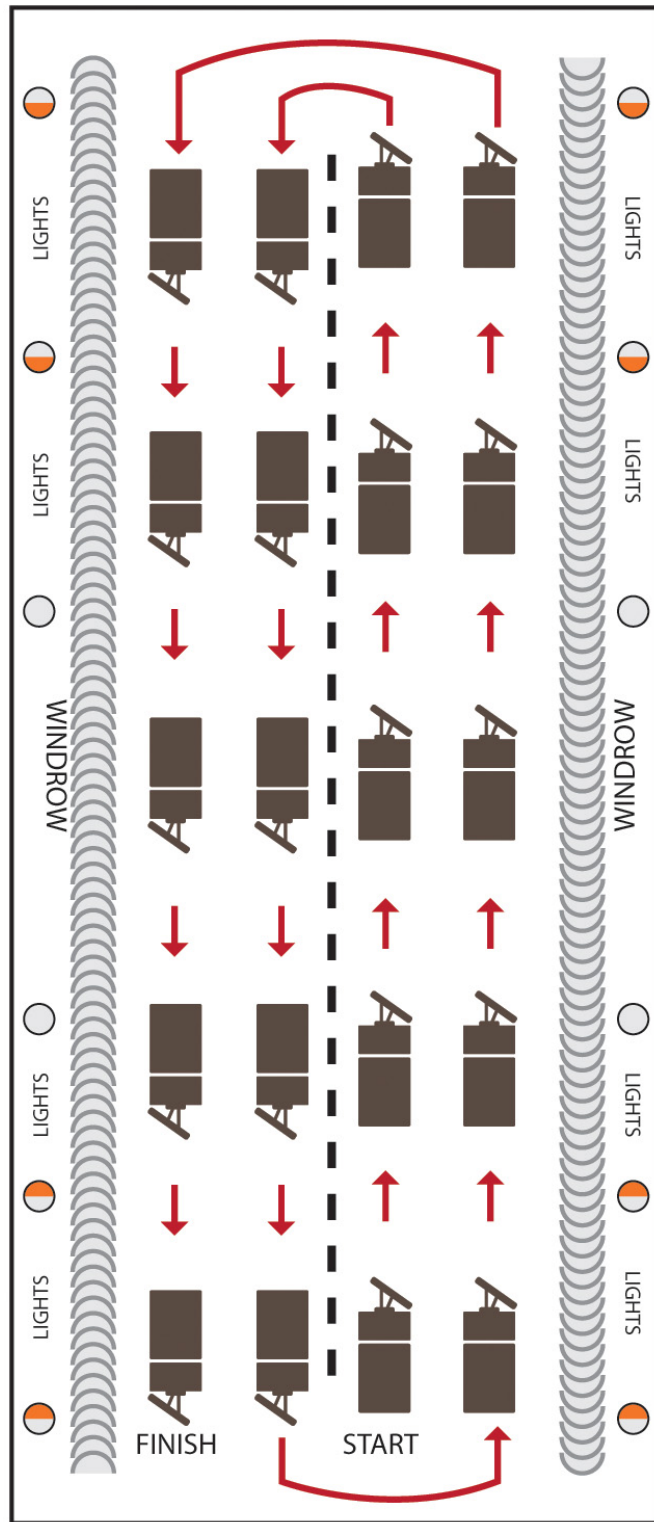


Figure 3

# SNOW REMOVAL: PLOW ACROSS THE RUNWAY

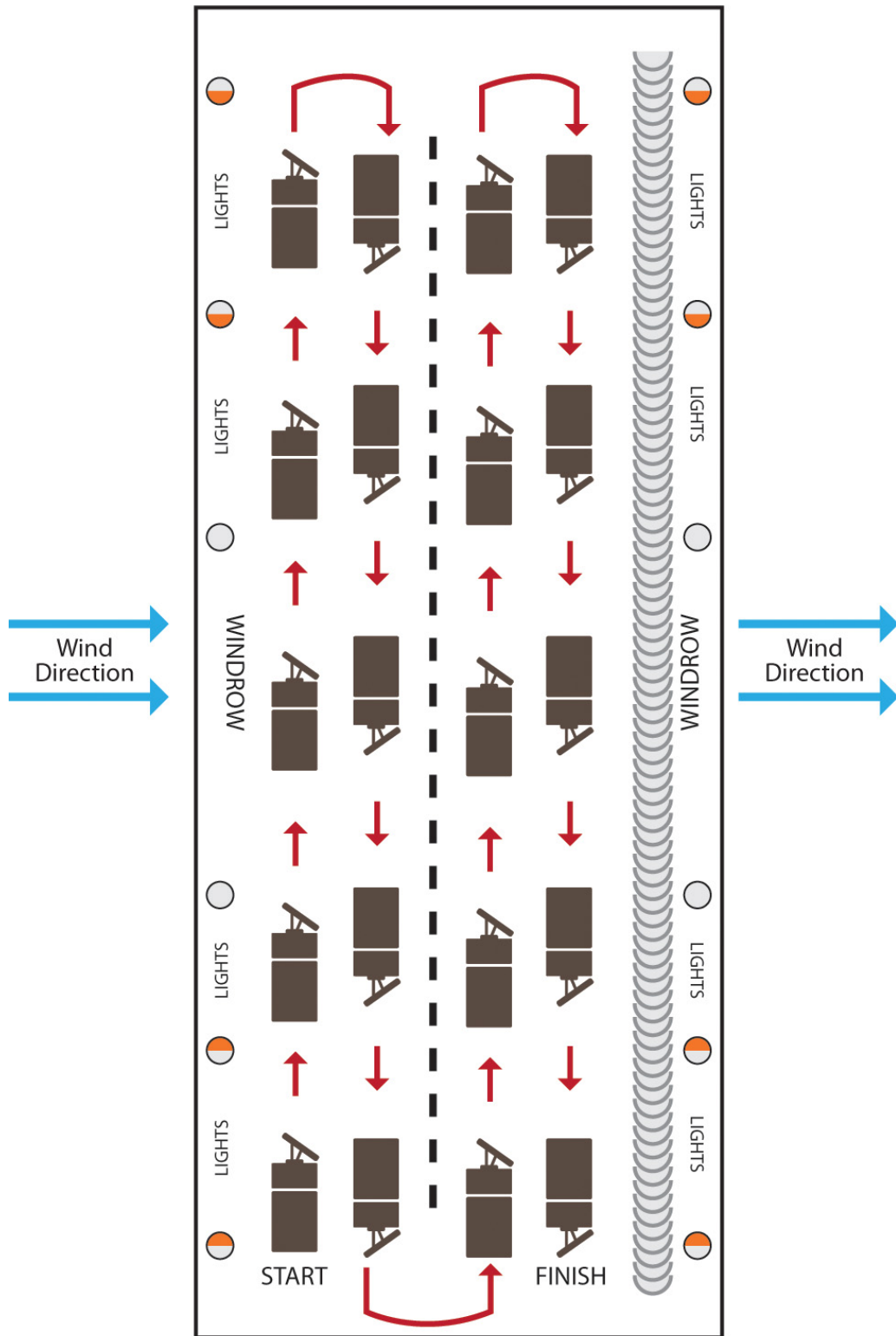


Figure 4

## 10. SUMMARY

As you can see, obtaining a state contract for airport maintenance comes with many rewards and responsibilities. Many people rely on you to do a safe and accurate job maintaining the airport in your community. If you feel that something is unsafe or if you are having problems with your equipment, never hesitate to call your supervisor. Using this manual as a training and a reference guide should make your job become easier, safer, and more efficient.



## EMPLOYEE ORIENTATION CHECKLIST

Employee: \_\_\_\_\_

Supervisor: \_\_\_\_\_

Does the employee understand:

- |   |                |
|---|----------------|
| 1. The contractor responsibilities?           | Yes ___ No ___ |
| 2. The importance of safety and security?     | Yes ___ No ___ |
| 3. The general airport knowledge?             | Yes ___ No ___ |
| 4. The airfield marking and lighting?         | Yes ___ No ___ |
| 5. Driving and communicating on the airfield? | Yes ___ No ___ |
| 6. How to maintain the SREB?                  | Yes ___ No ___ |
| 7. How to do basic equipment maintenance?     | Yes ___ No ___ |
| 8. How to do winter maintenance?              | Yes ___ No ___ |

Employee Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Supervisors Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## EVALUATION FOR EQUIPMENT ORIENTATION

Equipment Type: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

It is very important to know and understand the equipment you are running. Please mark the level of understanding you feel you have received from this orientation.

<u>Poor</u>	<u>Below Average</u>	<u>Average</u>	<u>Above Average</u>	<u>Excellent</u>
1	2	3	4	5

1. \_\_\_\_\_ **Walk around for entire machine**
2. \_\_\_\_\_ **Engine compartment** (Engine oil, transmission fluid, hydraulic fluid, And coolant)
3. \_\_\_\_\_ **Cab** (Warning lights, gauges, switches, controls, steering and seat Adjustments)
4. \_\_\_\_\_ **Attachments** (attaching and removing buckets)
5. \_\_\_\_\_ **Operator maintenance** (what to lubricate, change cutting edges)
6. \_\_\_\_\_ **Equipment limitations**
7. \_\_\_\_\_ **Safety** (getting in and out of the equipment, seat belts, fire extinguisher)
8. \_\_\_\_\_ **Were all your questions answered?**
9. \_\_\_\_\_ **Was the training worthwhile?**

Was there any information that was missed? \_\_\_\_\_

## OPERATORS DAILY INSPECTION GUIDE

VEHICLE NUMBER \_\_\_\_\_ MONTH/YEAR \_\_\_/\_\_\_

### ITEMS TO BE CHECKED DAILY:

1. **Clean Vehicle** (Interior, Windows)
2. **Damage** (Exterior, Interior, Missing Parts)
3. **Tires and Rims** (Damage, Proper Inflation, Lugnuts are Tight)
4. **Fluid Leaks** (Puddles under vehicle, fluids in engine compartment)
5. **Check Fluid Levels** (Oil, Hydraulic, Transmission, Coolant, Fuel)
6. **Belts and Hoses** (Check for fraying and cracks)
7. **Lights and Strobes** (Make sure they are clean and functioning properly)
8. **Safety Devices** (Seatbelts, Signs on vehicle)
9. **Instruments, Horn, Wipers**
10. **Brakes and Steering** (responsiveness and effectiveness)

**Date** Initial the appropriate date once inspections are complete.

1. _____	11. _____	21. _____	31. _____
2. _____	12. _____	22. _____	
3. _____	13. _____	23. _____	
4. _____	14. _____	24. _____	
5. _____	15. _____	25. _____	
6. _____	16. _____	26. _____	
7. _____	17. _____	27. _____	
8. _____	18. _____	28. _____	
9. _____	19. _____	29. _____	
10. _____	20. _____	30. _____	

