U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM	Date: 12/19/96 Initiated By: AFS-400	AC No: 120-57A Change:

1. PURPOSE. This Advisory Circular (AC) describes the standards and provides guidance in the development of a Surface Movement Guidance and Control System (SMGCS) plan for U.S. airports where scheduled Air Carriers are authorized to conduct operations when the visibility is less than 1,200 feet runway visual range (RVR). A SMGCS plan facilitates the safe movement of aircraft and vehicles on the airport by establishing more rigorous control procedures and requiring enhanced visual aids.

2. APPLICABILITY. The guidance in this AC applies to all Title 14 of the Code of Federal Regulations (14 CFR) part 139 airports where air carriers are authorized to conduct takeoffs or landings below 1,200 feet RVR.

3. CANCELLATION. AC 120-57, Surface Movement Guidance and Control System, dated 9/4/92, is canceled.

4. RELATED REGULATIONS (CFR) AND READING MATERIAL.

a. Reference part 139, Certification and Operations: Land Airports Serving Certain Air Carriers.

b. Reference Appendix 1 for a listing of Advisory Circulars (AC's) and FAA Orders relating to SMGCS.

c. Reference Appendix 2 for an example of a typical SMGCS plan.

d. Reference Appendix 3 for guidelines in developing a SMGCS plan for operations below 1,200 feet RVR down to and including 600 feet RVR.

e. Reference Appendix 4 for additional guidelines in developing a SMGCS plan for operations below 600 feet RVR.

5. DEFINITIONS. Definitions pertaining to SMGCS procedures are listed below and when available, the source document from which the definition was derived, such as the Code of Federal Regulations (CFR), Aeronautical Information Manual (AIM), or related Advisory Circulars (AC's).

a. Apron (Ramp). A defined area on an airport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. The apron area includes the following components: (reference AIM and AC 150/5340-1G)

(1) Aircraft Parking Positions. Intended for parking aircraft to enplane/deplane passengers, load or unload cargo.

(2) Aircraft Service Areas. On or adjacent to an aircraft parking position. Intended for use by personnel/equipment for servicing aircraft and staging of equipment to facilitate loading and unloading of aircraft.

(3) Taxilanes. Apron areas which provide taxiing aircraft access to and from parking positions.

(4) Vehicle Roadways Markings. Identified rights of way on the apron area designated for service and Aircraft Rescue and Fire Fighting (ARFF) vehicles.

b. ARFF. Aircraft Rescue and Fire Fighting capability.

c. Clearance Bar. A clearance bar consists of three in-pavement steady-burning yellow lights. (reference AIM)

d. Controlling Region. Refers to the FAA geographic region in which an airport is located.

e. Gate Designator Markings. Pavement markings used to identify an aircraft parking position/gate(s).

f. Geographic Position Markings. Pavement markings used to identify the location of aircraft or vehicles during low visibility conditions. They are referred to as "spots" by air traffic control (ATC). (reference AC 150/5340-1G)

g. Judgmental Over-Steering. When the taxiway centerline does not provide an adequate turn radius, the pilot may intentionally over-steer the aircraft nose wheel to keep the aircraft's main gear within the defined edges of the taxiway.

h. Low Visibility Operations. The movement of aircraft or vehicles on the airport paved surfaces when visibility conditions are reported to be less than 1,200 feet RVR.

i. Movement Area. Refers to the runways, taxiways, and other areas of an airport which are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas. (reference part 139.3)

j. Non-movement Area. Refers to taxiways and apron areas that are not under ATC.

k. Runway Guard Lights--Elevated. Fixture consists of a pair of elevated flashing yellow lights installed on both sides of a taxiway, at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions. (reference AIM)

l. Runway Guard Lights--In-pavement. Fixture consists of a row of in-pavement flashing yellow lights installed across the entire taxiway, at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions. (reference AIM)

m. Runway Visual Range (RVR). An instrumentally derived value based upon standard calibrations that represents the horizontal distance a pilot will see down the runway from the approach end. (reference AC 97-1A)

(1) Touchdown RVR. The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

(2) Mid-RVR. The RVR visibility readout values obtained from RVR equipment located midfield of the runway.

(3) Rollout RVR. The RVR visibility readout values obtained from RVR equipment located nearest the rollout end of the runway.

n. Stop Bar. Stop bar lights consist of elevated and in-pavement red fixtures that are installed at the runway holding position or instrument landing system (ILS) critical area holding position marking. Stop bars may be controllable by ATC and will include a system of in-pavement green taxiway centerline/lead-on lights at locations where aircraft will enter or cross a runway.

o. Surface Movement Guidance and Control System (SMGCS). A SMGCS system consists of the provision of guidance to, and control or regulation of, all aircraft, ground

vehicles and personnel on the movement area of an aerodrome. Guidance relates to facilities, information and advice necessary to enable the pilots of aircraft or the drivers of ground vehicles to find their way on the aerodrome and to keep the aircraft or vehicles on the surfaces or within the areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows smooth and freely. (reference ICAO SMGCS Manual Doc 9476-AN/927)

p. Surface Movement Surveillance System (SMSS). A system which provides positive identification and accurate positional information on all aircraft and vehicles.

q. Surface Painted Holding Position Sign. Pavement marking which is used to identify a specific runway. These markings are configured the same as the associated sign. (reference AC 150/5340-1G)

r. Surface Painted Direction Sign. Pavement markings that are configured the same as the associated sign and provided when it is not possible to provide taxiway direction signs at intersections. (reference AC 150/5340-1G)

s. Surface Painted Location Sign. Pavement markings that are configured the same as the associated sign, and are used to supplement the signs located along side the taxiway and assist the pilot in confirming the designation of the taxiway on which the aircraft is located. (reference AC 150/5340-1G)

t. Taxi Route. In this document, a specific sequence of lighted taxiways used by aircraft during low visibility operations.

u. Unserviceable. In this document, refers to equipment which is inoperative, obscured (i.e., by ice, snow, sand), degraded, not operating normally (e.g., abnormally low intensity), or not performing its intended function.

6. IMPLEMENTATION OF SMGCS.

a. SMGCS Working Group. The airport operator, in consultation with the users, should establish a SMGCS working group for all takeoff and landing operations below 1,200 feet RVR. The SMGCS working group should include representatives from:

(1) Airport staff involved with airfield operations, lighting, aircraft rescue and fire fighting (ARFF), security/traffic control, and any other appropriate personnel.

(2) FAA ATC (local and/or regional).

(3) FAA Airports District office (ADO) or Regional office.

(4) FAA Flight Standards (local and/or regional).

(5) FAA Airway Facilities Sector office.

(6) Appropriate scheduled airlines.

(7) Appropriate Air Transport Association representative.

(8) Air Line Pilots Association (ALPA) or other appropriate pilot groups.

(9) Appropriate cargo/package operators and military aviation tenants.

(10) Appropriate operators under 14 CFR part 91 and/or service corporations. (Includes general aviation and corporate operators.)

b. Airport Evaluation. Since no two airports nor aircraft capabilities are alike, the SMGCS working group should review the existing airport layout, facilities, instrument flight restriction (IFR) minima, and operational procedures at the airport, prior to the development of the airport SMGCS plan. Comparison of the existing and planned operating capability with the guidelines of this AC should determine what additional measures are necessary to achieve the desired low visibility operations. This review should include at least the following:

(1) Airport layout and surface traffic patterns. (Includes runways, taxiways, fillets, and taxilanes used for current low visibility operations and those needed to achieve new low visibility operations.)

(2) Air traffic procedures used for current low visibility operations, and changes or additional facilities needed to support new low visibility operations.

(3) Surface lighting, marking, and signs used for runways, taxiways, taxilanes and gate lead-in markings. (Identify additional needs in support of low visibility operations, i.e., stop bars, runway guard lights, clearance bars, taxiway centerline lighting, reflectors, geographic position markings, etc.) Additionally, review the capability to electronically monitor and inspect lighting systems.

(4) Equipment, procedures, and training to support aircraft rescue and fire-fighting (ARFF) services in low visibility operations.

(5) Ground support vehicle operations during low visibility conditions. (Review any restrictions, controls, or training needed, and whether airport operations or tenants will provide, if necessary, follow-me or towing services on the movement area.)

(6) Protection of ILS critical areas and obstacle free zones.

(7) Snow removal equipment routing and priorities during low visibility conditions.

(8) The adequacy of current airport charts.

(9) Advanced technologies for below 600 feet RVR operations (e.g., enhanced vision systems (EVS), head-up-display systems (HUD), forward looking infrared systems (FLIR), and global positioning system (GPS)).

c. SMGCS Operations Minimum Selection. Most airports authorized for Category II/III operations already have most of the basic airport signing, lighting and marking required under a SMGCS plan. The additional requirements contained in this AC are designed to enhance the safety of low visibility operations. These requirements represent both an initial capital cost and continuing maintenance and operations budget requirements. Prior to establishing the ultimate low visibility minimums for the SMGCS plan, the SMGCS working group should perform a detailed analysis to insure that the benefits from seeking lower takeoff or landing minimums justify the initial costs of the equipment and continuing maintenance costs. The analysis should consider at least the following:

(1) A compilation and evaluation of historic low visibility weather data for the airport. The data may be obtained from the National Oceanic and Atmospheric Administration (NOAA), Asheville, NC; the local National Weather Service (NWS); or other private industry sources. This data should reflect actual RVR values and be analyzed for time of day and number and frequency of affected aircraft operations.

(2) A determination of which users are capable of using the low visibility takeoff and landing procedures. This is available from the FAA published CAT II/III Status List. The list contains current air carriers, aircraft type, and airport authorizations. Refer to Appendix 5 for instructions on how to access this and other SMGCS information from the FAA on-line bulletin board system.

(3) Costs for both RVR ranges, less than 1,200 feet RVR down to and including 600 feet RVR, and less than 600 feet RVR. These costs may include:

(a) Taxiway edge lights
(b) Taxiway centerline lights
(c) Runway guard lights
(d) Stopbar lights
(e) Associated hardware and software

(f) Taxiway/ramp markings
(g) Airport Surface Detection Equipment (ASDE) III or equivalent
(h) Expanded communications facilities/ramp control
(i) Paving (taxiway fillets)
(j) Ground equipment/vehicles (follow-me, tow or ARFF vehicles)
(k) Charting
(l) Operation and Maintenance (O & M)
(m) Training
(n) Personnel
(o) Other advanced technologies

d. Airport SMGCS Plan. A detailed SMGCS plan should be developed for each airport to cover existing or planned low visibility operations. Appendix 2 contains a sample SMGCS plan. Appendix 3 and Appendix 4 contain guidance for developing a SMGCS Plan.

(1) Airports with takeoff and/or landing operations below 1,200 feet RVR should submit to the controlling FAA Flight Standards Division a completed SMGCS plan. The plan should include a timetable for budgeting and implementing the various components of the proposed plan. The airport operator should promptly initiate action to institute its SMGCS plan once FAA approval to proceed is received. Upon receipt of the plan, the FAA will advise the airport operator which actions included in the timetable, if any, should be delayed.

(2) The SMGCS plan should cover planned low visibility operations. Each low visibility operation and taxi route should be described in detail with its supporting facilities and equipment.

(3) The plan should clearly identify the responsibilities of those involved (e.g., airport operator, ATC, ARFF, air carriers, and ground vehicle operators). The plan should also clearly identify how and when these responsibilities will be carried out (e.g., the plan may identify different requirements for operations between 1,200 feet RVR and 600 feet RVR, and those operations below 600 feet RVR).

(4) All SMGCS plans should be submitted to the appropriate FAA Regional Flight Standards Division for approval.

(5) Revisions to SMGCS plans may be accomplished by the SMGCS working group when desired, and routed through the region Flight Standards Division for approval.

7. RESPONSIBILITIES.

a. Flight Standards - Headquarters. The Manager, Technical Programs Division, AFS-400, is the FAA Headquarters point-of-contact for the SMGCS program and will maintain a status list of SMGCS airports. When needed, AFS-400 will also provide advice and guidance in resolving SMGCS questions.

b. Flight Standards - Controlling Region. The FAA's controlling Flight Standards Division will have responsibility for:

(1) Participation in SMGCS Meetings. A representative of Flight Standards should participate in SMGCS working group meetings.

(2) Review and Approval of SMGCS Plans. Flight Standards is responsible for coordinating the review of draft SMGCS plans to determine conformance with the criteria contained in existing FAA orders, advisory circulars, and guidance in this AC. This should include coordination with the Airports and Air Traffic Divisions. The airport operator will be notified of any deficiencies or recommendations. The controlling region Flight Standards will also be the approving authority for SMGCS plans and subsequent revisions and SMGCS operations.

(3) On-Site Inspection. An on-site inspection should be accomplished for all SMGCS airports and can be completed as an ongoing process, a specific event, or associated with the airport certification inspection. The inspection should be accomplished by controlling FAA Flight Standards, Airports, and ATC personnel and other airport tenant officials. The on-site inspection should be accomplished at night to simulate restricted visibility conditions, and will be used to evaluate lighting, markings, procedures, etc. as denoted in the SMGCS plan. The evaluation should also include the review of appropriate communications between ATC and the airport operator on the initiation and termination of SMGCS procedures, and availability of the airport SMGCS chart. Evaluation of alternative procedures of inoperative components such as stop bar and taxiway centerline lighting systems, Surface Movement Radar, etc. should also be reviewed if installed. Noted deficiencies and corrective recommendations will be provided to the airport operator and appropriate organizations. The on-site inspection(s) should be completed prior to beginning initial SMGCS operations.

(4) Adherence to SMGCS Plans. When notified of a SMGCS deficiency or recommendation, the controlling Flight Standards Division will advise the appropriate FAA organization (Airports or ATC) and/or airport operator. Safety related deficiencies may require the temporary withdrawal of approval for specified low visibility operations.

(5) FAA Headquarters Coordination. In order to maintain a current status of SMGCS airports and their operations, advise AFS-400 when a SMGCS plan and/or SMGCS operation is approved. If warranted, AFS-400 will be available to aid in resolving complex SMGCS questions.

c. Airports Division - Controlling Region. The FAA's controlling regional Airports Division will have responsibility for:

(1) Participation in SMGCS Meetings. A representative of Airports Division and/or ADO should participate in SMGCS working group meetings.

(2) Review of SMGCS Plans. Airports Division should review SMGCS plans in coordination with Flight Standards and Air Traffic.

(3) Advice and Guidance. Airports Division is responsible for providing advice and guidance to SMGCS working groups regarding such matters as the standards on lighting, marking, signs, and paving. They may also advise on the eligibility of projects for Airport Improvement Program (AIP) funding.

d. Air Traffic Division. The controlling FAA Air Traffic Division will be responsible for those sections of the SMGCS plan which are under its control and should correct deficiencies that are observed or brought to its attention.

(1) Participation in SMGCS Meetings. A local or regional Air Traffic representative should participate in SMGCS working group meetings. They should assure that designated low visibility routes and procedures will enhance the safe and expeditious flow of traffic on the movement area during low visibility conditions.

(2) Advice and Guidance. Air Traffic is responsible for providing advice and guidance to SMGCS working groups.

(3) Review of SMGCS Plans and Taxi Route Charts. Air Traffic Division is responsible to review submitted SMGCS plans and low visibility taxi route charts in coordination with Flight Standards and Airports Divisions. The chairman of the SMGCS working group will be notified of any deficiencies and recommendations. The low visibility taxi route charts will be coordinated with FAA Headquarters, Air Traffic Rules and Procedures Service, Terminal Procedures Branch, ATP-120, for suitability.

(4) Initiation and Termination of SMGCS Procedures. Air Traffic will be responsible to initiate and terminate each phase of SMGCS procedures in accordance with the SMGCS plan. (Initiation of SMGCS procedures will take some time. Therefore, the

implementation and termination should be based on meteorological trends of increasing/decreasing RVR values and weather phenomena such as patchy fog and pilot reports.) ATC will notify airport operations of the pending initiation of SMGCS procedures. Airport operations should notify Air Traffic when all appropriate tenants have been contacted. ATC will subsequently notify airport operations of their termination of low visibility operations.

(5) Automatic Terminal Information Service (ATIS). The initiation of SMGCS procedures should be broadcast on the ATIS.

(6) **For operations below 1,200 feet RVR,** ATC will operate stop bar lights where installed.

(7) Geographic Positioning. ATC will control aircraft and ground vehicles on the movement area by monitoring their geographic positioning and spatial relationship. The SMGCS plan should outline ATC procedures to be employed in the event the surface movement surveillance system (SMSS) becomes inoperative during visibility's less than 600 feet RVR.

(8) Notifying and Assisting Aircraft Rescue and Fire Fighting (ARFF). During low visibility operations the role of ATC in notifying and assisting ARFF services increases in significance. Procedures, systems and/or techniques should be established and reviewed annually, in coordination with the airport operator, to ensure that aircraft requiring assistance can be located and ARFF services provided.

e. Airport Operator. The airport operator will be responsible for those sections of the SMGCS plan which are under its control and should correct deficiencies that are observed or brought to its attention. The airport operator will designate from its staff the chairperson of the airport's SMGCS working group. The airport operator should:

(1) Call and chair meetings of the airport's SMGCS working group. This group should meet at least annually to review the SMGCS plan, procedures, and operations. They should also solicit attendance from appropriate personnel from the organizations listed in paragraph 6a.

(2) Coordinate actions necessary to analyze the cost benefit study in regard to desired minima; to reach a working group consensus on which desired minima is feasible and cost beneficial; and to achieve the installation and operation of facilities, equipment and/or procedures required to support low visibility operations.

(3) Coordinate the drafting, editing, submission, publication, distribution, and revision of the SMGCS plan.

(4) Assure that initial and recurrent training on SMGCS procedures is accomplished and documented for ARFF personnel, airport vehicle operators, and tenant vehicle operators.

(5) Notify other organizations having responsibilities under the SMGCS plan of deficiencies observed or brought to their attention which require their correction.

(6) If remote electronic monitoring capability is not available, ensure the timely inspection of airfield visual aids, such as lights, signs, and markings. Assure timely issuance and cancellation of appropriate notice to airmen (NOTAMS) regarding outages of airport facilities and equipment which support low visibility operations.

(7) Notify tenants of ATC's impending initiation or termination of SMGCS procedures.

(8) Advise ATC of airfield conditions or irregularities which may impact air traffic control operations.

(9) Coordinate with the SMGCS working group actions necessary in developing a low visibility chart.

(10) Make follow-me services available.

f. Tenant Organizations. Airport tenants will be responsible for adherence to the SMGCS plan and will correct such deficiencies that are observed or brought to their attention.

8. VISUAL AID REQUIREMENTS. During low visibility operations, adequate visual cues to pilots and vehicle operators are necessary in order to maintain their situational awareness and to ensure the continuation of safe, efficient ground operations. Visual aids should be installed in accordance with the standards set forth in the AC 150/5340 series (listed in Appendix 1).

a. Taxiway Lighting.

(1) **Movement Area**.

(a) **For operations below 1,200 feet RVR**, one of the following should be installed along each taxi route in the movement area:

1 Taxiway edge lights **or**;

2 Taxiway centerline lights supplemented with raised edge reflectors on curves and turns.

Note: Centerline lights are more effective than edge lights in low visibility operations; however, at airports where ice and snow could obscure centerline lights, it may be advantageous to install edge lights.

(b) **For operations below 1,200 feet RVR**, taxiway edge lights should be installed at intersections along the taxi route where an aircraft is expected to turn and the taxiway width or pavement fillet does not meet the design standards of AC 150/5300-13, Airport Design, current edition. (See Appendix 1.)

(c) **For operations below 600 feet RVR**, taxiway centerline lights supplemented on curves and turns with edge lights should be installed along each taxi route in the movement area. The taxiway centerline lights should extend continuously from the runway centerline to the non-movement area. When the taxi route crosses or extends onto a runway, centerline lights should be installed.

Note: It is recommended that taxiway lights be turned off, to the maximum extent possible, on those taxiways or runway exits that are not part of a low visibility taxi route.

(2) **Non-movement Area**.

(a) **For operations below 1,200 feet RVR,** down to and including 600 feet RVR, neither lighting nor reflectors are required. Note: The installation of centerline lights, or secondarily, centerline reflectors, is recommended along taxiway and taxilane centerlines to provide improved guidance.

(b) **For operations below 600 feet RVR:**

1 Taxiway centerline lights should be installed **or**,

2 The SMGCS plan must contain provisions for taxiing assistance for pilots in the form of a "follow me" vehicle, towing via a tug, or ground marshalling.

b. Lights at Access to Active Runways.

(1) **For operations below 1,200 feet RVR:**

(a) Except as provided in the following paragraph, all taxiways that provide access to an active runway (regardless of whether they are part of the low visibility taxi route) should have runway guard lights installed at the runway holding position on the taxiway. If both a runway holding position **and** ILS critical area holding position marking are present, runway guard lights should be installed at the runway holding position only. (See Appendix 5)

(b) In certain instances, the SMGCS working group may determine that at certain taxiway/runway intersections runway guard lights may not be necessary. In making such a evaluation, the working group should consider if the intersection and runway environment is safe-guarded from the inadvertent entry of aircraft and vehicles through other means (e.g., traffic volume and routings, airport configuration).

> Note: The new installation or upgrading of elevated runway guard lights may not be required if in-pavement runway guard lights or stop bar lights are installed at the same location.

(2) **For operations below 600 feet RVR:**

(a) In addition to the criteria specified in paragraph 8b (1), all illuminated (i.e., centerline and/or edge lights turned on) taxiways that provide access to an active runway (regardless of whether or not they are part of the taxi route) should have stop bar lights installed at the runway holding position. If both a runway holding position and an ILS critical area holding position marking are present, the stop bar should be installed at only the ILS critical area holding position. Stop bars on taxiways which are used to enter or cross an active runway should be capable of being operated individually. Such stop bars are termed "controlled stop bars." The remaining "uncontrolled" stop bars may be operated by a single switch. Stop bar lights are used to positively control access to an active runway. At the approach end of a runway, in-pavement green lead-on lights will illuminate to provide a secondary visual confirmation of clearance onto the runway by ATC personnel.

(b) All non-illuminated taxiways (i.e., centerline and edge lights turned off) will be considered not available for taxiway or runway access, and do not need stop bars installed. However, the SMGCS working group should evaluate the need for any additional "uncontrolled" stop bars.

c. Runway Guard Light Selection. There are two configurations of runway guard lights. The following criteria should be used to determine which configuration should be installed at a specific runway holding position.

(1) Elevated runway guard lights should be installed at the runway holding position if the taxiway does not have taxiway centerline lights installed **and** is 150 feet wide or less. However, if the taxiway has a stop bar installed at the runway holding position, elevated runway guard lights should be co-located with the stop bar, regardless of taxiway width or the presence of taxiway centerline lights.

(2) In-pavement runway guard lights should be installed at the runway holding position if the taxiway has centerline lights installed, or the taxiway is greater than 150 feet wide, or a stop bar is installed at the ILS critical area holding position.

(3) In-pavement combination stop bar/runway guard light fixtures (dual red/yellow lens) may be installed at the discretion of the airport operator. The yellow in-pavement lights may not be turned on when the stop bar is in operation. If the stop bar is located at an ILS critical area holding position, dual red/yellow fixtures should not be selected. (This would result in the installation of two sets of runway guard lights at different locations which serve the same intersection.)

> Note: At airports where ice and snow could obscure in-pavement runway guard lights, it may be advantageous to also install elevated runway guard lights.

d. Clearance Bars/Holding Position Markings. Hold points along taxi routes should be appropriately denoted by the following:

(1) **For operations below 1,200 feet RVR,** taxiway holding position markings should be painted to denote hold points.

(2) **For operations below 600 feet RVR,** clearance bar lights should be installed at hold points, in addition to the taxiway holding position marking and geographic position marking.

e. Taxi Guidance Signing and Marking.

(1) **For operations below 1,200 feet RVR,** taxi guidance signs should be installed at taxiway intersections. Surface painted signs should be located on the pavement where they will enhance the operation as determined by the SMGCS working group, or where it is not feasible to install guidance signs.

(a) Paint markings that are bright and provide good contrast with the pavement are a significant low visibility guidance aid. These markings along low visibility taxi routes should receive special attention and be repainted when the

conspicuity is degraded through wear and tear. Taxiway centerline markings, outlined with black borders, should be painted on light-colored pavements.

(b) The use of reflective or glass beaded paint should be used for geographic position markings. Glass beads should not be added to black paint.

(2) **For operations below 600 feet RVR**, geographic position "spot" markings identifying hold points, and co-located with a lighted clearance bar light, should be painted on the taxiway pavement. A geographic position marking located without a taxiway clearance bar light can also be used for positioning information or where location verification or additional guidance is expected to be needed. These markings will be at locations in the movement area where they enhance low visibility operations as determined by the SMGCS working group.

f. Monitoring and Visual Inspection of Lighting Aids. Controlled stop bars should be electronically monitored with a status indication provided in the ATC tower. It is recommended that all other lighting systems which support low visibility operations be electronically monitored.

(1) **For operations below 1,200 feet RVR:**

(a) An initial visual inspection of stop bar lights, runway guard lights, clearance bar lights, taxiway centerline lights, and taxiway edge lights installed on the low visibility routes or taxiways that intersect the low visibility runway(s) should be conducted by the airport operator prior to the implementation of SMGCS procedures. This visual inspection is conducted to ensure that the lighting systems are "serviceable" as described in paragraph 8g, and that the lighting system status indicated on any associated electronic monitoring systems reflect the actual operating condition of the lights. All controlled stop bars should be checked for proper function (i.e., operation of sensors, lead-on lights, etc.). Taxiway centerline lights which lie beyond all uncontrolled stop bars are not part of a standard stop bar system and therefore, need not be visually inspected.

(b) A periodic visual inspection need not be conducted for lighting systems described in 8f(1)(a) which are electronically monitored except when meteorological conditions may render them unserviceable (e.g., snow, blowing snow, sand, etc.). Those lighting systems which are not electronically monitored should be periodically inspected every 2 to 4 hours. The interval is normally based on taxiway complexity/configuration, number of low visibility routes, number of taxiways that provide access to active runways, etc.

(2) **For operations below 600 feet RVR:**

(a) With the following exception, a visual inspection of stop bar lights, runway guard lights, clearance bar lights, taxiway centerline lights and taxiway edge lights installed on the low visibility routes or taxiways that intersect the low visibility runway(s) should be conducted by the airport operator prior to the commencement of operations below 600 feet RVR. Exception: Unless meteorological conditions may render the lights unserviceable (e.g., snow blowing snow, sand, etc.), the status of any of the aforementioned lighting systems which are electronically monitored may be determined from the lighting status indication on the monitor, provided that the monitor is capable of remotely detecting the unserviceability conditions in paragraph 8g. An inspection conducted within 2 hours prior to commencement of operations below 600 feet RVR would be acceptable for this inspection. This visual inspection is conducted to ensure that the lighting systems are "serviceable" as described in paragraph 8g. Because controlled stop bars are checked for proper function at the initial visual inspection and because of continuous use by aircraft, re-inspection of stop bars for functionality need not be performed. Taxiway centerline lights which lie beyond uncontrolled stop bars need not be visually inspected.

(b) The serviceability of lighting systems described in paragraph 8f(2)(a), except taxiway edge lights, which are electronically monitored with a system capable of remotely detecting the unserviceability conditions in paragraph 8g, should be determined every 2 hours from the lighting status indication on the monitor. Lighting systems which are not electronically monitored with a system of the same capability should be periodically inspected every 2 hours to ensure that the lighting systems remain "serviceable." The periodic inspection of controlled stop bars need not include a check for proper function. Taxiway centerline lights which lie beyond all uncontrolled stop bars need not be visually inspected.

g. Maintenance Criteria for Lighting Aids. Taxiway edge lights, taxiway centerline lights, clearance bar lights, runway guard lights and stop bar lights supporting low visibility operations that are not electronically monitored should be included in a system of preventive maintenance that has the following objectives:

(1) Taxiway edge lights, taxiway edge reflectors and taxiway centerline lights along the low visibility taxi route -- no two adjacent lights or reflectors unserviceable.

(2) Stop bar lights or in-pavement runway guard lights -- no more than three lights per location unserviceable nor two adjacent lights unserviceable.

(3) Elevated runway guard lights -- no more than one light in a fixture unserviceable.

(4) Clearance bar lights -- no more than one light unserviceable.

(5) When any of the lighting aids do not meet the maintenance objectives above:

(a) Traffic should be rerouted to areas where the visual aids are operating normally or;

(b) Alternative procedures should be implemented to accommodate the operations or;

(c) Low visibility operations should be terminated until the lighting aids are returned to normal service.

(6) Lighting aids along the low visibility taxi route(s) that are inoperative should be repaired promptly with minimal disruption of service. If warranted, appropriate NOTAMS should be issued or canceled expeditiously.

h. Maintenance Criteria for Lighted Signs.

(1) Mandatory instruction signs, at entrances to the active low visibility runway(s), and location and direction signs, along low visibility taxi routes where aircraft will be required to hold or turn, should be inspected prior to implementation of SMGCS procedures, and every 2 to 4 hours thereafter while the SMGCS plan is in effect.

(2) When any required sign is not illuminated, unserviceable or missing, it should be repaired promptly with minimal disruption of service. If warranted, appropriate NOTAMS should be issued or canceled expeditiously, and:

(a) Traffic should be rerouted to areas where the visual aids are operating normally or;

(b) Alternative procedures should be implemented to accommodate the operations or;

(c) Low visibility operations should be terminated until the sign(s) are returned to normal service.

9. SURFACE MOVEMENT SURVEILLANCE SYSTEMS (SMSS).

a. **For operations below 1,200 feet RVR**, a surface movement radar (SMR), such as airport surface detection equipment (ASDE-3 equivalent), or alternative technologies that allow ATC to establish the geographic position of all aircraft and vehicles may be used.

b. **For operations below 600 feet RVR**, an SMR should be installed and operational. In the event that the SMR becomes inoperative during operations below 600 feet RVR, operations may continue while utilizing approved geographic positioning procedures until operations below 600 feet RVR are terminated. The SMR must be operational before resuming operations below 600 feet RVR.

10. AIRPORT FACILITIES AND SERVICES.

a. Aircraft Rescue and Fire Fighting (ARFF). During reduced visibility conditions, the role of ATC in notifying and assisting ARFF services increases in significance. Procedures, systems and/or techniques should be established and reviewed annually, in coordination with the airport operator, to ensure that aircraft requiring assistance can be located and ARFF services provided. **For operations below 600 feet RVR,** the pre-positioning of ARFF equipment (so as not to create a new obstacle), installation of forward looking infrared radar (FLIR) and global positioning system (GPS), or other approved alternative technology should be considered.

b. Taxiway Configuration. The SMGCS working group should examine the airport for adequacy of fillets and landing gear and/or wingtip clearances along taxiways used in low visibility conditions.

(1) **For operations below 1,200 feet RVR,** it is recommended that inadequate taxiway fillets be upgraded to meet current standards. Those locations that are not upgraded should be depicted on appropriate SMGCS low visibility taxi route charts. The notation may be in the form of a symbol identifying specific turning points or a general note such as "judgmental oversteering required along the taxi route."

(2) **For operations below 600 feet RVR,** inadequate taxiway fillets and clearances at turning points or other locations along taxi routes used for operations below 600 feet RVR should be upgraded to meet the current standard.

c. SMGCS Low Visibility Procedures. SMGCS procedures should be developed for each SMGCS airport authorized for low visibility operations. The procedures should include a method of notifying key personnel of participating organizations that SMGCS procedures have been initiated or terminated by ATC. Copies of the approved SMGCS plan and any revisions should be provided to all parties involved.

(1) All vehicle operators should receive SMGCS training in areas such as airport lights, signs, and markings procedures to follow if lost in the aircraft movement area, and if applicable, radio telephone procedures, including lost-communication procedures. The airport operator should review driver training programs to ensure that low visibility procedures are included and the training is documented. Vehicle operators supporting SMGCS operations should have a low visibility taxi route chart or equivalent available.

(2) Procedures for evaluating special situations such as construction activities, snow removal, and deicing procedures should be included in the SMGCS plan to determine any limitations that should be imposed on those vehicle activities when the SMGCS plan is implemented.

(3) **For operations below 1,200 feet RVR,** describe the method of limiting vehicle access to aircraft movement areas. Vehicular traffic in the movement areas should be restricted to the essential minimum to support low visibility operations. The SMGCS working group should review vehicle control and, if necessary, identify additional marking, lighting, restrictions, or other measures necessary to control vehicles in non-movement areas.

(4) **For operations below 600 feet RVR,** the SMGCS working group should ensure positive control of vehicles in situations where active roadways cross designated taxi routes in movement areas. This may include such methods as barriers, gates, signs, markings, traffic lights, and "road guards".

d. Apron Traffic Management. **For operations below 600 feet RVR,** the SMGCS plan should include an apron traffic management plan for all non-movement apron areas used by aircraft or vehicles. The apron traffic management plan should indicate the party or parties who will coordinate the traffic movement in the apron area. The apron management entity(s) must limit access to the apron area to ensure the safe movement of all aircraft and vehicles operating within the area. Roadways which cross taxilanes must be kept clear by positive control methods, such as radio communications, when aircraft are using the apron area.

e. Taxiing Assistance in Non-Movement Areas. **For operations below 600 feet RVR**, where centerline lights are not installed, the SMGCS plan must contain provisions for taxiing assistance. Taxiing assistance may include such measures as follow-me vehicles or towing via a tug. The assistance should be provided by a method agreed upon by the SMGCS working group. Ground marshalling may be used to assist aircraft from the intersection of the taxilane centerline and the gate lead-in line.

11. AIRPORT CONDITION REPORTING. The loss of minima for low visibility landings or takeoffs can adversely affect aircraft operations, overall safety, and capacity. There are a number of critical components such as stop bar lights, centerline lights, etc.

which, if become inoperative, may have an immediate impact on availability of takeoff or landing operations. This especially affects operations below 600 feet RVR. It is time-critical that pilots and dispatchers be notified quickly of these outages and their effects on operations. This will enable timely and appropriate decisions to be made.

a. Due to its importance, such adverse impacts on operations should be quickly disseminated by the airport operator via means available such as land line communications to local station dispatchers, and on ATIS in order to alert pilots of aircraft inbound to the airport.

b. The timely notification of inoperative components should be thoroughly covered in the SMGCS plan and with interested parties such as ATC, the airport operator, and local tenants.

c. Inoperative components affecting low visibility operations may be reported through the NOTAM system and/or the FAA Traffic Management System.

12. FLIGHT OPERATIONS. The SMGCS plan should identify any aspects of the following list of items that are specific or unique to the airport, relative to low visibility operations. Aircraft operators should address these items in appropriate training programs for **all** flight crew and ground support personnel who may be involved in aircraft or vehicle operations on the movement or non-movement areas of the airport. Such training should also be documented. Training items include but are not limited to:

a. Apron (ramp) operations.

b. ILS critical areas, runway safety areas, and obstacle free zones.

c. Stop bar lights.

d. Runway guard lights.

e. Taxiway centerline lights, including ILS critical area alternating green and yellow lights from runway centerline.

f. Clearance bar lights.

g. Runway lead-on and lead-off lights.

h. Geographic position markings.

i. Taxiway and runway hold position markings.

j. Movement/non-movement boundary marking.

k. Other pavement markings such as surface painted signs.

l. Use of low visibility taxi route(s) chart(s).

m. Taxi procedures at turns requiring judgmental oversteering.

13. AIRPORT LOW VISIBILITY TAXI ROUTE(S) CHART.

a. A low visibility taxi route(s) chart(s) must be provided for use by flight crew, ATC personnel, ARFF personnel, ground support vehicle operators and ground marshalling crews, if appropriate. The airport low visibility taxi route chart should be limited to one page, if possible, and is generated by the SMGCS working group in coordination with region Air Traffic Control, Flight Standards, and Airports divisions. The taxi route chart is coordinated with the Technical Programs Division, AFS-400, and approved by the Terminal Procedures Branch, ATP-120.

b. The chart(s) should provide at least the following information:

(1) Designated low visibility taxi route(s) for operations below 1,200 feet RVR down to and including 600 feet RVR.

(2) Designated low visibility taxi route(s) for operations below 600 feet RVR, if applicable.

(3) A legend depicting appropriate symbology and terminology.

(4) Location of runways, taxiways, aprons, and concourses.

(5) Location of runway and taxiway centerline lights, including lead-on and lead-off lights.

(6) Location of stop bar lights.

(7) Location of geographic position markings.

(8) Location of taxiway hold points.

(9) Location of clearance bar lights.

(10) Location of movement area boundaries.

(11) Location of inadequate fillets on taxiway turns and the need for judgmental oversteering by pilots.

(12) Location of de-icing pads.

(13) Location of ARFF stations.

(14) Unique airport characteristics and/or procedures.

William J. White
Deputy Director, Flight Standards Service

APPENDIX 1 -- RELATED READING MATERIAL

1. Related advisory circulars listed below are available from the Superintendent of Documents at: New Orders, Superintendent of Documents P.O. Box 371954, Pittsburgh, PA 15250-7954. (Prices are subject to change.)

a. AC 150/5300-13, Airport Design, current edition. SN 050-007-853-8, $15.00.

b. AC 150/5300-13, Airport Design, Change 1, 6/5/91. SN 050-007-907-1, $4.50.

2. Copies of **current editions** of the following publications may be obtained free of charge from; U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.

a. AC 97-1, Runway Visual Range.

b. AC 120-28, Criteria for Approval of Category III Landing Weather Minima.

c. AC 120-29, Criteria for Approving Category I and Category II Landing Minima for FAR 121 Operators.

d. AC 150/5320-12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces.

e. AC 150/5340-1, Standards for Airport Markings.

f. AC 150/5340-4, Installation Details for Runway Centerline Touchdown Zone Lighting Systems.

g. AC 150/5340-18, Standards for Airport Sign Systems.

h. AC 150/5340-19, Taxiway Centerline Lighting System.

i. AC 150/5340-24, Runway and Taxiway Edge Lighting System.

j. Other applicable AC 150/5340 series, cataloged in AC 00-2, Advisory Circular Checklist (and Status of other FAA Publications for sale by the U.S. Government Printing Office (GPO)).

k. Order 6750.24, Instrument Landing System & Ancillary Electronic Component Configuration & Performance Requirement.

l. Order 6750.16, Siting Criteria for Instrument Landing Systems.

m. Order 8400.8, Procedures for Approval of Facilities for FAR Part 121 and Part 135 CAT III Operations.

APPENDIX 2 -- SAMPLE SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM PLAN

THE AIRPORT DEPICTED IN THIS SAMPLE PLAN IS FICTITIOUS. THIS PLAN DESCRIBES ONLY OPERATIONS IN THE LESS THAN 1,200 FEET RVR DOWN TO AND INCLUDING 600 FEET RVR VISIBILITY RANGE. IF OPERATIONS BELOW 600 FEET RVR ARE APPLICABLE, REFER TO APPENDIX 4 FOR ADDITIONAL INFORMATION AND GUIDANCE THAT MAY BE ADDED TO THE SMGCS PLAN.

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM PLAN

_____ INTERNATIONAL AIRPORT

DATE

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1.0 INTRODUCTION

1.1 This Surface Movement Guidance and Control System (SMGCS) Plan describes enhancements, procedures and actions at _____ International Airport (____) that are applicable to the airport operator, air traffic control (ATC), airlines, and other tenants of the Airport during low visibility conditions.

1.2 These enhancements, procedures, and actions are in accordance with the guidance set out in Federal Aviation Administration (FAA) Advisory Circular 120-57, Surface Movement Guidance and Control System, current edition. A SMGCS Plan is necessary for airports where scheduled air carriers conduct takeoff or landing operations in visibility conditions of less than 1,200 feet runway visual range (RVR).

1.3 The procedures contained in this plan were developed by the SMGCS Working Group which consisted of representatives from: Airport staff involved with airfield operations, lighting, aircraft rescue and fire fighting (ARFF), security/traffic control, airport consultants; FAA Air Traffic Control (local and/or regional); FAA Airports District or Regional office; FAA Flight Standards (local and/or regional); FAA Airway Facilities Sector office; appropriate scheduled airlines; appropriate Air Transport Association representative; Air Line Pilots Association (ALPA) or other appropriate pilot groups; appropriate cargo/package operators; military aviation tenants; appropriate operators under Title 14 Code of Federal Regulations part 91, and service corporations. (Includes general aviation and corporate operators.)

1.4 This document does not supersede established policies, procedures, rules or guidelines for airports, aircraft or vehicle operators, or air traffic control. It does prescribe certain airfield lighting and marking improvements and operating procedures that have been designed to enhance the safety and efficiency of aircraft and vehicle movements.

1.5 To enhance the safety of low visibility operations, part 91 operators should follow the guidance in this plan to the maximum extent possible and expect follow-me assistance to and from the runway environment.

1.6 This plan addresses both current and future enhancements to support low visibility takeoff, landing, and taxiing operations at the airport. The work of the SMGCS Working Group will continue after the initial plan is

approved by the FAA. The SMGCS working group should meet as necessary, but not less than once a year to assess low visibility operations, and to modify the plan as necessary.

2.0 DEFINITIONS

2.1 Airfield. That portion of the Airport intended to be used wholly or in part for the arrival, departure, and movement of aircraft.

2.2 Airport apron controller. The term "airport apron controller" refers to personnel from the airlines and Airport operations providing joint control of the concourse non-movement area

2.3 Airport Operations. The term "Airport Operations" refers to personnel assigned from the Airport Operations Department who are responsible for the overall management of: the airfield. This may include Airport security, technical services; apron control, air cargo area, airport operations and safety; and other activities specified in Title 14 Code of Federal Regulations part 139.

2.4 Apron (Ramp). A defined area on an airport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, and maintenance. The apron area includes the following components:

(1) Aircraft Parking Positions. Intended for parking aircraft to enplane/deplane passengers, load or unload cargo.

(2) Aircraft Service Areas. On or adjacent to an aircraft parking position. Intended for use by personnel/equipment for servicing aircraft and staging of equipment to facilitate loading and unloading of aircraft.

(3) Taxilanes. Apron areas which provide taxiing aircraft access to and from parking positions.

(4) Vehicle Roadways. Identified rights of way on the apron area designated for service and ARFF vehicles.

2.5 Clearance bar. A clearance bar consists of three in-pavement steady-burning yellow lights.

2.6 Controlling region. Refers to the FAA geographic Region in which an airport is located.

2.7 Geographic position marking. Pavement markings used to identify the location of aircraft or vehicles during low visibility conditions. They are referred to as "spots" by air traffic control (ATC).

2.8 Low Visibility Operations. The movement of aircraft or vehicles on the airport paved surfaces when visibility conditions are reported to be less than 1,200 feet RVR.

2.9 Movement area. Refers to the runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas.

2.10 Non-movement Area. Refers to taxiways and apron areas that are not under air traffic control.

2.11 Runway Guard Lights--(Elevated). Fixture consists of a pair of elevated flashing yellow lights, installed on both sides of a taxiway, at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions.

2.12 Runway Guard Lights--(In-pavement). Fixtures consists of a row of in-pavement flashing yellow lights installed across the entire taxiway, at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions.

2.13 Stop bar. Stop bar lights consist of elevated and in-pavement red fixtures that are installed at the runway holding position or ILS critical area holding position marking. Stop bars may be controllable by ATC and will include a system of in-pavement green taxiway centerline/lead-on lights at locations where aircraft will enter or cross a runway.

2.14 Surface Movement Guidance and Control System (SMGCS). A SMGCS system consists of the provision of guidance to, and control or regulation of, all aircraft, ground vehicles and personnel on the movement area of an aerodrome. Guidance relates to facilities, information and advice necessary to enable the pilots of aircraft, or the drivers of ground vehicles to find their way on the aerodrome, and to keep the aircraft or vehicles on the surfaces

or within the areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows smooth and freely.

2.15 Surface Painted Holding Position Sign. Pavement marking which is used to identify a specific runway. These markings are configured the same as the associated sign.

2.16 Surface Painted Direction Sign. Pavement markings that are configured the same as the associated sign and provided when it is not possible to provide taxiway direction signs at intersections.

2.17 Surface Painted Location Sign. Pavement markings that are configured the same as the associated sign, and are used to supplement the signs located along side the taxiway, and assist the pilot in confirming the designation of the taxiway on which the aircraft is located. (ref. AC 150/5340-1G)

2.18 Taxi route. A specific sequence of lighted taxiways used by aircraft during low visibility operations.

3.0 FACILITIES, SERVICES AND EQUIPMENT

3.1 Runways. The Airport has two north-south parallel runways that are used, individually or in combination, for both takeoffs and landings in a northerly flow direction for this plan. Runway 35L and Runway 35R are useable for takeoffs and landings down to 600 RVR. Each of these runways are 12,000 feet long and are served by Category III instrument landing systems; touchdown, midpoint, and rollout RVR equipment; runway instrument markings; ALSF-2 approach lighting systems with sequence flashers; touchdown zone and centerline lighting, and high intensity edge lighting.

3.2 Taxiway lighting. Continuous green taxiway centerline lights and blue taxiway edge lights are installed on all taxiways leading to and from the low visibility runways. Continuous green taxiway centerline lights are installed on all apron taxiways.

Taxi routes and taxi procedures are described in paragraph 6, AIR TRAFFIC CONTROL PROCEDURES.

3.3 Runway Guard Lights. Elevated runway guard lights are located at all runway access points and may be illuminated at all times to prevent runway incursions.

3.4 Stop bars. Lighted stop bars are installed at all runway access points. During low visibility operations the stop bars, located on the first two taxiways that are used as runway entrances for departure aircraft on Runway 35L and Runway 35R, are controlled by ATC.

3.5 Taxiway clearance bars. Taxiway clearance bars are located at various locations throughout the Airport. These clearance bars occur at the edges of runway protection zones where aircraft tail heights or vehicles might penetrate runway operational surfaces, and where taxiway-to-taxiway intersections warrant additional caution. Clearance bars are illuminated whenever the taxiway centerline lights are illuminated. Aircraft are not required to hold at a taxiway clearance bar unless directed to do so by ATC.

3.6 Taxiway guidance signing and marking inspections. Taxiway guidance signing and marking are inspected routinely as part of the Airport operations airfield inspection program. Electronic monitoring is provided for all signs and lights associated with low visibility taxi routes. This monitoring alerts ATC whenever threshold outage levels are exceeded. Airport maintenance is also notified by an alarm and will take corrective action.

3.7 Non-movement area control. Control of the non-movement area between and around the concourses is administered by the airlines and/or the Airport Operations Department. Other non-movement areas are controlled by the tenants of those respective areas. Appropriate movement/non-movement area markings are installed on apron edges.

3.8 Surface movement surveillance. The Airport has airport surface detection equipment (ASDE-3). FAA utilizes this equipment to monitor the geographical position of aircraft and vehicles during reduced visibility conditions and at night.

3.9 Follow-me service. The Airport Operations Department will provide "follow-me" service for air carrier aircraft upon request, subject to availability of equipment and the need to accomplish higher priority duties. To enhance safe operations in low visibility conditions, part 91 operators should expect follow-me services to and from the runway environment.

The Airport operations follow-me vehicle is identified by yellow flashing emergency lights. A follow-me request may be initiated by the pilot, ATC, or the airport apron controller.

3.10 Aircraft docking. The airline assumes control of the aircraft in the vicinity of the gate, as directed by the airport apron controller, and provides aircraft docking by the use of wing walkers, follow-me vehicles, tugs or other appropriate means as set out in the airline's operations manual.

4.0 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF)

4.1 ARFF coverage. Each of the ARFF stations provide primary coverage during low visibility operations, depending on runway use configuration. ARFF Station #1 is located at the intersection of Taxiway AA and Taxiway G and provides primary coverage to the west airfield. ARFF Station #2 is located adjacent to Runway 17R on Taxiway CS and provides primary coverage to the east airfield. Equipment and personnel will remain on alert status at these stations when low visibility operations are in progress.

4.2 ARFF coordination. Coordination between ATC and ARFF is accomplished annually to ensure effectiveness of ARFF services. This coordination is accomplished as part of the annual airport emergency plan review required by Part 139.

5.0 VEHICLE CONTROL

5.1 Vehicle access. Vehicle access to the Airport is controlled by a system of perimeter fencing and gates. All Airport and tenant vehicles entering the airport operations area (AOA) are identified by a mandatory apron access permit, displayed on the windshield of the vehicles, which is obtained from the Airport Operations Department and enforced by Airport Security. Vendors and contractor vehicles are also identified through the apron permit system or are escorted by authorized personnel. Airport security shall insure that all vehicles operating on the AOA are properly marked and lighted.

During low visibility conditions, vehicles requiring access from outside the restricted security area must be cleared by Airport Operations through a security gate before entrance is gained to the AOA.

5.2 Vehicle service roads. Except for the necessary movement in leased areas, vehicles must be operated within the clearly marked system of vehicle service roads. These service roads are identified by solid white edge lines with a dashed white line used as centerline divider. Where a service road intersects a taxiway, a solid white stop line is provided across the vehicle lane at a point that assures adequate clearance from taxiing aircraft. Standard stop and yield signs are installed in line with the stop line, on the right side of the road, at each entrance. Dashed white lines may be provided across certain taxiways where driver reference is needed, because of the width of the intersecting taxiway and the possibility of the driver becoming lost in low visibility conditions.

5.3 Driver training. Vehicles driven on the AOA during low visibility conditions will only be operated by drivers that have completed SMGCS driver training. All personnel authorized to drive on the airfield in movement or non-movement areas are provided driver training by the Airport Operations Department. Exception: Qualified tenants may provide training to their employees under the supervision of the Airport Operations Department. Construction crews and other temporary access personnel are provided individual instruction by Airport Operations. All Airport and tenant driver training courses use video training aids which include SMGCS lighting, signing, marking, and procedures and include written tests. Drivers are instructed to pay particular attention to striped and dashed yellow lines used in combination with one another, i.e., a single stripe and single dash, or two stripes and two dashes. These markings, denote runway holding positions or the movement/non-movement area boundary and must not be crossed without authorization from ATC. The driver training programs are reviewed annually by Airport Operations to ensure that they are current.

5.4 Access restrictions. Only vehicles operated by the Airport or by FAA Airways Facility maintenance personnel are allowed on the Airport movement area. All other access to the movement area will be coordinated and approved by Airport Operations. In low visibility conditions, no vehicles are permitted in the movement area that are not in direct support of the SMGCS plan.

6.0 AIR TRAFFIC CONTROL PROCEDURES

6.1 Background and operating concept. The SMGCS plan provides guidance and control of aircraft between various apron locations and the runways in a safe and efficient manner during low visibility conditions. The coordinated efforts of ATC and Airport Operations are all focused on assuring safe movement and avoiding inadvertent or unauthorized entry onto the movement area during low visibility conditions. When one portion of the Airport is in a low visibility condition, i.e., visibility less than 1200 feet RVR, the entire Airport is considered to be in low visibility conditions and SMGCS procedures and restrictions are placed in effect.

The concept for accomplishing these objectives is to only use the north-south runways in a northerly flow direction only. The principal arrival runway is Runway 35R while Runway 35L is predominately used for departures. In certain instances, both runways may be used for arriving and departing aircraft.

6.2 Visibility reporting. ATC will coordinate with Airport Operations when lowering ceiling and visibility conditions indicate that visibility less than 1,200 feet RVR is imminent and SMGCS procedures are going into effect. Airport Operations will in turn will advise the airlines, service companies, other airport tenants, and air cargo operators by telephone. Individual airlines will notify service companies or vendors, which are not notified by Airport Operations, that the SMGCS plan is in effect.

These procedures are terminated by ATC when no longer deemed necessary due to prevailing weather conditions. ATC will also advise Airport Operations when the SMGCS plan is no longer required, and Airport Operations will advise the airport tenants and other organizations noted above that the SMGCS plan is no longer in effect. The airlines will make appropriate notifications when the SMGCS plan has been terminated.

6.3 Departures. Each airline or aircraft operator is responsible for positioning aircraft at the movement area boundary. This may be accomplished with a tug, signalman, follow-me vehicle or other appropriate means, including unassisted taxi, if visibility on the apron permits. When established at the movement area boundary, the aircraft will contact ATC ground control for taxi instructions. ATC may provide RVR readings to pilots prior to taxiing in the movement area.

When visibility is less than 1,200 feet RVR, down to and including 600 feet RVR, all taxiway lighting may be illuminated. Taxiway edge lights, without centerline lighting, may be illuminated at various times for snow removal or other operational reasons.

The FAA ground controller may use ASDE or pilot position reports to monitor the aircraft position prior to its entry into the movement area. The controller will then provide taxi instructions and traffic advisories appropriate to the route. The north-south parallel taxiways in the movement area are operated in opposing directions, with Taxiways G and L used as the primary departures taxiways to Runways 35L and 35R, respectively.

6.4 Departure routings. Aircraft routings for departure will vary depending on the initial location of the aircraft and whether deicing is required prior to departure. Aircraft must have ATC clearance prior to entering Taxiway G, Taxiway L, or Taxiway M.

(1) Runway 35L departures.

a. Aircraft departing on Runway 35L from the concourse apron proceed west on the lighted apron taxiways to Taxiway G, and continue north on Taxiway G to Taxiway CN. Aircraft proceed west on Taxiway CN and continue west onto Taxiway F1 to reach Runway 35L. ATC may require aircraft taxiing on Taxiway G to hold at the intersection of Taxiway CN. If deicing is required from a concourse deicing pad prior to departure, aircraft will proceed west on the apron taxiway to Taxiway H and turn north or south on Taxiway H to the assigned deicing pad. Upon completion of deicing, the aircraft must contact ATC for clearance to proceed onto Taxiway G.

b. Aircraft departing on Runway 35L from the south air cargo apron proceed east on the cargo Taxiway SC to Taxiway SA, and south on Taxiway SA to Taxiway A. Aircraft then proceed east on Taxiway A to the Runway 35R holding position movement area boundary marking, where contact is established with ATC. Aircraft continue east on Taxiway A to Taxiway M, north on Taxiway M to Taxiway CN, west on Taxiway CN, then onto Taxiway F1 to reach Runway 35L. ATC may require periodic position reports along the taxi route to confirm or supplement ASDE-3 information.

If deicing is required prior to departure, aircraft proceed east on Taxiway SC to Taxiway SA, south on Taxiway SA to Taxiway A, then east on Taxiway A to the south deicing pad. Upon completion of deicing, aircraft exit the pad at the intersection with Taxiway M and proceed as described in the above paragraph. Should the aircraft require secondary deicing from a concourse deicing pad prior to departure, the pilot should advise ATC and request clearance to the concourse deicing pad area.

Coordination between aircraft on the south air cargo apron and ATC is required to insure that conflicting, i.e., opposite direction traffic flows, do not occur on Taxiway M. Aircraft on the south cargo area should advise ATC prior to taxi.

c. Aircraft departing on Runway 35L <u>from the general aviation area</u> proceed north on Taxiway M to Taxiway CN, west on Taxiway CN onto Taxiway F1 to reach Runway 35L. Departures must contact ATC for taxi clearance before leaving the general aviation ramp. ATC may require aircraft to hold on the ramp prior to entering Taxiway M, when exiting on Taxiway M, or when reporting clear of the Runway 35R approach area located between Taxiway M5 and Taxiway M6. If deicing is required prior to departure, the pilot should request ATC clearance to the concourse apron deicing area.

(2) <u>Runway 35R departures</u>.

a. Aircraft departing on Runway 35R <u>from the concourse apron</u> proceed east on lighted apron taxiways to the Taxiway L holding position (movement area boundary) marking. Prior to entering the movement area, the aircraft should contact ATC for taxi instructions. Aircraft will proceed southbound on Taxiway L. ATC may require aircraft taxiing on Taxiway L to hold at apron taxiway intersections for sequencing. Aircraft will continue south on Taxiway L to its intersection with Taxiway AA, east on Taxiway AA to Taxiway M, and then south on Taxiway M to Taxiway A, continuing east on Taxiway A to reach Runway 35R.

If deicing is required at the south deicing pad, the aircraft proceeds south on Taxiway M to Taxiway SC, then west on Taxiway SC, south on Taxiway SA, and east on Taxiway A into the south deicing pad. Upon completion of deicing, ATC clearance is required prior to

re-entering the movement area at Taxiway M. Aircraft exit the deicing pad on Taxiway M, proceed north on Taxiway M to its intersection with Taxiway A and turn eastbound on Taxiway A, continuing east on Taxiway A to reach Runway 35R.

b. Aircraft departing on Runway 35R from the south air cargo apron proceed east on cargo Taxiway SC to Taxiway SA, and south on Taxiway SA to Taxiway A. Aircraft then proceed eastbound on Taxiway A to the Taxiway M holding position (movement area boundary) marking where contact is established with ATC. Aircraft continue east on Taxiway A to reach Runway 35R. If deicing is required prior to departure, aircraft will follow the same routing on Taxiway A into the south deicing pad. Upon completion of deicing, aircraft exit the deicing pad and immediately contact ATC prior to entering Taxiway M for clearance on Taxiway A to Runway 35R.

c. Aircraft departing on Runway 35R from the general aviation area proceed south on Taxiway M and follow the same routing as described in paragraph 6.4(2)a. above. Departures must contact ATC for taxi clearance before leaving the general aviation ramp. ATC may require aircraft to hold on the ramp prior to entering Taxiway M. If deicing is required prior to departure, aircraft will follow the same routing on Taxiway M into and out of the south deicing pad as described in paragraph 6.4(2)a. above.

d. When departure and arrival operations are conducted on Runway 35R, Taxiway CN is used in a westbound direction favoring arrivals. Departures going to Runway 35R from the north side of Concourse C proceed west on Taxiway CN to Taxiway H, south on Taxiway H to the apron taxiway designated by ATC for transition east to Taxiway L, and then south on Taxiway L as described in paragraph 6.4(2)a. above.

6.5 Arrivals. Landings may be conducted on Runway 35L or Runway 35R. The apron taxiways are operated in an alternating east and west flow pattern to minimize taxi time to the gate. Taxiways F and M are used as the primary arrival taxiways.

When visibility is less than 1,200 feet RVR, down to and including 600 feet RVR, all taxiway lighting may be illuminated. Taxiway edge lights without centerline lighting, may be illuminated at various times for snow removal or other operational reasons.

At various times, ATC may ask arriving aircraft to report "clear" of the runway or ILS critical area.

6.6 Arrival routings. Aircraft arrival routings vary depending on the particular runway used for arrival, the airfield operating configuration and the destination of the aircraft on the airport.

(1) Runway 35R arrivals.

a. Aircraft arriving on Runway 35R will use mid-field Taxiways M6 or M7 to exit the runway, or continue to roll out to the end of the runway (Taxiway M10). Upon exiting the runway, aircraft will use Taxiway M to go north to the assigned apron taxiway to access the concourse apron, or to access Taxiway L to go south to the general aviation area or the south cargo area. ATC may require aircraft taxiing south on Taxiway L to hold at apron taxiway intersections.

Aircraft exiting at the end (Taxiway M10) and going to the general aviation area or the south cargo area, will continue south on Taxiway L to Taxiway AA, proceed east on Taxiway AA to Taxiway M and southbound on Taxiway M. ATC may require aircraft taxiing on Taxiway L to hold at apron taxiway intersections. Aircraft accessing the south cargo area will use cargo Taxiway SC west from the intersection with Taxiway M. ATC may require aircraft taxiing west on Taxiway SC to report "clear" of Taxiway L.

Upon receipt of an appropriate ATC clearance, aircraft exiting on Taxiways M6 and M7 may immediately turn south on Taxiway M to access the south air cargo apron or general aviation area. The taxiway routing from Taxiways M6 and M7 south to the south air cargo apron or general aviation area is as described above.

(3) Runway 35L arrivals.

a. Aircraft arriving on Runway 35L will use mid-field Taxiway F9 to exit the runway, or continue to roll out to the end of the runway (Taxiway F12). Upon exiting the runway, aircraft will use Taxiway F to go south to Taxiway Z. Aircraft proceed east on Taxiway Z to Taxiway L. Access to the concourse apron, general aviation, and south cargo area on Taxiways L and M is conducted as described above. ATC may require aircraft taxiing southbound on Taxiway L to hold at intersecting apron taxiways.

6.7 Mixed operations. Effective air traffic management coordination is essential when departures are conducted on Runway 35R in mixed operations. ATC should ensure that arrivals and departures originating and terminating in the south cargo area are managed to prevent congestion (i.e., "nose to nose operation") on Taxiway M. All aircraft departing the south cargo area should contact ATC prior to entering the movement area on Taxiways A or SC.

When mixed operations are being conducted on Runway 35L, aircraft arriving or departing Runway 35L will use the routings as described above.

7.0 AIRLINE PROCEDURES DURING LOW VISIBILITY CONDITIONS

7.1 General. Pilots conducting low visibility operations at ____ are required to have a copy of the low visibility taxi route chart. Low visibility taxi routes are depicted on the appropriate NOS and Jeppesen charts.

The airport apron controller will resolve aircraft and vehicle movement conflicts in the non-movement area. This will be accomplished through the use of two-way radio communication, ground movement control procedures, follow-me vehicles, and ground marshalling. ATC will monitor and control aircraft in the movement area.

7.2 Departures. Departing aircraft will follow company procedures for pushback, engine start, and initial taxi to the movement area boundary at the apron taxiway holding position. If appropriate, the pilot should request from the ground handling agency taxiing assistance such as signalman and wingwalkers, follow-me service, or towing to the apron taxiway holding position. In all cases, aircraft must have ATC clearance prior to entering the movement area.

7.3 Arrivals. Arriving aircraft will follow company procedures for taxi to the gate on the apron concourse or to other parking areas as appropriate. The airline assumes control of the aircraft in the vicinity of the gate and provides aircraft docking by the use of signalman and wingwalkers, follow-me service, towing or other appropriate means as set out in the airline's operating instructions.

7.4 Taxi routing. The principal taxi flow direction on the parallel taxiways between concourses in the concourse apron area is from east to west. This direction is established on the basis that Runway 35R is predominately an arrival runway in low visibility conditions while Runway 35L is predominately used for departures. The westbound flow provides for arrivals on the east airfield to flow into the concourses to the aircraft parking position and out the other side to the west airfield for departure. When Runway 35L is used for mixed operations or as an arrivals only runway, aircraft are routed east on Taxiway Z to the east north-south taxiway complex and enter the concourse apron area from the east, thereby retaining the westbound direction of flow between adjacent concourses.

During the limited periods when Runway 35R is used for departures, an adjustment is made to the westbound flow direction so that all aircraft exiting the concourse apron area can more readily access Runway 35R for departure. The southern taxiway of the two taxiways between parallel concourses is routed in an eastbound direction. This routing effects the flow direction of Taxiway AA, Taxiway AN, and Taxiway BN, which are used to access Taxiway L. All other taxiways in the concourse apron area maintain the westbound flow direction.

8.0 RESPONSIBILITIES

8.1 Airport operator.

(1) Serve as the point of contact for the SMGCS plan, hold meetings of the SMGCS Working Group and maintain documentation of proceedings.

(2) Coordinate a review of the SMGCS plan and airfield activities on at least an annual basis, and amend, publish, and distribute the initial and revised SMGCS plan.

(3) Monitor adherence to the sections of the SMGCS plan that are under the Airport's control and take action to correct deficiencies.

(4) Conduct inspections, report failures and provide maintenance of lighting aids associated with the SMGCS plan.

8.2 Air Traffic Control Tower.

(1) Initiate and terminate the SMGCS procedures specified in paragraph 6, AIR TRAFFIC CONTROL PROCEDURES.

(2) Coordinate with the Airport Operations Department prior to implementing the SMGCS plan.

(3) Provide directional assistance to ARFF units and other emergency equipment responding during an emergency in low visibility conditions.

(4) Monitor and control aircraft and vehicles in the movement areas.

(5) Develop and coordinate the Low Visibility Taxi Route(s) chart(s) with the regional Air Traffic Division and FAA Headquarters, Air Traffic Rules and Procedures Service, Terminal Procedures Branch, ATP-120.

8.3 Airport Tenants.

(1) Participate in the SMGCS Working Group and disseminate low visibility procedures to company employees.

(2) Train personnel in low visibility procedures.

(3) Enforce SMGCS plan driving procedures and, if authorized, conduct driver training.

(4) Assure adherence to the sections of the SMGCS plan that are under airport tenant control, and take action to correct deficiencies.

8.4 Military Tenants.

(1) If required, request follow-me service from Airport Operations when the SMGCS plan has been implemented.

9.0 PLANS AND MILESTONES

9.1 Near term.

(1) Install runway guard lights at all runway/taxiway intersections.

(2) Ensure complete training of all personnel involved with the SMGCS plan.

(3) Coordinate and publish a low visibility taxi route chart.

9.2 Long term.

(1) Consider the application of new ARFF technology and snow removal equipment to operate in low visibility conditions.

REVISION PAGE CONTROL CHART

Remove Pages	Dated	Insert Pages	Dated

DISTRIBUTION LIST

Name	Address	Organization	Phone/FAX

LOW VISIBILITY TAXI ROUTE CHART

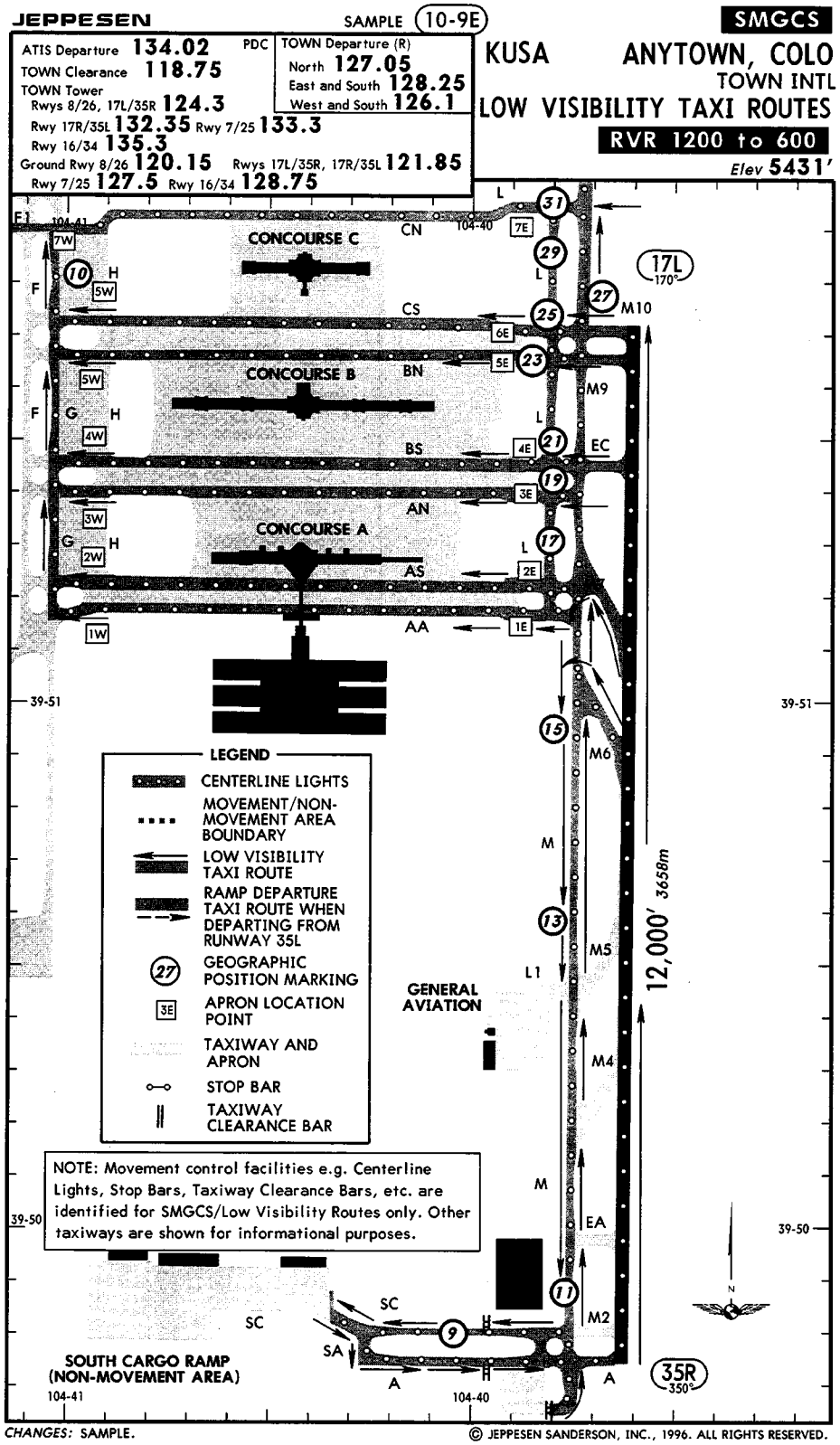


Figure 1 (East Side)

LOW VISIBILITY TAXI ROUTE CHART

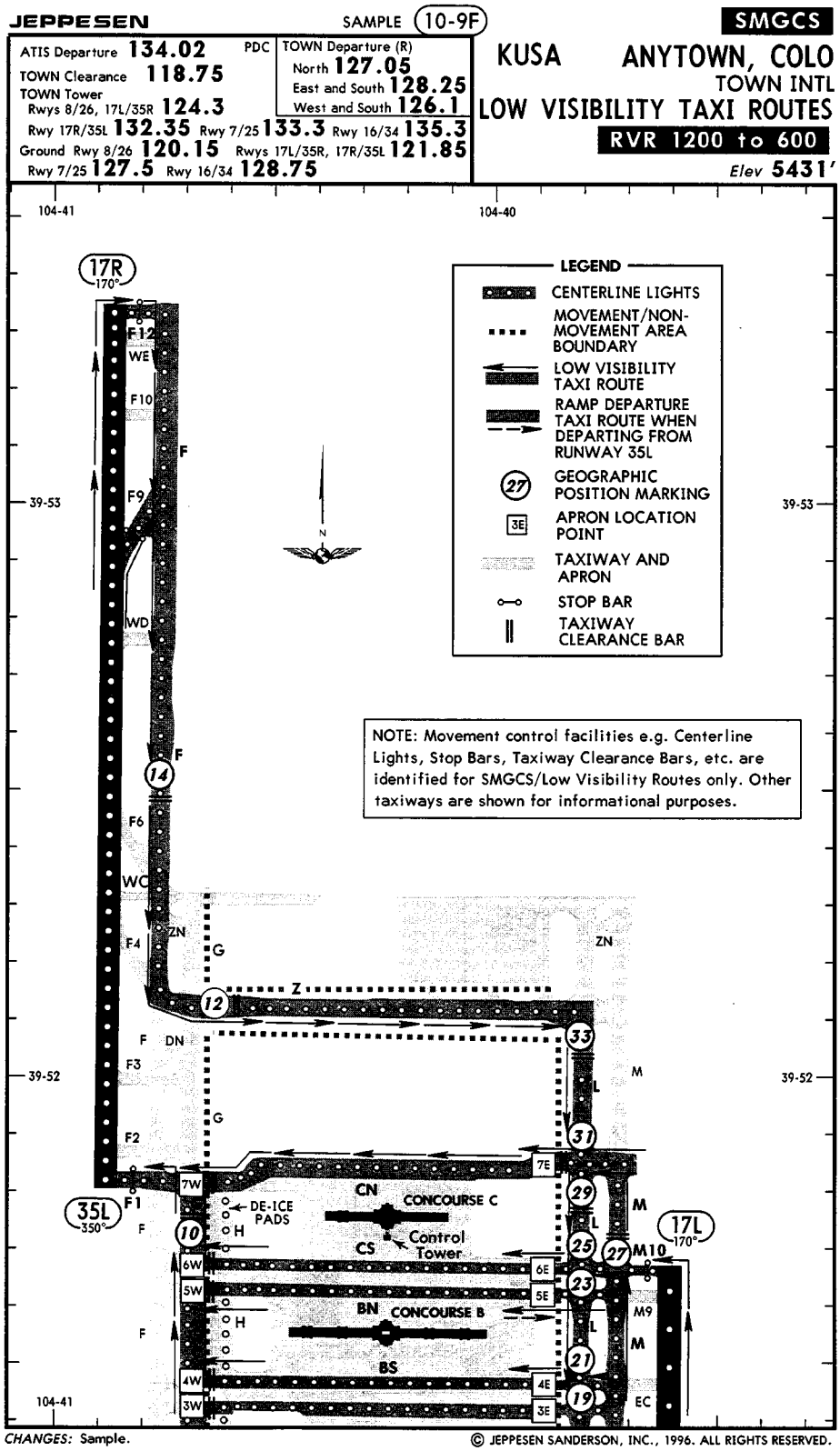


Figure 2 (West Side)

LOW VISIBILITY TAXI ROUTE CHART

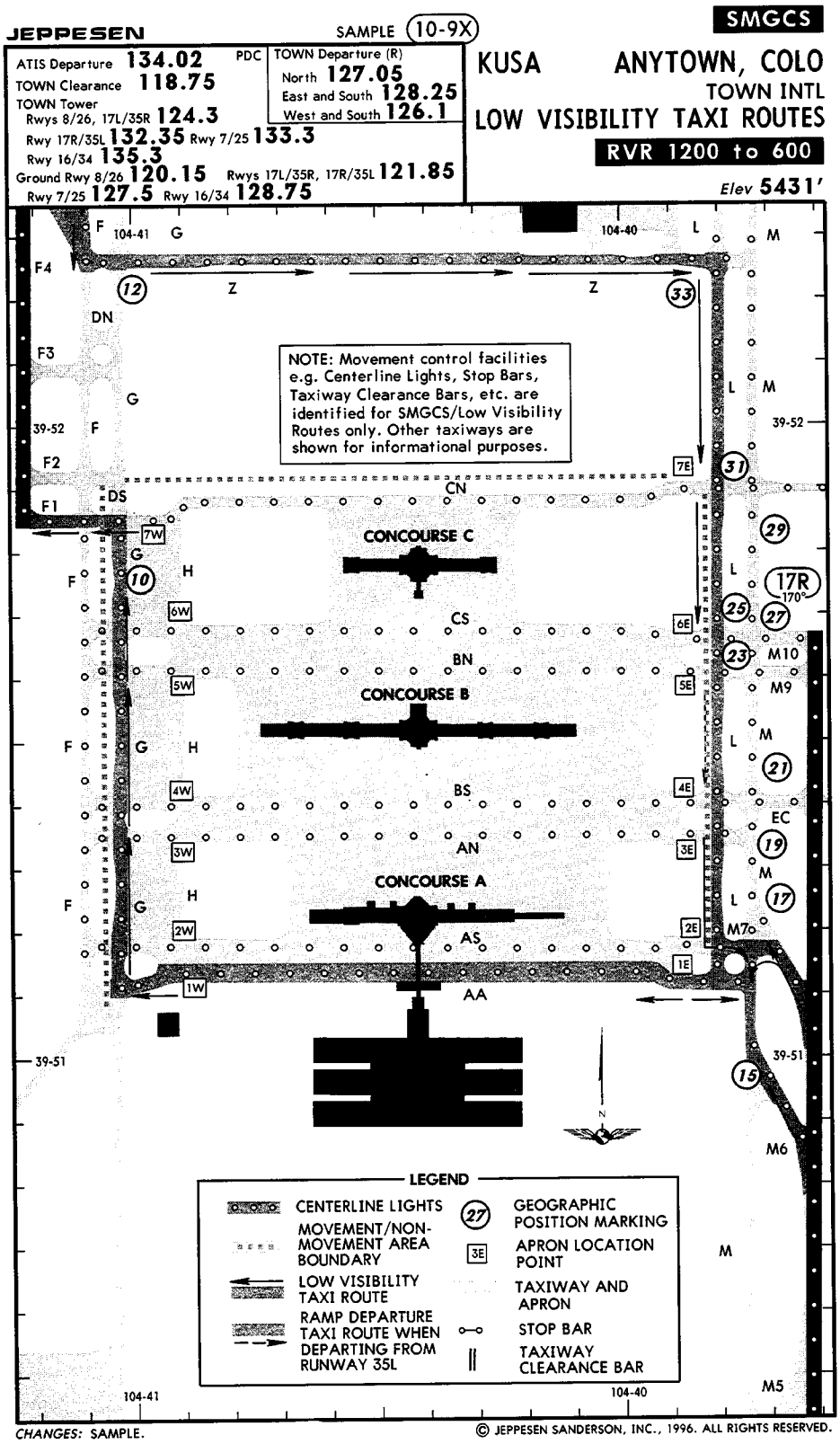


Figure 3 (Apron Area)

APPENDIX 3 -- GUIDELINES FOR SMGCS OPERATIONS BELOW 1,200 FEET RVR DOWN TO AND INCLUDING 600 FEET RVR

General Note -- For quick reference only, the following list includes the visual aids for less than 1,200 feet RVR, down to and including 600 feet RVR visibility operations:

MOVEMENT AREA

Runway guard lights
Taxiway edge or centerline lights
Taxiway signs
Taxiway hold markings
Surface painted direction or location signs

1. Review Purpose of SMGCS Advisory Circular 120-57.

2. Determine Applicability of SMGCS AC 120-57 to The Airport.

3. Review Pertinent FAA Regulations and Resources.

4. Review Definitions Pertinent to SMGCS.

5. Take Actions to Establish SMGCS.

   a. Appoint chairperson of SMGCS working group.

   b. Establish SMGCS working group.

   c. Perform airport evaluation.

   d. Identify SMGCS low visibility taxi routes.

   e. Identify and establish needed facilities.

   f. Identify and establish needed procedures.

   g. Identify responsibilities of participants.

      (1) FAA: Flight Standards
      Airports
      Air Traffic Control

(2) Airport Operator
(3) Airport Users
(4) Airport Tenants

h. Formulate SMGCS Plan.

6. Considerations in Establishing and Maintaining a SMGCS plan.

a. Runways.

* Minimum length and width.
* Paved overruns or blast pads.
* Gradients within standards.
* High intensity runway lights.
* Centerline lighting and marking.
* Lead-on lighting and marking.
* Lead-off lighting and marking.
* Number of runway exits (2 or 3; plus runway end).
* Touchdown zone lights.
* Precision runway markings.
* CAT IIIb ILS rated III/E/3 or III/E/4.
* Proper RVR configurations for landing.
* Proper RVR configurations for takeoff.

b. Taxiways.

* Minimum width.
* High speed exits, if appropriate.
* Connectors meet gradients standards.
* Edge lighting, reflectors.
* Determine if elevated lights are required due to snow or other factors.
* Lighted connector taxiways must have the proper configuration of runway guard lights at the runway hold line (elevated or in-pavement).
* Taxiway centerline marking enhancements: 12 inch yellow reflective stripe with 6 inch black borders. Glass beads may be used to increase the conspicuity of markings (1.5 or 1.9 index of refraction).
* Taxiway designator markings.
* Taxiway hold line markings and guidance signs.
* Signs and marking denoting boundary of ILS critical area.
* Surface Painted Holding Position Sign.

* Vehicle roadway markings.
* Movement area boundary markings.
* Taxi guidance signs.
* Taxi guidance markings.

c. Aprons/non-movement areas.
* Appropriate lighting.
* Taxi lanes, properly marked (reflective) and identified.
* Vehicle roadway markings.

d. Inspection and monitoring of lights and visual aids.
* Maintenance program within standards.
* Monitoring within standards.
* Inspection before entering low visibility conditions.
* Re-inspection every 2 to 4 hours.

e. Airport Rescue and Fire Fighting (ARFF).
* Review existing procedures and determine if enhancements are required.

f. Low Visibility Taxi Routes.
* Determine primary and alternate exits from runway(s) and taxi route(s) in support of landing operations below 1,200 feet RVR down to and including 600 feet RVR.
* Determine taxi route(s) and entrance(s) to runway(s) for takeoff operations below 1,200 feet RVR down to and including 600 feet RVR. Consider exits and routes for runway abort.
* Assure that the SMGCS low visibility taxi routes chart(s) is developed by ATC Tower, coordinated, and submitted to ATP-120 for publication.

g. Snow Removal Equipment.
* Routing.
* Priorities.

h. Re-Positioning of Aircraft.
* Determine routes to be used.
* Determine visibility limitations.
* Determine taxi/tow/follow-me procedures for air carrier operators.
* Determine follow-me procedures for part 91 operators.

* Determine specific operational limitations; i.e., no passengers on board.
* Require personnel to have documented SMGCS training and use SMGCS low visibility taxi chart(s).
* Determine whether additional lighting; including stop bars, markings, signs, or restrictions are necessary.

i. Air Traffic Control Procedures.
* Internal coordination procedures for monitoring visibility trends, and making decisions to initiate and terminate SMGCS operations down to and including 600 feet RVR.
* Procedures for notification of the airport operations and pilots of initiation or termination of specific SMGCS plan operations, by land line, ATIS, NOTAM, or voice communication.
* Procedures for surface movement surveillance.
* Procedures for informing pilots of outages of required equipment by voice communications, ATIS, NOTAM, or TMS, as appropriate.
* Review of procedures for coordinating ARFF response in low visibility conditions.
* Procedures for coordinating airfield lighting inspections.

j. Detailed Airfield Lighting/Marking/Signs Diagrams.
* Submit as an attachment to the SMGCS plan.

k. SMGCS Low Visibility Taxi Routes Chart(s).
* Submit as an appendix to the SMGCS plan.

l. Assure NOTAM System Procedures Are Established and Understood.
* It can be critical to aircraft operational safety and capacity that pilots and dispatchers are timely made aware of outages in the SMGCS system which might adversely affect the usability of the lowest published landing and/or takeoff minima for a runway or airport. NFDC NOTAM issuance is critical to enable wide area distribution.

7. Submit SMGCS Plan to FAA For Review and Approval.
* Through Region Flight Standards Division.
* Host on-site inspection of SMGCS (day/night).
* Correct discrepancies in plan/system.
* Receive SMGCS plan "approval" notification.
* Correct specified conditions.

8. Determine Readiness of SMGCS and Participants.
    * Training reported as complete and documented by participating responsible entities.
    * Operations Specifications reported from users as approved by Flight Standards.
    * SMGCS taxi route(s) chart(s) distributed and available for pilots and vehicle operators.
    * Appropriate landing and/or takeoff minima coordinated for a specific publication date.

9. Accomplish Regular Reviews of the SMGCS Plan.
    * Maintain documentation of training for inspection under part 139.
    * Correct discrepancies which are discovered or brought to the attention of the SMGCS working group chairman.
    * Carry out planning for future SMGCS operational capabilities as listed in the plan or as agreed upon by the SMGCS working group.

APPENDIX 4 -- GUIDELINES FOR SMGCS OPERATIONS BELOW 600 FEET RVR

General Note -- For quick reference only, the following list includes the visual aids for less than 600 feet RVR visibility operations:

MOVEMENT AREA

Stop bar lights
Runway guard lights
Taxiway centerline lights
Clearance bar lights
Taxiway hold markings
Surface painted direction or location signs
Geographic position markings

NON-MOVEMENT AREA

Taxiway centerline lights or taxiing assistance

The following items are in addition to those contained in Appendix 3

a. Runways.
   * Grooved (saw cut) surface or porous friction course (PFC) surface.
   * Number of runway exits (1 or 2; plus runway end).
   * CAT IIIb ILS rated III/E/4.

b. Taxiways.
   * Pavement fillets enable cockpit over centerline taxi.
   * Centerline lighting required, and must be continuous even when crossing a runway.
   * Centerline lighted taxiways must be used unidirectional or be physically separated.
   * Stop bar lights installed on all lighted taxiways at runway hold lines.
   * Determine stop bars which are to be controllable or non controllable by ATC Tower.
   * Determine where lead-on lighting to the runway will be associated with a controllable stop bar.
   * At intersections offering a choice of routes, the angle of divergence must be clearly apparent, and distinct identification markings for each choice must be visible on the pavement, or the centerline lights must be controllable by the ATC Tower for channeling the aircraft in the cleared route direction.

* Alternating yellow/green centerline lights within the ILS critical area.
* Clearance bar lights and markings.
* Geographic position "spot" markings.
* Taxi assistance available by follow-me or tow.
* Use of glass beads (1.5 or 1.9 index of refraction) or retro-reflective paint markings for at least geographic position markings.

c. Aprons/non-movement areas.
* Gate designators and lead in gate lead-in markings.
* Publish Apron Traffic Management Plan specifying restrictions, controls, ground support vehicle operations, training and its documentation.
* Taxi assistance available by follow-me, tow and/or ground marshalling.

d. Inspection and monitoring of lights and visual aids.
* Maintenance program within standards.
* Monitoring within standards.
* Inspection before entering low visibility conditions.
* Re-inspection every 2 hours.

e. Airport Rescue and Fire Fighting (ARFF).
* Review existing procedures and determine if enhancements are required.
* Consider pre-positioning of ARFF vehicle(s) as an option.

f. Surface Movement Surveillance System (SMSS).
* ASDE-3 or equivalent or new technology installed in ATC Tower and functioning.
* Back up system of geographical position "spot" markings, clearance bars, and hold markings associated with ATC Tower geographic positioning procedures.

g. Low Visibility Taxi Routes.
* Determine the exit from the runway(s) and the taxi route(s) in support of landing operations below 600 feet RVR.
* Determine taxi route(s) and entrance(s) to runway(s) for takeoff operations below 600 feet RVR.

* Determine taxi route(s) in support of re-positioning of aircraft from maintenance areas to aprons.
* Taxi routes should be physically separated or used unidirectional.

h. Snow Removal Equipment.
* Routing.
* Priorities.

i. Air Traffic Control Procedures.
* Internal coordination procedures for monitoring visibility trends, and making decisions to initiate and terminate SMGCS operations below 600 feet RVR.
* Procedures for geographic positioning of aircraft, using the system of geographic position "spot" markings, clearance bars, hold lines, and voice communications.

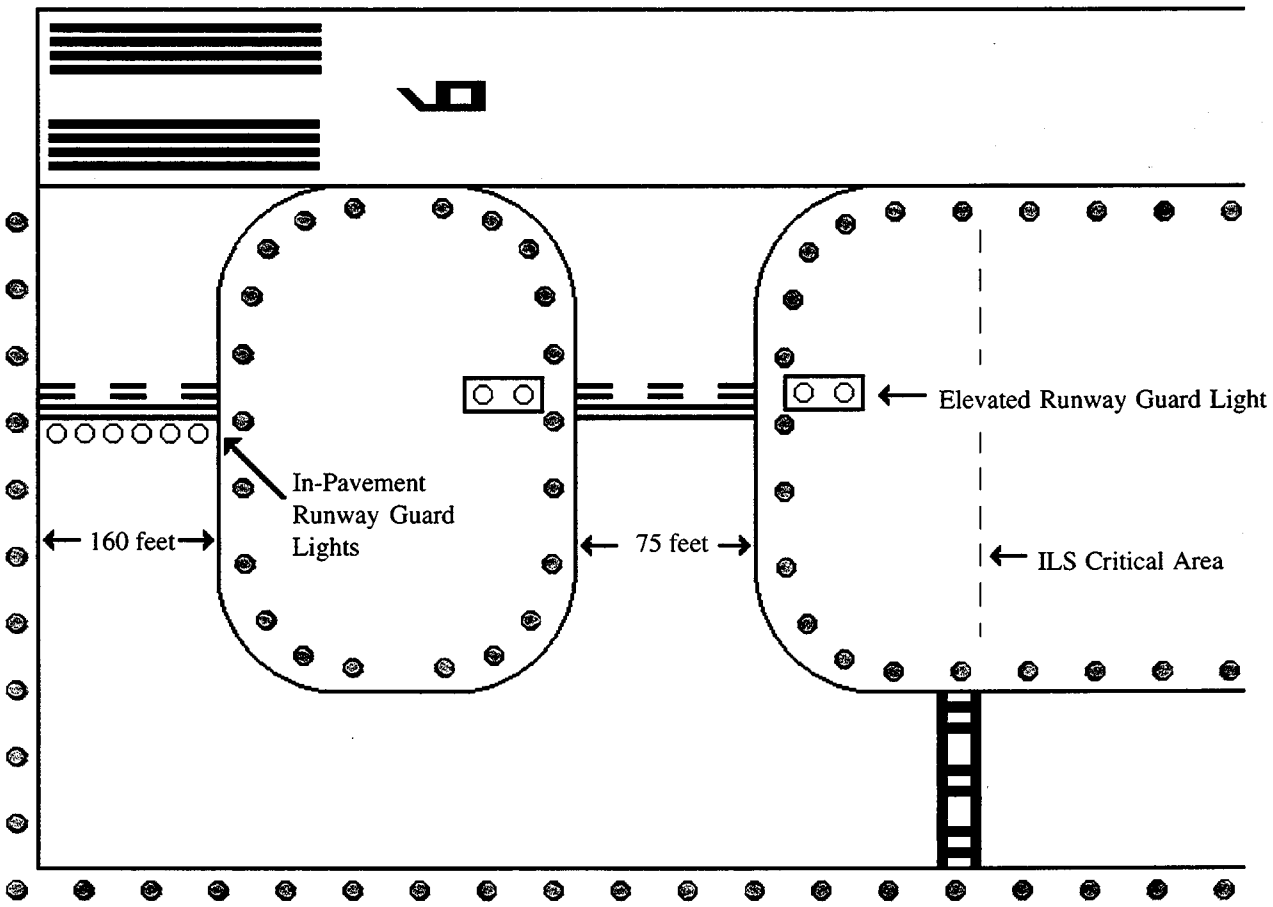
j. Detailed Airfield Lighting/Marking/Signs Diagrams.
* Update SMGCS plan/chart.

k. SMGCS Low Visibility Taxi routes Chart(s).
* Update SMGCS plan/chart.

l. Apron Management Plan.
* Add to SMGCS plan.

m. Assure NOTAM System Procedures Are Established and Understood.
* Critical for below 600 feet RVR operations.

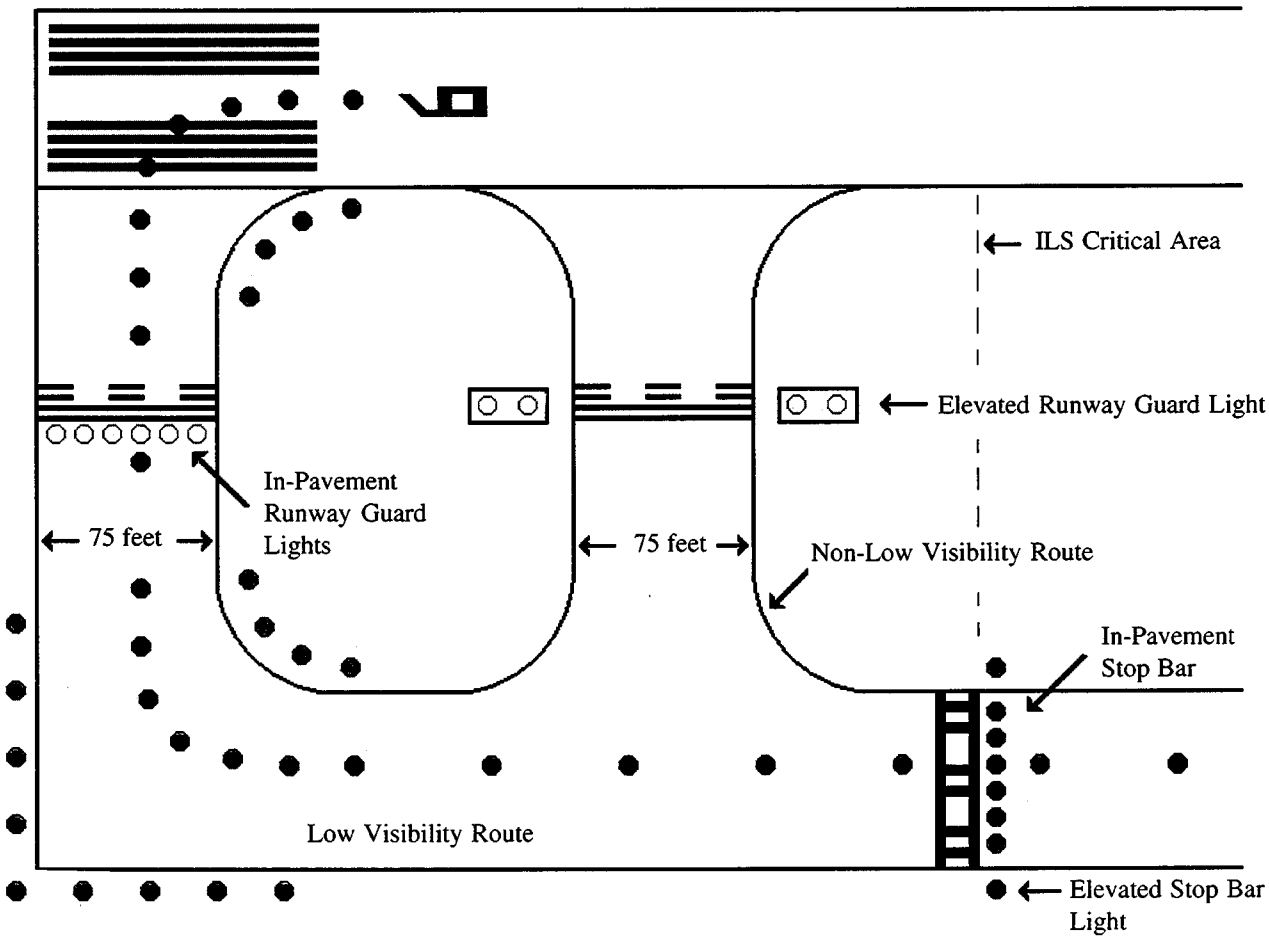
APPENDIX 5 -- SAMPLE LIGHTING CONFIGURATION



NOTE: Diagram Not To Scale

Figure 1. OPERATIONS BELOW 1,200 FEET RVR TO 600 FEET RVR

APPENDIX 5 -- SAMPLE LIGHTING CONFIGURATION (Continued)



NOTE: Diagram Not To Scale

Figure 2. OPERATIONS BELOW 600 FEET RVR

APPENDIX 6 -- SMGCS BULLETIN BOARD

An electronic bulletin board is available to provide up-to-date information on SMGCS operations. Information may be obtained in Word for Windows 6.0 and ASCII text formats by accessing the FAA Airports Electronic Bulletin Board System. Some information may be available for on-line reading or must be downloaded using the following procedures.

1. Set your communications software for 8 data bits, 1 stop bit, no parity (common default settings). All baud rates up to 14,400 BPS are supported.

2. Dial (202) 267-5205 with your modem. (The system may also be accessed toll free via the [I]nterchange command on the FAA Corporate BBS. Dial (800) 224-6287.)

3. The first time you log on, you must answer a short registration questionnaire. Subsequent calls require only that you remember the password you choose on your first call.

4. You may read or bypass the Newsletter and Bulletin Menus. When you reach the Main Menu, proceed to step 5 for on-line reading of SMGCS information; to download files, proceed to step 10.

5. Enter [K] to read information on-line.

6. Strike <Enter> to proceed to the On-line reader menu.

7. Enter [R] to read files.

8. Enter the number of the file you wish to read.

9. Enter [Q] twice to return to the Main Menu.

10. Enter [F] to access the Files Menu.

11. At the Files Menu, Enter [L] to list files, then enter [3]. (For other directories, enter [L] again for a list.)

12. Enter [D] to download files. Enter the reference number of the file to download when prompted. Enter a blank line when you are through selecting files.

13. Select Auto-logoff if desired.

14. If you did not select a default download protocol when you registered, you will be prompted to select a protocol at this point. The system will send the file. Most protocols will require you to instruct your own communications software to receive the file. This procedure varies by software - check your users' manual. If you choose a non-batch protocol, you will have to instruct your system to receive each file as the BBS sends it. (Protocol's include ZMODEM, XMODEM, KERMIT, etc.)

15. After returning to the Files Menu, enter [G] to log off.

16. The file you receive will be compressed, ending in a suffix of ".ZIP." You must have of PKUNZIP.EXE, latest version, (presently **2.04G**) on your system to expand the file into a usable format. If you do not have that program, download the file PKZ**204G**.EXE (also latest version) from the Utilities Directory. Place the file in a subdirectory called "C:\ZIP" and run it. It will self-expand, producing several files including PKUNZIP.EXE.

17. Type "C:\ZIP\PKUNZIP {filename} {destination}"; where {filename} is the full path to the file you wish to expand and {destination} is the path of the directory where you wish to place the expanded files.

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**Federal Highway
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