Belize Department of Civil Aviation

ADVISORY CIRCULAR

Subject:	Operational Safety on Airports During Construction	**Date:** 23/08/2018
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1. THE PURPOSE OF THIS ADVISORY CIRCULAR.

This document has been developed in order to minimize interruptions to airport operations, reduce construction costs, and maximize the performance and safety of construction activity. Strict adherence to the provisions of the Construction Safety and Phasing Plan (CSPP) by all personnel assigned to or visiting the construction site is mandatory for construction projects.

2. WHAT THIS AC CANCELS

This AC is the first version of this subject.

3. WHO THIS AC AFFECTS.

Operations and maintenance managers, for national and international aerodromes, public or private.

4. WHERE TO GET A COPY OF THIS AC. You can ask fort a copy of this AC in the Technical Library of the BDCA

DEPT. OF CIVIL AVIATION BELIZE

Lindsay Garbutt

Director, Belize Department of Civil Aviation

Table of Contents

A. PURPOSE

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's Construction Safety and Phasing Plan (CSPP) and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard.

The CSPP sets forth benchmarks and requirements for the project to help ensure the highest levels of safety, security and efficiency at the airport at the time of construction. The CSPP is a standalone document, written to correspond with the safety and security requirements set forth the airport safety and security requirements, and local codes and requirements. The CSPP is to be used by all personnel involved in the project. The CSPP covers the actions of not only the construction personnel and equipment, but also the action of inspection personnel and airport staff.

This document has been developed in order to minimize interruptions to airport operations, reduce construction costs, and maximize the performance and safety of construction activity. Strict adherence to the provisions of the CSPP by all personnel assigned to or visiting the construction site is mandatory for construction projects.

The Contractor shall be required to submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how the Contractor will comply with the requirements set forth in this CSPP. The SPCD must be submitted to the Belize Airport Authority for approval prior to issuance of the Notice to Proceed.

In the event the Contractor's activities are found in non-compliance with the provisions of the CSPP or the SPCD, the Belize Airport Authority Representative will direct the Contractor, in writing, to immediately cease those operations in violation. In addition a safety meeting will be conducted for the purpose of reviewing those provisions in the CSPP/SPCD which were violated. The Contractor will not be allowed to resume any construction operations until conclusion of the safety meeting and all corrective actions required by the contractor have been implemented. , The main goal is to maintain as much as possible normal operations.

B. Scope

Describe in this paragraph the scope of the contract, number of bidding, location of the works, the name and address of the consultant firm, state that the works shall be completed as set forth in the Technical Specifications, Contract Conditions, and Drawings and the time contracted to finish the project.

Necessary construction locations, activities have been identified and their impact to airport operations has not yet been assessed, the main goal is to maintain as much as possible normal operations.

C. PLAN REQUIREMENTS

1) Coordination

Airport operators and/or tenants impacted during construction have been or will have the opportunity to pose questions at pre-design and pre-construction conferences. In addition, construction progress meetings, scope of schedule changes, and meetings with the Belize Airports Authority will be held as required through the performance of the contract.

a) Pre Design Conference

A pre-design conference along with several working group meetings were held throughout the design process. In attendance were representatives from The Airport Concessionaire, OPERATOR, BDCA and the main Contractors These meetings were used to discuss various items relating to design parameters, airport safety, routing of aircraft and equipment, sequencing of construction operations, environmental considerations, and any other requirements pertinent to the project. The pre-design conference and working group meetings were essential in identifying and outlining potential affects and/or conflicts to airport operations during construction.

b) Pre Bid Conference.

Representatives of the Airport Concessionaire, OPERATOR, BDCA and the Bidders shall conduct a pre-bid conference to help clarify and explain construction methods, procedures, and safety measures required by the contract.

The meeting shall be held prior to the bid opening date. The pre-bid conference will be mandatory for all general contractors intending to bid on this project.

Typical agenda items included for this meeting are construction methods, construction procedures (i.e. statistical acceptance testing), operational safety requirements, and other civil rights and labor requirements.

One of the primary focuses of the Pre-bid Conference will be to cover relevant information concerning the contractor's requirements for developing and submitting an SPCD for review and approval. This will include both general and specific elements required in the SPCD. In addition, information on how the contractor shall format the document to illustrate their plans for compliance with those provisions detailed out within this CSPP will also be provided.

Any changes or modifications recommended during the conference will be included in an addendum to the bid documents. A copy will be furnished to each prospective bidder who had requested a set of bid documents.

Copies of the proceedings, containing all items discussed, including responses to questions, will be made available to each of the participants, upon request.

c) Preconstruction Conference.

A pre-construction conference convened and conducted by the Concessionaire or the (OPERATOR) shall be used to discuss operational safety, testing, quality control, quality acceptance, security, safety, labour requirements, environmental factors, and other issues. This meeting, among all parties affected by the construction, should assist in a better understanding of potential problems and possible solutions for the course of the performance of this contract.
The pre-construction conference shall be conducted as soon as practicable after the contract has been awarded and before issuance of the notice to proceed. This document assumes that the Contractor have visited and examined the site of the proposed works, and shall fully acquaint himself with all of the existing site conditions including site access, location of power, water and telephone services, available space for storage of materials and other temporary works, normal hours of operations of the facility, etc. without limit to it.

The expected participants for this meeting shall include the following parties:

- Concessionaire
- Sponsor's engineer.
- Belize Airports Authority representative.
- Airport management.
- Testing laboratory representative.
- Contractor and subcontractor(s).
- Contractor's project superintendent.
- Contractor's project clerk.
- Airport users impacted by the proposed construction.
- Utility companies affected by the proposed construction.
- State, or local agencies affected by the proposed construction
- Representative of Belize Department of Civil Aviation.

The OPERATOR Representative will prepare an agenda prior to the pre-construction conference. This will include but is not limited to:

- The scope of the project and the sequence and timing of all operations.
- Relationship between the Airport representative and the Contractor.
- Identification of the contractor's superintendent and a discussion of his/her authority and responsibilities.
- Designation of sponsor representative responsible for notifying to the Operations Manager of the airport of the proposed start and completion dates of construction or of any circumstances requiring a NOTAM.
- Scheduling of work and the need to perform certain items at various stages of the project, including operational safety problems that might arise because of the proposed work.
- Notice to proceed date.
- Safety during construction, including the responsibility for marking and lighting of closed and hazardous areas. See for reference only FAA AC 150/5370-2F *Operational Safety on Airports During Construction* and AC 150/5340-1K, *Standards for Airport Markings*, current edition or in document 9 following this link

http://www.cocesna.org/subpagina.php?id=269&lng=0 Not all articles are applicable for Belize.

- Security requirements.
- The need for continuing vigilance for potential or existing hazards relative to any of the items associated with construction operations on an active or closed airfield surface.

d) Contractor Progress Meetings.

Weekly construction meetings shall be held to discuss work progress and to address current or potential security and safety concerns. These meetings may be adjusted to a day-to-day basis as necessary for specific work items. Operational safety and security shall be a standing agenda item for discussion during these weekly/daily construction progress meetings.

e) Scope or Schedule Changes.

Changes in the scope and/or duration of the project may necessitate revisions to the CSPP. The OPERATOR shall be promptly notified of any proposed changes to this CSPP. Changes to this document require review and approval by the OPERATOR in coordination with the BDCA prior to implementation. In addition, the OPERATOR shall coordinate proposed changes with any and all appropriate local government agencies if they have to be involved.

f) Operator Coordination

Coordination with the OPERATOR has been made throughout the design to schedule airway facility shutdowns and restarts. Sections of the airport will be closed during portions of the project. Prior to reopening these pavements back to air traffic, a thorough inspection must be performed by the OPERATOR representative and the contractor.

2) Phasing:

The works under this contract include *(describe in this paragraph all the works and the proposed phasing plan)*

Phasing for the project has been established to minimize impacts to the Aircraft Operations Area (AOA). The approach to minimize impacts is to install a temporary fence around a majority of the project site. A portion of work is adjacent to taxiways that must remain active; therefore, the temporary construction fence is not feasible for all

The nature of the works is such, however, that the extent of each item may be varied based on actual site conditions at the time of construction. The Consultants shall direct the Contractor on the specific items and extent of these items that are required during construction and shall advise on any variations that will be necessary. The Contractor shall allow for such variations as directed on site.

The Contractor shall include in his SPCD a complete and well explained phasing plan including all the requirements written in this CSPP. This plan has to be discussed and

approved by de OPERATOR in coordination with de BDCA prior to proceed with the works

a) Phase Elements.

The sequence of construction for this project has been phased in order to maintain aircraft operations at an acceptable level of efficiency at the airport for the duration of this contract. General elements of this sequencing and phasing are as follows:

- **Construction staging areas**
  - Staging areas location and general safety and security notes concerning use of the staging areas.
  - Construction staging areas and contractor employee parking areas are to remain outside of the Airport Operations Area (AOA) at the airport.

- **Construction access and haul routes** for routing layouts, per phase.
  - Applicable control along contractor haul routes for both safety and security must be maintained at all times. This is especially considered at those locations that require the contractor to cross or move through active airfield surfaces.

- **ARFF access routes** – Emergency ARFF access in and around the site will be maintained by the contractor, as required, for the duration of this project.
  - Contractor must prominently mark open trenches and excavations within the construction site, with approval from Airport Operations, and light them with red lights during hours of restricted visibility or darkness.

- **Required hazard marking and lighting** – Low profile barricades, closed runway or taxiway markings with a 2,5x2,5 m lighted cross, signs, lighting and/or safety flags.

- **Lead times for required notifications** – The contractor is required to coordinate this with the Construction Manager and Airport Operations. Lead times for required notifications shall be established at the pre-construction meeting.

Phase 1. Phase 1 consists in.....*Describe in this section each phase of the project*
Phase 2. Phase 2 consists in ....

b) Construction Safety Drawings

Graphical exhibits specifically indicating operational safety procedures and methods in areas affected by construction activities associated with this project (by phase) shall be provided by the Contractor and incorporated into the project drawing set.

3) Areas and operations affected by the construction activity:

Runways and other airfield surfaces shall remain in use by aircraft to the maximum extent possible without compromising safety. The performance of this contract will require that any partial closures on a scheduled and phased basis.

a) Identification of affected areas.

Construction Safety Drawings and Phasing drawings above for graphical identification of areas affected by construction operations. The contractor shall be to perform procedures in order to minimize operations and hazards during de project. Of particular concern are the following:

- Closing, or partial closing, of runways, taxiways and aprons: Closure of the runway throughout this project is due to construction activities and movement of aircraft and ground vehicles.
- Closing of Aircraft Rescue and Fire Fighting (ARFF) access routes: Access into, through, and/or around the project work area by ARFF vehicles will be impacted and coordinated during construction.
- Closing of access routes used by airport and airline support equipment: Access into, through, and/or around the project work area by service vehicles will be impacted and coordinated during construction.
- Interruption of utilities, including water supplies for firefighting
- Approach/departure surfaces affected by heights of objects:
- Construction areas: These areas include the project work area, storage/stockpile areas, staging areas, and contractor haul routes near active airfield surfaces. These shall be identified graphically in the drawings set.

b) Mitigation of effects.

This CSPP has established specific requirements and operational procedures necessary to maintain the safety and efficiency of airport operations during the construction of this project. All coordination pertaining to airport operations during construction will go through the OPERATOR Representative and the Airport Operations Manager. Any required NOTAM's to be issued will be sent through the OPERATOR and issued by Airport Operations.

- **Temporary Changes to runway and/or taxiway operations:** The affected runways, taxilanes and taxiways identified in the previous section for reduced access or identified as being closed entirely to aircraft traffic, will be barricaded by the use of low profile, lighted barricades placed as shown in the exhibits provided. Required NOTAM's shall be issued on the various temporary changes to aircraft access through the affected areas.

- **Detours for ARFF and other airport vehicles:** The project work site shall remain open to all ARFF vehicles in emergency situations. The contractor is required to maintain access in and around the project work area for all ARFF vehicles. Proper routing of this traffic will be effectively communicated to all supervisory personnel involved in the construction project.

- **Maintenance of essential utilities:** Special attention shall be given to preventing unscheduled interruption of utility services and facilities. Where required due to construction purposes, the OPERATOR shall locate all of their underground utilities. The contractor shall locate and/or arrange for the location of all the underground utilities. When an underground cable or utility is damaged due to the Contractor's negligence the Contractor shall immediately repair the affected cable or utility at his/her own expense. Full coordination between airport staff, field

inspectors, and construction personnel will be exercised to ensure that all airport power and control cables are fully protected prior to any excavation. Locations of cabling and other underground utilities will be marked prior to beginning excavation.

- **Temporary Changes to air traffic control procedures:** Changes to air traffic control procedures must be coordinated with airport operations office and ATS.

4) Protection of navigations aids

Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordination with the appropriate BDCA, COCESNA to evaluate the effects of construction activity and the required distances and direction from the NAVAID is required.

5) Contractor access:

The CSPP details those areas to which the contractor must have access, and how contractor personnel will access those project work areas. The contractor shall coordinate with the Concessionaire, or the OPERATOR their conditions of access to the work areas. This should be done during the pre-construction meeting. The contractor have to notice this agreement in his Safety Plan Compliance Document (SPCD)

a) Location of stockpiled construction materials.

Stockpiled materials and equipment storage are not permitted near the Runway, Obstacle Free Zone (OFZ) or Object Free Area (OFA) of the taxiway. Stockpiled material shall be constrained in a manner to prevent movement resulting from either aircraft blast or wind conditions in excess of ten miles per hour. In addition, stockpiled material shall have silt fence located around the material to prevent FOD from moving onto the airfield pavements or polluting watercourses. Open trenches exceeding 3 inches in depth and 5 inches in width or stockpiled material are not permitted within the limits of safety areas of operational runways. Stockpiled material shall not be permitted within the protected areas of the runways, or allowed to penetrate into any of the protected airspace. In addition, all demolished pavement materials and unclassified excavation materials shall be removed and legally disposed of off airport property and not stockpiled on airport property.

b) Vehicle and pedestrian operations.

Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The OPERATOR will coordinate requirements for vehicle operations with the affected airport tenants. Specific vehicle and pedestrian requirements for this project are as follows:

All construction vehicles and personnel shall be restricted to the immediate work areas specified by the contract for this project. These areas include the haul routes into the work area, the designated contractor staging area and the apron area under construction. Use of alternate haul

routes or staging areas by the contractor shall not be permitted without prior notification and approval by the OPERATOR Representative.

Access or haul routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Construction traffic must remain on the designated haul routes, never straying from the approved paths. Maintenance and upkeep of the haul routes are the responsibility of the contractor. Dust must be removed from any haul route pavement by mechanical sweeping. Application of water on dirt or gravel haul routes must be provided as often as necessary. Haul roads in any airport traffic areas must be especially monitored for dust and debris to prevent any potential Foreign Object Debris (FOD) situations. The contractor is responsible for any damage caused by construction traffic on the haul routes, regardless of whether in an approved or un-approved traffic area. Following construction completion, the contractor shall grade, reseed, clean or otherwise restore the haul route areas to clean, turfed condition. Special attention must be given to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul roads do not interfere with NAVAIDs or approach surfaces of operational runways.

Contractor parking and equipment staging areas have save to be identified as the Contractor Staging Area and are graphically identified in the drawing set.
Contractor must service all construction vehicles within the limits of the project work area or the contractor staging area. Parked construction vehicles must be outside the OFA and never in the safety area of an active runway. In some cases a complex setup procedure makes movement of specialized equipment infeasible (i.e. slip form paving machines and concrete hard forms), inactive equipment must not be parked on closed taxiways or runways. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees shall also park construction vehicles outside the OFA when not in use by construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of the runway nor obstruct any runway visual aids, signs, or navigation aids.

Portions of the project area(s) shall be bounded by the low-profile barricades identifying contractor personnel and vehicle area operation limits. At no time will vehicles or personnel enter portions of the secure AOA outside the contract area unless permitted and accompanied by an airport approved escort.

All construction-related activity taking place within any airport defined movement area requires the presence of an authorized Airport escort having radio communication with the OPERATOR representatives Airport Operations. Spotters and/or flaggers having radio or telephone contact with the Airport may be used with the approval of the on shift Airport Operations Manager. Any command or instruction given shall be immediately obeyed by the operator.

All vehicles operating on the airport and in the general vicinity of the safety area or in aircraft movement areas must be marked with flashing yellow/amber beacons or orange and white flags during daylight hours. In addition, the vehicles and equipment will have identifying symbols at a minimum of 8-inch block-type characters of contrasting colour that are easily legible. During hours of darkness or low visibility they shall be marked with at least flashing yellow/amber beacons.

Beacons and flags must be maintained to standards and in good working and operational condition. Beacons must be located on the uppermost part of the vehicle structure, visible from

any direction, and flash 75 +/- 15 flashes per minute. Flags shall be 3' by 3' with alternating 1' by 1' international orange and white squares, and shall be replaced by the contractor if they become faded, discoloured, or ragged as determined by OPERATOR Representative. Beacons should be kept running in dark or low visibility conditions.

At no time shall active taxiways or runways be crossed by construction equipment without notification and proper approval/clearance from radio-trained Airport Operations.

Aircraft traffic will continue to use existing runways, aprons, and taxiways of the Airport during the time that work under a contract is being performed. The Contractor shall, at all time, conduct the work as to create no hindrance, hazard, or obstacle to aircraft using the Airport.

Airport operators and contractors must also maintain a high level of security during construction when access points are created in the security fencing to permit construction vehicle access. Temporary gates shall be equipped and/or manned by construction personnel to prevent unauthorized access by vehicles, animals or people. Procedures conforming to Airport security protocols should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. Access shall be made available at all times to all airport emergency vehicles traveling to operations areas within the proximity of the construction work zone.

6) Wildlife management:

Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports.

a) Trash.
Food scraps from construction personnel activity must be collected.

b) Standing water.
Water shall not be allowed to collect and pool for more than any single 24-hour period.

c) Tall grass and seeds.
The use of millet seed in turfing and seeding operations shall not be permitted.

d) Disruption of existing wildlife habitat.
The contractor should take into account as far as possible to keep the habitat of the species present, especially if there are enclaves nests or sensitive species or endangered.

7) Foreign Object Debris (FOD) management:

Special care and measures shall be taken to prevent Foreign Object Debris / Damage (FOD) when working in an airport environment. The Contractor shall be held responsible for implementing an approved FOD Management Plan as a part of the SPCD. The FOD Management Plan will have procedures for prevention, regular cleanup, and containment of construction material and debris. The Contractor will ensure all vehicles related to the

construction project using paved surfaces in the AOA shall be free of any debris that could create a FOD hazard. Special attention will be given to the cleaning of cracks and pavement joints. All taxiways, aprons, and runways must remain clean. Waste containers with attached lids shall be required on construction sites. Special attention should be given to securing lightweight construction material (concrete insulating blankets, tarps, insulation, etc.). Specific securing procedures and/or chain link enclosures may be required.
Contractors will provide their own equipment for vehicle and equipment washing and clean up. Immediate access to a power sweeper is required when construction occurs on any pavement area inside the AOA, unless an appropriate alternative has been approved by the OPERATOR Representative and the BDCA.

8) Hazardous materials (HAZMAT) management:

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel, hydraulic fluid, or other chemical fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. To that end, the contractor is required to develop and implement spill prevention and response procedures for vehicle operations. The contractor shall incorporate these procedures into the SPCD. This includes maintenance of appropriate MSDS (Safety specifications) data and appropriate prevention and response equipment on-site.

9) Notification of construction activities:

The following is information and procedures for immediate notification of airport users and the OPERATOR of any conditions adversely affecting safety of the airport.

a) Points of contact/list of responsible representatives.

Including engineers, foremen, safety personal, owners and subcontractors' employees, 24 hrs/day, 7 days/wk

b) Notices to Airmen (NOTAM).

Only the Operations Office may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway or taxiway. The Operations Office must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with the Operations Manager of the airport and must provide information on closed or hazardous conditions on airport movement areas to the Operations Office so it can issue a NOTAM. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the Operations Office.

Any NOTAMs for planned airfield closures for this project must be coordinated through the airport operations manager and the airports duly appointed construction management representative.

c) Emergency notification procedures.

In the event of an emergency, the contractor shall be required to contact the Operations Manager of the airport and emergency services. In the event of an aircraft emergency, severe weather conditions, or any issue as determined by the Airport that may affect aircraft operations, the Contractor's personnel and/or equipment may be required to immediately vacate the area(s) affected. Points of contact for the various parties involved with the project shall be identified and shared at the pre construction meeting among the various parties, reference Section 1.a) page 4: *Pre-construction Conference.* Specific emergency notification procedures shall be incorporated into the contractor's SPCD.

d) Coordination with ARFF Personnel.

The contractor shall coordinate, through the duly appointed airport representative, with ARFF personnel, mutual aid providers, and other emergency services if construction requires the following:

- The deactivation and subsequent reactivation of water lines or fire hydrants, or
- The re-routing, blocking and restoration of emergency access routes, or
- The use of hazardous materials on the airfield.

Procedures and methods for addressing any planned or emergency response actions on the airfield concerning this project shall be established and implemented prior to the start of construction.

10) Inspection requirements:

a) Daily (or more frequent) inspections.

Inspections shall be conducted by the contractor at least daily, but more frequently if necessary, to ensure conformance with the CSPP. A sample checklist is provided in Appendix 2 of this document. In addition to contractor's required inspections, airport operations will inspect the construction site two (2) times a day to ensure compliance with the CSPP and the SPCD. Contractor shall have full-time inspectors monitoring activity throughout construction.

b) Final inspections.

A final inspection with the BDCA and the OPERATOR will take place prior to allowing airport operations.

11) Underground utilities:

Special attention shall be given to preventing unscheduled interruption of utility services and facilities. Where required due to construction purposes, the OPERATOR shall locate all of their underground cables. The Contractor shall locate and/or arrange for the location of all the underground cables. When an underground cable or piping are damaged due to the Contractor's negligence the Contractor shall immediately repair the cable or pipe affected at his/her own expense. Full coordination between airport staff, field inspectors, and construction personnel will be exercised to ensure that all airport power and control cables are fully protected prior to any excavation. Locations of cabling will be marked prior to beginning excavation.

Excavations that could affect underground cables will not be allowed during reduced visibility conditions or night operations,

12) Penalties:

Failure on the part of the contractor to adhere to prescribed requirements may have consequences that jeopardize the health, safety or lives of customers and employees at the airport. The Airport may issue warnings on the first offense based upon the circumstances of the incident. Individuals involved in non-compliance violations may be required to surrender their Airport ID badges and/or be prohibited from working at the airport, pending an investigation of the matter. Penalties for violations related to airport safety and security procedures will be established by the Airport.

Note: project shutdown or misdemeanour citations may be issued on a first offense. When construction operations are suspended, activity shall not resume until all deficiencies are rectified.

13) Special conditions:

In the event of an aircraft emergency, the Contractor's personnel and/or equipment may be required to immediately vacate the area. The contractor will receive notification from airport operations when special conditions require the construction site to be vacated. In any event, extreme care should be exercised should construction personnel identify any ARFF (Airport Rescue and Fire-Fighting) vehicle moving toward the Runway with emergency lights displayed. This will generally mean that an emergency situation is imminent.

14) Runway and taxiway visual aids:

Marking, lighting, signs, and visual NAVAIDs. Those areas where aircraft will be operating shall be clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, the contractor shall inspect and verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs and visual NAVAIDs remain in place and operational.

a) General.
Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, reactors blast, wing vortices, or other wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

b) Markings.

Markings must be in compliance with BCAR 14, BCAR 139 standards, and the drawings and technical specifications of this project. For reference only see FAA AC 150/5340-1K, Standards for Airport Markings current edition.

c) Lighting and visual NAVAIDs.

All runway, taxiway edge lights in those sections closed to aircraft traffic will be either de-energized or blacked out by use of an appropriately cut length of PVC pipe.

d) Signs.

Airfield signage will be installed and/or replaced along impacted runways, taxiways and taxilanes.

15) Marking and signs for access routes:

Location of haul routes on the airport site shall be as specified in the project drawing set. It shall be the contractor's responsibility to coordinate off-site haul routes with the appropriate owner who has jurisdiction over the affected route. The haul routes, to the extent possible, shall be marked and signed in accordance with OPERATOR airfield signage requirements.

16) Hazard marking and lighting:

a) Purpose.

Hazard marking and lighting prevents pilots from entering areas closed to aircraft, and prevents construction personnel from entering areas open to aircraft. To that end, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles shall be installed and maintained by the contractor for the duration of construction operations.

b) Equipment.

Type 1 - Detail in the project drawings Low Profile Barricades with omnidirectional flashing lights or by any other form of demarcation visible in dark or low visibility placed outside the safety area of intersecting taxiways at the edge of the closed airfield surfaces and the project work limits. The demarcation should be checked for proper operation at least once per day, preferably at dawn and at dusk.

The contractor shall have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dawn and at dusk .

17) Protection of Runway and Taxiway Safety Areas:

Safety area encroachments, improper ground vehicle operations and unmarked or uncovered holes and trenches in the vicinity of aircraft operation surfaces and construction areas are the three most recurring threats to safety during construction. The contractor shall implement a procedure to minimize these situations. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces shall be a standing requirement for the duration of construction operations.

a) Runway Safety Area (RSA).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway by aircraft.

No construction may occur within the existing RSA while the runway is open. Any construction between RSA and Holdline must be approved with Airport Operations prior to starting work.

The airport operator must coordinate any adjustment of RSA dimensions, to meet the above requirement, with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.

Open trenches or excavations are not permitted within the RSA while the runway is open. The contractor must backfill trenches before the runway is opened. Coverings are not allowed in runway safety areas.

After the Runway has been closed, Contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

b) Runway Object Free Area (ROFA).

Runway	*RSA Distance from Centerline (ft) RSA Holdline*	*RSA Width (ft)*	*RSA Length from End of Runway (ft)*
07-25	250	500	1000

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittals and justification provided to the OPERATOR for approval prior to proceed.

Runway	**ROFA Distance from Centreline (m)**	**ROFA Width (m)**	**ROFA Length fron end of Runway (m)**
PGIA	30	30	30

c) Taxiway Safety Area (TSA).

The taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the

taxiway. No construction may occur within the TSA while the taxiway is open for aircraft operations.

Taxiway	TSA Distance from Centreline (m)	TSA Width (m)
PGIA	15	15

Open trenches or excavations are not permitted within the TSA while the taxiway is open. The contractor must backfill trenches before the taxiway is opened. Coverings are not allowed in taxiway safety areas.

After the Taxiway has been closed, Contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

d) Taxiway and Taxilane Object Free Area (TOFA).
Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway/taxilane object free area during normal operations. Thus the restrictions are more stringent. No construction equipment may be parked within the TOFA while the taxiway/taxilane is open for
aircraft operations.

Taxiway	TOFA Distance from Centreline (m)	TOFA Width (m)
PGIA	27	27

e) Obstacle Free Zone (OFZ).

Construction personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. The OFZ is a defined volume of

airspace centred about and above the runway centreline. The following figure shows the measures. Refer to: Precision Approach Runway Code Number 3,4

Table 4-1. Dimensions and slopes of obstacle limitation surfaces — Approach runways

APPROACH RUNWAYS

	RUNWAY CLASSIFICATION									
	Non-instrument Code number				Non-precision approach Code number			Precision approach category I Code number		II or III Code number
Surface and dimensions[a]	1	2	3	4	1,2	3	4	1,2	3,4	3,4
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
CONICAL										
Slope	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Height	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	100 m
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m
Radius	2 000 m	2 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m
INNER APPROACH										
Width	—	—	—	—	—	—	—	90 m	120 m[c]	120 m[c]
Distance from threshold	—	—	—	—	—	—	—	60 m	60 m	60 m
Length	—	—	—	—	—	—	—	900 m	900 m	900 m
Slope								2.5%	2%	2%
APPROACH										
Length of inner edge	60 m	80 m	150 m	150 m	150 m	300 m	300 m	150 m	300 m	300 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10%	10%	10%	10%	15%	15%	15%	15%	15%	15%
First section										
Length	1 600 m	2 500 m	3 000 m	3 000 m	2 500 m	3 000 m	3 000 m	3 000 m	3 000 m	3 000 m
Slope	5%	4%	3.33%	2.5%	3.33%	2%	2%	2.5%	2%	2%
Second section										
Length	—	—	—	—	—	3 600 m[b]	3 600 mb	12 000 m	3 600 m[b]	3 600 m[b]
Slope	—	—	—	—	—	2.5%	2.5%	3%	2.5%	2.5%
Horizontal section										
Length	—	—	—	—	—	8 400 m[b]	8 400 m[b]	—	8 400 m[b]	8 400 m[b]
Total length	—	—	—	—	—	15 000 m	15 000 m	15 000 m	15 000 m	15 000 m
TRANSITIONAL										
Slope	20%	20%	14.3%	14.3%	20%	14.3%	14.3%	14.3%	14.3%	14.3%
INNER TRANSITIONAL										
Slope	—	—	—	—	—	—	—	40%	33.3%	33.3%
BALKED LANDING SURFACE										
Length of inner edge	—	—	—	—	—	—	—	90 m	120 m[c]	120 m[c]
Distance from threshold	—	—	—	—	—	—	—	c	1 800 m[d]	1 800 m[d]
Divergence (each side)	—	—	—	—	—	—	—	10%	10%	10%
Slope	—	—	—	—	—	—	—	4%	3.33%	3.33%

f) Runway approach/departure surfaces.

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces.

Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial run way closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate Operations Manager with air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

18) Other limitations on construction:

a) Prohibitions.

The following prohibitions are in effect for the duration of this project:

- No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.
- No use of electrical blasting caps or explosives of any kind on or within 1,000 ft (300 m) of the airport property.
- No use of flare pots within the AOA.

b) Restrictions.

- Construction suspension required during specific airport operations
- Areas that cannot be worked on simultaneously
- Day or night construction restrictions some times.

19) Duties of the Contractor:

The Contractor shall comply with next issues without limit to them:

a) Issue a letter in which it agrees to comply with the regulations set forth in this CSPP.
b) Develop SPCD indicate how and where the resources used to meet the CSPP and submit it to the OPERATOR for approval.
c) The Contractor shall include in his SPCD a complete and well explained phasing plan including all the requirements written in this CSPP. This plan has to be discussed and approved by de OPERATOR in coordination with de BDCA prior to proceed with the works
d) Include in the drawings all aspects listed in this document such as markings, signs, haul routes for each phase, Safety an Security check points, etc.
e) Keep in the field a resident inspector for safety at all times during the construction process and make daily inspections.
f) Keep field communications equipment needed to communicate information and warnings, in the same frequency with the Operations Manager
g) Send a complete set of drawings to the OPERATOR and BDCA with their technical specifications.
h) Prepare a detailed budget estimate of works in phases including all Operational Safety issues and subject to the approval of the OPERATOR and the BDCA.

Appendix 1. Safety and Phasing Plan Checklist

Coordination	Reference	Addressed			Remarks
General Considerations					
Requirements for preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	1	Yes	No	NA	
Operational safety is a standing agenda item for construction progress meetings.	1	Yes	No	NA	
Scheduling of the construction phases is properly addressed.	2	Yes	No	NA	
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	3.a	Yes	No	NA	
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	3.a(1)	Yes	No	NA	
Access routes used by ARFF vehicles affected by the project are addressed.	3.a(2)	Yes	No	NA	
Access routes used by airport and airline support vehicles affected by the project are addressed.	3.a(3)	Yes	No	NA	
Underground utilities, including water supplies for fire fighting and drainage.	3.a(4)	Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	3.a(5)	Yes	No	NA	
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	3.a	Yes	No	NA	
Temporary changes to taxi operations are addressed.	3.b(1)	Yes	No	NA	

Coordination	Reference	Addressed	Remarks

Detours for ARFF and other airport vehicles are identified.	3.b(2)	Yes	No	NA	
Maintenance of essential utilities and underground infrastructure is addressed.	3.b(3)	Yes	No	NA	
Temporary changes to air traffic control procedures are addressed.	3.b(4)	Yes	No	NA	
VISUAL AIDS					
Procedures for coordination with the OPERATOR, Operations, including identification of points of contact, are included.	3	Yes	No	NA	
Contractor Access					
The CSPP addresses areas to which contractor will have access and how the areas will be accessed.	4	Yes	No	NA	
The location of stockpiled construction materials is depicted on drawings.	4.a	Yes	No	NA	
The requirement for stockpiles in the ROFA to be approved by OPERATOR is included.	4.a	Yes	No	NA	
Requirements for proper stockpiling of materials are included.	4.a	Yes	No	NA	

Coordination	Reference	Addressed			Remarks
Construction site parking is addressed.	4.b(1)	Yes	No	NA	
Construction equipment parking is addressed.	4.b(2)	Yes	No	NA	
Access and haul roads are addressed.	4.b(3)	Yes	No	NA	
A requirement for marking and lighting of vehicles to comply with AC 150/5210-5, Painting, Marking and Lighting of Vehicles Used on an Airport, is included.	4.b(4)	Yes	No	NA	
Proper vehicle operations, including requirements for escorts, are described.	4.b	Yes	No	NA	
Training requirements for vehicle drivers are addressed.	4.b	Yes	No	NA	
Two-way radio communications procedures are described.	4.b	Yes	No	NA	
Maintenance of the secured area of the airport is addressed.	4.b(10)	Yes	No	NA	
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	5	Yes	No	NA	
Foreign Object Debris Management					
The airport operator's FOD management procedures are addressed.	6	Yes	No	NA	
Hazardous Materials Management					
The airport operator's hazardous materials management procedures are addressed.	7	Yes	No	NA	
Notification of Construction Activities					
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	8	Yes	No	NA	

Coordination	Reference	Addressed			Remarks
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	11	Yes	No	NA	
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	12	Yes	No	NA	
Runway and Taxiway Visual Aids -Marking, Lighting, Signs, and Visual NAVAIDs					
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	13	Yes	No	NA	
The use of a lighted X is specified where appropriate.	14	Yes	No	NA	
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to the BAA standards.	14	Yes	No	NA	
Hazard Marking and Lighting					
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	15	Yes	No	NA	

Coordination	Reference	Addressed			Remarks
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	8.a	Yes	No	NA	
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	8.b	Yes	No	NA	
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	8.c	Yes	No	NA	
Emergency notification procedures for medical, fire fighting, and police response are addressed.	8.c	Yes	No	NA	
Coordination with ARFF personnel for non-emergency issues is addressed.	8.d	Yes	No	NA	
Inspection Requirements					
Daily inspections by both the airport operator and contractor are specified.	9.a	Yes	No	NA	
Final inspections are specified when required.	9.b	Yes	No	NA	
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	10	Yes	No	NA	

Coordination	Reference	Addressed			Remarks
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	15	Yes	No	NA	
The CSPP considers less obvious construction-related hazards.	15	Yes	No	NA	
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	15	Yes	No	NA	

The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	15	Yes	No	NA	
Red lights meeting the luminance requirements of the State Highway Department are specified.	15	Yes	No	NA	
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 in high.	15	Yes	No	NA	
Barricades marked with diagonal, alternating orange and white stripes are specified to indicate construction locations in which no part of an aircraft may enter.	15	Yes	No	NA	
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	15	Yes	No	NA	
Markings for temporary closures are specified.	15	Yes	No	NA	
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	15	Yes	No	NA	
Protection of Runway and Taxiway Safety Areas					
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	16.a(1), 16.c(1)	Yes	No	NA	
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions and issues a local NOTAM.	16	Yes	No	NA	

Coordination	**Reference**	**Addressed**			**Remarks**
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	16	Yes	No	NA	
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open.	16	Yes	No	NA	

Appropriate covering of excavations in the TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	16	Yes	No	NA	
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	16	Yes	No	NA	
Grading and soil erosion control to maintain TSA standards are addressed.	16	Yes	No	NA	
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	16	Yes	No	NA	
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	16	Yes	No	NA	
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	16	Yes	No	NA	
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	16	Yes	No	NA	
Provisions for protection of runway approach/departure areas and clearways are included.	16	Yes	No	NA	
Other Limitations on Construction					
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	17	Yes	No	NA	
The CSPP prohibits the use of flare pots within the AOA at any time.	17	Yes	No	NA	
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	17	Yes	No	NA	

Appendix 2. Construction Project Daily Safety Inspection Checklist

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project.

Potentially Hazardous Conditions

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.			
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and approach zones.			
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.			
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.			

Item	Action Required	or	None
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.			
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.			
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.			
Obliterated or faded temporary markings on active operational areas.			
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.			
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.			
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.			
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.			
Lack of radio communications with construction vehicles in airport movement areas.			
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.			
Water, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.			
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.			

Item	Action Required	or	None
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).			
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.			
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.			
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.			
Site burning, which can cause possible obscuration.			
Construction work taking place outside of designated work areas and out of phase.			