SECTION 11 – SEQUENCING OF CONSTRUCTION

11-1 GENERAL

The Contractor shall perform all work in accordance with the construction sequencing plans as shown on the plans and as described herein. The plans and descriptions are intended to give a general outline of the order in which the work is to be accomplished, and to set forth operating restrictions which will be in effect for each Work Area. Neither the sequencing plans, nor the descriptions contained in this section, are intended to be a comprehensive list of work items. It is the Contractor's responsibility to anticipate upcoming work and to coordinate his operations and schedule accordingly to ensure a timely flow of construction operations. The Contractor's schedule shall be submitted to the Engineer prior to commencement of construction as required under Sections 6, and 19 of the Specifications. The Contractor's Schedule shall be based upon furnishing sufficient labor, equipment, and materials that will allow all work to be completed within the contract time limit.

The Contractor shall closely coordinate and schedule work with other Contractors completing work on the airfield. Prior to preparing the construction schedule and regularly during the construction, the Contractor shall meet with the LAWA Engineer to discuss other work occurring on the airfield. The Contractor shall incorporate into the construction schedule any required restrictions or dates required to make sure that no conflicts with other Contractors occur.

[The Engineer will issue an individual Notice to Proceed for each Work Area as described hereafter and a separate Notice to Proceed will be issued for construction within a fuel line right of way. Before the Contractor may begin any work in a given Work Area, he shall request, in writing, that the Engineer issue the NTP for that Work Area/ right of way.**]**

The Contractor shall perform improvements within each Work Area in the order presented in this section, and shall complete each Work Area within the periods of time specified. Included in the Work Area time allotment is the cure time for any epoxy, paints, cement, etc. required for approval by the Engineer. As described below, some Work Areas shall be completed and inspected by the Engineer prior to commencement of other phases of work. Liquidated damages in the amounts specified in Section 6 shall be assessed if the Contractor fails to complete all Work Areas within the specified allowable duration.

The words "Work Area" are used hereafter to describe either the period of time, and/or the area in which certain work is to be done. These are indicated on the plans and herein with alpha-numeric labels. The most demanding operational restrictions or closures of adjacent taxiways and runways, as outlined below for each Work Area, shall apply regardless of other concurrent work in progress. For instance, if work in Area ABC requires closure of Twy XX and work in Area XYZ allows Twy XX to remain open, simultaneous work by the Contractor in both Areas ABC and XYZ will require the closure of Twy XX. The term "Predecessor" used in the descriptions below identifies Work Areas for which all work must be completed, beneficial occupancy granted, and in some cases, the area opened to aircraft traffic before work in the Work Area under discussion can begin. The term "Successor" used in the descriptions below identifies

Work Areas for which no work may begin until all work in the Work Area under discussion has been completed, beneficial occupancy granted, and the area opened to aircraft traffic.

11-2 PROJECT SEQUENCING

11-2.1 Work within Work Area Limit Lines

The limits of work for each Area of construction are clearly shown on the construction sequencing plans, indicating offset distances from adjacent active runways and/or taxiways. For each Work Area, these lines show the limit of the work area in which the Contractor may have workers, equipment, and materials, and in which he may conduct work for that area. In no circumstance will work be allowed to take place within **[250]** feet of active runway centerlines, or within **[125]** feet of active taxiway centerlines. Limit lines shown on the plans are often larger than these minimums, in which cases the limits shown on the plans shall control.

In daytime work areas, the Contractor shall maintain conditions for Runway Safety Areas (RSAs) in all areas within **[250]** feet of an active runway centerline. Conditions to be maintained in these areas are the design standards for Runway Safety Areas listed in FAA Advisory Circular, 150/5300-13, Paragraph 305, which reads:

A. Design Standards

The runway safety area shall be:

(1) "Cleared and graded and have no potentially hazardous ruts, humps, depressions or other surface variations;

(2) Drained by grading or storm sewers to prevent water accumulation;

(3) 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; and

(4) Free of objects, except for objects that need to be located in the runway safety area because of their function. Objects higher than 3 inches above grade should be constructed on low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches above grade. Other objects such as manholes should be constructed at grade. In no case should their height exceed 3 inches above grade."

The Engineer shall retain the right to shut down Contractor operations in any Work Area if these conditions are not being met.

11-2.2 Operations

The Contractor shall conduct all his operations in such a manner so as to maintain a smooth, safe, uninterrupted flow of aircraft and vehicular traffic adjacent to the work site. The construction staging sequence and schedule shown on the plans has been developed to minimize the impact of construction activities on airfield operations.

The Contractor shall conduct all his earthwork construction in such a manner so as to minimize any potential differential settlement between the edges of two adjacent construction phases. He shall also ensure that runway and taxiway safety areas adjacent to active aircraft operations are in conformance with FAA standards at all times. At the Contractor's own cost, temporary precast panels, steel plating, shotcrete, gabions, engineering fabric or other approved methods can be applied at limited locations in order to satisfy these requirements. See Section 37 of these Specifications for specific criteria. Any such method must receive advance approval of the Engineer prior to its use on the project.

Work Areas that are not under construction shall be accessible and operational at all time.

Limits of the various Work Areas shall be clearly delineated with barricades, warning signs; barricade lights and other markings as shown on the plans and specified herein, in order to deter aircraft and vehicles from entering the construction areas. The Contractor shall work closely with Airport Operations personnel and the Engineer to ensure that the work is accomplished with minimal interference to aircraft movements.

Elements of the various Work Areas as shown on the Construction Sequencing Plans shall be constructed in accordance with the schedule and sequence outlined on the plans and in this Section. The "Duration" period shown in each schedule is the maximum time allowed for completion of each Work Area. Mobilization will be the first work activity the Contractor will be required to perform under the contract prior to beginning any Work Area as outlined below. See Section 16 of these specifications for a list of work tasks considered necessary for completion of Mobilization.

The Contractor shall note that the alpha-numeric numbering of the Work Area *does not* imply ordering (i.e., construction of Part B of any particular Work Area may not necessarily follow part A; Part 2 may not necessarily follow Part 1, etc. Contractor is advised to review the schedule given and to note the necessary predecessors and successors to each Work Area).

The Contractor shall maintain power supply for all runway and taxiway lighting systems at all times, unless otherwise specified. When temporary bypasses of active lines are to be constructed in order to work on portions of the circuits, the circuits shall be de-energized and re-energized in conformance with the procedures specified these Specifications.

For all work in Daytime Work Areas, the Contractor shall use one 10-hour work shifts each and every day, except Sundays and holidays, when no work shall be done. Barricade lighting and flagging, and temporary taxiway closure markings shall be erected and maintained around the perimeter of all Daytime Work Areas at all times, as shown on the plans.

Work within the Nighttime Work Areas shall be performed within the allowed times noted for each specific Work Area in Section 11-4. Barricade lighting must be placed at the locations shown on the plans and taxiway closure markings as directed by the Engineer, at the beginning of each Nighttime Work shift, and shall be removed at the conclusion of each shift.

Work within the Weekend or other Limited-time Work Areas shall be performed within the allowed times noted for each specific Work Area in Section 11-4. Barricade lighting must be placed at the locations shown on the plans and taxiway closure markings as directed by the Engineer, at the beginning of each Weekend or other Limited-time Work shift, and shall be removed at the conclusion of each shift.

[Figure 11.1, and the end of this Specification, shows a sequencing chart of the various Phases and Work Areas as they relate to each other and to the overall project duration.**]**

11-3 OPENING SECTIONS OF THE WORK TO TRAFFIC

11-3.1 Completion of Work Areas

The Contract work on this project will be accepted for beneficial occupancy on a Work Area basis. Each Work Area of the work as specified hereafter, and as shown on the plans, shall be completed within the period of time specified. As each Work Area is completed, the Contractor shall request, in writing, that the Engineer accept beneficial occupancy of that portion of the work. If the Engineer deems the work to be complete, a written notice of substantial completion and acceptance for beneficial occupancy will be given and the calculation of liquidated damages for that portion of the work will cease. If the Engineer deems that additional work is required on that work area, but still accepts beneficial occupancy, contractor will be required to schedule with the Engineer on the work hours to complete the final items on the work area.

11-3.2 Daily Inspection at Completion of Work Shift

Some areas of nighttime, weekend or other limited-time construction require the Contractor to construct new pavement in an incremental manner so that aircraft operations may resume over the area under construction during daytime hours. Construction in these areas will necessitate the use of innovative pavement construction techniques to provide temporary load-bearing pavements to safely support taxiing aircraft between work shifts. See Section 37 of these specifications for details. For those areas that will be opened to aircraft traffic during off-construction hours, steel plating may be required prior to opening these work areas to aircraft traffic to satisfy the airfield safety requirements listed in these specifications. Construction in these areas includes the extension of electrical services, including construction of new electrical in-pavement and edge lighting and signs, including, in some locations, concrete duct-bank crossings of taxiways. Prior to the completion of a work shift in which the work area will be opened to aircraft traffic, the area must be properly cleaned to remove all FOD and electrical edge lights (temporary or permanent) must be placed and operational.

It will be the Contractor's sole responsibility to develop a method of construction which will satisfy both the technical and scheduling requirements of the project and no extensions to the schedule will be allowed due to the difficulties of constructing under the short construction windows allowed. All extra costs for the work in these areas will be considered to be included in the Contractor's unit bid prices for the various items of work.

At the conclusion of each nighttime, weekend or other limited-time work shift in areas that are scheduled to be reopened to aircraft traffic each morning, the Engineer or Inspector will conduct a morning inspection of each of construction area before the Contractor's workers leave that work area for the day, and before the Contractor can be relieved of liquidated damages assessment for delays to runway or taxiway opening times for that night's work shift. This inspection is to ensure that the site is safe for aircraft operations. All areas within **[250]** feet of the runway centerline, within **[125]** feet of active taxiway centerlines shall satisfy the conditions described below before opening to aircraft traffic.

Conditions which Inspectors will consider potentially hazardous, and which must be corrected prior to reopening the runways and taxiways each morning, are listed in Section **[10-3.9]** of these Specifications.

11-3.3 Changes to Sequencing Plans

The sequence of work as outlined in this section, and on the plans, has been developed to provide the best flow of construction operations for the project. Due to other on-going projects on the airfield, however, it may be necessary at the time of construction to reorder the sequence of some work in order to minimize overall operational impacts on the airport which may be caused by delays or schedule changes on other projects. LAWA therefore retains the option of modifying the sequence or work as set forth herein, without penalty, if necessary. Such changes, should they occur, are anticipated to place entire blocks of work in a different order (Work Area 2 prior to Work Area 1, for example) as opposed to reordering individual components of individual work areas. The Contractor will be given all possible advance notification of any such required changes to the construction sequencing.

11-3.4 Pre-work Requirements

(1) Contractor Mobilization

(2) Setup Contractor's staging area**[, including concrete batch plant(s) and material crushing equipment].**

(3) Relocation of **[ ].**

(4) Obtain all required permits.

(5) Preparation of required submittals in accordance with the project specifications,

(6) [Pre-Demolition Work].

(7) **[Test Strip(s)].**

(8) **[Procurement and transport of long lead construction materials to the job site].**

(9) **[Temporary lighting and other lighting work required to maintain and operational airfield].**

(10) **[Install barricades, flag lines and fences as depicted in the construction drawings].**

(11) **[Fiber Optic and Power System rerouting required to maintain the airfield operation].**

(12) **[Haul route improvements].**

(13) **[Other].**

11-3.5 Unscheduled Closures

Minimizing the effects of construction activities on airfield operations is of paramount importance. The Contractor will be expected to accomplish all work within the allowed time periods within each Work Area as stated. Should any unscheduled closures of a runway or taxiway be necessitated by the Contractor's negligence, Liquidated Damages in the amount set forth in Section 6-9 of these specifications will be assessed.

11-4 CONSTRUCTION SEQUENCING

11-4.1 [Daytime] [Nightime] Work Area [1A]:

A. Description: Daytime Work Area [1A]:

Construction of all improvements within Work Area [1A] as shown on the plans and described herein.

B. Work to be done in Work Area [1A]:

All work called for on the plans to accomplish the following:

(1) Placement of barricades and temporary lighting required to delineate the work areas and to maintain a safe separation of aircraft and construction operating areas.

(2) Temporary marking and marking removals shall be the first work to occur in work areas after placement of barricades and temporary lighting.

(3) Demolition of existing **[airfield lighting and signage; other miscellaneous utilities/items]** shown on the plans and scheduled for demolition.

(4) Construction/Modification of **[airfield pavements; airfield lighting and signage; storm drain lines and appurtenances; other underground utilities improvements]** shown on the plans.

(5) **[Installation of closure markers for Runway [ ] prior to beginning work]every night.]**

(6) **[Taxiway closure markings shall be removed and permanent marking installed upon completion of other improvements in each work area.]**

C. Airfield pavement areas to be closed during construction of Work Area [1A]:

(1) For Work Area 1A: Close Runway **[ ]**; portions of Taxiways **[ ]**.

D. Airfield pavement areas to remain open during construction of Work Area [1A]:

[List nearby pavement areas to remain open][All other operating surfaces shall remain open].

E. Other Conditions for Work Area [1A]:

(1) The airfield electrical lights and circuits will be phased by the Contractor to match the pavement areas that are open and closed during all of the phases.

(2) Contractor shall work **[ ]** days a week – **[p.m.]** to **[a.m.]** for nighttime areas and **[ ]** days a week and a minimum of one **[ ]**-hour shift per day for the day-time work areas.

(3) Any work on Taxiways to remain open, including, but not limited to, striping removal, or any work within **[250]** feet of active Runways, shall be coordinated with the Engineer and will only be allowed during the time period of **[p.m.]** to **[a.m.].**

(4) All utilities within and passing through the work area shall be kept operational at all times, unless otherwise specified.

(5) Contractor shall install and maintain barricade lights, flags and closed taxiway markers as shown on the plans and as directed by the Engineer during work shift hours. **[Closure lights and markers shall be removed at the end of the shift immediately prior to reopening the pavement areas.]**

(6) **[Contractor shall take extra care to ensure that service roads shown on the plans are maintained, remain open and/or are rerouted to remain open during construction.]**

(7) **[At the conclusion of work shifts, areas shall satisfy the requirements in Section 11-3.2, before pavement can be opened to aircraft traffic, and before the Contractor can be relieved of liquidated damages for that shift.]**

F. Predecessors to Work Area [1A]: [Mobilization] [Work Area]

G. Successors to Work Area [1A]: [Work Area]

11-4.2 [Daytime] [Nightime] Work Area [ ]:

[Provide specific details for A-G above for all subsequent phases and/or subphases of Work]

11-5 MEASUREMENT AND PAYMENT

Sequencing of the work as described herein will not be measured for payment. The Contractor shall make his own estimate of the inherent difficulties involved in completing the work under the conditions stated and shall not claim any added compensation by reason of delay or increased costs due to opening a portion of the contract work or for difficulties or costs associated with other staging considerations.

[INSERT FIGURE 1-1 GANTT DIAGRAM]

END OF SECTION 11

THIS PAGE LEFT BLANK INTENTIONALLY