1. GENERAL

.1 A facility start-up process shall be used to bring the facility to a fully operational state, free of deficiencies, in the most efficient and timely manner achievable.

.2 This Section specifies the Contractor's and owner's responsibilities during each of the following successive sub-phases of Facility Start-Up:

   .1 Contractor Start-Up which leads to Interim Acceptance of the Work.
   .2 Performance Testing which leads to Practical Completion of the Work.

2. RELATED SECTIONS

   .1 Facility Start-Up Payments: Section 00631.
   .2 Contractor Start-Up Report Forms: Section 01335.
   .3 Contract Acceptance Procedures: Section 01775.
   .4 Starting of Equipment and Systems: Section 01812.
   .5 Testing, Adjusting and Balancing: Section 01813.
   .6 Equipment and Systems Demonstration and Instruction: Section 01821.
   .7 Mechanical Systems: Division 15
   .8 Electrical Systems: Division 16

3. CONTRACTOR START-UP

   .1 Contractor shall do the following during Contractor Start-Up, not necessarily in order listed:

   .1 Start equipment and systems as specified in Section 01812.
   .2 Test, adjust and balance equipment and systems as specified in Section 01813.
   .3 Demonstrate equipment and systems as specified in Section 01821.
   .4 Complete and submit Start-Up reports including:

       .1 Contractor's system and equipment start-up reports.
       .2 Manufacturers' equipment start-up reports.
   .5 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.
   .6 Correct Contract Deficiencies identified as a result of the foregoing and as may be identified by the owner.
   .7 Execute Change Orders.
.8 Perform all other work and activities required for fulfillment of prerequisites to Interim Acceptance of the Work as specified in Section 01775.

.2 Commissioning Agent will do the following during Contractor Start-Up.
   .1 Carry out pre-interim inspections as necessary.
   .2 Witness manufacturers' equipment start-up.
   .3 Verify starting, testing, adjusting and balancing by Contractor.
   .4 Provide start up reports for all systems and equipment and review and approve Contractor Start-Up reports.
   .5 Cooperate in systems and equipment demonstration and instruction.
   .6 Initiate Change Orders as required.
   .7 Verify correction of Contract Deficiencies by Contractor.
   .8 Verify execution of Change Orders by Contractor.
   .9 Perform other activities related to Substantial Completion of the Work as specified in Section 01775.

.3 The foregoing will be carried out in an ongoing cycle of:
   .1 Owner's inspections.
   .2 Documentation of results.
   .3 Diagnosis of problems.
   .4 Correction of Contract Deficiencies and execution of Change Orders as required.
   .5 Verification of results.

4. PERFORMANCE TESTING

.1 Performance testing will be carried out by the Commissioning Agent.
   .1 Performance testing will be completed prior to substantial completion.
   .2 Performance testing will be completed when all systems have been balanced and tested and are operating to the satisfactory of the Commissioning Agent.
.3 Contractor shall do the following during Performance Testing:

.1 Correct Contract Deficiencies previously outstanding and those identified during Performance Testing.

.2 Execute Change Orders.

.4 The foregoing will be carried out in an ongoing cycle of:

.1 Performance testing.
.2 Documentation of results.
.3 Diagnosis of problems.
.4 Correction of Contract Deficiencies and execution of Change Orders as required.
.5 Verification of results.

5. SEASONAL CONSTRAINTS

.1 Notwithstanding all-inclusive requirements specified in this Section, additional separate cycles of Contractor Start-Up, Performance Testing and Fine Tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.

.2 Contractor's responsibilities with respect to such later Facility Start-Up activities shall be as specified in this Section.
6. PARTIAL UTILIZATION OF WORK

.1 When partial utilization of the Work is required, the applicable requirements specified in this Section shall apply to the part(s) of the Work to be utilized.

.7 THIRD PARTY TESTING

.1 Third party independent testing will be carried out for the following prior to substantial completion:

<table>
<thead>
<tr>
<th>Category</th>
<th>Tests/Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural</td>
<td>Roofing, Radiation Protection, Materials testing, Asphalt testing, Thermal scans, Building envelope testing</td>
</tr>
<tr>
<td>Mechanical</td>
<td>Medical gas testing</td>
</tr>
<tr>
<td>Electrical</td>
<td>Z32, Power Distribution</td>
</tr>
<tr>
<td>Structural</td>
<td>Steel Deck, Concrete testing, Soil testing, Weld testing, Structural testing</td>
</tr>
</tbody>
</table>

.2 The contractor will co-operate with all independent testing agencies to enable thorough and detailed testing of all systems and equipment.

END OF SECTION