

**CONSTRUCTION SPECIAL SPECIFICATION**

**SECTION 01311-S**

**PROJECT SCHEDULE**

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**SPECIAL SPECIFICATION**

**SECTION 01311-S**

**PROJECT SCHEDULE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

The Contractor shall prepare a cost-loaded baseline schedule utilizing Critical Path Method (CPM) and update progress in a corresponding working schedule. The baseline schedule shall reflect the Contractor's plan to organize and execute the work and, once approved by the Sandia National Laboratories (SNL) Project Manager (PM), this schedule will be the basis for measuring performance. Initially, the baseline and working schedules will be the same. As construction proceeds, the working schedule will diverge from the baseline and be used to capture actual dates. Conversely, if activities do not start or complete as planned, the Contractor will be required to adjust the start and finish dates in the working schedule to report realistic dates for impacted activities. A comparison between the baseline and working schedules will provide performance data to the SNL project team.

The Contractor shall prepare a Schedule Of Values (SOV) associated with each item of scope from the drawing package. The schedule dollar value for each activity in the working schedule will be used for payment application and cash flow predictions.

## 1.02 SUBMITTALS

### A. BASELINE SCHEDULE

Within fourteen (14) days after award of contract, the Contractor shall submit a proposed baseline schedule for review and approval. The baseline schedule shall be delivered electronically in the original format they were developed (i.e., .xer for Primavera e/c, .mpp for Microsoft Project, or .stx for Primavera SureTrak). In addition, the Contractor may also submit courtesy printouts of these items as a Portable Document Format (pdf).

The baseline schedule shall indicate a project completion date on, or before, the contract end date. The schedule will be reviewed by SNL's Project Manager, Construction Manager and Project Scheduler (PS). Review comments from SNL will be returned to the Contractor within fourteen (14) days. The Contractor must address comments and resolve issues directly with the SNL PM or PS, as appropriate. Approval of the baseline schedule by the SNL Project Manager is a requirement before issuance of the Notice to Proceed or approval of the initial payment application.

### B. SCHEDULE OF VALUES (SOV)

A Schedule of Values (SOV) will initially be submitted by the Contractor to the SNL Project Manager for review and approval. The SOV will include associated cost values for each activity reported in the baseline schedule and will be the basis for evaluating payment applications. Additionally, the SOV will indicate whether or not the activities require paperwork submittals prior to completion (i.e., commissioning paperwork boiler symbol 109). As work proceeds, the Contractor shall update the task percent completions and submit the SOV along with their payment application. SOV task percentage completions need to match progress reported on the working schedule updates. The Contractor will be required to estimate progress through SNL's monthly cut-off dates. These dates are typically 3-5 days prior to the end of the month and should coincide with the "data-date" used when "scheduling" the project. For the "data date" use SNL's monthly cut-off date. An SOV example is provided in figure 1.

PO-XXXXX		Progress Payment Invoice #				Date: XX/XX/2009			
HSM 09-XX Bldg-XXX		Task Value	Task % Complete	Current Pay Request	Previous Pay Application	Total Progress To date	Contract Amount Remaining	Paper Work Required	Paper Work Completed
Activity ID									
100	<b>BLDG-XXX GENERAL CONDITIONS</b>								
110	Bond	2,500.00	0%	-	-	-	2,500.00	No	No
120	Safety Plan	2,500.00						No	No
140	Submittals	7,500.00	0%	-	-	-	7,500.00	No	No
160	Mobilization	8,000.00	0%	-	-	-	8,000.00	No	No
170	<b>BUILDING XXX STEAM DEMO</b>								
180	Main Building Steam Shutdown	1,000.00	0%	-	-	-	1,000.00	No	No
190	Electrical Demo	1,200.00	0%	-	-	-	1,200.00	No	No
200	Controls Demo	2,500.00	0%	-	-	-	2,500.00	No	No
210	Steam & Condensate Piping Demo	5,000.00	0%	-	-	-	5,000.00	No	No
220	<b>UNIT HEATERS SYM-61, 62, 63</b>								
230	Order Unit Heaters	1,250.00	0%	-	-	-	1,250.00	No	No
250	Receive Unit Heaters	5,262.00	0%	-	-	-	5,262.00	Yes	No

Figure 1: Schedule of Values

C. WORKING SCHEDULE UPDATES

The first update shall be submitted two weeks after the baseline schedule is approved. Updates shall be submitted with each payment application thereafter. Each update shall contain the following information:

1. Detailed working schedule (with an assigned baseline/target schedule) submitted with each payment application to verify progress,
2. Paper copy of a two week look-ahead schedule submitted to the project team at progress meetings, and
3. Ad hoc, ‘What if’, or recovery schedules submitted to the SNL PM.

D. VARIANCE ANALYSIS

The Contractor shall submit a written narrative to the SNL PM explaining significant variances (i.e., +/- 10% as defined by the SNL PM) between baseline and working schedule dates for key activities (i.e., critical submittals) and controlling milestones (i.e., boiler start ups). This narrative will also include corrective actions identified by the Contractor to remedy the situation.

All submittals must be posted to the project collaboration web site by the Contractor. The SNL PS will verify information in the web site and forward discrepancies to the Contractor.

## PART 2 – SCHEDULING APPROACH

### 2.01 APPROVED SOFTWARE

Contractors are required to use a scheduling software application compatible with the most current versions approved for use at SNL. The following software applications are acceptable:

1. Primavera Project Planner (version 6.0)
2. Primavera SureTrak (version 3.0)
3. Microsoft Project (2003)

### 2.02 SCHEDULE MODEL

The Schedule Logic will be developed using the Precedence Diagramming Method and analyzed using the Critical Path Method (CPM). The calculations supporting CPM are inherent to the scheduling software and are determined from the logic and durations assigned to each activity in the schedule. The project start milestone (i.e., contract award) should be the only item in the schedule without a predecessor activity. Similarly, the project end milestone (i.e., contract end) should be the only item in the schedule without a successor. To establish a meaningful critical path, all other activities or milestones in the schedule must have at least one predecessor and one successor assigned.

The project schedule should be organized using a Work Breakdown Structure (WBS) that differentiates production at the building level with the capability of summarizing at the construction package (i.e., contract) level.

In general, construction activities throughout the schedule may not exceed 15 days; however, exceptions may be allowed by the SNL Project Manager (i.e., critical submittals or long-lead procurement items).

## 2.03 REQUIRED ACTIVITIES AND CONTROLLING MILESTONES

The project baseline schedule shall include all activities required to complete the project as defined in the universal construction packages and subsequent contract documents.

Include activities and controlling milestones such as: contract award, safety plan, notice-to-proceed, submittals, electrical outages, steam outages, equipment deliveries, electrical controls, boiler startups, equipment commissioning checklists, substantial completion, final punch list, close-out activities, project completion, and contract end.

## 2.04 SCHEDULE LAYOUT

The Schedule Layout shall include the following columns: Unique Activity Number, Task Description, Duration, Percent Complete, Early Start (working date), Early Finish (working date), Target Start (baseline date), Target Finish (baseline date), Total Float, SOV amount, and Paperwork Required. A schedule layout example is provided in figure 2.

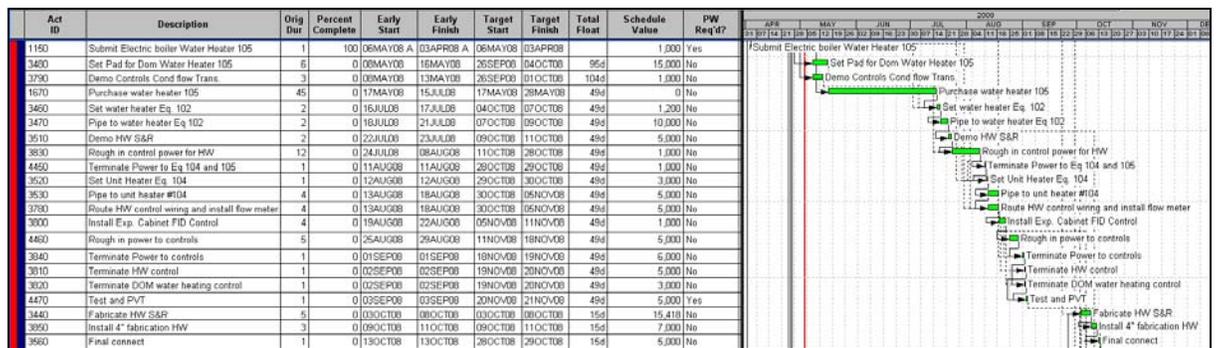


Figure 2: Schedule Layout

## PART 3 – EXECUTION

### 3.01 UPDATING THE WORKING SCHEDULE

At regular intervals the working schedule will need to be updated by the Contractor to reflect progress. The status of each project will be captured through the following data that will need to be entered on a monthly basis for all activities and milestones:

1. Actual dates for activities that start during the current period,
2. Revised planned start or end dates if they are no longer realistic,
3. Actual finish dates for all activities and milestones that complete during the current period,
4. Actual percent complete for ongoing activities (i.e., 50% for an activity that is started, or 80% for a completed activity that requires start-up/commissioning paperwork), and
5. Actual finish dates for activities and milestones that are 100% complete.

The information that is recorded must provide enough detail to analyze the remaining work and determine the overall status of the project. The data collected during the monthly update process must coincide with SNL's monthly cut-off date. For the "data date" use SNL's monthly cut-off date: the scheduling software will reschedule remaining work based on pre-established logic. After moving the "data date" and "scheduling" the project for the current reporting period, the Contractor should ensure that the working schedule accurately represents their view of the project's remaining work.

### 3.02 MAINTAINING THE BASELINE SCHEDULE

Every project should have an approved project baseline established in the scheduling software along with the working schedule. The baseline, also known as the "target", becomes the benchmark against which performance may be measured.

END OF SECTION