SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1: GENERAL

1.1. Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2. Summary

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

1.3. Definitions

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor activity is an activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
1. Float or slack time, as calculated by Primavera P6, using retained logic, associated with one chain or activities is defined as amount of time between earliest start date and latest start date or between earliest finish date and latest finish date for such activities, as calculated as part of the Construction Schedule. Float or slack time shown on the Construction Schedule is not for exclusive use or benefit of either the Owner or the Contractor and is available for use by ei-

ther of them according to whichever first needs the use or benefit of the float to facilitate the effective use of available resources and to minimize the impact of Project problems, delays or Changes in the Work which may arise during performance. Contractor specifically agrees that float time may be used by the Owner in conjunction with their review activities or to resolve Project problems. Contractor agrees that there will be no basis for any modification of the Specific Dates or an extension of the Contract Time, or a claim for additional compensation as a result of any Project problem, Change Order or delay which only results in the loss of available positive float on the Construction Schedule.

2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Target Dates: The baseline start and finish dates for an activity. A schedule baseline is the target, or goal, of your schedule, and shows when you hope to accomplish each activity.

1.4. Submittals

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

B. Submittals Schedule: The submittal schedule shall be integrated into the construction schedule. Include the following information:
   1. Description, Specification Section number and title.
   2. Scheduled date for first submittal.
   3. Scheduled date for Architect's final release or approval.

C. Preliminary Construction Schedule: Submit with in 7 days after Notice to Proceed. Submit two printed copies and one electronic copy formatted for Primavera P6 (file in .XML format). Primavera P3 may be utilized if converted to .XML format for importing into P6.

D. Contractor's Construction Schedule: Submit within 30 days after Notice to Proceed. Submit three printed copies of initial schedule, large enough to show entire schedule for entire construction period.
   1. Submit an electronic copy of schedule, using Primavera P6, on recordable compact disks (CD-R) or USB Flash drive, and labeled to comply with requirements for submittals. Include

type of schedule (Initial or Updated) and date on transmittal. Other electronic transfer methods (e-mail, FTP or other file exchange site) may be utilized if approved.

E. Construction Photographs: Submit progress photographs monthly or as required. Photographs shall be in digital format.
   1. Digital Images: Submit a complete set of digital image electronic files with each submittal of prints on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped. Include a Photo log with information specified under Subparagraph 2. Identification
   2. Identification: Provide the following information with the digital photos.

      a. Date photograph was taken.
      b. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

F. Daily Construction Reports: Submit two copies at weekly intervals.

G. Material Location Reports: Submit two copies at weekly intervals.

H. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

I. Special Reports: Submit two copies at time of unusual event.

1.5.Quality Assurance

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

B. Retain paragraph below with "Construction Photographs" Article in Part 3; otherwise, delete.

C. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

   1. Review software limitations and content and format for reports.
   2. Verify availability of qualified personnel needed to develop and update schedule.
   3. Discuss constraints, including work stages, area separations, and interim milestones.
   4. Review and finalize list of construction activities to be included in schedule.
   5. Review procedures for updating schedule.

1.6.Coordination

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from parties involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2: PRODUCTS

2.1. Preliminary Construction Schedule

A. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

B. Submittals Schedule: Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication

2.2. Contractor's Construction Schedule

A. Procedures: Comply with procedures contained in Association of General Contractor's (AGC) Construction Planning & Scheduling." Manual.

B. Computer Software: Prepare schedules using Primavera P6

C. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

D. Contract completion date shall not be changed by submission of a schedule that shows an early or late completion date, unless specifically authorized by Change Order.

E. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work

F. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect

G. Include Milestones for Notice to Proceed, Substantial Completion and Final Completion

H. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 30 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery

I. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule

J. Startup and Testing Time: Include time for startup and testing

K. Commissioning: Include commissioning activities completing before substantial completion,

L. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion

M. Punchlist: Include activities to be performed to reach Final Completion

N. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date

O. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected

P. Work Restrictions: Show the effect of the following items on the schedule.
   1. Coordination with existing construction
   2. Limitations of continued occupancies.
   3. Uninterruptible services.
   4. Partial occupancy before Substantial Completion.
   5. Use of premises restrictions.
   6. Provisions for future construction

Q. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   1. Submittals.
   2. Purchases.
   3. Mockups.
   4. Fabrication.
   5. Deliveries.
   6. Installation.
   7. Tests and inspections.
   8. Curing.
   9. Startup and placement into final use and operation.
   10. Commissioning
   11. Punch list

R. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following
   1. Structural completion
   2. Permanent space enclosure.
   3. Completion of mechanical installation
   4. Completion of electrical installation
   5. Substantial Completion.

S. Critical Path Method (CPM) Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram. Prepare network diagrams using AON (activity-on-node) format

   1. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates
   2. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work.
   3. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities
   4. Use "calendar day" as the unit of time.
   5. Format:

a. The Ghant Chart schedule shall include the following columns as the Standard View: Activity ID, Activity Description, Original Duration, Remaining Duration, Percent Complete, Early Start, Early Finish and Total Float.
b. The critical path shall be marked in red.
c. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

6. Target Dates: Define the target dates before schedule is updated to show progress.
7. No activities shall be open-ended except for those listed in above 2.2.F. All activities shall have predecessor and successor ties.
8. Constraint of Last Activity Milestone: The Contractor shall include as the last activity in the project schedule, an activity named "Final Completion". The "Final Completion" activity shall have a mandatory finish constraint equal to the contract Final Completion date for the project
9. Calculation of project updates shall be such that if the finish of the last activity falls after the contract completion date, then the float calculation shall reflect negative float on the critical path and if the finish of the last activity falls before the contract completion date, the float calculation shall reflect positive float on the critical path
10. Target Dates: Define target dates once CPM schedule has been completed and before schedule is updated to show progress.
11. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

T. Cost Loading and Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1. The CPM schedule shall be cost-loaded in a manner that can be utilized to validate monthly pay applications and evaluate “Earned Value”.

2. Contractor shall assign costs to construction activities on the CPM schedule so the recorded progress on the activity (as percent complete) is utilized to calculate the cost earned for that activity. Work breakdown structures and activity codes shall be utilized to correlate activities on the CPM schedule with the Schedule of Values. A one-to-one correlation is not required between the Schedule of Values and Cost-loaded activities, but the cost-loaded activities must roll-up to the line items on the schedule of values.

3. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.

4. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.

5. Each activity cost shall reflect an accurate value subject to approval by Architect.

6. Total cost assigned to activities shall equal the total Contract Sum. Change orders costs shall be incorporated in to the CPM schedule after they are approved through a WVU change order.

U. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

V. Submittals Schedule: The submittal schedule shall be integrated into the construction schedule.

1. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates
2. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule

2.3. Reports

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Incidents involving students or public, specifically harassment
16. Construction Change Directives received.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial Completions and occupancies.
20. Substantial Completions authorized.
21. Work performed, including concrete and structural steel deliveries and placement reports.

B. Material Location Reports: At weekly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4. Special Reports

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Accidents: When an accident occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons injured, witnesses, first responders, hospital or clinic where injured was treated. Notify West Virginia University's Environmental Health and Safety Department immediately when an accident resulting in an injury occurs.

PART 3: EXECUTION

3.1.Contractor's Construction Schedule

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.

1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.

2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. As the Work progresses, indicate Actual Completion percentage for each activity or remaining duration for each activity.

C. Distribution: Distribute copies of approved schedule to Architect, Owner, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.

2. Submit, with pay application, a comprehensive, fully developed, CPM horizontal Gantt-chart-type, Contractor's Schedule within 30 days of date established for commencement of the Work. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
   a. No invoices will be processed until the Contractor's Construction Schedule is submitted. No subsequent invoices will be processed until this schedule is approved by the University.

3.2.Construction Photographs

A. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in filename for each image.

2. Field Office Images: Maintain one set of images in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

B. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

C. Preconstruction Photographs: Before starting construction, take color photographs of Project site and surrounding properties from different vantage points, as directed by Architect. Show existing conditions adjacent to property.

D. Periodic Construction Photographs: Take progress photographs on a weekly basis and submit monthly coinciding with cutoff date associated with each Application for Payment. Photographer shall select vantage points to best show status of construction and progress since last photographs were taken.

E. Final Completion Construction Photographs: Take a minimum eight photographs after date of Substantial Completion for submission as Project Record Documents.

3.3. Construction Videotapes

A. Preconstruction Videotape: Before starting construction, record videotape of Project site and surrounding properties from different vantage points, as directed by Architect.

1. Flag construction limits before recording construction videotapes.

2. Show existing conditions adjacent to Project site before starting the Work.
3. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of construction.
4. Show protection efforts by Contractor.

END OF SECTION 013200