SECTION 01 32 10 - COLLABORATIVE CONSTRUCTION PLANNING PROCESS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

A. Section Includes:
   1. Definitions
   2. Basic Requirements of Contractor’s Scheduling System
   3. Collaborative Schedule Overview/Background
   4. LPS Facilitation
   5. Collaborative Schedule Process
      a. Required Participants
      b. LPS Implementation Material and Tools
      c. Preconstruction Meeting
      d. Master Milestone Schedule
      e. Phase Pull Scheduling
      f. 6 Week Make Ready Planning
      g. Weekly Work Plan
      h. Workable Backlog
      i. Daily Work Planning Huddles
   6. Deliverables
   7. Responsibility for Completion

1.3 DEFINITIONS

A. Constraint – In the context of the Last Planner® System, an input, directive, resource or other requirement that will prevent a task or an assignment from starting, advancing or completing as planned.

B. Constraint Log – A list of constraints, each one with an identification of the individual or champion who promises to remove it by an agreed upon date.

C. Last Planner® System (LPS) – A system for project production planning and control aimed at creating a work flow for reliable execution.

D. Last Planner – The person who conducts the final planning of a task or activity and makes the work resource assignments for those in production.

E. Milestone Plan – A master plan schedule developed collaboratively by a project team that identifies major milestones in the project as well as each team members’ milestones and their timing.

F. Pareto chart - Named after Vilfredo Pareto, this chart contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line.
G. Percent Planned Complete (PPC) – Metric used in the Last Planner® System to gauge plan reliability. Defined as the ratio of the number of actual activities completed in a given time period over the number of actual activities planned (typically weekly).

1.4 BASIC REQUIREMENTS OF CONTRACTOR’S SCHEDULING SYSTEM

A. This Section specifies CSU expectations, administrative and procedural requirements for planning and scheduling. The CSU requires that Lean Construction planning principles and techniques shall be utilized as described herein. This specification section requires the integrated and coordinated use of the Reliable Production plan based on the LPS and conventional CPM scheduling. The CSU requires a high level of use of the LPS and expects the Contractor to have experience at all levels of planning and scheduling using these systems.

B. The Schedule shall be prepared, updated and maintained using Primavera Project Planner, Microsoft Project, or other platform as approved by the Trustees.

1.5 COLLABORATIVE SCHEDULE OVERVIEW / BACKGROUND

A. The primary function of the LPS is the collaborative planning process that involves Last Planners, the persons executing the work, for planning in greater detail as the team gets closer to doing the work. The LPS is an opposite way of thinking when compared to conventional push scheduling principles, where the work that should be done is planned in weekly meetings emphasizing adherence to the master schedule milestones. In contrast to traditional CPM scheduling, the LPS incorporates pull planning principles where only the work that can and will be done is considered and promised by Last Planners themselves. At its core, LPS is a system view versus individual optimization, where the Last Planners’ active engagement in this systemic process is a fundamental requirement. The LPS is a team sport.

B. The purpose of the Collaborative Schedule process is to build a reliable project Master Schedule within a collaborative team environment. The primary goal is to 1) establish, solidify and maintain the Milestones within the Master Schedule, and 2) support the teams and work flow improvements necessary to produce safe, reliable and interruption-free project delivery, increasing the reliability of project production planning and improving project performance.

C. The Collaborative Schedule process is iterative and constantly measured with metrics. When executed successfully, the Weekly Work Plans can be easily formulated and Monthly Schedule Updates are naturally produced.

D. The Collaborative Schedule process makes detailed plans by those who execute and manage the work. The System promotes conversations between trade foremen and project management, at appropriate levels of detail, to resolve issues before they become critical. As an activity nears execution the team collaboratively acts to remove constraints and verify that the promises made are tied to milestones. The promises made must be firm commitments, timely and without ambiguity.

E. Use planning procedures described herein to create a Master Schedule, a Look-Ahead Schedule, and a commitment-based Weekly Work Plan schedule through front-end planning using LPS and Lean Construction Planning techniques.

F. LPS Planning Process Overview
The key elements of LPS are:

1. **Master Schedule Planning**: Setting milestones and strategy for the entire project including identification of long-lead items and major constraints. Incorporates critical path method (CPM) logic at a high level to determine overall project duration, what project work should be done. The milestone plan is used to develop the overall sequencing and flow of the work on the project. This will be a CPM-based schedule.

2. **Phase Pull Planning**: Strategically planning segments of work (typically 3 to 4 months in duration) in order to produce progressively detailed Weekly Work Plans. Collaborative reverse phase (pull) schedule planning by those who will be doing the work, at sufficient level of detail to specify handoffs, and identify and resolve operational conflicts. This effort will identify schedule activity durations and what project work can be done. Phase pull planning often results in modifications to the CPM logic used for initial project planning.

3. **6-Week Make-Ready Planning**: Look-ahead scheduling and constraint removal (roadblock removal process) in support of the progressively detailed planning process to assure that work is made ready for installation. This effort will identify what project work will be done. The plan is updated weekly constraints that threaten reliable workflow are identified and captured for the team’s action to remove them.

4. **Weekly Work Planning**: Team collaboration to plan each day’s work, conditions for handoff and acceptance, sequencing and synchronizing next week’s work. Commitments are made to perform work in a certain manner and a certain sequence. What project work are we to do this week. Weekly work planning is the point of maximum progressive detailing to create reliable work plans. Plan reliability at this level is promoted by making only quality assignments and reliable promises so that the production unit will be shielded from upstream uncertainty.

5. **Daily Huddles**: Daily team check-ins, discussions based on the Weekly Work Plan. How are we doing? What do we need to maintain the plan in progress?

6. **Percent Plan Complete**: Number of activities completed divided by the total number of planned activities. At the end of each week, assignments are reviewed for completeness in order to measure the reliability of the planning.

7. **Reasons for Missed Commitments Variance Analysis**: Charted using Excel and/or Pareto charts (see example below) to identify trends, learning and understanding what needs to be fixed in order to improve next week’s PPC.
8. **Learning**: By measuring percent of promises complete (PPC), tracking reasons for variance, diving deep into reasons for plan failures, and developing/implementing lessons learned to improve future plan reliability. Analyzing reasons for plan failures and acting on these reasons is the basis of learning.

9. **Reliable Promising**: Projects are essentially made up of an extensive set of reliable promises. LPS makes the planning processes and work flow highly reliable, and builds necessary trust within a collaborative team environment.

### 1.6 LAST PLANNER FACILITATION

**A. LPS Facilitator**

1. No later than ten (10) days after Contract NTP, the Contractor shall identify a facilitator to provide one day of training in the LPS and submit the facilitator’s relevant qualifications for Trustees’ review and approval. The facilitator may be in-house for the Contractor if the facilitator’s qualifications meet the Trustees’ approval. In general, it is expected that the facilitator has successfully led LPS on a number of projects previously. A listing of past experience and the project outcomes should be provided as part of the facilitator’s qualifications. The facilitator is to be jointly chosen/approved by the contractor and Trustees. If an outside facilitator is selected, this shall be a shared service between contractor and Trustees with the cost split 50/50 with no contractor mark-up allowed. All subcontractors and general contractor personnel responsible for executing this specification shall attend.

2. The LPS facilitator shall attend Pull Planning sessions commensurate with the experience of the General Contractor, and as necessary to assure that all process and requirements detailed herein are satisfied.
3. Teams may have variable past experience with LPS. For teams that have never participated in a project delivered using LPS, six (6) facilitated sessions at the beginning of the project are typically required for project teams without LPS experience to develop working competency. This is not considered a minimum, but is a suggested training level. Teams more experienced with LPS may require a reduced level of facilitation.

4. If the cumulative Percent Planned Complete (PPC) drops below 70 percent, then a LPS facilitator needs to be brought back to assist the team in identifying why the plan is not reliable and assist in identifying and implementing appropriate countermeasures to improve reliability of the plan.

1.7 COLLABORATIVE SCHEDULE PROCESS

A. Required Participants

1. Since LPS is a collaborative process, all those that have a planning role on the project need to participate in the scheduling process at the appropriate time. It is expected that there will be different participants required at different times in the project timeline depending on their respective scope of work and the timing of when it will be planned and performed. The right people need to participate at the right time for the plan to be informed and reliable. These individuals will be expected to participate in all phases of LPS as described in this section.

2. Required Project Stakeholders (the list is not exhaustive, participation by others may be required):
   a. General Contractor
   b. CSU Project Manager
   c. All subcontractors, and/or discipline-specific trades
   d. Project Manager from each trade and/or subcontractor
   e. General foremen and superintendents from each trade subcontractor
   f. Key project engineers and/or construction coordinators
   g. Vendor and/or suppliers with key materials, as necessary
   h. Off-site fabricators, as necessary
   i. Third-party support (testing, inspection, commissioning agents, LEED certification specialists, etc.)
   j. Architects and engineers
   k. University representatives including IT, campus police, purchasing and others as necessary. The University end-users shall be represented through separate user group meetings to identify items of concern, constraints, etc.
   l. LPS Facilitator.

B. LPS Implementation Materials and Tools

1. These forms are included by reference:
   a. Short-Term Production Plan
   b. Constraint Log

2. Large Meeting Room – Job Site Trailer, large enough for 30 individuals, ideally from a single location, “The Big Room”.


4. Walls dedicated to visual system aids.

5. Standard 3-inch size “sticky notes”, dedicated color for each Trade Contractor and/or design discipline.
6. Weekly work plan boards for the 6-week make work ready plan that are freestanding and contain columns and rows for “sticky notes”. Boards should have 7 columns, one for each day of the week, and approximately 20 rows of 4 inch by 4 inch squares for standard 3-inch size “sticky notes”. The surface of the boards should allow good adhesion of the “sticky notes”. Boards should also be easily movable to accommodate rolling planning done weekly.

7. Microsoft Office Suite, specifically Microsoft Excel, for creation of Weekly Work Plans and other necessary LPS elements. Microsoft Project or Primavera scheduling software, for creation and documentation of milestone schedule, milestone relationships and 6-week Look-Ahead schedules.

8. Display well-maintained outputs for the group to use at Daily Huddles and Weekly Coordination Meetings in The Big Room.

9. The four primary Visual Outputs tools of LPS are:
   a. Weekly Work Plans (WWP) – boards described above.
   b. Percent Plan Complete (PPC) trend over time.
   c. Reasons for Variance Pareto, graph, or pie chart.
   d. Constraint Log.

C. Preparatory Meeting
   1. Submit a Draft Master Milestone Schedule (High-Level Master Milestone) and an initial 6 Week look-ahead schedule at the Preparatory Meeting which will include mobilization activities, first collaborative pull planning session, etc.

D. Master Milestone Schedule
   1. Prior to the first pull planning Milestone session, the General Contractor will prepare a high-level master milestone CPM schedule in advance of the session for the entire project to identify major project milestones and general sequence of how the project may be executed. These milestones should include required delivery dates for major long-lead equipment items like switch gear, transformers, chillers, etc.
   2. As part of the Milestone Plan pull planning session, the major project milestones (e.g., CSU constraints and contract milestone requirements, foundation poured, topping out, weathered in, permanent power) developed through the CPM schedule will serve as the dates to work the Milestone Plan.
   3. Milestones have zero duration and represent the completion or start of a particular activity or action.
   4. Milestones used in the Milestone Plan should be completion milestones for the most part. Select start milestones for critical activities may also be appropriate to include in the plan.
   5. Milestones for trade contractors should represent completion of major trade activities and for completion of trade work in a specific area of the project (e.g., floor, gridline or elevation).
   6. Each trade should have multiple milestones and with sufficient detail to identify interim trade milestones at least every 6 weeks to help develop more reliable make work ready planning.
   7. The team works backward from the final project milestone to pull towards the milestone plan.
   8. The collaboratively developed milestone plan is used to validate or challenge the required CPM schedule, and collaboratively inform necessary changes to the CPM schedule.
9. Include milestones for each trade contractor, each phase, key submittal approvals, key release dates for long-lead equipment and material, shipment/arrival of key materials and/or equipment, key inspections, occupancy, commissioning, project completion, etc.

10. Any constraints that are identified that will prevent a task or an assignment from starting, advancing, or completing as planned need to be captured in a Constraint Log. The log should clearly identify the constraint, by what date it needs to be removed to not impact project production, and the member of the project team that has been assigned responsibility to lead the efforts to remove the constraint. The constraint log should be maintained and updated throughout the project and displayed visually in The Big Room so that all project team members can see it.

11. Master Milestone Schedule CPM Format
   a. Activities shall be coded in a logical manner to allow for sorting and grouping of like characteristics, including but not limited to such items as: phase, work shift, project area, activity type (e.g., submittal, agency review, and construction activity), trade, etc.
   b. Include activities and milestones as requested for work completed by University under separate contract, University-furnished materials, move-in, etc.
   c. The schedule duration shall be calculated for the Initial Construction Schedule, Contract Construction Schedule, and subsequent schedule updates.
   d. Contractor’s Superintendent and Project Manager shall be integrally involved in production of the Initial Master Schedule and each subsequent update.
   e. Failure by Contractor to include any element of the work required for performance of the Contract shall not relieve Contractor of the obligation to complete the entire Work of the Contract in accordance with the Contract Completion Date.

E. Phase Pull Scheduling
   1. Phase Pull Scheduling generates a detailed schedule magnifying the master schedule into more detailed project components strategically planning segments of work and activities in order to produce progressively detailed Weekly Work Plans.
   2. The purpose of Phase Pull Scheduling is to produce a plan:
      - for completing a phase of work that everyone involved understands and supports, and
      - from which scheduled activities are drawn into the look-ahead process to be exploded into operational detail and made ready for assignment in weekly work plans.
   a. The project milestones shall be placed at the top of the visual phase plan which is developed at the wall.
   b. The level of detail in the Phase Schedule is determined by the requirement that the Phase Schedule specify the handoffs between subcontractors involved in doing the work.
   c. The phase plan will consist of activity tags completed for each trade by the Last Planner for that trade.
   d. Activities should be no longer than 10 days in duration. Any task longer than 10 days can be broken down into smaller discrete activities which allow for better planning.
   e. Identify the specific task to be completed with an action verb, identify what is required to release the work (predecessor or constraint), location, crew size, and duration.
f. Each discipline or trade is responsible for completing and placing its own tags on the plan.

   g. The phase will pull, starting from the completion of the interim milestone associated with the end of the phase, and working backwards (right to left). After the pull backwards, then a forward pass (left to right) needs to be conducted to ensure that the plan demonstrates a logical building sequence and that the sum of the total activity durations is within the allowable time to meet the project milestone(s), and to identify opportunities to resolve conflict and improve production flow. Do not double count durations for concurrent tasks.

   h. The completion of a “phase” should be sequenced so that the “phase” completion releases new work.

   i. Participants: All team members involved in planning and execution of work during the Phase Schedule.

   j. A Phase Pull schedule is produced for a typical duration of approximately three (3) months using an appropriate interim milestone as the completion point of the phase.

   k. After the initial Phase Pull plan, subsequent Phase Pull plans should be developed every six (6) weeks to reflect the next three (3) months of project production. This will allow for a fully informed rolling 6-week Make-Work Ready Plan on the project.

   l. The Phase Pull plan should be visually displayed in The Big Room for all to see and to inform subsequent 6-week Make-Work Ready Plans.

3. Phase Pull Schedule Format

   a. Activities shall be organized in a logical manner to allow for grouping of like characteristics, including, but not limited to such items as: phase, work shift, project area, activity work stream. The use of swim lanes on the Phase Pull plan may also be included to designate different work areas, phases, or work streams.

   b. An appropriate number of interim milestones will be used to help develop the Phase Pull schedule activities. Milestones from the Preparatory meeting shall be incorporated.

   c. Identify work days and non-work days on the Phase Pull production schedule.

   d. Contractor shall work in conjunction with each subcontractor and supplier to ensure that all relevant submittal, procurement, delivery and installation dates for the various trades are accurately represented in the Phase Pull schedule.

   e. Include activities related to critical project submittals and approvals.

F. 6-Week Make Ready Planning

1. The 6-Week Make Ready / Look Ahead Plan is a visual plan of activities that need to be accomplished over the upcoming six weeks. Standard 3-inch “sticky notes” placed on 6 weekly activity boards are used to establish the rolling 6-week Make Ready Plan.

   a. Once an activity has entered into the Look Ahead Plan, it is the team’s task to make that activity ready for execution by the scheduled time, remove constraints, and execute the work within the expected duration.

   b. Look ahead week activities should be planned as a whole identifying operations to be planned jointly by multiple trades with respect to hand-offs and work areas.

   c. The Last Planners create the make-work ready plan that consists of weekly work plans with daily tags for each crew on site identifying what and where they will be working for the next 6 weeks and the size of the respective crew.
d. The quality of the work assignments/activities needs to be in greater detail and accuracy for the upcoming two weeks of work.

e. After the initial 6-Week Make Ready Plan has been developed, the next 6th week of work is planned as part of the weekly schedule meeting in the Big Room to provide a rolling 6-week plan.

f. Any new constraints that are identified during the 6-Week Make Ready planning are identified need to be captured in the constraint log with an assigned champion to remove them and required completion date.

g. Participants: All Team members involved in planning and execution of work during the next 6 weeks.

G. Weekly Work Plan

1. Weekly Work Planning is tactical team collaboration to plan each day’s work during the next week including defining work areas and zones, conditions for handoff and acceptance between trades and disciplines, and crew sizing.
   a. Weekly Work Plan updates shall occur as planned by the project team. These may coincide with the Weekly Owners Meeting where it makes sense to do so.
   b. The Weekly Work Plan needs to be highly reliable to produce effective work flow and production on the project.
   c. Specify tasks planned to be done next week and on which days.
   d. The five minimum requirements to control quality of input into the Weekly Work Plan are:
      1) What is the Task?
      2) What will be done? (e.g. install wire way sections 1, 2, 3)
      3) Where it will be done? (e.g. Column A/1, above AC Box)
      4) When it will be done? (e.g. Tuesday and Wednesday)
      5) Who will do it? (e.g., company, crew size)
   e. Identify make ready actions by assessing their feasibility prior to making assignments in the weekly work plan so as to shield production workers from uncertainty.
   f. Synchronize tasks made ready relative to the promises of the team members.
   g. The conditions for hand off and acceptance are clearly communicated within the team and all constraints removed.
   h. Optimization of the team capabilities to plan, synchronize, execute, learn and improve.
   i. At the end of each week, assignments are reviewed for completeness in order to measure the reliability of the planning system. Analyzing reasons for plan failures and acting on these reasons is the basis of learning.
   j. Participants: All Team members involved in planning and execution of work during the next 6 weeks.

2. Weekly Work Plan Meeting Typical Agenda.
   a. Review constraint log and note any overdue constraints and impact (5 minutes)
   b. Review 6-week look-ahead plan (15 minutes)
   c. Review the new week – Note activities that are starting up in week 6.
   d. Review weeks 2-5 only by new exceptions that pop up. (Team should have been looking at weeks 2-5 for the last 5 weeks.)
   e. Review last week’s performance (5 min.)
f. Last week’s PPC: The number of activities completed since the last weekly meeting divided by the total number of planned activities which were supposed to occur.
g. Current week’s PPC  
h. The Percent Plan Complete Statistic shall be kept on a Project Log showing each weeks Percent Plan Complete Statistic for each week of the project schedule until completion.
i. Trend chart  
j. Variance chart, and reasons for variance: charted in Pareto or pie charts to see trends and facilitate learning, knowing what needs to be fixed in order to improve next week’s PPC  
k. Finalize next week’s Weekly Work Plan (30 minutes)  
l. Plus/Delta (2 minutes)

H. Workable Backlog
1. Capacity limitations of a production unit may prevent the Last Planner from assigning all work shown in the first week of the Look-ahead that satisfy the definition, soundness, and sequence criteria.
2. There may be more work made ready than a production unit can reasonably be expected to complete in any week.
3. Overloading a production unit is held against the performance of the Last Planner as assigned work that remains incomplete counts against the plan reliability measure.
4. Ready work that cannot be assigned is recorded as Workable Backlog on the Weekly Work Plan.
5. Should a production unit for any reason not be able to complete an assignment on their Weekly Work Plan, or should they complete assignments sooner than expected, the Workable Backlog will provide them with other work so they need not be idle or wind up doing out-of-sequence work.
6. Items in workable backlog must meet the same quality criteria as do priority assignments for the week.

I. Daily Work Planning Huddles
1. Daily Huddles are meetings where team members quickly give the status of the previous shift’s accomplishments and failures, plus the current shift’s plan of work for that day.
2. Daily Huddle discussions must be directly connected to the team’s Weekly Work Plan.
3. Transparency and reliable commitments are measured in the Daily Huddles for the Last Planners themselves to see and interact with directly.
4. This is the rallying point for “our plan,” which has “my input” accurately reflected. This is the heart of LPS, it is of utmost importance for the team to establish and drive healthy Daily Huddle discipline.

1.8 DELIVERABLES

A. Schedule Deliverables:
1. Master Milestone Schedule / Baseline schedule – Due Prior to NTP
2. Initial Phase Pull Plan – Due 15 days after NTP
3. Updated 6-Week Make Work Ready Look Ahead Schedule – Due every week
4. Weekly Metric Report (Percent Plan Complete for week, variance analysis for week’s missed commitments, Current Constraint Log)
   a. If weekly PPC is less than 70%, specify what specific efforts the Contractor will undertake to improve its weekly work plan reliability.

5. Monthly Master Schedule Updates – Due Every Month
   a. The updated Contract Construction Schedule shall accurately represent the as-built condition of all completed and in-progress work activities as of the schedule data date.
   b. The level of detail shall be sufficient to describe and forecast the scheduled completion dates for the phase milestones used in the Phase Pull Planning.
   c. Planned percent complete (PPC) for the month and cumulative to date for the project on a weekly basis displayed in a graphical format.
   d. If the average weekly PPC is less than 70%, specify what specific efforts the Contractor will undertake to improve its weekly work plan reliability.
   e. Variance analysis for missed commitments with bar chart, Pareto chart or pie chart that visually shows trends for the month and trends for the project-to-date. Discuss proposed countermeasures to address root causes of most frequent causes of variance that will be implemented during the next month. These may include actions required by the Trustees.
   f. The current status of the phase milestones as established in the Milestone Plan.
   g. The reason phase milestones may not have been accomplished and their delaying factors.
   h. What mitigation efforts the Contractor or Trustees will undertake to complete the phase milestones without adversely impacting the overall project milestones leading to successful completion of the project by the finish milestone.
   i. Any changes made to the sequencing, durations, working time, etc. made to accomplish the phase milestones.
   j. Current Constraint Log with all outstanding items that have the potential to prevent a task or assignment from starting, advancing or completing as planned. This should include a constraint removal need by date to avoid adversely impacting the schedule and the name of the assigned individual to champion the efforts to remove the constraint.
   k. Current and anticipated delays not resolved by approved change order, including:
      o Cause of the delay – Contractor or Trustees
      o Corrective action and schedule adjustments to correct the delay
      o Known or potential impact of the delay on other activities, milestones, and Project completion date
   l. Pending items and status thereof including but not limited to:
      o Pending change orders
      o Time extension requests
      o Other items
   m. Contract completion date status:
      o If ahead of Construction Schedule, the number of Days ahead
      o If behind Construction Schedule, the number of Days behind.
B. All schedule submittals including the updated progress schedules will be reviewed jointly by the Trustees, the Architect, and the Contractor. Review of the Contractor’s schedules shall not constitute approval or acceptance of the Contractor’s construction means, methods, or sequencing, or a positive determination by the Trustees and/or the Architect of the Contractor’s ability to complete the Work in a timely manner.

1.9 RESPONSIBILITY FOR COMPLETION

A. Should any monthly or weekly update of the Contract Construction Schedule indicate that the Contract Completion Date has extended, Contractor shall work with the team and submit a written action plan to meet the Contract Completion Date. Contractor and the Trustees shall initiate corrective actions, as approved by the CSU Project Manager, at no additional cost, unless agreed otherwise for shared delays. These actions shall include, but not be limited to, one or more of the following:
1. Identify and remove constraints and barriers to the project production work flow.
2. Identify root causes for missed commitments and develop and implement countermeasures to address these.
3. In conjunction with the Last Planners, re-sequence activities in order to improve work flow production and subsequent completion of these activities.
4. In conjunction with the Last Planners, increase construction manpower in certain or all trades in order to bring the completion date into compliance with Contract requirements.
5. In conjunction with the Last Planners, increase the number of labor shifts, working hours per shift, or working days per week as required to bring the completion date into compliance with Contract requirements.
6. Arrange and pay for acceleration of fabrication schedules for long-lead material items.
7. Arrange and pay for alternate shipping or delivery methods in order to expedite material procurement.
8. Arrange and pay for acceleration of design / architectural responses, changes, and /or resolutions.

B. Comments provided by the CSU Project Manager concerning the Initial Construction Schedule, Contract Construction Schedule, or any schedule update shall not relieve Contractor from the responsibility for compliance with the entire requirements of the Contract Documents.

END OF SECTION 01 32 10
DRAFTING THE SUPPLEMENTARY GENERAL CONDITIONS.

If incorporating the previous Specification Section 01 32 10 – COLLABORATIVE CONSTRUCTION PLANNING PROCESS into your Project Documents, then use the following Supplementary General Conditions in lieu of the Contract General Conditions for the articles Contract Time and Schedule. In the chart below, the first column lists the Contract General Conditions for each Contract Type (delivery method), and in the columns to the right are the referenced articles/topics for which the section names and numbers are provided for each Contract Type. Using Contract Time for Design-Build delivery method in the SGC below, section b, Starting and Completion Date, there is a reference to a section named “Guarantee”, so Campus would replace Article xx.xx with Article 39.06.

Also, it is required to select the appropriate contract entity whether Contractor, Construction Manager (CM), or Design-Builder and use consistently throughout. All areas highlighted in yellow need review and appropriate selection of the relevant contract section numbering or contract entity.

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<th>Change Orders Section No</th>
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Supplementary General Conditions to the Contract General Conditions

Definitions—Reference the Definitions found in the Contract General Conditions for the delivery method chosen, and, if not in the Contract General Conditions, check Division One Section 01 32 10, Collaborative Construction Planning Process, section 1.3—Definitions.

Article **xx.xx, Contract Time**, delete and replace with the following:

a. Time of the Essence.
   All time limits specified in this Contract are the essence of the Contract.

b. Starting and Completion Date.
   The Trustees shall designate in the Notice to Proceed the starting date of the Contract on which Contractor/CM/Design-Builder (select appropriate party to be used throughout based on contract type) shall immediately begin and thereafter diligently prosecute the Work to completion. Contractor/CM/Design-Builder agrees to complete the Work on the date specified for completion of Contractor/CM/Design-Builder’s performance in the Contract unless such time is adjusted, in writing, by change order by the Trustees. Contractor/CM/Design-Builder may complete the Work before the completion date if it will not interfere with the Trustees or other contractors engaged in related or adjacent Work. The Work shall be regarded as completed on the acceptance date noted on the Trustees’ Notice of Completion. This date shall be used as the date the guarantee period begins as defined in Article **xx.xx, Guarantee**.

c. Adjustment of Contract Time Due to Acts of God, etc.
   Contractor/CM/Design-Builder shall not be assessed with liquidated damages, nor the cost of engineering and inspection, during any delay in the completion of the Project caused by acts of God, the public enemy, fire, flood, epidemic, quarantine restriction, strike, freight embargo, discovery of archaeological or paleontological artifacts, and unusual action of the elements; provided that Contractor/CM/Design-Builder shall notify the Trustees in writing of the causes of the delays within 24 hours from the beginning of any such delay. The Trustees shall determine the facts with regard to the delay and the reasonable period of time by which the date of completion should be extended by reason thereof, if any. The Trustees’ findings thereon
shall be final and conclusive. There shall be no compensation to Contractor/CM/Design-Builder for costs associated with this kind of delay.

d. The term “unusual action of the elements” is limited to extraordinary, adverse weather conditions and conditions immediately resulting therefrom which cause a cessation in the progress of the Work which will delay the time of completion of the Contract. Contractor/CM/Design-Builder shall have no right to an adjustment in the time of completion due to weather conditions or industrial conditions which are normal for the locality of the site. The time for completion of the Contract has been calculated with consideration given to the average climatic range and usual industrial conditions prevailing in the locality of the site.

e. Adjustment of Contract Time Due to Acts of the Trustees.
If Contractor/CM/Design-Builder is delayed in completing the Contract by reason of any act or omission of the Trustees not provided by the Contract, or by reason of changes made pursuant to Article xx.xx, Change Orders, without reaching agreement as to any time adjustments, the time for completion of the Contract may be extended for a period commensurate with the delay. Contractor/CM/Design-Builder shall notify the Trustees in writing of the causes of the delay within seven (7) Days from the beginning of the delay.

No extension of time will be granted for any of the causes for which extensions may be granted unless Contractor/CM/Design-Builder demonstrates to the satisfaction of the Trustees that Contractor/CM/Design-Builder has made every reasonable effort to fully prosecute the Work and complete the Work within the Contract Time. The causes of delay shall be subject to the same determinations as stated in Article xx.xx.


g. Trustees’ Adjustment of Contract Time.
Even though Contractor/CM/Design-Builder has no right to an extension of time for completion, the Trustees may extend the time at the request of Contractor/CM/Design-Builder, if they determine it to be in the best interest of the State. If the time is extended, the Trustees may, in lieu of assessing liquidated damages, charge Contractor/CM/Design-Builder, its successors, heirs, assigns, or sureties, and deduct from the final payment for the Work all or any part, as they may deem proper, the value of the lost use of the completed Project, and of the actual cost to the Trustees of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the Contract, and which accrue during the period of such extension. Such costs will not exceed liquidated damages.

h. Adjustment of Contract Time Due to Reasons beyond Trustees’ Control.
Should the Trustees be prevented or enjoined from proceeding with Work either before or after the start of construction by reason of any litigation or other reason beyond their control, Contractor/CM/Design-Builder shall not be entitled to make or assert any claim for damage by reason for said delay; but time for completion of the Work will be extended to such reasonable time as the Trustees may determine will compensate Contractor/CM/Design-Builder for time lost by such delay. Any such determinations will be set forth in writing.

i. Liquidated Damages.
Attention is directed to Article xx.xx, “Delay in Completion--Liquidated Damages.”

Article xx.xx, Schedule, delete and replace with the following:

a. Time is of the essence of this Contract, including the time of beginning, the rate of progress, and the time of completion of the Work. The Work shall be prosecuted at such time, in such manner, and on such part or parts of the Project as may be required to complete the Project as contemplated in the Contract Documents and Contractor/CM/Design-Builder’s Construction Schedule.

b. Contractor/CM/Design-Builder shall prepare and submit to the Trustees’ Construction Administrator the Contractor/CM/Design-Builder’s initial construction schedule prior to Notice to Proceed. The Contractor/CM/Design-Builder’s initial Construction Schedule shall comprise a high-level milestone critical path method. Contractor/CM/Design-Builder’s initial Construction Schedule shall show the dates on which each major part or division of the Work is expected to be started and completed. The initial Construction Schedule shall also show all major dates for submission and approval of submittals required by the Contract as well as required delivery dates for major pieces of long-lead material or equipment. Contractor/CM/Design-Builder
shall also submit a separate listing of all submittals required under the Contract and noting the anticipated date that each submittal will be submitted. Contractor/CM/Design-Builder shall submit a projected monthly cash flow schedule with the initial Construction Schedule and shall revise the cash flow schedule with each Construction Schedule revision. The cash flow schedule is Contractor/CM/Design-Builder’s estimate of the dollar value of Contract Work completed and billable each month of the Project. Contractor/CM/Design-Builder’s initial Construction Schedule shall begin with the effective date of the Notice to Proceed and conclude with the date of acceptance.

c. Contractor/CM/Design-Builder shall identify the number of work days that reflects anticipated rain delay during the performance of the Contract. The duration shall reflect the average climatic range prevailing in the locality of the site. Weather data shall be based on information provided by the National Oceanic and Atmospheric Administration (NOAA).

d. Contractor/CM/Design-Builder may submit an initial Construction Schedule that shows the Work completed in less time than the specified Contract Time. However, the acceptance of such a Construction Schedule will not change the Contract Time. The Contract Time shall control in any determination of liquidated damages or extension of the Contract Time. Buffer, or schedule contingency, is the unused time within the Construction Schedule and the difference in time between the Project’s early completion date and the required Contract completion date. This buffer is not for the exclusive use of either the Trustees or the Contractor/CM/Design-Builder, but is jointly owned by both and is a resource available to and shared by both parties as needed to meet Contract milestones and the Contract completion date.

e. Comments made by the Trustees on Contractor/CM/Design-Builder’s initial Construction Schedule during review will not relieve Contractor/CM/Design-Builder from compliance with the requirements of the Contract Documents. The review is only for general conformance with the scheduling requirements of the Contract Documents. Upon the Trustees’ request, Contractor/CM/Design-Builder shall participate in the review of Contractor/CM/Design-Builder’s initial Construction Schedule submissions (including the original submittal, all update submittals, and any re-submittals). The Trustees may request the participation of subcontractors in these reviews, as determined necessary by the Trustees. All revisions shall be resubmitted within fifteen (15) Days after the Trustees’ review.

f. The submittal of a fully revised and acceptable Contractor/CM/Design-Builder’s initial Construction Schedule shall be a condition precedent to the processing of the second monthly payment application, unless the Trustees grant a time extension due to unusual circumstances.

g. Contractor/CM/Design-Builder shall submit the required monthly Master Schedule Updates to the Construction Administrator with a copy to the Project Manager/Construction Inspector five (5) Days prior to the submittal of Contractor/CM/Design-Builder’s monthly payment request. The submittal of the monthly Progress Schedule that satisfies the requirements of this Article, accurately reflects the status of the Work, revises the cash flow schedule, and incorporates all changes into the Construction Schedule, shall be a condition precedent to the processing of the monthly payment application. Progress Schedules shall also be submitted at such other times as the Trustees may direct. If Contractor/CM/Design-Builder fails to comply or is late in compliance with this requirement, and the Trustees find it to be in their best interest to process the monthly payment, an amount not exceeding $10,000 shall be retained from each monthly progress payment until compliance is achieved.

h. Adjustment of Contract Times for Completion.

In addition to the provisions in the Contract General Conditions, the Contract Time for completion of the Work will be adjusted in accordance with these procedures.

Whenever Contractor/CM/Design-Builder submits a request for an adjustment of the Contract Time for completion for Trustees-requested changes, differing site conditions, weather impacts, or delays or alleged delays in removal of Trustees’ constraints, Contractor/CM/Design-Builder shall also submit an evaluation of the Constraints Log identifying items that have impacted the schedule that are not within the responsibility of the Contractor/CM/Design-Builder. Contractor/CM/Design-Builder shall also submit information regarding Planned Percent Complete for the Project to date and for time periods of interest, with a detailed variance analysis for missed commitments in the weekly work planning, clearly indicating items beyond the responsibility of the Contractor/CM/Design-Builder that have adversely impacted the schedule. The Trustees will not grant time extensions unless substantiated by the analysis.
Contractor/CM/Design-Builder shall determine the impact based on the date or dates when the change or changes were issued, or the date or dates when the alleged delay or delays began.

If the Construction Administrator finds, after review of the analysis, that Contractor/CM/Design-Builder is entitled to any extension of time for completion, the Contract Time for completion will be adjusted accordingly by the Construction Administrator, and Contractor/CM/Design-Builder shall then revise the Milestone Plan accordingly.

No time extensions shall be granted nor indirect costs paid, unless Contractor/CM/Design-Builder can clearly demonstrate the delay on the basis of the Progress Schedule current as of the month the change is issued or the delay occurred, and which delay cannot be mitigated, offset, or eliminated through revising the intended sequence of Work or other means. Contractor/CM/Design-Builder shall include field instructions and change orders in the revised Construction Schedule. Failure to include field instructions or change orders shall waive rights to a Contract time extension or delay damages.

i. As a condition precedent to the release of retained funds, Contractor/CM/Design-Builder shall, after completion of the Work has been achieved, submit a final Contractor/CM/Design-Builder’s As-Built Milestone Baseline Plan with Percent Planned Complete (PPC) graphically displayed for the duration of the project.

-End of Supplementary General Conditions-