## SECTION 01 32 00 - PROJECT PLANNING AND SCHEDULING

## PART 1 - GENERAL

1.1. DEFINITIONS

1.1.1 The term “Baseline Schedule,” as used throughout the contract documents, shall refer to a fixed projection of the project schedule. It is the standard by which project performance is measured.

1.1.2 The term “Calendar Day,” as used throughout the contract documents, is any day of the week, including weekends and holidays.

1.1.3 The term “Construction Schedule” (a.k.a. Work Progress Schedule as defined by the UGC), as used throughout the contract documents, shall refer to the schedule for the construction phase of the Project as developed, monitored and maintained, by the Contractor’s Scheduler, and as used by the Project Team during Pre-Construction and/or Construction Services.

1.1.4 The term “Critical Path,” as used throughout the contract documents, shall refer to the sequence of activities that determines the longest duration for the Project when the Longest Path has zero or less Total Float, the Longest Path becomes the Critical Path.

1.1.5 The term “Critical Path Method” (CPM), as used throughout the contract documents, is a technique used to predict project duration by analyzing which sequence of activities has the least amount of scheduling flexibility. Early dates are figured by a forward pass using a specific start date and late dates are figured by using a backward pass starting from a completion date. Most scheduling programs (e.g., Microsoft Project, Primavera) automatically calculate the Longest Path using the CPM to identify critical activities.

1.1.6 The term “Data Date,” as used throughout the contract documents, shall refer to the day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."

1.1.7 The term “Detailed Schedule,” as used throughout the contract documents, shall refer to a schedule with small-scale, well-defined activities that are typically less than 30 calendar days in length.

1.1.8 The term “Fragnet,” as used throughout the contract documents, shall refer to a copy of the Construction Schedule (or portion thereof) used to conduct an analysis of proposed changes or revisions to the Construction Schedule.

1.1.9 The term “Free Float,” as used throughout the contract documents, is the time by which an activity may be delayed or extended without affecting the start of any succeeding activity. Note: Free float can never be negative.

1.1.10 The term "Longest Path," as used throughout the contract documents, shall refer to the sequence of interdependent activities that aggregate to determine the minimum duration of a project.

1.1.11 The term "Milestone Schedule," as used throughout the contract documents, shall refer to a schedule with specific non-duration related activities, work packages, stages, or phases, typically marked by a high level event such as an approval, execution of a contract, Notice to Proceed, issuance of a set of documents, completion of work, etc.

1.1.12 The term "Precedence Diagramming Method" (PDM), as used throughout the contract documents, shall refer to the relationship between activities by linking sequences with precedence relationships in the development of the Construction Schedule.

1.1.13 The Term "Project" means all activities necessary for the realization of the Work. This includes design, contract award(s), execution of the Work itself, and fulfillment of all contract and warranty obligations.

1.1.14 The term "Project Team," as used throughout the contract documents, shall refer to the Owner, Architect, Design Consultants, User, Contractor and Subcontractors (as applicable) that are contracted and/or specifically assigned to the Project.

1.1.15 The term "Total Float," as used throughout the contract documents, shall refer to the time by which an activity may be delayed or extended without affecting the total project duration or violating a target finish date (i.e. Substantial Completion Date).

Negative Total Float indicates that the Project is late, while Positive Total Float is the property of the Project and does not belong to any one party (Refer to the UGC).

1.1.16 For the term "Weather Day" – refer to Attachment "C" to the Owner's Special Conditions.

1.1.17 The term "Work Day," as used throughout the contract documents, shall refer to a day in which a minimum of 8 hours of work is planned, excluding weekends and holidays.

1.2. PURPOSE

1.2.1 **Time is an essential part of this contract. Therefore, the timely and successful completion of the Work requires careful planning and scheduling of all activities inherent in the completion of the Project.**

1.2.2 **Acceptance of the Construction Schedule, or any subsequent update thereof by the Owner, is for format and extent of detail of the Construction Schedule only. Such "Acceptance" does not indicate approval of the Contractor's means or methods, or of any change to the contract terms including without limitation any required contract Milestones.**

1.2.3 The Construction Schedule shall be developed to allow for a minimum amount of Total Float for the Project during Pre-Construction and/or Construction Services, and shall be formatted in a manner that facilitates reporting of progress and trends, identification of risks and opportunities, projecting upcoming activities, and forecasting of project milestones.

1.2.4 The Owner must be able to reasonably rely on the Contractor's Construction Schedule for projected activity dates in order to make accurate commitments to design professionals, contractors, vendors, user group(s), campus administration and other parties as necessary.

1.2.5 This specification applies to all project delivery methods regardless of contract type. For Projects with multi-phase delivery, the requirements within shall pertain to each.

1.2.6 All references to Pre-Construction Services in this specification shall apply to all contract types other than Competitive Sealed Proposals (CSP).

1.3. RELATED DOCUMENTS

1.3.1. In addition to specific references indicated herein, the Contractor's attention is specifically directed to, but not limited to, the following Sections and Documents, which include additional administrative requirements.

1.3.1.1. Uniform General Conditions for University of Texas System Building Construction Contracts (UGC)

1.3.1.2. Owner's Special Conditions

1.3.1.3. Section 01 31 00 - Project Administration

1.3.1.4. Section 01 35 23 - Project Safety Requirements

1.3.1.5. Section 01 45 00 - Project Quality Control

1.3.1.6. Section 01 77 00 - Project Closeout Procedures

1.3.1.7. Section 01 91 00 – Project Commissioning

1.4. CONTRACTOR RESPONSIBILITY

1.4.1. The Contractor is responsible for planning, management, coordination, and scheduling of all activities from a Notice to Proceed for Construction to Final Completion of the Project within the time allotted by the Agreement.

1.4.2. The Contractor is responsible for keeping the Owner and the Project Team fully informed of schedule status and upcoming activities throughout the Project via the Construction Schedule.

1.4.3. The Contractor is solely responsible for scheduling and statusing of all activities related to Pre-Construction, procurement of materials and subcontractors, construction, testing, inspection, commissioning, and Project turn-over to the Owner.

1.4.4. The Contractor shall provide adequate, reasonable, and detailed project planning throughout all aspects of its work to ensure completion of all activities within the Contract Time.

1.4.5. The Contractor's Pre-Construction and Construction project management personnel shall actively participate in the planning and development of the Construction Schedule and shall be prepared to review such development and progress with the Owner, Architect, and any other members of the Project Team so that the planned sequences and procedures are clearly understood by all parties.

1.4.6. The Contractor shall plan for appropriate activity durations to allow for thorough review, procurement, submittal, installation, inspection, testing, and commissioning, of all work and/or systems in order to confirm contract compliance, including work relying on Owner participation or coordination.

1.4.7. The Contractor shall include in the schedule any activities required by local, municipal, county, state, or federal authorities having jurisdiction over the project including, but not limited to, durations for permits, easements, and utility connections.

## PART 2 – PRODUCTS

### 2.1 QUALIFICATIONS OF THE CONTRACTOR'S SCHEDULER

2.1.1 The Contractor shall assign a Scheduler who shall be responsible for the Construction Schedule throughout Pre-Construction and Construction Services.

2.1.2 The Contractor's Scheduler shall have at least an undergraduate degree in a construction related field, and continuous experience on similar size and type of project(s) within the past five (5) years including at least two (2) years with the current specified scheduling software.

2.1.3 In lieu of a degree, the Contractor's Scheduler may have at least five (5) years continuous experience on similar size and type of project(s) with the current specified scheduling software.

2.1.4 The Contractor's Scheduler shall be an integral part of the Project Team during Pre-Construction Services and on-site full time for Construction Services until at least Substantial Completion of the work. The Contractor's Scheduler may have additional responsibilities such as Senior Project Manager, Project Manager, Superintendent, Assistant Project Manager, Assistant Superintendent, or Project Engineer.

2.1.5 If the Contractor's Scheduler is outsourced, the Contractor shall assign an on-site contact for all Construction Schedule related issues.

2.1.6 All Contractor personnel involved in the preparation, updating and reporting of the Construction Schedule shall possess adequate construction scheduling knowledge related to the Project, Critical Path Method (CPM) scheduling, as well as a general understanding of the specified software.

## 2.2 REQUIRED SCHEDULING SOFTWARE

2.2.1 The Construction Schedule shall be developed and maintained by the Contractor's Scheduler using Oracle Primavera P6 software.

Website: www.Oracle.com

## 2.3 NAMING THE CONSTRUCTION SCHEDULE

2.3.1 The Contractor's Scheduler shall title the Project Baseline Schedule "*Project No.* BL *yymmdd*" (i.e., 102-081 BL 160901) once accepted by the Owner's Designated Representative.

2.3.2 Subsequent updates to the Construction Schedule shall be titled "*Project No.* UD *yymmdd*" (i.e., 102-081 UD 161025) where "yymmdd" equals the schedule update's Data Date – October 25th, 2016.

2.3.3 If at any time the Baseline Schedule is "reset" (with approval by the Owner), the title shall be titled "*Project No. BLR# yymmdd*" (i.e., the first revised baseline would be 102-081 BLR1 170626) once accepted by the Owner's Designated Representative.

## 2.4 CONSTRUCTION SCHEDULE DEVELOPMENT REQUIREMENTS

2.4.1 The Construction Schedule calendar shall be based on a five (5) day work week.

2.4.1.1 The term "Holidays", as used throughout the contract documents, shall refer to New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving (including the Friday after), Christmas Eve, Christmas Day, and New Year's Eve.

2.4.1.2 The Contractor may plan to work weekends and holidays, but the Construction Schedule shall be based on completing all work during normal work days and hours.

2.4.1.3 The Contractor shall include in the Construction Schedule any other non-work periods such as campus special events, ceremonies, and final exams referenced in the Owner's Special Conditions or as directed by the ODR.

2.4.2 The Construction Schedule shall include a Work Breakdown Structure (WBS) organized by project phase, stage, location, building, floor, area, elevation, system, etc.

| Example WBS Organization | |
|---|---|
| FP | Facilities Programming |
| SD | Schematic Design |
| DD | Design Development |
| CD | Construction Documents |
| TH | THECB Submittal |
| GM | Guaranteed Maximum Price |

| Example WBS Organization | |
|---|---|
| SP | Subcontractor Bidding / Procurement |
| SU | Submittals |
| FD | Fabricate and Delivery |
| C | Construction |
| PC | Project Close-Out |
| CX | Commissioning Activities |

2.4.3 The Construction Schedule shall assign "Responsibility Codes" (i.e., create a responsibilities directory) for every Contractor, subcontractor, supplier, fabricator, installer, design consultant, Owner, and any other party responsible for the accomplishment of an activity using the following Responsibility Codes as applicable:

| Responsibility Code & Description | |
|---|---|
| Arch | Architect / Engineer |
| AV | A/V Equipment |
| Blind | Blinds, Shades, Window Coverings |
| Carp | Carpet |
| Casf | Casework Fabricator |
| Casi | Casework Installer |
| Cocw | Concrete Formwork |
| Conf | Concrete Finishing |
| Ctil | Ceiling / Acoustical Tile |
| Door | Doors & Frames |
| Dryw | Drywall / Light Gauge Stud Installer |
| Elec | Electrical |
| Elev | Elevator |
| Falm | Fire Alarm Systems |
| Fire | Fire Protection Systems |
| Ftil | Floor Tile |
| Furn | Furnishings |
| Glas | Glass / Glazing |
| Hard | Hardware |
| Hvac | HVAC |
| Insu | Insulator |
| Irri | Irrigation |
| Labc | Laboratory Casework Fabricator |
| Labi | Laboratory Casework Installer |
| Land | Landscaping |
| Lbeq | Laboratory Equipment |
| Masn | Masonry |
| Offe | Owner's Furnishings |
| Omat | Owner's Material Testing Firm |

| Responsibility Code & Description | |
|---|---|
| OPCI | Owner Provided – Contractor Installed Equipment |
| OPOI | Owner Provided – Owner Installed Equipment |
| Otab | Owner's Test & Balance Firm |
| Ownr | Owner |
| Pntr | Paint & Wall Coverings |
| Pier | Piers / Piles / Caissons |
| Plas | Plaster / EIFS |
| Plum | Plumber |
| Rebf | Reinforcing Steel Fabricator |
| Rebi | Reinforcing Steel Installer |
| Roof | Roofing |
| Seal | Sealants |
| Sign | Signs |
| Site | Sitework |
| Stee | Steel Erector |
| Stef | Steel Fabricator |
| Mstf | Miscellaneous Steel Fabricator |
| Msti | Miscellaneous Steel Installer |
| Site | Site Utilities |
| Tele | Telephone / Communication Systems |
| Terz | Terrazzo |
| Toia | Toilet Accessories |
| Toip | Toilet Partitions |
| Watp | Waterproofing / Dampproofing |
| Wodf | Wood Flooring |
| Wods | Wood Framer & Supplier |

2.4.3.1 The Contractor's Scheduler shall use additional Responsibility Codes as applicable.

2.4.3.2 If a subcontractor(s) has been procured, the Contractor may substitute the associated Responsibility Code above with a different code identifying the name of the subcontractor.

2.4.3.3 The Contractor's Scheduler may use additional Secondary Activity and Responsibility Codes as necessary for monitoring, statusing, and reporting the Construction Schedule.

2.4.4 The Contractor's Scheduler shall assign a unique "Activity Identification" (Activity ID) and "Activity Description" to every activity, and they shall be meaningful, easily understood by the Project Team, similar to like activities at differing locations, and as shown on the Contractor's Schedule of Values.

2.4.4.1 Activity Descriptions shall start with a verb to indicate what is to be done and end with a location (Example: Install Metal Studs - 3rd floor Bldg B).

2.4.4.2 A "Milestone" Activity shall refer to any major event or phase, or any other important point in the Project, including the following Activities as applicable:

| Milestone Activity ID & Description | |
|---|---|
| PC1 | NTP for Pre-Construction Services |
| SD1 | Start Schematic Design |
| SD2 | Submit for Owner Review |
| SD3 | Joint Review for Owner Comments |
| SD4 | Approve Schematic Design |
| BR1 | FPCC & BOR Submission |
| BR2 | FPCC & BOR Approval |
| DD1 | Start Design Development |
| DD2 | Submit for Owner Review |
| DD3 | Joint Review for Owner Comments |
| DD4 | Approve Design Development |
| TH1 | Construction Application Submittal |
| TH2 | Construction Application Approval |
| GM1 | Submit GMP |
| GM2 | Approve GMP |
| CD1 | Start Construction Documents |
| CD2 | Submit for Owner Review |
| CD3 | Joint Review for Owner Comments |
| CD4 | Approve Construction Documents |

| Milestone Activity ID & Description | |
|---|---|
| C1 | NTP for Construction Services |
| C2 | Partnering/Pre-construction Conference |
| C3 | Establish Site Controls /Mobilize |
| C4 | Complete Primary Foundations |
| C5 | Structural Top-Out |
| C6 | Building Dry-In |
| C7 | Start Mockups |
| CX1 | Commissioning Kickoff Meeting |
| CX2 | Bldg. Automation Sys Smtl. Approval |
| CX3 | Control Sequence Coordination. Mtg. |
| CX4 | Ethernet Connectivity |
| CX5 | Bldg Envelope Testing & Verif. Docs |
| CX6 | Major HVAC System Startup |
| CX7 | System Specific TAB Activities |
| CX8 | Integrated System Tests |
| CX9 | Entire Facility Integration Tests |
| C8 | Start Above Ceiling Inspections |
| C9 | Start Pre-Final Inspections |
| C10 | Start Final Inspections |
| C11 | Substantial Completion |

2.4.4.3 A "Detailed" Activity shall refer to a singular work event in the Project.

2.4.4.4 A "Summary" Activity shall refer to a grouping (or a summary) of Milestone and/or Detailed activities in the Construction Schedule.

2.4.5 The Construction Schedule shall include all construction procurement "Administration" activities associated with the submittal, fabrication and delivery of work as applicable. The schedule shall, at a minimum, include procurement activities for materials and equipment that may have significant fabrication and delivery lead times. This does not preclude the requirement for the Contractor to maintain a separate detailed submittal tracking log.

2.4.6 A minimum of 15 calendar days total shall be allotted to the A/E and ODR for each submittal review unless otherwise approved by the ODR.

2.4.7 The Construction Schedule shall include all detailed commissioning related activities as listed in Part 3 of Specification Section 01 91 00, General Commissioning Requirements, as applicable.

2.4.8 The Construction Schedule shall include activities for any anticipated local, municipal, county, state, or federal requirements for utilities connections, easements, vacations, upgrades, replacements, extensions, and/or permits.

## 2.5 PROJECT SCHEDULING REQUIREMENTS

2.5.1 The Contractor's Scheduler shall use the Critical Path Method (CPM) as the scheduling technique in the development of the Construction Schedule.

2.5.1.1 "Retained Logic" is the required scheduling mode when scheduling progressed activities. The "Retained Logic" scheduling mode requires that the remaining duration of a progressed activity not be scheduled until all of its predecessors are completed. The Contractor's Scheduler shall not use the "Progress Override" mode option in developing or updating the Construction Schedule.

2.5.1.2 Appropriate activity predecessor and successor logic relationships must be in place. With the exception of the first and last activity in the schedule, every activity shall have at least one predecessor and one successor activity.

2.5.1.3 Other than the first and last activity, the construction schedule shall be free of any mandatory date constraints unless approved by the ODR.

2.5.1.4 The use of a "Must Finish By" constraint on the overall Project is required. The "Must Finish By" constraint is placed at the project level and not at the activity level.

2.5.2 Estimated construction Activity Durations shall be stated in work days (i.e. Monday through Friday).

2.5.2.1 The maximum duration for any Detailed Activity shall be thirty (30) work days.

2.5.2.2 The minimum durations for any Owner Inspection activity (i.e. concealed space, above ceiling, substantial and final completion) shall be at least three (3) work days per inspection and re-inspection, per work area.

2.5.3 Estimated remaining Activity Durations shall be stated in work days, as of the Data Date of every Construction Schedule update.

2.5.4 Administrative activities, including material and equipment procurement lead times, may have durations longer than thirty (30) work days.

## 2.6 CONSTRUCTION SCHEDULE ANALYSIS REQUIREMENTS

2.6.1 The Contractor's Scheduler shall use the Critical Path Method (CPM) technique to determine the overall Project duration through the analysis of the durations of each of the activities, their schedule dependencies, and their resultant float.

2.6.2 In accordance with the UGC, the Project Schedule shall include at least **10%** Total Float from the effective date of Notice to Proceed for Construction Services to the Substantial Completion Date.

2.6.2.1 If the Project warrants the planning of work to occur on Saturday and/or Sunday, the respective days shall be used in the calculation of the Total Float requirements. (i.e., Normal 5 day work week x 10% = 0.5 days of Total Float required, while an Accelerated 6 day work week x 10% = 0.6 days of Total Float required.)

2.6.2.2 The 10% minimum Total Float requirement for construction services shall be in addition to the anticipated weather days specified in Attachment "C" in the Owner's Special Conditions.

2.6.2.3 The 10% minimum Total Float requirement for construction services shall not be represented as a single activity, but rather the resultant of the relationship between the early and late finish dates or early and late start dates of each Activity on the schedule's Longest Path.

2.6.2.4 Per the Uniform General Conditions (UGC), float time contained in the CPM schedule is not for the exclusive benefit of the Contractor or the Owner, but belongs to the Project and may be consumed by either party as needed on a first-used basis. The use of project Total Float shall be documented in the "Executive Summary Report" (see Attachment A) and agreed upon by the Project Team.

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## 2.7 COORDINATION WITH OTHER DOCUMENTS AND WORK

2.7.1 The Construction Schedule shall be coordinated with the Contractor's Submittal Schedule and Schedule of Values, as required by the UGC and Specification Section

01 31 00. (i.e., the Work Breakdown Structure shall be arranged, numbered, and described consistently across the various documents.)

2.7.2 Cost and/or resource loading of the Construction Schedule is allowed. If the Contractor elects to cost-load the Construction Schedule, the Contractor shall provide a separate Schedule of Values in the format required by Specification Section 01 31 00 - Project Administration.

## PART 3 – EXECUTION

### 3.1 PLANNING AND SCHEDULING WORKSHOP

3.1.1 Within fifteen (15) calendar days after a Notice to Proceed, the Contractor shall conduct a Planning and Scheduling Workshop with at least the Contractor's Scheduler, Project Manager, Superintendent, the Owner, the Architect, User representatives, and any available Subcontractors prior to submitting the Construction Schedule to the Owner.

3.1.1.1 The Contractor's Scheduler shall schedule and coordinate the workshop with the Owner's Designated Representative at least ten (10) calendar days prior to the Planning and Scheduling Workshop.

3.1.1.2 The Contractor's Scheduler shall submit a complete draft Construction Schedule to the Owner's Designated Representative at least five (5) calendar days prior to the Planning and Scheduling Workshop.

3.1.1.3 The Contractor's Scheduler shall review the draft Construction Schedule with the Project Team, including a verbal description of the logic and sequencing of activities, method for determining estimated activity durations and corresponding resources required, and any activities involving Owner participation and/or approval.

3.1.2 For CM and DB projects, at least two (2) Planning and Scheduling Workshops shall be scheduled; the first shall be within fifteen (15) calendar days after a Notice to Proceed Pre-Construction Services and the second at within fifteen (15) calendar days after a Notice to Proceed Construction Services for each "major" GMP executed.

The purpose of the pre-construction conference shall result in approval of the baseline for pre-construction.

3.1.3 Attendance at the Planning and Scheduling Workshop and acceptance of the Baseline Construction Schedule is a condition precedent to the Contractor submitting initial and any subsequent progress payments.

## 3.2 CONSTRUCTION PHASE BASELINE SCHEDULE SUBMITTAL

3.2.1 The Baseline Construction Schedule shall be submitted to the Owner with the required Total Float and a current Data Date (less than or equal to five (5) work days) as prescribed by the UGC (or as accepted by the Owner in the Project Planning and Scheduling Workshop).

3.2.1.1 The Contractor is responsible for submitting the Baseline Construction Schedule within the prescribed time regardless of when Subcontractors are procured and brought on to the project.

3.2.1.2 For contract types other than Competitively Sealed Proposals (CSP), the Construction Schedule may include Milestone and/or Summary Activities for the remaining work that has not been approved in an executed GMP Proposal for Construction Services.

3.2.1.3 Once the "full" scope of the Project has been approved (i.e., the last Stage GMP Change Order has been executed), the Contractor's Scheduler shall coordinate with the Owner's Designated Representative to "reset" the Baseline Construction Schedule.

3.2.1.4 The minimum 10% Total Float (or as amended by the Owner's Special Conditions) shall remain in the Construction Schedule from the Notice to Proceed for Construction Services until the Baseline Schedule is accepted by the Owner, regardless of any delays incurred by the Project without affecting the Substantial Completion Date.

3.2.1.5 No activity shall have a Total Float amount greater than the minimum Total Float identified by the Longest Path plus forty-five (45) days.

3.2.1.6 The Owner reserves the right to withhold any and all payments related to the Construction Schedule and/or General Conditions if a Baseline Construction Schedule is not submitted, or is not acceptable to the Owner. If the parties cannot agree on a Baseline Schedule, the Owner may deduct any monies related to Project Scheduling, and/or costs associated with schedule recovery.

3.2.1.7 If the Baseline Construction Schedule has not been accepted by the Owner, each successive baseline submittal shall be updated to status the current progress of the work until it is accepted by the Owner.

3.2.1.8 A Baseline Construction Schedule that does not have at least the minimum amount of Total Float at submission shall result in the Contractor forfeiting all claims to Construction Schedule extensions and/or delays as a result of contract changes and/or excusable delays as described in the UGC.

3.2.2 The Contractor's Scheduler shall submit two (2) electronic Primavera P6 backup files (.xer), two (2) electronic Adobe PDF files, and two (2) paper copies of the following Baseline Construction Schedule reports to the Owner's Designated Representative:

3.2.2.1 Graphic Time-Scaled Report (Gantt Chart): A graphic time-scaled view including all activities, Percent Complete, Start and Finish dates, estimated durations, and Total Float. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date.

3.2.2.2 Longest Path Time-Scaled Report (Gantt Chart): A graphic time-scaled view of Detailed Activities on the Longest Path from the Data Date to Contract Completion. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date.

3.2.2.3 Owner Activity Time-Scaled Report (Gantt Chart): A graphic time-scaled view of Detailed Owner Activities from the Data Date to Contract Substantial Completion. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date.

3.2.2.4 Milestone Activity Report: A listing of every Milestone Activity organized by Work Breakdown Structure (WBS) and sorted by Milestone Start Date.

3.2.2.5 Detailed Activity Report: A listing of every Detailed Activity sorted by activity Start Date.

3.2.2.6 CPM Logic Report: A listing of every detailed activity identifying every Predecessor and Successor activity sorted by Activity ID.

3.2.3 Once the initial Construction Schedule has been accepted, it shall be referred to as the Baseline Construction Schedule, and shall be used for all future Construction Schedule updates and reports as "Project Baseline."

3.2.3.1 For all project delivery methods other than Competitively Sealed Proposals (CSP), the Construction Schedule may include Milestone and Summary activities until thirty (30) days prior to the submittal of a Guaranteed Maximum Price (GMP) Proposal for Construction Services, but shall include Detailed Activities for at least the first ninety (90) days of Construction Services when submitted with the GMP Proposal.

## 3.3 UPDATING THE CONSTRUCTION SCHEDULE

3.3.1 Once the Baseline Construction Schedule has been accepted, the Contractor's Scheduler shall update the Construction Schedule for Pre-Construction and Construction Services at least once a month and submit reports at least five (5) work days prior to any application for payment.

3.3.1.1 Construction Schedule updates shall be based on actual work progress, current logic and remaining durations.

3.3.1.2 The Contractor shall maintain throughout the duration of construction a Total Float value on the Longest Path of not less than 10% of the remaining schedule duration unless approved by the ODR. Use of Total Float shall be documented in the monthly schedule update and associated "Executive Summary Report" (see Attachment A) and agreed upon by the Project Team.

## 3.4 MONTHLY CONSTRUCTION SCHEDULE REPORTS

3.4.1 The Data Date for all Construction Schedule Update Reports shall be current within five (5) work days of submission to the Owner's Designated Representative.

3.4.2 The Contractor's Scheduler shall submit two (2) electronic Primavera P6 backup files (.xer), two (2) electronic Adobe PDF files, and two (2) paper copies of the following construction schedule reports to the Owner's Designated Representative:

3.4.2.1 Executive Summary Report: A narrative report developed, monitored and updated by the Contractor's Scheduler **for each schedule submission** that includes:

3.4.2.1.1 A Total Float Usage Log that identifies the number of days lost / gained each month

3.4.2.1.2 A description of the progress of the Detailed Activities on the Longest Path Bar Chart

3.4.2.1.3 A description of current and anticipated problems and/or delaying factors and their possible impact

3.4.2.1.4 An explanation of any and all changes to the CPM logic, including constraints, durations, and relationships

Refer to Attachment A to this specification for an example Executive Summary Report.

3.4.2.2 Graphic Time-Scaled Report (Gantt Chart): A graphic time-scaled view including all activities, Percent Complete, Start and Finish dates, estimated durations, and Total Float. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date. Include a comparison to the accepted Baseline Construction Schedule.

3.4.2.3 Longest Path Bar Chart: A graphic time-scaled view of on-going and future Detailed Activities on the Longest Path from the Data Date to the contract Substantial Completion Date.
Level 1 Filter is "Longest Path = Yes"
Level 2 Filter is "% Complete < 100"

3.4.2.4 Owner Activity Bar Chart: A graphic time-scaled view of Detailed Owner Activities from the Data Date to the Owner's established Substantial Completion Date.

3.4.2.5 Three-Month Rolling Bar Chart: A graphic time-scaled view of all Detailed Activities completed, on-going or starting one (1) month earlier and two (2) months after the Data Date.

Level 1 Filter is "Actual Finish WR DD – 20"
Level 1 Filter is "Actual Finish WR DD + 0"
Level 1 Filter is "Early Start WR DD + 0"
Level 1 Filter is "Early Start WR DD + 40"
Level 2 Filter is "Activity % Complete < 100"

3.4.2.6 The Owner at any time may request additional Construction Schedule reports.

## 3.5 FORMATTING CONSTRUCTION SCHEDULE REPORTS

3.5.1 Printed schedule reports shall be on standard 8 ½" x 11" paper unless otherwise directed by the Owner's Designated Representative.

3.5.2 Electronic copies of the Construction Schedule and the associated reports shall be submitted on compact disc with the contents clearly labeled (example: 102-081 2/28/17 Schedule Update).

All electronic Construction Schedule submittals shall include copies of the Primavera P6 backup file in XER format and associated reports in Adobe PDF format.

3.5.3 Each report shall include a footer with the following information:

3.5.3.1 A "Date Block" indicating the start date, finish date, Data Date, run date, and "Must Finish By" date

3.5.3.2 A "Title Block" indicating the OFPC Project Number and Title, and the Name of the Report (i.e., Layout)

3.5.4 Refer to "Attachment A" to this specification for an example Gantt chart report layout.

## 3.6 CONSTRUCTION SCHEDULE SLIPPAGE

3.6.1 If the percent Total Float used by the project exceeds the percent of construction duration spent, or the Total Float is negative, the Contractor's schedule update shall include a Recovery Plan to make immediate revisions to the work force, work-hours, shifts, material deliveries or any other aspects of the work. The Recovery Plan shall be for review and acceptance by the Owner's Designated Representative (ODR) as part of the following month's schedule update (i.e., If the project has 50% of the original construction duration remaining, but has only 25% of the original Total Float remaining, the Contractor shall submit a Recovery Plan.)

3.6.2 The Contractor shall submit the Recovery Plan to the Owner's Designated Representative (ODR) as required in the UGC, clearly describing all the changes in schedule or work enacted and/or planned in order to ensure completion by the contract Substantial Completion date.

The Owner shall have the right to review and comment on any Recovery Plan activities that include Owner participation, or affect any Owner consultants or outside contractors.

3.6.3 Once the Owner's Designated Representative (ODR) accepts the Recovery Plan, the proposed revision shall be incorporated into the Construction Schedule.

## 3.7 CONSTRUCTION SCHEDULE CHANGES

3.7.1 If the Owner or Architect issues a Change Order Proposal, the Contractor shall submit a proposed fragnet revision for all proposed contract changes that affect the Substantial Completion Date or remaining Total Float with the Change Order Proposal pricing.

Proposed fragnet revisions shall be accompanied by a narrative listing of the affected activities including a statement of the expected overall impact of the change proposed.

## 3.8 EXCUSABLE DELAYS AND TIME EXTENSIONS

3.8.1 Excusable delays shall be administered per the UGC.

3.8.2 If an excusable delay extends the Contract Substantial Completion Date, the Owner's Designated Representative may extend the contract time by the number of excusable calendar days lost on the Construction Schedule, or take other actions as appropriate under terms of the Agreement.

Change Order Proposal pricing that does not impact the Substantial Completion Date or does not include a proposed fragnet revision prior to approval by the Owner's Designated Representative, shall not be due a time extension.

3.8.3 Once the Owner's Designated Representative accepts a time extension, and authorizes the Contractor to proceed with the contract change, the proposed revision shall be incorporated into the Construction Schedule.

END OF SECTION 01 32 00

ATTACHMENT A – EXAMPLE EXECUTIVE SUMMARY REPORT

# The University of Texas at Austin
# Example Project
# Job No. XXX-XXX

Executive Summary Report for MAR 2006
Contractor Name
As of March 25, 2006

**Schedule Overview**

| | | | |
|---|---|---|---|
| a. | Date of Notice to Proceed | 5/10/2005 | |
| b. | Current Contractual Substantial Completion Date * | 11/15/2006 | |
| c. | Duration in Calendar Days | 554 | *(b-a)* |
| d. | Duration in Work Days | 396 | *(c*5/7)* |
| e. | 10% Minimum Total Float in Baseline * | 40 | *(d*10%)* |

| | | | |
|---|---|---|---|
| f. | CPM Update Date (Data Date) | 3/25/2006 | |
| g. | Calendar Days Consumed | 319 | *(f-a)* |
| h. | Work Days Consumed | 228 | *(g*5/7)* |
| i. | % Time Consumed (From NTP through CPM Data Date | 58% | *(h/d)* |
| k. | % Time Remaining (From CPM Data Date to Current S/C Date) | 42% | *(1-i)* |
| l. | 10% Total Float Expected for Remaining Project Duration | 17 | *(k*e)* |
| m. | Actual days Total Float Remaining on CPM's Longest Path | 21 | |
| n. | Days Ahead (+)/Behind(-) based on CPM Total Float | +4 | *(m-l)* |

- ***Executed Change Orders involving time will need to be accounted for in rows (b) and (e).***

**Project Duration and Total Float**

The project Total Float increased to 21 days for this Monthly Update (3/25/06). The substantial completion date remains November 15, 2006. Following issues caused changes in project Total Float.

1. AUG 2005 (Revised Baseline Schedule)
   a. Site Permit Delay to Start Work - 11 days
   b. Biggs's Heavy Duty Plumbing - 6 days
   c. Relocation for Overhead Utilities - 10 days
2. AUG 2005 (Monthly Update)
   a. Relocation for Overhead Utilities - 8 days
3. Recovery Schedule (9/15/2005)
   a. Recovery Plan + 24 days
4. OCT 2005 (Monthly Update)
   a. Weather Day (11 Oct 05) - 1 day
   b. Approval for the Windows - 11 days
5. NOV 2005 (Monthly Update)
   a. Windows Fab & Delivery Expedition + 4 days
6. DEC 2005 (Monthly Update)
   a. No changes this month 0 days

1. Main Building (Phase 2)
   - ♦ M/S frame & exterior gypsum
   - ♦ Set FCU's and carriers

2. Utility/Tunnel Work
   - ♦ Tunnel Work Completed.
   - ♦ SS Line MH #6 to ML #8 Completed.

### Current and Anticipated Problem, Delays and Impact

1. The slab deflections are greater than the engineer's model. If a load test is required, this could have an impact on our schedule. After the meeting on February 1, 2006, Contractor was unofficially informed that a load test was not going to be performed. However, Contractor has not received the official report indicating this issue is resolved.
2. The issuance of construction documents for interior finishes dated 2/22/06 were received on February 24, 2006. Contractor is currently reviewing these drawings and will forward on any schedule impacts created by these drawings.
3. The brick veneer was delivered and it did not match the mockup. Our subcontractor is currently working with their suppliers to have the brick remade. Contractor continues to track this issue and will forward any schedule impacts created by this issue.

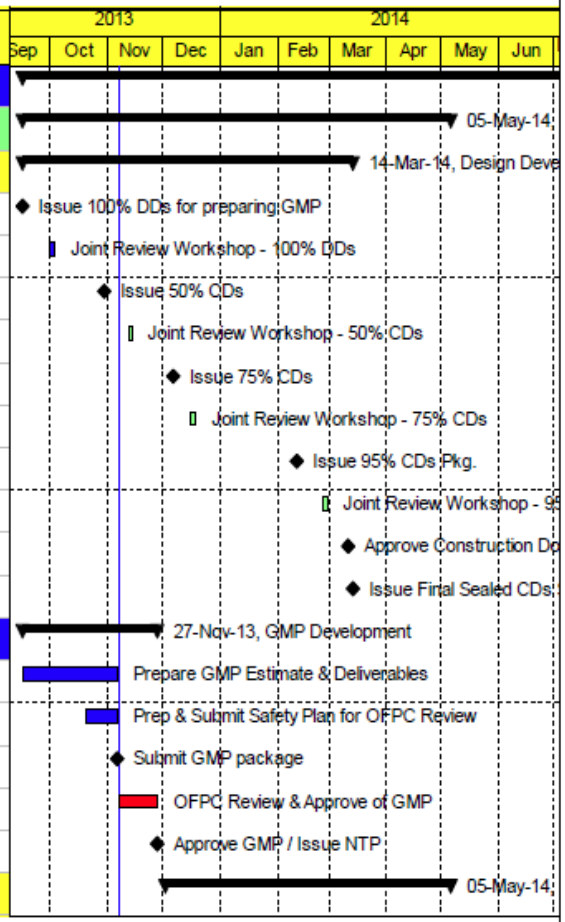
### Added, Deleted and Revised activities and Logic

1. New activities named "1st, 2nd and 3rd Owner-EXT. Finish Inspection" were added on schedule instead of the Owner-EXT. Finish Inspections of each side to reflect actual construction sequence.
2. Added new activity for "Insulate Duct Work" and tied to "Frame hard ceiling" as a predecessor with FS relationship.
3. Revised the activity description "Install/Insulate process pipe" to "Install process pipe".
4. Set Plumbing Fixtures is tied to 2nd Side Drywall with FS relationship as a successor to reflect actual sequence.
5. Deleted the FS relationship between Install Brick Veneer, Cast Stone (P1LE04****) and Install Deck & Felt @ Roof (P1LR05****) to reflect actual sequence.
6. Deleted the FS relationship between Install Brick Veneer, Cast Stone (P1LE04****) and Install Wood Soffits, Gutter System (P1LE07****) to reflect actual sequence.
7. Deleted the FS relationship between Owner-Roof Inspection (P1LR077500) and Install Wood Soffits, Gutter System (P1LE07****) to reflect actual sequence.
8. Install Process Pipe @ Level 6 Wall is tied to Insulate Process Pipe @ Level 1 with FS as a predecessor to reflect actual construction sequence.

# ATTACHMENT B – EXAMPLE GANTT CHART LAYOUT

PROJECT# - PROJECT NAME HERE | COMPANY NAME HERE | 15-Nov-13 11:35

| Activity ID | Activity Name | OD | Activity % Complete | Start | Finish | TF | Late Finish |
|---|---|---|---|---|---|---|---|
| **01 32 00 Sample Gantt Chart Layout** | | 470 | | 16-Sep-13 A | 28-Jul-15 | 46 | 01-Oct-15 |
| **PRECONSTRUCTION / GMP:** | | 160 | | 16-Sep-13 A | 05-May-14 | 141 | 21-Nov-14 |
| Design Development | | 123 | | 16-Sep-13 A | 14-Mar-14 | 0 | 13-Mar-14 |
| DD1000 | Issue 100% DDs for preparing GMP | 0 | 100% | 16-Sep-13 A | | | |
| DD1060 | Joint Review Workshop - 100% DDs | 3 | 100% | 01-Oct-13 A | 03-Oct-13 A | | 10-Feb-14 |
| DD1010 | Issue 50% CDs | 0 | 100% | 30-Oct-13 A | | | |
| DD1050 | Joint Review Workshop - 50% CDs | 2 | 0% | 12-Nov-13* | 13-Nov-13 | 66 | 21-Feb-14 |
| DD1030 | Issue 75% CDs | 0 | 0% | 06-Dec-13* | | 52 | |
| DD1070 | Joint Review Workshop - 75% CDs | 3 | 0% | 16-Dec-13* | 18-Dec-13 | 46 | 26-Feb-14 |
| DD1080 | Issue 95% CDs Pkg. | 0 | 0% | 11-Feb-14* | | 12 | |
| DD1090 | Joint Review Workshop - 95% CDs | 3 | 0% | 25-Feb-14* | 27-Feb-14 | 2 | 03-Mar-14 |
| DD2000 | Approve Construction Documents | 0 | 0% | | 11-Mar-14 | 2 | 13-Mar-14 |
| DD3000 | Issue Final Sealed CDs Set | 0 | 0% | | 14-Mar-14* | 0 | 13-Mar-14 |
| **GMP Development** | | 53 | | 16-Sep-13 A | 27-Nov-13 | 46 | 07-Feb-14 |
| GM010 | Prepare GMP Estimate & Deliverables | 35 | 100% | 16-Sep-13 A | 06-Nov-13 A | | 20-Jan-14 |
| GM020 | Prep & Submit Safety Plan for OFPC Review | 10 | 100% | 21-Oct-13 A | 06-Nov-13 A | | 20-Jan-14 |
| GM1 | Submit GMP package | 0 | 100% | | 06-Nov-13 A | | 20-Jan-14 |
| GM030 | OFPC Review & Approve of GMP | 15 | 0% | 07-Nov-13 | 27-Nov-13 | 46 | 07-Feb-14 |
| GM2 | Approve GMP / Issue NTP | 0 | 0% | | 27-Nov-13 | 46 | 07-Feb-14 |
| Subs Buy-Out / Procurement | | 107 | | 02-Dec-13 | 05-May-14 | 141 | 21-Nov-14 |




| | |
|---|---|
| Start Date | 10/25/13 |
| Finish Date | 07/28/15 |
| Must Finish Date | 10/01/15 |
| Data Date | 11/07/13 |

Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 7-NOV-13 | 50% CD's | AUB | TGR |
| | | | |
| | | | |
| | | | |

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

| Date | Paragraph Revised |
|---|---|
| 09/01/08 | Revised section 3.6.2.1 - All Electronic Construction Schedule submittals shall be in *.xer (P6) or concentric format (P3 to P5)**.** |
| | Revised "Project Schedule" to "Construction Schedule" throughout the document in recognition that the specification only controls the contractor's schedule, and not the entire Capital Improvement Program project schedule as previously implied. |
| | Updated entire section 2.5 |
| 03/02/09 | Added scheduling terms to section 1.1 |
| | Revised list of required milestones in section 2.4.4.2 – Due to the transition from P3 to P6 the requirement to include Final Completion and Operational Occupancy milestones was deleted. |
| | Revised section 2.5.1.3 to allow the final Substantial Completion Date Milestone to have an open end, in lieu of Final Completion. |
| 03/01/11 | Updated section 2.2.1 Oracle contact information; added Commissioning Activities to sections 2.4.2 and 2.4.4.2; revised "Owner Provided – Owner Installed Equipment" Responsibility Code & Description in section 2.4.3 |
| 10/01/16 | Overhauled spec section to align with P6. Removed references and vocabulary related to earlier versions of P6. Spec was originally written around a decade old version of P3. Also modified, added, deleted, and clarified other sections to align the specification with current policies and procedures.<br>• Replaced references of "Precedence Diagram Method PDM" with "Critical Path Method (CPM).<br>• Added definition of "Calendar Day" in Definitions section 1.1<br>• Added definition of "Project" in Definitions section 1.1<br>• Added further definition to "Work Day" as a minimum 8-hour day in section 1.1.15<br>• Added reference to Attachment "C" to the Owner's Special Conditions for definition of "Weather Day".<br>• Added Section 01 35 23 – Project Safety Requirements to 1.3 – Related Documents.<br>• Added requirement for contractor to include any activities involving local municipal or county authorities (i.e.: permits, easements, connection, etc.)<br>• Updated section 2.3 to reflect P6's current file naming conventions.<br>• Updated section 2.4.1 to require contractor to include activities for campus special events, ceremonies, and final exams referenced in the Owner's Special Conditions.<br>• Updated section 2.4.2 to replace the term "Activity Code" with "Work Breakdown Structure." |

| | |
|---|---|
| | • Updated section 2.4.3 to include responsibility codes for several trades.<br>• Updated section 2.4.4 to include milestone activities for mockups and above ceiling inspections.<br>• Updated section 2.4.4.4 to remove the term "Hammock" as that term is no longer used by Primavera.<br>• Updated section 2.4.5 to better define what procurement activities should be included in the schedule.<br>• Added section 2.4.6 to clarify that the A/E and Owner shall be given a minimum of 15 calendar days to review submittals per the UGC.<br>• Clarified that the finish constraint for project completion shall be placed on the project and not on the last activity. Provides consistency on "Longest Path" reporting and Total Float calculations.<br>• Clarified section 2.6.2.4 to state that the use of project Total Float shall be documented in the "Executive Summary Report" in Attachment A and agreed upon by the Project Team.<br>• Updated section 3.2, 3.4, and 3.6 to reflect P6's current nomenclature for file names, backup files, column headers, and other functionality changes since version P3.<br>• Updated section 3.3.1.2 to state that use of Total Float shall be documented in the monthly schedule update and associated "Executive Summary Report" (see Attachment A) and agreed upon by the Project Team.<br>• Updated section 3.4 and 3.6 to remove references to Total Float Variance reporting requirements as these fields are no longer available in the current version of P6. Generalized language for contractor to "include a comparison to the accepted baseline" in the hopes that the Float Variance will be included in a future P6 release.<br>• Updated section 3.5 to remove requirement for 24"x36" paper copies of the schedule. Large format printing can still be requested by the ODR/OFPC.<br>• Updated Attachment A to include a "Schedule Overview" chart with calculations.<br>• Updated Attachment B "Example Gantt Chart" to reflect current P6 layout. |