

SECTION 01 32 00 - PROJECT PLANNING AND SCHEDULING

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- 1.1.1. The Contractor's attention is specifically directed, but not limited, to the Uniform General and Supplementary General Conditions for University of Texas System Building Construction Contracts (UGC) for other requirements.

1.2. SUMMARY

- 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 Contractor must develop the Project Schedule to allow for a minimum amount of Float for the Project during Pre-Construction and/or Construction Services. Contractor must format the Project Schedule in a manner that facilitates reporting of progress and trends, identification of all critical paths, identification of each activity's predecessor(s) and successor(s), risks and opportunities, projection of upcoming activities, and forecasting of Project milestones.
- 1.2.3 The Owner must be able to reasonably rely on the Contractor's Project 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.
- 1.2.4 **Owner's acceptance of the Project Schedule and any subsequent update of the Project Schedule are acceptance of the format and extent of detail of the Project Schedule only. Owner's 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 Milestone Activities.**
- 1.2.5 This Specification applies to all Project delivery methods, regardless of contract type, whether the contracting firm, referred to as the Contractor, is a General Contractor, Construction Manager-at-Risk (CM-R), or Design/Build (DB) Contractor.
 - 1.2.5.1 All references to Pre-Construction Services in this Specification shall apply to requirements for CM-R and DB contract types only.

1.3. DEFINITIONS

- 1.3.1. The term "Project Schedule", as used throughout the Contract Documents, shall refer to the schedule for the Project as developed, monitored, and maintained, by the Contractor's Project Scheduler, and as used by the Project Team during Pre-Construction and/or Construction Services.
- 1.3.2. The term "Project Team", as used throughout the Contract Documents, shall refer to the Owner, Architect, Design Consultants, Engineer, User, Contractor, Owner's Service Providers, and Subcontractors (as applicable) that are contracted and/or specifically assigned to the Project.
- 1.3.3. The term "Owner's Planning and Scheduling Specialist", as used throughout the Contract Documents, shall refer to the Owner's scheduling specialist representative, with all correspondence to be addressed to:

MD Anderson Cancer Center
Capital Planning and Management, Mail Box 703
1515 Holcombe Boulevard, Suite 1010

1.3.4. The term “Data Date”, as used throughout the Contract Documents, shall refer to the date of the Project Schedule update.

1.3.5. The term “Total Float” (Float), as used throughout the Contract Documents, shall refer to the number of calendar days an activity on the Longest Path can be delayed without delaying the Substantial Completion date.

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

1.3.6. The term “Longest Path”, as used throughout the Contract Documents, shall refer to the sequence of activities that determines the longest duration for the Project when the Float is greater than zero.

1.3.6.1. 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 Float is equal to or less than zero.

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 Pre-Construction and 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 Project Schedule.

1.4.3. The Contractor is solely responsible for the schedule and status of all activities related to Pre-Construction, procurement of materials and subcontractors, construction, testing, inspection, commissioning, and Project turnover to the Owner. The Contractor shall integrate the schedule and status of Owner furnished services such as test, adjust, and balance. Contractor shall schedule completion of activities and proactively submit for Owner’s review and approval, all documentation related to commissioning, including, but not limited to, the following. (Refer to Section 01 91 00 – Project Commissioning and Section 01 77 00 – Project Closeout Procedures for additional requirements.)

1.4.3.1. Commissioning Plan.

1.4.3.2. Equipment Matrix.

1.4.3.3. Submittal Schedule.

1.4.3.4. Format, content, and tab structure for Operating and Maintenance Manuals and submittal of binders.

1.4.3.5. Request for Start-Up/Functional Performance Test Form.

1.4.3.6. Prefunctional Checklists.

1.4.3.7. Functional Performance Test Procedures.

1.4.3.8. Integrated System Test Procedures.

1.4.3.9. Additional Commissioning and Closeout Manual documentation.

- 1.4.4. The Contractor shall provide adequate and reasonable Project planning in sufficient detail throughout all Project phases, as applicable for all aspects of Contractor's 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 Project Schedule and shall be prepared to review such development and progress with the Owner, Architect/Engineer, 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.

PART 2 – PRODUCTS

2.1 QUALIFICATIONS OF THE PROJECT SCHEDULER

- 2.1.1 The Contractor shall assign a Project Scheduler who shall be responsible for the Project Schedule throughout Pre-Construction and Construction Services.
- 2.1.2 The Contractor's Project 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 specified scheduling software.
 - 2.1.2.1 In lieu of a degree, the Contractor's Project Scheduler may have at least five (5) years continuous experience on similar size and type of project(s) with the specified scheduling software.
- 2.1.3 The Contractor's Project Scheduler shall be an integral part of the Project Team during Pre-Construction Services and shall be on-site full-time for Construction Services until at least Substantial Completion of the Work.
 - 2.1.3.1 The Contractor's Project Scheduler may have additional responsibilities such as Senior Project Manager, Project Manager, Superintendent, Assistant Project Manager, Assistant Superintendent, Project Engineer, etc.
 - 2.1.3.2 If the Contractor's Project Scheduler is outsourced, the Contractor shall assign an on-site contact for all Project Schedule related issues.
- 2.1.4 All Contractor personnel involved in the preparation, updating, and reporting of the Project Schedule shall possess adequate construction scheduling knowledge related to the Project, Critical Path Method (CPM) knowledge, and a general understanding of the specified software.

2.2 REQUIRED SCHEDULING SOFTWARE

- 2.2.1 Regardless of Project size or type, Contractor shall develop and maintain the Project Schedule using the latest version of Microsoft Project available as of the effective date of the Contract.

2.3 NAMING THE PROJECT SCHEDULE

2.3.1 The Contractor shall title the initial Owner approved Project Schedule, the Baseline Project Schedule: BPS1. Contractor may not “reset” the Baseline Project Schedule unless the Owner approves the reset.

2.3.1.1 If the Owner approves the Contractor’s request to “reset” the Baseline Project Schedule, the new Baseline Project Schedule shall be titled sequentially (i.e. BPS1, BPS2, BPS3, etc.).

2.3.2 Subsequent updates to the Baseline Project Schedule shall be named by the last two (2) digits of the year and the month (Example: a March 2004 Baseline Project Schedule title would be “BPS2-0403”).

2.4 PROJECT SCHEDULE DEVELOPMENT REQUIREMENTS

2.4.1 The Contractor shall assign a standard “Activity Code” using a custom field, to every activity or task; organized by at least the Project phase, stage, location, building, floor, area, elevation, or system, etc., (i.e. work breakdown structure) including the following primary Activity Codes:

<u>Activity Code & Description</u>	
CP	Contract Procurement
PP	Programming/Pre-Project Planning
SD	Schematic Design
DD	Design Development
CD	Construction Documents
BOR	U.T. System Board of Regents
GMP	Guaranteed Maximum Price
TH	THECB Approval
SP	Subcontractor Bidding / Procurement

<u>Activity Code & Description</u>	
C	Construction
GC	General Conditions
SU	Submittals
FD	Fabricate and Delivery
CI	Contractor Inspections
OI	Owner Inspections
Cx	Commissioning
TAB	Test, Adjust, and Balance
OP	Owner Provided - Contractor Installed

2.4.2 The Contractor shall assign a standard “Resource Code” to every Contractor, Subcontractor, Supplier, Fabricator, Installer, Design Consultant, Owner, and any other party responsible for the accomplishment of an activity, including, but not limited to, the following primary Resource Codes (as applicable):

<u>Resource Code & Description</u>	
A/E	Architect / Engineer
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

<u>Resource Code & Description</u>	
Omat	Owner’s Material Testing Firm
Otab	Owner’s Air Testing & Balance Firm
Ownc	Owner
Pain	Paint & Wall Coverings
Pier	Piers / Piles / Caissons
Plas	Plaster / EIFS
Plum	Plum
Rebf	Reinforcing Steel Fabricator
Rebi	Reinforcing Steel Installer
Roof	Roofing
Sign	Signs
Site	Sitework
Stee	Steel Erector
Stef	Steel Fabricator
Mstf	Miscellaneous Steel Fabricator
Msti	Miscellaneous Steel Installer

<u>Resource Code & Description</u>	
Hard	Hardware
Hvac	HVAC
Insu	Insulator
Irri	Irrigation & Landscaping
Labc	Laboratory Casework Fabricator
Labi	Laboratory Casework Installer
Lbeq	Laboratory Equipment
Masn	Masonry

<u>Resource Code & Description</u>	
Stut	Site Utilities
Tele	Telephone / Communication Systems
Terz	Terrazzo
Toia	Toilet Accessories
Toip	Toilet Partitions
Watp	Waterproofing / Damp proofing
Wodf	Wood Framing
Wods	Wood Framing Supplier

2.4.2.1 The Contractor shall use additional Owner approved Resource Codes, as applicable.

2.4.3 The Contractor shall use additional Secondary Task and Resource Codes, as necessary, to monitor, provide status, and report the Project Schedule.

2.4.4 The Contractor shall assign a unique "Work Breakdown Structure" (WBS Code) and "Task Name" to every activity. The WBS Code and Task Name must be meaningful, easily understandable 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 A Task Name shall start with a verb to indicate what is to be done and shall end with a location (Example: Install metal studs - 3rd floor Bldg B).

2.4.4.2 A "Milestone" Task shall refer to any major event or phase, or any other important point in the Project, including the following Tasks:

<u>Milestone Task & Description</u>
• NTP for Pre-Construction Services
• Authorize Architect/Engineer Start
• Submit for Owner Review
• Joint Review for Owner Comments
• Approve Schematic Design
• Authorize Architect/Engineer Start
• Submit for Owner Review
• Joint Review for Owner Comments
• Approve Design Development
• FPCC Meeting Deadline
• BOR Approval
• Submit Construction Application
• Approve Construction Application
• Submit GMP
• Approve GMP

<u>Milestone Task & Description</u>
• Authorize Architect/Engineer Start
• Submit for Owner Review(s)
• Joint Review(s) for Owner Comments
• Approve Construction Documents
• NTP for Construction Services
• Partnering/Preconstruction Meeting
• Establish Site Controls /Mobilize
• Complete Primary Foundations
• Structural Top-Out
• Building Dry-In
• Systems Commissioning
• Substantial Completion
• Final Completion
• Operational Occupancy

2.4.4.3 A "Detailed" Task shall refer to a single Work event in the Project. The following table contains examples of Detailed Tasks for scheduling:

<u>Detailed Task - Example</u>
<ul style="list-style-type: none"> • Site Mobilization
<p>Material</p>
<p>Approval/Procurement</p> <ul style="list-style-type: none"> • Door Frames Shop Drawings • Contractor/A/E review • Fabrication • Door Frame Delivery • Light Fixtures Submittal • Contractor/Architect/Engineer Review • Fabrication • Light Fixture Delivery • Sprinkler Shop Drawings/Calculations • Contractor/Architect/Engineer Review • Fabrication • Initial Equipment Delivery • Millwork Shop Drawings/Laminate Samples • Contractor/Architect/Engineer Review • Fabrication • Initial Millwork Delivery
<p>Construction</p> <ul style="list-style-type: none"> • Layout/Top Track • MEP/Sprinkler Overhead Rough-In • Door Frames/Wall Framing • MEP In-Wall Rough-In • In-Wall Inspection • Corrections • Cover Walls • Tape and Float • Frame Ceilings • Furr-Downs/Recessed Light Coves • Furr Down/Ceiling Drywall Cover • Ceramic Tile • Plumbing Fixtures - Toilet Rooms • Prime/One-Coat Paint

<u>Detailed Task - Example</u>
<ul style="list-style-type: none"> • Toilet Partitions • Ceiling Grid • Curtaintrack Blocking • Light Fixtures/Grilles/Sprinkler Drops/Smoke Detectors • Overhead Inspections • Overhead Corrections • Ceiling Cover • Light Coves • Sheet Vinyl Flooring • Millwork • Cast Plastic • Toilet Accessories • Dark Room Equipment • Plumbing Fixtures - Millwork • Doors • Hardware • Glass & Glazing/Blinds • Curtaintrack • Biosafety Cabinets/Fume Hoods • Darkroom Equipment • Lockers • Final Paint Coat/Wallcovering • MEP Trim • Film Illuminators • TV Support Brackets • Appliances • Carpet Flooring • Resilient Base • Wall Protection • Final Clean • Pre-Final Inspections • TAB • Start-up and Testing • Corrections

2.4.4.4 A “Summary” Task (i.e. Hammock) shall refer to a grouping (or a summary) of Milestone and/or Detailed Tasks in the Project Schedule.

2.5 PROJECT SCHEDULING METHOD REQUIREMENTS

2.5.1 "Retained Logic" is the required mode of Project Schedule processing.

2.5.2 The estimated Activity Duration of an activity shall be expressed in calendar days.

2.5.2.1 During Pre-Construction Services and Construction Services, the Project Team shall determine the maximum duration for any activity.

2.5.2.2 During Construction, the minimum duration for any Owner milestone 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, or as approved by the Project Team.

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

2.5.3 Except for the Notice to Proceed for Construction (Preconstruction for CM-R and DB contracts) and the Final Completion Date Milestone, activities shall not have "open ends".

2.6 PROJECT SCHEDULE ANALYSIS REQUIREMENTS

2.6.1 The Contractor shall use the 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 For CM-R and DB contracts, the Project Schedule shall include at least **20%** Float from the Notice To Proceed for Pre-Construction Services to the Substantial Completion date.

2.6.3 The Project Schedule shall include at least **10%** Float from the Notice To Proceed for Construction Services to the Substantial Completion date as identified by the Owner in the Notice To Proceed.

2.6.4 Float shall be shown as an activity within the Project Schedule. It should be the last activity prior to the Substantial Completion date Milestone.

2.7 COORDINATION WITH OTHER DOCUMENTS AND WORK

2.7.1 The Contractor shall coordinate the Project Schedule with the Contractor's Submittal Schedule and Schedule of Values, as required by the UGC and Section 01 31 00 - Project Administration (i.e. the Work breakdown structure shall be arranged, numbered, and described consistently across the various documents).

2.7.1.1 Cost and/or resource loading of the Project Schedule are allowed.

2.7.1.1.1 If the Contractor elects to cost-load the Project Schedule, the Contractor shall provide a separate Schedule of Values in the format required by the Owner in Section 01 31 00 - Project Administration.

PART 3 – EXECUTION

3.1 PLANNING AND SCHEDULING WORKSHOP

3.1.1 Within thirty (30) calendar days after a Notice To Proceed, the Contractor shall schedule and conduct a Planning and Scheduling Workshop with at least the Contractor's Project Scheduler, Project Manager, Superintendent, the Owner's Project Manager and Owner's Planning and Scheduling Specialist (if applicable), the Architect/Engineer, Owner's representatives, and any available Subcontractors prior to submitting the Project Schedule to the Owner.

- 3.1.1.1 The Contractor shall schedule and coordinate the workshop with the Owner at least ten (10) calendar days prior to the Planning and Scheduling Workshop. The Contractor shall submit a complete draft Project Schedule to the Owner at least five (5) calendar days prior to the Planning and Scheduling Workshop.
 - 3.1.1.2 The Contractor shall review the draft Project 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-R and DB projects, Contractor shall schedule and conduct at least two (2) Planning and Scheduling Workshops. The first shall be within thirty (30) calendar days after a Notice to Proceed with Pre-Construction Services and the second shall be within thirty (30) calendar days after a Notice to Proceed with Construction Services for each "major" Guaranteed Maximum Price (GMP) Proposal executed.
 - 3.1.3 Contractor's attendance at the Planning and Scheduling Workshop(s) and Owner's acceptance of the Baseline Project Schedule is a condition precedent to the Contractor submitting initial and any subsequent progress payments.
- 3.2 BASELINE PROJECT SCHEDULE SUBMITTAL
- 3.2.1 The Baseline Project Schedule shall be submitted to the Owner with the required Float within sixty (60) calendar days from the effective date of the Notice To Proceed for Pre-Construction and/or Construction Services (or as approved by the Owner in the Project Planning Scheduling Workshop).
 - 3.2.1.1 A Baseline Project Schedule that does not have at least the minimum amount of Float at submission will result in the Contractor forfeiting all claims to Project Schedule extensions and/or delays as a result of Contract changes and/or excusable delays as described in the UGC.
 - 3.2.1.1.1 If conditions arise prior to submission of the Baseline Project Schedule that are beyond the Contractor's control, the Contractor shall include an Executive Summary with the Baseline Project Schedule to justify the reduction in Float.
 - 3.2.1.2 For CM-R and DB projects, the Baseline Project Schedule shall include identified Milestone and/or Summary Tasks for the remaining Work that has not been approved in an executed GMP Proposal for Construction Services.
 - 3.2.1.2.1 When the Owner has approved the "full" scope of the Project (i.e. the last GMP Change Order has been executed), the Contractor shall coordinate with the Owner to "reset" the Baseline Project Schedule.
 - 3.2.2 The Contractor shall submit one (1) electronic copy of the entire Baseline Project Schedule and one (1) paper copy of the following Baseline Project Schedule reports to the Owner within ten (10) calendar days when the "full" scope of the Project as been approved:
 - 3.2.2.1 Graphic Time-Scaled Report or Gantt Chart: A graphic time-scaled view including all activities, early start and finish dates, estimated durations and Float sorted by Activity Code.
 - 3.2.2.2 Milestone Activity Report: A listing of every Milestone Task and critical path sorted by early start date.
 - 3.2.2.3 Detailed Activity Report: A listing of every Detailed Task sorted by early start date including a fully completed predecessor and successor column.

3.2.3 When the Owner has approved the initial Project Schedule, it shall be referred to as the Baseline Project Schedule, and shall be used for all future Project Schedule updates and reports as "BPS1."

3.2.3.1 For CM-R and DB projects, the Project Schedule shall include Milestone and Summary Tasks until thirty (30) calendar days prior to the submittal of a GMP Proposal for Construction Services. The Project Schedule shall also include Detailed Tasks for at least the first ninety (90) calendar days of Construction Services when submitted with the GMP Proposal.

3.3 UPDATING THE PROJECT SCHEDULE

3.3.1 When the Owner has approved the Baseline Project Schedule, the Contractor shall update the Project Schedule for Pre-Construction and Construction Services at least once per calendar month and submit reports at least seven (7) calendar days prior to the Owner's monthly Project Progress Meeting.

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

3.3.1.2 The Owner will determine which meeting will be designated as the Owner's monthly Project Progress Meeting.

3.4 MONTHLY PROJECT SCHEDULE REPORTS

3.4.1 The Data Date for all Project Schedule Update Reports shall be current within five (5) calendar days of submission to the Owner.

3.4.2 Contractor shall submit a Total Float usage log with Contractor's monthly Project Schedule Update Reports that identifies the number of days lost or gained each month.

3.4.3 Owner retains the authority, which shall not be unreasonably withheld, to approve or reject Contractor's utilization of Total Float. If Contractor desires to utilize a portion or all of the Total Float, Contractor must submit a written request with its monthly Total Float usage log to the Owner seeking Owner's written approval of utilization of Total Float.

3.5 SUBMITTING MONTHLY PROJECT SCHEDULE REPORTS

3.5.1 The Contractor shall submit one (1) electronic schedule back-up in ".mpp" format and one (1) paper copy of the Project Schedule to the Owner.

3.6 FORMATING PROJECT SCHEDULE REPORTS

3.6.1 Electronic copies shall be submitted on compact discs and as attachments to electronic mail.

3.6.1.1 All electronic Project Schedule submittals shall be "backups" created in the specified software and included on the website if required, within one (1) calendar day of required completion.

3.7 PROJECT SCHEDULE SLIPPAGE

3.7.1 If the Project Schedule indicates schedule slippage for two (2) consecutive calendar months or if the Owner notifies the Contractor of a determination that the Work is behind schedule, the Contractor shall develop a "Recovery Plan" to make immediate revisions to the work force, work-hours, shifts, material deliveries, or any other aspects of the Work.

3.7.2 The Contractor shall submit the "Recovery Plan" to the Owner, as required in the UGC, clearly describing all changes in the Project Schedule or work enacted and/or planned in order to ensure completion by the Contract Substantial Completion date.

3.7.2.1 The Owner has the right to review and comment on any "Recovery Plan" activities that include Owner participation or affect any Owner consultants or outside contractors.

3.7.3 When the Owner approves the "Recovery Plan", the Contractor shall incorporate the proposed revision into the Baseline Project Schedule.

3.8 PROJECT SCHEDULE CHANGES

3.8.1 If the Owner or Architect/Engineer issues a Change Proposal, the Contractor shall submit a proposed revision for all proposed Contract changes that affect the Substantial Completion date or remaining Float with the Change in Work Cost Analysis Form.

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

3.9 EXCUSABLE DELAYS AND TIME EXTENSIONS

3.9.1 Excusable delays shall be administered per the UGC.

3.9.2 If an excusable delay extends the Contract Substantial Completion date, the Owner may extend the Contract time by the number of excusable calendar days lost on the Project Schedule or take other actions as appropriate under terms of the Agreement.

3.9.2.1 Change Proposal pricing that does not impact the Substantial Completion date or does not include a proposed revision prior to approval by the Owner shall not include a time extension.

3.9.3 Once the Owner accepts a time extension and authorizes the Contractor to proceed with the Contract change, the proposed revision shall be incorporated into the Baseline Project Schedule.

END OF SECTION 01 32 00