
USACE / NAVFAC / AFCEC / NASA UFGS-01 32 17.00 20 (May 2018)
Change 1 - 11/18

Preparing Activity: NAVFAC Superseding
UFGS-01 32 17.00 20 (February 2015)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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UNIFIED FACILITIES GUIDE SPECIFICATIONS

SECTION 01 32 17.00 20

COST-LOADED NETWORK ANALYSIS SCHEDULES (NAS)
05/18

NOTE: This guide specification applies to Design-Bid-Build and Design-Build projects and covers the preparation and use of Cost-Loaded Network Analysis Schedules (NAS) for construction using Primavera P6.

This specification Section applies primarily to MILCON projects and any other similar projects with multiple disciplines working simultaneously. These projects may have known critical completion dates and may involve multiple phases.

Confirm with the Administering FEAD/ROICC that the project schedule should be prepared under the requirements of this section. Further, this section must be reviewed and approved by the administering FEAD/ROICC prior to completion of the Request for Proposal (RFP).

Coordination is required with Section 01 20 00.00 20 PRICE AND PAYMENT PROCEDURES Section 01 20 00.05 20 PRICE AND PAYMENT PROCEDURES FOR DESIGN-BUILD with selection of "Earned Value Report" rather than "Schedule of Prices" in that section.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

NOTE: This section contains tailoring for Design-Build (DB), Design-Bid-Build (DBB), TABS, and

Commissioning (CX). Use TABS tailoring when Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC and Section 23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC are included in the contract specifications.

PART 1 GENERAL

1.1 DEFINITIONS

The cost-loaded Network Analysis Schedule (NAS) is a tool to manage the project, both for Contractor and Government activities. The NAS is also used to report progress, evaluate time extensions, and provide the basis for progress payments.

For consistency, when scheduling software terminology is used in this section, the terms in Primavera's scheduling programs are used.

1.2 SCHEDULE REQUIREMENTS PRIOR TO THE START OF WORK

1.2.1 Preliminary Scheduling Meeting

Before preparation of the Project Baseline Schedule, and prior to the start of work, meet with the Contracting Officer to discuss the proposed schedule and the requirements of this section.

1.2.2 Project Baseline Schedule

NOTE: This paragraph is tailored for Design-Bid-Build.

Submit the Baseline NAS at the PreConstruction Meeting. Government review comments on the Contractor's schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents. Only bonds may be paid prior to acceptance of the Baseline NAS. The acceptance of a Baseline NAS is a condition precedent to:

- a. The Contractor starting demolition work or construction stage(s) of the contract.
- b. Processing Contractor's invoices(s) for construction activities/items of work.
- c. Review of any schedule updates.

Submittal of the Baseline NAS, and subsequent schedule updates, is understood to be the Contractor's certification that the submitted schedule meets the requirements of the Contract Documents, represents the Contractor's plan on how the work will be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

1.2.3 Project Baseline Schedule

NOTE: This paragraph is tailored for Design-Build.

1.2.3.1 Baseline NAS

Submit and present the Baseline NAS at the Post-Award Kickoff (PAK) Meeting. The Baseline NAS must include detailed design activities, general (summarized) approach for the construction phase(s) of the project and required milestone activities. If the project is being Fast-Tracked or allows Early Start of construction, the Baseline NAS must include all fast-tracked design construction phases, including the required or proposed critical path design submittals within each phase that will occur during the duration of the project. The most current updated design schedule must accompany each design submittal.

The acceptance of a Baseline NAS is a condition precedent to processing Contractor's pay request(s) for design activities/items of work. Government review comments on the Contractor's schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents. Only bonds may be paid prior to acceptance of the Baseline NAS. The acceptance of a Baseline NAS is a condition precedent to:

- a. The Contractor starting work on the demolition or construction stage(s) of the contract.
- b. Processing Contractor's invoices(s) for construction activities/items of work.
- c. Review of any schedule updates.

1.2.3.2 Construction Baseline NAS

Develop the Construction Baseline Schedule, as design progresses, with detailed construction activities. If design must be completed and accepted prior to construction, submit the complete design and construction network analysis schedule and obtain acceptance prior to starting construction work. If the project is Fast-Tracked, each construction stage must be detailed and built upon the previous Fast-Tracked Baseline Schedule (including any interim updates) and accepted prior to starting that stage of the construction work. Payment for completed work is dependent on an accepted, detailed schedule for that portion of work.

Submittal of the Construction Baseline NAS, and subsequent schedule updates, is understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work must be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

1.3 THREE-WEEK LOOK AHEAD SCHEDULE

1.3.1 Weekly CQC Coordination and Production Meeting

Deliver three hard copies and one electronic file of the 3-Week Look Ahead Schedule to the Contracting Officer no later than 8 a.m. each Monday, for review during the weekly CQC Coordination or Production Meeting.

1.3.2 Look Ahead Schedule Requirements

Prepare and issue a 3-Week Look Ahead schedule to provide a more detailed day-to-day plan of upcoming work identified on the Project Network Analysis

Schedule. Requirements include:

- a. Key the work plans mapped to NAS activity numbers and updated each week to show the planned work for the current and following two-week period.
- b. Include upcoming outages, closures, field evaluation tests, preparatory meetings, and initial meetings.
- c. Identify critical path activities on the Three-Week Look Ahead Schedule.
- d. The detail work plans are to be bar chart type schedules, derived from but maintained separately from the Project NAS on an electronic spreadsheet program and printed on 216 by 279 mm 8-1/2 by 11 inch sheets as directed by the Contracting Officer.
- e. Activities must not exceed 5 working days in duration and have sufficient level of detail to assign crews, tools and equipment required to complete the work.

1.4 MONTHLY NETWORK ANALYSIS

1.4.1 Monthly Network Analysis Updates

Meet with Government representatives at monthly intervals to review and agree on the information presented in the updated project schedule. The submission of an acceptable, updated schedule to the Government is a condition precedent to the processing of the Contractor's invoice. Submit an acceptable, updated schedule to the Government regardless of whether a Contractor's invoice is submitted for the given period. The Contractor and Government must consent to agree on unit quantities of work completed equating to a percentage of payment for each activity progressed during the update period. Monthly update schedules must incorporate as-built events as they occurred and provide ongoing status of anticipated finish dates. As-built events must correspond to contemporaneous records including but not limited to submittals, daily production reports and quality control reports.

Provide the following with each Schedule submittal:

- a. Time-Scaled Logic Diagram.
- b. Reports listed in paragraph REQUIRED TABULAR REPORTS.
- c. Data disks containing the project schedule. Include the back-up native .xer program files.

1.4.2 As-Built Schedule

As a condition precedent to the release of retention and making final payment, submit an "As-Built Schedule," as the last schedule update showing all activities at 100 percent completion. This schedule must reflect the exact manner in which the project was actually constructed.

1.5 CORRESPONDENCE AND TEST REPORTS

Reference Schedule activity IDs that are being addressed in each correspondence (e.g., letters, Requests for Information (RFIs), e-mails, meeting minute items, Production and QC Daily Reports, material delivery tickets, photographs) and test report (e.g., concrete, soil compaction,

weld, pressure).

1.6 ADDITIONAL SCHEDULING REQUIREMENTS

References to additional scheduling requirements, including systems to be inspected, tested and commissioned, that are located throughout the remainder of the Contract Documents, are subject to the requirements of this section.

1.7 SUBMITTALS

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Locate the "S" submittal under the SD number that best describes the submittal item.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

NOTE: The Construction Baseline NAS is tailored for Design-Build.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control

approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Designated Project Scheduler; G[, [_____]]

Baseline NAS; G[, [_____]]

Construction Baseline NAS; G[, [_____]]

SD-07 Certificates

Monthly Network Analysis Updates; G[, [_____]]

SD-11 Closeout Submittals

As-Built Schedule; G[, [_____]]

1.8 SOFTWARE

Prepare and maintain project schedules using Primavera P6 software in a version compatible with Government's current version. Importing data into P6 using data conversion techniques or third party software is cause for rejection of the submitted schedule.

1.9 DESIGNATED PROJECT SCHEDULER

Submit to the Contracting Officer for approval an individual who will serve as the Designated Project Scheduler. Include a copy of the candidate's resume with qualifications. The Contracting Officer may remove the Designated Project Scheduler, and require replacement, if the scheduler does not effectively fulfill their duties in accordance with the contract requirements. Payment request will not be processed without an approved Designated Project Scheduler.

1.9.1 Qualifications

The Designated Project Scheduler must have prepared and maintained at least three previous construction schedules, of similar size and complexity to this contract, using Primavera P6.

1.9.2 Duties

NOTE: In item f., select one of two options concerning the meeting between the Designated Scheduler, Prime Contractor, and Government Representative. Select the first option for most projects. Only select the second option if specifically requested by the FEAD/ROICC office because requiring job site visits by the scheduler will likely add significant cost to the project.

Duties of the Designated Project Scheduler:

- a. Prepare Baseline NAS.
- b. Prepare monthly schedule updates.
- c. Prepare tabular reports.
- d. Prepare Time Impact Analysis (TIA) as necessary.
- e. Provide certification that NAS and TIA submittals conform to the contract requirements.
- f. Participate with the Prime Contractor and Government Representative in a monthly [teleconference call,][meeting at the job site in-person,] and scheduled with sufficient time to support the Monthly Network Analysis Updates process, to discuss project status, schedule updates, critical activities, potential delays, and contract modifications impacting the schedule.

1.10 NETWORK SYSTEM FORMAT

The system must include time-scaled logic diagrams and specified reports.

Prepare the schedule in accordance with the following Primavera P6 settings and parameters. Deviation from these settings and parameters, without prior consent of the Contracting Officer, is cause for rejection of schedule submission.

1.10.1 Diagrams

Provide 29.9 by 43.2 cm 11 by 17 inch hard-copy of Time-scaled Logic Diagram in color and landscape-oriented. Clearly show activities on the longest path. Include the following information for each activity and include accompanying Gantt chart:

- a. Activity ID
- b. Activity Name
- c. Original Duration in Work Days
- d. Remaining duration in Work Days
- e. Physical Percent Complete
- f. Start Date
- g. Finish Date
- h. Total Float

1.10.2 Schedule Activity Properties and Level of Detail

1.10.2.1 Design-Build Schedules

NOTE: This paragraph is tailored for use in Design-Build projects only.

Logically incorporate design and construction for the entire project in a single schedule. Unless otherwise indicated, the Contractor may begin construction when design is signed, stamped and submitted to the Government via the Contractor's quality control organization. If Government approval is required for any portion of a final signed and sealed design package prior to construction, include that review time in the schedule.

1.10.2.2 Activity Identification and Organization

NOTE: Item a. contains tailoring for Design-Build projects, and item d. contains tailoring for sections used in Design-Bid-Build and Design-Build.

- a. Identify design and construction activities planned for the project and other activities that could impact project completion if delayed in the NAS.
- b. Identify administrative type activity/milestones, including all pre-construction submittal and permit requirements prior to demolition or construction stage.
- c. Include times for procurement, Contractor quality control and construction, acceptance testing and training in the schedule.
- d. Include the Government approval time required for the submittals that require Government Approval prior to construction, as indicated in Section 01 33 00 SUBMITTAL PROCEDURES Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.
- e. Create separate activities for each Phase, Area, Floor Level and Location the activity is occurring.
- f. Do not use construction category activity to represent non-work type reference (e.g. Serial Letter, Request for Information) in NAS. Place Non-work reference within the P6 activity details notebook.

Activity categories included in the schedule are specified below.

1.10.2.3 Activity Logic

- a. With the exception of the Contract Award and Contract Completion Date (CCD) milestone activities, activity must not be open-ended; each activity must have predecessor and successor ties.
- b. Activities must not have open start or open finish (dangling) logic.
- c. Do not use lead or lag logic without Contracting Officer prior approval.
- d. Minimize redundant logic ties.
- e. Once an activity exists on the schedule it must not be deleted or renamed to change the scope of the activity and must not be removed from the schedule logic without approval from the Contracting Officer.

(1) While an activity cannot be deleted, where said activity is no

longer applicable to the schedule, but must remain within the logic stream for historical record, change the activity to a milestone and clearly label "NO LONGER REQUIRED" after the activity name. Redistribute accordingly any remaining budget associated with that activity.

- (2) Document any such change in the milestone's "Notebook," including a date and explanation for the change.
- (3) The ID number for a "NO LONGER REQUIRED" activity must not be re-used for another activity.

1.10.2.4 Critical and Near Critical Activity Baseline Limitation

NOTE: Choose 20 percent threshold baseline in the bracketed item for most projects. However, for horizontal construction, and the more linear a project, (for example, sidewalk, roadway) consult with the FEC Construction Management Scheduler as this threshold may be reduced accordingly to as little as 0 percent, depending on the type of project.

For P6 settings, critical activities are defined as being on the Longest Path. "Near Critical" is defined as having total float, of up to 14 days more, than the greatest float value found on the Longest Path. Longest Path (Critical) and Near Critical Activities must not make up more than [20 percent] [_____] of all activity within the Baseline Schedule.

1.10.2.5 Assigned Calendars

All NAS activity must be assigned calendars that reflect required and anticipated non-work days.

1.10.2.6 Activity Categories

1.10.2.6.1 Design Activities

NOTE: This paragraph is tailored for Design-Build projects.

Design activities must include design decision points and design submittal packages, including critical path submittals for Fast Tracked Phases. Review times for design development packages must be included in the schedule. Refer to Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES FOR DESIGN-BUILD, for specific requirements.

1.10.2.6.2 Pre-construction Activities

Examples of pre-construction activities include, but are not limited to, bond approval, permits, pre-construction submittals and approvals. Include pre-construction activities that are required to be completed prior to the Contractor starting the demolition or construction stage of work.

1.10.2.6.3 Procurement Activities

Examples of procurement activities include, but are not limited to: Material/equipment submittal preparation, submittal and approval of material/equipment; material/equipment fabrication and delivery, and material/equipment on-site. As a minimum, separate procurement activities must be provided for critical items, long lead items, items requiring Government approval and material/equipment procurement for which payment will be requested in advance of installation. Show each delivery with relationship tie to the Construction Activity specifically for the delivery.

1.10.2.6.4 Government Activities

NOTE: The paragraph below includes Design-Build tailoring for Design and Construction Start activities.

Government and other agency activities that could impact progress must be clearly identified. Government activities include, but are not limited to; Government approved submittal reviews, Government conducted inspections/tests, environmental permit approvals by State regulators, utility outages, Design Start, Construction Start (including Design/Construction Start for each Fast-Track Phase, and delivery of Government Furnished Material/Equipment.

1.10.2.6.5 Construction Quality Management (CQM) Activities

The Preparatory and Initial Phase meetings for each Definable Feature of Work identified in the Contractor's Quality Control Plan must be included in the Three-Week Look Ahead Schedule. Preparatory and Initial phase meetings are not required in the NAS, but can be represented by a start milestone linked to successor parent Construction Activity. The Follow-up Phase must be represented by the Construction Activities themselves in the NAS.

1.10.2.6.6 Construction Activities

No on-site construction activity may have a duration in excess of 20 working days. Contractor activities must be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days, unless otherwise defined in this contract.

1.10.2.6.7 Turnover and Closeout Activities

Include activities or milestones for items on the NAVFAC Red Zone Checklist/POAM that are applicable to this project. As a minimum, include required Contractor testing, required Government acceptance inspections on equipment, Pre-Final Inspection, Punch List Completion, Final Inspection and Acceptance. Add an unconstrained start milestone for the initial NAVFAC Red Zone - Facility Turnover Planning Meeting at approximately 75 percent construction contract completion or six months prior to Contract Completion Date (CCD), whichever is sooner.

1.10.2.6.8 Testing of HVAC - DALT, TAB, and PVT Activities

NOTE: Use this paragraph when Section 23 05 93

TESTING, ADJUSTING AND BALANCING FOR HVAC and Section 23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC are included in the contract specifications; otherwise, delete. This paragraph is tailored for TABS.

Include in the baseline schedule, activities and milestones associated with Government acceptance of Duct Air Leakage Test (DALT), Testing, Adjusting, and Balancing (TAB) and Performance Verification Test (PVT) as required and in accordance with Section 23 05 93 TESTING, ADJUSTING AND BALANCING FOR HVAC and Section 23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC.

- a. Identify the general area or location(s) for Government Acceptance Testing of DALT, TAB and PVT.
- b. Incorporate into the baseline schedule, time periods required for advance notification of work, and Government submittal review in accordance with Section 23 05 93 TESTING, ADJUSTING AND BALANCING FOR HVAC, paragraph DALT AND TAB SUBMITTAL AND WORK SCHEDULE.
- c. Include the following as schedule activities or milestones:
 - (1) Pre-DALT/TAB/PVT Meeting
 - (2) TAB Design Review Report, Government review
 - (3) TAB Pre-Field Engineering Report, Government review
 - (4) DALT Field Work
 - (5) DALT Field Acceptance Testing
 - (6) Certified Final DALT Report, Government review
 - (7) Control Contractors PVT Plan, Government review
 - (8) Equipment Suppliers PVT Plan, Government review
 - (9) Season I TAB Field Work
 - (10) Season I Certified Final TAB Report, Government review
 - (11) Endurance Testing, Government review
 - (12) PVT Field Work
 - (13) PVT Report, Government review
 - (14) Season I TAB Field Acceptance Testing
 - (15) Season II TAB Field Work
 - (16) Season II Certified Final TAB Report, Government review
 - (17) Season II TAB Field Acceptance Testing

NOTE: Insert the following when required by, and

coordinate the post-occupancy endurance testing and
post occupancy PVT Field Work with, Section 23 09 00
INSTRUMENTATION AND CONTROL FOR HVAC.

[(18) Post-Occupancy Endurance Testing Government review

(19) Post-Occupancy PVT Field Work

]

1.10.2.6.9 Commissioning Activities

NOTE: This paragraph is tailored for Commissioning
(CX). Use this paragraph if Section 01 91 00.15
TOTAL BUILDING COMMISSIONING is included in the
contract specifications.

Include in the baseline schedule activities and milestones associated with
Commissioning.

- a. Identify the general area or location(s) of systems for Commissioning
Inspection and Testing
- b. Incorporate into the baseline schedule time periods for Government
submittal review

1.10.2.7 Contract Milestones and Constraints

1.10.2.7.1 Project Start Date Milestones

Include as the first activity on the schedule a start milestone titled
"Contract Award," which must have a Mandatory Start constraint equal to the
Contract Award Date.

1.10.2.7.2 NAVFAC Red Zone - Facility Turnover Planning Meeting Milestones

See paragraph TURNOVER AND CLOSEOUT ACTIVITIES above.

1.10.2.7.3 Substantial Completion Milestone

Include an unconstrained finish milestone on the schedule titled
"Substantial Completion." Substantial Completion is defined as the point
in time the Government would consider the project ready for beneficial
occupancy wherein by mutual agreement of the Government and Contractor,
Government use of the facility is allowed while construction access
continues in order to complete remaining items (e.g. punch list and other
close out submittals). Include a separate Substantial Completion Milestone
for each phase if the contract requires construction to be completed in
phases.

1.10.2.7.4 DD-1354 Finish Milestone

Add unconstrained finish milestone, titled "DD-1354" and scheduled 30
calendar days prior to Substantial Completion, whenever a Form DD-1354 is
required in accordance with Section 01 20 00.00 20 PRICE AND PAYMENT
PROCEDURES.

1.10.2.7.5 Projected Completion Milestone

**NOTE: Section 01 45 00.00 20 is tailored for
Design-Bid-Build Section 01 45.05 20 is tailored for
Design-Build in paragraph below.**

Include an unconstrained finish milestone on the schedule titled "Projected Completion." Projected Completion is defined as the point in time all contract requirements are complete and verified by the Government with a successful Final Inspection in accordance with Section 01 45 00.00 20 QUALITY CONTROL Section 01 45 00.05 20 DESIGN AND CONSTRUCTION QUALITY CONTROL. This milestone must have the Contract Completion Date (CCD) milestone as its only successor.

1.10.2.7.6 Contract Completion Date (CCD) Milestone

Last schedule entry must be an unconstrained finish milestone titled "Contract Completion (CCD: DD-MM-YY)." DD-MM-YYYY is the current contract completion date at data date, day-month-year corresponding to P6 Must Finish Date. NAS milestone updates of Project Completion finish date for longest path must reflect calculated float as positive or negative based on CCD. Calculation of schedule updates must be such that if the finish of the "Projected Completion" milestone falls after the contract completion date, then negative float is calculated on the longest path. If the finish of the "Projected Completion" milestone falls before the contract completion date, the float calculation must reflect positive float on the longest path.

1.10.2.8 Work Breakdown Structure & Activity Code

At a minimum, establish a Work Breakdown Structure (WBS) and provide activity codes identified as follows:

1.10.2.8.1 Work Breakdown Structure (WBS)

Group all activities and milestones within appropriate WBS categories including, at a minimum, the following:

a. Project Milestones:

- (1) Management Milestones
- (2) Project Administrative Meetings
- (3) Permits

b. Pre-Construction Phase:

- (1) Submittals and Reviews
- (2) Procurement
- (3) Mobilization

c. Construction Phase: Create multiple sub-sections in accordance with project specific categories of work including in WBS descending order as follows:

(1) General Area

(a) Type of Work Item

1. Location

NOTE: The following item d. is tailored for
Commissioning. Use this paragraph if Section
01 91 00.15 TOTAL BUILDING COMMISSIONING is included
in the contract specifications.

d. Commissioning & Testing:

(1) Specific area/locations of commissioning

(2) Final Testing

(3) Training

d. Project Closeout: Include activity items such as Punchlist, Demobilization, O&M, As-built Drawings, Training, and As-built NAS.

e. Modifications: Create sub-category of Conformed and Non-Conformed under Modification WBS. Create multiple sub-sections as the project progresses identified by issue and Fragnet placed in Conformed for modifications issued prior data date, or Non-Conformed for issues not modified to contract prior data date.

f. Removed Activity: Activity "removed" by remaining within logic sequence and changing to Finish Milestone. Actualize finish date to date activity removed from schedule and provide reason(s) for removal explained in Activity Notebook.

1.10.2.8.2 Responsibility Code

All activities in the project schedule must be identified with the party responsible for completing the task. Activities must not belong to more than one responsible party.

1.10.2.8.3 Activity Category Code

Provide user defined "CAT" codes for Project Level activity codes. Use the following codes:

a. Assign "Procure" to Procurement type activity

b. Assign "Construct" Construction type activity

c. Assign "Close Out" to dedicated Commissioning, Testing & Close Out type activity.

d. Assign "Other" to other activity not otherwise designated.

[1.10.2.8.4 Construction Specification Institute (CSI) Masterformat Code

NOTE: Retain either or both of the following two paragraphs where justified by project complexity.

Identify all activities in the project schedule with its respective Specification Section number. Activities must not belong to more than one Section number. If an activity does not have an applicable CSI Code (e.g. Mobilize), the code must be "0000".

]1.10.2.8.5 Drawing Code

Identify all activities in the project schedule with its respective Drawing Code. The Drawing Code is the Sheet Number on the primary project drawing which indicates work to be performed. If an activity does not have an applicable Drawing Code (e.g. Mobilize), the code must be "0000".

]1.10.2.9 Anticipated Weather Lost Work Days

NOTE: Check with the FEC's Scheduling Subject Matter Expert or with the FEAD/ROICC for known site-specific Adverse Weather Delays to determine how to edit this paragraph. If historical data is not available, choose the first paragraph using NOAA historical monthly averages as the basis for establishing non-workdays. Note that NOAA historical data may not be available for all OCONUS locations.

If the historical adverse weather data is available, use the second paragraph and table and populate the table with the known data. Insert the data for each month in the blank, bracketed item provided. A bracketed choice of 2 days per month is provided only as an option to remind the Designer to insert the actual data.

[Use the National Oceanic and Atmospheric Administration's (NOAA) Summary of Monthly Normals report to obtain the historical average number of days each month with precipitation, using a nominal 30-year, greater than 2.5 mm 0.10 inch precipitation amount parameter, as indicated on the Station Report for the NOAA location closest to the project site as the basis for establishing a "Weather Calendar" showing the number of anticipated non-workdays for each month due to adverse weather, in addition to Saturdays, Sundays and all Federal Holidays as non-work days.

]Use the following schedule of anticipated monthly non-work days due to adverse weather as the basis for establishing a "Weather Calendar" showing the number of anticipated non-workdays for each month due to adverse weather, in addition to Saturdays, Sundays and all Federal Holidays as non-work days.

| MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS | | | | | | | | | | | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] | [2][_] |

] Assign the Weather Calendar to any activity that could be impacted by adverse weather. The Contracting Officer will issue a modification in accordance with the contract clauses, giving the Contractor a time extension for the difference of days between the anticipated and actual adverse weather delay if the number of actual adverse weather delay days exceeds the number of days anticipated for the month in which the delay occurs and the adverse weather delayed activities are critical to contract completion. A lost workday due to weather conditions is defined as a day in which the Contractor cannot work at least 50 percent of the day on the impacted activity.

[1.10.2.10 Anticipated Restricted Delays

NOTE: Use this paragraph if base access restrictions are anticipated during the project timeframe; otherwise, delete.

NOTE: Section 01 14 00 is tailored for Design-Bid-Build Section 01 14 00.05 20 is tailored for Design-Build in paragraph below.

Unless otherwise noted or defined in Section 01 14 00 WORK RESTRICTIONS, Section 01 14 00.05 20 WORK RESTRICTIONS FOR DESIGN-BUILD, allow in the schedule one lost workday for every two months of project duration for instances where base access is not permitted or where work areas are temporarily not accessible for security reasons which causes a delay in the work. Use Anticipated Restricted Delays as basis for establishing a "Security Calendar" showing the number of anticipated non-workdays for each month due to anticipated restrictions, in addition to anticipated adverse weather, Saturdays, Sundays and all Federal Holidays as non-work days. Assign the Security Calendar to any activity that could be impacted by restriction delays. The Contracting Officer will issue a modification in accordance with the contract clauses, giving the Contractor a time extension for the difference of days between the anticipated and actual lost work days if the number of actual restriction delay days exceeds the number of anticipated for the month in which the delay occurs and the restriction delayed activities are critical to contract completion. A lost workday due to restriction delay is defined as a day in which the Contractor cannot work at least 50 percent of the day on the impacted activity.

]1.10.2.11 Cost Loading

The Project Network Analysis Schedule (NAS) must be cost-loaded and will provide the basis for progress payments. Earned Value Reports must be derived from and correspond to cost loaded NAS. Use the Critical Path Method (CPM) and the Precedence Diagram Method (PDM) to satisfy time and cost applications.

1.10.2.11.1 Cost Loading Activities

**NOTE: Choose 10 percent in the brackets below,
unless FEC or FEAD/ROICC scheduler directs otherwise.**

Assign Material and Equipment Costs, for which payment will be requested in advance of installation, to their respective procurement activity (i.e., the material/equipment on-site activity). Assign cost for material/equipment, paid for after installation; labor; and construction equipment to their respective Construction Activities. Provide breakdown of definable features of work for cost loaded activities comprising Mobilization and De-Mobilization (Lump sum not allowed). The value of commissioning, testing and closeout WBS section may not be less than [10] [_____] percent of the total costs for Procurement and Construction Activities. Evenly disperse overhead and profit to each activity over the duration of the project.

1.10.2.11.2 Partial Payment

Breakdown unit of measure and cost must be defined within P6 Activity Detail Expenses for partial payment of any cost loaded activity. Lump sum cost loaded activity will not be partially paid.

1.10.3 Schedule Software Settings and Restrictions

- a. Activity Constraints: Date/time constraint(s), other than those required by the contract, are not allowed unless accepted by the Contracting Officer. Identify any constraints proposed and provide an explanation for the purpose of the constraint in the Narrative Report as described in paragraph REQUIRED TABULAR REPORTS.
- b. Default Progress Data Disallowed: Actual Start and Actual Finish dates on the CPM schedule must match the dates on the Contractor Quality Control and Production Reports.
- c. Software Settings: Handle schedule calculations and Out-of-Sequence progress (if applicable) through Retained Logic, not Progress Override. Show all activity durations and float values in days. Show activity progress using Remaining Duration. Set default activity type to "Task Dependent".
- d. At a minimum, include the following settings and parameters in P6 Schedule preparation:
 - (1) General: Define or establish Calendars and Activity Codes at the "Project" level, not the "Global" level.
 - (2) Admin Drop-Down Menu, Admin Preferences, Time Periods Tab:
 - (a) Set time periods for P6 to 8.0 Hours/Day, 40.0 Hours/Week, 172.0 Hours/Month and 2000.0 Hours/Year.
 - (b) Use assigned calendar to specify the number of work hours for each time period: Must be checked.
 - (3) Admin Drop-Down Menu, Admin Preferences, Earned Value Tab:

- (a) Earned Value Calculation: Use "Budgeted values with current dates".
- (4) Project Level, Dates Tab:
 - (a) Set "Must Finish By" date to "Contract Completion Date", and set "Must Finish By" time to 05:00pm.
- (5) Project Level, Defaults Tab:
 - (a) Duration Type: Set to "Fixed Duration & Units".
 - (b) Percent Complete Type: Set to "Physical".
 - (c) Activity Type: Set to "Task Dependent".
 - (d) Calendar: Set to "Standard 5 Day Workweek". Calendar must reflect Saturday, Sunday and all Federal holidays as non-work days. Alternative calendars may be used with Contracting Officer approval.
- (6) Project Level, Calculations Tab:
 - (a) Activity percent complete based on activity steps: Must be Checked.
 - (b) Reset Remaining Duration and Units to Original: Must be Checked.
 - (c) Subtract Actual from At Completion: Must be Checked.
 - (d) Recalculate Actual units and Cost when duration percent complete changes: Must be Checked.
 - (e) Link Actual to Date and Actual This Period Units and Cost: Must be Checked.
 - (f) Price/Unit: Set to "\$1/h".
 - (g) Update units when costs change on resource assignments: Must be Unchecked.
- (7) Project Level, Settings Tab:
 - (a) Define Critical Activities: Check "Longest Path".
- (8) Work Breakdown Structure Level, Earned Value Tab:
 - (a) Technique for Computing Performance Percent Complete: "Activity percent complete" is selected.
 - (b) Technique for Computing Estimate to Complete (ETC): "PF = 1" is selected.

1.10.4 Required Tabular Reports

Include the following reports with the Baseline, Monthly Update and any other required schedule submittals:

- a. Log Report: P6 Scheduling/Leveling Report.
- b. Narrative Report: Identify and justify:
 - (1) Progress made in each area of the project;
 - (2) Longest Path;
 - (3) Date/time constraint(s), other than those required by the contract
 - (4) Listing of all changes made between the previous schedule and current updated schedule include: added or deleted activities, original and remaining durations for activities that have not started, logic (sequence constraint lag/lead), milestones, planned sequence of operations, longest path, calendars or calendar assignments, and cost loading;
 - (5) Any decrease in previously reported activity Earned Amount;
 - (6) Pending items and status thereof, including permits, changes orders, and time extensions;
 - (7) Status of Contract Completion Date and interim milestones;
 - (8) Current and anticipated delays (describe cause of delay and corrective actions(s) and mitigation measures to minimize);
 - (9) Description of current and potential future schedule problem areas.

Each entry in the narrative report must cite the respective Activity ID and Activity Name, the date and reason for the change, and description of the change.

- c. Earned Value Report: Derive from and correspond to P6 cost loaded schedule. List all activities having a budget amount cost loaded. Compile total earnings on the project from notice to proceed to current progress payment request. Show current budget, previous physical percent complete, to-date physical percent complete, previous earned value, to-date earned value and cost to complete on the report for each activity.
- d. Schedule Variance Control (SVC) Diagram: With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates and 2) Earned Value to-date. Revise Cash Flow S-Curves when the contract is modified, or as directed by the Contracting Officer.

NOTE: Retain the following paragraph where justified by project complexity.

- [e. Daily Reported Production Activity: Submit on a monthly basis, in electronic spreadsheet (format provided by the Government), summary of daily reported production activity for the reporting month in the update schedule. Use the following columns for reporting:

- (1) Date
- (2) Activity ID
- (3) Work Description
- (4) Contractor
- (5) Billable Hours

]1.11 CONTRACT MODIFICATION

1.11.1 Time Impact Analysis (TIA)

Submit a Time Impact Analysis with each cost and time proposal for a proposed change. TIA must illustrate the influence of each change or delay on the Contract Completion Date or milestones. No time extensions will be granted nor delay damages paid unless a delay occurs which consumes all available Project Float, and extends the Projected Completion beyond the Contract Completion Date.

- a. Each TIA must be in both narrative and schedule form. The narrative must define the scope and conditions of the change; provide start and finish dates of impact, successor and predecessor activity to impact period, responsible party; describe how it originated, and how it impacts the schedule. The schedule submission must consist of three native files:
 - (1) Fragnet used to define the scope of the changed condition
 - (2) Most recent accepted schedule update as of the time of the proposal or claim submission that has been updated to show all activity progress as of the time of the impact start date.
 - (3) The impacted schedule that has the fragnet inserted in the updated schedule and the schedule "run" so that the new completion date is determined.
- b. For claimed as-built project delay, the inserted fragnet TIA method must be modified to account for as-built events known to occur after the data date of schedule update used.
- c. All TIAs must include any mitigation, and must determine the apportionment of the overall delay assignable to each individual delay. Apportionment must provide identification of delay type and classification of delay by compensable and non-compensable events. The associated narrative must clearly describe analysis methodology used, and the findings in a chronological listing beginning with the earliest delay event.
 - (1) Identify and classify types of delay defined as follows:
 - (a) Force majeure delay (e.g. weather delay): Any delay event caused by something or someone other than the Government or the Contractor, or the risk of which has not been assigned solely to the Government or the Contractor. If the force majeure delay is on the longest path, in absence of other types of concurrent delays, the Contractor is granted an extension of contract time, classified as a non-compensable event.

(b) A Contractor-delay: Any delay event caused by the Contractor, or the risk of which has been assigned solely to the Contractor. If the contractor-delay is on the longest path, in absence of other types of concurrent delays, Contractor is not granted extension of contract time, and classified as a non-compensable event. Where absent other types of delays, and having impact to project completion, Contractor must provide to Contracting Officer a Corrective Action Plan identifying plan to mitigate delay.

(c) A Government-delay: Any delay event caused by the Government, or the risk of which has been assigned solely to the Government. If the Government-delay is on the longest path, in absence of other types of concurrent delays, the Contractor is granted an extension of contract time, and classified as a compensable event.

(2) Functional theory must be used to analyze concurrent delays, where: separate delay issues delay project completion, do not necessarily occur at same time, rather occur within same monthly schedule update period at minimum, or within same as-built period under review. If a combination of functionally concurrent delay types occurs, it is considered Concurrent Delay, which is defined in the following combinations:

(a) Government-delay concurrent with contractor-delay: excusable time extension, classified non-compensable event.

(b) Government-delay concurrent with force majeure delay: excusable time extension, classified non-compensable event.

(c) Contractor-delay concurrent with force majeure delay: excusable time extension, classified non-compensable event.

(3) Pacing delay reacting to another delay (parent delay) equally or more critical than paced activity must be identified prior to pacing. Contracting Officer will notify Contractor prior to pacing. Contractor must notify Contracting Officer prior to pacing. Notification must include identification of parent delay issue, estimated parent delay time period, paced activity(s) identity, and pacing reason(s). Pacing Concurrency is defined as follows:

(a) Government-delay concurrent with contractor-pacing: excusable time extension, classified compensable event.

(b) Contractor-delay concurrent with Government-pacing: inexcusable time extension, classified non-compensable event

d. Submit Data disks containing the narrative and the source schedule files used in the time impact analysis.

e. All as-built and known planned activity must be included in NAS. Add cost loading or change Contract Completion Date to NAS in accordance to conformed contract modifications issued prior to Data Date of NAS update.

1.11.2 No Reservation of Rights

All direct costs, indirect cost, and time extensions will be negotiated and

made full, equitable and final at the time of modification issuance.

1.12 PROJECT FLOAT

Project Float is the length of time between the Contractor's Projected Completion Milestone and the Contract Completion Date Milestone. Project Float available in the schedule will not be for the exclusive use of either the Government or the Contractor.

The use of Resource Leveling or other techniques used for the purpose of artificially adjusting activity durations to consume float and influence critical path is prohibited.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --