

^{A16}**SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION**

1.01 SCOPE:

^{A19}The execution of the Works shall be monitored and managed through the application of the project management and coordination activities, including all aspects of development and execution stipulated in this Section. The Contractor shall make use of plans, programmes, project management tools, and processes as appropriate to implement an effective overall project management effort for the Works. Two key elements of the Contractor's project management system shall be (1) the Project Management Plan (detailed later in this Section) and (2) a detailed cost-loaded time programme (detailed later in this Section). ^{A19} Additional resource loading (for purposes other than cost loading) may also be incorporated into the Contractor's programmes if the Contractor determines that it would be beneficial.

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS:

- A. **Project Communications:** ^{A19}The Contractor's primary project communication tool shall be the document tracking and control system (DTCS) that has been implemented by the Employer. ^{A19} This is specified in more detail in Section 01 32 00 (*Project Communications and Document Management*.)
- B. **Meeting Documentation:** The Contractor shall prepare agendas, issue meeting invitations, and take notes for all meetings and conferences specified herein. Meeting notes shall include attendees, a record of topics discussed, and action items. Draft meeting notes shall be provided to the Employer's Representative for review and input within 2 days after the meeting.

1.03 PROJECT COORDINATION:

- A. **General:** Close coordination throughout the Works is essential. Both the Employer's Representative and the Contractor's Representative may call unscheduled meetings to effect coordination, communicate progress, or to resolve issues.
- B. **Post Award Conference:**
 - 1. The Contractor shall attend a Post Award Conference to be conducted by the Employer and held in the Republic of Panama within 28 calendar days after the Commencement Date. The Contractor shall collaborate with the Employer's Representative to make sure that appropriate individuals are present for the meeting.
 - 2. At the Post Award Conference, the administrative requirements of the Contract will be reviewed, the stakeholders will be introduced, and the processes through which the Works will be executed will be discussed.
 - 3. Prior to the Post Award Conference, the Contractor shall add cost loading information to the Contractor's Tender Programme. ^{A17}The Contractor shall then deliver such cost loaded version of the Contractor's Tender Programme to the Employer's Representative by the date of the Post Award Conference. ^{A17}
 - 4. ^{A17}Also by the date of the Post Award Conference, the Contractor shall deliver to the Employer's Representative the Contractor Work Breakdown Structure (Contractor WBS) and Contractor Cost Breakdown Structure (Contractor CBS). ^{A17}

5. The Contractor shall demonstrate to the Employer's Representative at the Post Award Conference that their plan to implement the Works through review and discussion of the cost-loaded version of the Contractor's Tender Programme and other tender documents.
6. ^{A19}The dates for the Baseline Programme workshop and Design Kickoff Conference will be set at the Post Award Conference. ^{A19}

C. Baseline Programme Workshop:

1. ^{A19}The Contractor shall conduct a collaborative Baseline Programme workshop to be held in the Republic of Panama within 14 calendar days after the conclusion of the Post-Award Conference. ^{A19} This workshop shall be conducted by the Contractor's Representative with the objective of the Employer and Contractor working together to agree on a baseline programme for completing the Works and satisfying the Employer's Requirements. ^{A19}The intended result of the Baseline Programme workshop is the development of the Accepted Baseline Programme, which shall be derived from and based on the cost-loaded version of the Contractor's Tender Programme and which shall maintain (unless otherwise agreed by the Employer's Representative) the Milestones and Milestone Dates as shown in the Contractor's Tender Programme.
2. At the Baseline Programme workshop, the Contractor shall present to the Employer's Personnel his proposed Baseline Programme, narrative description of approach and assumptions, and risk analysis in a way that is easy for all to see. ^{A19} The Contractor's presentation shall address design and construction package scope, including allowance for submittal review periods, the programme activities, the programme logic and sequencing, the activity durations, activity codes schemes, handling of weather impacts, risk analysis, cost loading and potentially resource loading and set out and maintain (unless otherwise agreed by the Employer's Representative) the Milestones and Milestone Dates from the Contractor's Tender Programme. Discussion and further work shall be performed at the workshop with the intent of reconciling all concerns expressed at the workshop sessions. The Contractor's risk analysis, shall consider the consequences of potential risks, including long lead time, procurement deliveries, landslides, earthquakes, material shortages, labor availability, stakeholder activities, environmental factors, and navigation accidents. It shall list each risk and include a qualitative risk analysis to rank the probability of occurrence and cost and schedule impacts of each risk and overall risk as low, medium, or high. It shall also include the Contractor's plan to mitigate the identified risks and the organization responsible for mitigating the risk should it occur. ^{A19}A follow-on Risk workshop may be initiated by either the Employer's Representative or by the Contractor to discuss the project risk analysis and risk mitigation. ^{A19}
3. The Employer's Representative will review the planned attendance roster for the workshop to make sure that appropriate individuals are present. Required Contractor's Personnel may include the Contractor's Representative, design team manager, Atlantic and Pacific locks project managers, project controls manager, Atlantic and Pacific construction managers, and appropriate program and project -control staff members. It may not be appropriate for some individuals to participate in the entire workshop, but all individuals listed above should plan on attending the opening and closing workshop sessions to make sure that there is

- full agreement regarding the proposed Baseline Programme at all levels in the Contractor's organization.
4. ^{A19}The process for producing programme updates during the course of the Works as required in this Section shall be discussed in detail during the Baseline Programme workshop.
 5. At the Baseline Programme workshop there will also be a review of the Contractor's Stage 1 Project Management Plan submission.^{A19} This plan shall consist of an outline of the operating parameters that will govern the Contractor's overall project management. Included in this plan will be detailed information to forecast and identify the Contractor's programme management activities in the first 120 days of the Works (post-Commencement Date). ^{A17}Based on the comments received during this conference, the Contractor shall proceed to produce a final Project Management Plan as described in Paragraph 1.07 below.^{A17}
 6. ^{A19}The Contractor shall plan on the Baseline Programme workshop lasting for **a total of ten working days**.^{A19} This time will be shortened if in the opinion of the Employer's Representative all objectives of the workshop are accomplished in a shorter time and the Accepted Baseline Programme is agreed. If all the work needed to reach agreement on the Accepted Baseline Programme cannot be completed during the workshop, the Contractor shall make all agreed-upon changes within seven additional calendar days and submit the proposed Baseline Programme to the Employer's Representative within this period.
 7. The Employer's Representative will accept or reject the Baseline Programme submitted by the Contractor within 14 calendar days after the receipt of all required information. ^{A17}If the proposed Baseline Programme is rejected, then the Employer's Representative will provide comments to the Contractor stating the reasons why the proposed Baseline Programme was rejected.^{A17} The Contractor shall comply with the instructions of the Employer's Representative and shall re-submit the proposed Baseline Programme and all associated submittals within seven calendar days. Time extensions will not be granted to complete this process.
 8. ^{A19}Any comments made by the Employer's Representative relative to the proposed Baseline Programme during review or during the Baseline Programme workshop shall not relieve the Contractor from full compliance with the requirements of the Contract. ^{A19} Once accepted by the Employer's Representative, the proposed Baseline Programme shall become the Accepted Baseline Programme. ^{A17}The Employer's Representative and its personnel may rely upon this programme, the approved Current Programmes as described below, and upon any updates of the same as approved by the Employer's Representative when planning its activities.^{A17}
 9. ^{A19}The Contractor shall document the Baseline Programme workshop with comprehensive meeting minutes which shall be submitted to the Employer's Representative.^{A19}
 10. **The allocation of the Adjustment Quantities that were entered by the Contractor in the Price Adjustment Timetable shall be reviewed and discussed during the Baseline Programme Workshop to verify that they will be generally consistent**

with the relevant portions of the Accepted Baseline Programme. Obvious unbalancing or unrealistic time phasing of the Adjustment Quantities shall be corrected (without changing the total of the Adjustment Quantities for each Specified Material that were entered by the Contractor) during the Baseline Programme Workshop (or as soon thereafter as practical) to make the allocation of the Adjustment Quantities generally consistent with the Accepted Baseline Programme. Once such corrections have been made, the Adjustment Quantities shall remain fixed for the duration of the Contract.

1.04 DESIGN PHASE PROJECT COORDINATION:

- A. **General:** ^{A17}The Contractor shall execute all design work in accordance with the Employer’s Requirements. The Contractor shall provide the Employer’s Representative with the opportunity to perform Over-the-Shoulder Review of the design in progress, in accordance with Section 01 40 00 (*Quality Requirements*).^{A17} It is expected that overall the design phase will significantly overlap with the construction phase.

B. **Design Phase Project Offices:**

1. **Project Integration Office:** ^{A19}The Contractor shall establish a Project Integration Office in close proximity to the Pacific lock project Site.^{A19} The purpose of this office is to provide a single location for overall design integration and interface with the Employer. This office shall be established by the beginning of the design phase of the Works. The Contractor shall locate key individuals at this office with overall responsibility for the following functions:

- a. ^{A17}Locks, including Water-Saving Basins.^{A17}
- b. Gates and valves.
- c. Site work.
- d. Mechanical, electrical, and instrumentation and controls.
- e. Overall design lead and integration.
- f. Quality.
- g. Dams.

The Contractor shall provide office space for seven Employer’s Personnel representatives at the Project Integration Office and will also make provision for Over-the-Shoulder Review to be conducted in this office. This office space shall be fully functional and shall be similar to the office space provided for the individuals providing the functions listed above. At a minimum, the provided space shall include a desk and chair, computer and monitor, phone, basic office supplies, and shared access to a copier, printer and fax machine.

2. **Project Design Center(s):** The location of the Contractor’s Project Design Center(s) shall be at the discretion of the Contractor. These office(s) will be where the project design is performed. The Contractor shall provide a design center deployment plan to the Employer’s Representative to describe what design functions will be performed in each design center location so that the Employer can, if desired, deploy staff to the design center locations to carry out Over-the-Shoulder Review. ^{A17}The Contractor shall provide office space for a total of 10 Employer’s staff members in the Project Design Center(s) during the period of Over-the-Shoulder Review, save that if there are multiple Project Design Center

locations, the Contractor shall provide space for a minimum of 3 Employer's staff members at each location.^{A17 A19}The office space provided shall have access to the Internet and shall include a desk and chair, phone, basic office supplies, and shared access to a copier, printer and fax machine.^{A19}

C. **Design Kick-Off Conference:** The Design Kick-Off Conference shall follow the Post-Award Conference. The Employer's Representative and the Contractor's design manager will co-chair the Design Kickoff Conference and collaborate on the conference agenda.

1. The Employer's Representative shall approve the attendance roster for the meeting to make sure that appropriate individuals are present. Required Contractor's Personnel may include the Contractor's Representative, design team manager, Atlantic and Pacific locks project managers, lead designers, lead programmer, quality assurance manager, health and safety manager, security officer, and environmental system manager. The Employer's Representative will arrange attendance by Employer's Personnel and consultants who have the background knowledge of the Works, and with whom the Contractor is required to coordinate in order to complete the Works.
2. At a minimum, the Parties will:
 - a. Discuss the cost-loaded version of the Contractor's Tender Programme as it relates to design activities. Review the requirements including completion criteria for all design milestones, design processes, and key deliverables. Contractor shall make any adjustments to the Current Programme that have been agreed upon.
 - b. ^{A19}Discuss the initial set of design tasks in detail and clarify the roles and responsibilities of the Parties.^{A19}
 - c. Discuss the locations of the Contractor's planned design centers and how the Over-the-Shoulder Review process will be implemented.
 - d. Discuss the development of a technical design submittal process to facilitate the interaction between the Employer's Representative and the Contractor's design team on design review submittals, including a log to manage review comments and their resolution. The submittal process shall be consistent with the requirements of Section 01 33 00 (*Submittal Procedures*).
 - e. Discuss the requirements and contents of interim and final design deliverables and how the Contractor proposes to manage the process for releasing drawings and other documents for Construction.
 - f. Identify any issues requiring resolution before the design effort can proceed at the programmed pace. Develop an action plan for resolution of those issues.

D. **Weekly Progress Meetings:**

1. The Contractor shall conduct weekly progress meetings. ^{A19}The Employer's Representative will review planned attendance rosters for these meetings to make sure that appropriate individuals are present. Typically, these meetings will be attended by the Employer's Representative, the Contractor's representative, and involved Subcontractors. Required Contractor's Personnel may include the

- Contractor's representative, construction manager, Atlantic and Pacific lock project managers, design team manager, lead designers, lead programmer, quality-assurance manager, health and safety manager, and the individuals on the Contractor's team who are responsible for security and for environmental compliance.^{A19} The Employer's Representative will arrange for attendance by appropriate Employer's Personnel and consultants.
2. The Contractor shall discuss the weekly programme progress update at the weekly progress meeting. ^{A17}This update shall feature a sub-set of the Current Programme to highlight the status of those activities that are either currently active as of the update, that will start within the upcoming three weeks including submittal delivery to the Employer's Representative, or that were completed in the past week.^{A17} The weekly programme progress update shall be made available to the Employer's Representative at least 24 hours prior to the weekly progress meeting. ^{A19}At each meeting, the Contractor shall demonstrate to the satisfaction of the Employer's Representative that they have the resources required to perform the portion of the Works included in the construction package as specified; and that the Contractor's health, safety and environment, and quality control plans are adequate for the phase of work to be commenced.^{A19}
 3. As a minimum, the weekly progress meetings shall cover:
 - a. Minutes from the previous meeting.
 - b. The weekly programme progress update and progress of the design since the last meeting.
 - c. Status of submittals and requests for information.
 - d. Safety and security issues, including conditions at the Site and in work areas, as required.
 - e. ^{A17}Quality issues, non-conformances, and corrective action processes.^{A17}
 - f. Compliance with work plans, environmental-management plans, health and safety plans, and security plans.
 - g. New and unresolved issues.
 - h. Coordination with other contracts.
- E. **Monthly Progress Meetings:** The second weekly progress meeting of each month shall include all of the items for the weekly progress meeting, plus the following additional items:
1. The Contractors presentation and discussion of the monthly progress report as required by Sub-Clause 4.21 [*Progress Reports*] of the Conditions of Contract.
 2. The Contractors presentation and discussion of the Current Programme.

1.05 CONSTRUCTION PHASE PROJECT COORDINATION:

- A. **General:** The construction phase will begin with the construction activities for the first construction package.

- B. **Weekly Progress Meetings:** ^{A19}In the construction phase, the Contractor shall continue to conduct weekly progress meetings in accordance with paragraph 1.04. ^{A19}
- C. **Monthly Progress Meetings:** ^{A19}In the construction phase, the Contractor shall continue to conduct monthly progress meetings in accordance with paragraph 1.04. ^{A19}
- D. **Pre-Construction Coordination Meetings:**
- The Contractor shall conduct pre-construction coordination meetings at least 28 days before the commencement of construction activities associated with each construction package. Not less than 7 days prior to the scheduled meeting date, the Contractor shall notify the Employer's Representative of the date and time of these meetings.
1. These meetings shall be attended by Contractor's Representative, Contractor's lead programmer, representatives from major Subcontractors, the program-management staff of the Employer's Representative, including the project programmer, plus appropriate members of the Employer's staff that potentially could be affected by the work.
 2. Specific items to be covered, as a minimum, shall include construction methods, communication plans, quality plans, health and safety plans, and the detailed construction package programme from the Current Programme.
- E. **Other Project Meetings:**
- The Contractor shall conduct other periodic meetings as necessary for the completion of the Works. ^{A17}They may cover topics such as design, quality, testing, startup, commissioning, public relations, and coordination with the Employer's operations. ^{A17} The Employer's Representative shall be invited to participate in any such meetings. Also, the Contractor shall provide appropriate representation at other meetings that the Employer's Representative may arrange.

1.06 OPERATION & MAINTENANCE PHASE PROJECT COORDINATION:

- A. **General:** Specific project coordination requirements for the operation and maintenance phase are in Section 01 93 00 (*Maintenance Services*.)

1.07 PROJECT MANAGEMENT PLAN (PMP):

- A. **General:** The PMP shall be prepared by the Contractor and submitted in accordance with Sections 01 33 00 (*Submittal Procedures*) and 01 32 00 (*Project Communications and Document Management*). The PMP shall provide an overall plan for the performance of the Works. The PMP shall incorporate and build upon the information in the Contractor's Technical Proposal required by Volume V, Part 1 (*General Execution Plan*); Volume V, Part 5 (*Design Plan*); Volume V, Part 6 (*Construction Plan*); Volume V, Part 7 (*Maintenance Services*), and Volume V, Part 8 (*Training Plans*) of the RFP. ^{A19}In addition, the risk analysis and management process used to develop the Tender and Baseline Programmes shall be incorporated into the PMP. ^{A19}
- B. **Outline PMP:** The Contractor shall develop the PMP in two stages. The first stage will produce a general outline of the PMP, along with a sub-plan describing the planned operations for the first 120 days of the Contract (post-Commencement Date). ^{A19}This first stage of the PMP will be submitted within 28 days of the Commencement Date, will set the stage for the project start-up, and will be discussed as part of the Baseline Programme workshop as required in this Section. ^{A19}

- C. **Complete PMP:** ^{A19}The complete PMP, finalized during the second stage, shall be submitted to the Employer’s Representative for approval within 120 days of the Commencement Date, incorporating comments from the Baseline Programme workshop.^{A19} It shall be consistent with the Employer’s Requirements and shall describe items such as the following:
1. Contractor’s organization chart, including how interactions with Subcontractors, quality control/quality assurance, and the Employer’s Personnel are to be managed.
 2. ^{A19}The Contractor’s planned methods for chartering both their internal teams and the combined locks delivery team of the Tenderer, Employer, and Employer’s Staff using chartering sessions with two-way communication to engage team members and other participants to define the “how’s” of the project, such as responsibilities, operating guidelines, etc.
 3. The delivery plan for the design efforts, including, but not limited to:
 - a. The Contractor’s design staffing plan;
 - b. The Contractor’s plans for the Project Integration Office and Project Design Center(s); and
 - c. The proposed plan for engaging the Employer’s Personnel (or the staff of the Employer’s other contractors) in the Over-the-Shoulder Review process. ^{A17}This proposed plan shall include the Contractor’s suggestions for when the Over-the-Shoulder Review meetings should be performed, although the Employer reserves the right to request additional working meetings if required to satisfy itself that the design will be compliant with the Contract requirements.^{A17}
 4. The incorporation of the Quality Management System into the delivery of design and construction efforts. The Contractor’s quality plans shall be submitted as an appendix to the PMP. See Section 01 40 00 (*Quality Requirements*) for more information on the incorporation of QMS and quality plans into the PMP.
 5. The duties, responsibilities, and authority of key personnel.
 6. Procedures for procurement of goods, equipment, and systems and for assessing, selecting, and appointing Subcontractors.
 7. Procedures for control of Subcontractors; for obtaining, reviewing, and approving Subcontractors’ documents; and for quality auditing of Subcontractors.
 8. Procedures for managing Variations.
 9. Procedures for proposing modifications to the Accepted Baseline Programme, updating the Current Programme, and weekly programme progress update.
 10. Detailed procedures for submitting statements.
 11. Procedures for and contents of the monthly progress reports.
 12. Plan for submission of documents to the Employer’s Representative for review. This shall be in conformance with Section 01 33 00 (*Submittal Procedures*.)
 13. The delivery plan for the construction effort, including, but not limited to: ^{A19}
 - a. The Contractor’s field office.

- b. Staging and support yard locations and layouts.
 - c. Access roads.
 - d. Movement of Contractor Personnel to and around the Site.
 - e. Plans for any off-site facilities.
 - f. Overall construction approach.
 - g. Anticipated major equipment to be used.
 - h. Logistics for delivery of construction materials to the Site.
14. ^{A19}Control of communications and documents. This should be in conformance with Section 01 32 00 (*Project Communications and Document Management*.)
15. Control of non-conforming products and of corrective and preventive actions.
16. Staff assessment, suitability, and training (labor-management plan).
17. System for reviewing and verifying the quality, completeness, and applicability of operations and maintenance manuals and other technical documentation, special tools, and initial spare parts that are necessary for the proper Operation and maintenance of the Works after the Works are commissioned.
18. Risk- management plan. ^{A19}
- D. **Revisions to PMP:** In the event that the Employer's Representative considers it necessary to do so it may require the Contractor to revise and resubmit their PMP. The Contractor shall make revisions and resubmit their PMP within 28 days of such a request.

1.08 PROJECT ADMINISTRATION:

- A. **General:** Refer to Section 01 32 00 (*Project Communications and Document Management*) for specific requirements regarding handling, transmission, and storage of various project records and for a description of the DTCS.
- B. **Project Contact List:** The Contractor shall maintain an up-to-date contact list for all key Contractor Personnel in the DTCS. This shall include at least e-mail addresses; physical addresses; and work phone, mobile phone, and home phone numbers.
- C. **Drawing Records:**
- 1. **Drawing Log:** The Contractor shall maintain a current drawing log in the DTCS. This shall begin with all design drawings that are submitted with the Contractor's Technical Proposal. Each subsequent revision of each drawing and each new drawing shall be noted on the log with the appropriate information. At a minimum, the drawing log shall contain drawing number, title, revision number, revision reason, and drawing or revision date. ^{A19}The log shall contain links to the individual drawing files so they can be viewed online. ^{A19}
 - 2. **Drawing Files:** The Contractor shall manage and keep project drawing files on a non-DTCS server that is to be provided and managed by the Contractor. These drawing files shall be made available to designated personnel of the Contractor and Employer in both native format and in Adobe Acrobat PDF format. As new or updated drawings become available, the appropriate information shall be entered in the DTCS drawing log. The Contractor shall provide an adequate

drawing management system to organize the drawing files and to provide drawing version control.

D. **Submittal Records:**

1. **General:** Contractor submittals shall follow the procedures and requirements in Section 01 33 00 (*Submittal Procedures*).
2. **Submittal Log:** The Contractor shall maintain a current submittal log in the DTCS. This shall begin with the initial submittal register that the Contractor provides with the Contractor's Technical Proposal. The log shall then be continuously updated as the design develops. The log shall contain links to the individual submittal files so they can be viewed on-line. At a minimum, the submittal log shall contain the information required in Section 01 33 00 (*Submittal Procedures*).
3. **Submittal Files:** The Contractor shall manage and keep project submittal files on a non-DTCS server that is to be provided and managed by the Contractor.^{A17} These submittal files shall be made available to designated Contractor and Employer's personnel in Adobe Acrobat PDF format.^{A17} As new or updated submittals become available, the appropriate information shall be entered in the DTCS submittal log. The Contractor shall provide an adequate submittal management system to organize the submittal files and to provide version control.

E. **Sample Records:** The Contractor shall enter information regarding the submission of samples in the submittal log, as described above.

F. **Operation and Maintenance Manual Records:** Contractor operation and maintenance submittals shall follow the procedures and requirements in Section 01 78 23 (*Operation and Maintenance Data*.) In addition, operation and maintenance manual records shall be treated the same as required above for submittal records.

G. **Guarantee and Warranty Records:** A separate DTCS log shall be developed by the Contractor for any specific project guarantees and warranties that are to be extended to the Employer by the Contractor and its Subcontractors. The information in this log shall be kept current and include all project guarantees and warranties. At a minimum, the information should include a description of the warranty, the date the warranty begins, the expiration date, and the contact information to be used for initiation of a warranty claim.

H. **Test Report Records:** Test reports shall be logged in the DTCS by the Contractor. At a minimum, the test report log shall contain the test date, a description of the test, applicable Section(s) specifying test requirements, observed/measured test results, determination of whether the test passed or failed, and comments. As test reports become available, the Contractor shall also upload test report files, in Adobe Acrobat PDF format, to the DTCS.

I. **Transmittal Records:** All project transmittals shall be created electronically by the DTCS.^{A19} The transmittals shall be automatically numbered and dated as they are created and shall be electronically forwarded to the appropriate Parties.^{A19} The DTCS shall be configured to automatically create and maintain a transmittal log.

J. **Request for Information Records:**^{A19} The Contractor shall generate Requests for Information (RFIs) to the Employer's Representative in the DTCS.^{A19} The DTCS shall be set up to track typical information, such as RFI number, description, originator,

referenced specification or drawing, “ball-in-court” responsibility, Employer response, individual responsible for the response, and response date. The title of each RFI shall begin with the relevant entry from the Contractor WBS. ^{A19}The Employer’s Representative will monitor the RFI log and generate responses to the RFIs. ^{A19}

- K. **Correspondence:** The DTCS shall be used for all project correspondence. Each letter shall have a unique identifying serial number.
- L. **Daily Reports:** The DTCS shall be used to prepare, log, transmit, and store the Contractor’s daily reports. These reports shall provide a detailed accounting of the Contractor’s activities each day and shall be entered into the system no later than 10 a.m. of the work day following the day of the report. The daily reports shall document the weather, crew size, equipment used, work performed, issues encountered, etc. in enough detail to allow an accurate recreation of the days activities to be developed at a later date.
- M. **Variations:** Variations shall be handled as specified in Sub-Clause 13 of the Conditions of the Contract. The DTCS shall be used to prepare, log, transmit, and store Variation requests.
- N. **Quality Records:** Quality records shall be submitted as defined in Section 01 40 00 (*Quality Requirements*)
- O. **Other Project Administration Records:** The DTCS shall be used to prepare, log, transmit, and store the following project administration records:
 - 1. Meeting agendas and minutes.
 - 2. Telephone call records.
 - 3. E-mail records.
 - 4. Other items that should be a part of the project record.

1.09 PROGRAMME:

- A. **Qualifications of Lead Project Programmer:** The Contractor shall employ or retain the services of a full-time, on-site lead programmer and such other staff as required to maintain project controls. The lead programmer shall attend all meetings pertaining to programming of the Works and shall meet the following minimum requirements:
 - 1. A bachelor’s degree in construction management, engineering, project management, or a related field.
 - 2. At least 15 years of hands-on planning and programming experience with demonstrated competence in “Earned Value” concepts as they pertain to construction progress payments using resource- and cost-loaded CPM programmes.
 - 3. ^{A17}At least 5 years of experience preparing and maintaining detailed programmes using Primavera project management programming software. ^{A17}
 - 4. Knowledge of critical path method (CPM) on large infrastructure projects, including the ability to analyze programmes to determine duration and logic issues and to develop and update a logical CPM programme so that it accurately represents the sequence and progress of the Works.

- B. **Software.** The Contractor shall develop all required programmes using Primavera P6. The Contractor shall submit all programmes electronically as directed by the Employer's Representative. ^{A19}The programmes shall be submitted through the DTCS by exporting the whole Primavera P6 project to the ".xer" format or by other automated means agreed upon during the Baseline Programme workshop. ^{A19}
- C. **Overall Programme Strategy:** The Accepted Baseline Programme shall set out the intended execution plan of logically-sequenced activities required to successfully execute the Works. The Accepted Baseline Programme shall demonstrate the Contractor's intended critical path and identify the chain of activities that determines completion of the Works by the Time for Completion.
- D. **Incorporating Construction Package Programme Information:** When a construction package is completed, a detailed sub-programme shall be prepared by the Contractor for that specific construction package, including cost and budgeting information, and incorporated into the Accepted Baseline Programme and the Current Programme. The addition of a construction package sub-programme shall not change any aspects of the remaining Accepted Baseline Programme or Current Programme, except as required to fill in detail within the existing Accepted Baseline Programme framework or as may be approved by the Employer's Representative.
- E. ^{A17}(Reserved)^{A17}
- F. **Accepted Baseline Programme:** ^{A19}The Accepted Baseline Programme shall be based on the cost loaded version of the Contractor's Tender Programme as may be modified during the Baseline Programme workshop. ^{A19} Once accepted by the Employer's Representative, the Accepted Baseline Programme shall be revised by the Contractor and submitted for acceptance to the Employer's Representative only for the following reasons: (1) to incorporate executed Variations, (2) to incorporate design and construction package sub-programmes as the design and associated construction and other activity programme information becomes available, (3) to incorporate any extensions of time awarded pursuant to sub-clauses 8.4 and 8.4A of the Conditions of Contract, and (4) other changes proposed by the Contractor and approved by the Employer's Representative. The Employer's Representative will accept or reject any Contractor's proposed modifications to the Accepted Baseline Programme within fourteen calendar days after the receipt of all required information. Once accepted, this version becomes the new Accepted Baseline Programme. The same modifications must be made to the Current Programme to keep it up-to-date. The sub-programme for each design and construction package shall include all tasks associated with that specific construction element including planning, design, procurement, construction, and other activities. Each design and construction package shall have a defined start milestone and a defined completion milestone in its sub-programme. After changes to the Accepted Baseline Programme have been reviewed and accepted by the Employer's Representative, a new Accepted Baseline Programme is established. The Accepted Baseline Programme is intended to be a reasonable plan for the execution of the Works. The Accepted Baseline Programme will be used by the Employer's Representative as the base against which the Current Programme will be compared to determine progress and performance measurement. The Accepted Baseline and Current Programmes shall be cost loaded by the Contractor in such a way that the sum of the cost loaded activity values equals the Contract Price.

- G. **Current Programme:** The Current Programme shall be based on the Accepted Baseline Programme by incorporating current and past monthly status update and as-built information. The status update and as-built information shall contain accurate information on logic, status, completion percentages, earned value, actual start and finish dates, remaining duration, and critical path and near critical path changes from the prior month. The update shall also include detailed information for planning, procurement, construction and other activities for execution of the Works. The Current Programme shall contain the Contract Price. ^{A17}See Paragraph 1.10 below for additional details of the Current Programme update process. ^{A17}
- H. **As-Delivered Programme:** ^{A17}The last submitted Current Programme shall be identified by the Contractor as the as-delivered programme. The as-delivered programme shall reflect the exact manner in which the Works were actually delivered, including start and finish dates for all activities. The Employer's Representative will accept or reject the as-delivered programme within 14 calendar days. Rejection of the as-delivered programme will be accompanied by instructions on corrective action process required for re-submittal which the Contractor shall comply with within a further 7 calendar days. ^{A17}
- I. **Programme Requirements:** All programmes prepared by the Contractor for the Works shall comply with the following requirements. ^{A19}The details regarding these requirements will be discussed and finalized during the Baseline Programme workshop. ^{A19}
1. **General Programme Requirements:**
- a. The Contractor's programmes shall provide all information concerning the sequencing, logic, and duration of all activities.
 - b. To the extent reasonable, the programmes shall demonstrate the final level of detail for each activity. They shall contain the required relationships (completely identified) and the duration of each activity based on work quantities and planned resources to accomplish the work.
 - c. The programmes shall show all interdependencies with others so these can be tracked during the execution of the Contract.
 - d. Programmes shall clearly indicate the critical path of activities from commencement of work to completion.
 - e. Programmes shall consider seasonal weather conditions and their impact on all work so that all aspects of the Works are completed within the allotted time.
 - f. The Contractor shall collect information from Subcontractors for incorporation into the programmes, including but not limited to, estimated duration, cost, resources (if so loaded), and quantities. The Contractor shall cooperate and coordinate with major lower-tier Subcontractors and with the Employer's Representative to comply with all programme requirements. The Contractor shall ensure that Subcontractors shall provide all programme requirements specified herein to the Contractor so that he can prepare a fully coordinated

programme. The Contractor shall staff the job as needed to meet these requirements. To the extent applicable, the Contractor shall incorporate Subcontractor programme input into the Current Programme.

- g. All programmes produced by the Contractor shall incorporate the Contractor WBS and the Contractor CBS integral to their structure.
- h. ^{A19}Activities shall be coded for sorting using the appropriate capabilities of Primavera P6. Activity coding schemes shall be discussed and agreed to during the Baseline Programme workshop. At a minimum, activity coding shall include activity design or construction package identification, location, type of work, phase of work, and responsibility.

2. **Items to be Included in the programmes:**

- a. All purchases, submittals, submittal reviews, fabrications, deliveries, manufacturer factory tests, field tests, readiness tests, and installation activities for all Materials and equipment for which the Contractor intends to seek payment. ^{A19}
- b. Periods for the Employer's Representative's review and approval of required plans, shop drawings and material samples including all the periods for review and approval under Sub-Clause 5.2 [Contractor's Documents] of the Conditions of Contract and for any other submissions, approvals and consents specified in the Contract.
- c. ^{A19}Contractor-obtained permits and approvals required by regulatory agencies or other third Parties. ^{A19}
- d. Identification of all work to be carried out by Subcontractors and assignments of responsibility for performing specific activities.
- e. Access to and availability of work areas and connections to all existing systems and requirements.
- f. All temporary utilities and construction.
- g. Interruption and shut-down requests for existing Employer facilities or utilities in order to allow for new connections.
- h. All start up, testing, training, and assistance required under the relevant Sections of the Employer's Requirements or elsewhere in the Contract.
- i. ^{A19}The sequence and timing of all start up, testing, training, and assistance required under the relevant Sections of the Employer's Requirements or elsewhere in the Contract. ^{A19}
- j. Contractor activities that will be coordinated with ongoing Employer activities.
- k. Material and equipment installation.
- l. Preparation of coordination and layout drawings.
- m. Clear identification of all non-workdays in the programme.
- n. Punch lists.
- o. Final cleanup.

- p. Monthly updating of Contract record drawings and final submittal of as-built drawings at project completion or as directed by the Employer's Representative.

J. Duration and Time for Completion:

1. The Contractor's programmes shall begin with the Commencement Date and conclude within the Time for Completion.
2. The Contractor's programmes shall comply with all limits imposed by the Works, with all contractually specified intermediate milestones and completion dates; and with all constraints, restraints, or sequences included in the Contract.
3. The programmes shall show the sequence and interdependence of activities required for complete performance of the Works.
4. Lag durations contained in the programmes shall not have a negative value unless specifically approved by the Employer's Representative.
5. At the project level, the "must finish by" constraint shall be set to equal the date corresponding with the Time for Completion.

K. Project Calendars: The project calendars to be used for the Contractor's programmes shall define the available work hours in each calendar day. They shall also specify national holidays, the Contractor's holidays, project-specific work/non-workdays, and resource vacation days.

1. The Contractor's programmes shall show all activities in calendar days, but activity durations may be programmed in working days.
2. The project calendar shall be defined within the programmes and accurately reflect the work plan. It shall not allow for work to be programmed on days designated to be non-work days.
3. If any particular work crew is to work on a different calendar from the one used for the rest of the Works, then a separate calendar shall be defined for that work crew and the work shall be programmed utilizing that special calendar.
4. The use of or requirement for special work programmes or calendars shall be communicated in the monthly progress report.

L. Activity Durations and Level of Detail: The activities shown on each programme shall be of sufficient detail to ensure adequate planning and execution of the Works so that, in the judgment of the Employer's Representative, they provide an appropriate basis for forecasting, monitoring, and evaluating the progress of the Works.

1. Activity durations shall be no shorter than one day and no longer than necessary to control the Works. In general, activities shall be no longer than 20 work-days, except when approved by the Employer's Representative. For the construction portion of the Accepted Baseline Programme or Current Programme, this level of detail need only be provided for packages of work that will have progress over the next 6 months based on information from the Current Programme.
2. Activity durations shall be consistent with production rates for assumed labor and equipment typical for the specific activity.

3. ^{A19}Not Used ^{A19}

M. Submittals and Procurement Activities:

1. The Contractor's programmes shall include activities to represent all required submittals in chronological order, showing the Section specifying the submittal and the submittal name, to the extent possible.
2. Task ID numbers for submittals shall be coded to clearly identify the submittal number. ^{A17}To make each task number unique, re-submittals shall be coded with the same task ID as the original submittals, with the addition of one alphabetic character starting with A and progressing to subsequent letters for each re-submittal of the same submittal until it is approved.^{A17}
3. To the extent possible, the Contractor shall avoid including submittals in the critical path, and sufficient time shall be included in the programme to allow for re-submittal if necessary.
4. The programmes shall also include activities to cover the complete procurement process, including, but not limited to, submittal, review, approval, procurement, fabrication, delivery, permits, and similar pre-construction work.
5. Delivery of submittals to the Employer's Representative shall be clearly and accurately reflected on the weekly programme progress update.

N. Cost Loading:

1. Appropriate activities contained within the programmes shall be cost-loaded so that the Contract Price is properly distributed among each of the cost-loaded programme activities in accordance with the Contractor CBS and be in accordance with the Contractor's Price Proposal. Subtotals shall be provided at a minimum for each item shown on the Employer CBS. [Except as provided herein, cost](#) shall only be loaded for design activities and for [on-Site](#) construction activities that result in the actual construction of the Permanent Works. ^{A19} [Items](#) such as bonding, insurance, mobilization, Temporary Works, demobilization and other items that are not incorporated into the Permanent Works shall not be separately cost loaded. ^{A19} The costs for these items shall be appropriately prorated into the cost-loaded activities for the design and [on-Site](#) construction of the Permanent Works. The Advance Payment for Mobilization and the Advance Payment for Plant will be accounted for and administered separately, so they shall not be included on the cost-loaded programmes.
2. ^{A19}However, the Contractor may include activities in his cost-loaded programmes for the cost of the on-Site deployment of equipment, machinery and facilities that the Contractor may require as part of his start-up of the Works. The total amount [that may be included in the cost loaded programmes for such start-up activities shall not exceed 150 million US Dollars.](#) These on-Site deployment activities shall be clearly identified in the Contractor's cost-loaded Programmes. The amount of each payment shall be determined [in accordance with Subparagraph 1.09 R and be based on the Current Programme.](#) In addition, [valuation reports from the Contractor may be required by the Employer's Representative to substantiate](#) the value of the equipment, machinery and facilities. [Such](#) valuation reports shall be certified by an [Acceptable Contractor Auditor](#) and shall be subject to audit, at the discretion of the Employer's

Representative. The equipment, machinery and facilities that the Contractor deploys at the Site and that are included in the cost-loaded programmes shall not be removed from the Site until they are no longer required for the Works and the Employer's Representative agrees to their removal.

3. The Contractor shall also include activities in his cost-loaded programmes for payment of Plant and Materials intended for the work, in accordance with Sub-Clause 14.5 and the Appendix to Tender. The specific programme activity costs for each allowed item shall be calculated from the relevant lump sum prices quoted in Section 2.3.3 *[Additional Cost Breakdown for Lock Gates, Lock Valves, and WSB Valves]* of the Contractor's Price Proposal. Where stated, amounts are entered for (a) only the price to furnish and deliver the items, with all necessary components to make a complete unit; and (b) all other prices for the item including installation, testing, overhead and profit. The total price entered for furnishing and delivering a specific item will be divided by the total number of units to be provided per the Contractor's design to arrive at a unit price, for the purpose of progress payment, to furnish and deliver each type of gate or valve. Progress payments will only be made for Plant and Materials intended for the work under Sub-Clause 14.3.3(a) when the conditions specified in Sub-Clause 14.5.1 have been properly met.
 4. The activities contained within the programmes shall be cost loaded using resource assignments with accurate quantities.^{A19} "Non-Labor" shall be used as the resource type for all resources used in cost loading.
- O. **Key Production Indicator Quantity Loading:** ^{A19}The Contractor shall load the appropriate programme activities with quantities for the following key indicators: unclassified excavation, dredge excavation, reinforcing steel available on site, reinforcing steel incorporated into the Works, coarse aggregate and fine aggregate available on the Site, coarse aggregate and fine aggregate incorporated into the Works, cement available on the Site, and concrete incorporated into the Works.^{A19}
- P. **Float:** Free float or time contingency within any programme is not for the exclusive use of either the Employer or the Contractor, but is jointly owned by both and is an expiring resource available to and shared by both, as needed to meet Milestones Dates and the Time for Completion. The Employer's Representative and Contractor shall discuss the consumption of, or planned consumption of, project float during the weekly progress meetings.
1. The Contractor shall be entitled to Extensions of Time under Sub-Clauses 8.4 and 8.4A of the Conditions of Contract
 2. Use of float-suppression techniques (such as preferential sequencing, special lead/lag logic restraints, extended activity times, or imposed dates) shall be a cause for rejection of the proposed Baseline Programme and any revisions or updates or other programmes including the Current Programme.
- Q. **Programme Submittal:** ^{A19}The Contractor shall submit two (2) hard copies and one (1) electronic copy of the Accepted Baseline Programme, Current Programme, as-delivered programme, and Baseline Programme narrative report as required in Sections 01 33 00

(*Submittal Procedures*) and 01 32 00 (*Project Communications and Document Management*).^{A19}

1. **Accepted Baseline Programme Narrative Report:** ^{A17}The Contractor shall prepare and submit this report as part of the initial baseline programme submittal and each subsequent submittal, including the following information.^{A17}
 - a. The Contractor's transmittal letter.
 - b. A description of the critical path as identified in the Accepted Baseline Programme, as well as any near-critical paths with a total float of less than 30 calendar days.
 - c. A general description of the means and methods proposed for the execution of the Works including, but not limited to, the proposed number of working days per week for each calendar; the planned holidays to be observed during the life of the Contract (by day, month, and year); the planned number of shifts per day; and the number of hours per shift.
 - d. A listing of all Milestones and Milestone Dates.
2. **Accepted Baseline Programme Network Diagram:** The Contractor shall prepare and submit paper and electronic copies of the Accepted Baseline Programme network diagram as specified for the Accepted Baseline Programme narrative report.
3. **Version Control:** The Contractor shall retain electronic and paper copies of all Accepted Baseline Programmes and make copies of this information available to the Employer's Representative upon request.

R. **Basis of Payment:**

1. With the exception of the Advance Payment for Mobilization, payment will only become due in accordance with the Conditions of Contract once the Accepted Baseline Programme has been approved by the Employer's Representative.
2. Submittal by the Contractor and acceptance by the Employer's Representative of the Current Programme as required herein shall be a condition for making payments that are due or may become due under the terms of the Contract, since the Current Programme will be used as the primary tool for determining the estimated contract value of the Works executed and the Contractor's Documents produced up to the end of each month for the purpose of interim payments under Sub-Clause 14.3.3 (a) of the Conditions of Contract. ^{A19}Delays in processing Interim Payment Certificates may result if the Accepted Baseline Programme status and Current Programme status do not match the actual progress of the Works. Any such delays shall be considered the Contractor's responsibility. The period for issue of any Interim Payment Certificate in Sub-Clause 14.6 and the period for payment in Sub-Clause 14.7 shall not commence until the status of the Accepted Baseline Programme and the status of the Current Programme both are accepted by the Employer's Representative.^{A19}

S. **Contractor WBS and Contractor CBS:**

1. The Contractor shall extend the Employer WBS and the Employer CBS beyond their level of detail to develop the Contractor WBS and the Contractor CBS.

2. Level 5 of the Contractor WBS and Contractor CBS shall have a single task representing this Contract. No activities shall be created at this level.
4. Level 6 of the Contractor WBS and Contractor CBS shall represent the top-level deliverables under the Contract.
5. Level 7 of the Contractor WBS and Contractor CBS shall represent the major groupings of work. Individual pay items in the Contractor's programmes shall roll up to these groupings as well as to the corresponding groupings in the Contractor CBS.
6. Level 8 of the Contractor WBS and Contractor CBS, and any levels below, shall be used by the Contractor to group the work in a logical way that represents how the Works are planned to be done.
7. ^{A19}The cost of indirect work, including, but not limited to the following, shall be prorated throughout and included in the appropriate specific tasks at the appropriate level of the Contractor CBS: (1) management, (2) supervision, (3) inspection, and (4) quality control. ^{A19}

T. Milestones.

1. Where reference is made in this Section 00 31 00 to "milestones" such reference shall include Milestones as set out in Sub-Clause 8.3 of the Conditions of Contract (unless otherwise stated).
2. In addition to the Milestones and Milestones Dates shown in the Contractor's Tender Programme (and subsequently in the Accepted Baseline Programme and all Current Programmes) the Contractor may incorporate additional programme milestones into the Accepted Baseline Programme and Current Programmes only as a means to measure and to report the progress of the Works. These additional milestones shall be defined in such a way as to clearly indicate a certain level of completion of the work and will have no monetary withholding associated with them.

1.10 PROGRAMME UPDATES: The Contractor shall prepare and submit programme updates as required herein. The update period end date shall be the last day of the each month. ^{A19}The monthly update cycle and related activities will be defined in more detail at the Baseline Programme workshop. ^{A19}

- A. **Weekly Programme Progress Update:** At least 24 hours prior to each weekly progress meeting, the Contractor shall provide a weekly programme progress update that includes selected programme activities that are either active as of the update date, that are scheduled to start in the upcoming 3 weeks including submittal delivery to the Employer's Representative, or that have been accomplished in the last week. The weekly programme progress update will be a key basis for discussion at the weekly progress meetings. The weekly programme progress update shall be submitted in electronic form only.
- B. **Current Programme:** ^{A19}The Contractor shall use the Current Programme as the Contractor's primary tool for planning and documenting the execution of the work. ^{A19}The Contractor shall submit the Current Programme within 7 calendar days of the last day of each month and present the Current Programme for discussion at the Monthly Progress Meeting. The Contractor shall submit 2 paper copies and one electronic copy of

the Current Programme, in accordance with the requirements of Sections 01 33 00 (*Submittal Procedures*) and 01 32 00 (*Project Communications and Document Management*.) The Current Programme shall be compared to both the Accepted Baseline Programme and the prior month’s Current Programme. Each Current Programme shall be labeled by period with data date and report date identified on the hard copy and electronic file. The Employer’s representative will accept or reject the Current Programme within 7 calendar days after the date of the Monthly Progress Meeting.

- C. **Data Date:** The Current Programme shall accurately portray the work performed by the Contractor as of the last calendar day of the month, the update period end date. The Contractor shall set the project’s data date to correspond to this date.
- D. **Progress Data:** All activity progress shall be based upon completion percentages, as verified by completed units as a percentage of total units.
 - 1. Default progress data provided from the programming system shall not be allowed.
 - 2. Actual start and finish dates shall not be automatically updated by default mechanisms that may be included in the programming software.
 - 3. The Contractor shall ensure that the software settings prevent completion percentages and remaining duration from being related. The Contractor shall use actual physical progress to determine remaining duration for activities at each programme update. Each activity shall incorporate an objective measurement method to objectively quantify the calculation of percent complete.
 - 4. The Contractor shall not retrospectively change data provided on previous programme updates including, but not limited to, actual start and finish dates, completion percentages, actual units installed, actual man-hours, budgets, actual costs and calendars.
- E. **Changes to the Accepted Baseline Programme:** Overall, the Contractor shall execute the Works in accordance with the Accepted Baseline Programme.
 - 1. ^{A19}The Contractor shall revise the Accepted Baseline Programme and Current Programme only for the reasons stated in Subparagraph 1.09 F. - Accepted Baseline Programme of this Section.^{A19} If the Contractor desires to make an Accepted Baseline Programme change for any other reason, the Contractor shall submit a proposal to the Employer's Representative in writing, stating the specific reasons for the change, such as the proposed changes in activities, original activity duration, logic, interdependencies, milestones, planned sequence of operations, and cost or resource loading of the Accepted Baseline Programme.
 - 2. No change to the accepted activities, original activity duration, logic, interdependencies, milestones, planned sequence of operations, or cost or resource loading for the Accepted Baseline Programme shall be made without prior notification to and acceptance by the Employer's Representative.
 - 3. The Employer’s Representative shall respond within 14 calendar days after the receipt of the Contractor’s request to change the Accepted Baseline Programme.
 - 4. Any activity that is added or changed by a Variation shall be identified by a Variation identifier code. Activities shall not be identified by more than one

Variation identifier code. The total cost of all Variation activities shall equal the agreed-to value of the Variation.

5. For the avoidance of doubt, changes to Milestones shall not be permitted and changes to Milestone Dates shall only be made in accordance with Sub-Clause 8.4A of the Conditions of Contract.

F. Delays and Recovery:

1. ^{A17}In accordance with Sub-Clause 8.6 [*Rate of Progress*] if the Employer's Representative determines that the Contractor's work progress is materially behind the Contractor's planned progress as shown on the Accepted Baseline Programme, the Employer's Representative may instruct the Contractor to produce a recovery programme **which is acceptable to the Employer** and to undertake the other actions required below at the risk and cost of the Contractor.^{A17}
2. The recovery programme shall show a revised plan of execution of the Works (supported by a programme revision, workforce/staffing plan, project calendar, work week requirements, graphic analysis, etc.) in order to recover from the current deficient progress and/or programme deficit(s) so as to complete the Works by the Time for Completion. Actions expected to be incorporated into recovery programmes may include:
 - a. Increase manpower in such quantities and crafts to eliminate the backlog of work.
 - b. ^{A19}Increase the number of working hours per shift, shifts per day, work days per week, or the amount of construction equipment in a manner sufficient to recover such delays.^{A19}
 - c. Reprogram work activities that were programmed sequentially so that they occur in parallel and submit any revised programmes (including the recovery programme) to the Employer's Representative for approval in accordance with this Section.
3. A recovery programme will not be required for relatively minor programme variances.
4. A recovery programme shall not be limited to critical path activities.
5. The recovery programme shall accurately reapportion project costs to reflect the planned work and payment in a manner that is consistent with the Accepted Baseline Programme.

- G. ^{A19}Disputed Accepted Baseline or Current Programme Content:** If during any formal or informal programme reviews it becomes apparent that the Contractor and Employer disagree significantly on the content of certain programme elements, the Employer may direct the Contractor to create a sub-network for the disputed elements. This sub-network shall subsequently be carried forward in the Current Programme to provide current status of the disputed items until such time as resolution is reached. Upon resolution, the Contractor shall update the Current Programme, and Accepted Baseline Programme, as

appropriate to integrate the agreed items into the main program and to remove the disputed sub-network.^{A19}

1.11 REPORTING: The Contractor shall provide an electronic version and 2 paper copies of each of the following reports in accordance with Sections 01 33 00 (*Submittal Procedures*) and 01 32 00 (*Project Communications and Document Management*).

A. Progress Report:

1. The Contractor shall prepare and submit a monthly progress report as required by Sub-Clause 4.21 of the Conditions of Contract which as well as including the Current Programme and the other matters required by Sub-Clause 4.21, shall include the following:
 - a. A description of the status of the work performed; significant accomplishments (including contract and programme milestones due to have been achieved during the month, forecasts of achievement of any missed milestones, and those due in the next month); planned completion dates for all activities according to the Current Programme; current planned completion dates and status for all activities; critical items and problems; corrective actions taken or planned; and other pertinent activities. The description shall address interface issues and resolutions, including permits, contract modifications, time-extension requests, and items with long procurement lead times.
 - b. Critical-Path Analysis: If actual progress of the Works or any part thereof is not in accordance with the Current Programme, a discussion of programme slippage and progress along the critical path shall be provided, including paths with negative float; causes of the delays; impacts on other activities, milestones, and completion dates for all activities; and plans for corrective action and programme adjustments necessary to recover any delays so as to maintain the Current Programme. The critical path analysis shall also identify the changes to the Current Programme critical and near-critical paths and the total float change from the prior month.
 - c. A description of all significant changes in construction sequence, logic changes, relationship changes, or duration changes and the rationale associated with each change.
 - d. Identification and justification of all activities worked out of sequence. Out-of-sequence activities shall not be left as such in the Current Programme and shall be corrected in logic revisions before submittal of the next update.
 - e. Revisions to activities not worked on during the period, including changes in duration, revisions to activity relationships, and revisions to constraints on activities, are all to be considered logic revisions. Similarly, this shall include descriptions and explanations of the reason for any changes to calendars being used in Primavera as well as any changes to calendar assignments of activities.
 - f. A risk analysis and mitigation report, addressing the advantages, disadvantages, and risks associated with each course of mitigation action. The analysis and mitigation report shall, as a minimum, consider the

consequences of all potential risks, including slides, earthquakes, material shortages, labor availability, stakeholder activities, environmental events, and navigation accidents.

- g. A sensitivity analysis of potential delays and a strategy for delay recovery in each case. As a minimum, this analysis shall address such issues as effects of a delay in one part of the Works delaying progress in another; delays due to collapses, changed rock conditions, or water ingress; breakdowns in removal of spoil, placement of concrete, or both; procurement delays; and Contractor's Equipment failures.
 - h. A safety analysis detailing all injuries (first-aid, recordable, lost time, and disabling), incidents, accidents and near-misses. Include information on planning of new work with regard to health risk, safety training status, and the disposition of all Unsafe Condition Notifications.
 - i. A QA/QC analysis in accordance with Section 01 40 00 (*Quality Requirements*.)
 - j. The most recently produced weekly Programme report as required in this Section.
2. **Graphic Progress Representation of the Work.** The progress report shall be accompanied by a graphic representation of the Works in progress as of the reporting date. As a minimum, this shall illustrate the development of the Site and work areas, including logistic routes, traffic routes, environmental controls, and the extent of development of the Works and fabrication of off-Site components.
3. **Post-Construction Phase Progress Reporting:** The Contractor shall continue to prepare and submit monthly progress reports under Sub-Clause 4.21 along with their Statements under Sub-Clause 14.3, during the Defects Notification Period. This Statement shall cover activities and accomplishments in the period to substantiate the amount of payment requested. It is expected to be much simpler than that required for prior to issue of the Taking-Over Certificate. The exact format, topics to be included and level of detail will be determined by the Employer's Representative prior to Taking Over.

B. **Procurement Report.** The Contractor shall prepare and submit a procurement report as part of the monthly progress report. The procurement report shall include the following:

- 1. A summary of all significant procurement activities during the period, including action taken to overcome problems.
- 2. Major items of Plant and Materials to be incorporated into the Works. These shall be segregated by type as listed in the Contractor CBS. For each item, the report shall show the programmed/actual purchase order date, manufacturer/supplier and origin, progress of manufacture, programmed/actual manufacturer/supplier ship date, method of shipment, and programmed/actual arrival date at port or airport.

- C. **Cash Flow Report:** ^{A19}The Contractor shall prepare and submit cash flow reports as part of the initial and each subsequent Accepted Baseline Programme and Current Programme submittals.
1. The Accepted Baseline Programme cash flow reports shall contain estimated monthly payment projections throughout the life of the Contract based on cost-loading using the early and late finish dates.
 2. Updated cash flow reports with payment projections shall be submitted by the Contractor each month based on the Current Programme reported progress. These cash flow reports shall include a description of major differences between the Accepted Baseline and Current Programme projections and be included in the monthly narrative report. The Contractor shall specifically notify the Employer if the Current Programme projected payment curve exceeds the curve from the Accepted Baseline Programme by more than 10%. ^{A19}
- D. **Production Reports:** The Contractor shall provide monthly production reports for key production indicators. At a minimum, the monthly production reports shall contain a summary of the actual and planned average, maximum, and minimum production for that period and for the Works to date based on the status of the construction packages at the time of the report. The data shall be presented as a comparison to the Accepted Baseline Programme. The data shall be presented numerically and graphically, and shall contain a narrative that includes a discussion of the production rates and an explanation of positive or negative variances. ^{A19}The details of the key production indicators tracking and reporting system shall be presented and discussed at the Baseline Programme workshop. ^{A19} The Contractor's production reports shall include:
1. Labor by trade in terms of man-days worked on the Site.
 2. Dry excavation and dredge excavation quantities.
 3. Reinforcing steel available for use and incorporated into the Works.
 4. Coarse aggregate and fine aggregate available for use and incorporated into the Works.
 5. Cement available for use.
 6. Concrete incorporated into the Works.
- E. **Variations Report:** The Contractor shall prepare and submit this report as part of each Current Programme submittal. ^{A17}The Variations report shall include a listing of all approved, rejected, and pending Variations, sorted by status. This list shall contain the Variation number, its description, its status (in progress, submitted, approved, disapproved, more information requested,) an identification of the activities affected, a description of the scope and cost of the Variation, and a description of the impact of the Variation on the Accepted Baseline Programme and Current Programme and on the critical path. Variations shall be managed in accordance with Sub-Clause 13 of the Conditions of Contract. ^{A17}

Attachment A

Work Breakdown Structure

Work Breakdown Structure

Level	1	2	3	4	5	6	7
EPS	A	Panama Canal Expansion Program					
	A.01	Post Panamax Locks					
	A.01.03	Post Panamax Locks Design and Construction					
PROJECT	0115	Design and Build Post Panamax Locks					
WBS	E30	Contract for the Design-Build of the Third Set of Locks					
	E30.10	^{A19} On-Site Deployment of Equipment, Machinery and Facilities ^{A19}					
	E30.10.01	Overall Locks Project					
	E30.10.02	Atlantic Locks					
	E30.10.03	Pacific Locks					
	E30.20	Design of the Atlantic Post-Panamax Locks					
	E30.20.01	Intermediate Design					
	E30.20.02	^{A19} Final Design ^{A19}					
	E30.20.03	As Built Design					
	E30.21	Construction of the Atlantic Post-Panamax Locks					
	E30.30	Design of the Pacific Post-Panamax Locks					
	E30.30.01	Intermediate Design					
	E30.30.02	^{A19} Final Design ^{A19}					
	E30.30.03	As Built Design					
	E30.31	Construction of the Pacific Post-Panamax Locks					
	E30.80	Provisional Sums for the Post-Panamax Locks					
	E30.80.01	Provisional Sum No. 1 – Atlantic Locks Northeast Approach Structure					
	E30.80.02	Provisional Sum No. 2 – Pacific Locks Northwest Approach Structure					
	E30.80.03	Provisional Sum No. 3 – Pacific Locks Southwest Approach Structure					
	E30.80.04	Provisional Sum No. 4 - Maintenance Closure System					
	E30.80.05	Provisional Sum No. 5 - Atlantic Locks Maintenance Services					
	E30.80.06	Provisional Sum No. 6 - Pacific Locks Maintenance Services					

Attachment B

Cost Breakdown Structure

Cost Breakdown Structure

Level	1	2	3	4	5	6	7	
EPS	A	Panama Canal Expansion Program						
	A.01	Post Panamax Locks						
	A.01.03	Post Panamax Locks Design and Construction						
PROJECT		0115	Design and Build Post Panamax Locks					
CBS				E3	Contract for the Design-Build of the Third Set of Locks			
				0				
				^{A19} E30.10	On-Site Deployment of Equipment, Machinery and Facilities			
					E30.10.01	Overall Locks Project		
					E30.10.02	Atlantic Locks		
					E30.10.03	Pacific Locks ^{A19}		
				E30.20	Design of the Atlantic Post-Panamax Locks			
					E30.20.01	Intermediate Design		
					E30.20.02	^{A19} Final Design ^{A19}		
					E30.20.03	As Built Design		
				E30.21	Construction of the Atlantic Post-Panamax Locks			
					E30.21.01	Unclassified Excavation		
					E30.21.02	Structural Fill		
					E30.21.03	Unclassified Dredging		
					E30.21.04	Not Used		
					E30.21.05	Non-Reinforced Concrete		
					E30.21.06	Structural Concrete (not including reinforcing)		
					E30.21.07	Roller-compacted Concrete		
					E30.21.08	Reinforcing Steel		
					E30.21.09	Lock Valves and Bulkheads		
					E30.21.10	WSB Valves and Bulkheads		
					E30.21.11	Gates and Recess Closures		
					E30.21.12	Plant Mechanical Systems and Equipment		
					E30.21.13	Electrical Systems		
					E30.21.14	Instrumentation and Control Systems		
					E30.21.15	Locks Appurtenances		
					E30.21.16	Bridgeways		
					E30.21.17	Sitework		
					E30.21.18	Buildings		
					E30.21.19	Utilities		
					E30.30	Design of the Pacific Post-Panamax Locks		
						E30.30.01	Intermediate Design	

Cost Breakdown Structure

Level	1	2	3	4	5	6	7
							E30.30.02 ^{A19} Final Design ^{A19}
							E30.30.03As Built Design
	E30.31						Construction of the Pacific Post-Panamax Locks
							E30.21.01Unclassified Excavation
							E30.21.02Structural Fill
							E30.21.03Unclassified Dredging
							E30.21.04Dams
							E30.21.05Non-Reinforced Concrete
							E30.21.06Structural Concrete (not including reinforcing)
							E30.21.07Roller-compacted Concrete
							E30.21.08Reinforcing Steel
							E30.21.09Lock Valves and Bulkheads
							E30.21.10WSB Valves and Bulkheads
							E30.21.11Gates and Recess Closures
							E30.21.12Plant Mechanical Systems and Equipment
							E30.21.13Electrical Systems
							E30.21.14Instrumentation and Control Systems
							E30.21.15Locks Appurtenances
							E30.21.16Bridgeways
							E30.21.17Sitework
							E30.21.18Buildings
							E30.21.19Utilities
	E30.80						Provisional Sums for the Post-Panamax Locks
							Provisional Sum No. 1 – Atlantic Locks Northeast
							E30.80.01Approach Structure
							Provisional Sum No. 2 – Pacific Locks Northwest
							E30.80.02Approach Structure
							Provisional Sum No. 3 – Pacific Locks Southwest
							E30.80.03Approach Structure
						Provisional Sum No. 4 - Maintenance Closure	
						E30.80.04System	
						Provisional Sum No. 5 - Atlantic Locks	
						E30.80.05Maintenance Services	
						Provisional Sum No. 6 - Pacific Locks	
						E30.80.06Maintenance Services	

END OF SECTION

A19 **THIS PAGE NOT USED** A19