# 1. [WORK PACKAGING FOR PROJECT CONTROL (RS6-6)](https://www.construction-institute.org/work-packaging-for-project-control-1c331ec5598a66eaef8ada3dba40b1a6)

**Report Summary:** Work packaging is a method of organizing and defining the scope of work by breaking down the project into manageable tasks, or work packages, for execution. Work packaging is an application of the management principle that a whole can best be managed by breaking it into manageable parts and then assigning responsibility for the detailed management of each level and element. Overall, work packaging provides structure for the efficient integration of engineering, procurement, construction, and startup as well as cost, schedule, and materials control.

**Key Takeaways:**

## (1) Plan the engineering effort to meet the procurement and construction needs.

## (Project Phase: Feasibility through Commissioning and Start-Up)

* Define the project scope and requirements by analyzing the owner's need date and working backwards.
* Develop a rough schedule for the start-up, construction, procurement, detailed engineering, and conceptual engineering phases.
* Identify required engineering packages, key procurements, and start-up sequences through planning and coordination with stakeholders.
* Break down the total project into smaller work packages that comprise a total project and serve as essential planning tools for all players.
* Validate the completeness and accuracy of the historical database to ensure the proper application of data during the planning phase.

## (2) Direct the procurement operations to deliver critical materials and equipment on time.

## (Project Phase: Feasibility through Commissioning and Start-Up)

* Determine critical material and equipment needs by analyzing the project scope and requirements.
* Establish need dates for materials and equipment based on the planned start dates of construction work packages.
* Issue purchase orders with contractual requirements that include a reasonable contingency time and earliest need date.
* Track each procurement activity in coordination with project controls to ensure timely delivery.
* Verify that procurement milestones are included as a single activity on the Control Schedule.

## (3) Guide the construction process using the owner's need date/startup milestones.

## (Project Phase: Feasibility through Commissioning and Start-Up)

* Establish a schedule of start-up milestones to guide the construction planning and execution phases.
* Define system completion schedules that meet the ultimate guides for planning, i.e., the start-up milestones or the owner's need date.
* Track the construction effort on the Control Schedule, following the area concept until an overlap with the start-up activities begins.
* Govern the construction activity using the Start-up Plan once overlap occurs, ensuring alignment with the completion schedules.
* Monitor and report progress against the start-up milestones to ensure timely and successful project delivery.

## (4) Track start-up on the Control Schedule to meet owner's need date.

## (Project Phase: Feasibility through Commissioning and Start-Up)

* Monitor and track the project completion schedules against the ultimate guides for planning, i.e., the start-up milestones or the owner's need date.
* Ensure that the construction work packages follow the area concept until an overlap with the start-up activities begins, and then switch to governing according to the Start-up Plan.
* Schedule project completion to meet the target dates (start-up milestones or owner's need date) on the Control Schedule.
* Verify and update the Control Schedule regularly to reflect changes in project progress and to ensure alignment with the ultimate guides for planning.
* Report any deviations from the planned start-up schedules to stakeholders, including the owner, and implement corrective actions as necessary.

## (5) Combine personnel, materials, equipment, and time in work packaging.

## (Project Phase: Feasibility through Commissioning and Start-Up)

* Assign responsibility to each level of management (engineering, procurement, construction, start-up) for managing specific parts of the project.
* Develop a Control Schedule that presents the plan for completing the total project in a logical format, with enough detail to establish key relationships.
* Identify and quantify personnel, materials, equipment, and time requirements for each work package using resource allocation templates or similar tools.
* Ensure that each work package has its own unique combination of resources (personnel, materials, equipment), and schedule the milestones to meet the owner's need date or start-up milestone dates.
* Verify and update the Control Schedule regularly to reflect changes in project progress and to ensure alignment with the ultimate guides for planning.

## (6) Present the Control Schedule logically to complete the project.

## (Project Phase: Feasibility through Commissioning and Start-Up)

* Review and approve the Control Schedule that presents the plan for completing the total project in a logical format and with enough detail to establish key relationships.
* Verify that each work package has its own unique combination of resources (personnel, materials, equipment), and schedule the milestones to meet the owner's need date or start-up milestone dates.
* Ensure that the construction effort is tracked on the Control Schedule by system, aligning with either the owner's need date or start-up milestones as the ultimate guides for planning.
* Monitor project progress regularly against the approved Control Schedule to identify any deviations or changes that are needed to stay on track and meet the desired completion date.
* Update the Control Schedule as necessary to reflect changes in project scope, schedule, or resources, and ensure that all stakeholders are informed of any adjustments.

## [(7) Tool: Project Control for Engineering (RS6-1)](https://www.construction-institute.org/project-control-for-engineering)

## (Project Phase: Feasibility through Commissioning and Start-Up)

This tool does the following:

* Provides a visual representation of the cost breakdown structure for an example project.
* Relates only to engineering work products that have been chosen as the basis for progress reporting.
* Can be used for specification writing, model building, and studies.
* Involves estimating and budgeting on a bulk allocation basis rather than as a production measure.
* Determines the ‘percentage complete’ by dividing the hours/dollars spent to date by the current estimate of hours/dollars at completion.

## [(8) Tool: Scope Definition and Control (RS6-2)](https://www.construction-institute.org/scope-definition-and-control)

## (Project Phase: Feasibility through Commissioning and Start-Up)

This tool does the following:

* Identifies major process equipment to establish cost relationships.
* Prepares order-of-magnitude estimates using conceptual assumptions with ± 30% accuracy.
* Develops control estimates once piping and instrumentation diagrams and civil drawings are available, aiming for ± 15% accuracy.
* Establishes detailed or definitive estimates only when detailed drawings are complete, targeting ± 10% accuracy.
* Focuses on developing the design to the point of scope definition, rather than relying on factored estimates.

## [(9) Tool: Contractor Planning for Fixed-Price Construction (RS6-4)](https://www.construction-institute.org/contractor-planning-for-fixed-price-construction)

## (Project Phase Feasibility through Commissioning and Start-Up)

This tool does the following:

* Ensures that planning formats are compatible with control formats for future planning.
* Develops unique management guidance for each project to cover specific situations that are not covered by standard policies and procedures.
* Incorporates oral or written guidance into an official letter that designates the project team.
* Uses a matrix to identify functions, individuals, and organizational elements that are involved in a project's management effort.
* Provides bid cost data on contract forms, including lump-sum prices for total contracts or individual portions.