

10-10 Glossary

If you have questions or comments, leave a note at the end of this page.

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Bridging Documents

In bridging projects, drawings and specifications, prepared after schematic design, “along with forms of contract, etc., make up the Bridging Contract Documents. The basic idea is to design, illustrate and specify everything that needs to be tied down to fully protect both the owner and the designer” while leaving as much latitude as possible to design-build bidders to use their skills and experience to give the owner the best buy. (Source: <http://www.bridginginstitute.org/faq>)

Building Gross Square Feet (BGSF)

The floor area of the entire building or project, which includes floor area occupied by rooms/spaces, walls, corridors, conveyances, mechanical/utility rooms, and shafts.

Capacity, Name Plate and Capacity Unit

The capacity and capacity unit characterize the capacity of the new facility, the added capacity (in case of additions), or the capacity of specific equipment of system being replaced or installed in renovation projects. For instance, the installation of a compressor in a gas processing facility can be characterized by the unit HP. For a new gas processing facility, the unit cubic feet per day characterizes the capacity of the facility or project. Table 1 provides example of common units for different sectors and project types. Similarly, for a cogeneration project inside a manufacturing plant, the capacity unit should describe the nature of the cogeneration project. This is important to allow comparisons between projects of similar type.

	Project Type	Converted Unit
INDUSTRIAL	Automotive Manufacturing	frames per day, HP (horse Power)

	Chemical Manufacturing	barrels per day, cubic feet per day, gallons per day, meter skids, MW, short tons per day
	Cogeneration	MW
	Consumer Products Manufacturing	bushels per hour, cans per minute, short tons per day
	Electrical (Generating)	kV, MW
	Environmental	gallons per day, MW, pounds per day, short tons per day
	Foods	short tons per day
	Metals Refining/Processing	cubic feet per day, short tons per day
	Microelectronics Manufacturing	MW per year
	Mining	short tons per day
	Natural Gas Processing	BBL, barrels per day, cubic feet, cubic feet per day, HP, short tons per day
	Oil Refining	BBL, barrels per day
	Oil Sands Mining/Extraction	barrels per day
	Oil Sands SAGD	barrels per day
	Oil Sands Upgrading	barrels per day
	Oil/Gas Exploration/Production (well-site)	barrels per day, HP
	Pharmaceutical Labs	people
	Pharmaceutical Manufacturing	BGSF, liters cell culture, short tons per day
	Pulp and Paper	napkins per minute, short tons per day
INFRASTRUCTURE	Airport	na
	Electrical Distribution	kV
	Flood Control	na
	Highway	lane miles
	Marine Facilities	na
	Central Utility Plant (CUP)	na
	Process Control	na
	Navigation	na
	Rail	miles
	Tunneling	na
	Water/Wastewater	gallons per day, cubic feet per day
	Telecom, Wide Area Network	na
	Pipeline	miles, MW, cubic feet per day, barrels per day
	Tank Farms	BBL
	Gas Distribution	cubic feet per day, barrels per day
BUILDINGS	Communication Center	BGSF
	Courthouse	BGSF
	Dormitory/Hotel/Housing/Residential	BGSF
	Embassy	BGSF
	Low-rise Office (<=3 floors)	BGSF
	High-rise Office (>3 floors)	BGSF
	Hospital	BGSF

Laboratory	BGSF
Maintenance Facilities	BGSF
Movie Theatre	BGSF
Parking Garage	BGSF
Physical Fitness Center	BGSF
Prison	BGSF
Restaurant/Night club	BGSF
Retail Building	BGSF
School	BGSF
Warehouse	BGSF
Other Buildings	BGSF

Change, Scope

Changes in the base scope of work or process basis. A scope change alters the project content or parameters such as size, capacity, use, location or product mix. Examples include changes in feedstock, site location, throughput, or the addition of unrelated scope.

Change, Project Development

Change required to execute the original scope of work or obtain the original process results as defined by the Owner. Project development changes are trends that do not alter the project premise. Examples: unforeseen site conditions that require a change in design/construction methods, changes required due to design errors and omissions, market escalation, productivity, estimate variations, design growth, schedule trends, and back charges and / or rework.

Commissioning Management Team

See Startup management team

Concession Agreement

A [concession](#) or [concession agreement](#) is a grant of rights, land or property by a government, local authority, corporation, individual or other legal entity.

Contract Type

If your project has alternative contracts, the chosen contract type should be the one that is most similar to the project contract. For mixed contracts (i.e., part Cost Reimbursable and part Lump Sum), the contract type should indicate the type with the largest contract amount.

Cost of Quality

This is the costs to conform to the required quality of the project. It consists of three different types of costs:

- Prevention costs are associated with keeping defective product away from the customer.
- Appraisal costs are associated with checking the product to make sure it is conforming.
- Failure costs are associated with the failure of a defective product. Internal failure costs are related with failure before commissioning and external failure costs are related with failure after commissioning.

Decisions (made by the managers)

For a contractor responding to the survey, these decisions should be the ones taken within your organization. For an owner responding to the survey, these decisions are those taken by the owner's project manager, within the scope of the owner's work.

Delivery Method

Design-Bid-Build: Serial sequence of design and construction phases: owner contracts separately with designer and constructor.

Design-Build: Owner contracts with Design-Build (EPC) contractor.

CM at Risk: Owner contracts with designers and construction manager (CM). CM holds the contracts.

Parallel Primes: Owner contracts separately with designer and multiple prime constructors.

Estimated Project Cost TBD: ad contract award for contractors. If Cost reimbursable? When you sign the actual contract with cost. See general program notes.

Duration, Forecast Project Duration

The forecast project duration [at the end of the phase](#). For owner companies, the forecasted project duration should include all phases from start of FEP to end of Startup. For contractors, the project duration reflects the participation of the contractor. For instance, an EPC contractor, will report the duration of procurement, engineering and construction phases.. If the contractors participating only in one phase, for instance, engineering or construction, then the forecast duration if the actual duration of the phase at the end of the phase.

First Aid

Using a nonprescription medication at nonprescription strength ([OSHA definition](#)). First aid is emergency care provided for injury or sudden illness before emergency medical treatment is available. The first-aid provider in the workplace is someone who is trained in the delivery of initial medical emergency procedures, using a limited amount of equipment to perform a primary assessment and intervention while awaiting arrival of emergency medical service (EMS). (Source: <https://www.osha.gov/Publications/OSHA3317first-aid.pdf>)

Full-Time Equivalent (FTE) and Team Size

Full-Time Equivalent (FTE) represents the number of participants and the percent of time each is allocated to the project. For example, if one team member, responsible for procurement, works ½ time on the project, then the procurement contribution to the FTE measure is 0.5. Likewise, if two project controls specialists work on the team full time, they contribute 2.0 FTE. For the team size, you should consider only the FTE working within your organization. For an owner, these include only the owner personnel working on the project. For instance, only the engineers working for the owner organization are counted in the Engineering team. For a contractor, all FTEs working directly for the contractor or subcontracted should be included.

Integrated Project Delivery (IPD)

A method of project delivery distinguished by a contractual arrangement among a minimum of owner, constructor and design professional that aligns business interests of all parties. IPD motivates collaboration throughout the design and construction process, tying stakeholder success to project success, and embodies the contractual and behavioral principle. (Source:<http://www.aia.org/about/initiatives/AIAS076981>)

Interim Product Database (IPD)

The term Interim Product Database (IPD) refers to a design-production integration scheme observed (by RT 232) in the Asian shipbuilding industry. The IPD consists, in essence, of a library of designs for “chunks” or modules of ships, design rules to allow rapid resizing, and all of the production information to drive a mechanized, automated assembly line to construct those chunks. See https://store.construction-institute.org/detail.aspx?id=RR255_11_E and <https://store.construction-institute.org/SearchResults.aspx?searchterm=rr232&searchoption=ALL>.

Major Equipment

Examples of Major Equipment are provided in Table 2. The count should include equipment listed on the procurement list. Contractors should only report major equipment that is included in their scope of work (both in terms of count and cost).

Table 2: Examples of Major Equipment

Examples of Major Equipment	Kinds of Equipment Covered
HVAC Systems	Prefabricated air supply houses
Columns and Pressure Vessels	Towers, columns, reactors, unfired pressure vessels, bulk storage spheres, and unfired kilns; includes internals such as trays and packing.
Tanks	Atmospheric storage tanks, bins, hoppers, and silos.
Exchangers	Heat transfer equipment: tubular exchangers, condensers, evaporators, reboilers, coolers (including fin-fan coolers and cooling towers).
Direct-Fired Equipment	Fired heaters, furnaces, boilers, kilns, and dryers, including associated equipment such as super-heaters, air preheaters, burners, stacks, flues, draft fans and drivers, etc.
Pumps	All types of liquid pumps and drivers.
Vacuum Equipment	Mechanical vacuum pumps, ejectors, and other vacuum producing apparatus and integral auxiliary equipment.
Motors	600V and above
Electricity Generation and Transmission	Major electrical items (e.g., unit substations, transformers, switch gear, motor-control centers, batteries, battery chargers, turbines, diesel generators).
Materials-Handling Equipment	Conveyers, cranes, hoists, chutes, feeders, scales and other weighing devices, packaging machines, and lift trucks.
Package Units	Integrated systems bought as a package (e.g., air dryers, air compressors, refrigeration systems, ion exchange systems, etc.).

Special Processing Equipment	Agitators, crushers, pulverizers, blenders, separators, cyclones, filters, centrifuges, mixers, dryers, extruders, fermenters, reactors, pulp and paper, and other such machinery with their drivers.
Conveyor systems	Elevator, escalators

Medical Treatment

Medical treatment means the management and care of a patient to combat disease or disorder. Medical treatment does not include: visits to a physician or other licensed health care professional solely for observation or counseling; the conduct of diagnostic procedures, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (e.g., eye drops to dilate pupils); or "first aid" ([OSHA definition](#)).
Synonym: [recordable case](#).

Midpoint of Phase

A date used for normalizing project and phase costs. It should fall within the reported actual phase start and end dates.

Modularization

Modularization is a major section of a plant resulting from a series of remote assembly operations and may include portions of many systems; usually the largest transportable unit or component of a facility. Modularization refers to the use of offsite construction (including a segregated area onsite). For the purposes of the benchmarking data, modularization includes all work that represents substantial offsite construction and assembly of components and areas of the finished project. Examples that would fall within this categorization include:

- Skid assemblies of equipment and instrumentation that naturally ship to the site in one piece, and require minimal on-site reassembly.
- Super-skids of assemblies of components that typically represent substantial portions of the plant, intended to be installed in a building.
- Prefabricated modules comprising both industrial plant components and architecturally finished enclosures.

Modularization does not include offsite fabrication of components. Examples of work that would be excluded from the definition of modularization include:

- Fabrication of the component pieces of a structural framework
- Fabrication of piping spool-pieces

(Source: CII General Program glossary)

Offsite Costs

"Costs arising from a construction project that are spent in places other than the construction site. The expenses connected to the extension of roads and power lines to a new housing community would be an example of offsite costs, since the money would be spent on development of resources away from the project location". (Source: <http://www.businessdictionary.com/definition/off-site-cost.html#ixzz2zjno6lr5>)

Offsite Fabrication

Offsite Fabrication is the practice of preassembly or fabrication of components both off the site and onsite at a location other than at the final installation location.

Phases

Table 3: Definitions of Phases

Phase	Typical Participants:	Start/Stop	Typical Activities and Products	Typical Cost Elements
Front End Planning / Programming	<ul style="list-style-type: none"> • Owner Personnel • Planning Consultants • Constructability Consultant • Alliance/Partner 	<p>Start: Defined Business Need that requires facilities</p> <p>Stop: Total Project Budget Authorized</p>	<ul style="list-style-type: none"> • Options Analysis • Life-cycle Cost Analysis • Project Execution Plan • Appropriation Submittal Pkg • P&IDs and Site Layout • Project Scoping • Procurement Plan • Arch. Rendering 	<ul style="list-style-type: none"> • Owner Planning Team Personnel Expenses • Consultant Fees & Expenses • Environmental Permitting Costs • Project Manager /Construction Manager Fees • Licensor Costs

Engineering / Design	<ul style="list-style-type: none"> • Typical Participants: • Owner Personnel • Design Contractor • Constructability Expert • Alliance/Partner 	<p>Start: Contract award to engineering firm</p> <p>Stop: Release of all approved drawings and specs for construction (or last package for fast-track)</p>	<ul style="list-style-type: none"> • Drawing & Spec Preparation • Bill of Material Preparation • Procurement Status • Sequence of Operations • Technical Review • Definitive Cost Estimate 	<ul style="list-style-type: none"> • Owner Project Management Personnel • Designer Fees • Project Manager /Construction Manager Fees
Procurement	<ul style="list-style-type: none"> • Typical Participants: • Owner Personnel • Design Contractor • Alliance/Partner 	<p>Start: Procurement Plan for Engineered Equipment</p> <p>Stop: All engineered equipment has been delivered to site</p>	<ul style="list-style-type: none"> • Supplier Qualification • Supplier Inquiries • Bid Analysis • Purchasing • Engineered Equipment Transportation • Supplier QA/QC • Owner Project Management Personnel 	<ul style="list-style-type: none"> • Owner Project Management Personnel • Project/Construction Manager Fees • Procurement & Expediting Personnel • Engineered Equipment Transportation • Shop QA/QC
Construction	<ul style="list-style-type: none"> • Typical Participants: • Owner Personnel • Design Contractor (Inspection) • Construction Contractor and its Subcontractors 	<p>Start: Commencement of foundations or driving piles</p> <p>Stop: Mechanical Completion</p>	<ul style="list-style-type: none"> • Set Up Trailers • Procurement of Bulks • Issue Subcontracts • Construction Plan for Methods/Sequencing • Build Facility & Install Engineered Equipment • Complete Punchlist • Demobilize Construction Equipment 	<ul style="list-style-type: none"> • Owner Project Management Personnel • Project Manager /Construction Manager Fees • Building Permits • Inspection QA/QC • Construction Labor, Equipment & Supplies- • Bulk Materials • Construction Equipment • Contractor Management Personnel • Warranties
Startup / Commissioning	<p>Note: Not usually applicable to infrastructure or building projects</p> <ul style="list-style-type: none"> • Owner personnel • Design Contractor • Construction Contractor • Training Consultant • Equipment Suppliers 	<p>Start: Mechanical Completion</p> <p>Stop: Custody transfer to user /operator (steady state operation)</p>	<ul style="list-style-type: none"> • Testing Systems • Training Operators • Documenting Results • Introduce Feedstocks and Obtain First Product • Hand-off to User/Operator • Operating System • Functional Facility • Warranty Work 	<ul style="list-style-type: none"> • Owner Project Management Personnel • Project Manager /Construction Manager Fees • Consultant Fees & Expenses • Operator Training Expenses • Wasted Feedstocks • Supplier Fees

Phase Cost

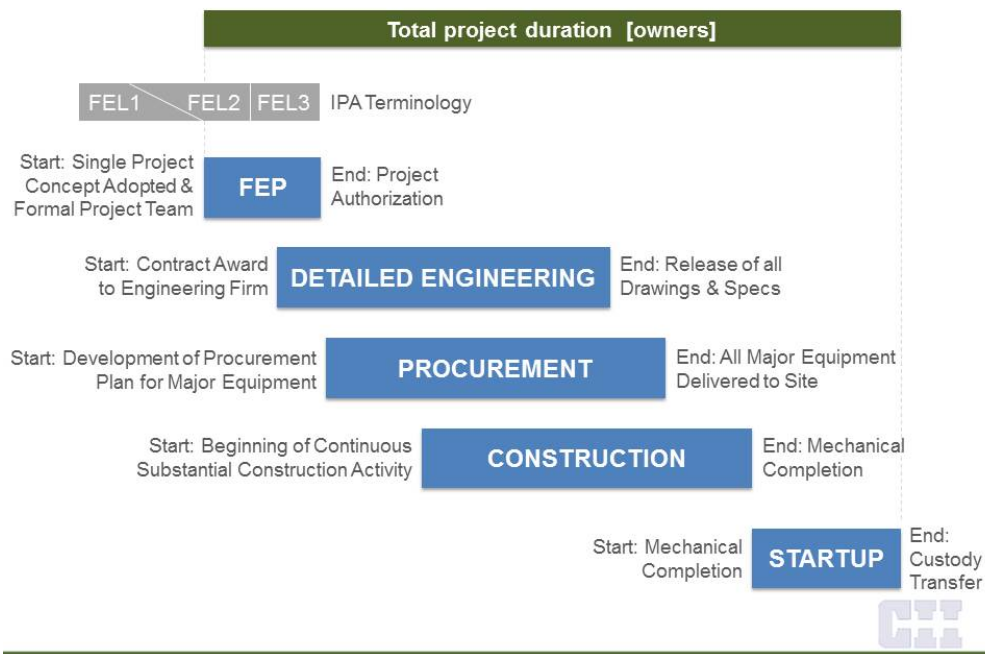
The cost of the project phase at the time of phase completion.

See Typical Cost Elements in the Phase Definitions on Table 3 above.

Phase Schedule

Please see the figure below for the definitions of the start and end of the 10-10 phases.

Phase Start and End - Definitions



Plan Percent Complete (Planned Percent Complete):

A basic measure of how well the planning system is working - calculated as the "number of assignments completed on the day stated" divided by the "total number of assignments made for the week". It measures the percentage of assignments that are 100% complete as planned. The Lean Construction Institute explains that "PPC is not a form of Earned Value that measures the percentage of completion achieved for an activity; rather it measures the percentage of assignments that are 100% complete".

Preassembly

Preassembly is a process by which various materials, prefabricated components, and/or equipment are joined together at a remote location for subsequent installation as a sub-unit; generally focused on a system.

Prefabrication

Prefabrication is a manufacturing process, generally taking place at a specialized facility, in which various materials are joined to form a component part of a final installation. Prefabricated components often involve the work of a single craft.

Processes and Systems

These are the management work processes and systems, including coordination, communication, controls, cost, schedule and quality systems. These systems should include all systems used within the respondent's organization (including the systems also used by both owners and contractors). Note that these can include tools driven by partners but also used within your company.

Program Changes

These are changes to the project's Program (defined as a set of related projects under the same umbrella) that will cause substantial changes in the scope of your project. Such a change is initiated mainly by owners during design development, but it can also occur later in the process. A related term is 'Scope Changes,' which are "changes in the base scope of work or process basis. Examples include: feedstock change, changed site location, changed throughput, addition of unrelated scope." (General Program Glossary v11).

(Total) Project Cost and Forecasted/Estimated Project Cost

(Synonym: Total Installed Cost)

The total actual/forecasted project cost should include all actual project costs (excluding the cost of land) from Programming/Front-end Planning through commissioning, including capitalized amounts expended for in-house salaries, overhead, travel, etc. The forecasted cost is the cost forecasted at the end of the phase. Costs to be excluded from Total Project Cost:

- Site work: Subsurface investigation, site clearing and grubbing, mass excavations, site dewatering, railroads, paving and surfacing. Underground piping systems, tie-ins to existing systems, water distribution, firewater.

- Systems/distribution, wells and pumps, storm sewers and drainage, sanitary sewers, ponds, reservoirs, landscaping, fencing, signage, site substations, feeders, underground electrical (duct banks) feeders, cathodic protection.
- Demolition: Site, Civil, Structural, Architectural, Equipment, Piping, HVAC, Electrical, and Automation demolition.
- Spare Parts: Excluded except for Startup spares.
- Laboratory Equipment: Exclude all bench top laboratory equipment costs.
- Connecting Concourse: All costs related to connecting concourse should be excluded.

For building projects, the estimated project cost doesn't include any costs beyond five (5') feet of the building perimeter. Therefore, offsite costs such as tunnels and other infrastructure outside the building site are not included. However, costs, such as the costs of modules pre-fabricated offsite but incorporated into the building, should be considered.

Owners: Estimated (Budget) amounts include contingency and correspond to estimated value at the end of the project phase being entered in the system. The total project **estimated cost** amount should include all planned expenses (excluding the cost of land) from Front-end Planning through startup, including amounts estimated for in-house salaries, overhead, travel, etc.

Contractors: Only enter cost data for your scope of work. Budget amounts should include contingency and correspond to the estimate at time of contract award. The total project **budget** amount should be the planned expenses of all functions performed by your company, including amounts for in-house salaries, overhead, travel, etc.

Project Definition Rating Index (PDRI)

Project Definition Rating Index (PDRI) is a Front End Planning tool used to measure the level of scope definition. It helps project teams to communicate and identify risks related to project scope definition.

Project Management Team

Typical Project Management Team participants may include:

- Project Manager	- Procurement	- Maintenance
- Engineering Manager / Project Engineer	- Contracting	- Consultants
- Construction Manager	- Project Controls	- Business Unit Personnel
- Operation Manager	- QA/QC	- Project Sponsor
- Discipline Engineering Leads	- HSE	- Finance Manager

Project Nature

- Grass Roots (Green Field): A new facility from the foundation up. A project requiring demolition of an existing facility before new construction begins is also classified as grass roots.
- Brownfield (co-locate): The expansion, redevelopment, or reuse of property or facility which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Common examples are abandoned gas stations and dry cleaners, railroad properties, factories and closed military bases.
- Addition, Expansion: A new addition that ties in to an existing facility, often intended to expand capacity. Synonym: Addition.
- Modernization/Renovation/Upgrade/Revamp: A building or facility for which a substantial amount of the equipment, structure, or other components is replaced or modified, and which may expand capacity and/or improve the process or facility. Synonyms: Renovation, Upgrade / Infill / Shell & Core.

Project Type

Industrial:

Heavy Industrial: Includes chemical manufacturing, cogeneration, environmental remediation, gas distribution, metals refining/processing, mining, natural gas processing, oil exploration/production, oil refining, oil sands, power generation, and pulp and paper.

Light industrial: Includes automotive manufacturing, consumer products manufacturing, food and beverage, microelectronics manufacturing, office products manufacturing, pharmaceutical manufacturing, pharmaceutical labs, and clean room.

Infrastructure: Includes airport, electrical distribution, flood control, highway, marine facilities, navigation, pipeline, rail, tunneling, water/wastewater, telecom, and wide area network.

Building: Includes non-industrial facilities, such as a communications center, courthouse, dormitory, hotel, large apartment complex, embassy, office building, hospital, laboratory, maintenance facilities, movie theatre, parking garage, physical fitness center, prison, restaurant, nightclub, retail building, school, or warehouse.

Project Sector

Below are a few examples of project types by industry sector.

If you are a contractor, and your scope of work is restricted to the building itself, excluding the engineered equipment and other aspects of the plant, you could choose to enter the project to the Building sector.

Table 4: List of projects categories by industry sector

Industrial	Buildings	Infrastructure
Heavy Industrial	Airport (Terminal, parking garage)	Airport (runway)
Chemical Manufacturing	Communications Center	Central Utility Plant
Electrical (Generating)	Courthouse	Electrical Distribution
Environmental	Dormitory/Hotel/Housing/Residential	Flood Control
Metals Refining/Processing	Embassy	Highway (including heavy haul road)
Mining	Low rise Office (3 floors)	Marine Facilities
Tailing	High rise Office (>3 floors)	Navigation
Natural Gas Processing	Hospital	Process Control
Oil/Gas Exploration/Production (well-site)	Laboratory	Rail
Oil Refining	Maintenance Facilities	Tunneling
Oil Sands Mining/Extraction	Movie Theatre	Water/Wastewater
Oil Sands SAGD	Parking Garage	Telecom, Wide Area Network
Oil Sands Upgrading	Physical Fitness Center	Pipeline
Cogeneration	Prison	Tank farms
Pulp and Paper	Restaurant/Nightclub	Gas Distribution
Other Heavy Industrial	Retail Building	Other Infrastructure
	School	
Light Industrial	Warehouse	
Automotive Manufacturing	Other Buildings	
Consumer Products Manufacturing		
Foods		
Microelectronics Manufacturing		
Office Products Manufacturing		
Pharmaceutical Manufacturing		
Pharmaceutical Labs		
Pharmaceutical Warehouse		
Clean Room (Hi-Tech)		
Other Light Industrial		

Recordable Incident

A recordable incident is a work-related illness or any injury that results in loss of consciousness, restriction of work or motion, transfer to another job, or requires medical treatment beyond first aid.

Startup or Commissioning Management Team

Startup Management Team may include:

- Business Unit Manager
- Owner Project Manager
- Plant Manager
- Manufacturing/Operations Representative
- Maintenance Representative
- Contractor Project Manager
- Construction Manager
- Startup Manager
- QA/QC Manager
- Procurement Manager
- Project Teams - Planner/Scheduler

- Estimator
- Supplier

Workface Planning (Last Planner)

"Workface planning" is used to refer specifically to construction execution of the [Advanced work packaging](#) (AWP) process. Advanced work packaging is a construction-driven process that adopts the philosophy of "beginning with the end in mind." It is a process that reduces unproductive, non-value added time by providing a structure for focused execution planning that is directed at the construction workface. It is a process that reduces unproductive, non-value added time.

Work Hours, Engineering/Design

Engineering work hours are all engineering hours (direct and indirect) charged against the project during the engineering phase and related to engineering. Note that, for an owner organization responding to this question, these are not only the hours of the owner's engineers but also the work hours related to consultants and contractors.

Work Hours, Construction

Actual work hours (direct and indirect), including rework hours.