

Engineering & Construction Project Startup¹

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This paper looks at engineering and construction project startup for three different project execution approaches. While specific to this industry, project professionals in other industries may find it is a good analog for their own efforts.

The paper underscores that:

- Large complex projects require strong foundations
- A day at the beginning of a project is just as valuable as a day at the end
- Strong project foundations are built during project startup
- Vertical startup is enabled by the use of a dedicated startup team
- Project startup should consider lessons learned on other projects

This paper addresses project startup for three general types of contracts:

- Pure design or engineering contracts typically performed for the Owner
- Design/build contracts performed for the Owner but recognizes that engineering may be undertaken by an engineering subcontractor within the D/B team
- Pure construction contract

The underlying philosophy laid out in this paper is one of a vertical launch built on strong foundations. The use of a dedicated project startup team is recommended and the potential scope of such a team is reflected by the items in **red**. The scope may be larger or smaller and the highlight is intended to suggest possibilities and underscore the concept of a project startup team.

The startup period may be thought of as the first 90 days although in some fast track projects it may be significantly shorter. At the bid stage a project startup schedule should be prepared as a sanity check on the overall schedule and as a way to confirm scope has been comprehensively addressed.

The table is best read column by column, for the particular contract type envisioned. Contracts and projects can have infinite variety and as such this should be viewed as a starting point.

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This paper is best used in conjunction with the various lessons learned executive insights that may be found at the National Academy of Construction website².

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
Alignment with Owner	Confirm Owner's SBOs ³	Confirm Owner's SBOs	Confirm Owner's SBOs
	Confirm agreement with SBOs by internal stakeholders	Confirm agreement with SBOs by internal stakeholders	Confirm agreement with SBOs by internal stakeholders
	Confirm agreement with SBOs by key external stakeholders and note gaps	Confirm agreement with SBOs by key external stakeholders and note gaps	Confirm agreement with SBOs by key external stakeholders and note gaps
	Agree SBO focused KPIs ⁴	Agree SBO focused KPIs	Agree SBO focused KPIs
	Involve owner in communication of SBOs to project team	Involve owner in communication of SBOs to project team	Involve owner in communication of SBOs to project team
	Agree and document required owner approvals and timeframes (per contract)	Agree and document required owner approvals and timeframes (per contract)	Agree and document required owner approvals and timeframes (per contract)
	Agree and document required submissions (per contract) and distribution to owner staff	Agree and document required submissions (per contract) and distribution to owner staff	Agree and document required submissions (per contract) and distribution to owner staff
	Agree management reporting format based on standard project reports	Agree management reporting format based on standard project reports	Agree management reporting format based on standard project reports
	Agree invoicing process, including timing, format and handling of exceptions	Agree invoicing process, including timing, format and handling of exceptions	Agree invoicing process, including timing, format and handling of exceptions

² <https://www.naocon.org/insights/>

³ Strategic Business Objectives

⁴ Key Performance Indicators

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Agree change order process, required documentation and requirements for timely disposition.	Agree change order process, required documentation and requirements for timely disposition.	Agree change order process, required documentation and requirements for timely disposition.
	Submit and confirm satisfaction with required bonds	Submit and confirm satisfaction with required bonds	Submit and confirm satisfaction with required bonds
	Submit and confirm satisfaction with required licenses and corporate documentation	Submit and confirm satisfaction with required licenses and corporate documentation	Submit and confirm satisfaction with required licenses and corporate documentation
	Submit and confirm satisfaction with required insurance certificates	Submit and confirm satisfaction with required insurance certificates	Submit and confirm satisfaction with required insurance certificates
	Confirm completion and satisfaction with any forms or agreements incorporated in proposal or contract	Confirm completion and satisfaction with any forms or agreements incorporated in proposal or contract	Confirm completion and satisfaction with any forms or agreements incorporated in proposal or contract
	Agree and document any Owner governance processes not otherwise addressed	Agree and document any Owner governance processes not otherwise addressed	Agree and document any Owner governance processes not otherwise addressed
Alignment with JV⁵ Partners (if any)	Issue and obtain agreement on JV Board charter, reporting and powers reserved.	Issue and obtain agreement on JV Board charter, reporting and powers reserved.	Issue and obtain agreement on JV Board charter, reporting and powers reserved.
	Define any JV Board subcommittees, roles and responsibilities	Define any JV Board subcommittees, roles and responsibilities	Define any JV Board subcommittees, roles and responsibilities

⁵ Joint Venture

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Issue updated JV agreement to all JV members	Issue updated JV agreement to all JV members	Issue updated JV agreement to all JV members
	Establish JV banking relationships and signatories	Establish JV banking relationships and signatories	Establish JV banking relationships and signatories
	Execute any agreed to JV insurance programs	Execute any agreed to JV insurance programs	Execute any agreed to JV insurance programs
	Establish and issue policy on JV Board communication with owner	Establish and issue policy on JV Board communication with owner	Establish and issue policy on JV Board communication with owner
	Establish and issue policy on JV Board communication with project team	Establish and issue policy on JV Board communication with project team	Establish and issue policy on JV Board communication with project team
	Establish JV policy on external communications	Establish JV policy on external communications	Establish JV policy on external communications
	Execute any multi-party labor agreements (limited for engineering only contracts)	Execute any multi-party labor agreements	Execute any multi-party labor agreements
	Identify any 3 rd party legal counsel for JV	Identify any 3 rd party legal counsel for JV	Identify any 3 rd party legal counsel for JV
	Establish audit policy and select outside audit firm	Establish audit policy and select outside audit firm	Establish audit policy and select outside audit firm
	Establish and issue JV safety policy	Establish and issue JV safety policy	Establish and issue JV safety policy
	Review and confirm project risk register from JV perspective (JV Risk Register)	Review and confirm project risk register from JV perspective (JV Risk Register)	Review and confirm project risk register from JV perspective (JV Risk Register)
	Assign and mobilize key members of project team	Assign and mobilize key members of project team	Assign and mobilize key members of project team

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Authorize and deploy Project Startup Team	Authorize and deploy Project Startup Team	Authorize and deploy Project Startup Team
	Establish and implement intellectual property rights agreement	Establish and implement intellectual property rights agreement	Establish and implement intellectual property rights agreement
	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed
Project Management Standup and Initiation	Prepare prime contract summary, obtain JV Board or Company concurrence and issue to project team	Prepare prime contract summary, obtain JV Board or Company concurrence and issue to project team	Prepare prime contract summary, obtain JV Board or Company concurrence and issue to project team
	Conduct initial project kickoff meeting	Conduct initial project kickoff meetings. Initial meeting with entire D/B team followed by separate meeting of design and construction teams	Conduct initial project kickoff meeting
	Establish project team communication protocol and initial distribution lists	Establish project team communication protocol and initial distribution lists	Establish project team communication protocol and initial distribution lists
	Conduct listening session with Owner staff on project background to uncover any otherwise undisclosed concerns or information	Conduct listening session with Owner staff on project background to uncover any otherwise undisclosed concerns or information	Conduct listening session with Owner staff on project background to uncover any otherwise undisclosed concerns or information
	Establish schedule of face to face meetings with Owner	Establish schedule of face to face meetings with Owner	Establish schedule of face to face meetings with Owner

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Schedule and conduct initial Project Steering Committee (JV Board) meeting	Schedule and conduct initial Project Steering Committee (JV Board) meeting	Schedule and conduct initial Project Steering Committee (JV Board) meeting
	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed
<i>Scope</i>	Prepare project scope summary delineating items not in scope and who is responsible and issue to client for concurrence; issue to project team as baseline scope upon client concurrence. Advise JV Board or Company management of any variance from proposal.	Prepare project scope summary delineating items not in scope and who is responsible and issue to client for concurrence; issue to project team as baseline scope upon client concurrence. Advise JV Board or Company management of any variance from proposal.	Prepare project scope summary delineating items not in scope and who is responsible and issue to client for concurrence; issue to project team as baseline scope upon client concurrence. Advise JV Board or Company management of any variance from proposal.
	Issue Change Control Process to project team	Issue Change Control Process to project team. Change control process is with respect to prime contract with Owner. Change control with respect to engineering subcontract to constructor will use a compatible and supporting process. D/B contractor needs to pay attention to timeliness of notices since clock may begin with notice to	Issue Change Control Process to project team

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
		contractor by engineer.	
	Document all elements required for a “complete” project which are not within the prescriptive scope and confirm they are to be provided by the owner or through another contract	Document all elements required for a “complete” project which are not within the prescriptive scope and confirm they are to be provided by the owner or through another contract. Similarly confirm scope completeness if a performance or outcomes based scope.	Document all elements required for a “complete” project which are not within the prescriptive scope and confirm they are to be provided by the owner or through another contract
<i>Startup</i>	Issue client with a schedule of startup approvals required	Issue client with a schedule of startup approvals required. Engineering subcontract may require additional approvals from contractor who is their direct client.	Issue client with a schedule of startup approvals required
<i>Risk</i>	Review and update risk register and issue as project baseline. Advise JV Board or Company management of any variance from proposal.	Review and update risk register and issue as project baseline. Advise JV Board or Company management of any variance from proposal.	Review and update risk register and issue as project baseline. Advise JV Board or Company management of any variance from proposal.
	Identify high impact events for risk tracking whether provision has been made in risk assessment or not.	Identify high impact events for risk tracking whether provision has been made in risk assessment or not.	Identify high impact events for risk tracking whether provision has been made in risk assessment or not.

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Similarly track even if mitigated by contract or insurance. Rerun risk analysis with a fat tail distribution.	Similarly track even if mitigated by contract or insurance. Rerun risk analysis with a fat tail distribution.	Similarly track even if mitigated by contract or insurance. Rerun risk analysis with a fat tail distribution.
	Create or update assumption register linked to project baselines.	Create or update assumption register linked to project baselines.	Create or update assumption register linked to project baselines.
	Identify and address any Black Elephants ⁶	Identify and address any Black Elephants	
Schedule	Update startup 30, 60, 90 day startup schedule; initiate rolling 90 day schedule	Update startup 30, 60, 90 day startup schedule; initiate rolling 90 day schedule	Update startup 30, 60, 90 day startup schedule; initiate rolling 90 day schedule
	Ensure sufficient granularity around any actions required to support early deliverables or decision points	Ensure sufficient granularity around any actions required to support early deliverables or decision points. Concurrent engineering with construction changes the sequence of design.	Ensure sufficient granularity around any actions required to support early deliverables or decision points
		Identify permits, ROW ⁷ and utility relocations required by each construction package and program and schedule each item as a separate task.	Identify permits, ROW and utility relocations required by each construction package and program and schedule each item as a separate task
		Prepare submission schedule to each	Prepare submission schedule to each

⁶ Prieto, R. (2020). Black Elephants; *PM World Journal*, Vol. IX, Issue VIII, August. <https://peworldlibrary.net/wp-content/uploads/2020/07/pmwj96-Aug2020-Prieto-Black-Elephants-featured-paper.pdf>

⁷ Right of Way

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
		affected agency and utility to ensure awareness of timing of packages to be submitted and their priority.	affected agency and utility to ensure awareness of timing of packages to be submitted and their priority.
	Update contract Master Schedule reflecting any changes since original submission including any changes in seasonality. Issue as Schedule baseline.	Update contract Master Schedule reflecting any changes since original submission including any changes in seasonality. Issue as Schedule baseline.	Update contract Master Schedule reflecting any changes since original submission including any changes in seasonality. Issue as Schedule baseline.
	Initiate review of schedule precedencies and concurrencies.	Initiate review of schedule precedencies and concurrencies.	Initiate review of schedule precedencies and concurrencies.
	Initiate development of progressively detailed WBS ⁸ identifying major work packages and deliverables	Initiate development of progressively detailed WBS identifying major work packages and deliverables	Initiate development of progressively detailed WBS identifying major work packages and deliverables
	Add any schedule related assumptions to assumption register for tracking.	Add any schedule related assumptions to assumption register for tracking.	Add any schedule related assumptions to assumption register for tracking.
	Prepare calendar of client required approvals and timing on a rolling basis.	Prepare calendar of client required approvals and timing on a rolling basis. For engineering client includes both the contractor and the Owner	Prepare calendar of client required approvals and timing on a rolling basis.

⁸ Work Breakdown Structure

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
<i>Estimates (engineering; CAPEX⁹)</i>	Review and update estimate for any gaps or deficiencies	Review and update estimate for any gaps or deficiencies	Review and update estimate for any gaps or deficiencies
	Initiate development of a detailed estimate of indirect costs/ out of pocket expenses born by the project	Initiate development of a detailed estimate of indirect costs/ out of pocket expenses born by the project	Initiate development of a detailed estimate of indirect costs/ out of pocket expenses born by the project
	Review risk and contingency amounts in light of updates to other project baselines	Review risk and contingency amounts in light of updates to other project baselines. Reviews include those related to both the engineering effort as well as the overall D/B contract	Review risk and contingency amounts in light of updates since bid submittal.
	Add key estimate assumptions to assumption register for tracking	Add key estimate assumptions to assumption register for tracking	Add key estimate assumptions to assumption register for tracking
	Allocate budgets to responsible organizational elements of subcontractors	Allocate budgets to responsible organizational elements of subcontractors	Allocate budgets to responsible organizational elements of subcontractors
<i>Execution</i>	Issue Project Charter and consolidated project baseline	Issue Project Charter and consolidated project baseline. Project baseline will include both an engineering baseline, including an expanded basis of design, as well as all elements of a construction baseline	Issue Project Charter and consolidated project baseline

⁹ Capital Expenditures

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Prepare and issue project execution plan and execution processes	Prepare and issue project execution plan and execution processes. These will include an overall D/B plan which may incorporate the engineering equivalent. Alternately, engineering may issue its own plan and processes for dealing with engineering aspects and defining how it will operate with respect under its subcontract.	Prepare and issue project execution plan and execution processes
	Update and issue RACI ¹⁰ matrix	Update and issue RACI matrix. This will include engineering activities as well as construction activities and may reflect elements of review or approval from the engineering parent organization	Update and issue RACI matrix
	Establish project reporting and reports process and procedures; initiate project controls manual; initiate project control	Establish project reporting and reports process and procedures; initiate project controls manual; initiate project control. Reporting and control of engineering	Establish project reporting and reports process and procedures; initiate project controls manual; initiate project control

¹⁰ Responsible, Accountable, Consulted, Informed

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
		activities may include elements beyond what is just required in the D/B context.	
	Issue safety and ethics statements and implement required training; initiate any required safety manual	Issue safety and ethics statements and implement required training; initiate any required safety manual	Issue safety and ethics statements and implement required training; initiate any required safety manual
	Conduct initial project team alignment sessions	Conduct initial project team alignment sessions	Conduct initial project team alignment sessions
	Conduct initial Value Improvement Workshop	Conduct initial Value Improvement Workshop	Conduct initial Value Improvement Workshop
Project Administration	Obtain/establish project office (if any)	Obtain/establish project office (if any)	Obtain/establish project office (if any)
	Standup project IT system and processes; create and issue digital technology plan; issue list of approved software and obtain necessary licenses; create any required user accounts	Standup project IT system and processes; create and issue digital technology plan; issue list of approved software and obtain necessary licenses; create any required user accounts	Standup project IT system and processes; create and issue digital technology plan; issue list of approved software and obtain necessary licenses; create any required user accounts
	Implement any required project intranet	Implement any required project intranet	Implement any required project intranet
	Initiate any external website development and obtain any Owner approvals	Initiate any external website development and obtain any Owner approvals	Initiate any external website development and obtain any Owner approvals

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Prepare and implement a cybersecurity plan	Prepare and implement a cybersecurity plan	Prepare and implement a cybersecurity plan
	Standup document control processes and procedures	Standup document control processes and procedures	Standup document control processes and procedures
	Establish log and tracking of any Owner provided materials.	Establish log and tracking of any Owner provided materials. For the engineering subcontractor this would include anything furnished to them by the design-builder	Establish log and tracking of any Owner furnished materials, tools or equipment
	Standup project purchasing organization, process and procedures	Standup project purchasing organization, process and procedures	Standup project purchasing organization, process and procedures
	Negotiate and execute any early/ long lead procurements including pre-agreed subcontractors	Negotiate and execute any early/ long lead procurements including pre-agreed subcontractors	Negotiate and execute any early/ long lead procurements including pre-agreed subcontractors
	Implement project safety and security during initial standup mobilization if required	Implement project safety and security during initial standup mobilization if required	Implement project safety and security during initial standup mobilization if required
	Standup BIM ¹¹ model process, procedures and access requirements and privileges for the Common Data Environment	Standup BIM model process, procedures and access requirements and privileges for the Common Data Environment	Obtain necessary hardware, software and system access to utilize project BIM model. Ensure appropriate privilege levels and mutually

¹¹ Building Information Modeling

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
			protective IP ¹² agreements.
	Update staffing plan and initiate recruitment	Update staffing plan and initiate recruitment	Update staffing plan and initiate recruitment
	Draft initial Project Orientation Guide	Draft initial Project Orientation Guide	Draft initial Project Orientation Guide
	Establish any project specific labor agreements or contracts required	Establish any project specific labor agreements or contracts required	Establish any project specific labor agreements or contracts required
	Implement time collection processes and procedures	Implement time collection processes and procedures	Implement time collection processes and procedures
	Initiate any surveying or boring contracts	Initiate any surveying or boring contracts	Initiate any surveying or boring contracts
	Standup and implement billings and payments until final organization in place. (In JV this may initially be done by Managing Partner)	Standup and implement billings and payments until final organization in place. (In JV this may initially be done by Managing Partner). Establish process and procedures for any engineering subcontractor billings.	Standup and implement billings and payments until final organization in place. (In JV this may initially be done by Managing Partner)
	Identify any contract required notice or action requirements and educate project team	Identify any contract required notice or action requirements and educate project team	Identify any contract required notice or action requirements and educate project team
	Prepare first client notice (when required)	Prepare first client notice (when required). In D/B arrangement this would include notice	Prepare first client notice (when required)

¹² Intellectual Property

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
		to D/B contractor for changes outside of scope directed by contractor whether originating from or a result of Owner directed or caused changes.	
	Establish and implement any document classification system (confidential; proprietary; secret; privileged legal document; trade secret	Establish and implement any document classification system (confidential; proprietary; secret; privileged legal document; trade secret	Establish and implement any document classification system (confidential; proprietary; secret; privileged legal document; trade secret
	Initial identification of training needs	Initial identification of training needs	Initial identification of training needs
	Implement knowledge management including establishment of project library with all available project information	Implement knowledge management including establishment of project library with all available project information. Separately, various D/B players will require access to their respective parent knowledge management systems.	Implement knowledge management including establishment of project library with all available project information
	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed
Stakeholders	Confirm responsibilities with respect to	Confirm responsibilities with respect to	Confirm responsibilities with respect to

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	stakeholders with Owner and obtain concurrence on understanding	stakeholders with Owner and obtain concurrence on understanding	stakeholders with Owner and obtain concurrence on understanding
	Compile/ issue master stakeholder list including contact information	Compile/ issue master stakeholder list including contact information	Compile/ issue master stakeholder list including contact information
	Prepare summary of stakeholder commitments made by owner and obtain owner concurrence	Prepare summary of stakeholder commitments made by owner and obtain owner concurrence	Prepare summary of stakeholder commitments made by owner and obtain owner concurrence
	Create register of issues by stakeholder noting common issues and conflicts	Create register of issues by stakeholder noting common issues and conflicts	Create register of issues by stakeholder noting common issues and conflicts
	Develop strategy and initial plan for stakeholder engagement and confirm roles and responsibilities with Owner	Develop strategy and initial plan for stakeholder engagement and confirm roles and responsibilities with Owner	Typically an Owner responsibility but as required develop strategy and initial plan for stakeholder engagement and confirm roles and responsibilities with Owner
	Prepare stakeholder information above for both internal and external stakeholders	Prepare stakeholder information above for both internal and external stakeholders	As required, prepare stakeholder information above for both internal and external stakeholders
	Schedule initial stakeholder listening sessions with all stakeholders	Schedule initial stakeholder listening sessions with all stakeholders	Schedule initial stakeholder listening sessions with all stakeholders, in conjunction with other Owner driven stakeholder activities.

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed
Engineering	Establish an expanded basis of design (Business Basis of Design ¹³)	Establish an expanded basis of design (Business Basis of Design)	Review engineering basis of design for construction impacting elements
	Establish quality requirements, QC ¹⁴ and QA ¹⁵ processes	Establish quality requirements, QC and QA processes	Review quality of design documents received and initiate addressing any systemic issues
	Establish design margin tables	Establish design margin tables	Review adequacy of design margins for transient/ temporary loads during construction, startup or commissioning
	Establish required BIM environment with attendant policies, process, procedures and privileges.	Establish required BIM environment with attendant policies, process, procedures and privileges.	Access to required BIM environment with attendant policies, process, procedures and privileges. Integrate/ interface any contractor specific BIM tools or programs.
	Review design libraries and catalogs for potential design reuse	Review design libraries and catalogs for potential design reuse	Identify any reused design elements and availability of pre-existing construction or erection plans or lessons learned.
	Prepare initial draft of project standards	Prepare initial draft of project standards	Prepare initial draft of project and construction standards; go-bys,

¹³ <https://www.naocon.org/wp-content/uploads/Business-Basis-of-Design.pdf>

¹⁴ Quality Control

¹⁵ Quality Assurance

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
			instructions and checklists
	Develop interface management matrix	Develop interface management matrix	Develop interface management matrix or confirm items on an Owner provided matrix
	Identify long lead equipment	Identify long lead equipment	Identify long lead equipment and initiate procurement or if separately ordered by Owner confirm status.
	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed
Construction			Procure and install project signage
	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed	Best practices and lessons learned reviewed
		Establish value of time	Establish value of time
<i>General Conditions</i>		Prepare and issue initial site general arrangements	Obtain final General Arrangements to facilitate construction planning
		Initial site traffic plan	Initial site traffic plan
		Initial laydown, storage and warehousing plan and implementation	Initial laydown, storage and warehousing plan and implementation
		Initial plan and implementation for administrative/ office facilities	Initial plan and implementation for administrative/ office facilities
		Initial plan and layout of shop and maintenance	Initial plan and layout of shop and maintenance

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
		facilities. Implement as required.	facilities. Implement as required.
		Initial project logistics plan and offsite areas	Initial project logistics plan and offsite areas
		Initial labor and crew related facilities plan and implementation.	Initial labor and crew related facilities plan and implementation.
		Estimate of Indirect Field Costs prepared or updated	Estimate of Indirect Field Costs updated
			Initial fleet plan and procurement
		Initial site fencing and security implemented	Initial site fencing and security implemented
		Plan temporary site services implemented (water, waste (solid and liquid), commissary)	Temporary site services implemented (water, waste (solid and liquid), commissary)
		Project HSE ¹⁶ stood up and operational	Project HSE stood up and operational
		Time control for craft in place	Time control for craft in place
Construction Planning			Cataloging and review of engineering drawings noting status and quality
			Onsite access to BIM model
			Initial construction work areas and work package definition
			Construction equipment plan
			Rough grading plan complete and rough grading initiated

¹⁶ Health Safety Environmental

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
			Foundation excavation plan initiated
		Modularization strategy initiated	Modularization strategy initiated
		Supplier prequalification/ shop audit plan	Supplier prequalification/ shop audit plan
			Initiate startup and commissioning plan
			Initiate system turnover identification and packaging
			Establish turnover documentation requirements
Construction Technology		Construction technology plan initiated	Construction technology plan completed
			Materials testing plan completed and vendors engaged
Construction		Initiate initial clearing and grubbing	Initiate initial clearing and grubbing
		Identify and protect surveying and other monuments	Identify and protect surveying and other monuments
		Identify and initiate additional borings and soil testing	Identify and initiate additional borings and soil testing
		Establish initial environmental controls (dust, noise, erosion and pollution)	Establish initial environmental controls (dust, noise, erosion and pollution)
		Rough grading initiated	Rough grading initiated
		Temporary roads and parking lots well underway	Temporary roads and parking lots well underway

	Design/Engineering Project	Design/Build (D/B) Project	Construction Project
			Utility trenches identified and initiated where possible
			Offsite power being mobilized
		Initial safety training underway (continuous)	Initial safety training underway (continuous)
<i>Construction engineering</i>			Initiate design of temporary works
			Develop cut and fill plan

About the Author



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Bob Prieto is a senior executive effective in shaping and executing business strategy and a recognized leader within the infrastructure, engineering and construction industries. Currently Bob heads his own management consulting practice, Strategic Program Management LLC. He previously served as a senior vice president of Fluor, one of the largest engineering and construction companies in the world. He focuses on the development and delivery of large, complex projects worldwide and consults with owners across all market sectors in the development of programmatic delivery strategies. He is author of nine books including “Strategic Program Management”, “The Giga Factor: Program Management in the Engineering and Construction Industry”, “Application of Life Cycle Analysis in the Capital Assets Industry”, “Capital Efficiency: Pull All the Levers” and, most recently, “Theory of Management of Large Complex Projects” published by the Construction Management Association of America (CMAA) as well as over 700 other papers and presentations.

Bob is an Independent Member of the Shareholder Committee of Mott MacDonald. He is a member of the ASCE Industry Leaders Council, National Academy of Construction, a Fellow of the Construction Management Association of America and member of several university departmental and campus advisory boards. Bob served until 2006 as a U.S. presidential appointee to the Asia Pacific Economic Cooperation (APEC) Business Advisory Council (ABAC), working with U.S. and Asia-Pacific business leaders to shape the framework for trade and economic growth. He had previously served as both as Chairman of the Engineering and Construction Governors of the World Economic Forum and co-chair of the infrastructure task force formed after September 11th by the New York City Chamber of Commerce. Previously, he served as Chairman at Parsons Brinckerhoff (PB) and a non-executive director of Cardno (ASX)

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