

Path of Construction - Input Checklist

Input Owner	Input	Type	Due Date	✓	Output	Type	✓
Project Management	Project Charter	Doc					
	Enterprise Objectives	Doc					
	Project Objectives	Doc					
	Project Delivery System	Doc					
	Project Key Milestone/Deadlines	Schedule					
	Project Quality Manual	Doc					
	Important Risks/Risk Mgmt plan	Doc					
	High-level Deliverables List	Doc					
	High-level Scope	Doc					
	Priliminary Level II WBS	Doc					
	Major long lead items	Doc					
	Modularization Srategy	Doc					
Operation C & SU	Start up Schedule	Schedule					
	Preliminary System Turnover Schedule	Schedule					
Construction Management	Heavy Lift Plan	Doc					
	List of Constraints (permits, live areas, hazardous areas, operational constraints, shut down schedule, camp space, other projects, environmental)	Doc					
	Access and Mobility issues	Doc					

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Input Owner	Input	Type	Due Date	✓	Output	Type	✓
Engineering	Preliminary Plot Plan	Drawing					
	Preliminary PFD	Drawing					
	Engineering key milestones	Doc					
	Engineering Level II WBS	Doc					
	Engineering Level II Schedule	Schedule					
	Constructability implementation plan	Doc					
	Identified Engineering Constraints	Doc					
	Preliminary Construction Specs	Doc					
Project Controls	Quality Control Procedures	Doc					
	Level I Schedule	Schedule					
	Lessons Learned	Doc					

ASSUMPTIONS

Project Charter is approved
Adequate resources are available and correct
The proper reviews and authorizations will be applied to support the process
The appropriate technical tools (Organizational Process Assets) exist
Constructability studies have been applied
Scope Management is not a consideration

1 INPUTS

- .1 Project Scope Statement / Scope Baseline
- .2 Project Charter
- .3 Enterprise Environmental Factors
- .4 Enterprise Objectives and Considerations
- .5 Site Plan – High level process areas layout
- .6 C & SU Systems Priorities Defined
- .7 WBS (Equipment and Systems identified)
- .8 Plot Plans
- .9 Project Delivery Model
- .10 Project Management Plan
- .11 Milestone Schedule
- .12 Construction Execution Plan
- .13 Construction Input / Expertise
- .14 Heavy Lift Requirements
- .15 Specialty Contractors
- .16 Procurement Constraints (Long Leads)
- .17 Organizational Process Assets (Standards, Procedures, Templates, Measurement Data, Project Files)

2 TOOL AND TECHNIQUES

- .1 Constructability Techniques Applied
- .2 Expert Judgment
- .3 Decomposition
- .4 Alternatives Identification
- .5 Select construction techniques – modularization, prefabrication, Contracting options
- .6 Activity Sequencing
- .7 Activity Duration Estimating
- .8 Work Packaging – defining CWP/EWP/FIWP
- .9 Interactive schedule development
- .10 Risk identification and management
- .11 Management of Change – Scope Control

3 OUTPUTS

- .1 Integrated Project Baseline Schedule with Engineering, Procurement, and Construction deliverables identified
- .2 Contracting Plan
- .3 CWP / EWP Schedule
- .4 FIWP release plan
- .5 Modularization, Prefabrication and Pre-assembly Plans
- .6 Construction Management Team Resource Requirements
- .7 Project Constraints
- .8 Construction Risk Identification
- .9 Critical Path

Path of Construction - RASCI Chart

R = Responsible - The Doers
A = Accountable - Owner of the Work
S = Supporting - Provide Resources
C = Consulted - Give Input
I = Informed - Require Updates/Progress

	<i>Construction Director</i>	<i>Construction Manager</i>	<i>Constructability Coordinator</i>	<i>CWP Coordinator</i>	<i>Engineering Manager</i>	<i>Procurement Manager</i>	<i>Scheduler</i>	<i>Contracts Manager</i>	<i>Project Manager</i>	<i>C&SU Manager</i>	<i>Operations Manager</i>	<i>Estimator</i>
INPUTS												
Project Scope Statement / Scope Baseline	I								R			
Project Charter									R			
Enterprise Environmental Factors									R			
Enterprise Objectives and Considerations									R			
Site Plan – High level process areas layout									R			
C & SU Systems Priorities Defined		S								R	A	
WBS (Equipment and Systems identified)						S			R			
Plot Plans	I	C	S		R							
Project Delivery Model									R			
Project Management Plan									R			
Milestone Schedule												
Construction Execution Plan	A											
Construction Input / Expertise	A											
Heavy Lift Requirements	A											
Specialty Contractors												
Procurement Constraints (Long Leads)												
Organizational Process Assets (Standards, Procedures, Templates, Measurement Data, Project Files)												

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	Construction Director	Construction Manager	Constructability Coordinator	CWP Coordinator	Engineering Manager	Procurement Manager	Scheduler	Contracts Manager	Project Manager	C&SU Manager	Operations Manager	Estimator
TOOLS AND TECHNIQUES												
Constructability Techniques Applied												
Expert Judgment												
Decomposition												
Alternatives Identification												
Select construction techniques – modularization, prefabrication, Contracting options												
Activity Sequencing												
Activity Duration Estimating												
Work Packaging – defining CWP/EWP/FIWP												
Interactive schedule development												
Risk identification and management												
Management of Change – Scope Control												
OUTPUTS												
Integrated Project Baseline Schedule												
with Engineering, Procurement, and Construction deliverables identified												
Contracting Plan												

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	Construction Director	Construction Manager	Constructability Coordinator	CWP Coordinator	Engineering Manager	Procurement Manager	Scheduler	Contracts Manager	Project Manager	C&SU Manager	Operations Manager	Estimator
CWP / EWP Schedule												
FIWP release plan												
Modularization, Prefabrication and Pre-assembly Plans												
Construction Management Team Resource Requirements												
Project Constraints												
Construction Risk Identification												
Critical Path												

MEGA PROJECT

Path of Construction: ABC Construction Company

Document Number: WFP-TMP-2013-A

DOCUMENT VERSION		
Revision	Description	Date
Rev. A	Authored and Issued for Review	01 JAN 13

AUTHORSHIP AND APPROVALS			
Originated By	J. Smith	01 JAN 13	
Reviewed By	First and Last Name	01 JAN 13	Signature
Approved By	First and Last Name	01 JAN 13	Signature

Record of Revision

Revision	Date	Revision Description	Originated By	Reviewed By	Approved By
Rev. A	01 JAN 13	Authored and Issued for Review	J. Smith		

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ABC Construction		Procedure
Department:	CONSTRUCTION MANAGEMENT	Number: PCM-GP-0001
Subject:	PATH OF CONSTRUCTION	Revision: A

1. Purpose

The purpose of this procedure is to outline the methodology for executing the path of construction process.

2. Scope

This document contains detailed information about conducting multiple sessions that follow a process flow diagram by projects stage versus roles outlining the inputs, activities, and outputs necessary to develop a path of construction.

3. Responsibilities

Who is responsible for the document and executing its contents; find definitions for RASCI in the definitions section.

3.1 Construction Director

Accountable to ensure the path of construction procedure is followed in the development of the path of construction.

3.2 Construction Manager

Responsible for using the path of construction procedure as a guideline for the process. The Construction Manager will facilitate the path of construction sessions and have the appropriate level of experience to perform the path of construction activities.

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3.2.1 Constructability Coordinator

Has a supporting role to the Construction Manager and the Path of construction activities.

3.2.2 CWP Coordinator

Develops and maintains CWP list and interfaces with engineering to ensure EWPs are in line with the path of construction

3.2.3 Engineering Manager

Participates in path of construction activities as a Subject Matter Expert and to represent Engineering's interests.

3.2.4 Procurement Manager

Participates in path of construction activities as a Subject Matter Expert.

3.2.5 Scheduler

Represents the path of construction in the project schedule in the form of CWPs.

3.2.6 Contracts Manager

Participates in path of construction activities as a Subject Matter Expert.

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3.2.7 Project Manager

Participates in path of construction activities as a Subject Matter Expert.

3.2.8 C&SU Manager

Participates in path of construction activities as a Subject Matter Expert.

3.2.9 Estimator

Participates in path of construction activities as a Subject Matter Expert.

3.2.10 Operations Manager

Participates in path of construction activities as a Subject Matter Expert.

3.3 Definitions

- **Responsible** - these people are the “doers” of the work. They must complete the task or objective or make the decision. Several people can be jointly responsible.
- **Accountable** - this person is the “owner” of the work. He or she must sign off or approve when the task, objective or decision is complete. This person must make sure that responsibilities are assigned in the matrix for all related activities. There is only one person accountable, which means that “the buck stops there.”
- **Supporting** - can provide resources or can play a supporting role in implementation

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- Consulted - these are the people who need to give input before the work can be done and signed-off on. These people are “in the loop” and active participants.
- Informed - these people need to be kept “in the picture.” They need updates on progress or decision, but they do not need to be formally consulted, nor do they contribute directly to the task or decision.
- Facilitator – is a person or party with proven credentials to manage the proceedings of a meeting of people from different backgrounds with different agendas and direct them to arrive at consensus decisions in an effective manner, all without interjecting the facilitator’s own preferences.
- Construction Work Area (CWA) - A portion (square) of the plot plan that has been defined by construction as being a logical area of work. The CWA includes all of the disciplines.
- Construction Work Package (CWP) - An executable construction deliverable that defines in detail a specific scope of work and should include a budget and schedule that can be compared with actual performance. The scope of work is such that it does not overlap another CWP. The CWP can be used as a scoping document for Requests for Proposal and Contracts.
- Engineering Work Package (EWP) - An engineering deliverable that is used to develop CWPs and that defines a scope of work to support construction in the form of drawings, procurement deliverables, specifications, and vendor support. The EWP is released in an approved sequence that is consistent with the CWP schedule. The scope of work is typically both by discipline and by area.
- Installation Work Package (IWP) - A detailed execution plan that ensures all elements necessary to complete the scope of the IWP are organized and delivered before work is started. This detailed planning enables craft persons to perform quality work in a safe, effective, and efficient manner. Generally, the scope of work associated with the IWP is small enough that it could be completed by a single-foreman team, typically in a one- or two-week time frame.

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- WorkFace Planning (WFP) - The process of organizing and delivering all the elements necessary, before work is started, to enable craft persons to perform quality work in a safe, effective, and efficient manner.
- Path of Construction – is the articulation of the optimum building sequence of the physical components of a facility.
- Design Basis Memorandum (DBM) - A “Controlled Document” produced during the front-end engineering study phase that defines the basic design parameters for the intended project. Generation, review, and approval of the DBM are prerequisites to AFE approval and release for development of the Engineering Design Specification (EDS).
- Engineering Design Specification (EDS) - The product of front-end engineering development (basic engineering) that defines all elements of project scope and is the Control Document for commencement of detail engineering and procurement activities on the project. A companion document to the EDS is the Project Execution Plan that sets forth the program for project implementation.
- Detailed Engineering - The phase of engineering following EDS, after approval has been given for the project. The DEP provides the specifications and construction drawings that detail all engineering aspects for the construction of a project.

4. Procedure

The established method of performing work; WHO does WHAT by WHEN. Procedures present a step-by-step sequenced way to do a task consistently and with maximum efficiency.

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4.1 Session Preparation

The Project Construction Manager is responsible for the preparation of the path of construction sessions.

He develops the path of construction agenda. The agenda must have a clearly stated objective and list of activities. This should be based on Appendix A Path of Construction Flow Diagram, Appendix B – Inputs, Tools and Techniques, Outputs and reflect the stage of the project at the time of the meeting. Appendix B Outputs should guide the list of activities for the session.

The time frame and scope of activities discussed during the path of construction session depends on the current project objectives. If the project’s current deliverables are for DBM or EDS purposes, then the activities discussed should only detail that phase of project development. If the current scope of the project is detailed design, it is correct to discuss detailed engineering activities. This approach avoids wasting time in discussing activities that are not relevant at the time of the path of construction meeting.

The Project Construction Manager distributes Appendix D Path of Construction Input Checklist by Functional Area to the participants.

The Project Construction Manager will assemble the data for review by the meeting participants prior to the session. This will ensure all relevant information is available and complete.

He sends out the meeting agenda and data package to attendees. In the meeting request make it clear that attendance is mandatory. If a person is unable to attend they must send a delegate.

4.2 Meeting Guidelines

Construction Manager will facilitate the path of construction sessions according to the agenda. Strong facilitation skills are critical to achieving path of construction outputs in the allotted time.

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A path of construction Log should be set up to keep lists of needs, assumptions and parking lot issues, so they can be addressed to list information requirements or assumptions used during the path of construction development.

Review cycles must be established during the path of construction session to ensure progressive elaboration and updates occur during the Front End of the project.

Holiday periods should not be overlooked during the path of construction development process.

4.3 Post-Meeting Activities

The path of construction session provides the basis for or input to the final project modularization strategy, procurement strategy, contracting plan, heavy lift plan, plot plan, work package schedules, and estimate with project team input and buy-in.

Path of construction outputs are critical inputs to participative planning sessions held by project controls to establish the project schedule.

5. Implementation

Who is responsible to ensure the document is being implemented.

5.1 Reference Documents

- CWP Best Practice
- EWP Standards
- IWP Standards
- WFP Implementation Manual

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5.2 Appendices

- Appendix A - Path of Construction Flow Diagram
- Appendix B – Path of Construction Inputs, Tools and Techniques, Outputs
- Appendix C – Path of Construction RASCI Chart
- Appendix D - Path of Construction Input Checklist by Functional Area

5.3 Acknowledgements

- COAA WFP Best Practices Committee
- Construction Industry Institute

6. Interpretation and Updating

Accountable for interpretation and updating to be defined using position titles. Should be one position only.

The Director, Construction Management is responsible to interpret and update this procedure.

7. Approved by

- Name
- Title
- Department

NOTE: ORIGINAL SIGNED COPY TO BE RETAINED BY THE LEAD DOCUMENT CONTROLLER FOR MAJOR PROJECT.

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Appendix A) Path of Construction Flow Diagram

(See following page[s])

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Appendix B) Path of Construction Inputs, Tools and Techniques, Outputs

(See following page[s])

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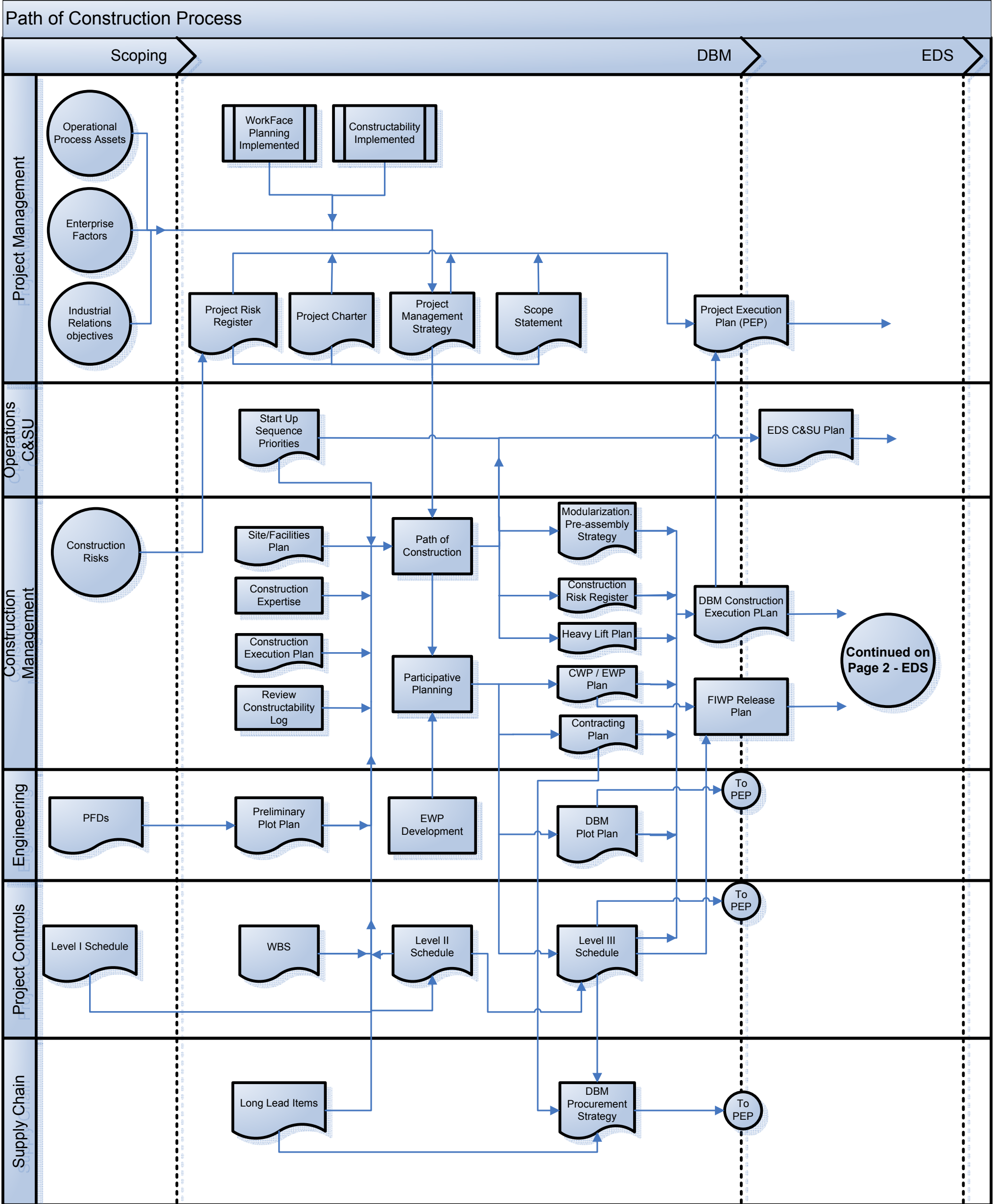
Appendix C) Path of Construction RASCI Chart

(See following page[s])

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Appendix D) Path of Construction Input Checklist by Functional Area

(See following page[s])



Path of Construction Process

