

**ADVANCED  
WORK PACKAGING**

*Community for  
Business Advancement*

AWP COMMUNITY FOR BUSINESS ADVANCEMENT

# AWP EDUCATION FRAMEWORK

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*Created by the AWP Education & Outreach Subcommittee*

# Construction Industry Institute (CII)

## What is it?

Construction Industry Institute (CII) defines AWP as “the overall process flow of all the detailed work packages (construction, engineering, and installation work packages). AWP is a planned, executable process that encompasses the work on an EPC project, beginning with the initial planning and continuing through detailed design and construction execution. AWP provides the framework for productive and progressive construction and presumes the existence of a construction execution plan.”

# ADVANCED WORK PACKAGING (AWP)

## What is it?

Advanced Work Packaging (AWP) is a construction-driven project delivery process that adopts the fundamental philosophy of “beginning with the end in mind.” A key requirement of this process is the collaboration between construction and engineering during the engineering planning phase to create a constraint-free work environment in the field. This collaboration ensures that the project is designed with a sequence that supports construction, and that the supply chain is sequenced accordingly by breaking down the project scope into Construction Work Packages that are fed with Engineering Work Packages.

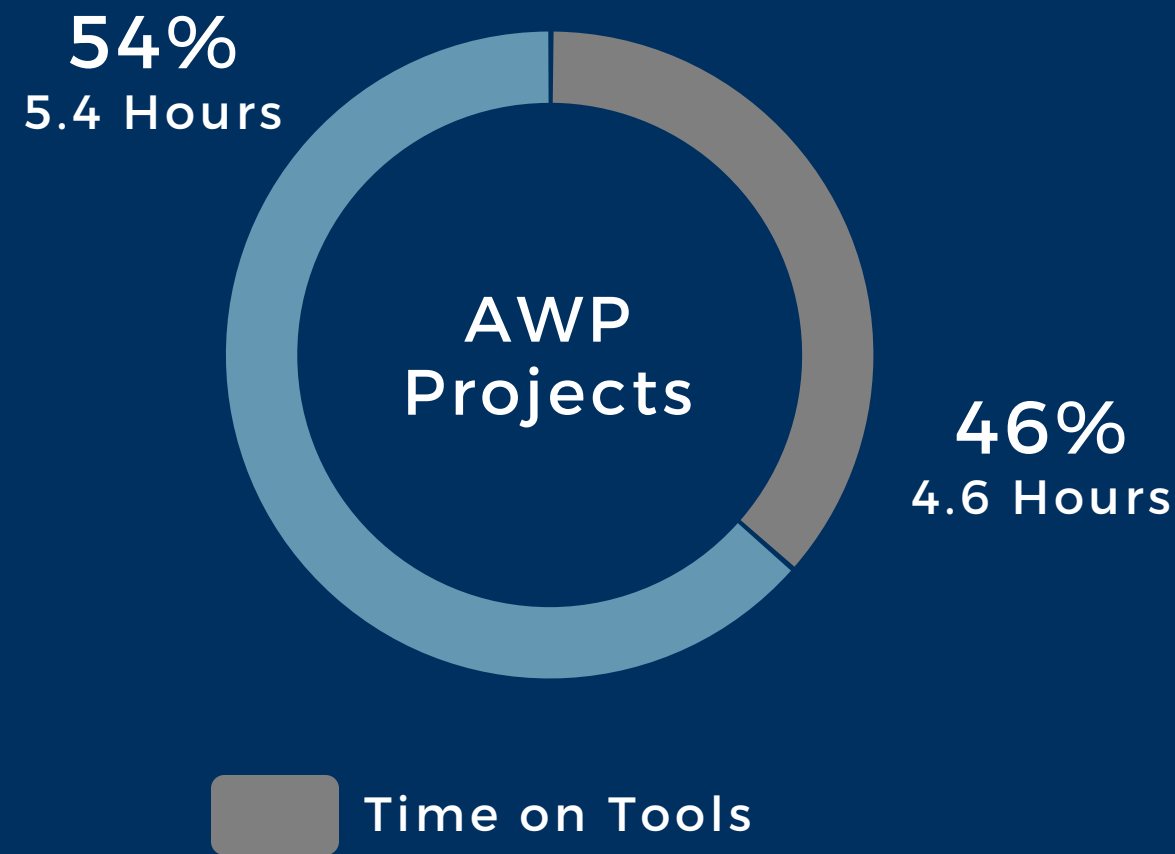
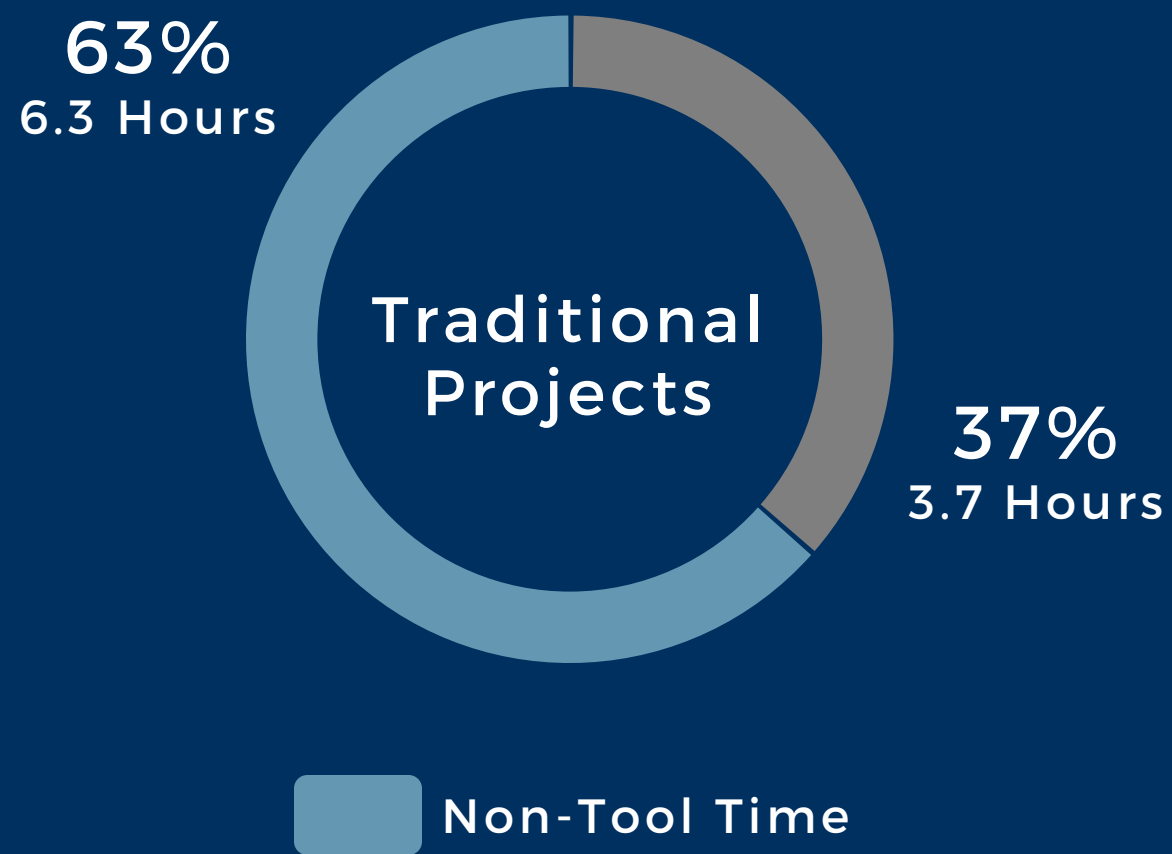


# ADVANCED WORK PACKAGING (AWP)

AWP is a project delivery method which flows from Front End Planning through Commissioning and aligns Engineering and Procurement deliverables with the Construction Sequence

It's a disciplined approach to improving project delivery which provides a structure for focused execution planning and production control that is directed at the construction work front

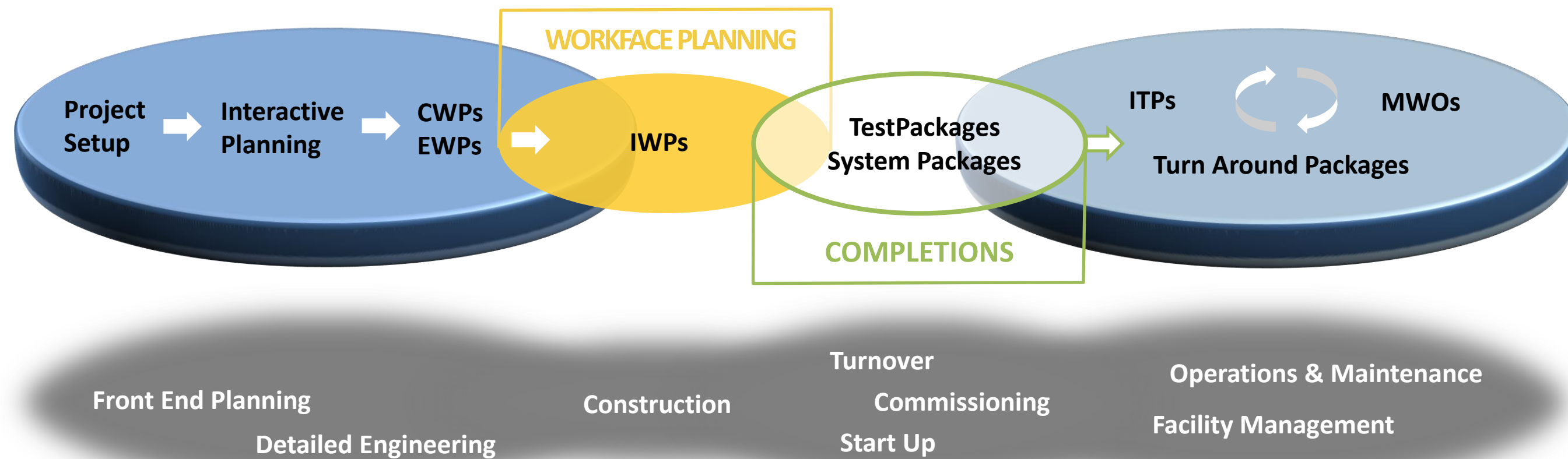
# ADVANCED WORK PACKAGING (AWP)



↑ 25% increase in productivity

↓ 10% reduction in TIC

# ADVANCED WORK PACKAGING

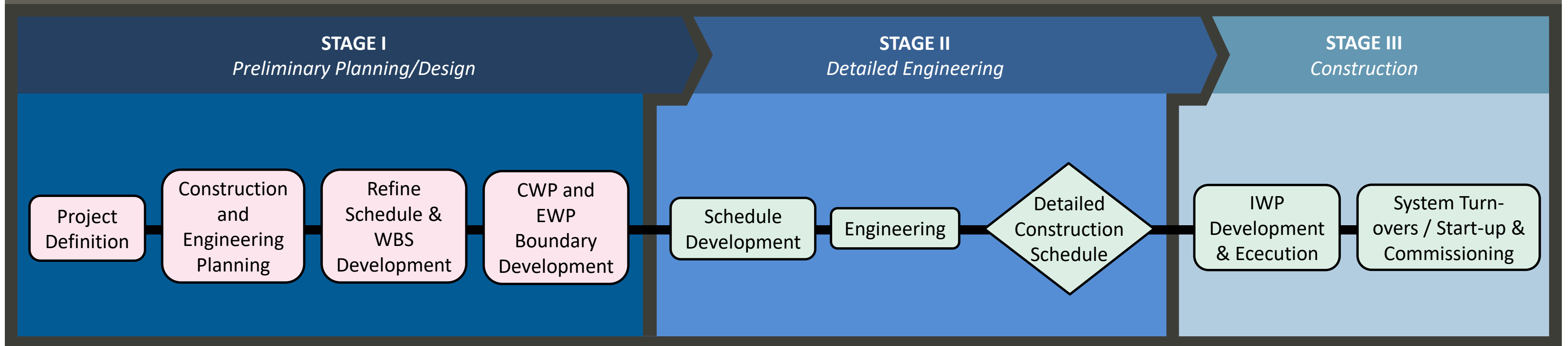


## ASSET LIFE-CYCLE INFORMATION MANAGEMENT



# ADVANCED WORK PACKAGING (AWP)

## Integrated Enhanced Work Packaging Flowchart

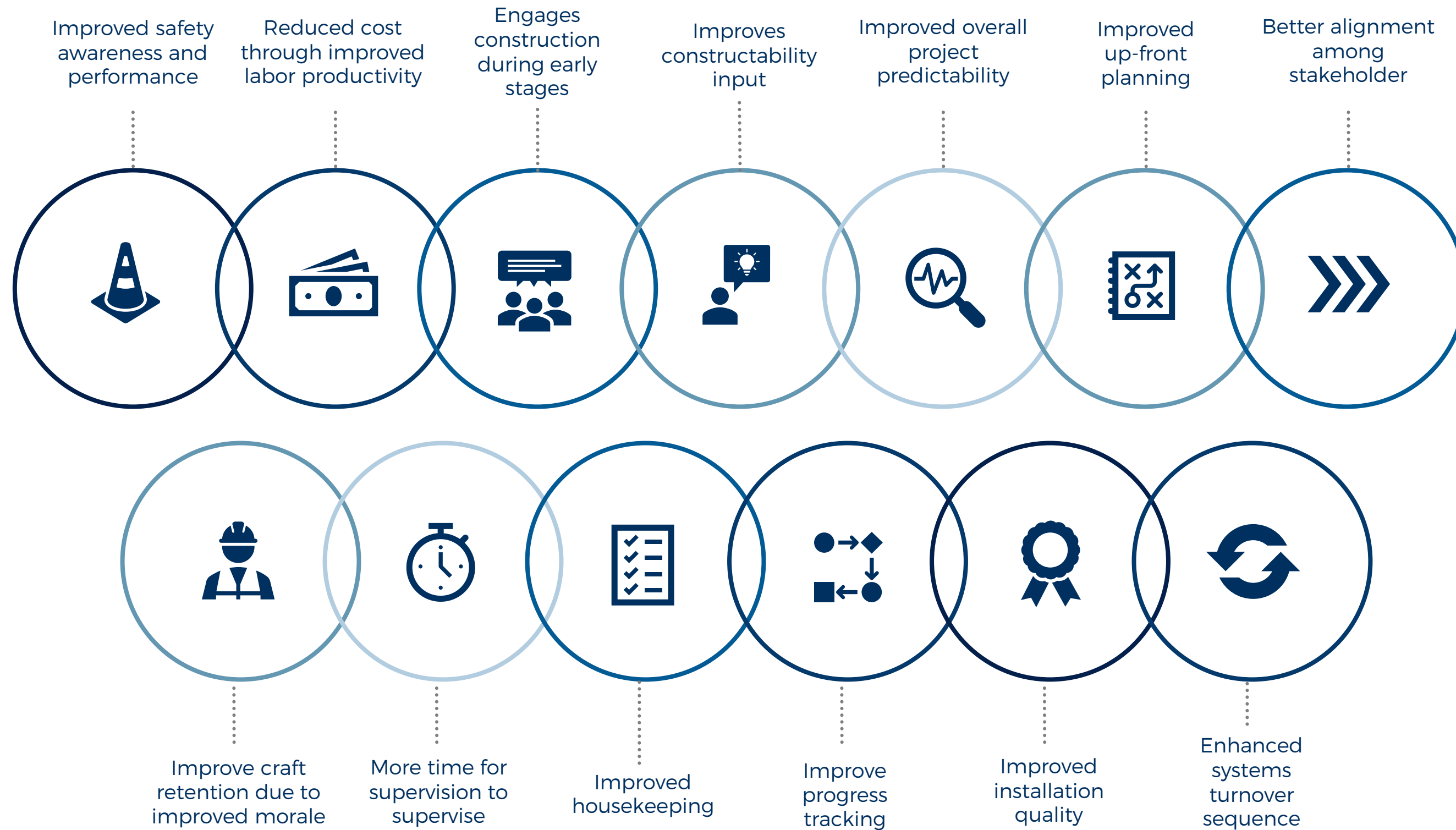




# Benefits & Value of AWP



# Benefits & Value of AWP





# Benefits & Value of AWP

The benefits listed above vary in degree, depending on the existing procedures and starting point. One project reported improvement in schedule performance (SPI) by 25 percent and cost performance (CPI) by 33 percent, compared to a project with similar scope and location; the key difference was work packaging. Multiple case studies now show a reduction of 10 percent of total installed cost (TIC). Reference: RS272-1 - Advanced Work Packaging: Design through Workface Execution, Version 2.1



Without AWP, out-of-sequence construction wastes time and money (typically 25% cost overruns and 33% schedule overruns).

To maximize savings, industrial leaders in the oil & gas and chemical sectors are now requiring AWP to be implemented for their



**10% REDUCTION  
IN COST**



**25% MORE  
TIME ON TOOLS**



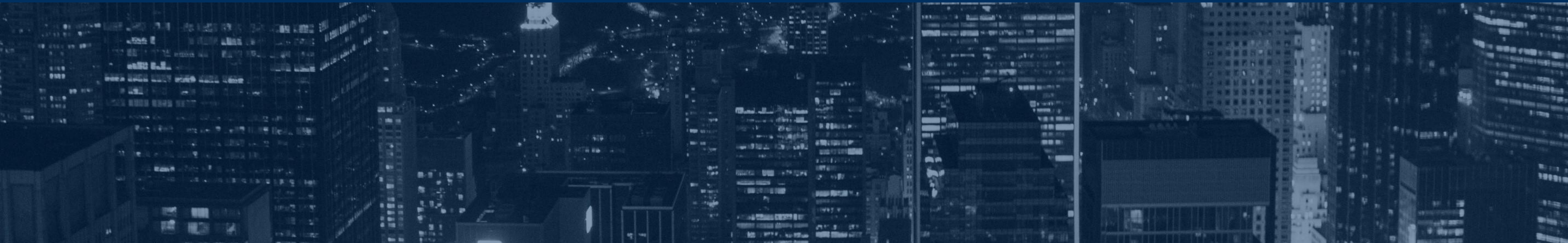
**IMPROVED SAFETY**

Reference - Validating Advanced Work Packaging as a Best Practice –  
RT 319, Construction Industry Institute, 2015 CII





# Origin & History of AWP





# **Myth Busted:**

**AWP is just a buzzword.**

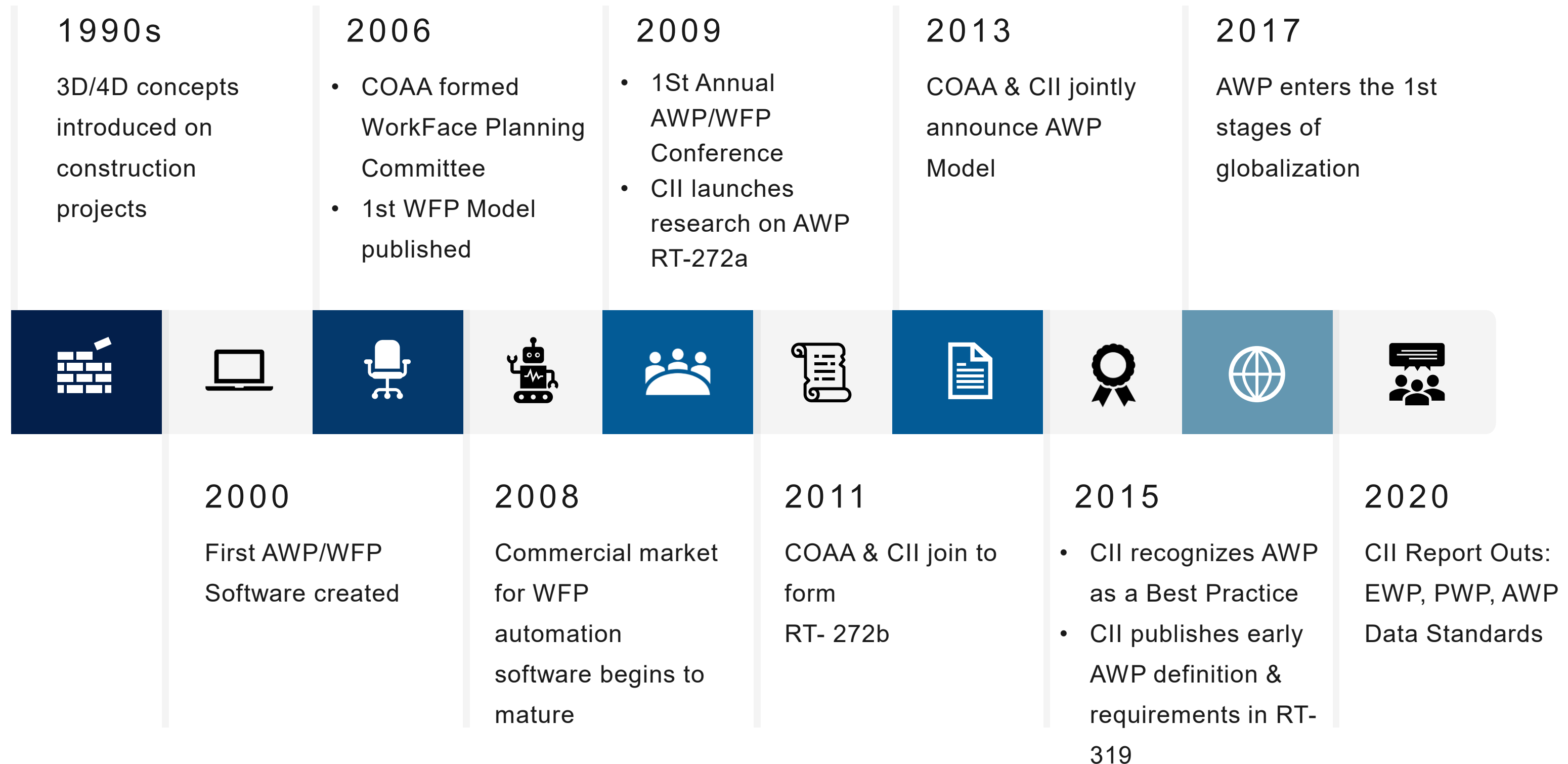
**It's been around for  
decades!**

# Early AWP Projects

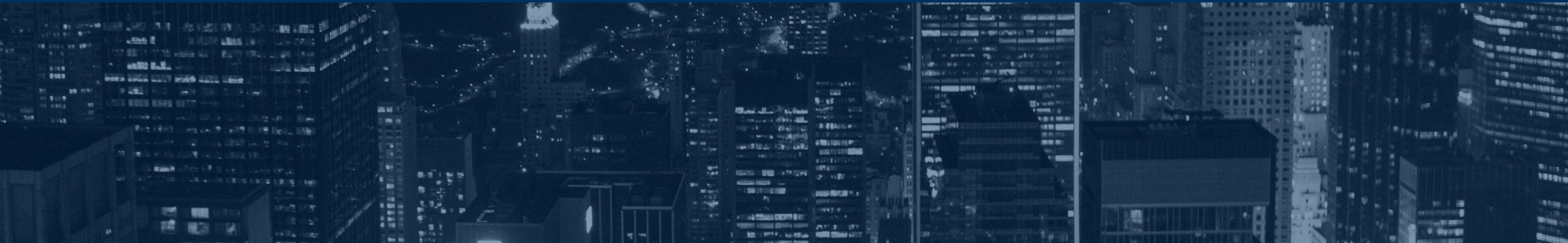
- Advantage discovered in projects that planned further in advance.
- Benefits recognized to package work into more manageable sizes: include materials, major equipment, tools, etc.
- 1990s - Project in Canadian Oil Sands leverages last planner. This was considered the beginning of Workface Planning.
- Engineering & Procurement components not in place yet.

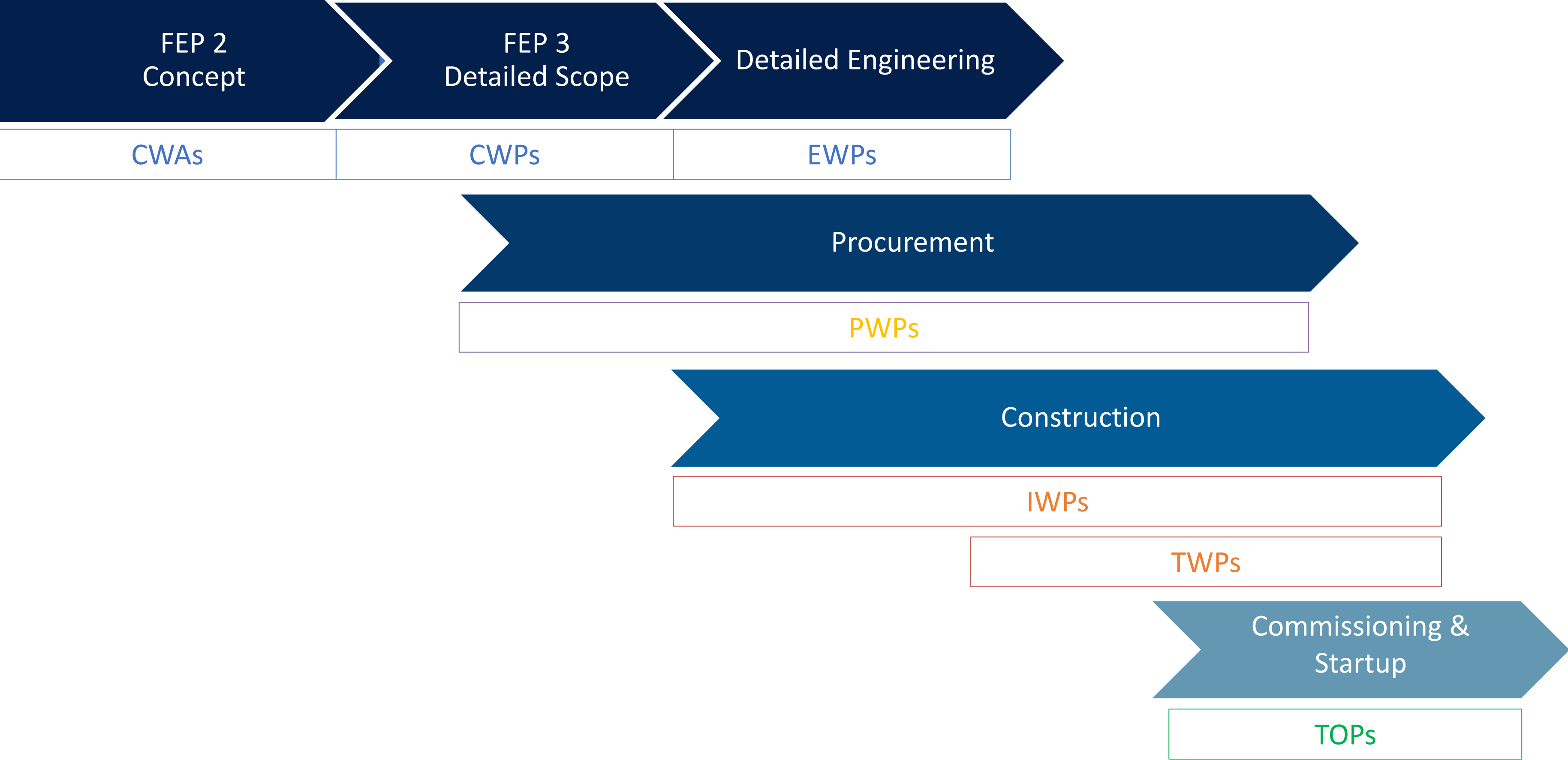


# Origin & History of AWP



# AWP by Project Phase







# FEP 2 - Concept

## Value of AWP

- Increase ENG Productivity by establishing an early Path of Construction (PoC)
- Increase Construction Productivity by establishing well-defined Construction Work Areas (CWAs)
- Ensure alignment on plan & methodology for using AWP & how it will impact the project

## Major Activities

- Alignment across stakeholders for AWP scope / WBS
- Define AWP data responsibility matrix & data mgmt. plan
- Develop preliminary AWP plan (key activities, milestones, etc.)
- Constraints definition & process for long lead items
- AWP Champion onboarded for EPC + Owner organizations
- Secure Construction representative to be involved in decisions
- Prep for Path of Construction meetings?
- Begin incorporating AWP activities in Level 2 schedule

## Example Deliverables

- AWP organization chart
- AWP project plan, goals & objectives
- Initial plot plan by CWA
- AWP RASCI Chart
- PoC meeting Terms of Reference
- CWA Index
- CWP Index

# FEP 3 – Detailed Scope

## Value of AWP

- Set up project for effective EWP program
- Align stakeholders with PoC development
- Optimize ENG hours by establishing a framework that can reduce "wait" times
- Increase field Time-On-Tools by aligning project schedule with CWAs & Construction Work Packages (CWPS)

## Major Activities

- Complete delineation of CWAs
- Identify long lead Procurement items by CWA
- Align Engineering Work Packages (EWPs) directly with CWP
- Hold Constructability reviews
- Hold Interactive Planning session for PoC development
- Structure the project into an optimal sequence of CWPs
- Build short list of contractors & subcontractors with knowledge of the Owner or EPC's AWP procedures
- Define PoC with Level 3 Schedule

## Example Deliverables

- Project estimation by CWP
- Vendor data review prioritization by CWP
- CWP release plan (fully developed with "clashes" identified)
- Asset lists encoded by CWP
- Initial EWPs release plan
- Constrained PoC
- Level 3 loaded schedule



# Procurement in the Early Stages

## Value of AWP

- Optimize Procurement planning to align with the PoC, ensuring early alignment of critical equipment and material delivery for Construction

## Major Activities FEP 2 - Concept

- Identify items best to purchase in FEP
- Sequence Procurement by EWPs & ROS dates
- Build out procurement tracking & reporting system to measure EP 30/60/90 & incorporate into weekly meetings

## Major Activities FEP 3 – Detailed Scope

- Organize purchase orders by CWP
- Complete Procurement Work Packages (PWPs) prior to the planned start date
- Develop a procurement Execution Plan that support the PoC
- Begin weekly procurement coordination with ENG & Construction

## Example Deliverables

- Vendor data requirements to support AWP (including update frequency standards)
- Defined PoC with Level 3 schedule & ROS dates for major equipment

# Detailed Engineering

## Value of AWP

- Optimize ENG hours through identifying & removing EWP constraints
- Increase field Time-On-Tools by organizing, tracking & expediting the hand-off of ENG deliverables to Construction by CWPs

## Major Activities

- EWPs have complete associations with CWPs, drawings, mechanical equipment, specifications, etc.
- Construction reviews CWPs & EWPs and how they support the project schedule
- Connect non-BIC engagements to Calendar in Q2
- Continue Constructability reviews
- Assign WP owners early to allow enough time for reviews & changes
- Begin regular CWP readiness review meetings & hold well in advance of CWP planned start date
- Conduct AWP maturity assessments: Early Works, civil, etc.

## Example Deliverables

- EWP release plan & EWPs delivered in accordance with that plan (in-sequence and on-time)
- Sequence Procurement by EWPs
- CWP Readiness Review Meeting Terms of Reference
- Complete list of EWP constraints



# Procurement in Detailed Engineering

Value of AWP	Major Activities	Example Deliverables
<ul style="list-style-type: none"><li>• Optimize ENG hours through digital upload of vendor data &amp; associated ETA dates into EPC procurement systems</li></ul>	<ul style="list-style-type: none"><li>• Purchase of all Engineered Equipment</li><li>• Expedite Vendor Data by Engineering Need Date</li><li>• Expedite Deliveries by Field Need Dates</li><li>• Purchase all Fabrication in accordance with the Procurement Strategy – if any prior to Construction</li><li>• Purchase and Manage Long Lead Valves</li></ul>	<ul style="list-style-type: none"><li>• Purchase of all Engineered Equipment</li><li>• Expedite Vendor Data by Engineering Need Date</li><li>• Expedite Deliveries by Field Need Dates</li><li>• Purchase all Fabrication in accordance with the Procurement Strategy – if any prior to Construction</li><li>• Purchase and Manage Long Lead Valves</li></ul>

# Construction

## Value of AWP

- Improve field safety & quality through enhanced planning and clear scopes
- Increase Time-On-Tools by improving the coordination of field constraints management & shared services across multiple Contractors
- Increase Time-On-Tools by debottlenecking constraints on Installation Work Packages (IWPs)

## Major Activities

- Finalize IWPs release plan & schedule
- Determine how to manage & measure exceptions to releasing only IWPs to the field that are 100% constraint free
- Conduct final Constructability reviews
- Begin weekly constraint review meetings
- Conduct AWP maturity assessments: electrical, mechanical, pipe, steel, contractors, subcontractors, suppliers, etc.
- Bag and Tag by IWP
- Initiate Test Work Packages (TWPs)
- Complete TWPs, Punchout & Complete by System

## Example Deliverables

- Constraint review meeting Terms of Reference
- Owner & EPC IWP completion and status report (by week)
- Materials list by IWP
- Mechanical equipment associations list by CWP & IWP

# Procurement in Construction

## Value of AWP

- Increase field Time-On-Tools by ensuring all materials to support a CWP are delivered to construction before ROS date

## Major Activities

- Establish Field Procurement at Site: site support, tools, equipment, consumables, shorts, etc.
- Initiate materials management, warehouse & preventative maintenance efforts
- Purchase of all materials & fabrication in accordance with the Materials Responsibility Matrix
- Purchase fabrication in accordance with the Procurement strategy
- Expedite equipment, materials, & fabrication to support field need dates

## Example Deliverables

- Subcontractor Packages



# Commissioning & Startup (CSU)

## Value of AWP

- Increase field work efficiency by improving the transition from construction to CSU through clearer line of sight on sequencing of construction completion to support the CSU schedule
- Increase field Time-On-Tools through early, iterative input of Operations and Commissioning into the PoC & linkage of an optimal CSU sequencing of Turnover Packages (TOPs) to the IWP sequencing

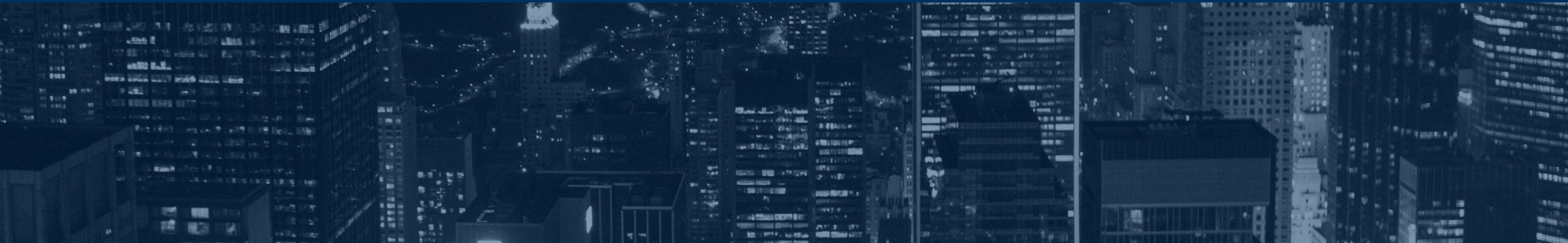
## Major Activities

- Right-size the workhours required to execute each TOP (mechanical, instrument engineers, etc.)
- Associate Test Work Packages (TWPs) and TOPs to applicable CWAs, CWP, EWP, & IWP
- Conduct regular turnover execution readiness reviews
- Assign the TOP Owner at least 12 weeks prior to the planned start date

## Example Deliverables

- TWP release plan by IWP
- TOP release plan by TWP
- Final, consolidated AWP Master Index

# Roles & Expectations





## The Role of the Owner

- Determines Scope of AWP
- Contract language
- Vetting contractors
- Managing expectations
- Managing performance
- Ensuring compliance

## The Role of the EPC or Contractor

- Developing internal and project programs
- Understanding the needs of the Owner and the project
- Setting up a team
- Delivering on expectations
- Continuous Improvement

# Stakeholder Roles



## Owner

## Construction Contractor (CMT pre-bid selection)

## Engineering & Procurement

## Project Management

## Construction Management Team

## Supply Chain Management

## Operations Manager

## Project Controls

- |                                                                                                                                                            |                                                                                                                                                             |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                           |                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Support Overall AWP Project Execution</li><li>• Develop AWP Strategy</li><li>• Allocate Budget Resources</li></ul> | <ul style="list-style-type: none"><li>• Develop CEP and Turnover Strategy</li><li>• Develop Path of Construction</li><li>• Defines CWP Boundaries</li></ul> | <ul style="list-style-type: none"><li>• Attend Interactive Project Planning Sessions</li><li>• Draft definition of the Construction Work Areas</li><li>• Develop Level 2 schedule &amp; estimate</li><li>• Draft Required At Site dates for major equipment</li></ul> | <ul style="list-style-type: none"><li>• Attend IPP Sessions</li><li>• Incorporate AWP into Project Execution Plan</li><li>• Identify AWP Qualified Contractors</li><li>• Define AWP Metrics</li><li>• Set Construction Execution Plan Parameters</li><li>• Maintain Policies &amp; Procedures</li><li>• Determine AWP Roles &amp; Responsibilities</li></ul> | <ul style="list-style-type: none"><li>• Lead IPP Sessions – Constructability Reviews, Path of Construction, Preliminary CWPs</li><li>• Ensure EWP Completions</li><li>• Support the Path of Construction</li><li>• Report Progress at EWP Level</li></ul> | <ul style="list-style-type: none"><li>• Attend IPP Sessions</li><li>• Ensure Procurement Strategy is Aligned with Contracts</li><li>• Supports AWP Requirements for Contracts</li></ul> | <ul style="list-style-type: none"><li>• Attend IPP Sessions</li><li>• Ensure IWPs, TWPs, and TOPs support the most effective turnover and startup sequence</li></ul> | <ul style="list-style-type: none"><li>• Track AWP Metrics by Project Phase</li><li>• Monitor the Health of AWP Adoption Metrics</li><li>• Track High Level Project Metrics that are supported / improved by AWP (Cost, Schedule, Quality, Safety)</li></ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



# AWP Specific Roles

## Corporate AWP Manager

- Responsible for the development and sustainment of the AWP program across an organization
- Program development
- Procedure creation
- Staffing
- Education and promotion
- Determine technology system needs
- Define data requirement needs

## AWP Champion

- Project Specific
- Establishes project expectations
- Audits performance
- Detailed reporting
- Capturing lessons learned
- Ensure data requirements are met

## EPC AWP Manager

- Responsible for the implementation of the AWP program on a project
- Project Execution
- Organizational Procedures
- Attending/Contributing to Project Management
- Collaborating
- Developing Training Plans
- Mentoring project stakeholders

Team size will vary based on project or portfolio size and available resources. Some projects may have one person covering multiple roles as needed.

# WorkFace Planning Specific Roles

## WorkFace Planning Lead

- Planning and overseeing the development of work packages
- Selecting and training of team members
- Performing quality checks
- Producing reports for management
- Mentoring WorkFace Planners

## WorkFace Planner

- Produces work plans to more efficiently execute construction
- Completes Constructability analysis
- Handles RFI's
- Understands the Path of Construction
- Dissecting CWPs into IWPs
- Quantity take offs
- Maintains project database
- Identifies constraints
- IWP Release Plans

Team size will vary based on project or portfolio size and available resources. Some projects may have one person covering multiple roles as needed.

# Stakeholder Deliverables Related to AWP

Optimized Preliminary Plot Plan

Construction Work Areas

Defined Startup Priorities

Path of Construction

Work Breakdown Structure

Project Organizational Chart

Intelligent, AWP Compliant Model

IPP Session - Schedule

Work Packages

Construction Execution Plan

-15 / 30% Estimate

Commissioning & Validation

Turnaround Requirements



# Types of Work Packages



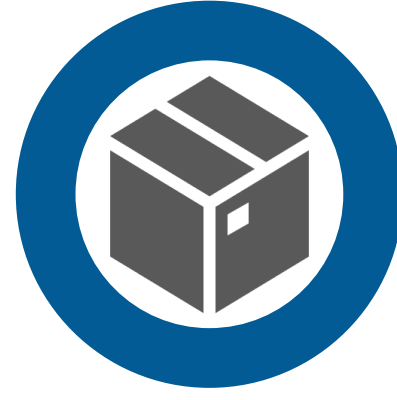
## Construction Work Area (CWA)

A location specific, multi-disciplinary representation of process units, major areas throughout the construction site.



## Procurement Work Package (PWP)

A complete list of supplied material and equipment for an EWP/CWP. The scope of a PWP can be specific to an engineered piece of equipment or to a group of bulks supply. A PWP does not have to be a physical package—a PWP can also be a scheduling or tracking exercise. Must support the Path of Construction.



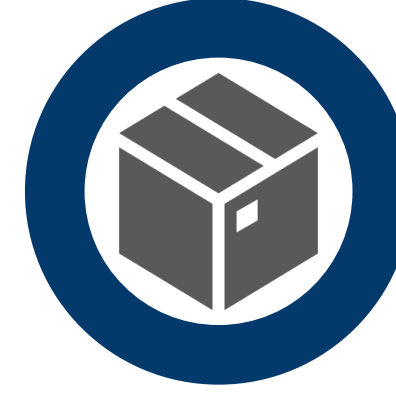
## Construction Work Package (CWP)

Created by the key stakeholders in accordance with the Path of Construction. Serves as a proposal for executives to ensure the construction of a given project or production is well-planned out. The better a CWP is prepared, the better chance that the project will be accepted by a company. CWPs are subsets of CWAs. Prepared by discipline or craft.



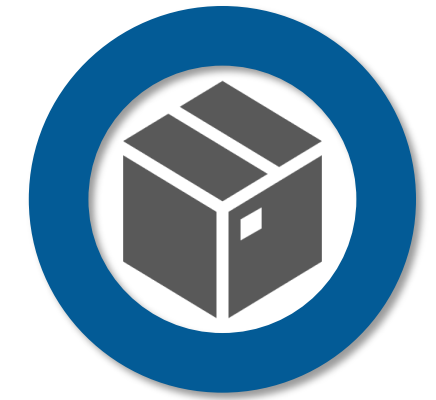
## Engineering Work Package (EWP)

Engineering deliverable that is used to develop (CWP) Construction Work Packages 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 CW schedule. The scope of work is typically both by discipline and by area. Prepared by discipline or craft.



## Installation Work Package (IWP)

Contains constraint free scope of work that allows trade to complete tasks independently for a specified time duration in a safe, predictable, measurable, and efficient manner. This includes supporting documents such as BOMs, tasks, and man-hour estimates to complete the task. IWPs are subsets of CWPs. Prepared by discipline or craft.



## Test Work Package (TWP)

A detailed plan to assure that each asset (Equipment, pipeline, etc) passes a predefined set of tests based on that object type in order to be deemed complete and ready to be handed over to the client. The testing is run after construction is complete, but before the handover (Also called turnover) to the owner/operator.

## Construction Work Area (CWA)

Geographically Identified

Multi-disciplinary

Represents all major areas

## Procurement Work Package (PWP)

List of all Material, Equip, & Vendor Data  
Required by Engineering

Linkage to a Specific CWP/EWP

Roles of Buying & Receiving Process

List of Associated Purchase Orders

Field Info – Tags, Material MGMT

Dependencies with other PWPs

Supports POC

## Construction Work Package (CWP)

Subset of a CWA

Discipline Specific

Estimated Man Hours

Planned Start & Finish Dates

CWP Release Plan

Recommended 1:1 Ratio to EWP

## Engineering Work Package (EWP)

Subset of a CWA and aligned to a CWP

Discipline Specific

Technical Specifications

Engineering Data & Drawings IFC

Vendor Data & Drawings IFC

Recommended 1:1 Ratio to CWP

## Installation Work Package (IWP)

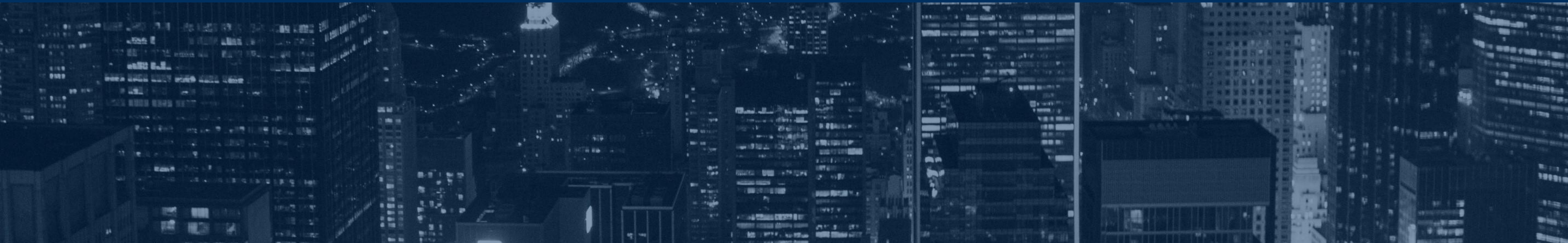
Subset of a CWP
Constraint List & Verification
Work Scope/Task List
Man Hour Allocation
Specialty Tool & Equip Requirements
BOM's
Technical Docs & DWGs
Screenshots from Model

## Test Work Package (TWP)


As-Built DWGs/BOM
QA/QC Documentation, Drawings
Test Procedures, Settings
Software Documentation
Equipment/Material Databases/Listings
Linked to assets, not CWPs/EWPs



# Path of Construction & IPP Meetings



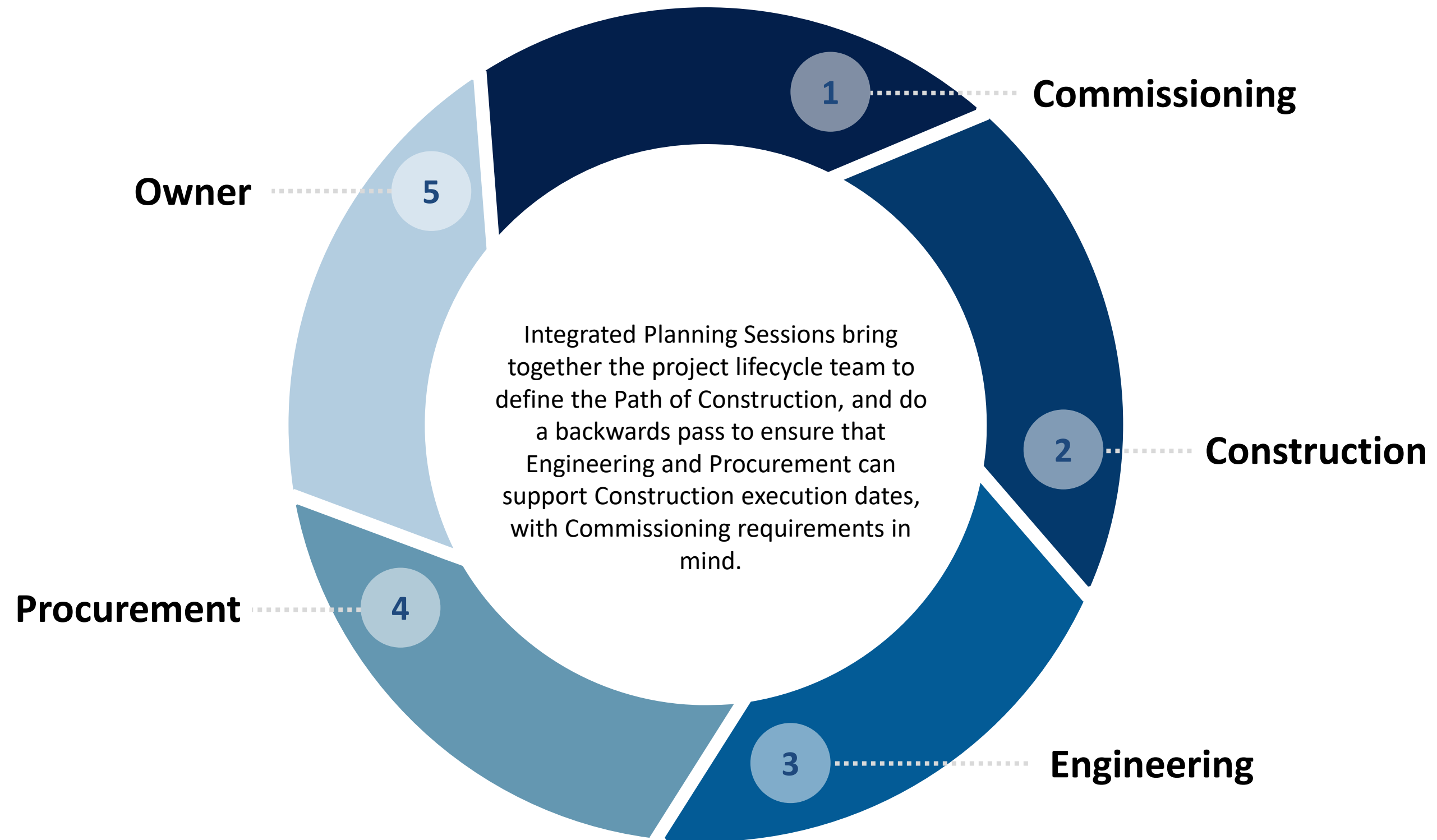




In a tradition project, Engineering is performed by system, Procurement in bulk, Fabrication by size, and Construction by area

AWP is designed to align Engineering, Procurement, and Fabrication with the Path of Construction...so that deliverables are managed and disseminated in the correct sequence to support the Construction plan

This process is initiated during the Integrated Planning Sessions

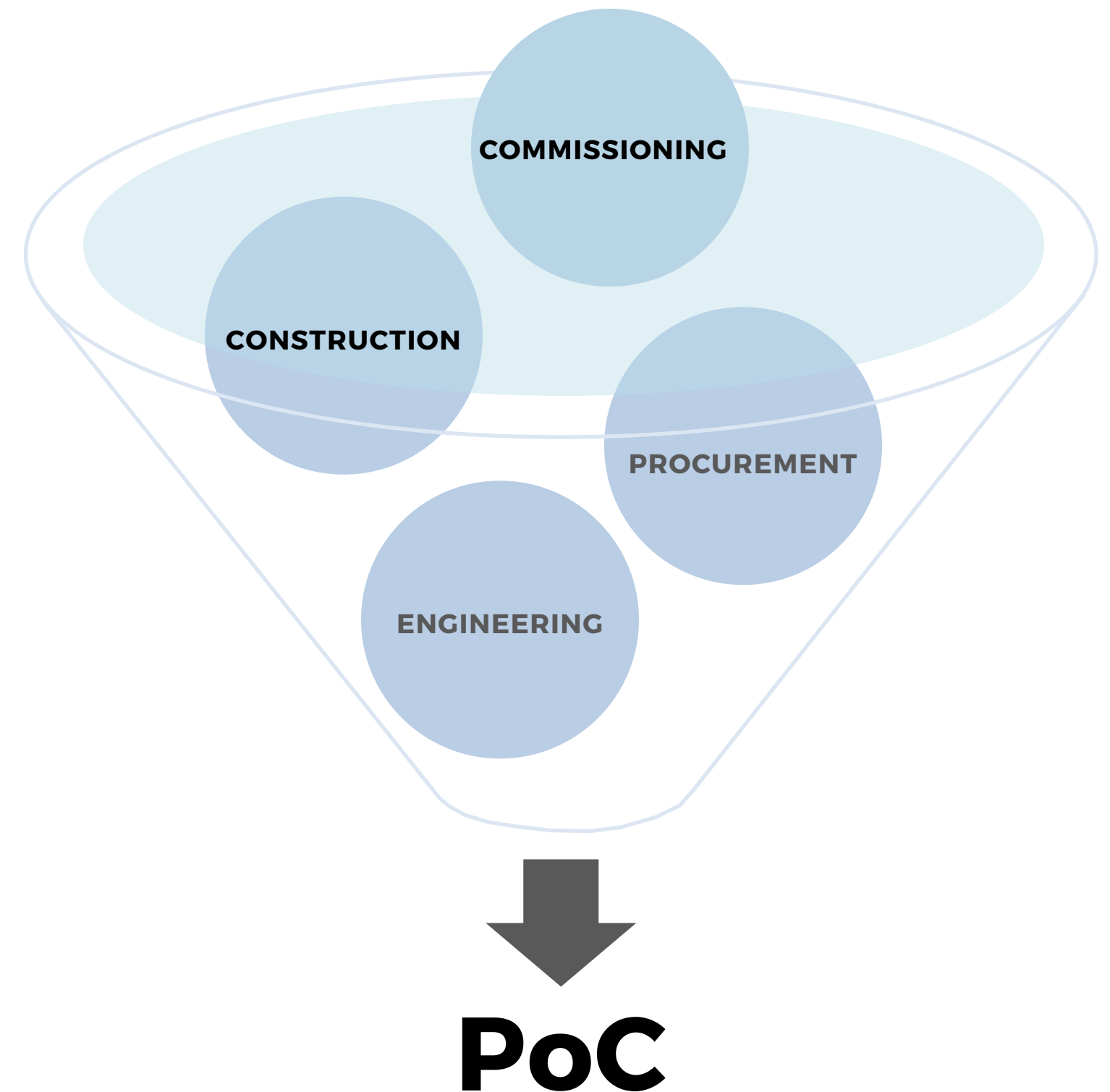


# PATH OF CONSTRUCTION (PoC)

The Path of Construction is the strategic sequencing of Construction (and Commissioning) execution activities by Construction Work Areas

The PoC identifies the Construction approach for project delivery and how Engineering and Procurement deliverables will support construction sequencing

\*Commissioning and plant startup operations set the priority and sequence for the project







**Who is required to provide  
information for determining the  
Path of Construction?**

ENGINEERING

PROCUREMENT

PROCESS

CONSTRUCTION

COMMISSIONING

PROJECT CONTROLS

# What information is required by each discipline?

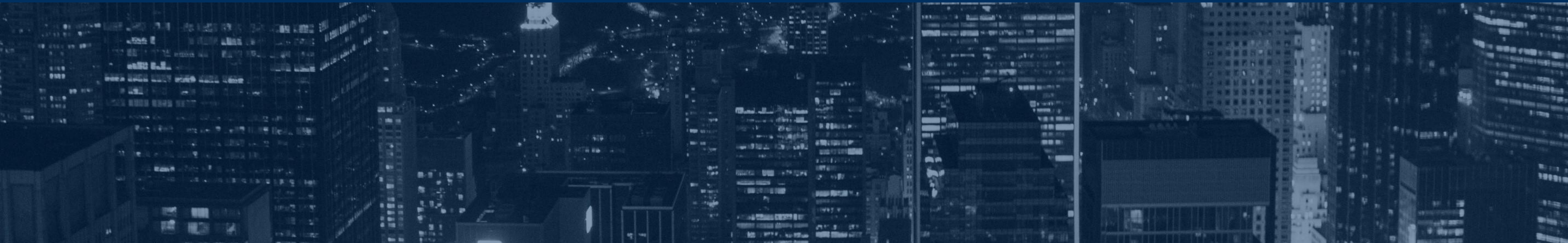
Engineering	Procurement	Process	Construction	Commissioning	Project Controls
<ul style="list-style-type: none"><li>• Vendor data delivery dates</li><li>• Design hours</li></ul>	<ul style="list-style-type: none"><li>• Long lead delivery times</li></ul>	<ul style="list-style-type: none"><li>• Specifications</li></ul>	<ul style="list-style-type: none"><li>• Heavy haul routes</li><li>• Heavy lift crane requirements</li><li>• Deep foundations</li></ul>	<ul style="list-style-type: none"><li>• Startup sequence</li></ul>	<ul style="list-style-type: none"><li>• Start / finish dates</li></ul>

# Deliverables from the Integrated Project Planning Meeting

- ✓ Construction Work Area boundaries defined on plot plan(s)
- ✓ Construction Work Areas prioritized
- ✓ Engineering and Construction Work Packages identified
- ✓ Path of Construction by Construction Work Areas
- ✓ Engineering and Construction Work Packages sequenced within Construction Work Areas
- ✓ Path of Construction supports Commissioning and Start Up



# Constraint Management





## What is a Constraint?

Any information, tools, materials, equipment, access issues or otherwise that prevent or delay the safe and successful execution of work in its entirety.

## What is Constraint Management?

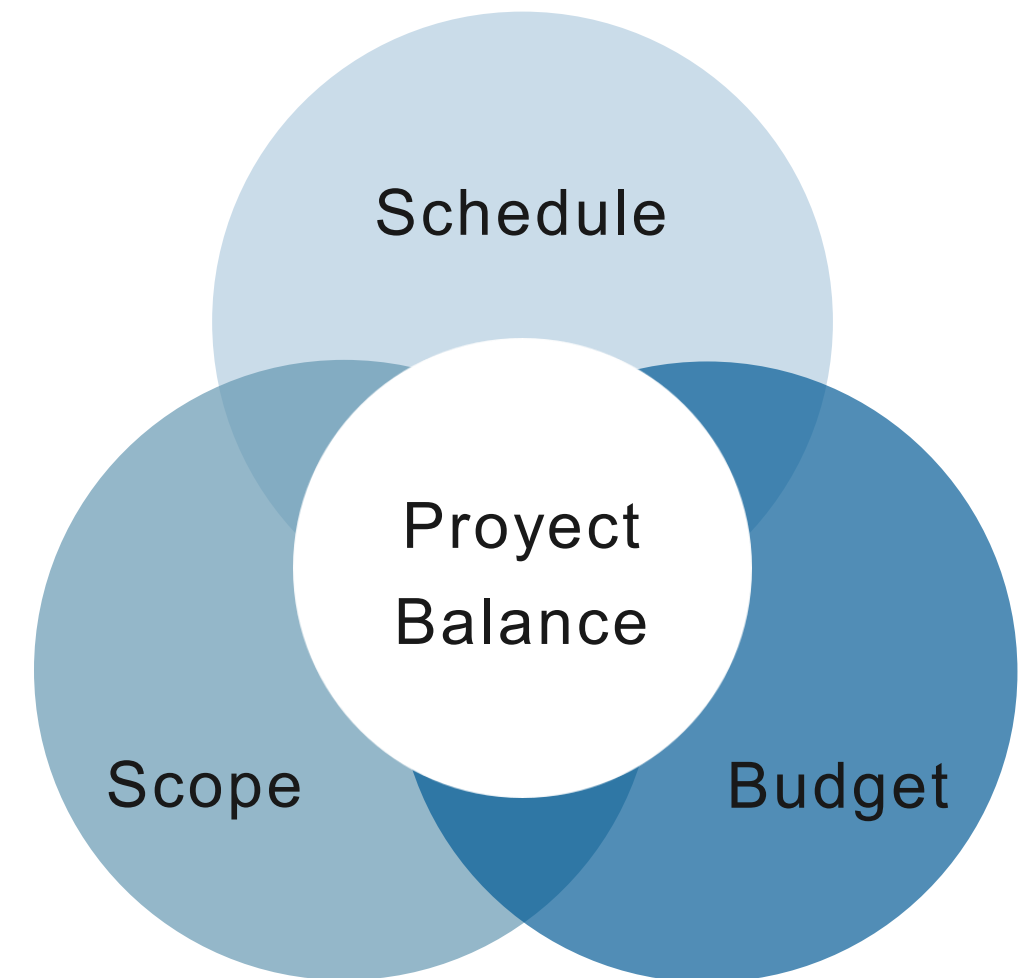
A process used by supervisors and other management personnel to help employees maintain task focus.

**“Work Packaging and the Constraint Management process remove the guesswork from executing at the work face by acutely defining the scope of all work involved and ensuring all things necessary for execution are in place. It ensures to a much greater degree that the work will be done in the time allotted.”**

- CII RT272 , page 35

# Benefits of Constraint Management

- . Alignment around priorities
- . Information visibility
- . Identification and Mitigation of Design Issues
- . Safety Issues
- . Ability to productively perform work
- . Reduced scaffolding costs
- . Cleaner, more organized jobsites
- . Increased project moral



# Common Constraints by Work Package Type

Construction Work Area (CWA)	Construction Work Package (CWP)	Engineering Work Package (EWP)	Procurement Work Package (PWP)	Installation Work Package (IWP)
<ul style="list-style-type: none"> <li>. Equipment</li> <li>. Access</li> <li>. Concurrent Projects</li> <li>. Area-Based Safety Requirements</li> <li>. Predecessor Completion</li> <li>. PWP Constraints</li> <li>. EWP Constraints</li> <li>. CWP Constraints</li> <li>. IWP Constraints</li> </ul>	<ul style="list-style-type: none"> <li>. Quality</li> <li>. IFC Drawings</li> <li>. Open RFIs</li> <li>. Company Materials</li> <li>. Contractor Materials</li> <li>. Predecessor Packages</li> <li>. Safety Requirements</li> </ul>	<ul style="list-style-type: none"> <li>. Predecessor Packages</li> <li>. Vendor Data</li> <li>. Geological Survey</li> <li>. Geotechnical Investigations</li> <li>. Modularization Strategy</li> <li>. Vendor Support Requirements</li> <li>. Execution Plan</li> <li>. Constructability Review</li> <li>. P&amp;ID Input</li> <li>. Site Drawings</li> <li>. Owners Approvals</li> </ul>	<ul style="list-style-type: none"> <li>. Predecessor Packages</li> <li>. Data Requirements</li> <li>. Scope of Material Finalization</li> <li>. Vendor Documentation</li> <li>. Vendor Hold Points</li> <li>. Interdependent Packages</li> </ul>	<ul style="list-style-type: none"> <li>. Drawings</li> <li>. Open RFI</li> <li>. Company Materials</li> <li>. Contractor Materials</li> <li>. Predecessor Packages</li> <li>. Clear Workface</li> <li>. Permitting</li> <li>. Equipment</li> <li>. Tools</li> <li>. Crew</li> <li>. Scaffolding</li> <li>. Quality Requirements</li> <li>. Work Package Rework</li> <li>. Safety Requirements</li> </ul>



# Who is Involved in Constraint Management?



**WorkFace  
Planning Lead**

- Runs the weekly constraint review meeting with the Owner & Contractors
  - Discusses any new constraints
  - Provides updates on existing constraints
- Manages the escalation of unresolved constraints that may impact the project



**WorkFace  
Planner**

- Identifies constraints for specific work packages
- Manages the issuing of constraint free work packages
- Status packages for release if work is impacted by an uncleared constraint



**Constraint  
Owner**

- Anyone working in any capacity on the project
- Responsible for clearing their assigned constraints such as permits, materials, safety gear, or equipment
- Provides details and updates on the constraint removal process

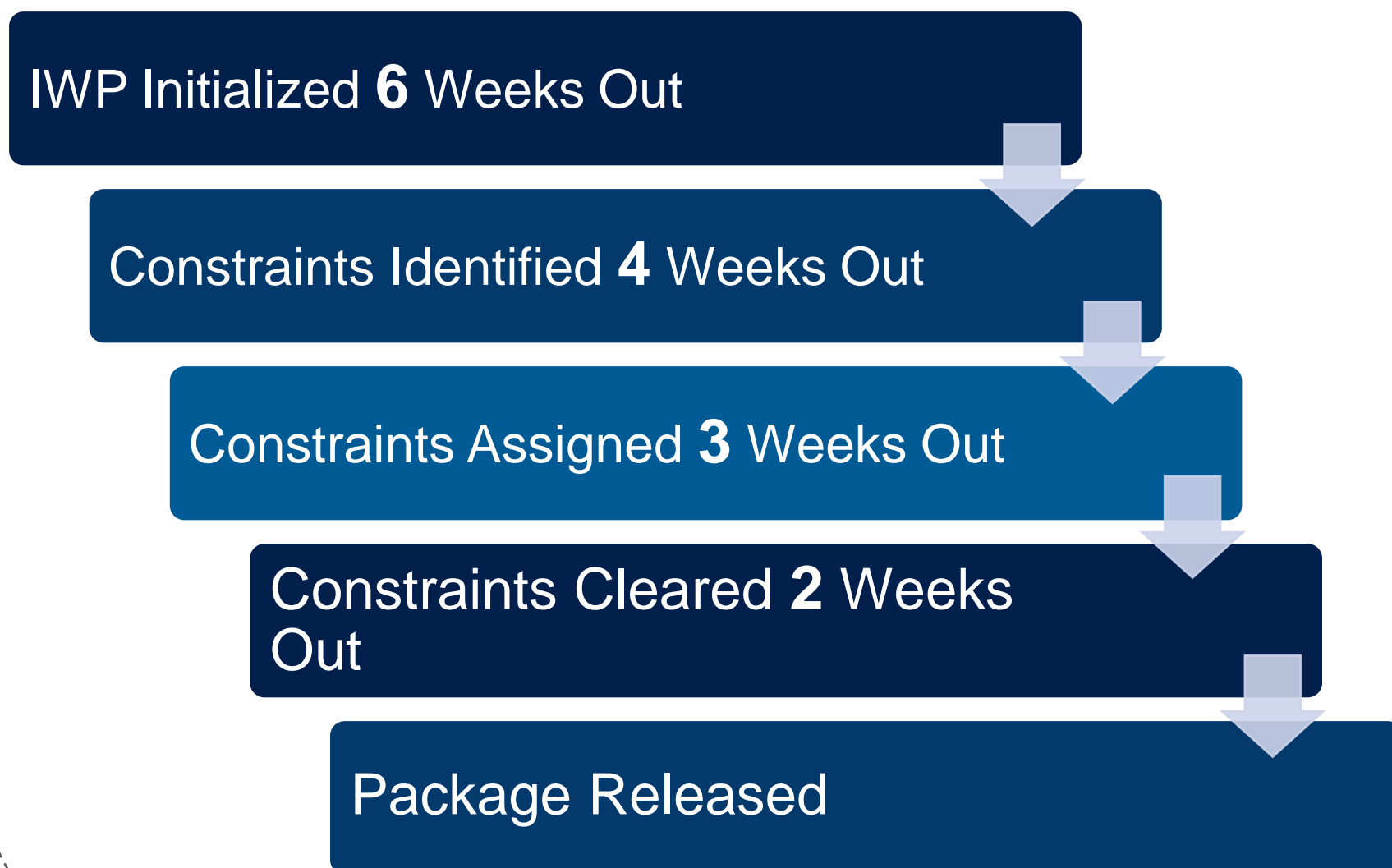


**Construction  
Manager**

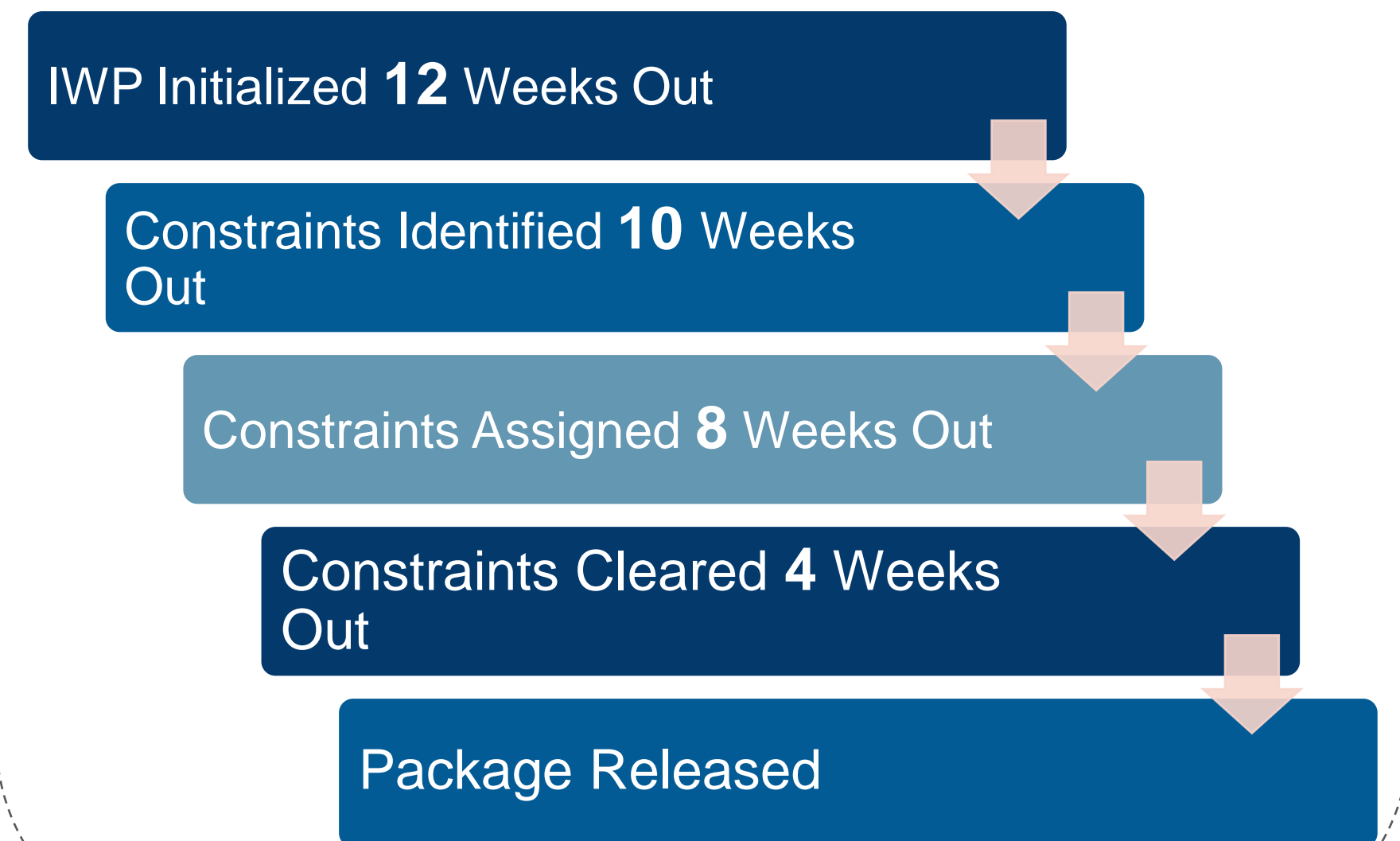
- Keeps track of the planned vs. actual start dates for work packages
- Monitors the quantities being held up by constraints to help with prioritization
- Understands the impact and criticality of all open constraints

# Typical IWP Constraint Schedule by Project Size / Type

## Small Project / Shutdown / Turnaround



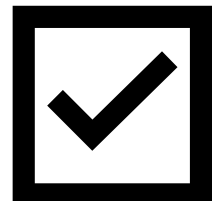
## Large / Mega / Giga Project



# Constraint Management Best Practices



One Consolidated List of All Open Constraints



Assignment of Owner, Due Date, and Priority for Each Open Constraint



Approval Workflow for Each Constraint Closeout by Package Type



Standardized Constraint Review Meeting Tools



Decision Tree for Work Packages That Have Open Constraints



Reporting on the Status of open Constraint Items



# Scaling AWP



# Introduction

AWP is in use globally and has been found to improve safety, schedule, predictability, quality, and labor productivity.

Increases of 25% in labor productivity and reductions of 10% in total installed costs have been reported for AWP systems that have progressed in maturity.

Some companies that started implementing AWP applied it on relatively large projects and saw benefits. These and other companies were interested in further information on applying AWP to smaller projects. COAA received additional requests to develop a "Scalable AWP Guideline" for implementation on projects under \$100 million without compromising the principles that result in improved project performance. Information on the resulting COAA Scalable Advanced Work Packaging Report is provided in the remainder of this Scalable AWP section.

# COAA Scalable AWP

The COAA Scalable AWP Model Report ([www.coaa.ab.ca/library/scalable-advanced-work-packaging-report/](http://www.coaa.ab.ca/library/scalable-advanced-work-packaging-report/)) was developed by four working committees and 40 experienced industry professionals (as committee members) with a 5-member steering committee and is based on the work of the Construction Industry Institute (CII) and COAA.

The COAA scalable AWP model concept was designed in 2019 to provide AWP benefits to smaller projects (under \$100 million) and is published in the Scalable AWP Report which includes example projects. The model introduces tools and resources developed by AWP experts. It is available for implementation by industry and is designed to provide benefits to a variety of project types, sizes, levels of complexity, and industry sectors.

# COAA Scalable AWP Model and Report

Scaling AWP first requires identifying key factors that would change the project delivery practices. Theis COAA Scalable AWP Report introduces two main factors: familiarity and complexity. If a project type is new to a company, then generally the project could be considered unfamiliar. If the project has been done before by the same team, it can be classified as familiar. The second main factor is complexity, as projects can vary greatly from extremely simple to extremely complex.

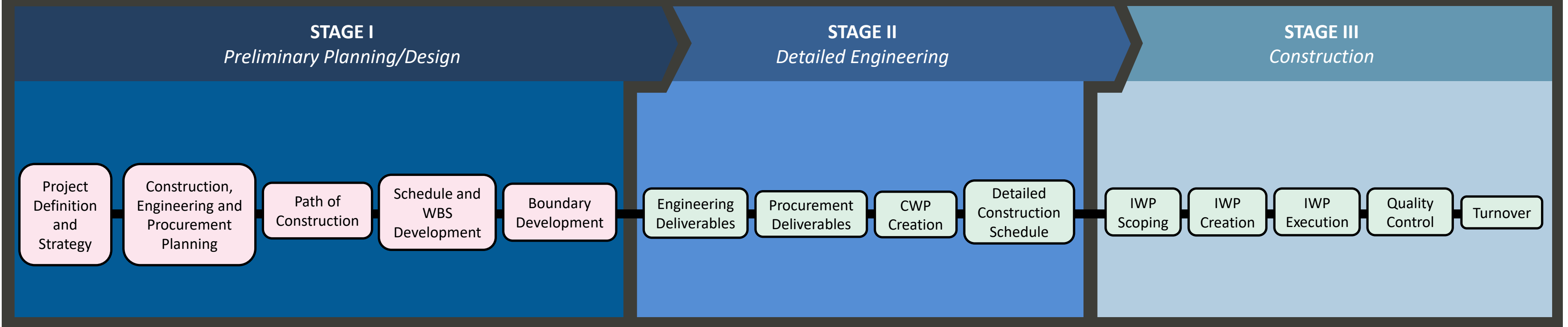
Key excerpts from the COAA Scalable AWP Report are included on the next pages.



# COAA Scalable AWP Report Key Excerpts

The scalable AWP model utilizes the integrated life cycle flow chart from the AWP best practice. The model has been formatted slightly so that it can be scaled up and down for project familiarity and complexity. To see the original model, please refer to the CII website.

## SCALABLE ADVANCED WORK PACKAGING FLOWCHART



## AWP Lifecycle Flowchart - Scalable

Source: [https://www.construction-institute.org/securefile.aspx?filename=319\\_1.pdf#page=13](https://www.construction-institute.org/securefile.aspx?filename=319_1.pdf#page=13)

# COAA Scalable AWP Report Key Excerpts

1. Category A - Unfamiliar Low Complexity (Project)
2. Category B - Familiar Low Complexity (Program)
3. Category C - Unfamiliar High Complexity (Project)
4. Category D - Familiar High Complexity (Program)

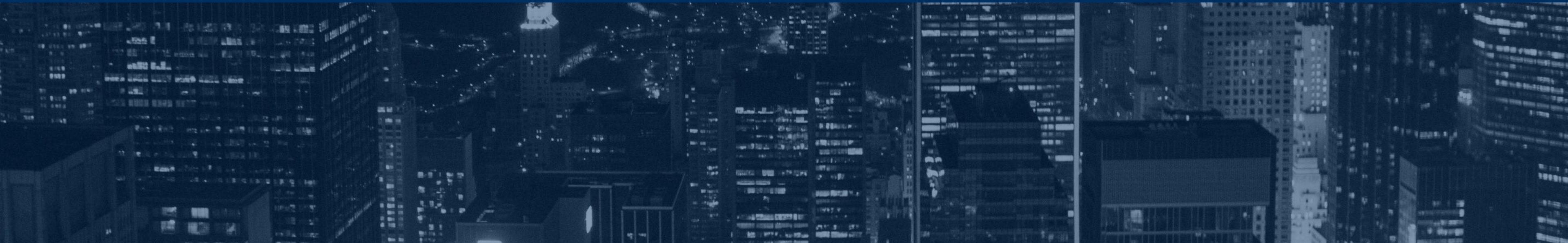
Project Risk Complexity Rating Matrix		
	Unfamiliar	Familiar
LOW Complexity	Medium	Low
HIGH Complexity	High	Medium

To determine the categorization of a project a screening tool was devised. The COAA screening tool asks a series of questions that help identify if a project is familiar / unfamiliar and low / high complexity.

**Source:** COAA Scalable Advanced Work Packaging Report , Page 10

[www.coaa.ab.ca/library/scalable-advanced-work-packaging-report/](http://www.coaa.ab.ca/library/scalable-advanced-work-packaging-report/)

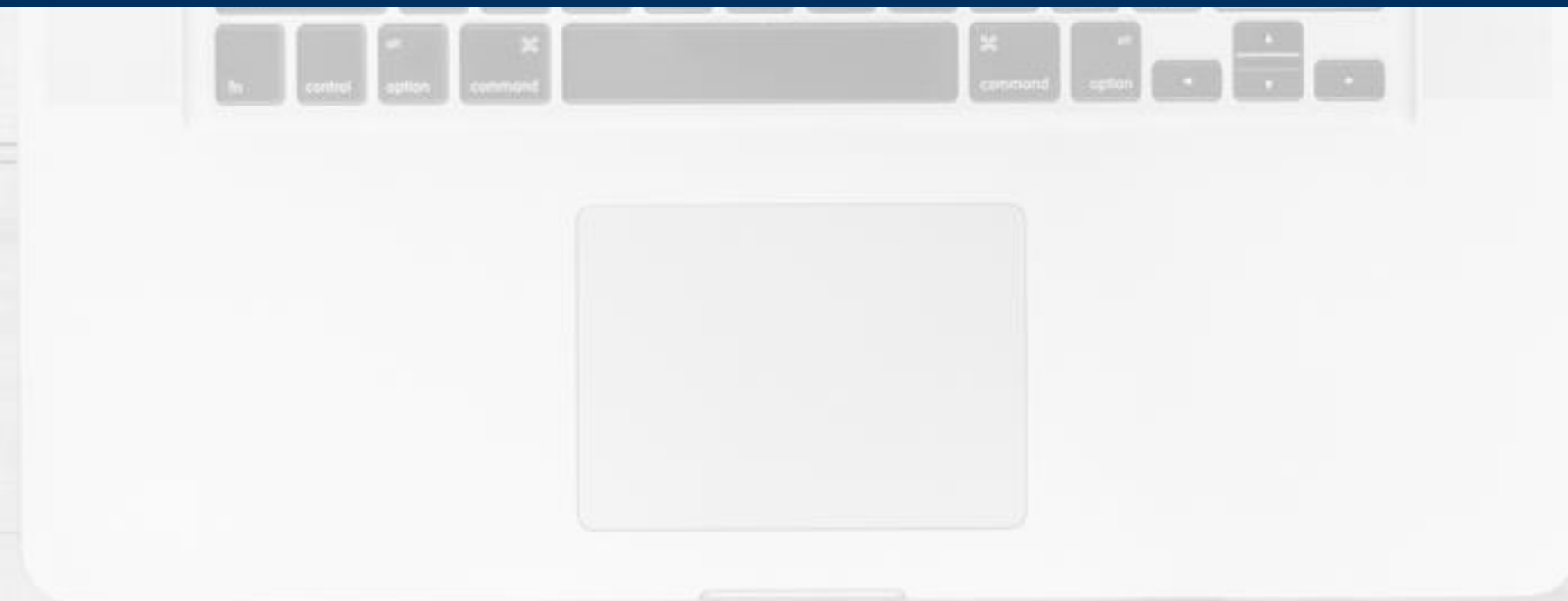
# Overcoming Common AWP Objections







OBJECTION:  
“I don’t have enough people.”





## RESPONSE

“

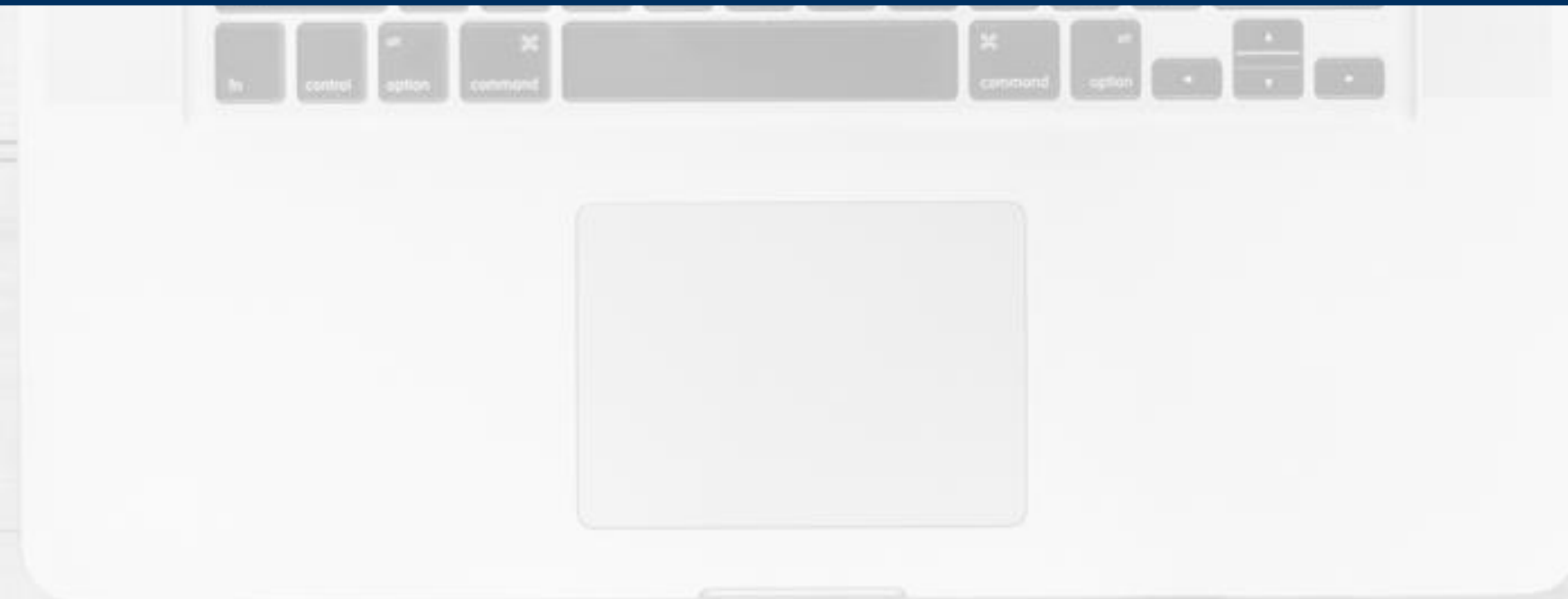
You must be committed to AWP from an organization level...if not then the program will fail at the project level. Most companies who say that they don't have enough people to perform AWP have not committed.

”



## OBJECTION:

“This isn’t how engineering works. This will slow down engineering.”







## RESPONSE

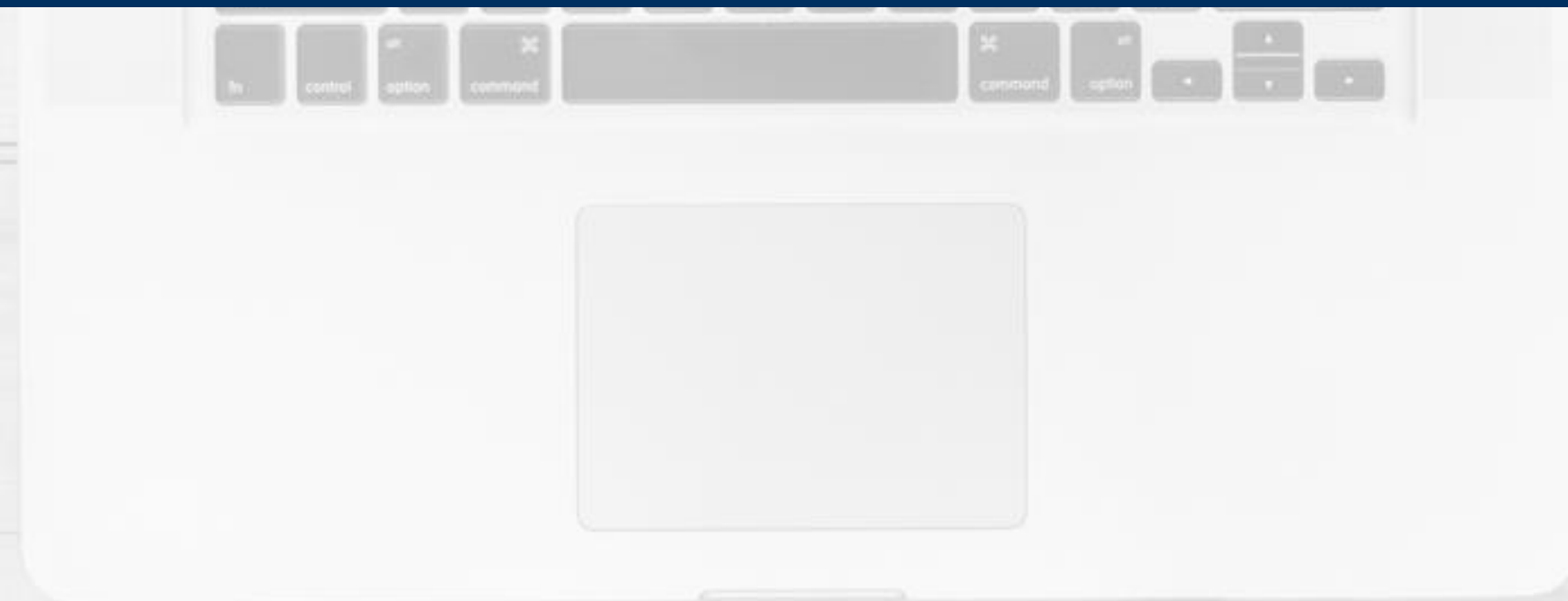
“

This is one of the great fallacies of AWP. The AWP process should have little impact to Engineering productivity. Engineering can still be done by system. The difference is in how the engineering deliverables are distributed and the priority driving the sequencing.

”



OBJECTION:  
“This is too hard / complex.”





## RESPONSE

“

Clients are demanding a more intelligent approach to project delivery. Technology is driving new approaches in project execution.

Companies that fail to innovate will fail to exist.

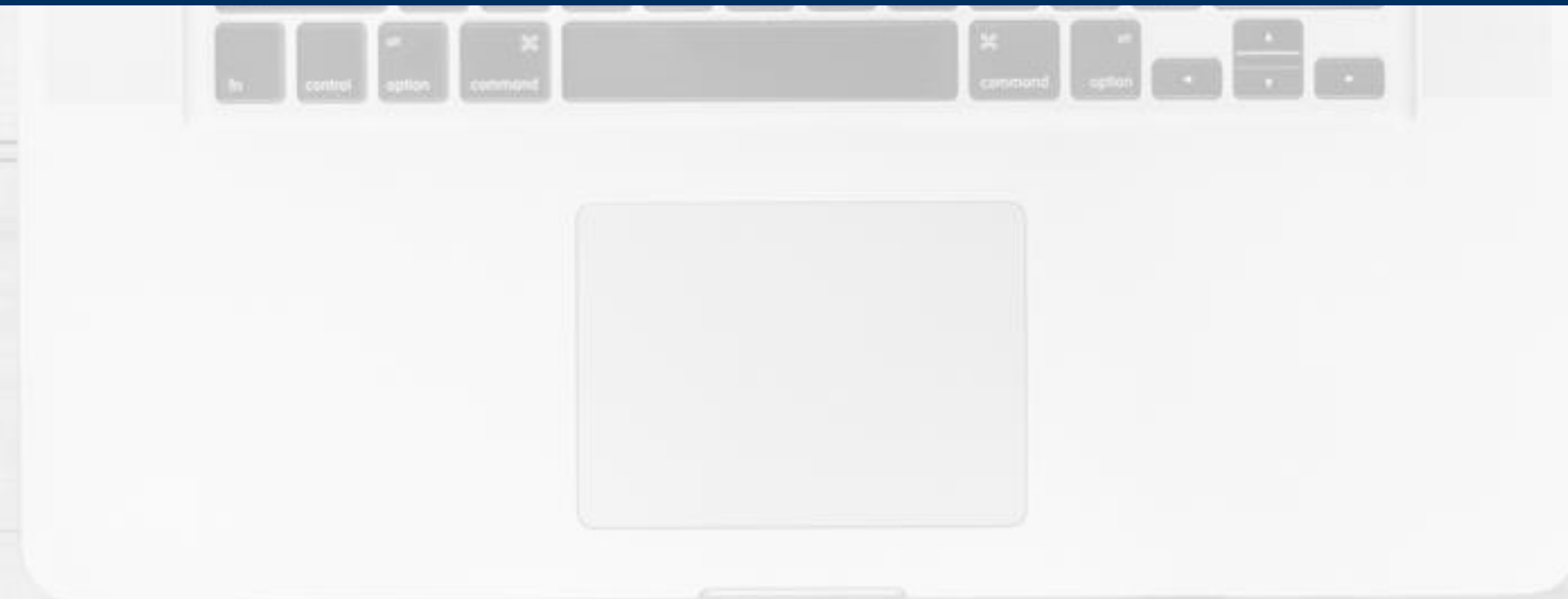
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OBJECTION:

“Our current process is just fine.”





# RESPONSE

“

Historically, the construction industry has been plagued with cost and schedule overruns.

70% of construction projects are over budget and behind schedule, and 52% of projects finish at 189% of their initial budget.\*

Misalignment between engineering, procurement and construction has contributed to an average tool time of just 3.7 hours (37%) per shift.\*\*

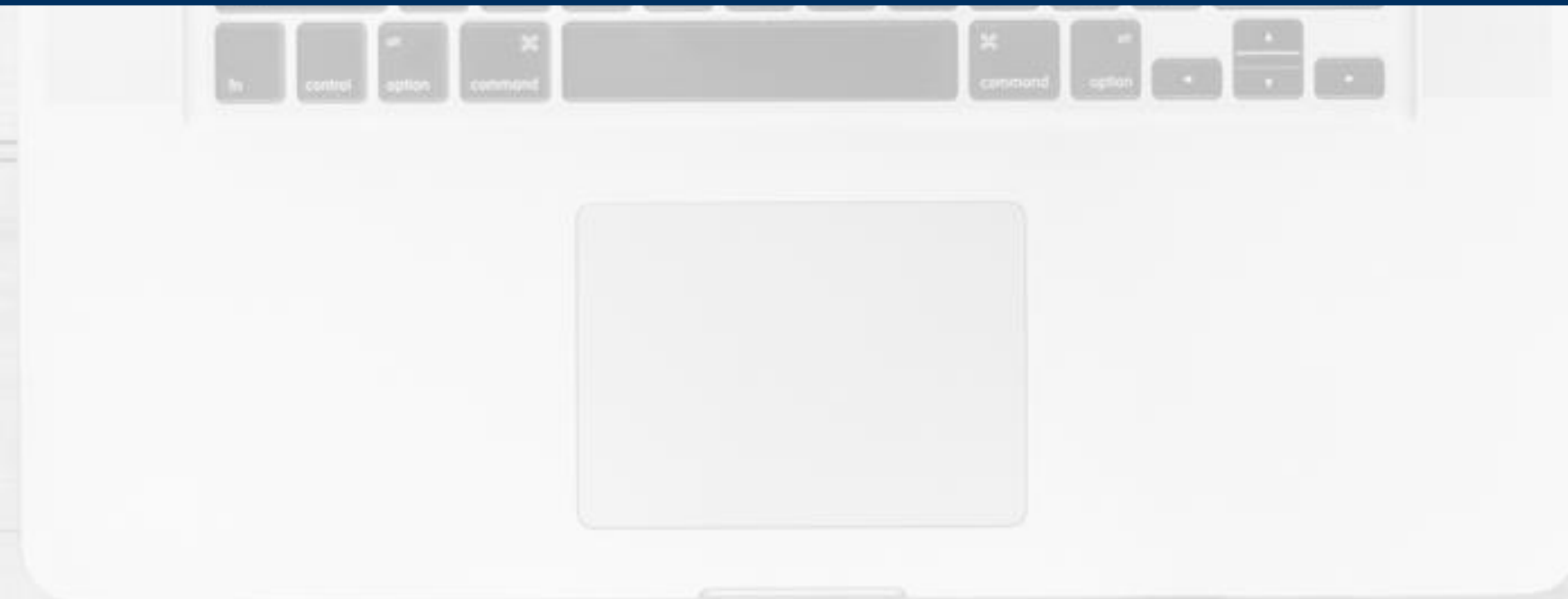
Just fine isn't good enough anymore.

”



## OBJECTION:

“I don’t have the technology or tools to do this.”







## RESPONSE

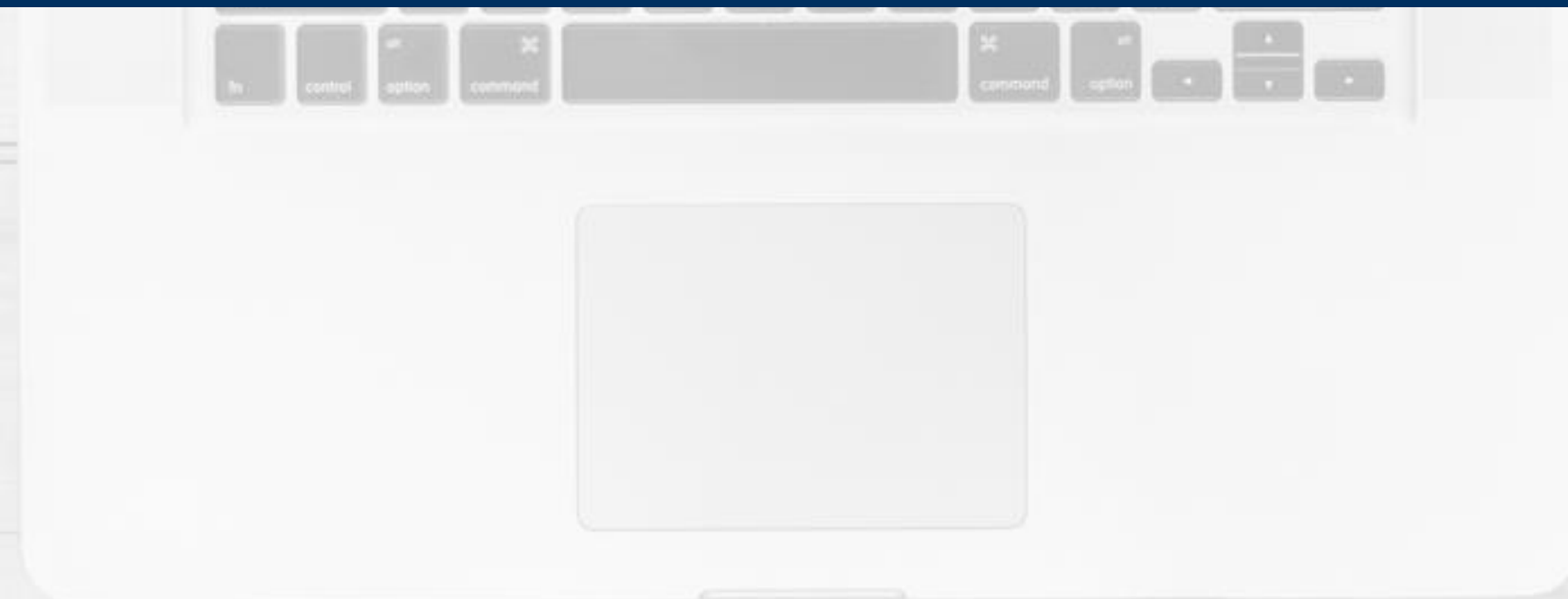
“

Having integrated systems configured to aid in AWP execution will allow your company to do more with less required resources. It will allow you to manage and control a vast number of vital functions with fewer project staff members.

”



OBJECTION:  
“AWP is just a buzz word.”





## RESPONSE

“

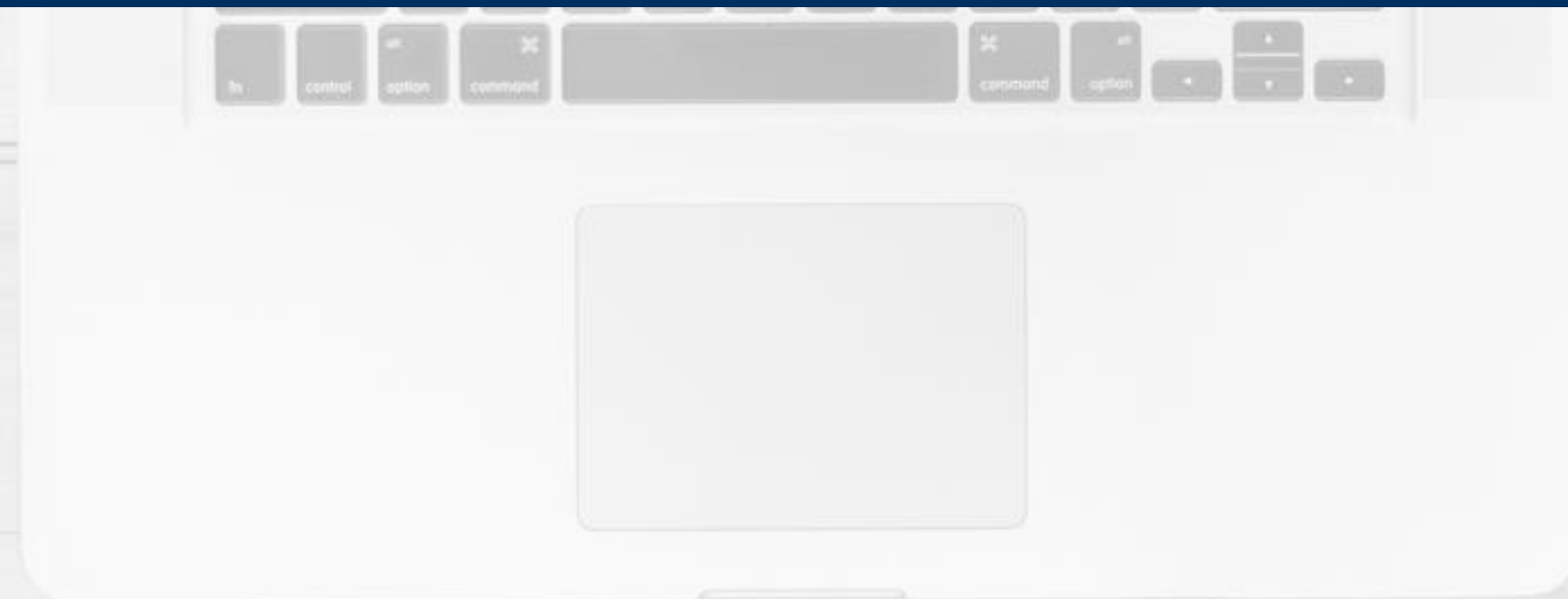
AWP has been recognized as an industry best practice by CII, COAA, and others.

AWP has become the required project delivery method for many major clients in the Oil, Gas, and Chemical Industry, and beyond. It's an intelligent approach to project delivery; not just a buzz word.

”



OBJECTION:  
“AWP isn’t right for my project.”







## RESPONSE

“

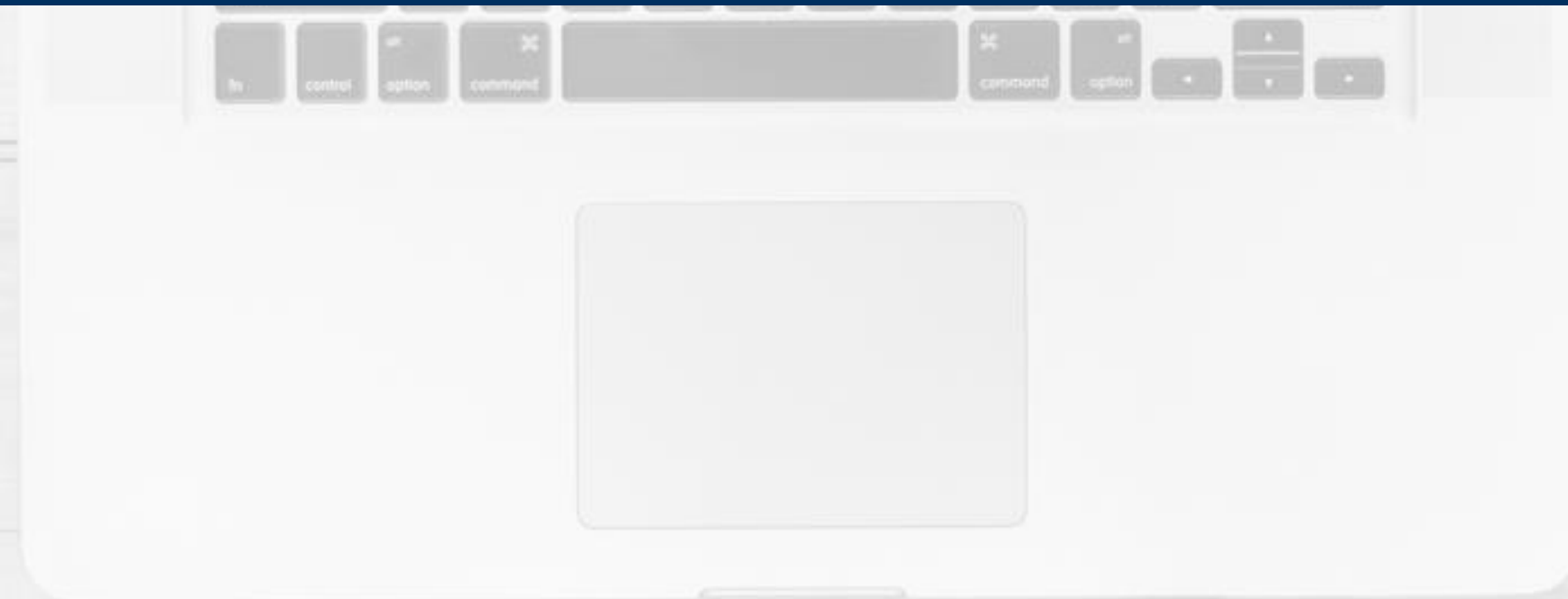
The basic concept of AWP can be applied to any project regardless of size or content. AWP is scalable and its benefits can be realized through a multitude of project types spanning an assortment of industries.

”



## OBJECTION:

“I don’t have time to learn something new right now.”





## RESPONSE

“

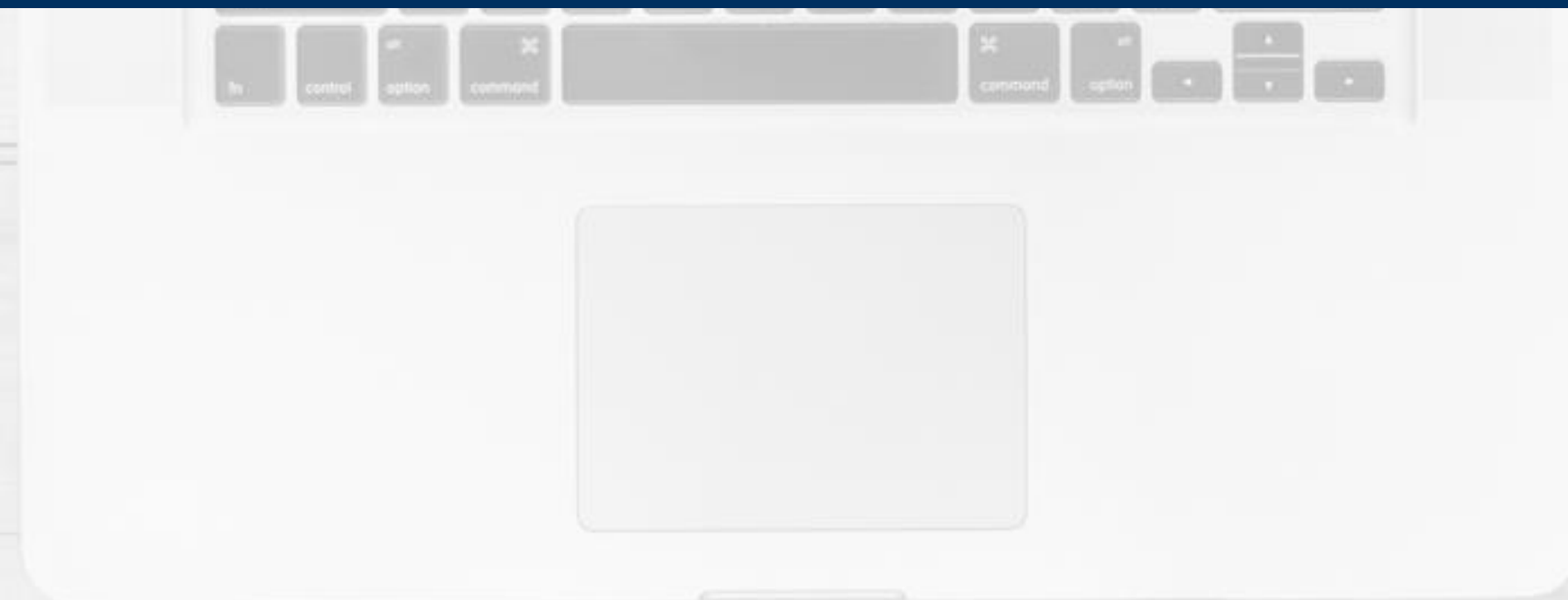
AWP education resources are readily available.

In addition, CII is developing an AWP concierge service to assist people (and companies) with their AWP journey.

”



OBJECTION:  
“My project is too small.”







## RESPONSE

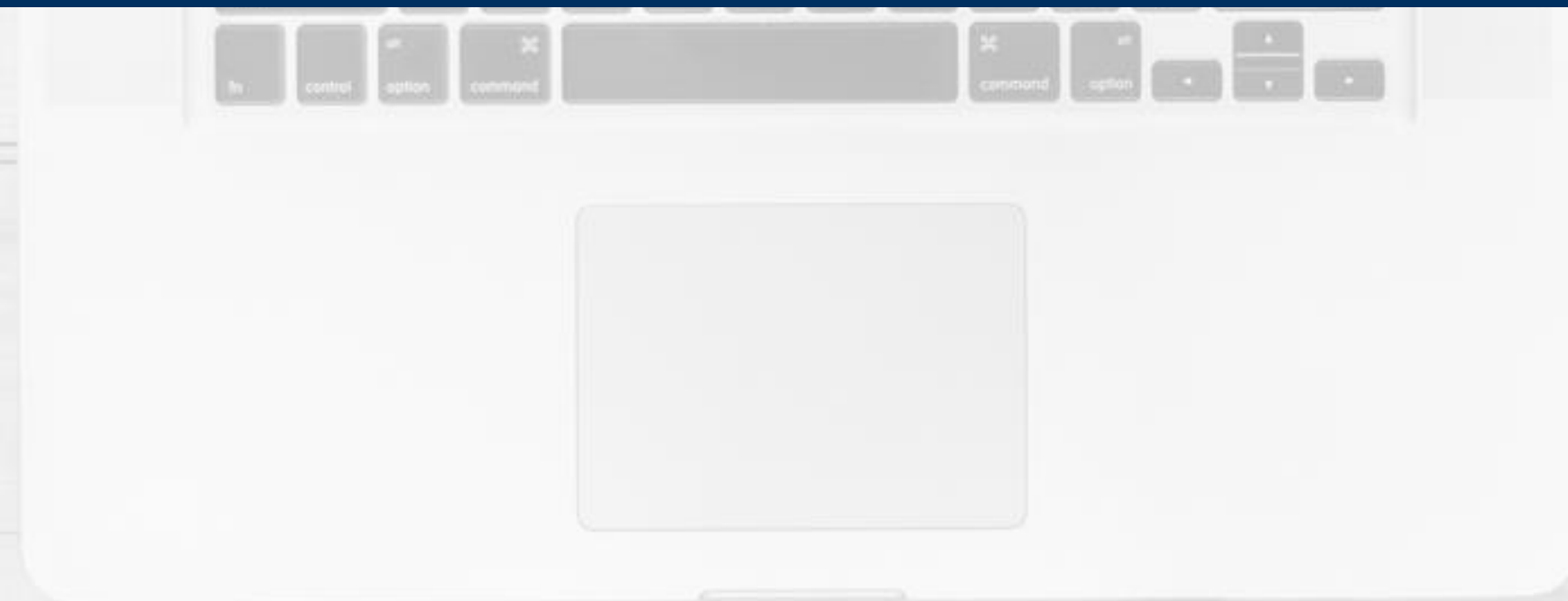
“

The core foundation of the AWP process is applicable to projects of all sizes. The new AWP scalability model addresses some of these questions for the OG&C industry.

”



OBJECTION:  
“My project is too far along.”





## RESPONSE

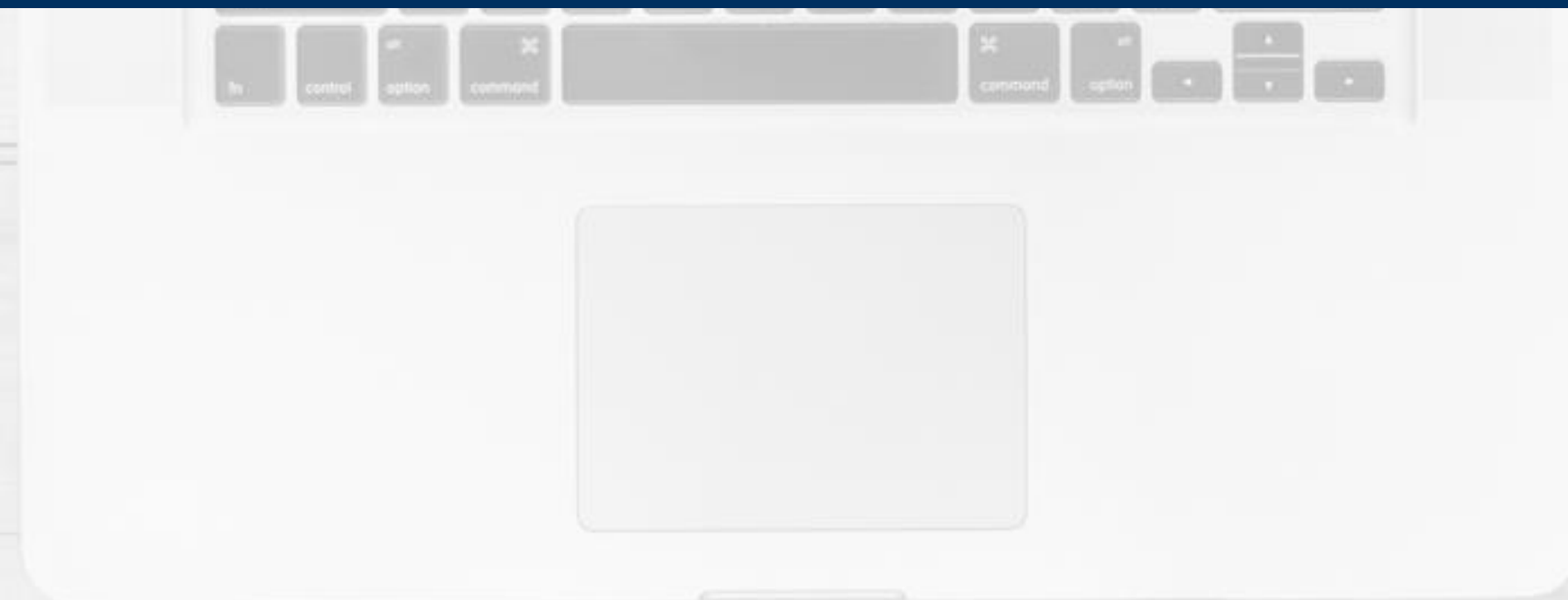
“

If engineering has progressed to the point where a change in bow direction will prove costly, and the procurement ship has already sailed, the best strategy may be to monitor (and manage if possible) constraints against Installation Work Packages as part of a Workface Planning process.

”



OBJECTION:  
“I have a Lump Sum job.”







## RESPONSE

“

Great! AWP will offer your company an opportunity to realize a positive increase in safety, direct labor production rates, and a reduction in total installed cost. This translates into a higher profit margin.

”



OBJECTION:  
“We already do AWP.”



## RESPONSE

“

Many companies have a misconception of the scope and breadth of AWP. They don't realize that Advanced Work Packaging is a comprehensive project delivery method which transcends from Front End Planning through Commissioning.

”

# THANK YOU

