The Knowledge Leader for Project Success

Owners • Contractors • Academics

COAA Construction Owners Association of Alberta

COAA – CII JOINT INITIATIVE

IMPLEMENTATION OF WORKFACE PLANNING THROUGH ADVANCED WORK PACKAGING

COAA BEST PRACTICE XX
MAY 16, 2012

AGENDA

1. Overview of joint venture (5 min)
2. CII RT272 Phase I Background (10 min)
3. Thrust areas
    a. *Process & Functional* (5 min)
    b. Contracts (3 min)
4. Survey (30 min)
5. Q&A (30 min)
6. Wrap up (10 min)

Overview of Joint Venture

WorkFace Planning is 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.

Background

- COAA commenced development of WorkFace Planning Best Practice 2003 – 2005.
- Concentrated on Construction Phase of Project with goal of increasing Tool Time 25% by reducing Wait Times.
- Developed Rules and Scorecards
- Introduced Contract Language to accommodate WFP

Background

- Developed FIWP Templates.
- Developed and Delivered Training Courses.
- Developed Path of Construction Best Practice
- Introduced Concept for Designated Occupations
- Flowchart of WFP Process thru Project Lifetime

Background

- CWP Best Practice
- Introduced series of WFP Conferences.
- Flowchart updated to include Swim lanes:

COAA WorkFace Planning Project Integration

Background

Why is it not working?

- Productivity was not improving to extent anticipated with implementing WFP.
- Constructors who were getting high marks utilizing guidelines of COAA WFP Scorecards not consistently getting higher productivities.
- **Realization that problems were still occurring in transfer of Front End Deliverables complete, on time and in right sequence to Contractors.**

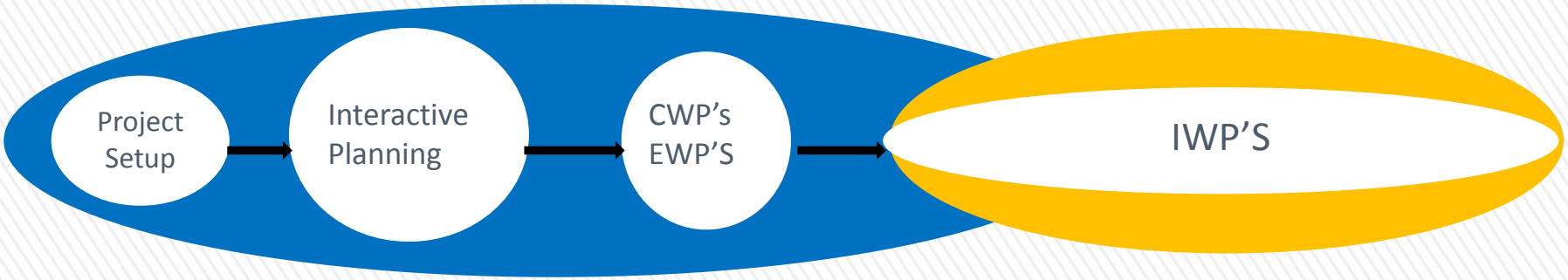
Overview of JV

- COAA WFP Committee was given mandate to provide guidelines for Front End Processes to support the deliverables required for successful implementation of WFP on project.
- CII had just published and presented “IR 272-2 Enhanced Work Packaging” which is their latest implementation resource.

Overview of JV

ADVANCED **WORK PACKAGING**

WORKFACE PLANNING



Front End

Construction
Commissioning
Start Up

GOAL OF JV

- Work together to update RT-272 and COAA Best Practices and integrate into an industry standard Recommended Practice for Implementation of *A*dvanced Work Packaging (of which WFP will continue to cover the Construction Phase as well as the Commissioning and Start Up.)

- Develop and Strengthen Processes and Procedures in the Front End to Support WFP.

- Integrate definitions, metrics and language.

GOAL OF JV

- Processes
- Functionality (Organization)
- Contract Language
- Maturity Assessment

➢ Presentation of RT272 (joint) at the CII Annual Meeting in summer 2013

CII RT272 Phase I Background :

Enhanced Work Packaging Planning for Productivity and Predictability

RT 272 Team

Steve Autry, *ConocoPhillips*

Richard Buxo, *SNC-Lavalin*

Doug House, *Zachry Industrial Inc.*

Mark Hunter, *Bechtel*

John Hyland, *Lauren Engineers & Constructors*

Jose LaRota, *Southern Company*

Fernanda Leite, *The University of Texas at Austin*

Brendan Lynam, *Kvaerner*

Enhanced Work Packaging

Sarah Meeks, *The University of Texas at Austin*

Robin Mikaelsson, *Bentley Systems, Inc*

Bill O'Brien, *The University of Texas at Austin*

Mark Parsons, *KBR*

Randy Paulson, *Progress Energy*

Sean Pellegrino, *Chevron*

Jim Rammell, *Wood Group Mustang*

Jim Vicknair, *WorleyParsons*

Implementation Learning Objectives

- Learn about work packaging across project life cycle; understand terms
- Recognize benefits of enhanced work packaging
- Understand model process for project life cycle and field implementation of work packaging
- Examine case studies
- Consider recommendations for action

Traditional Work Packaging

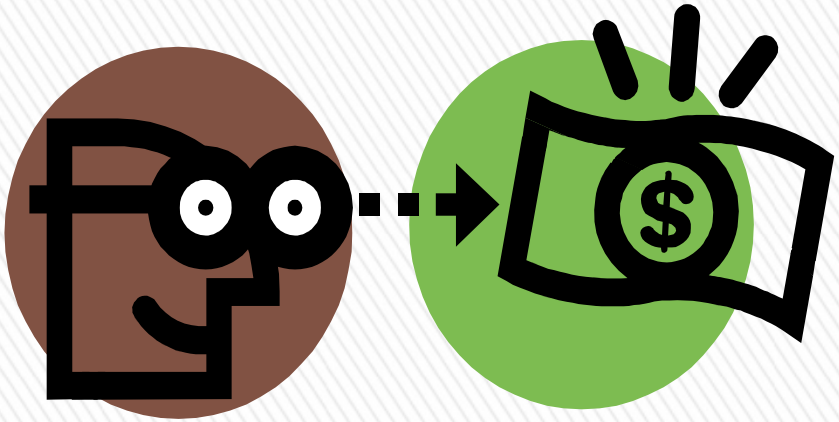
- Has been done on every project since the pyramids
- Is a formal/informal process of understanding and performing field work
- Is accomplished inconsistently

Enhanced Work Packaging

- Takes a proactive, structured approach to managing constraints at the work face
- Involves deliberate, early planning to support execution
- Holistically incorporates the full project life cycle
- Gives supervisors more field time

What's in It for Me?

- Improved productivity
- Predictable performance
- Standardized field execution practices



Construction Labor Productivity Is Key

- Direct labor accounts for 25% to 40% of construction installed costs
- Labor productivity is the cost area most influenced by engineering and construction management practices
- Increased productivity improves safety, cost, schedule, and quality

Improved labor productivity means improved, more predictable performance

Summary Benefits—Validated by Case Studies

- Cleaner, safer jobsite
- Alignment from engineering to construction
- Better craft retention
- Better turnover to commissioning/operations
- Improved project execution predictability
- Cost and schedule savings

Improvement “Opportunities” for the Industry

Current challenges:

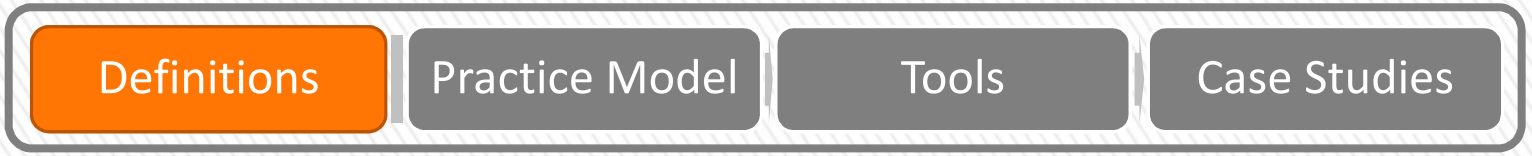
- Inconsistent terminology
- Need for standardization of work packaging
- Lack of guidelines around implementation of work packaging
- Little documentation of work packaging practices

RT 272 Contributions:
A Model for Enhanced Work Packaging

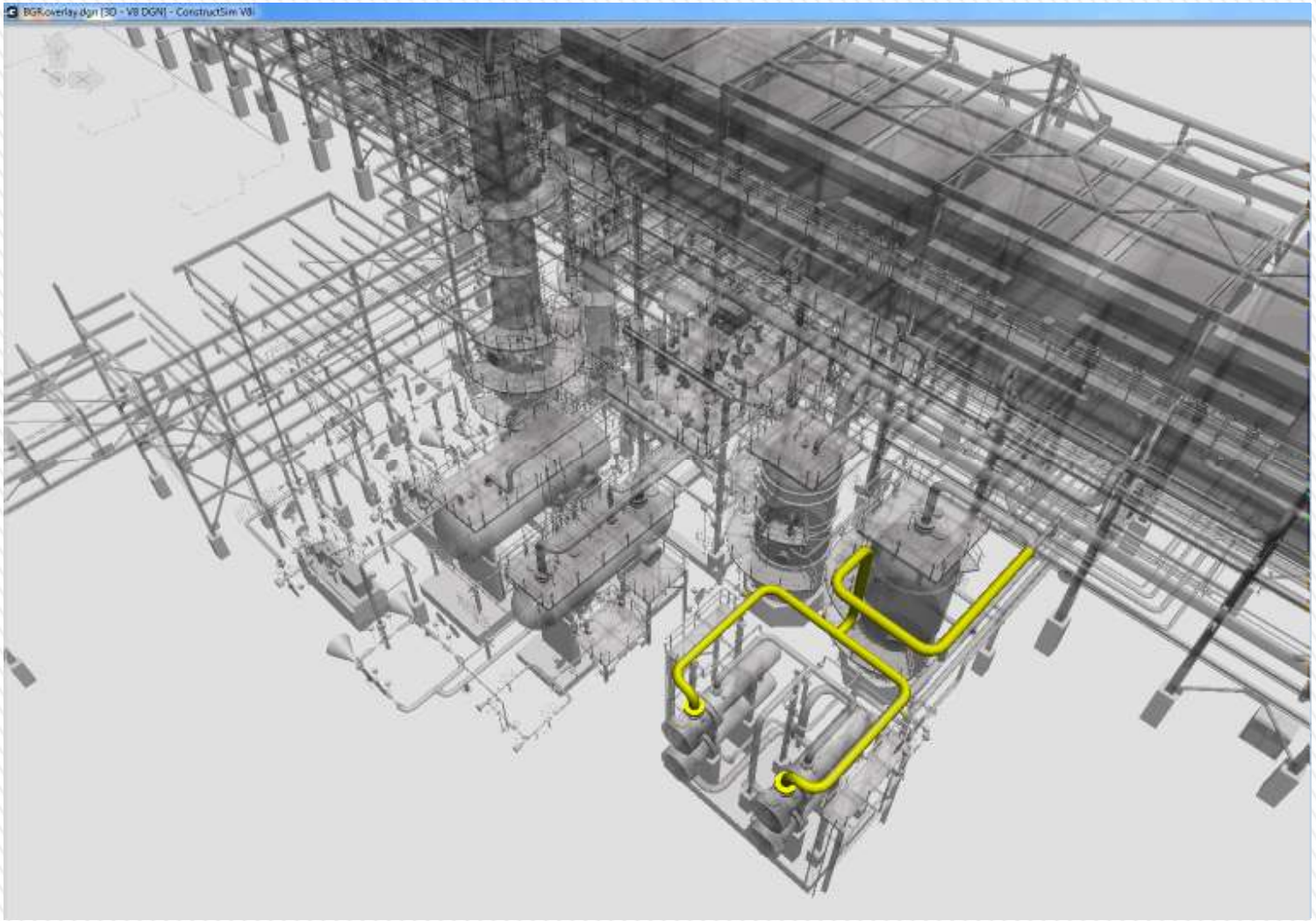
- Common Language → Definitions
- Recommended Practice Model
- Tools
- Case Studies

Common Language → Definitions

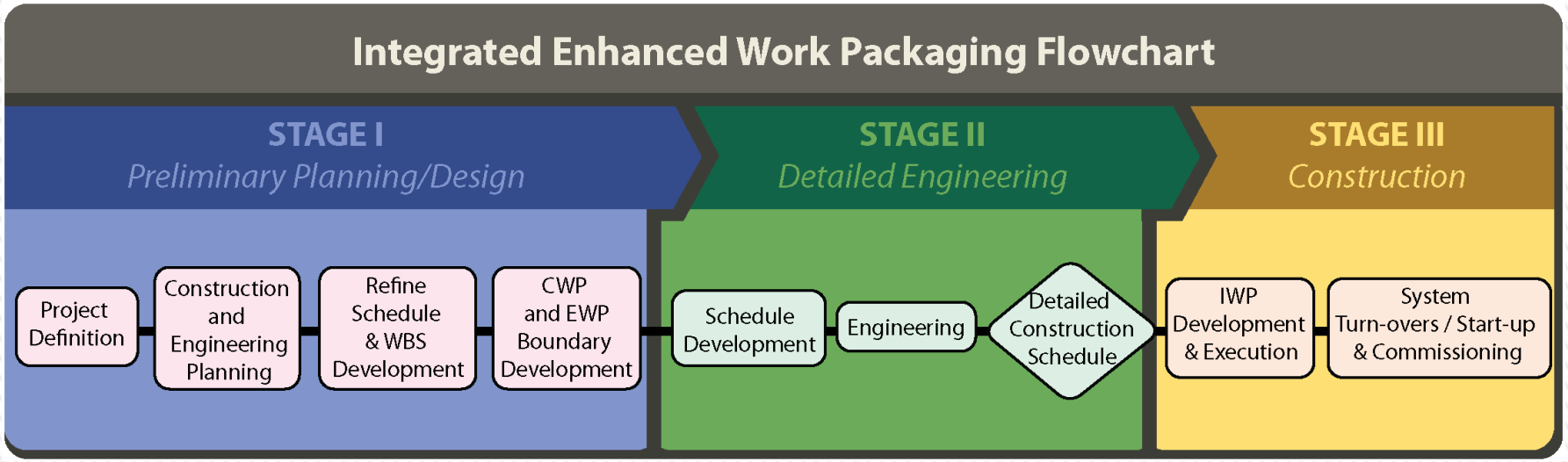
- Work Packaging
- Work Face Planning (WFP)
- Work Face Planner
- Engineering Work Package (EWP)
- Construction Work Package (CWP)
- Installation Work Package (IWP)



Work Package Hierarchy - Project Overall



Recommended Practice Model



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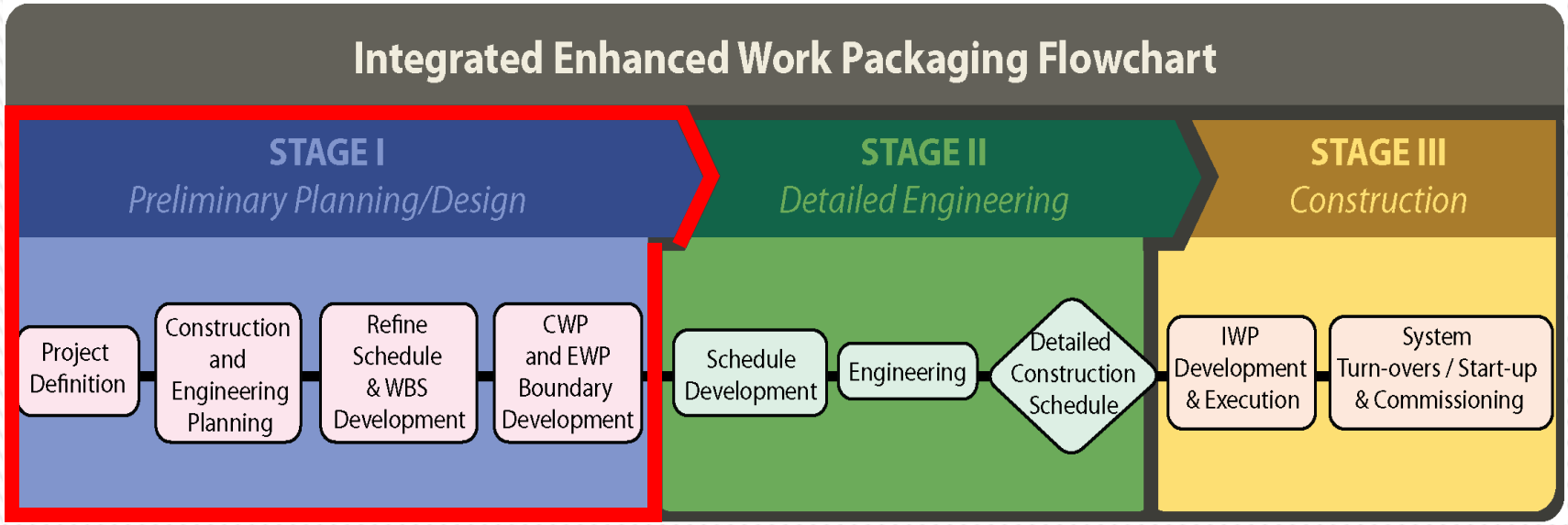
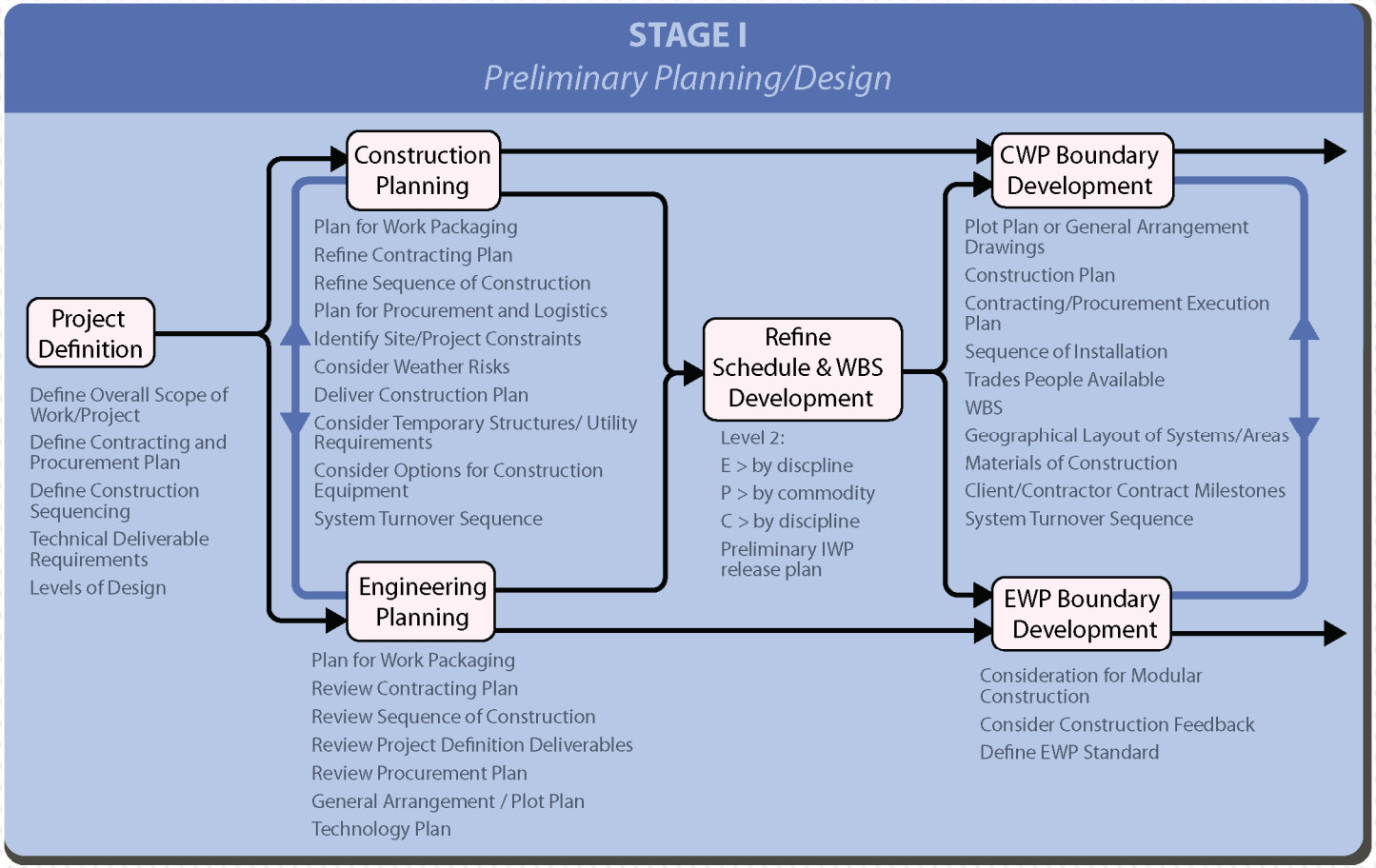
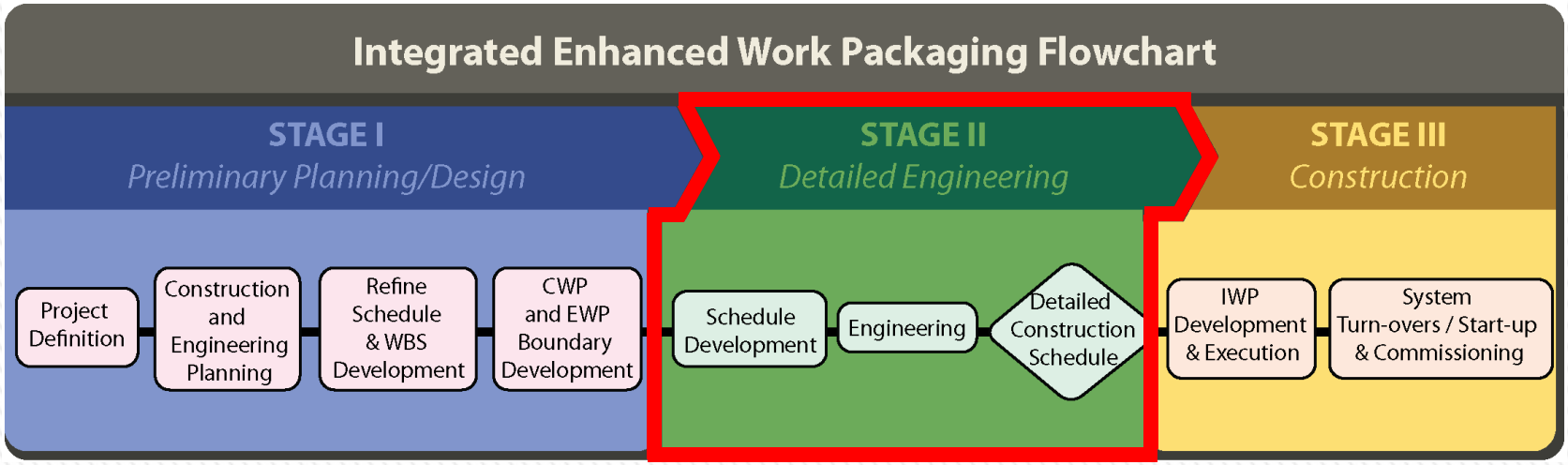


Definitions | Practice Model | Tools | Case Studies

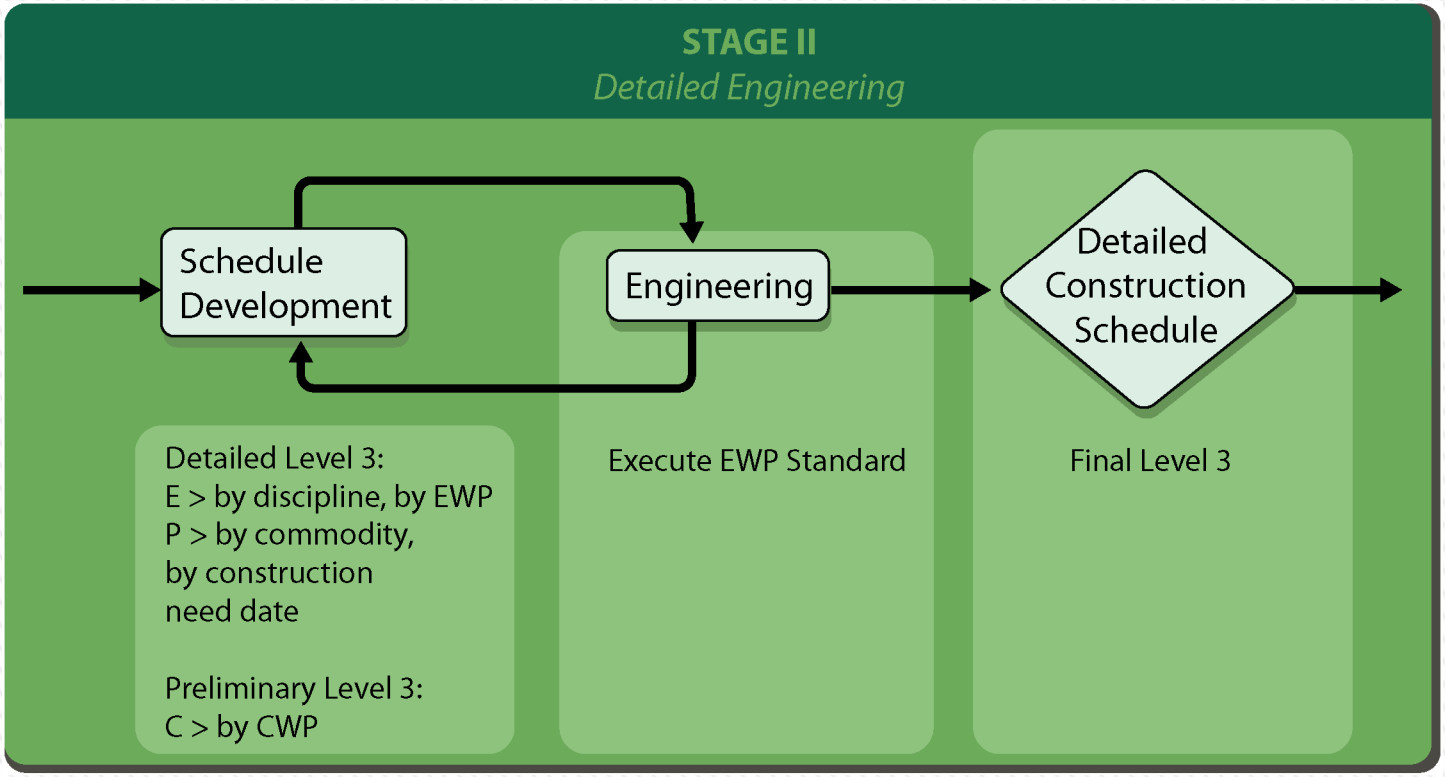
Stage I: Preliminary Planning/Design



Recommended Practice Model



Stage II: Detailed Engineering



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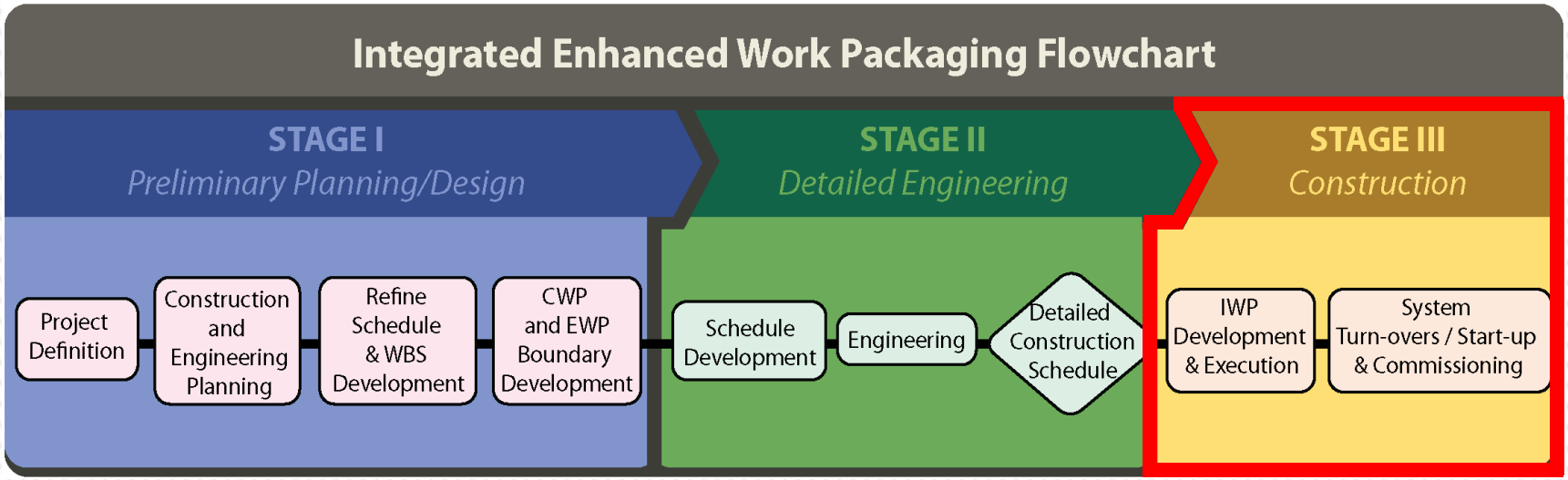
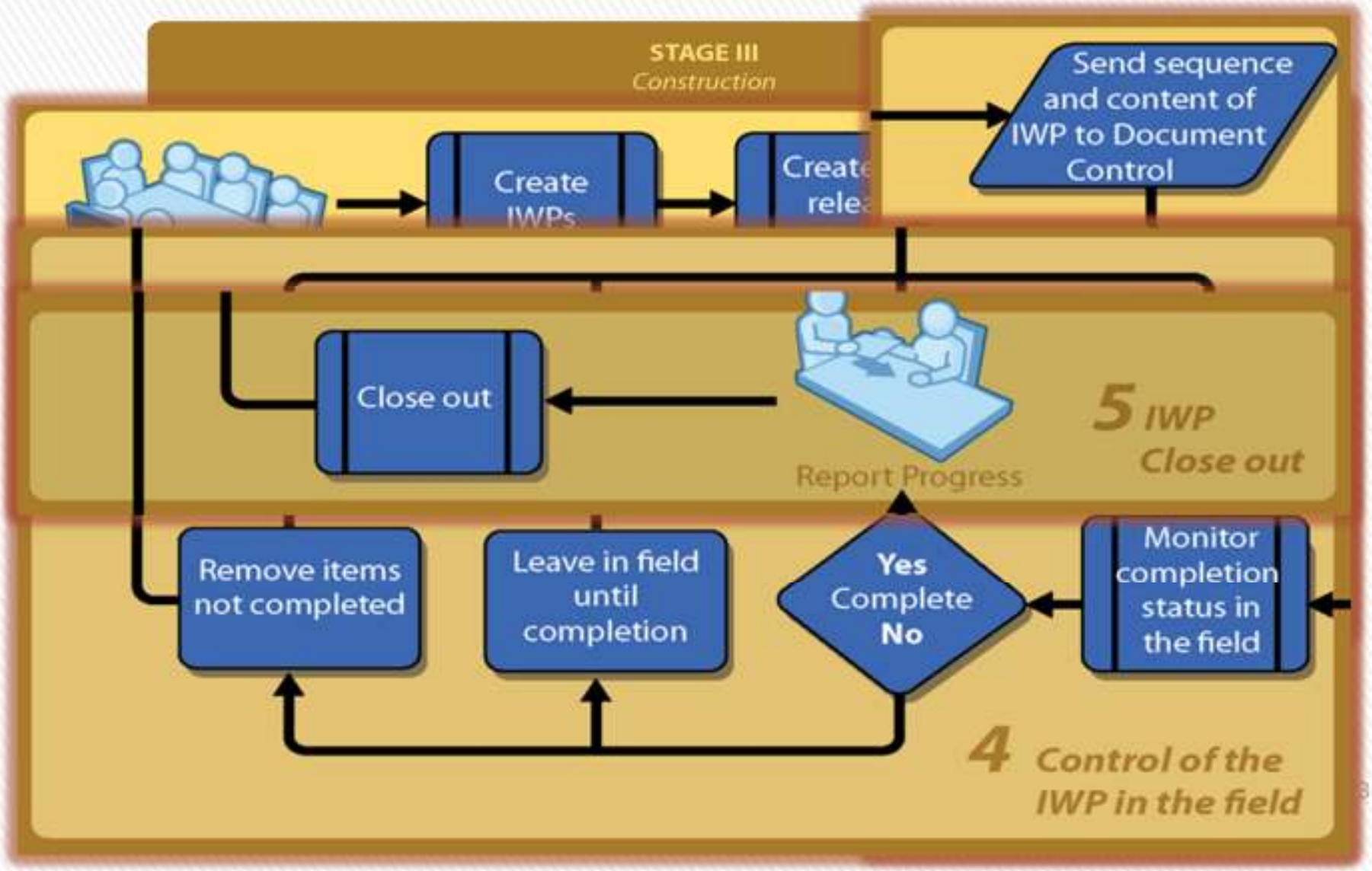


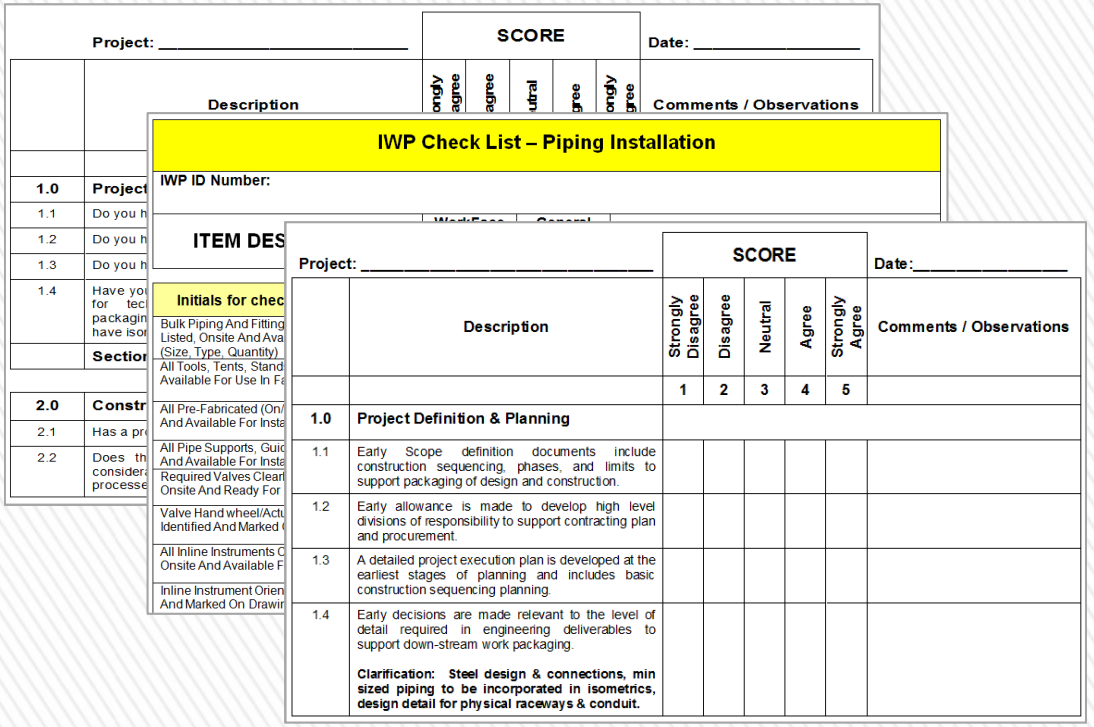
Definitions | Practice Model | Tools | Case Studies

Stage III: Construction



Tools

1. Assessment Tool
2. IWP Checklist
3. Scorecard



IWP Check List – Piping Installation

IWP ID Number:

Project: _____ Date: _____

	Description	SCORE					Comments / Observations
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
		1	2	3	4	5	
1.0	Project Definition & Planning						
1.1	Early Scope definition documents include construction sequencing, phases, and limits to support packaging of design and construction.						
1.2	Early allowance is made to develop high level divisions of responsibility to support contracting plan and procurement.						
1.3	A detailed project execution plan is developed at the earliest stages of planning and includes basic construction sequencing planning.						
1.4	Early decisions are made relevant to the level of detail required in engineering deliverables to support down-stream work packaging. **Clarification: Steel design & connections, min sized piping to be incorporated in isometrics, design detail for physical raceways & conduit.**						

Case Studies

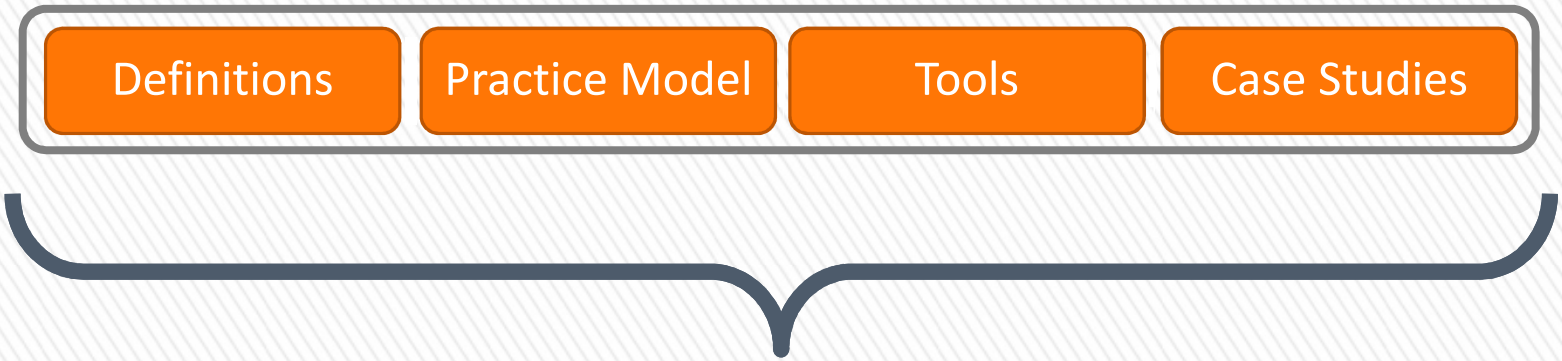
Ten case studies

- Identified current practices
- Determined ranges of implementation
- Documented lessons learned
- Performed validation

Several industries

- power
- oil & gas
- government
- commercial

RT 272 Contributions:
A Model for Enhanced Work Packaging



Productivity & Predictability

Thrust Areas:

a. Process & Functional

b. Contracts

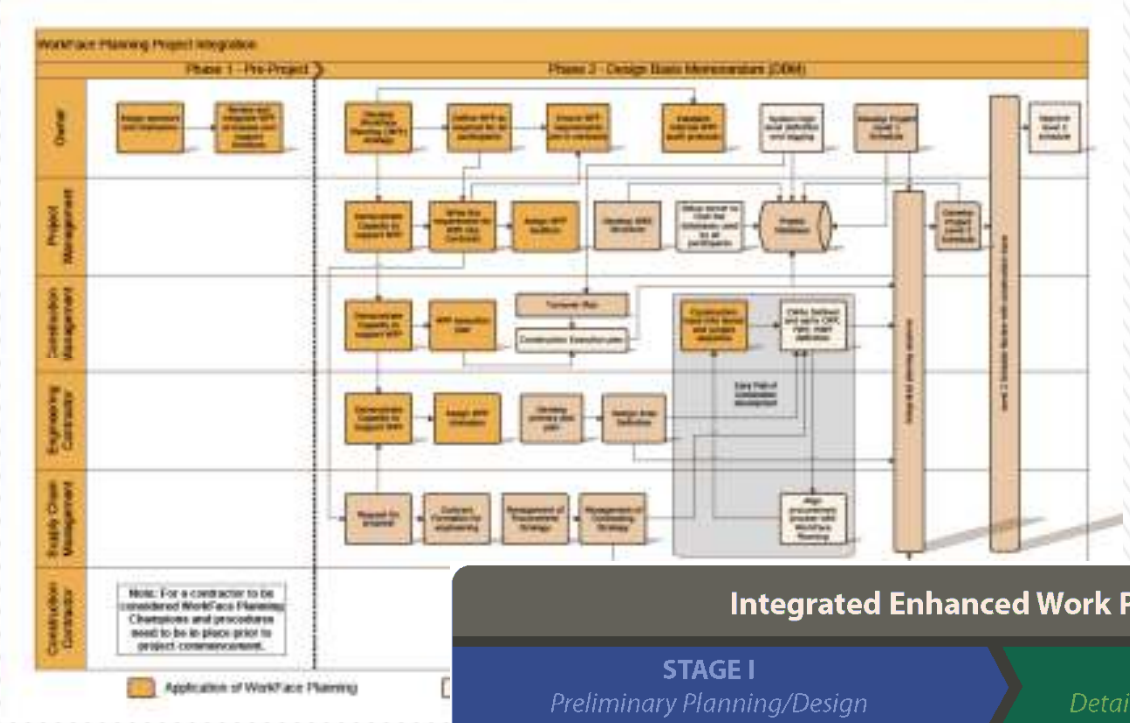
Thrust Areas:

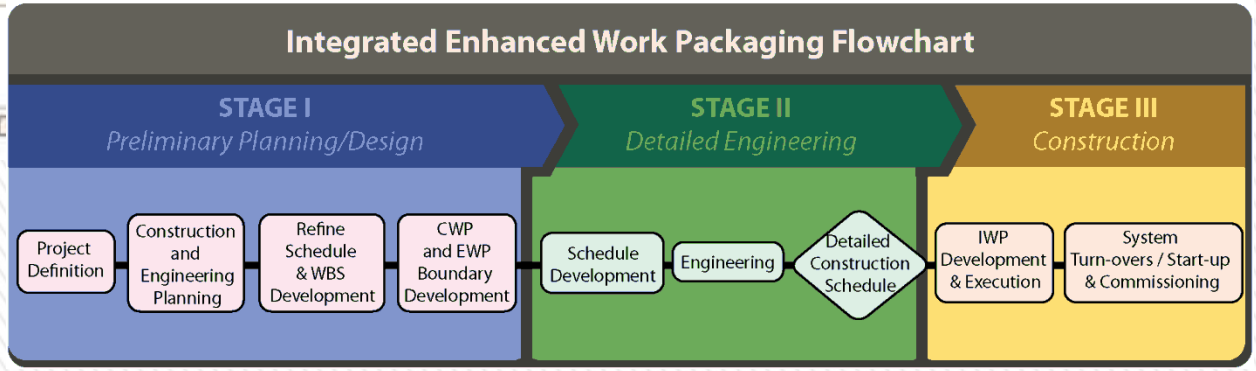
a. Process & Functional

CONSOLIDATING COAA BEST PRACTICE AND CII IR272-2

Advanced **Work Packaging**

COAA WFP INTEGRATION FLOWCHARTS





Advanced Work Packaging

COAA & CII FLOWCHARTS

- Thorough comparison and review of:
  - COAA WorkFace Planning Integration Flowchart
  - CII WorkFace Packaging Integration Flowchart
  - COAA CWP Chart
  - CII IWP Lifecycle Chart
- Ties to organizational functional requirements
- Ties to individual capabilities and responsibilities

TEMPLATES AND GO-BYS FOR WORK PACKAGING

- CWP Template
- EWP Template
- (F)IWP Template
- Other supporting examples and templates

OTHER ENHANCEMENTS AND FOCUS AREAS

- Reviewing terminology and definitions
- Simple Project
  - Single Construction Work Area
  - Multiple CWP's & EWP's
  - Demonstrate Correlation between CWP/EWP & CWP/(F)IWP

Thrust Areas:

b. Contracts

OBJECTIVE

The implementation of *A*dvanced work packaging will need to be an Owner driven program. As a result it will be necessary to provide direction to contractors through bidding documents and contracts. The COAA/CII joint venture Contracts Team will:

1. Review contractual requirements and contracting strategies,
2. Suggest what issues contracts should include,
3. Determine how workFace Planning should be included in various forms of executions strategies

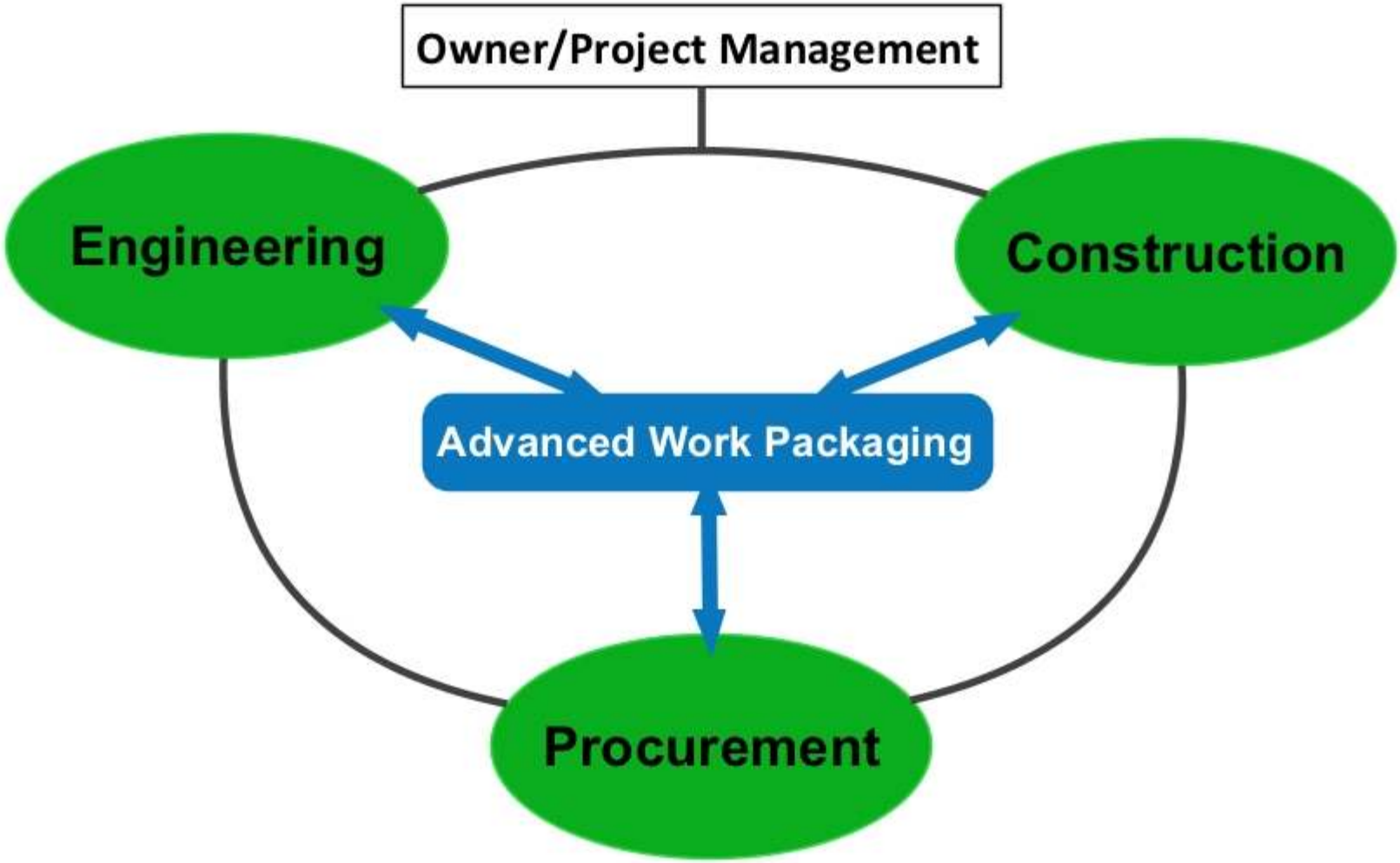
SCOPE FOR CONTRACTS TEAM

The Contracts Team will provide the following:

1. Review requirements of *A*dvanced Work Packaging and determine those issues that would require a directive from Owner.

2. Develop a report that will provide recommendations for the application of *A*dvanced Work Packaging in the development of bid documents or contracts for engineering, procurement and construction.

CROSS FUNCTIONAL INTERFACES



ADVANCED WORK PACKAGING PLANNING: CONTRACTUAL DELIVERABLES BY STAGE

1	Owner
2	EP Contractor
3	C Contractor
4	FEED Contractor
5	EPC Contractor

Deliverables		FEED by owner	FEED by contractor	EP-C		EPC	
				Stages		Stages	
				Detailed Engineering	Construction	Detailed Engineering	Construction
Assessment	Scorecard D	1	1	-	-		
	Contractor qualification scorecards	1	1	1	1,3	1	1,5
	Audit tool	-	-	-	1	-	1
	From swim lanes	-	-	1	1	1	1
Planning	Contracting	1	1	-	-	-	-
	Enhanced WP	1	4	2,3	3	5	5
	Integrative	1	4	1,2,3	3	1,5	5
	CWP	1	4	1,3	3	1,5	5
	EWP	1	4	1,2	-	1,5	-
	WBS (Aligned schedule with WBS)	1	4	1,2,3	-	1,5	-
	Organization	1	1,4	2,3	3	5	5
	Material Management	1	4	2,3	2,3	5	5
	Workface Planning (IWP Plan)	-	-	-	3	-	5
Progress measurement	by CWP	-	-	3	-	5	-
	by EWP	-	-	2	-	5	-
	by IWP	-	-	-	3	-	5

PATH-FORWARD

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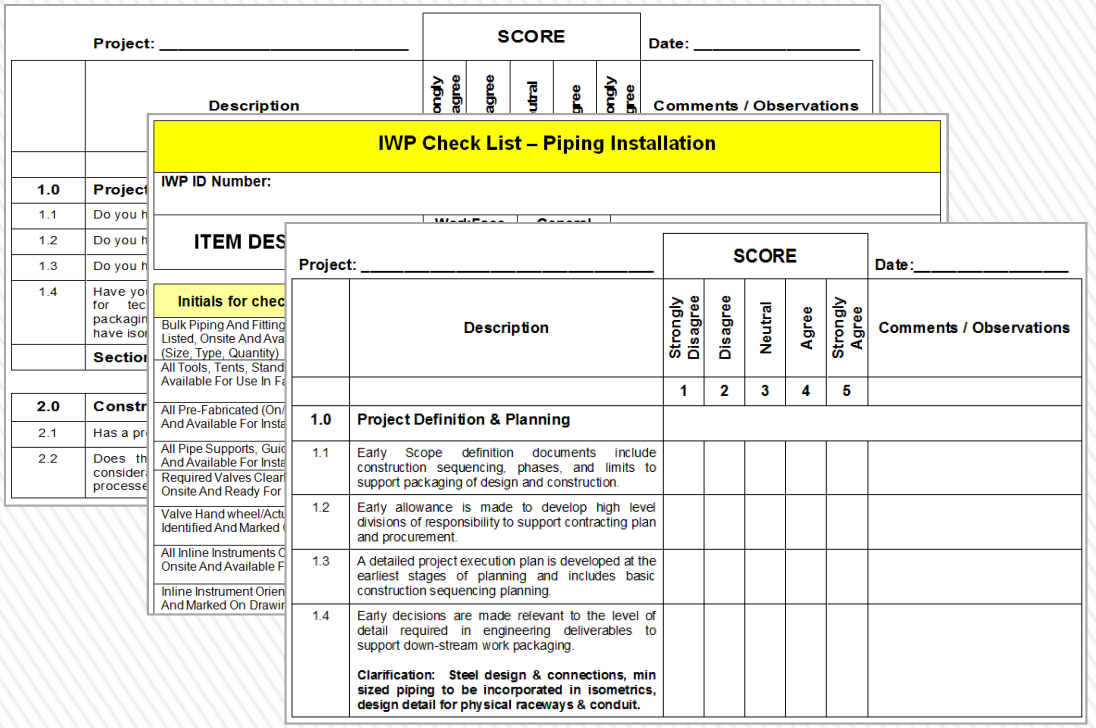

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Survey

The questions of the survey are divided into 4 sets of questions:

A. Participants' background
B. WorkFace Planning knowledge and resources
C. Perceptions of WorkFace Planning
D. Barriers to implementation

A. Participants' background

Questions		Options
Who are you?	1	Owner
	2	Construction Contractor
	3	Engineer
	4	Vendor/supply chain
	5	Other
What is your role in the company?	1	Executive
	2	Construction Management
	3	Engineering
	4	Project management
	5	Project Controls
	6	Workface planner
	7	Other
What is your main business?	1	Oil & Gas
	2	Mining and Metals
	3	Power
	4	Government
	5	Infrastructure
	6	Other
Where does your company do business?	1	Alberta only
	2	North America only
	3	Global

B. WorkFace Planning knowledge and resources

Questions		Options
What is your knowledge of WorkFace Planning?	1	None
	2	A little
	3	Average
	4	A lot
Are you familiar with COAA WFP documents?	1	No
	2	A little
	3	A lot
Have you ever used the COAA WFP Scorecard?	1	No
	2	Yes
Were you familiar with the CII Enhanced Work Packaging resources before today?	1	Never heard about it
	2	Heard about it but did not read it
	3	Read it

C. Perceptions of WorkFace Planning

Questions		Options
What is your experience with WFP per COAA/CII definitions?	1	Have not used
	2	I don't know
	3	Have participated in a single project
	4	Have participated in multiple implementations
Are you already implementing WorkFace Planning?	1	Yes (formal/ documented process)
	2	Yes (Informal process)
	3	No
	4	I don't know

WorkFace Planning perceived advantages

Questions		Options
Which area do you see as the biggest benefit of WFP ?	1	Predictability
	2	Communication
	3	Productivity
	4	Quality
	5	Safety
	6	Alignment between stakeholders
	7	Reduces field rework
	8	Reduced Engineering rework
Which area do you see as the biggest benefit of Advanced Work Packaging (early planning and engineering coordination with construction plans)	1	Predictability
	2	Communication
	3	Productivity
	4	Quality
	5	Safety
	6	Alignment between stakeholders
	7	Reduces field rework
	8	Reduced Engineering rework

D. Barriers to implementation

1. **Significant barrier/ challenge (prevents WFP implementation)**
2. **Moderate barrier (limits effective WFP execution)**
3. **Limited barrier (can be overcome during the WFP implementation process)**
4. **Not a barrier**

	1	2	3	4
Unknown Cost/ROI				
Too much up-front spending				
Perceived increased indirect costs				
Too difficult to understand				
Too big a culture shift; resistance to change;				
Engineering doesn't work this way (tradition/culture/competition)				
Resource capability/skills lacking in my organization				
Owners lack skills / responsiveness to make decisions				
Owner PMO				
Owners cannot drive the process				

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3. **Limited barrier (can be overcome during the WFP implementation process)**
4. **Not a barrier**

	1	2	3	4
WFP not in contract; lacks contractual clarity				
Contracts don't support integrated teams/outcomes				
Lack of definition around standard procedures				
Existing tools and systems don't support WFP processes				
Software not available				
Data and information protocols prevent data sharing				

Questions & Answers

Wrap up

Thank you!