COAA
Construction Owners
Association of Alberta

What's Included In This Package:

AWP Scalability Project
Committee Update

For projects up to $100 Million

COAA
Construction Owners Association of Alberta

Agenda

Lloyd

- AWP Overview
- Scalable AWP

Jeremy

- Project Classification
  - Familiarity
  - Complexity
- Tool Demo

Randy

- ESD Valve Project – First Time
- ESD Valve Program

Kirk

- Solar Farm
- Debottlenecking

Ben

- New WFP System

Narjis

- Development Roadmap
- Q & A

Committees and Chairs

- *The committees are composed of over 40 professionals from the owner, and engineering, supply chain and construction communities from both sides of the border*

Committee	Chair
Steering Committee	Lloyd Rankin (Group ASI)
Owners	Jeremy Furzer (Enbridge)
Engineering and Supply Chain	Randy Friesen (Fluor)
Front-End Construction (FEC)	Kirk Harris (Black & Veatch)
WorkFace Planning (WFP)	Ben Swan (Element Industrial)
Editor	Narjis Shahzad (Teknobuilt)

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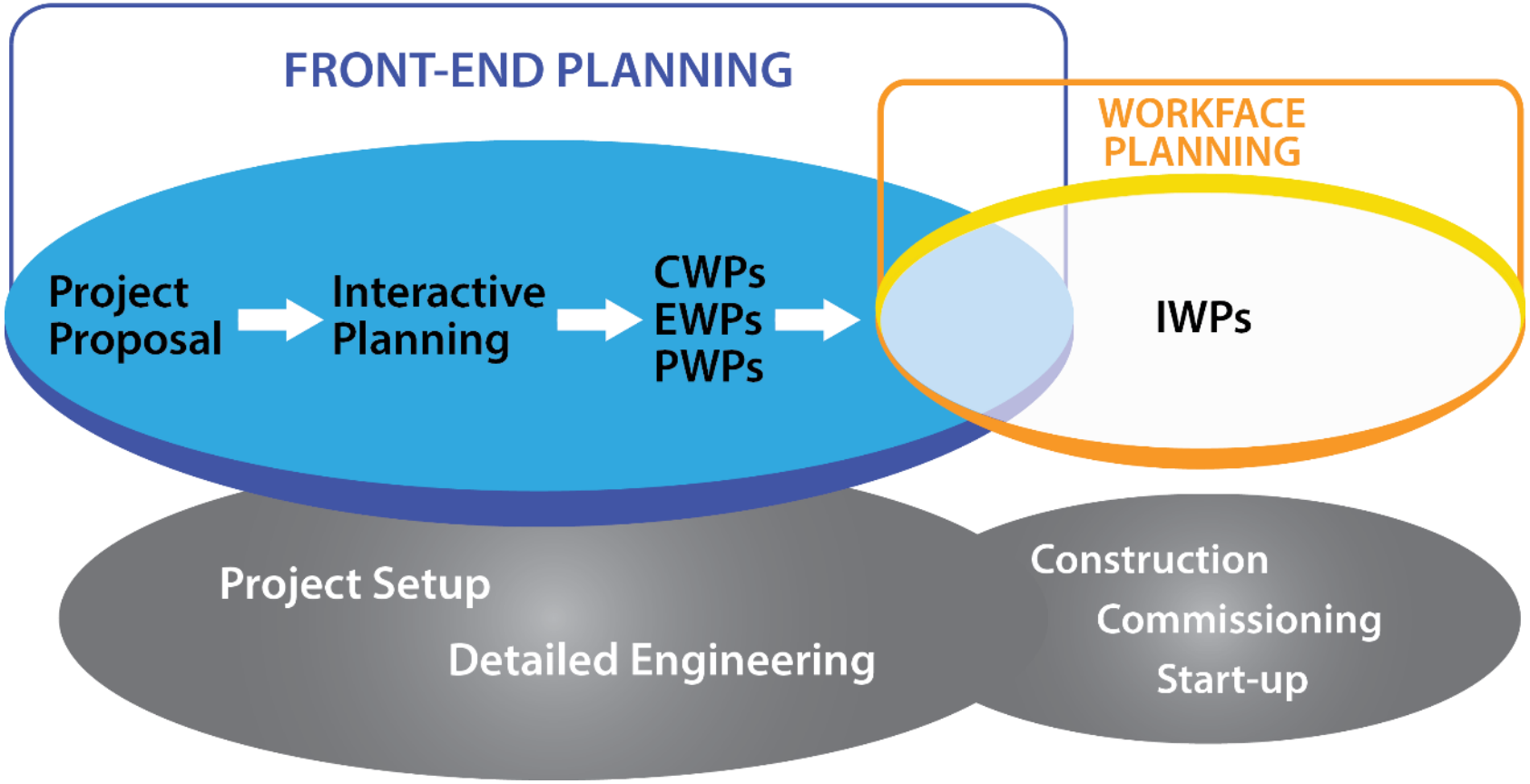
AWP Overview

Developed by The Construction Industry Institute (CII) https://www.construction-institute.org



Our Mandate

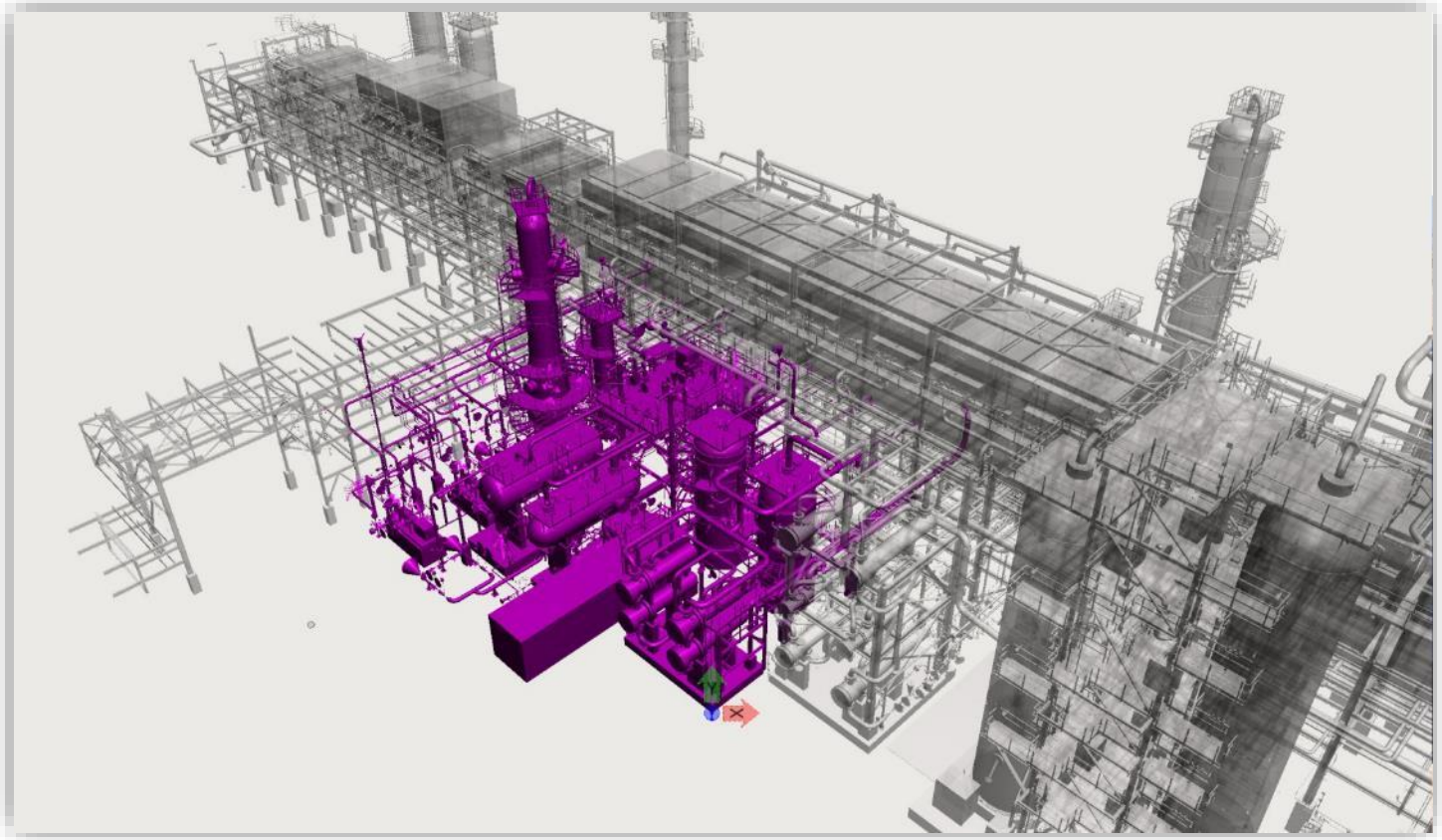
- Improving smaller projects' ($100 million and under) outcomes through the application of Advanced Work Packaging principles.
- The objective is… maximize value through the right planning at the right time to improve project performance as measured by:
  - Productivity
  - Cost
  - Safety
  - Schedule
  - Quality
  - Predictability

AWP Principles: Never Changing

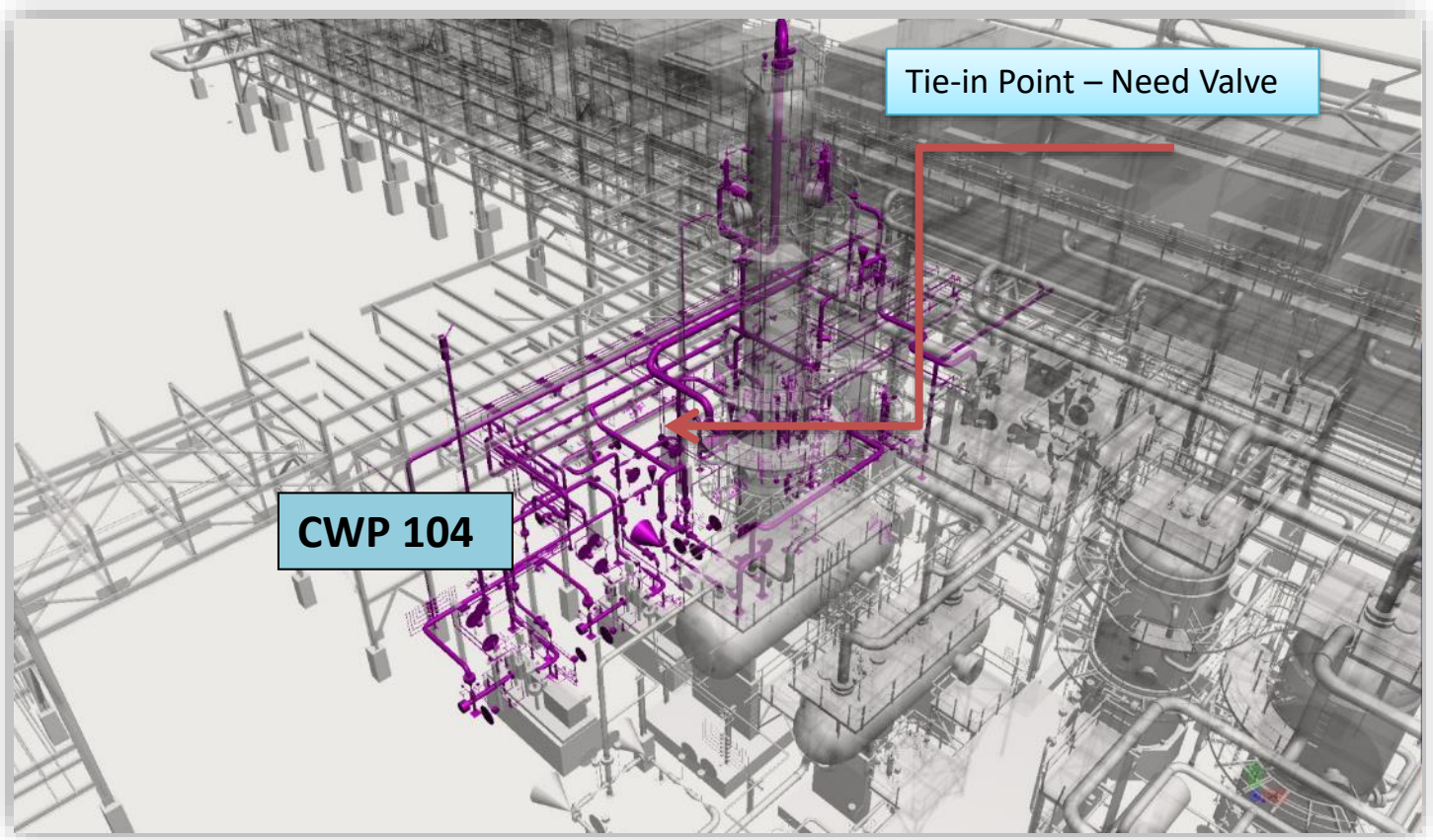
1. Determine how you will build the project (POC)
2. Determine how to package the project
3. Determine how to manage the packages
4. Identify and supply the necessary information
5. Identify and supply the necessary materials requirements
6. Identify and supply the necessary equipment requirements
7. Identify and supply the necessary labor requirements

AWP Practices: Must Change

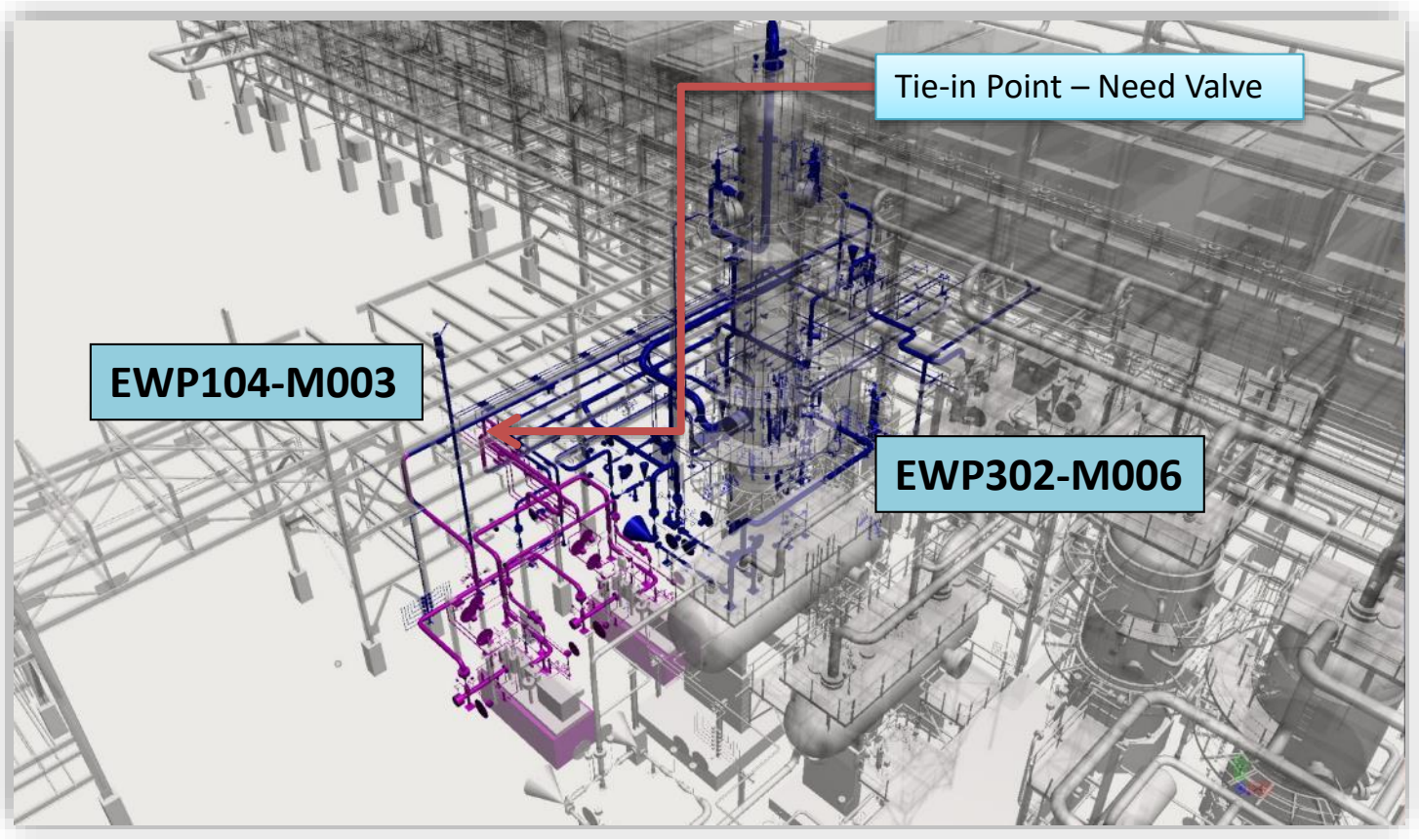
Example: Project Hierarchy (Construction Work Area [CWA])



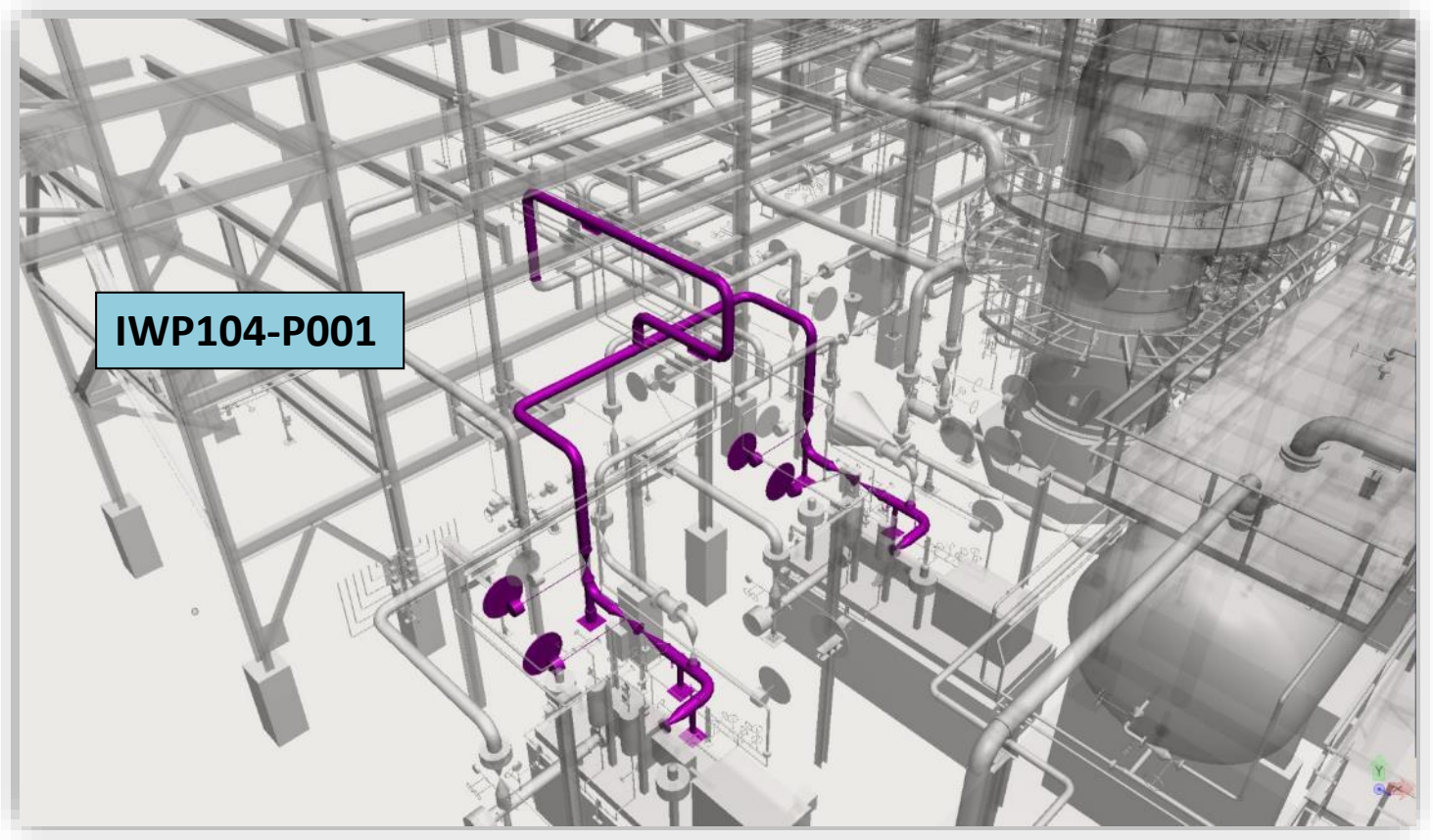
Example: Project Hierarchy (Construction Work Package [CWP])



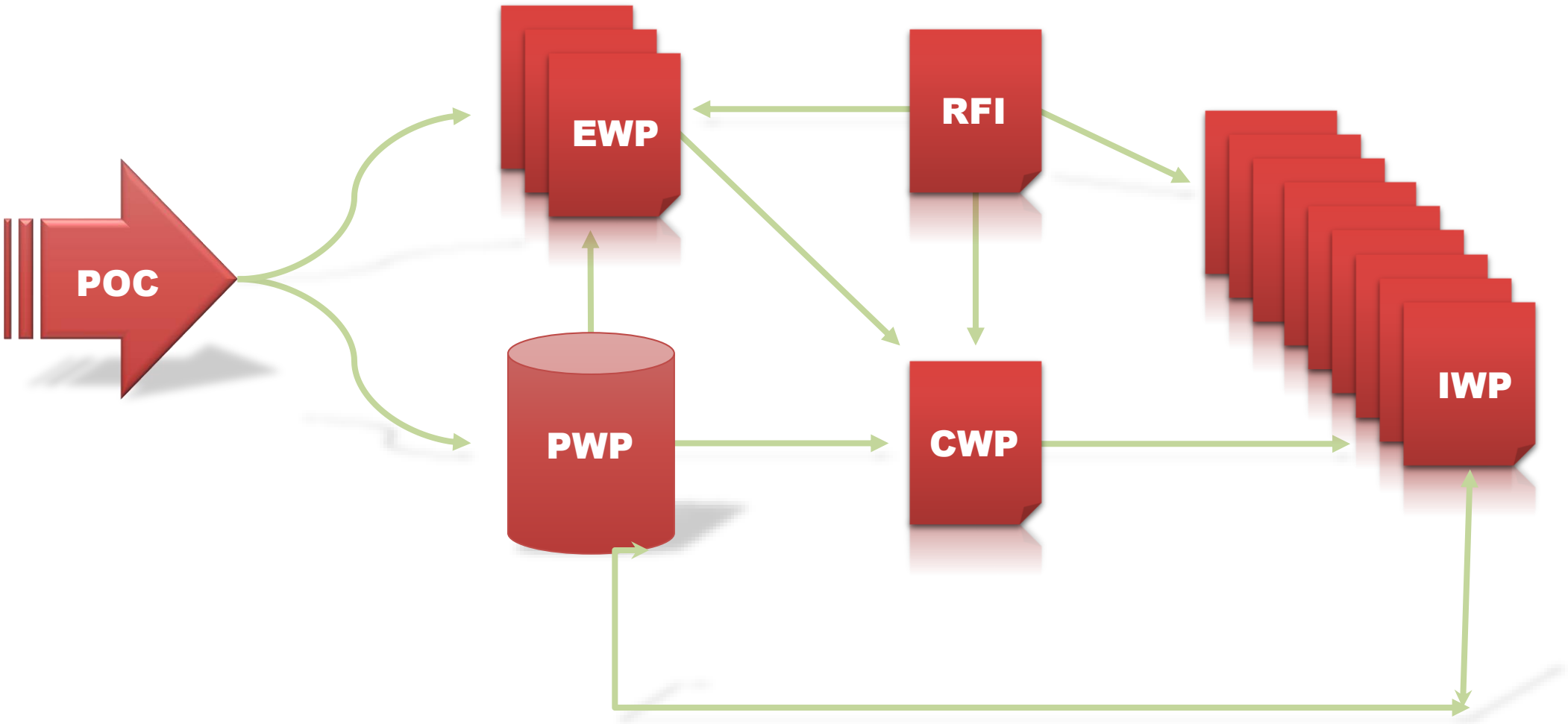
Example: Project Hierarchy (Engineering Work Package [EWP])



Example: Project Hierarchy
(Installation Work Package [IWP])

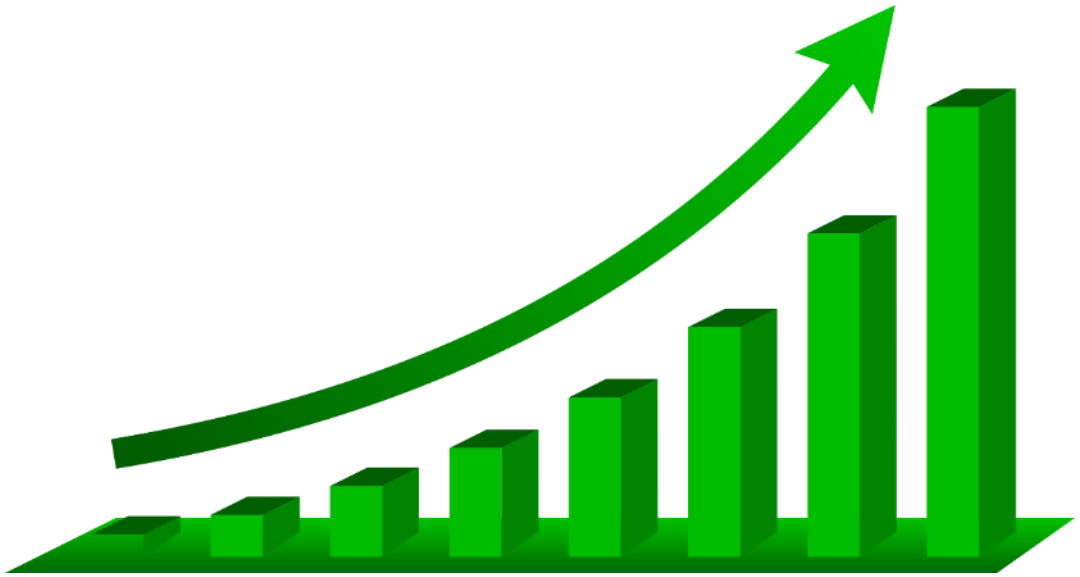


Procurement Work Processes - PWP



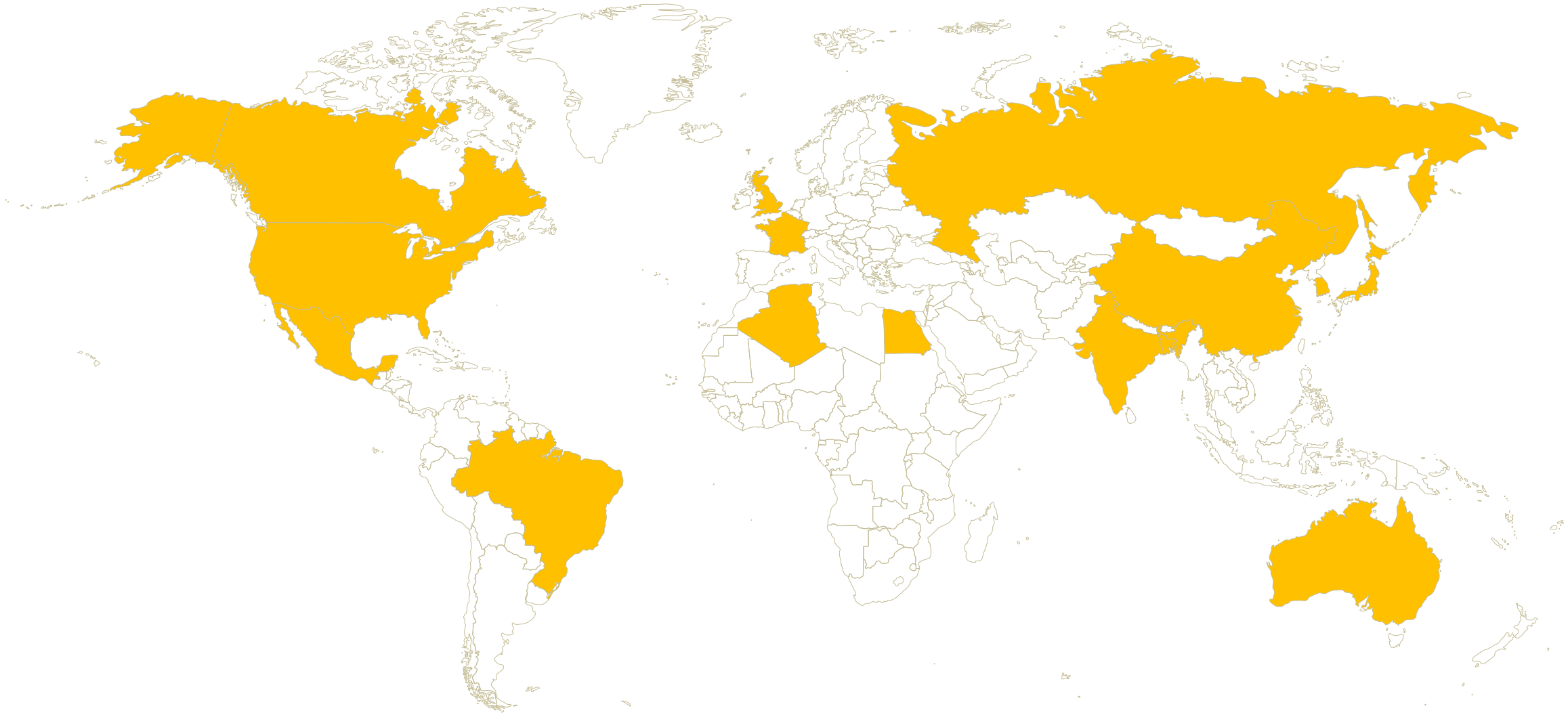
AWP Benefits

What positive effects will you see on your projects with effective AWP implementation?

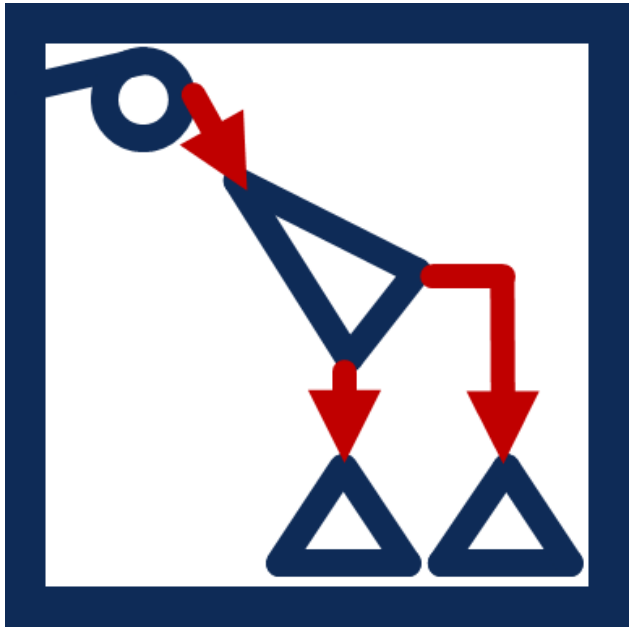


- Productivity (+25%)
- Cost (-10% TIC)
- Safety (0 TRIF)
- Schedule (improvement)
- Quality (0 rework)
- Predictability (improvement)

Where is AWP used?



Construction Familiarity and Complexity Screening Tool



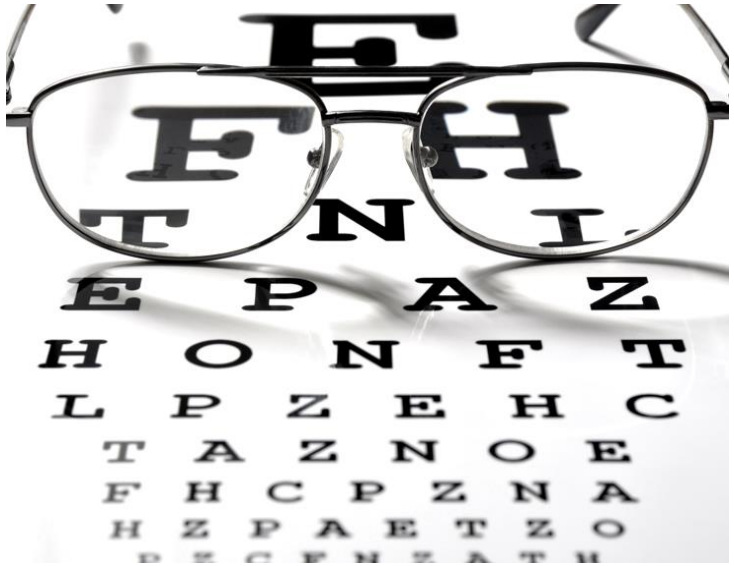
- Level Rank Projects: Low, Med, High
- Helps define planning, deliverables, reviews
- Input to RACI

Application

- Low complexity projects trend toward simplified planning and key AWP packaging

- High complexity projects trend toward detailed planning and comprehensive AWP packaging

Classification



- Like a Visual Acuity Test classification Requires a binary response
- Familiarity has 6 questions and requires a choice between Repeatable or Unique Projects
- Complexity asks 11 constructability questions requiring a choice between low and high.

F-C Classification

- Type1 Projects are predominately repeatable
- Type 2 Projects are predominately unique
- Complexity relates to Low or High Constructibility

Familiarity Type	Type 1 Count	Complexity Low Count	
1	>3	>5	Low
1	>3	1-5	Medium
2	1-3	>5	Medium
2	1-3	1-5	High

	Type 1	Type 2
Low Complexity	Low	Medium
High Complexity	Medium	High

Rank - Level

	Type 1	Type 2
Low Complexity	ESD Valve Program	ESD Valve Project – First Time
High Complexity	Solar Farm	Process Debottlenecking

COAA AWP - SCALABLE

Construction Familiarity & Complexity Screening Tool

Project Name	
Project General Description	
Review Date:	
Project Manager	
Construction Manager	

Level Rank Matrix		
	Type 1	Type 2
LOW	Low	Medium
HIGH	Medium	High

No	Question	Complexities (Risks)	Description	Type or Complexity	Screening General Comments
Familiarity Type			Select Low/Hi description from Drop Down Box ▽		Record key decisions and actions
1	Is Scope of Work (SOW) similar to previously executed projects?	SOW Familiarity	Duplicate project with scope of work similar to previously executed projects and has <50% scope change	TYPE 1	
2	Will the development be managed as a program, portfolio or project	Project execution efficiency	Managed as a Portfolio, Program	TYPE 1	
3	Are the work packages reusable for this project?	EWP/CWP production efficiency	Standardized design or >50% engineering and construction work packages are recycled from previous projects.	TYPE 1	
4	Regulatory and permitting requirement.	CSR, Regulatory, Reputation	Execution team has successfully completed project specific regulatory permitting requirements.	TYPE 1	
5	What type of construction contract is planned?	Project execution efficiency	Owner or EPC has partnered with select general contractors and assigns construction on a highest value bases	TYPE 1	
6	How is equipment and materials purchased?	Project execution efficiency	Owner or EPC purchase equipment and material from an approved vendors list	TYPE 1	

Project Classification Tool

[Familiarity-Complexity Screening Tool]

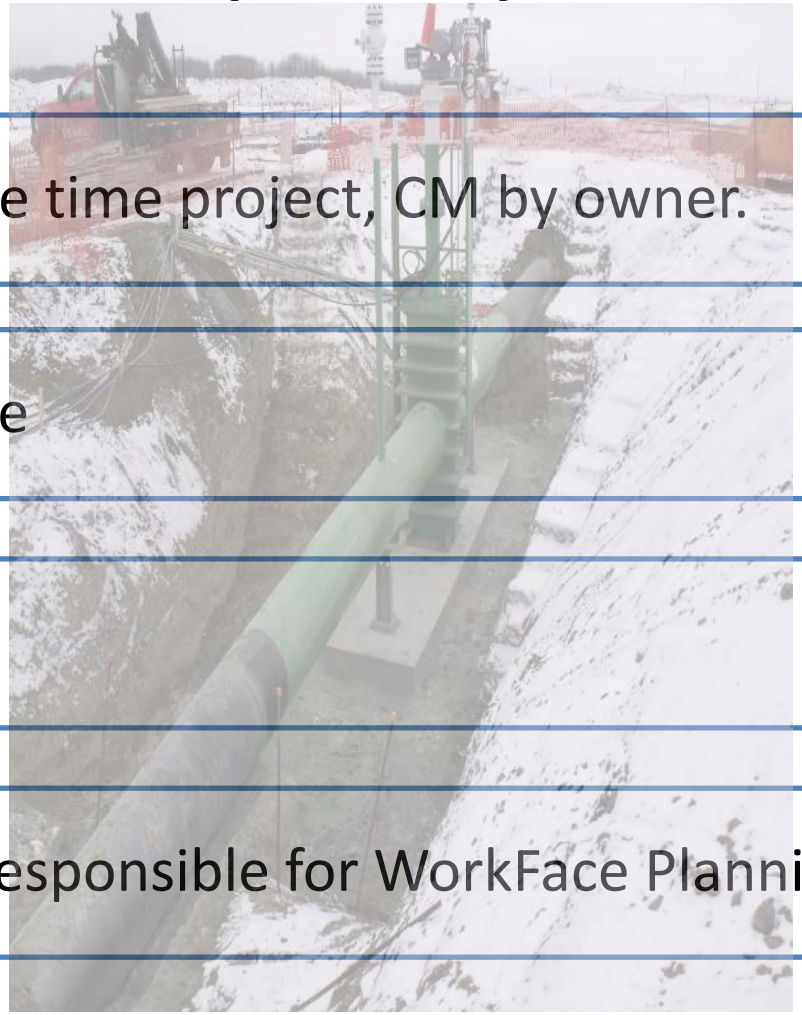
F-C Classification of the Worked Examples

	Type 1	Type 2
Low Complexity	ESD Valve Program	ESD Valve Project – First Time
High Complexity	Solar Farm	Process Debottlenecking

ESD Valve First Time - Type 2 Complexity (Unique)

5/25/2018

Type 2 (Unique) - Low Complexity



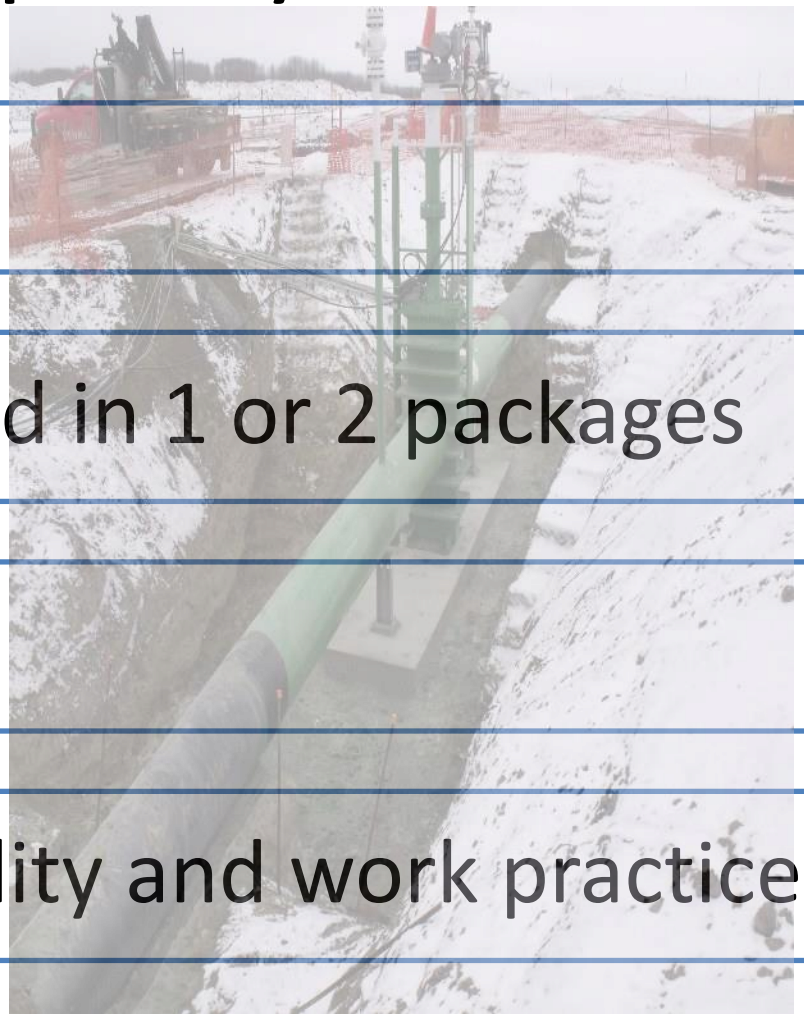
Contact Strategy
- Local Maintenance Contractor hired for a one time project, CM by owner.

POC
- Project Specific – Developed for first time use

Approach
- EP is external and CM by owner

Planners
- Superintendents and General Foremen are responsible for WorkFace Planning

Type 2 - Low Complexity



EWP

CWP

- EWP/CWP/PWP/ are combined in 1 or 2 packages

PWP

IWP

- Contractor adding safety, quality and work practices

Type 2 - Low Complexity

Reporting
- Standard level 1 reporting

Schedule
- Project Specific – Developed for first use

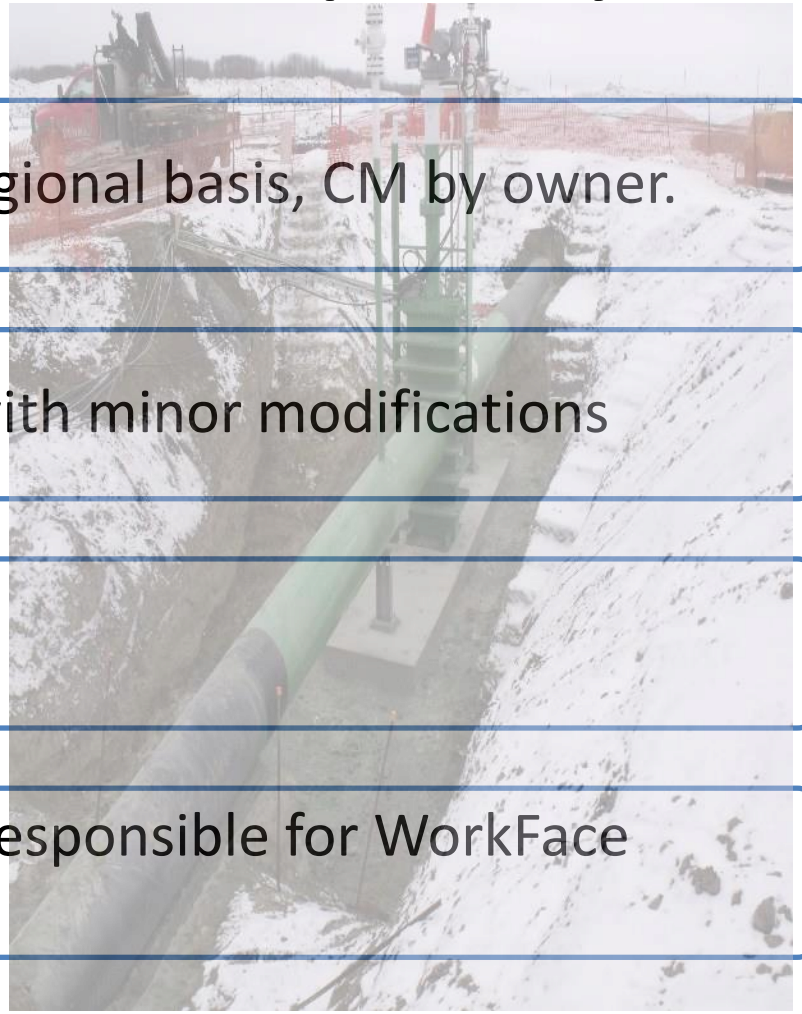
PM
- Managed as a discreet project

Materials
- Long Lead Items by owner, materials by EP, Contractor buys shorts

ESD Valve Program - Type 1 Low Complexity (Repeatable)

5/25/2018

Type 1 (Repeatable) - Low Complexity



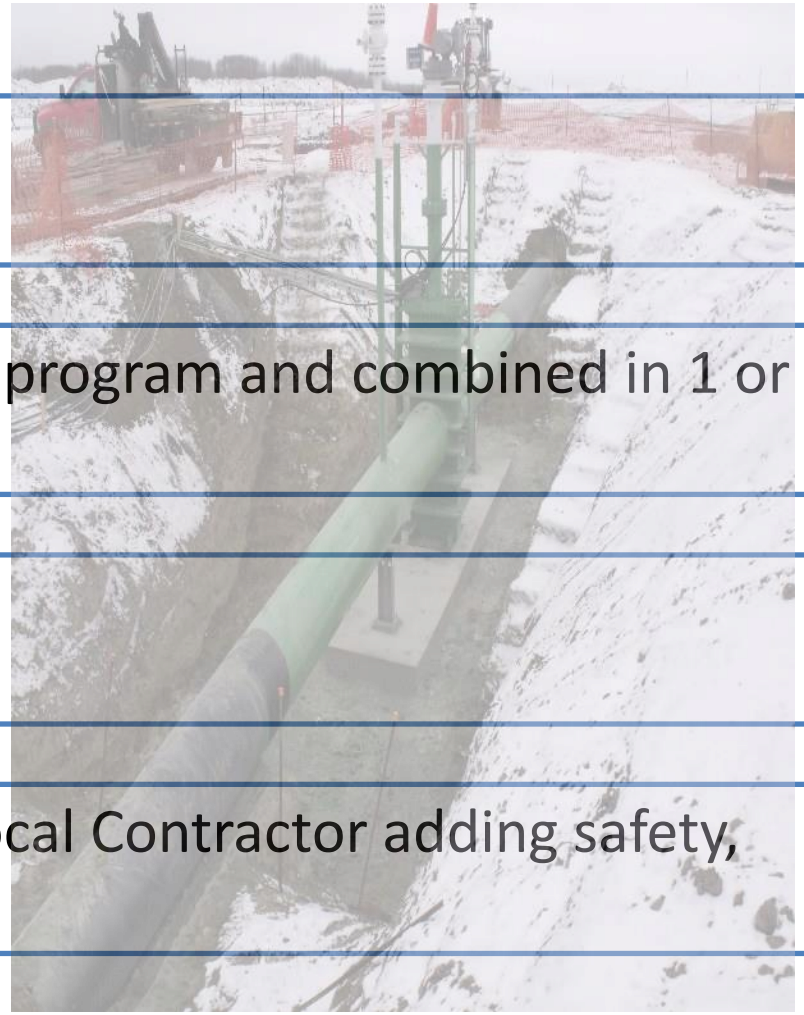
Contact Strategy
- Local maintenance contractors hired on a regional basis, CM by owner.

POC
- Standardized and reused for each location with minor modifications

Approach
- EP is external and CM by owner

Planners
- Superintendents and General Foremen are responsible for WorkFace Planning.

Type 1 - Low Complexity



EWP

CWP

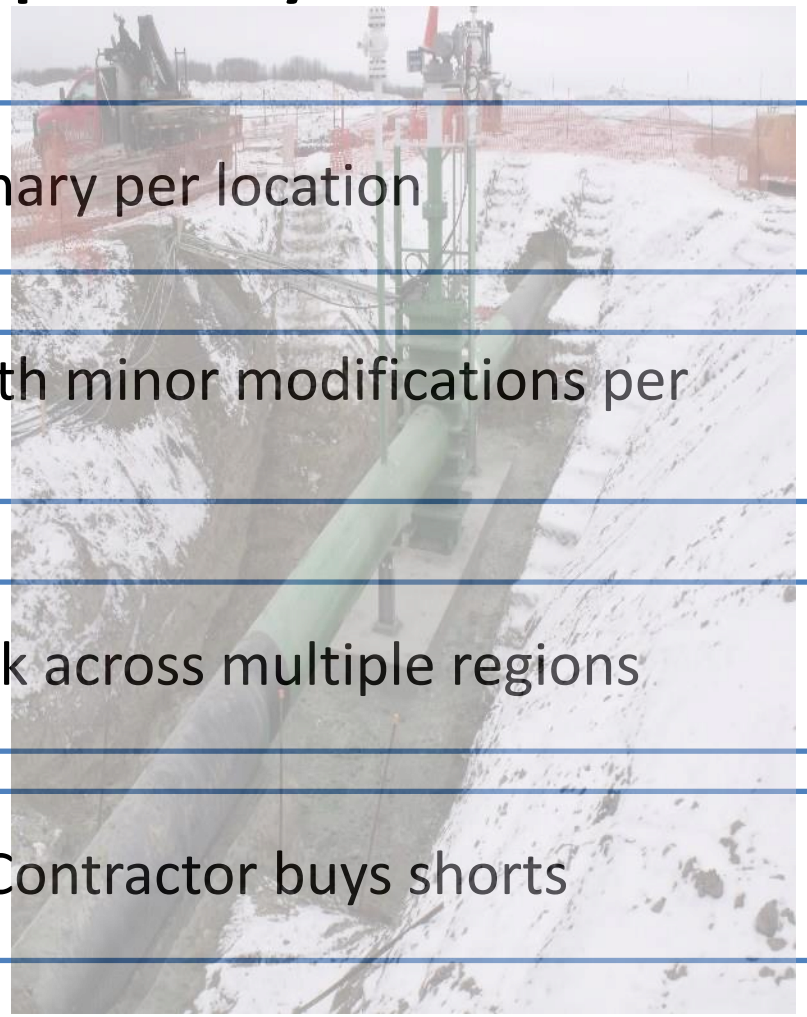
- EWP/CWP/PWP are standardized across the program and combined in 1 or 2 packages per site

PWP

IWP

- IWP is templated across the program with local Contractor adding safety, quality and work practices

Type 1 - Low Complexity



Reporting
- Simplified program dash-board with a summary per location

Schedule
- Templated schedules across the program with minor modifications per location

PM
- Program – Similar, repeatable scopes of work across multiple regions

Materials
- Long lead items by Owner, materials by EP, Contractor buys shorts

T1H – Solar Farm Program (Repeatable High Complexity)

Type 1 – High Complexity

Contact Strategy
- EPC Arrangement with Owner provided OEM equipment

POC
- Standardized for all projects and refined with minor modifications for project specific location and general arrangement changes

Approach
- EPC Program with limited oversight by the Owner

Planners
- WorkFace Planning is typically done by Superintendents and General Foremen with support from one WorkFace Planner for the entire project.

Type 1 – High Complexity

EWP

Discipline specific EWPs

All deliverables complete for the CWA prior to Construction work starting in that area

Template deliverables, Standard Installation details

CWP

CWP's are developed for one CWA and reusable for each subsequent CWA

Discipline specific CWP boundaries – matching CWA boundary – per Contract scope

CWA driven planning

Type 1 – High Complexity

PWP

- PWP are not required as material is bulk and interchangeable across CWA's
- All supplier data required to support EWPs

IWP

- IWP scope subdivides CWPs based on effort
- IWP's are developed for one CWA and reusable for each subsequent CWA
- Limited IWP count per CWP (likely 1 or 2 per discipline)

Type 1 – High Complexity

Reporting
- Dash Board for each project and roll-up reporting for all projects as a program

Schedule
- Standardized base for all projects and refined with minor modifications for project specific requirements

PM
- Typically managed as a Program/Portfolio

Materials
- EPC/Owner shared responsibility for material and equipment purchases across program

Solar Farm (Worked Example)

POC
General Arrangement
CWA /CWP Overview
CWP / EWP Boundary Development

Process Debottleneck Project (One-Off High Complexity)

WorkFace Planning

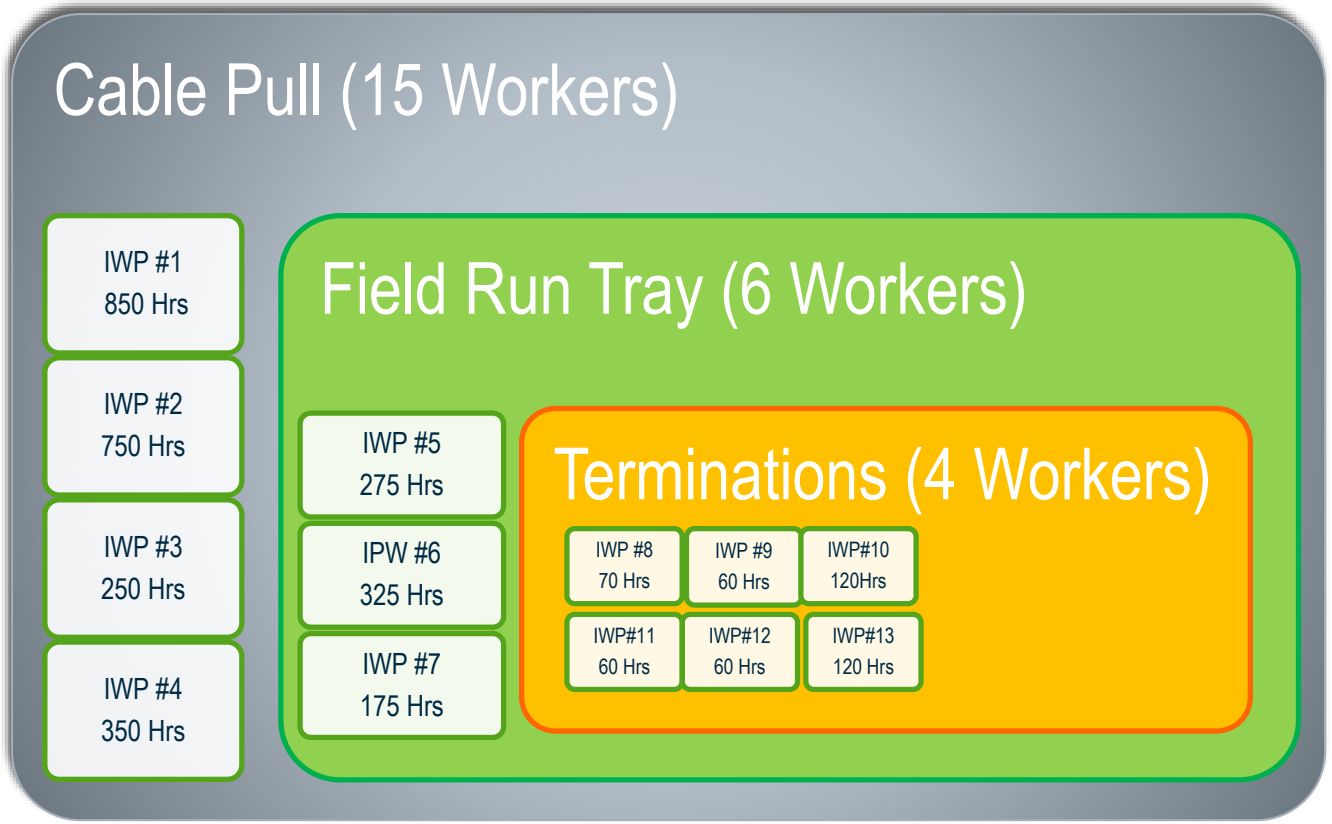
"WorkFace Planning is the process of organizing and delivering all elements necessary before work is started, to enable craft workers to perform quality work in a safe, effective and efficient manner."

Definition: Paradigm Shift

- ☒ IWPs packaged based on hours.
- ☑ IWPs packaged based on commodity or task
- ☑ IWPs are a contractor deliverable NOT engineering

NEW Definition: Installation Work Package

- "Installation Work Package (IWP) is a grouping of tasks targeted TO ALIGN WITH THE OPTIMUM PATH OF CONSTRUCTION. These IWPs will contain all of the necessary documents and descriptions required to carry out the tasks required. THE GOAL IS MAINTAIN ENOUGH EXECUTABLE IWP'S IN EACH F-MANS BACK LOG TO KEEP THEIR CREWS ACTIVE FOR 2 SHIFTS.



WorkFace Planning – Mega Project

Mega project

Requires dedicated planners

WorkFace Planning – Small Project

Scalable

Planner Tasks Delegated to Others

WorkFace Planning – Small Project

Scalable

Only require your putter

WorkFace Planning - Hazards

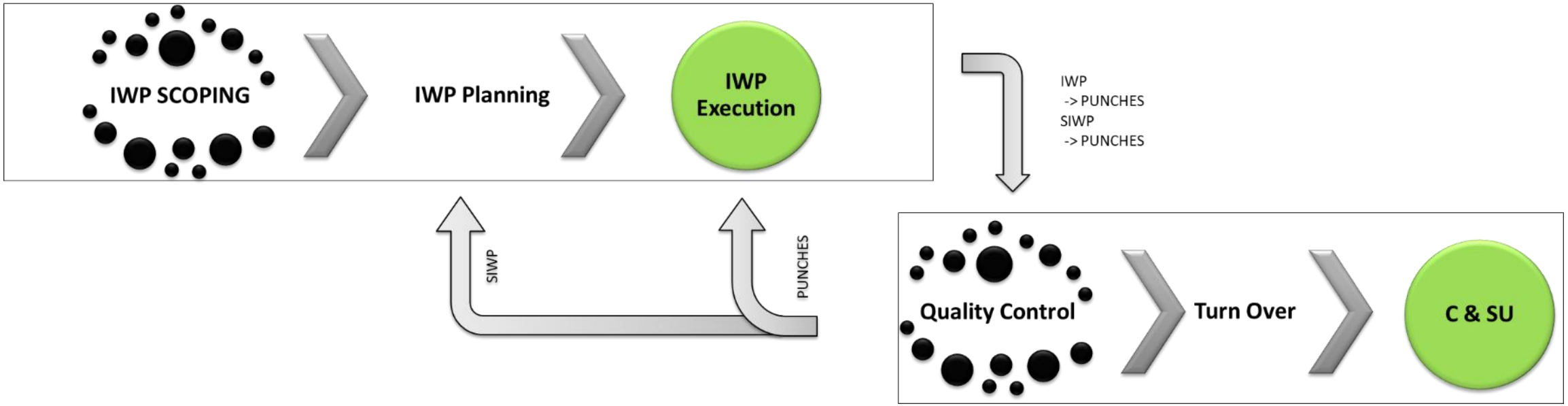
Scalable

Mega projects

WorkFace Planning - Challenges

Scalable

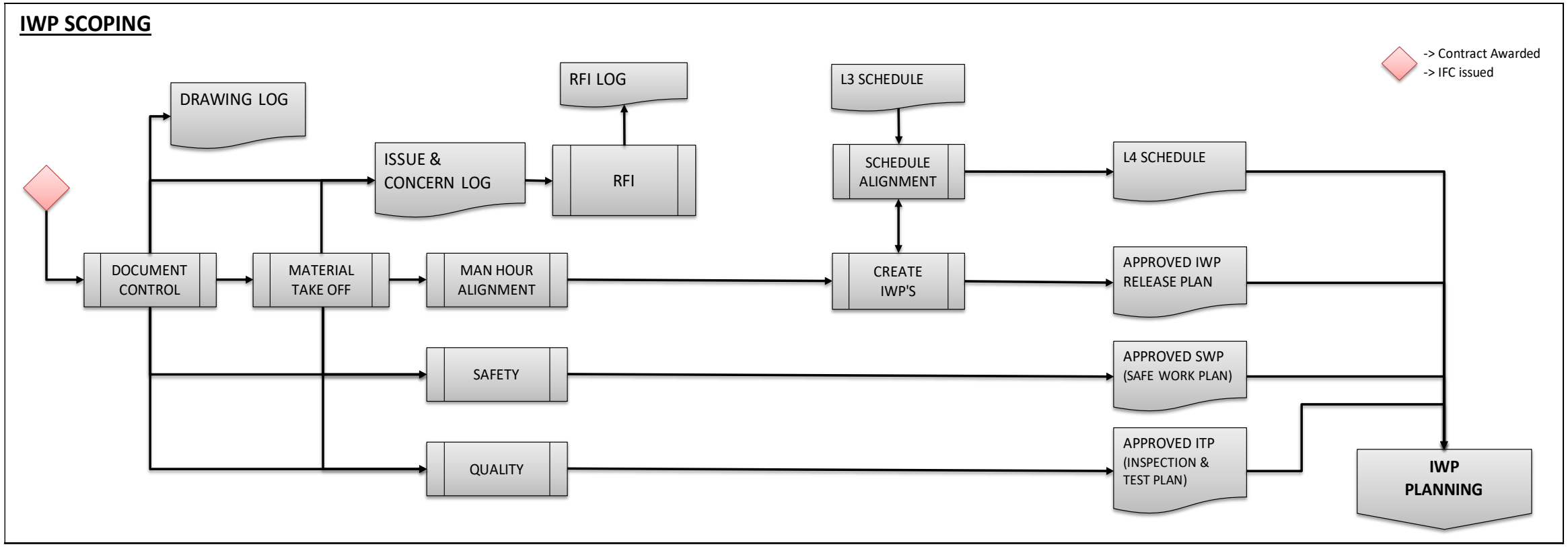
Mega Project

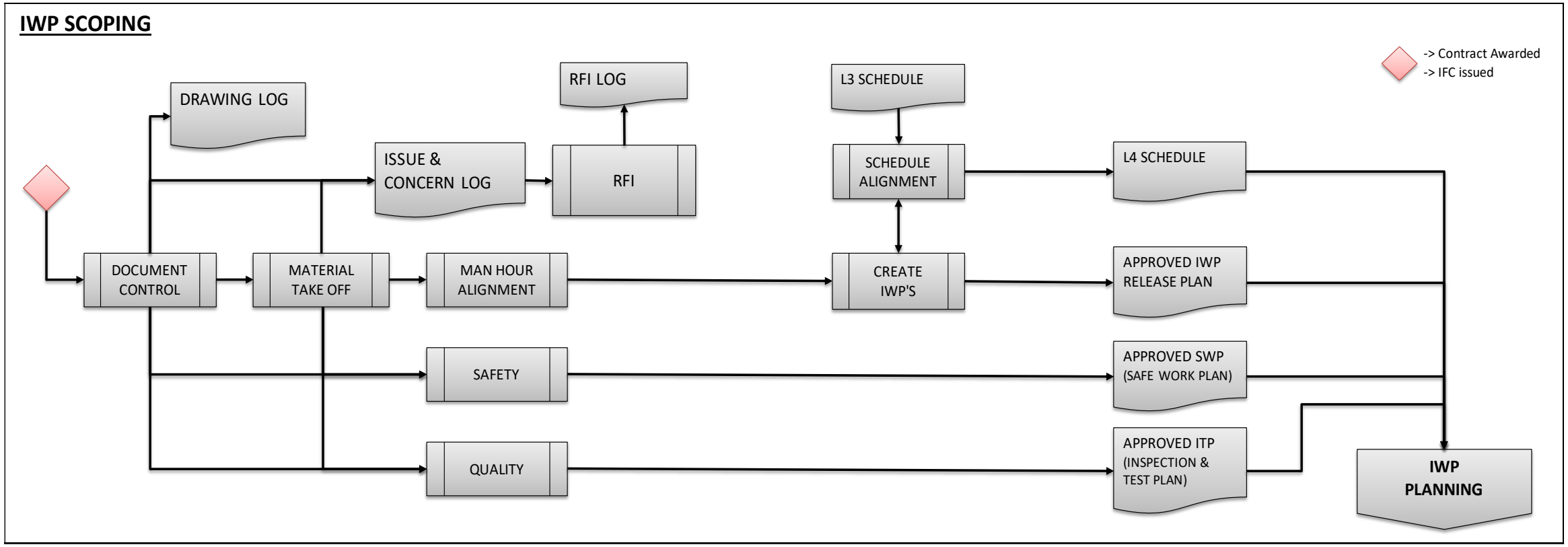


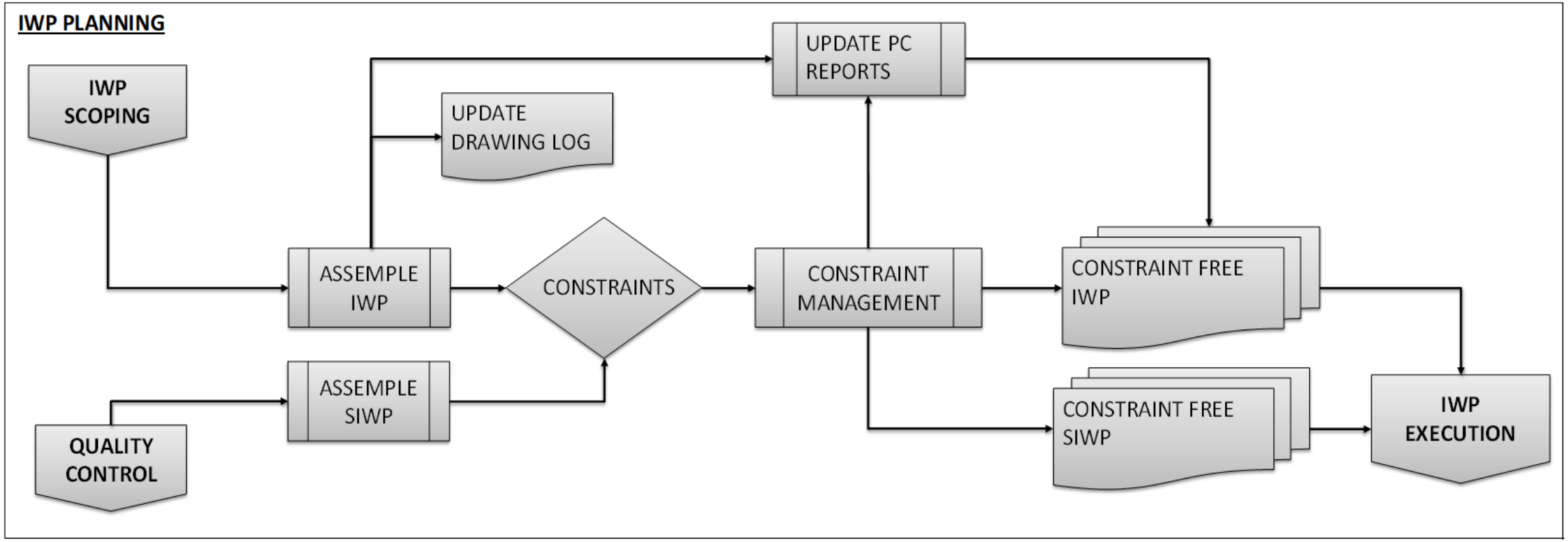
WorkFace Planning System

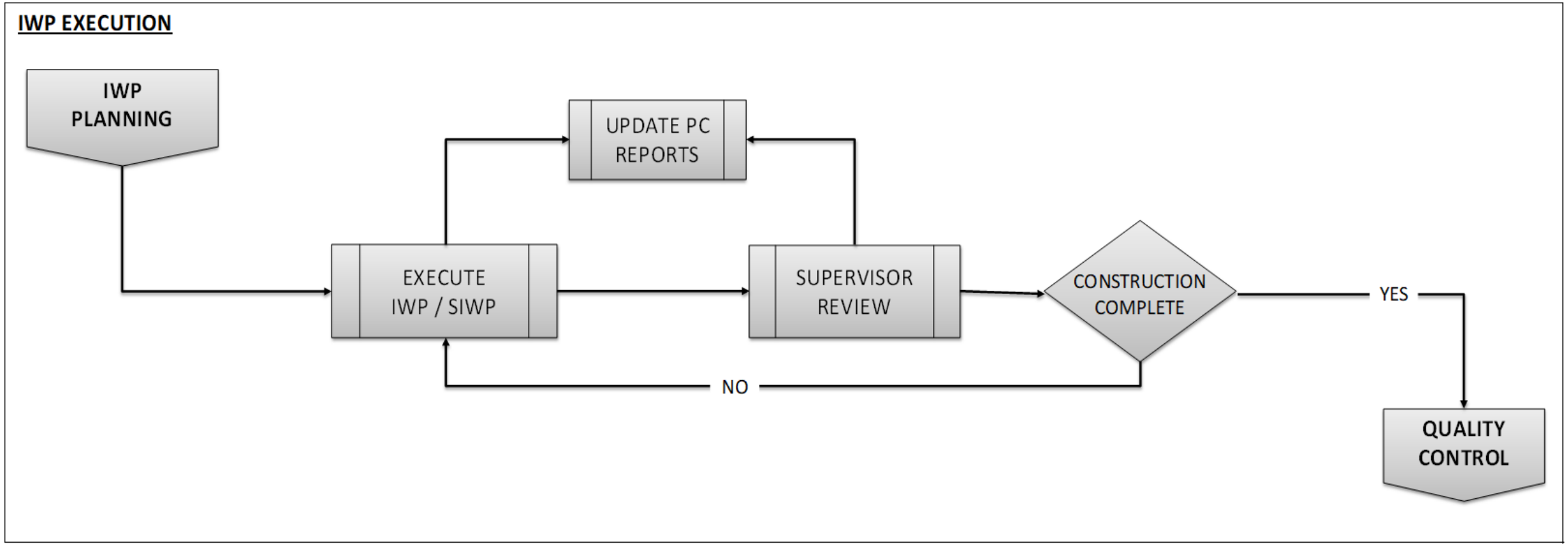
IWP SCOPING → IWP PLANNING → **IWP EXECUTION** → QUALITY CONTROL → TURN OVER

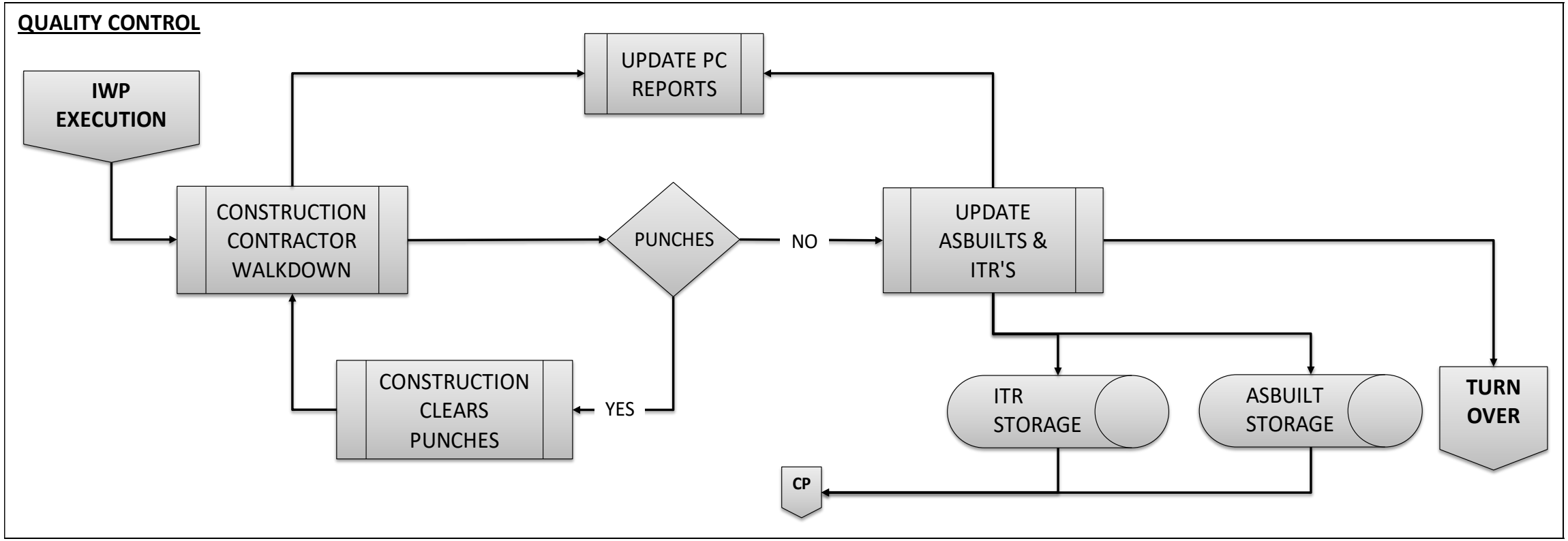
DOCUMENT CONTROL	ROLES		CONSTRUCTION MANAGEMENT	ROLES		QA / QC	ROLES		SAFETY	ROLES		PROJECTS CONTROLS	ROLES	
	R	A		R	A		R	A		R	A		R	A
Maintain Drwg Log			Internal Coordination			Construction Surveillance			Meetings			IWP Progress Reporting		
Maintain RFI Log			External Coordination			Receive new Drawings			Inspections			Address field identified Changes.		
Maintain MOC Log's			Equipment Coordination			Submit / Receive RFI's			Audits			Integrate system progress reporting		
			Redline changes to IWP documentation						JHA's			Schedule Updates		
			Monitor Constraints											
			Track & Report IWP Progress											
			Initiate RFI's and field changes											

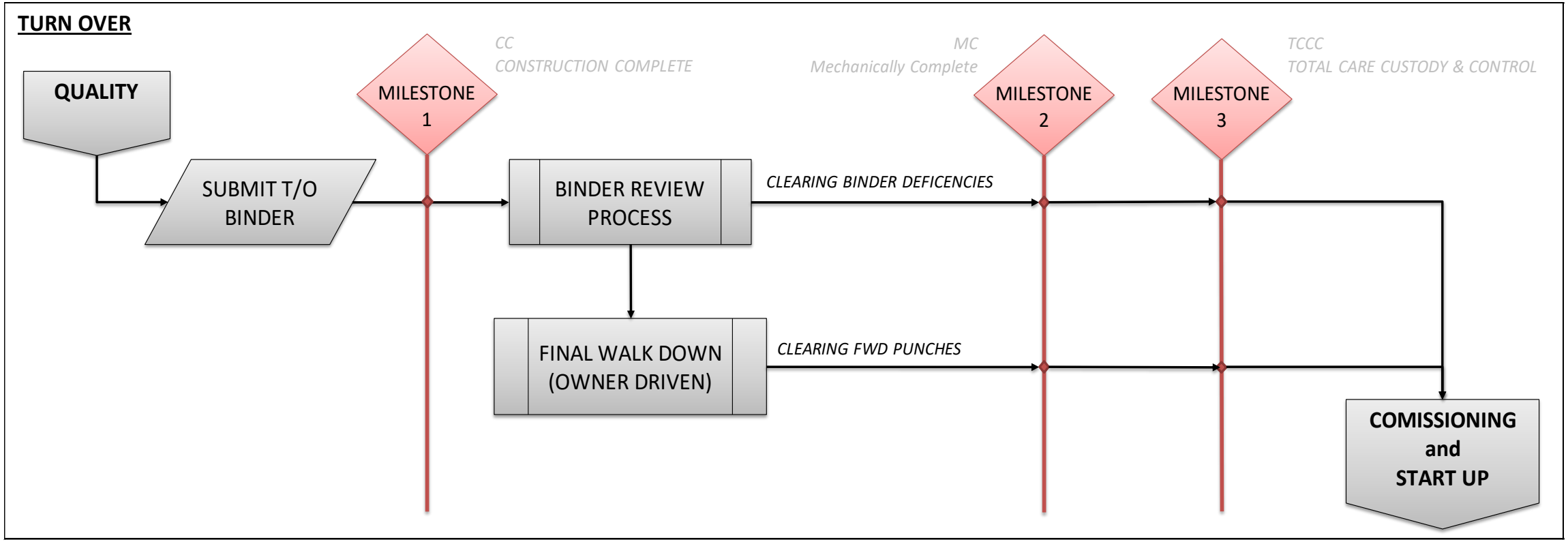












WorkFace Planning – where are you?

Level 1 maturity

Level 3 maturity

Deliverables

Project Classification Tool

Ready Now

COAA AWP - SCALABLE

Construction Familiarity & Complexity Screening Tool

Project Name	
Project General Description	
Review Date:	
Project Manager	
Construction Manager	

Level Rank Matrix		
	Type 1	Type 2
LOW	Low	Medium
HIGH	Medium	High

No	Question	Complexities (Risks)	Description	Type or Complexity	Screening General Comments
Familiarity Type			Select Low/Hi description from Drop Down Box ▽		Record key decisions and actions
1	Is Scope of Work (SOW) similar to previously executed projects?	SOW Familiarity	Duplicate project with scope of work similar to previously executed projects and has <50% scope change	TYPE 1	
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5	What type of construction contract is planned?	Project execution efficiency	Owner or EPC has partnered with select general contractors and assigns construction on a highest value bases	TYPE 1	
6	How is equipment and materials purchased?	Project execution efficiency	Owner or EPC purchase equipment and material from an approved vendors list	TYPE 1	
Complexity Level (Constructability)					
1	Is proposed facility is brownfield or greenfield?	Operations Interface, Ground Disturbance	Greenfield - No previous facilities existed above or below ground, new development will have minimum impact on operating facilities. New development is separated from the exiting facility by a minimum of 30 m (100 Ft.)	LOW	
2	What is number of separate construction areas?	Coordination, Interface, Battery limits	1 or 2 adjacent areas; Shared resources can be utilized	LOW	
	What is the count of construction	Coordination, work face density, Interface	< 7 of any of discipline: earthwork, foundations, structural,		

WorkFace Planning System

Ready Now

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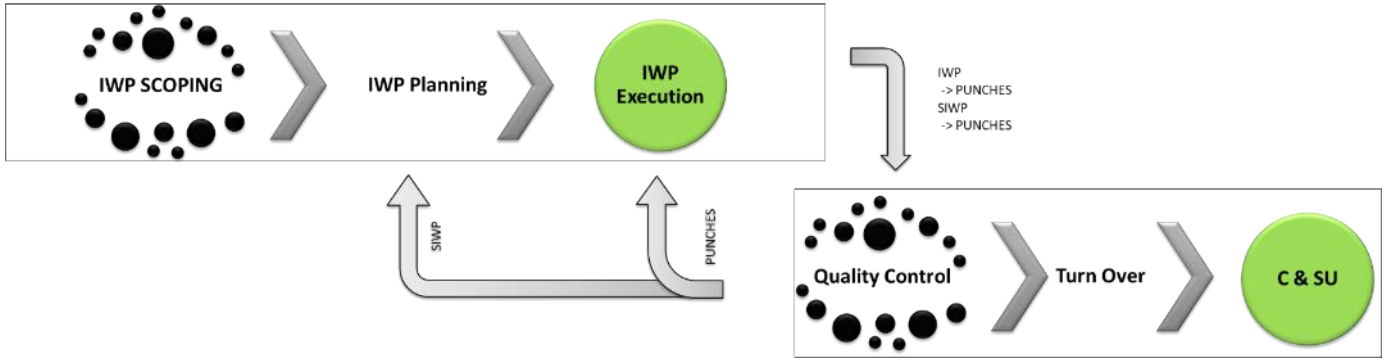


To be Reviewed By CII and Ready for October 2018

5/25/2018

ASI GROUP

AWP Conference

Houston, Texas | October 2-3, 2018

awpconference.com

The COAA AWP Scalability Steering Committee will report out at the upcoming Advanced Work Packaging Conference.

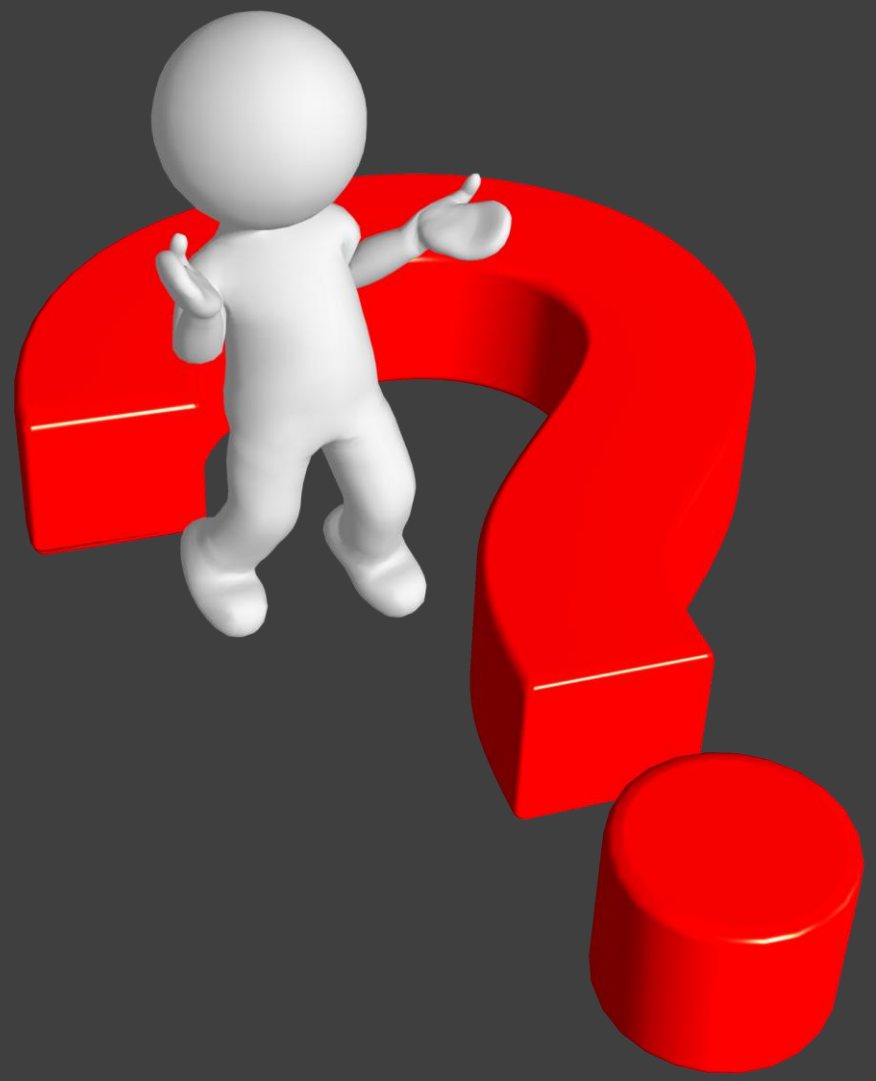
What is the AWP Conference?

- Global project owners, contractors and suppliers making AWP happen
- Two full days of owner-driven AWP content and thought leadership
- Professional networking and integrated industry tradeshow

Information and registration available at www.awpconference.com

Looking for Projects and Team members

Questions



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LOW/MED/HIGH RISK	TYPE 1 OR TYPE 2
LOW RISK	TYPE 1

Instructions:

1. Complete screening during AWP stage 1;
2. Under description: Select the appropriate familiarity and complexity responses from the drop down box;
3. Complete project specific screening comments.
4. The level-rank result will be indicated in the matrix as low, medium or high

Notes:

1. This risk assessment is intended to address constructability only and excludes business or other risks;
2. All questions are weighed equally;
3. The familiarity type is determined on the count of TYPE 1 projects:
   If >3 questions are rated TYPE 1 then familiarity = TYPE 1
   If 1-3 questions are rated TYPE 1 then familiarity = TYPE 2

4. The complexity level is determined on the count of LOW complexity assessments:
   If >5 questions rate "LOW" then complexity = LOW
   If 1-5 questions rate "LOW" then complexity = HIGH

COAA AWP - SCALABLE

Construction Familiarity & Complexity Screening Tool

Project Name	
Project General Description	
Review Date:	
Project Manager	
Construction Manager	

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2	What is number of separate construction areas?	Coordination, Interface, Battery limits	1 or 2 adjacent areas; Shared resources can be utilized	LOW	
3	What is the count of construction disciplines involved in the project?	Coordination, work face density, Interface, Startup	< 7 of any of discipline: earthwork, foundations, structural, Buildings, mechanical equipment, piping, insulation, painting/coating/lining, electrical, Instrumentation and controls.	LOW	
4	What is the scope or count of mechanical, electrical, instrumentation and controls tie-ins?	Hot Work, Plant Outage	Electrical, Instrumentation and Controls Only (El & C), Hot Work with no Loss of production	LOW	
5	Are critical or engineered crane lifts required?	Coordination, scheduling, risk to operations	All crane lifts are standard	LOW	
6	What are the known geotechnical conditions?	Ground Disturbance, water disposal, access, spoil piling	Ground Water Dewatering is not required and/or no rock excavation	LOW	
7	What type of excavation are required?	Ground Disturbance, Confined Space	2 m (6.5 Ft) or less depth excavation with trench box and/or OSHA Type 1 or 2 Soils and/or , < 10% Hydro-Vac	LOW	
8	Will the project be constructed working at heights?	Working at Heights, Productivity	< 25% scope requires working above 2 m (6.5 ft.) height	LOW	
9	What seasons will the project will be constructed?	Productivity, Transportation, ideal schedule	Spring/Summer/Fall Construction - Standard productivity	LOW	
10	Is the project planned on a compressed schedule?	Coordination, work face density, productivity	Construction is planned on day shift only and/or All EWP/CWP will be issued IFC prior to commencing construction. EPC phases are sequential	LOW	
11	Is project site remote?	Transportation, work force recruiting and turnover	Workers drive daily between project and place of residence, no subsistence	LOW	

Familiarity - Repeatability Type

1

		SOW Familiarity
Familiarity	Type 1	Duplicate project with scope of work similar to previously executed projects and has <50% scope change
	Type 2	One-off project or a duplicate of a previously executed project and the scope of work had changed by >50%.

Complexity - Constructability

1

		Greenfield, Brownfield
Complexity	Lo	Greenfield - No previous facilities existed above or below ground, new development will have minimum impact on operating facilities. New development is separated from the exiting facility by a minimum of 30 m (100 Ft.)
	High	Brownfield - New development will be constructed where previous above or below grown facilities or within 30 m (100 Ft.) of existing above or below ground facilities exist. New development interface with existing operation

Familiarity - Repeatability Type

2

Portfolio, Program or Project
Managed as a Portfolio, Program
Managed as a Project

Complexity - Constructability

2

Construction Area
1 or 2 adjacent areas; Shared resources can be utilized
3 or more adjacent or non-adjacent areas. Shared resources need to be coordinated and planned

Familiarity - Repeatability Type

3

Project Information & Documentation
Standardized design or >50% engineering and construction work packages are recycled from previous projects.
Customized engineering or <50% engineering and construction work package recycled from previous projects

Complexity - Constructability

3

Multi - Disciplines
< 7 of any of discipline: earthwork, foundations, structural, Buildings, mechanical equipment, piping, insulation, painting/coating/lining, electrical, Instrumentation and controls.
> 6 of any of discipline: earthwork, foundations, structural, Buildings, mechanical equipment, piping, insulation, painting/coating/lining, electrical, Instrumentation and controls.

Familiarity - Repeatability Type

4

Permitting
Execution team has successfully completed project specific regulatory permitting requirements.
Although capable, the execution team is not experienced in project specific regulatory permitting requirements.

Complexity - Constructability

4

Tie-Ins
Electrical, Instrumentation and Controls Only (El & C), Hot Work with no Loss of production
Mechanical only or Mech. and El & C or Plant/System Shut Down and Loss of production

Familiarity - Repeatability Type

5

Construction Contract Strategy
Owner or EPC has partnered with select general contractors and assigns construction on a highest value bases
Owner or EPC SCM formally request project specific proposals, evaluates and awards.

Complexity - Constructability

5

Critical Crane lifts
All crane lifts are standard
Critical crane lifts required

Familiarity - Repeatability Type

6

Equipment/Procurement Strategy
Owner or EPC purchase equipment and material from an approved vendors list
Owner or EPC SCM formally request project specific proposals, evaluates and awards.

Complexity - Constructability

6

Geotechnical Conditions
Ground Water Dewatering is not required and/or no rock excavation
Ground Water Dewatering is Required and/or rock excavation

7

Excavation
2 m (6.5 Ft) or less depth excavation with trench box and/or OSHA Type 1 or 2 Soils and/or , < 10% Hydro-Vac
> 2 m (6.5 ft.) depth of excavation and/or OSHA Type 3 soil and/or requires shoring and/or >10% Hydro-Vac

8

Working at heights
< 25% scope requires working above 2 m (6.5 ft.) height
> 25% scope requires working above 2 m (6.5 ft.) height

9

Construction Season
Spring/Summer/Fall Construction - Standard productivity
Winter Construction - Reduced worker productivity, freezing and icy conditions, construction may require hoarding and heating , road weight restrictions, etc.

10

Schedule Compression
Construction is planned on day shift only and/or All EWP/CWP will be issued IFC prior to commencing construction. EPC phases are sequential
Construction planned on day and night shifts and/or all EWP/CWP will not issued IFC prior to commencing construction. EPC phases may overlap.

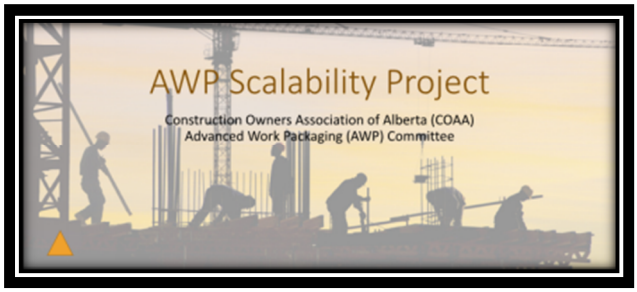
11

Project Site Remote
Workers drive daily between project and place of residence, no subsistence
Workers commute between project and place of residence between shifts, Projects accommodations or subsistence and turnaround costs required. Seasonal Roads and bridges may impact transportation plan.

TYPE 1 PROJECT

SAMPLE PROJECT 2 – SOLAR FARM

CWA/CWP & WBS STRUCTURE



Construction Work Areas

CWA's will be created and assigned based upon the Work Breakdown Structure and how the WorkFace Planning team will issue work to the field.

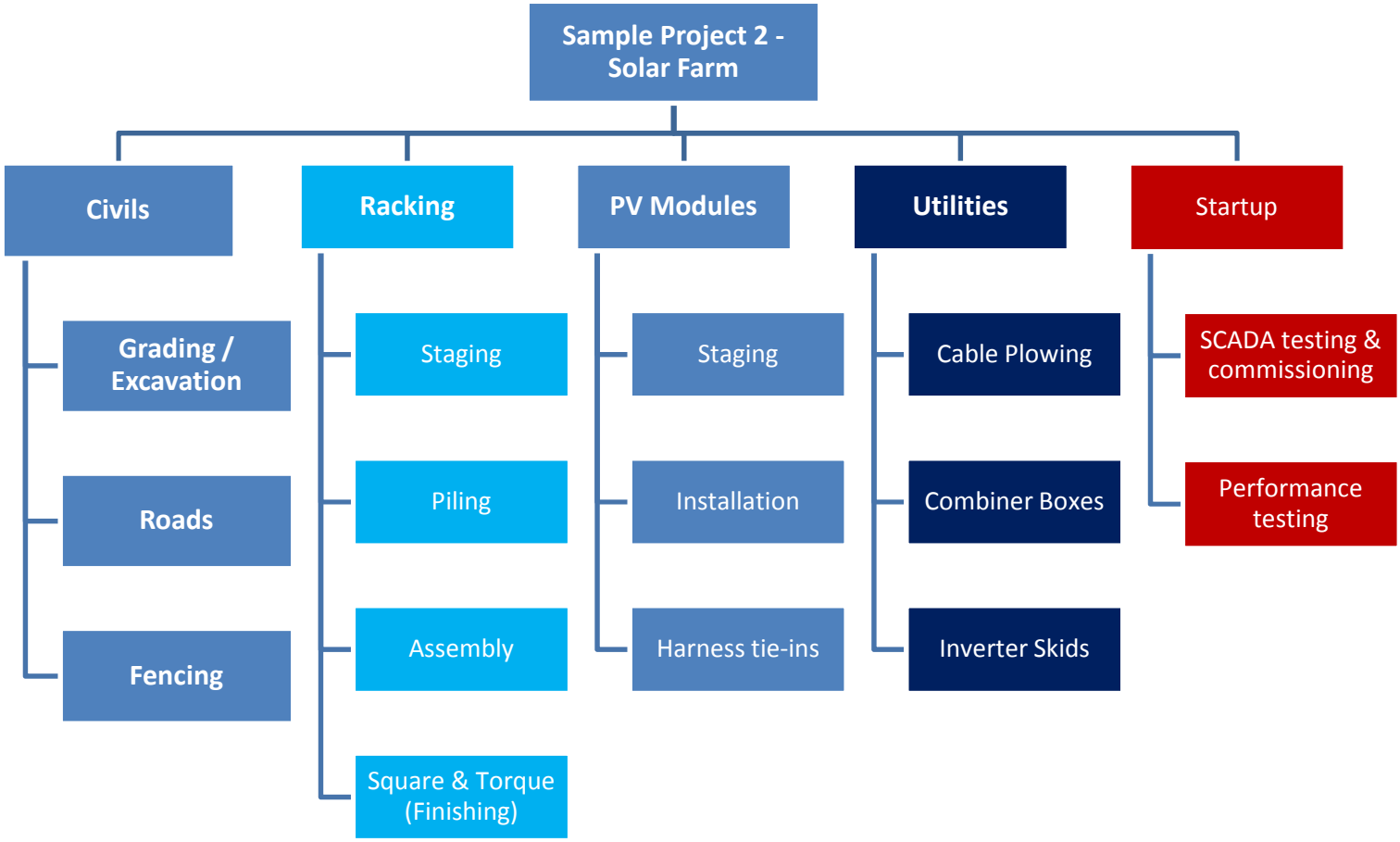
CODE	DESCRIPTION	GUIDANCE
PROJ	Project	Supporting project work.
000 A	Site	Encompasses entire site.
1100	Solar Block 1100	Encompasses area identified as Block 1 per contract G.A.
1200	Solar Block 1200	Encompasses area identified as Block 2 per contract G.A.
2100	Solar Block 2100	Encompasses area identified as Block 3 per contract G.A.
2200	Solar Block 2200	Encompasses area identified as Block 4 per contract G.A.

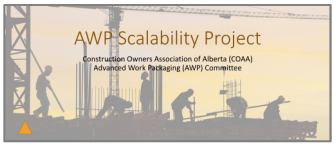
Construction Work Packages

CWP's will be created and assigned according to discipline-specific activities within the Work Breakdown Structure and how the work will be executed in the field.

CODE	DESCRIPTION	GUIDANCE
010 A	Site Development	Inclusive of site clearing, excavation, roads, environmentals, and fencing.
200 A	AC Cable & Terminations	AC cable installation and termination.
210 A	DC Cable & Terminations	A.G. DC cable installation and termination.
SL 05	Inverter Skids	Inclusive of the setting and hookup of the inverter skids.
020 A	Rack Piling	Installing rack posts in the field.
SL 02	Rack Staging / Assembly	Assembling racks in the field.
SL 03	PV Module Staging / Install	The receipt, offloading, and transport of PV modules prior to installation.
SL 04	DC – Harnesses/Combiners	Installing PV module harnesses and combiner boxes in the field.
SL 01	Cable Plowing	Inclusive of the excavation, placement and backfill of UG cable & conduit.
SL 07	Instrumentation / Comms.	Inclusive of SCADA and performance testing.
S 001	Startup & Commissioning	All activities related to Startup & Commissioning
S 040	Performance Testing	All activities related to Performance Testing.

Work Breakdown Structure



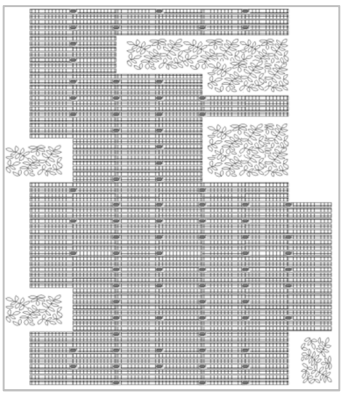


TYPE 1 COMPLEX

FRONT-END PLANNING

CWP AND EWP BOUNDARY DEVELOPMENT - NARRATIVE

PURPOSE: This document provides guidance in support of the *Front-End Planning, CWP and EWP Boundary Development, Type 1*, as part of the AWP Scalability Project. This sample project is structured an EPC role.



REFERENCE DOCS:

Acme Solar GA

Acme Solar GA with blocks

Type 1_Sample Proj 2_overview Rev3

GUIDANCE: During Front-End Planning, the Preliminary Engineering and Constructability Review activities serve as the primary guiding factors in developing CWP and EWP boundaries. Once the Construction Execution Strategy is developed, construction activities are identified, and a preliminary Work Breakdown Structure is formed. CWP and EWP boundaries are then created from this WBS. It's important at this stage that CWP boundary development is governed by a focus on contributing to the Path of Construction and not just on a cost collection structure, or detailed scheduling element.

For the Type 1 Complex Sample Project, the Constructability Review efforts result in a Work Breakdown Structure - activities required to execute the work.

Site Development
Rack Post Installation
Rack Frame Assembly
Solar Panel Installation
Solar Panel Wiring
Inverter Skid Installation
DC Wiring
System Turnover

GUIDANCE (continued):

From the WBS, or the basic execution steps of the project, more detailed craft activities are extracted.

Site Development	Excavation Roads Fencing Project Facilities
Rack Post Installation	Surveying Rack Post Driving
Rack Frame Assembly	Rack Frame Staging Rack Frame Assembly Rack Frame Square & Torque
Solar Panel Installation	Solar Panel Staging Solar Panel Installation
Solar Panel Wiring	Combiner Box Installation/Termination Solar Panel Harness Connections
Inverter Skid Installation	Inverter Skid Foundation Inverter Skid Conduit Installation Inverter Skid Set (Crane) Inverter Skid Termination
DC Wiring	Underground DC Conduit Installation Underground DC Cable Installation/Termination
System Turnover	Block 1 Turnover Block 2 Turnover Block 3 Turnover Block 4 Turnover

The project team then determines their preferred CWP <> EWP relationship rule: 1-to-1, or 1-to-many. For the purposes of scalability a 1-to-1 CWP <> EWP ratio is recommended, although information contained in a specific EWP may serve multiple CWPs and also be within another EWP. Construction and Engineering will eventually determine which disciplines and/or activities from the expanded list should be identified as Construction Work Packages. At this stage, as both functional groups are structuring their deliverables, collaboration is important to creating an efficient framework for work execution. Preliminary Engineering outputs are then mapped to these activities and the project team determines the most efficient structure for CWP and EWP boundaries.

GUIDANCE (continued):

Engineering Deliverables are associated with the Construction Activities / Tasks. At this point, project indirects are not listed or considered since they are not part of the execution Path of Construction.

CONSTRUCTION ACTIVITIES / TASKS		ENGINEERING DELIVERABLES
Site Development	Excavation Roads Fencing Project Facilities	General Arrangement Road elevation details Environmental details
Rack Post Installation	Surveying Rack Post Driving	Rack Post Layout/Coordinates
Rack Frame Assembly	Rack Frame Staging Rack Frame Assembly Rack Frame Square & Torque	Rack Frame Assembly details Rack Frame Assembly specs
Solar Panel Installation	Solar Panel Staging Solar Panel Installation	Solar Panel Install details Solar Panel Assembly specs
Solar Panel Wiring	Combiner Box Installation/Termination Solar Panel Harness Connections	Wiring Diagrams
Inverter Skid Installation	Inverter Skid Foundation Inverter Skid Conduit Installation Inverter Skid Set (Crane) Inverter Skid Termination	Foundation details Excavation & Conduit details Wiring diagrams
DC Wiring	U/G DC Conduit Installation U/G DC Cable Installation/Termination	Excavation & Conduit details Wiring diagrams
System Turnover	Block 1 Turnover Block 2 Turnover Block 3 Turnover Block 4 Turnover	SCADA details

Once the Engineering Deliverable mapping is completed and all stakeholders have reviewed and approved the WBS, the CWP boundaries can be identified. The resulting CWP boundaries serve as aggregates of the Construction Activities, and will exist within multiple Construction Work Areas.

GUIDANCE (continued):

CWP BOUNDARY	EWP BOUNDARY
Rack Post Installation Rack Frame Staging Rack Frame Assembly	Rack Specs / Installation Details
Solar Panel Staging Solar Panel Install	Solar Panel Specs / Installation Details
U/G Conduit & Cable	Excavation Details / Conduit Specs / Cable Specs
Foundations	Concrete Foundation Details
A/G Cable & Terminations	Wiring and Termination Details Cable Specs
Combiner Box Install	Combiner Box Specs / Installation Details
Inverter Skid Install	Inverter Skid Details Wiring and Termination Details
SCADA & MET Station	SCADA Specs / System Procedures

SUMMARY: The resulting CWP and EWP boundaries are applicable across the entire project and provide the necessary structure to plan, communicate, and execute the work. Early engagement by the construction management, or qualified construction representation, ensure effective information management and the transfer of critical project details to the execution team at the onset of WorkFace Planning.

The guidance within this document does not address specific owner requirements, which vary from project to project, nor does it address any internal commercial or project controls requirements which may exist within the EPC Company's organization.

TYPE 1 COMPLEX

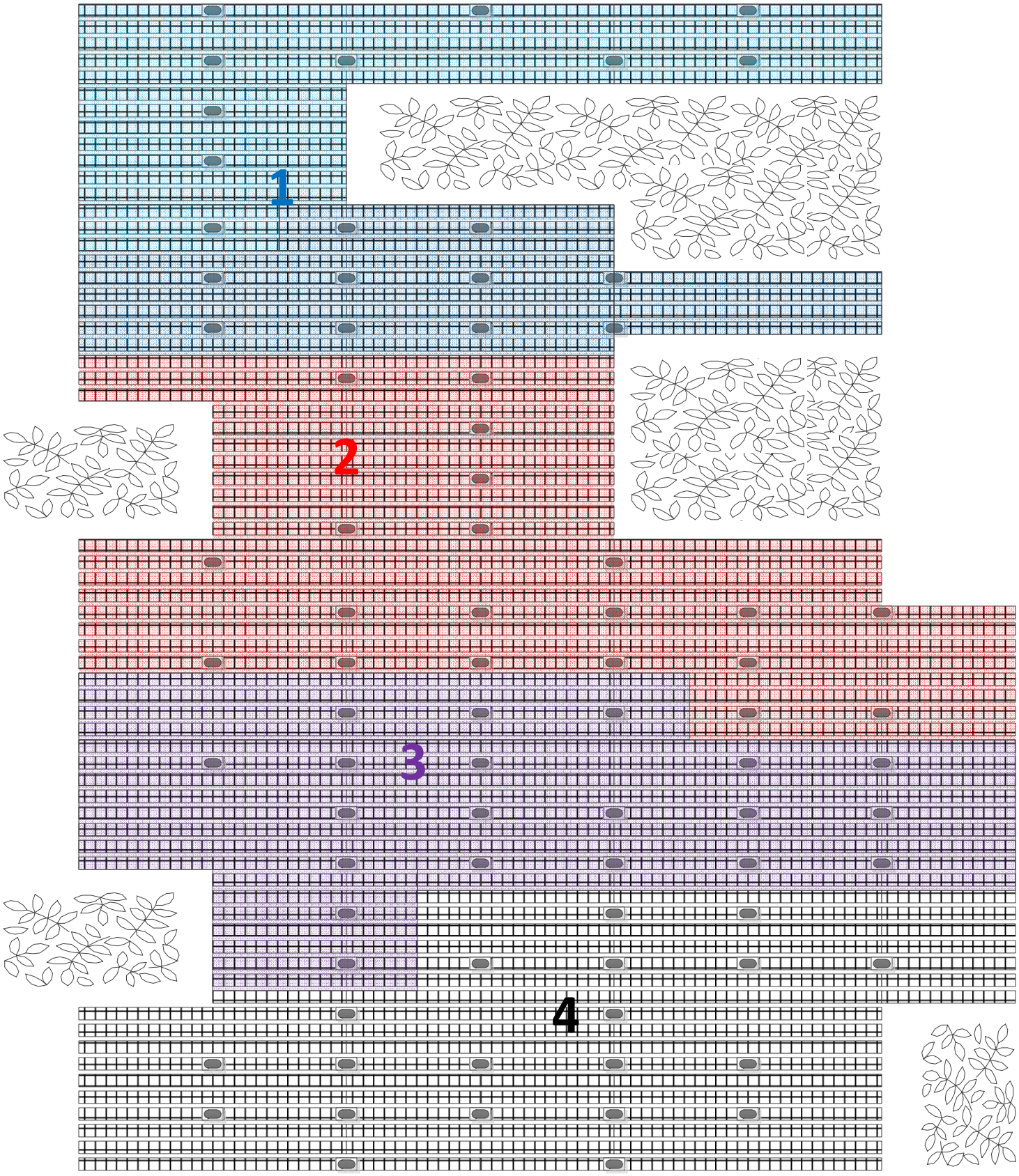
For demonstration purposes only.

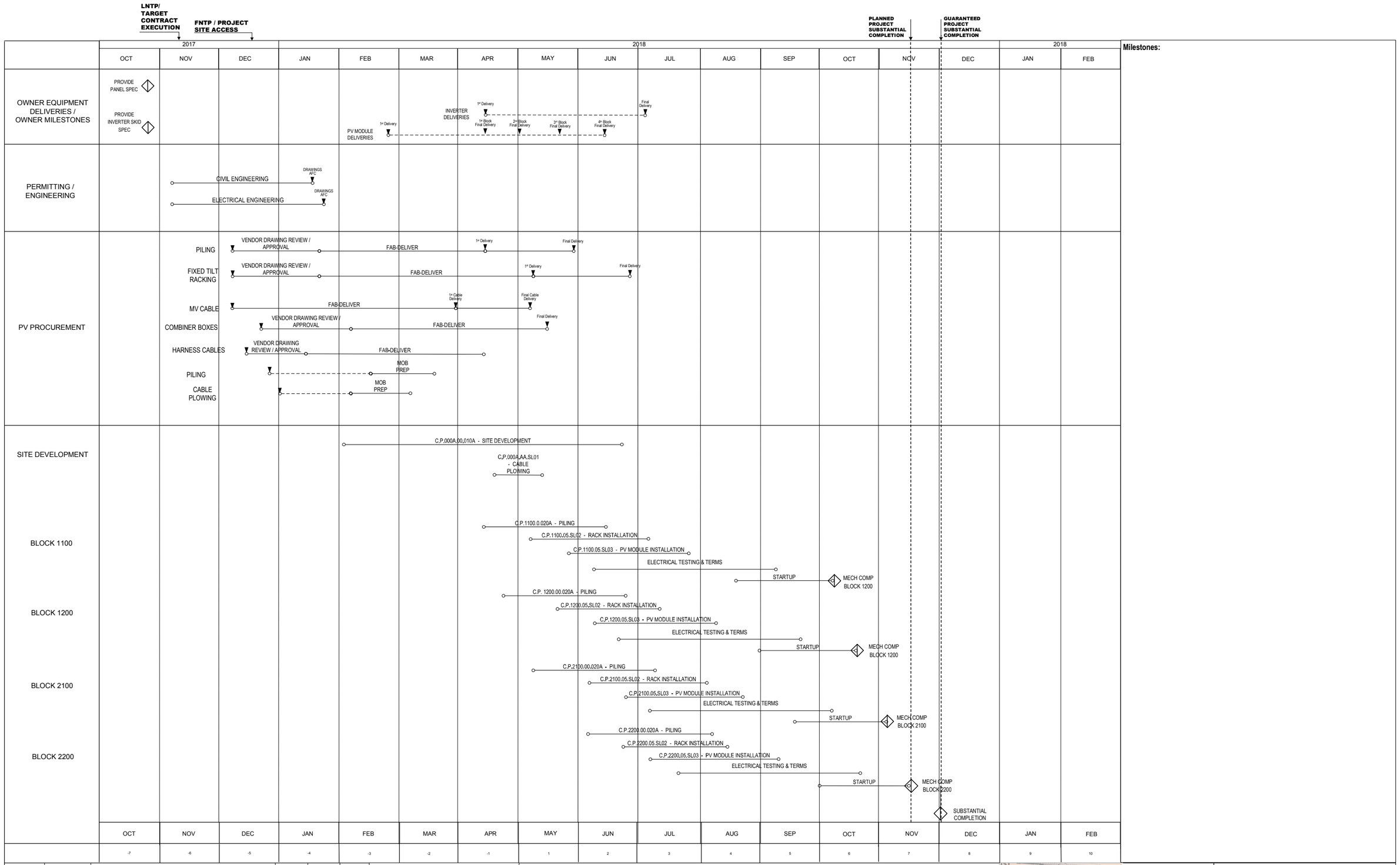
Solar panels

Protected land

1 Block Number

Inverter





REV	DATE	REVISIONS & RECORD OF ISSUE	DWN	CHK	APP
A	6 - SEP - 2017	Development & Updates for Proposal	RAG		

LEGEND:

MILESTONE

TYPE 1 – HIGH COMPLEXITY PROJECT – SOLAR FARM

AWP Scalability Project
Electrical Contractors Association of Alberta (ECAA)
Advanced Work Packaging (AWP) Competitive

DRAWING NUMBER

CODE

PAGE 1 OF 1