Advanced Work Packaging
Work Face Planning
Advanced Work Packaging
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Advanced Work Packaging

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The Need For Innovation

• *Success in construction is elusive*

• Independent Project Analysis (IPA) study of 318 projects > $2B:

  • 65% of projects **FAILED**, experiencing either:
    • > 25% cost overrun
    • > 25% schedule slip
    • Significant underperformance of the asset once constructed
Creation of Industry best practice Standards...
AWP/WFP – The Industry *Best Practice*
Extensive Industry Research

Volume I: Recommended Process

Volume II: Implementation Guidance

Volume III: Case Studies and Expert Interviews

CII/COAA AWP Implementation Resource IR 272-2

✓ 400 pages of guidance, tools, and templates
Making it Work
Advanced Work Packaging

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

Integrated Enhanced Work Packaging Flowchart

STAGE I
Preliminary Planning/Design
- Project Definition
- Construction and Engineering Planning
- Refine Schedule & WBS Development
- CWP and EWP Boundary Development

STAGE II
Detailed Engineering
- Schedule Development
- Engineering
- Detailed Construction Schedule

STAGE III
Construction
- IWP Development & Execution
- System Turn-overs / Start-up & Commissioning

Definitions
Practice Model
Tools
Case Studies
Stage I: Preliminary Planning/Design

**STAGE I**

**Preliminary Planning/Design**

- **Construction Planning**
  - Plan for Work Packaging
  - Refine Contracting Plan
  - Refine Sequence of Construction
  - Plan for Procurement and Logistics
  - Identify Site/Project Constraints
  - Consider Weather Risks
  - Deliver Construction Plan
  - Consider Temporary Structures / Utility Requirements
  - Consider Options for Construction Equipment
  - System Turnover Sequence

- **Engineering Planning**
  - Plan for Work Packaging
  - Review Contracting Plan
  - Review Sequence of Construction
  - Review Project Definition Deliverables
  - Review Procurement Plan
  - General Arrangement / Plot Plan
  - Technology Plan

- **Refine Schedule & WBS Development**
  - Level 2:
    - E > by discipline
    - P > by commodity
    - C > by discipline
    - Preliminary WIP release plan

- **CWP Boundary Development**
  - Plot Plan or General Arrangement Drawings
  - Construction Plan
  - Contracting/Procurement Execution Plan
  - Sequence of Installation
  - Trades People Available
  - WBS
  - Geographical Layout of Systems/Areas
  - Materials of Construction
  - Client/Contractor Contract Milestones
  - System Turnover Sequence

- **EWP Boundary Development**
  - Consideration for Modular Construction
  - Consider Construction Feedback
  - Define EWP Standard
Stage II: Detailed Engineering

Detailed Level 3:
E > by discipline, by EWP
P > by commodity,
by construction
need date

Final Level 3

Detailed Construction Schedule

Execute EWP Standard

Schedule Development

Engineering
Recommended Practice Model

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Definitions  Practice Model  Tools  Case Studies
Integrated Practice Model

Contract Requirement  Practice Model  Tools  Example
## Tools

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### Appendix B: Project Definition Assessment Tool

The project definition assessment tool is designed to evaluate the level of maturity in the project definition phase. It includes sections for:

- **Stakeholders and Scoping:** Adequate stakeholders and scope are established and followed.
- **Project Planning:** Project planning achieved through all phases.

The tool assesses the project definition phase using a scoring matrix, with criteria such as:

- **Scope:** Adequate project scope is established and followed.
- **Risk Management:** Risk management is integrated throughout all phases.

The tool also includes a section for **Community Observations**.

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### Example

Example sections from the tool include:

- **Project Description:** Detailed description of the project objectives.
- **Scope:** Clear, well-defined scope.
- **Schedule:** Realistic project timeline.

The tool is designed to support AWP management by ensuring projects are well-planned and executed efficiently.
Example
Example
RT 272 Contributions: A model for Advanced Work Packaging

Productivity & Predictability

- Contract Requirement
- Practice Model
- Tools
- Example
Perceptions of workface planning: WorkFace Planning perceived advantages

Q11: Which area do you see as the biggest benefit of WFP?
WorkFace Planning

Ben Swan
• Define
• Requirements
• Timeline
• Resource
WFP Definition

“Installation Work Package (IWP) is a grouping of tasks targeted at one shift in duration. These IWPs will contain all of the necessary documents and descriptions required to carry out the tasks required”

COAA & CII Best Practice

PRINCIPLES are timeless “There is nothing new under the sun”

PRACTICES are timely – “Continuous improvement”
"Installation Work Package (IWP) is a grouping of tasks targeted at one shift in duration. These IWPs will contain all of the necessary documents and descriptions required to carry out the task required.

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**Cable Pull (15 Workers)**

IWP #1  
850 Hrs

IWP #2  
750 Hrs

IWP #3  
250 Hrs

IWP #4  
350 Hrs

**Field Run Tray (6 Workers)**

IWP #5  
275 Hrs

IWP #6  
325 Hrs

**Terminations (4 Workers)**

IWP #7  
175 Hrs

IWP #8  
70 Hrs

IWP #9  
60 Hrs

IWP #10  
120 Hrs

IWP #11  
60 Hrs

IWP #12  
60 Hrs

IWP #13  
120 Hrs
• KISS - Keep it Simple.............Don’t be building books!
  • Scope
  • Drawings
  • Material
  • Safety
  • Quality
• Remember who your customer is the tradesperson
Productivity of a typical Construction Crew

- Early Quits: 14%
- Crew Planning: 11%
- Mat'l Movement: 11%
- Crew Movement: 15%
- Wait Time: 17%
- Tool Time: 32%

10% more tool time is nearly 25% improvement in productivity.

Labor is typically 40% of TIC = AWP Provides Up to 10% Reduction in TIC.
Excessive other duties reduces direct supervision and negatively effects safety.
Model for Workface Planning

Conventional WFP Best Practice

Plan The Work

Workface Planner

Superintendent

General Foreman

Foreman

Foreman

Foreman

Foreman

Foreman

Foreman

Foreman

Foreman

Foreman

Crew -10

Crew -10

Crew -10

Crew -10

Crew -10

Crew -10

Crew -10

Crew -10

Crew -10

Crew -10
WFP Requirements

1. Appoint Dedicated Planners
2. Develop Level 3 Schedule prior to Detailed Engineering
3. IWP complete 4 weeks prior to starting actual work
4. Workface Planners have access to latest information
5. Assign Integration Coordinator
6. Assign responsibilities for signoff of IWP’s
WFP Requirements Continued

8. IWP’s signed off before release to the field
9. Track progress of IWP’s
10. Develop backlog of IWP’s
11. Include WorkFace Planning into Contract
12. Audit the process
WFP Timeline

Timeline 120 Days

- **Pre IFC**
  - Develop path of construction
  - Pre IFC develop Engineering document/CWP/ FIWP release plans
  - Workface Planner manpower requirements based on release plan
  - Develop FIWP templates

- **120 days EWP’s IFC**
  - EWP checklist
  - Release IFC EWP’s as per agreed upon schedule
  - 30 days to develop CWP’s

- **90 days CWP’s IFC**
  - CWP Checklist
  - Order shorts
  - Purchase field material
  - Order tools and equipment
  - Confirm material suppliers will meet Required at Site dates
  - Subcontractor contractor requirements

- **60 days begin FIWP development**
  - Begin populating FIWPs
  - Confirm material, tool and equipment delivery dates
  - Check resources
  - FIWP readiness checklist
  - Develop Back Log or “Plan B” FIWPs

- **30 days FIWP ready for release**
  - Integrate plans with other disciplines
  - Add to 3-4 week look ahead
  - Confirm material and equipment received
  - Get sign off

- **10 days print FIWP hard copy**
  - Print Hard Copy of FIWPs that are 100% ready

Note: Initial procurement is outside the scope of this timeline
Why Implement WorkFace Planning?

- Improved site safety
- Up to ~10% reduction in TIC
- Better Coordination of Crews
- Greater predictability
- Lower Costs
- Greater Quality
- Less Rework
- Improved Project morale
- Ability to Compare across Contractors
- Schedule Optimization
www.coaa.ab.ca/construction/awpwfp

www.coaa.ab.ca/construction/AWPWFP/Flowcharts/InstallationWorkPackageLifeCycle
Thank You