



## Advanced Work Packaging EWP Readiness Playbook

A Best Practice of the  
Construction Owners Association of Alberta

ENGINEERING WORK PACKAGE											
Project Name:											
Project WBS No:											
EWP		Plant		Area		Discipline		Sequence No			
E	W	P	-								
Description:											
Rev. No	Rev Description	Date	Author	Checked By:			Approved By:				
A	Issued For Review	MM/DD/YYYY		OWNER	OWNER	OWNER	OWNER	OWNER	OWNER	OWNER	
B	IFC	MM/DD/YYYY									
C	Contractor Finalization	MM/DD/YYYY									

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## **Appendices**

A – EWP Readiness Assessment Tool

## Purpose

The purpose of this playbook is to provide instructions to properly apply and utilize the Engineering Work Package (EWP) Readiness Assessment Tool on projects. This supports the application of Advanced Work Packaging (AWP) by providing insight to the readiness of a given EWP so it can be successfully integrated by the construction partner(s) into their work packaging and planning activities.

This playbook is intended to give general guidance only and it is expected to be modified to suit your project and/or business as required.

## Scope

The scope of this playbook is to provide a consistent method of reporting the 'readiness' of each EWP (see *Appendix A - EWP Readiness Assessment Tool* for additional information) to allow better planning by the construction partner(s) for the execution of work packaging. (See also Section 4 Existing Practice to see the Difference Between EWP Readiness and Engineering Rules-of-Credit (RoC)).

Appendix A - EWP Readiness Assessment Tool is a guideline outlining:

- each of the engineering discipline milestone list of activities;
- suggested initial percentages to each milestone;
- glossary of terms; and,
- revision history.

The intent is that each of the discipline milestone lists can be further adjusted based on the need of the specific project and activities being performed.

## Intended Audience or Users

This playbook is intended to provide guidance to those responsible for:

- Ensuring that the inputs required to maintain adequate readiness assessment are done on a regular cycle and done using standard project formats;
- Reporting readiness to enable the project to clearly:
  - Identify opportunities (i.e. giving insight to upcoming data transfers from vendors or disciplines that can be proactively managed);
  - Identify potential problems (failure to receive the required vendor data when expected); and,
  - Increase visibility of the state of readiness of each discipline EWP to the project for all stakeholders.
- Assessing EWP readiness during the project lifecycle (see *Appendix A - EWP Readiness Assessment Tool for discipline checklists*);
- Auditing AWP processes; whereby, the EWP readiness activities and reports support the early work packaging and planning efforts.

## Impacts to Existing Practices

The industry current practice is to report engineering 'progress' via RoC; which, although essential for engineering and control, have proven difficult as a predictor to the 'readiness' of the EWP to be utilized for planning and work packaging development.

It is important to point out that the 'readiness' of an EWP is different than the 'progress' of an EWP as reported by the engineering disciplines in accordance with their specific discipline RoC.

### Progress

A measure of the cumulative completeness of the *deliverables* that together, make-up the EWP. Progress is determined by applying discipline rules-of-credit (RoC) to each individual deliverable with the weighted average representing the overall package progress.

### Readiness

The state of completion of an Engineering Work Package (EWP) as measured against the various engineering milestones required to be completed during the engineering *workflow*.

## Implementation of this Playbook

It is suggested that to develop your playbook, which will become your best practice in relation to assessing the readiness of each of the EWPs, the following can be used as a guideline:

### Update the EWP Readiness Assessment Tool

For best results, adoption of the EWP Readiness Assessment Tool and Playbook should be at the corporate level to garner consistency and application of the AWP processes.

- a) Update Glossary: review the glossary and ensure that your project, or company, specific definitions and acronyms are incorporated.
- b) Update Milestone Descriptions for each discipline: review and modify the milestone descriptions to best suit your engineering workflow. (note: the generic format can be utilized on its own or each discipline can be modified to suit)
- c) Update the Percentage Weighting for each Milestone: review the individual and cumulative percentages of each milestone and determine if a different weighting is better to suit your workflow.

### Incorporating the EWP Readiness Assessment Tool and Playbook at the Project Level

- a) Assign Responsibilities:
  - i. Assign the responsible person(s) to ensure timely inputs and updates of each of the milestone line items, by discipline, for each individual EWP for the project (i.e. this could be the individual Discipline Engineering Leads);
  - ii. Assign the responsible person(s) to ensure reporting of the inputs, based on the desired frequency, is completed in a timely manner (i.e. this could be the Project Controls Lead);
  - iii. Assign the responsible person(s) to assess and follow-up on the information being

gathered (i.e. this could be the assigned Project Engineer); and,

- iv. Assign the responsible person(s) to audit the process and data integrity of the information being gathered (i.e. this could be the Quality Lead).
- b) Establish Reporting Format and Dashboard: The project needs to provide a standard format of reporting and dashboarding to highlight both Leading and Lagging indicators.
- c) Document and Address Lessons Learnt: Assign accountability to capture lessons during the implementation of the EWP Readiness Assessment Tool and Playbook to enhance future applications of the AWP processes.
- d) Train the Team: Ensure your project stakeholders, and users, are provided adequate training to ensure they understand the EWP Readiness Assessment Tool and Playbook; what it is meant for, how it affects them, and what their roles are, etc. (Note: The intent is not to add additional burden for the project participants. Since the readiness assessment is aligned with the engineering workflow, it should be easily progressed as the work is progressing.)

## Assumptions for successful usage of the Playbook

The following assumptions were used in creation and implementation of the EWP Readiness Playbook and Tool:

- The AWP process is aligned with CII IR-272 Advanced Work Packaging. As such the EWP's are assumed to be aligned with PoC, are indicated in the project baseline schedule, etc.;
- The intent is to have the capability to raise a flag and prompt a discussion on how to plan for events in a proactive manner;
- EWP Readiness applies to Detail Engineering; therefore, preliminary Engineering is complete (also known as Front-end Engineering and Design (FEED), Front End Loading (FEL) or Basic Engineering);
- The document is a 'go-by' only and may be used as-is; although, it was developed to be modified to enable each organization to align it with its operational needs;
- This 'go-by' may not apply to all engineering activities and industries. It was modelled around the typical engineering workflow for commercial, municipal and industrial applications and may need revision for single engineering activities (i.e. analysis and studies or prototyping, etc.);
- This 'go-by' does not cover PWP (Procurement Work Package) readiness;
- The cumulative percentage is meant to help measure a gate for acceptability of the package by others, not as a progress milestone for engineering;
- Vendor Strategy has been defined to obtain the data required to input into the EWP at the right time

## Expected Outcomes

By following the guidelines of this playbook, it would be expected that you can integrate the EWP Readiness tool to help facilitate conversations at critical times to support early planning of construction deliverables in accordance with the AWP workflow. The tool will help normalize the approach used for readiness and provide the basis to ensure consistency across the organization and projects.

AWP Work Packaging - EWP Readiness Playbook | APPENDIX A

Engineering Work Plan (EWP) Readiness

Scope covered:		Date:	
Project:		Completed by:	

#	Notes:
1	EWP readiness applies to Detail Engineering (this is post: FEED, FEL or Basic Enguneering)
2	This documents is a 'go-by' only and may be used as-is; although, it was developed to be modified to enable each organization to align it with its operational needs
3	This documents intent is to provide a methodolgy to gauge the readiness of an EWP. This does not include other engineering specific deliverables such as: studies, material requisitions (MRs), etc.
4	The intent is to have the capability to raise a flag and prompt a discussion on how to plan for events in a proactive manner. (It is also assumed that some reasonable judgement is necessary to determine the overall impact (on planning) for any particular milestone missed (i.e. lack of vendor data may only affect 10% of an EWP, it may also allow advanced planning to occur on the other 90% or the complete package depending on how it effects fabrication or construction execution.)
5	The cumulative percentage is meant to help measure a gate for acceptability of the package by others, not as a progress milestone for engineering. Engineering must still evaluate deliverables based on rules-of-credit to determine the completeness of the deliverable effort and to control, prioritize and direct their work
6	The readiness can be assessed by the Project Engineer, Project Controls or the Engineer.
7	This 'go-by' may not apply to all engineering activities and industries. It was modelled around the typical engineering workflow for commercial, municipal and industrial applications and may need revision for single engineering activities (i.e. analysis and studies or prototyping, etc.).
8	This 'go-by' does not cover PWP (Procurement Work Package) readiness
9	A vendor data strategy, particular to each vendor supplying vendor data required to issue engoneering deliverables, should be developed to reduced the probability of EWP HOLDS.
10	The EWP readiness is aligned to the processes and practices as per CII IR-272 Advanced Work Packaging

Rev	Date	By	Change/Comments

Scope covered:	-
Project:	-

## Glossary of terms

Date:	-
Completed by:	-

TERM	DEFINITION / MEANING
30% Model review	This is defined as the state of the model produced at the end of the Front End Engineering and Design (also synonymous with Basic Engineering or a FEL stage). The model is generated to be representative of the final solution but may not be 100% correct and the 'details' are incomplete.
60% Model Review	Generally the first model milestone in Detailed Engineering. At this stage the solution is correct but the 'details' are incomplete.
90% Model Review	Generally the last model milestone in Detailed Engineering. At this stage the solution is correct and the 'details' are complete.
Preliminary	This refers to information that is used to progress engineering that is not FINAL.
Final	This is data that is in its final format. i.e. with vendor data, it would be information needed to issue the EWP for Construction (IFC or similar). It is not meant to be inclusive of all vendor data required but, is of a level which engineering can rely upon to authenticate the engineering design to proceed.
Vendor Data	Vendor information that is of a that which an engineer can rely upon to perform engineering design and elaboration. It is not inclusive of all vendor data needed for preservation, maintenance or operations, etc.
BOM (Bill of Material)	This is what is produced by the Engineer and is finalized and issued with the issued EWP. During the design development and elaboration the BOM may be requested (in it's preliminary format) to support procurement, estimating or other disciplines.
MTO (Material Take-off)	This is what is produced by the Execution Contractor, Vendor or Supplier and is usually more detailed than the BOM as it may contain identification of bulk requirements, temporary parts (i.e. replacement gaskets), etc. that facilitates the planning of the part, fabrication or field construction activity.
FROZEN	Information that may or may not be final but can be relied upon by others. This information is usually only privy to change through a rigorous change management process.



Scope covered:	-
Project:	-

GENERIC READINESS %

Date:	-
Completed by:	-

GENERIC STAGE DESCRIPTION (see glossary for terminology)	%	CUM	Comments
Initial scope identified	5%	5%	Agreed Scope, Basis of design and deliverables with client
Preliminary vendor data received	15%	20%	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Initial design (60%)	20%	40%	This is synonymous to the 60% model review.
Prelim BOM's	10%	50%	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Final vendor data received / checks	10%	60%	Where applicable
Final design (90%)	15%	75%	This is synonymous to the 90% model review.
Deliverables	10%	85%	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	90%	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	95%	Issued for construction (IFC)
EWP accepted by Construction	5%	100%	EWP deemed complete

Notes to User
This DATA is copied to all of the tabs
<b>Generic</b> description, percent and cumulative totals are used on every tab and can only be changed in this tab
These Generic stage descriptions and percentages provide consistency across all the EWP's. <b>Discipline specific</b> stages can be added in the individual tabs to provide additional readiness breakdown.
<b>DO NOT MAKE CHANGES HERE UNLESS YOU ARE SURE!</b>

Check Total:    100%    OK

Scope covered:	-
Project:	-

## EWP Readiness RESULTS

Date:	-
Completed by:	-

Readiness	Discipline Area	EWP #	% Done	Expected Stage of work Completion	Target	From Target	Status
Progress taken from individual tabs	Piping	-	0%	-	-	-	-
	Structural & Foundations	-	0%	-	-	-	-
	Civil	-	0%	-	-	-	-
	Electrical	-	0%	-	-	-	-
	Electrical EHT	-	0%	-	-	-	-
	Instrumentation	-	0%	-	-	-	-
	Mechanical	-	0%	-	-	-	-
	Other	-	0%	-	-	-	-

Progress	Discipline Area	Notes
Notes on status for each Discipline	Piping	
	Structural & Foundations	
	Civil	
	Electrical	
	Electrical EHT	
	Instrumentation	
	Mechanical	
	Other	

EWP #:	
Project:	-

## PIPING

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
P&ID Frozen	-	5%	-	-	
Preliminary stress completed	-	5%	-	-	
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Preliminary interdiscipline data received	-	5%	-	-	
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Final vendor data received / checks	10%	-	-	-	Where applicable
Final stress completed	-	5%	-	-	
Final interdiscipline data received	-	5%	-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
----	------------------

EWP #:	
Project:	-

## STRUCTURAL & FOUNDATIONS

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Preliminary interdiscipline data received	-	5%	-	-	
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Final vendor data received / checks	10%	-	-	-	Where applicable
Final interdiscipline data received	-	5%	-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
----	------------------

EWP #:	
Project:	-

## CIVIL

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
Underground conditions reviewed and assessed	-	5%	-	-	It is assumed the geotechnical/geophysical, hydrogeological and hydrology investigations and studies were complete in FEED.
Foundation assessment complete	-	5%	-	-	Shallow and deep foundations strategies are finalized.
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Preliminary interdiscipline data received	-	5%	-	-	Layouts, dimensions, preliminary lay-downs, etc.
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Final vendor data received / checks	10%	-	-	-	Where applicable
Final interdiscipline data received	-	5%	-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
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EWP #:	
Project:	-

## ELECTRICAL

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
Validation of SLD's, tie-in location and capacity	-	5%	-	-	This includes DCS, PLC, fire alarm, power, Load calc's, etc.
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Preliminary interdiscipline data received	-	5%	-	-	I&C termination signal requirements, panel space, civil undergrounds, plot plan, etc.
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Final interdiscipline data received	-	5%	-	-	
Final vendor data received / checks	10%	-	-	-	Where applicable
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
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EWP #:	
Project:	-

## ELECTRICAL EHT

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed type of EHT loops and equipment
Preliminary MTO	-	5%	-	-	To Estimating
Initial design of EHT	-	15%	-	-	This is NOT synonymous to the 60% model review.
IFC Isometrics for EHT	-	20%	-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
----	------------------

EWP #:	
Project:	-

## INSTRUMENTATION

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
P&ID FROZEN	-	5%	-	-	
Process data FROZEN	-	5%	-	-	Data sheet, LDT's, etc.
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Preliminary interdiscipline data received	-	5%	-	-	Electical (terminations, ...) / mech/piping (nozzle location and orientation, plot plan, ...), etc.
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Control Philosophy and alarm data	-	5%	-	-	
Final vendor data received / checks	10%	-	-	-	Where applicable
Final interdiscipline data received	-	5%	-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
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EWP #:	
Project:	-

## MECHANICAL

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
Preliminary interdiscipline data received	-	5%	-	-	Process data, sizing, modularization strategy, etc.
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
Final vendor data received / checks	10%	-	-	-	Where applicable
Final interdiscipline data received	-	5%	-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
----	------------------

EWP #:	
Project:	-

## OTHER

Date:	-
Completed by:	-

Stage of work	Gen	Disc	Done	CUM	Comments
Initial scope identified	5%	-	-	-	Agreed Scope, Basis of design and deliverables with client
	-		-	-	
	-		-	-	
Preliminary vendor data received	15%	-	-	-	Where applicable - used to initiate (but not finalize) engineering and may include cut sheets, catalog info, past (ref) parts or equipment used, etc. This also includes cross discipline vendor data where necessary.
	-		-	-	
	-		-	-	
	-		-	-	
Initial design (60%)	20%	-	-	-	This is synonymous to the 60% model review.
	-		-	-	
Prelim BOM's	10%	-	-	-	This may be used for Key Quantity Tracking, estimating or procurement/materials management alignment.
	-		-	-	
Final vendor data received / checks	10%	-	-	-	Where applicable
	-		-	-	
	-		-	-	
Final design (90%)	15%	-	-	-	This is synonymous to the 90% model review.
	-		-	-	
Deliverables	10%	-	-	-	includes drawings, BOM's, reference data, etc.
EWP Checks and Review(s) complete	5%	-	-	-	This is synonymous with the final reviews including: internal checking complete, interdisciplinary reviews (or squad check) and IFR (Issued For Review) to client/contractor for review
EWP c/w all drawings/specs/MTOs issued IFC	5%	-	-	-	Issued for construction (IFC)
EWP accepted by Construction	5%	-	-	-	EWP deemed complete

0%	Cumulative total
----	------------------