

WELL HOOK UP - CATALOGUE APPROACH

Opportunity “To drive *Efficiency* in Well Hook Up (WHU) through application of *Digital Catalogue Approach*. *Design one, Build Many*”



Document selection from pre engineered set.

Value Drivers

- Reduce Engineering time & Cost.
- Increased Replication.
- Reduction in Review and Approval cycle.
- Easier work flow and Project Execution Plan.
- Interchangeability of components. Helps Supply chain

..... Next Steps

- Competitiveness Review > Scope optimization.

Maintain:

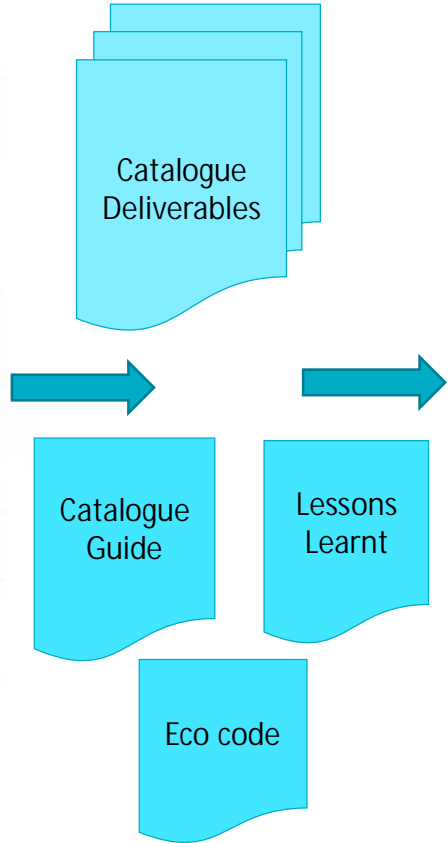
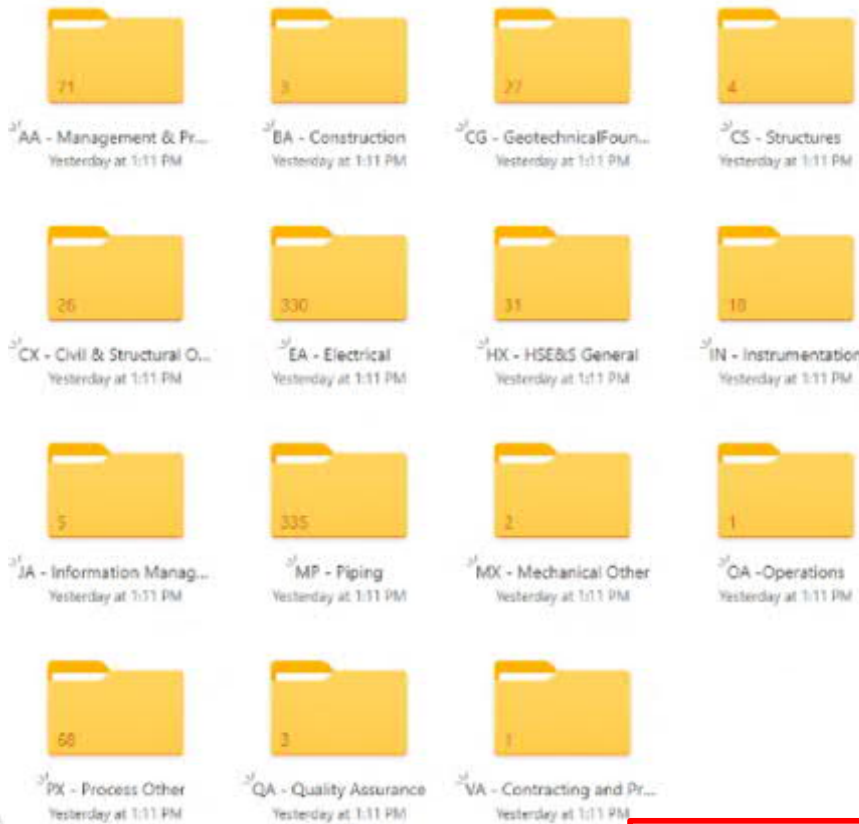
- Road Map for PAS, Work books and Expertization.

Update:

- *Based on variables (Well flow/Ratings, Topography, co-ordinates, Tie in points, flow line Crossings etc.) engineering deliverables will be adjusted.*
- *Pre Engineered document list Ready : Essential and documents with changes only for Review.*

Catalogues (with Natives) – Ready for Each Discipline

Digital Catalogue (pre engineered)-
One time



Deliverables for a specific Pad and WHU- **Smart replication and customization** for AFC Work packs

	As is	Adjust
Civils		
Plot Plan	Y	Topography, co-ordinates,
Site Dev, Road		Y –adjust
Cellars, Pits	Y	
Flow line crossings		Y
Equip Fdns	Y	
Process	As per Reservoir	
PFD	Y	
P&ID	Y	
Mechanical		
Modules- Prod and Flare. CI Skid.	Y	
Isometrics, Equip Numbering		Y (pre populated Equip numbers)
Equip Specs	Y	
MTO		Y - adjust

	As is	Adjust
Electrical		
Power req,	Y	
Heat Tracing; Cable routing	Y	Adjust
Specification	Y	
Instrumentation		
I/O, Bulk instrument &Tags	Y	Tags
Cable routing	Y	Adjust
Specification	Y	
Studies		
HAZID	Y	
HAZOP	Y	
SIL / Fully Rated	Y	
Constructability	Y	Adjust per site
Tie Ins and Flow line routing. Tie in integrity.		Y
BVS	As applicable	

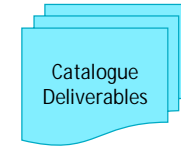
Agree standards documents (“As Is”) & Optimize Number of Deliverables (Reduce Engineering Efforts)

WELL HOOK UP DESIGN – STANDARDIZATION ROAD MAP

Phase I Develop the multidisciplinary spreadsheet – SOW & Typical Deliverables

Y/N	Discipline	Category	Scope of Work	Reference TECA well #	Deliverables	Manhour	Reference Document/Drawing No.
	Process Engineering	RBVS	To RMSUnit via existing Well TBA flowline via new RBVS.	9869/9873/9875	PID: Production Wellhead System Well Hook-Up PID: Gathering System Well RBVS Hook-Up - Demolition PID: Gathering System Well RBVS Hook-Up - Installation Line Designation Table (Line List) Process Scope of work & Explanatory Note Support to other discipline	70 10 25 55 40 40	
	Process Engineering	No RBVS	To RMSUnit via new/existing 10" flowline.	10" - 9877 6" - 9876	Installation P&ID's (Process) Demolition P&ID's (Process) Line Designation Table (Line List) Process Scope of work & Explanatory Note Support to other discipline Installation P&ID's (CAD) Demolition P&ID's (CAD)	60 15 40 40 20 10	
	Piping / Mechanical	Common					
	Detail design of the modular skids	Common	Provided by COMPANY	10" - 9869/9873/9875/9877 6" - 9876	Working Design Documentation for 6" Production Module Working Design Documentation for 10" Production Module Working Design Documentation for 4" Flare Module	-	KPO-10-ENG-WHP-00328-ER KPO-10-ENG-WHP-00329-ER KPO-10-ENG-WHP-00330-ER
	Interconnection piping	Common	New 10" (6" inch) production line between x-tree, production module and flowline		Well head orientation Process Part General Data Piping Erection Drawing and Section Isometric Collection Drawings Piping MTO	20 50 20 60 100 40	
		Common	New 4" (inch) flare line between x-tree, flare module and horizontal flare line	10" - 9869/9873/9875/9877 6" - 9876	Insulation, Painting & Pipe Supports, Material List, Termination Point List (Tie-in List)	30	
		Common	New 1" (inch) and 2" (inch) lines between flare module and UG cross		Horizontal Flare Line Plan	30	
	RBVS	RBVS	New 10" (6" inch) line at new RBVS	9869/9873/9875	RBVS Piping Erection Drawing and Section	60	
	Piping requirements	Common	Yes				
	Horizontal flare Package	Common	Ignition panel within flare module - provided by COMPANY				
		Common	New burner pip to be installed at burner pit				
	Pipeline	Common					
	Connection	RBVS	To RMSUnit via existing Well TBA flowline via new RBVS.	9869/9873/9875	Site survey Support to other discipline Crossing Matrix Flowline Route Flowline Alignment Sheets Pipeline MTO Stress Analysis Report Pipeline Scope of Work Crossing Drawings RoW for Flowline & FOC BOC Tie-in Approach Tie-in Schedule	30 50 20 90 120 30 180 30 60 60 Not in CTR Not in CTR Not in CTR	APID/190789-C0470 APID/190789-F0398 APID/190789-B0055 APID/190789-B0056 APID/190789-F0174 APID/190789-C0075 APID/190789-C0081 APID/190789-F0398 APID/190789-B0056 APID/190789-F0035 APID/190789-B0057 APID/190789-F0037
	Connection	No RBVS	To RMSUnit via new/existing 10" flowline.	10" - 9877 6" - 9876	Site Survey/report (piping and pipeline) Support to other discipline Crossing Matrix Flowline Route Flowline Alignment Sheets Pipeline MTO Stress Analysis Report Pipeline Scope of Work Crossing Drawings RoW for Flowline & FOC BOC	60 50 110 150 30 180 40 100 30 Not in CTR	APID/190789-C0077 APID/190789-F0393 APID/190789-F0391 APID/190789-F0392, F0388 APID/190789-F0484 APID/190789-C0075 APID/190789-C0081 APID/190789-F0398, F0390 APID/190789-F0392 APID/190789-F0394
	Flowline	Common	New 10" (6" inch) flowline, 26.8 mm/1.3 mm WT, length TBA meters approx.	10" - 9869/9873/9875/9877 6" - 9876			
	Horizontal flare lines	Common	New 4" (inch) lines 100 meters approx.		Part of Site Prep		
	Ignition and Pipe lines	Common	New 1" (inch) and 2" (inch) lines, length 100 meters approx.		Part of Site Prep		
		Common	Section of these lines will be pre-installed by separate project from burn pit up to the fence boundary, including cathodic protection for the flare lines and thermocouple compensating cable installation. Construction of the remaining sections, hooking up to the well site, installation of burner and testing of these installations shall be part of the RBVS.				
	Civil	Common					
	Burner pit	Common	Existing - pre-installed by separate project.		Civil Part	50	

Phase II Develop a Digital Catalogue



Scope	Deliverables	Manhours	MTO
✓
✓
✓

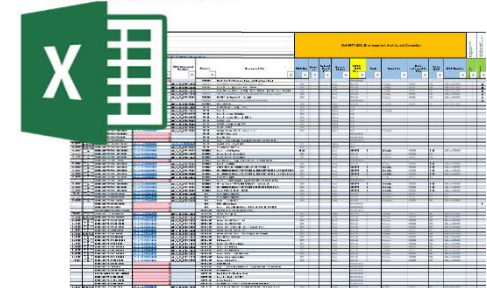
Phase III Further enhancement (a) To cover other aspects i.e. PAS, PLA, etc.

PAS	PLA
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(b) Develop a Workflow chart with clicking features (similar to eMOC system)



Phase IV Generate MDR



Phase V Generate Prelim MTO and link to SAP

