Proposal Generation Framework

How we built the Kingsford BMS proposal — a walkthrough

Agenda

- 1. The challenge — why we needed a new approach
- 2. The solution — a structured, agent-driven framework
- 3. Tier 0 — the customer's inputs (what we received)
- 4. The end-to-end flow
- 5. Tier 1 — the agent's first interpretation
- 6. Tier 2 — the engineering basis (working documents)
- 7. Tier 3 — derived working documents
- 8. Tier 4 — scope modules and integrated outputs
- 9. Tier 6 — the costed Bill of Quantities
- 10. Tier 7–8 — the customer-facing proposal and final deliverables
- 11. Design principles — applicability, determinism, mechanical/agent split
- 12. Quality and trust — why this approach is auditable
- 13. Time savings — before vs. after
- 14. v0 — this is the worst version this system will ever be
- 15. Vision — per-customer × per-discipline tracks (megaworld-bms, etc.)

The Challenge: proposals took too long, and quality was inconsistent

Why the old way wasn't working

Pain points

• Proposal preparation took 2–3 weeks per project, repeating much of the same work.

• Each estimator started from scratch, often with different assumptions.

• Junior staff had no structured framework to learn from.

• Customer asks 'where did this number come from?' — answer required digging through emails.

Hidden costs

• No clear inventory of what we'd assumed vs. confirmed.

• Schedule estimates didn't reconcile with manpower didn't reconcile with cost.

• Each new project forgot the lessons of the last.

• Customer clarifications were missed, ad-hoc, or sent late.

The Solution: structured, agent-driven, tier-based

Each step is a sub-routine the AI agent follows; documents flow in tiers

• • Two-layer separation: a reusable Master Playbook (sub-routines / agent instructions) + per-project workspace (working files)

• • 10 sequential phases (sub-routines) from intake to deliverables

• • Documents are organized in TIERS — Tier 0 = customer inputs, each generated tier reads only from lower tiers (strict DAG, no circular references)

• • Working documents capture the engineering basis at each tier

• • Mechanical helpers handle safe data aggregation between standardized formats

• • Engineering judgment stays in the agent's adaptive markdown sub-routines

• • Standard formats are the contract that lets it all stay deterministic

Tier 0

What we received from the customer

5 documents (~165 MB) — the raw material the agent reads but never produces

The 5 Tier 0 documents

What the customer sent — the agent's input boundary

Document	From	What it tells us
Customer Enquiry Letter (Requirement.rtf)	Megaworld	Scope statement: Complete supply, install, T&C of BMS
BMS Points list (TUEC).pdf, 3 sheets, 22 MB	R.J. Calpo & Co.	BMS-01 spec + I/O tabulation; BMS-02 more I/O; BMS-03 P&IDs
EE Plan (TUEC).pdf, 22 pages, 38 MB	Mario A. Alix Phils.	Construction Bulletin No.8 — revised electrical layouts and load schedules
MC Standards — ME Points List.pdf, 7 pages	Megaworld portfolio standard	Mechanical points-list baseline (DOAS, AHU, EAS, BOH templates)
MC Standards — PL Points List.pdf, 1 page	Megaworld portfolio standard	Plumbing points-list baseline (calorifiers, heat pumps, recirc pumps)

Tier 0 — Customer Enquiry Letter (Requirement.rtf)

Customer Enquiry Letter

Tier 0 — what the customer sent us

We would like to request your proposal for the Complete Supply, Delivery, Installation, Testing and Commissioning for the Rehabilitation of Building Management System for the Kingsford Ho

Source: 2026-04-kingsford-bms-AB2/_deliverables/screenshots/tier0-requirement.txt

One-paragraph scope statement. Note the word 'Rehabilitation' — the trigger for our triangulation rule on stage classification.

Tier 0 — BMS Points list (TUEC), Sheet BMS-01

el-rivera/RTRX13-Shared/Proposals/projects/2026-04-kingsford-bms-AB2/00-customer-inputs/_extracted/pages/BM

A1-format Construction Bulletin from R.J. Calpo & Co. — General BMS specifications + I/O tabulation per system.

Tier 0 — EE Plan (TUEC), Cover Letter

rojel-rivera/RTRX13-Shared/Proposals/projects/2026-04-kingsford-bms-AB2/00-customer-inputs/_extracted/pages/

Construction Bulletin No.8 cover from Mario A. Alix Phils. — adjusts mechanical layout and adds kitchen power provisions.

Tier 0 — MC Standards, Mechanical Points List

jel-rivera/RTRX13-Shared/Proposals/projects/2026-04-kingsford-bms-AB2/00-customer-inputs/_extracted/pages/M

Megaworld's CONDOTELS BMS standard for mechanical systems — applies as baseline where the project-specific is silent.

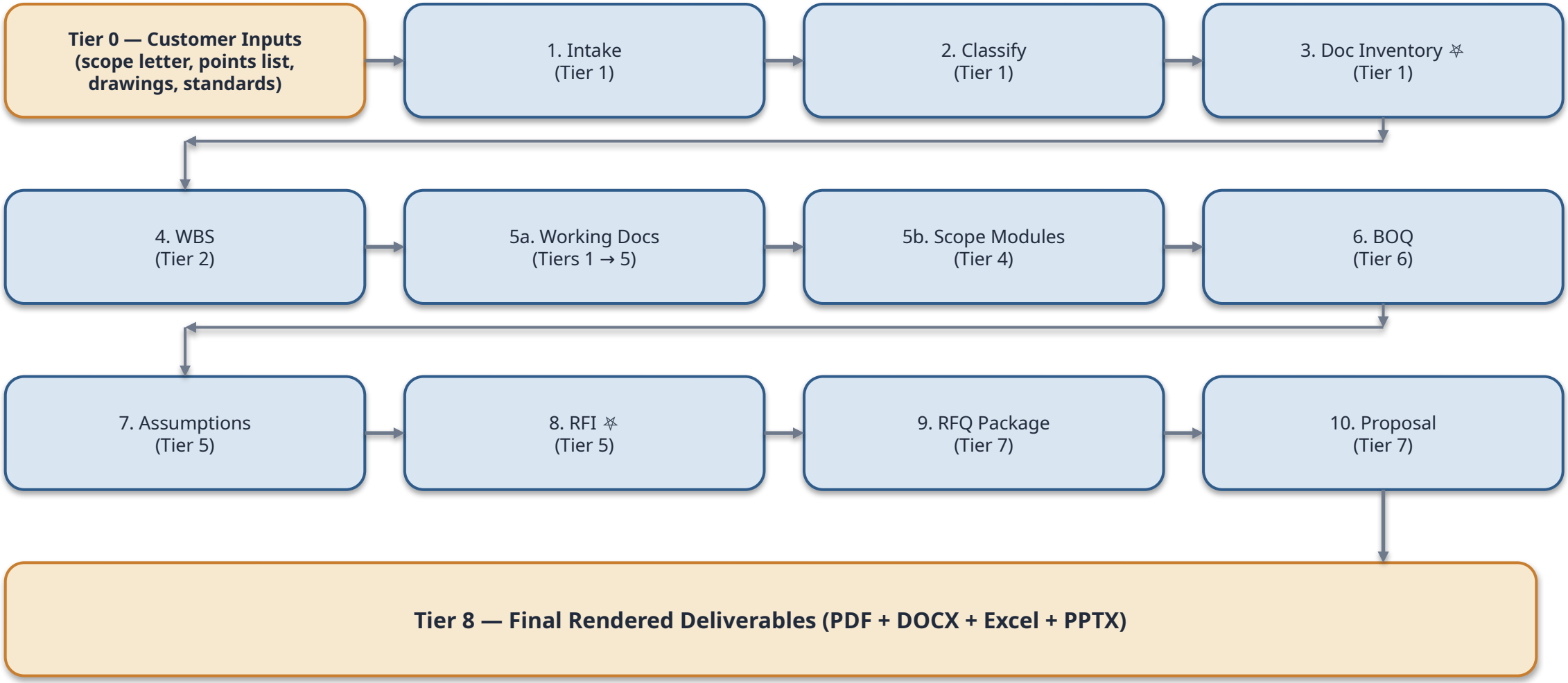
Tier 0 — MC Standards, Plumbing Points List

ojel-rivera/RTRX13-Shared/Proposals/projects/2026-04-kingsford-bms-AB2/00-customer-inputs/_extracted/pages/M

Megaworld's CONDOTELS BMS standard for plumbing — calorifiers, heat pumps, recirculating pumps.

End-to-End Flow

Each box is a sub-routine. ✲ marks gates where the team validates before continuing.



Tier 1

The agent's first interpretation

Documents produced directly from customer inputs — what the agent understands the project to be

Tier 1 — Project Requirement Brief

Project Requirement Brief

Tier 1 — agent's parsed understanding of the customer's enquiry

```
# 01 — Requirement Summary

**Project:** Kingsford Hotel Bacolod — Rehabilitation of Building Management System
**Customer:** Megaworld Corporation (Developer / Owner)
**Location:** Manhattan Street, The Upper East, Bacolod City, Negros Occidental, Philippines
**Date prepared:** 2026-04-28

## Explicit request

> "We would like to request your proposal for the **Complete Supply, Delivery, Installation, Testing and Commissioning for the Rehabilitation of Building Management System** for the **Kir

— Source: `00-customer-inputs/Requirement.rtf`

## Parties

| Role | Entity | Notes |
|------|--------|-------|
| Owner / Developer | Megaworld Corporation (APD — Asset Property Development) | Per cover letter addressee Rome Amiel P. Gonzales, 9/F Two World Square, 24th Upper Mckinley Road, Taguig
| Electrical Consultant | Mario A. Alix Philippines, Inc. (MAAP) — John Paul P. Dres, REE | EE Plan author; 2/F MAAP Bldg, 2220 Angel Linao Ext., Bgy.731, Malate, Manila; (02) 8995 3300 |
| Architect | Design Alliance Architecture & Planning | Title block on BMS-03 control diagram sheet |
| MEP Coordination / TUEC | (TUEC tag in source filenames — likely consultant or in-house team) | (not stated explicitly in inputs) |
| Reviewer | F.L. Dilidili (signed CB#8 2025-11-18); F. Villa-Real II (signed BMS sheets 2025-12-05); CABuenconsejo / APD release | Per stamp blocks |
| Main contractor | (not stated) | |
| BMS Contractor | To be awarded — proposal addressee | |

## Project context

- **Building type:** Hotel / Hospitality — boutique/casino hotel ("Kingsford Hotel Bacolod"). MC Standards reference is the developer's "REVISED BMS Standards CONDOTELS" (DRC-004-2024) —
- **Stage:** Cover letter says **"Rehabilitation"**. Supporting technical evidence (Construction Bulletins issued 2025-10/11 against a "For Construction" set, no existing-system inventory
- **Reference standards mentioned:**
  - Megaworld DRC-004-2024 — *REVISED BMS Standards CONDOTELS* (generic developer standard with ME and PL points lists)
  - BMS general specifications text printed on sheets BMS-01 and BMS-02
- **Schedule mentioned:** (not stated)
- **Commercial signals:** (not stated — no warranty, payment, tax, or currency wording in the cover letter)
- **Building structure (per riser diagram EE-24 + points-list zoning):**
  - Lower Ground / Basement 1 (calorifier room, plumbing equipment, toilet exhaust)
  - Ground Floor (lobby, public areas, restaurants, casino lobby per APD note)
  - 2nd Floor (chiller plant per points list — chillers, primary CHW pumps, CHW supply/return main headers, CW pumps, AHUs)
  - 3rd Floor (amenity area — toilet exhaust, general exhaust)
  - Guest-room floors (count not yet confirmed — riser shows multiple bands; MC Standards references "Roof Deck Level (Guest Room Levels)")
  - Roof deck (cooling towers, DOAS units, calorifier secondary set, exhaust fans)
- **Footprint estimate:** rectangular plan ~60–80 m × ~40–50 m (12-bay × 10-bay grid per EE Plan layouts, sheets EE-03/06/09/12).
... (24 more lines)
```

Source: Proposals/projects/2026-04-kingsford-bms-AB2/01-requirement.md

Generated from Tier 0 customer enquiry letter + supporting docs. The agent's parsed understanding of who, what, and where.

Tier 1 — Project Classification (with triangulation evidence)

Project Classification

Tier 1 — discipline × stage tagging with triangulation evidence

02 — Classification

Project: Kingsford Hotel Bacolod — BMS **Date:** 2026-04-28

Discipline

- **Primary:** BMS (Building Management System — HVAC + plumbing + EE monitoring + integration)
- **Secondary:** none significant. Power-provision interface to electrical contractor only.

Stage

- **Greenfield (new construction)** — classified per technical evidence, not cover-letter wording.
- **Cited evidence:**
  - EE Plan is **Construction Bulletin No.8 dated 2025-11-05** issued *"to provide information on the 'For Construction' documents reflecting the electrical revisions due to the adjusted mechanical layout and the added power provisions for the kitchen layouts from Basement to 3rd floor."* This is a new-construction document set with active design revisions.
  - BMS Points list sheets BMS-01/02/03 are **stamped "Construction Bulletin" dated October 2025**, reviewed by F. Villa-Real II 2025-12-05. Same new-construction mode.
  - **No existing-system inventory** in the input bundle (no controller make/model/age, no head-end as-built, no demolition scope, no phasing/cutover plan, no "as-is" notes).
  - The kitchen layout adjustments and "added power provisions" indicate continuing greenfield design work, not retrofit of an operating building.
- **Cover-letter wording mismatch (Q-001):** the requirement letter uses *"Rehabilitation of Building Management System"*. Per Phase 2 rule (technical evidence beats cover-letter wording when they conflict), classify as **Greenfield**. Raise `Q-001` asking the customer to confirm the wording — likely the term "rehabilitation" is being used loosely in a developer/PM context where the building is part of a larger property "rehabilitation" master programme but the BMS itself is a new design.
- **Worked-example reference:** this is the same triangulation pattern documented in `_playbook/phases/02-classify.md` (Worked example — Kingsford Hotel Bacolod, 2026-04). Classifying as rehab when the technical reality is greenfield would inflate the proposal by ~~₱~~2–4M (demolition takeoff, after-hours work premiums, cable-reuse evaluation, existing-system inventory).
- Decision recorded as **D-001** in `99-decision-log.md` .

Scope type

- [x] **Supply** — explicit ("Complete Supply")
- [x] **Installation** — explicit ("Delivery, Installation")
- [x] **Programming / Engineering** — implicit (a complete BMS without programming is non-functional; standard for S+I+T&C scope)
- [x] **Testing & Commissioning** — explicit ("Testing and Commissioning")
- [ ] **Training** — not stated. Assume *included as a standard line item* per industry norm; flag in Phase 8 (`Q-016`).

Discipline × stage tagging. Note the triangulation table: technical-document evidence (Construction Bulletins) overrides the cover letter's 'rehabilitation' wording.

Tier 1 — A1 I/O List (the foundation)

A1 — I/O List (the foundation)

Tier 1 — translated from customer's BMS Points list and MC Standards into our standard YAML schema · showing field: io_list · 474 record(s)

project: Kingsford Hotel Bacolod — BMS (AB-Run-2) · **date:** 2026-04-28 · **status:** draft

id	system	equipment_class	equipment_instance	location	point_description	type	field_device
P0001	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Entering Chilled Water Temperature	AI	Temperature Sensor
P0002	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Leaving Chilled Water Temperature	AI	Temperature Sensor
P0003	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Entering Condenser Water Temperature	AI	Temperature Sensor
P0004	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Leaving Condenser Water Temperature	AI	Temperature Sensor
P0005	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Chilled Water Return Flow	AI	Flow Sensor
P0006	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Chilled Water Supply Flow	AI	Flow Sensor
P0007	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Condenser Water Supply Flow	AI	Flow Sensor
P0008	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	CHW Isolation Motorized Valve Status	DI	Electric Valve Actuator
P0009	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	COW Isolation Motorized Valve Status	DI	Electric Valve Actuator
P0010	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Chiller Native — comprehensive package data (HLI)	Network	Chiller Native BACnet IP
P0011	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Chiller Compressor Pump On/Off Status	HLI	Chiller Native
P0012	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Chiller Compressor HOA Status	HLI	Chiller Native
P0013	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Chiller Compressor Trip Alarm	HLI	Chiller Native
P0014	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Motor Load Current	HLI	Chiller Native
P0015	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Motor Consumption (kW/BTU)	HLI	Chiller Native
P0016	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Winding Temperature	HLI	Chiller Native
P0017	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Oil Pump Status	HLI	Chiller Native
P0018	Chilled Water Plant	Chiller (Package Water-Cooled)	CH-1	2F Chiller Plant Room	Oil Pump Trip	HLI	Chiller Native

… showing 18 of 474 rows

Translated from BMS Points list + MC Standards into our standard YAML schema. 716 points; every row cites its source. Most downstream documents read from this.

Tier 2

The engineering basis begins

WBS, applicability matrix, and the first round of derived working documents

Tier 2 — Working Documents Applicability Matrix

Working-Documents Applicability Matrix

Tier 2 — what we need × what the customer gave us × what we generate

Working-Docs Applicability Matrix

Project: Kingsford Hotel Bacolod — BMS **Classification:** `bms-greenfield-hotel` **Date:** 2026-04-28 **Per ORCHESTRATOR Design Principle C** — produced before any working doc is generated.

Working doc	R / N-A	CP / AG / CP+AG	Source if CP / location if AG	Notes
A1. Consolidated I/O List	R	AG	`05-working-docs/A1-io-list.yaml`	Generated from BMS Points list (TUEC) BMS-01/02 + MC Standards ME/PL via project helper `_scripts/build-a1.py` (Principle B).
A2. Equipment Takeoff	R	AG	`05-working-docs/A2-equipment-takeoff.yaml`	Generated by `_playbook/tools/generate-a2-equipment-takeoff.py` from A1 + class defaults.
A3. Cable Schedule	R	AG	`05-working-docs/A3-cable-schedule.yaml`	Generated by `_playbook/tools/generate-a3-cable-schedule.py` from A1 + agent-authored `A3-route-lengths.yaml` (per OP #11).
A4. Panel Schedule	R	AG	`05-working-docs/A4-panel-schedule.yaml`	Generated by `_playbook/tools/generate-a4-panel-schedule.py` from A1.
A5. Network Architecture	R	AG	`05-working-docs/A5-network-architecture.md` (mermaid + inventory)	Per `_playbook/sub-routines/visualize-network-architecture.md`.
A6. Head-End Equipment List	R	AG	`05-working-docs/A6-head-end-equipment.yaml`	Per BMS-01 general spec (server, redundant workstation, GUI software, racks, UPS).
A7. Power Provisions Schedule	R	AG	`05-working-docs/A7-power-provisions.yaml`	Sized from A4 panel count + A6 head-end load + A5 edge devices.
B1. Programming Object Inventory	R	AG	`05-working-docs/B1-programming-objects.yaml`	Generated by

The agent's check-and-translate-and-generate plan. R/N-A × CP/AG/CP+AG marking for all 17 working-doc types.

Tier 2 — Work Breakdown Structure

Work Breakdown Structure

Tier 2 — 94 leaves across 7 lifecycle-phase branches

04 — Work Breakdown Structure

Project: Kingsford Hotel Bacolod — BMS **Date:** 2026-04-28 **Classification:** `bms-greenfield-hotel`

Level-1 outline

1.0 Project Management & Engineering 2.0 Material Supply 3.0 Installation 4.0 Programming & Configuration 5.0 Testing & Commissioning 6.0 Training & Handover 7.0 Optional / Out-of-scope

Detailed WBS

1.0 Project Management & Engineering

WBS	Title	Module	Source	Working docs	Status
1.1	Project management (mobilization, planning, reporting, close-out)	`modules/bms/project-management-engineering.md`	Standard for S+I+P+T&C	D1, D2	In scope
1.2	Engineering & design (shop drawings, panel layouts, cable schedule, network architecture)	(same)	BMS-01 spec block requires submittals	A1, A2, A4, A5, B1, B2	In scope
1.3	Submittals & approvals (material data sheets, mock-ups)	(same)	BMS-01 spec	—	In scope
1.4	Factory Acceptance Test (head-end + sample controllers)	(same)	Standard for Medium tier	—	In scope

2.0 Material Supply

WBS	Title	Module	Source	Working docs	Status
2.1	Head-end equipment (BMS server, workstation, GUI software, redundancy)	`modules/bms/head-end.md`	BMS-01 spec	A6	In scope
2.2	Network infrastructure (BACnet/IP backbone switches, routers, gateways, fiber/copper,	`modules/bms/network-infrastructure.md`	BMS-01 spec + EE-24 riser	A5	In scope

94 leaves across 7 lifecycle-phase branches (PM, Supply, Install, Programming, T&C, Training, Optional). Each leaf cites a module template.

Tier 2 — A2 Equipment Takeoff

A2 — Equipment Takeoff

Tier 2 — derived from A1 (135 equipment instances grouped by class, location, panel) · showing field: takeoff · 59 record(s)

project: Kingsford Hotel Bacolod — BMS (AB-Run-2)

id	equipment_class	quantity	location	system	panel	primary_co	io_summary
AHU-2F-A	AHU (Chilled-Water-Served)	1	2F Common Public	Air Conditioning	PNL-AIR-2F	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-2F-B	AHU (Chilled-Water-Served)	1	2F Common Public	Air Conditioning	PNL-AIR-2F	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-3F-AM	AHU (Chilled-Water-Served)	1	3F Amenity	Air Conditioning	PNL-AIR-3F	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-CASINO-1	AHU (Modulating CHW-served)	1	Ground Floor Casino	Casino Air Conditioning	PNL-CASINO-GF	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-CASINO-2	AHU (Modulating CHW-served)	1	Ground Floor Casino	Casino Air Conditioning	PNL-CASINO-GF	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-GF-CASINO	AHU (Modulating CHW-served)	1	Ground Floor Casino Lobby	Air Conditioning	PNL-CASINO-GF	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-GF-LOB	AHU (Chilled-Water-Served)	1	Ground Floor Lobby	Air Conditioning	PNL-AIR-GF	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
AHU-GF-REST	AHU (Chilled-Water-Served)	1	Ground Floor Restaurant	Air Conditioning	PNL-AIR-GF	Equipment Supplier	{'physical_io': 14, 'hli_subpoints': 0, 'network…
BLR-1	Steam Boiler	1	Lower Ground Boiler Room	Boiler	PNL-BLR-LG	Equipment Supplier	{'physical_io': 16, 'hli_subpoints': 0, 'network…
BLR-2	Steam Boiler	1	Lower Ground Boiler Room	Boiler	PNL-BLR-LG	Equipment Supplier	{'physical_io': 16, 'hli_subpoints': 0, 'network…
BTU-CHW-MAIN	BTU Meter	1	2F Chiller Plant Room	Chilled Water Plant	PNL-CH-PLANT-2F	BMS Contractor	{'physical_io': 0, 'hli_subpoints': 4, 'network_…
CALOR-LG	Calorifier (Hot Water Storage Tank)	1	Lower Ground Calorifier Room	Hot Water	PNL-PL-LG	BMS Contractor	{'physical_io': 1, 'hli_subpoints': 0, 'network_…
CALOR-ROOF	Calorifier (Hot Water Storage Tank)	1	Roofdeck DOAS	Hot Water	PNL-AIR-ROOF	BMS Contractor	{'physical_io': 1, 'hli_subpoints': 0, 'network_…
CH-1	Chiller (Package Water-Cooled)	1	2F Chiller Plant Room	Chilled Water Plant	PNL-CH-PLANT-2F	Equipment Supplier	{'physical_io': 9, 'hli_subpoints': 18, 'network…
CH-2	Chiller (Package Water-Cooled)	1	2F Chiller Plant Room	Chilled Water Plant	PNL-CH-PLANT-2F	Equipment Supplier	{'physical_io': 9, 'hli_subpoints': 18, 'network…
CHW-BYP	CHW Bypass Header	1	2F Chiller Plant Room	Chilled Water Plant	PNL-CH-PLANT-2F	BMS Contractor	{'physical_io': 4, 'hli_subpoints': 0, 'network_…
CHW-RET-HDR	CHW Return Main Header	1	2F Chiller Plant Room	Chilled Water Plant	PNL-CH-PLANT-2F	BMS Contractor	{'physical_io': 2, 'hli_subpoints': 0, 'network_…
CHW-SUP-HDR	CHW Supply Main Header	1	2F Chiller Plant Room	Chilled Water Plant	PNL-CH-PLANT-2F	BMS Contractor	{'physical_io': 2, 'hli_subpoints': 0, 'network_…

… showing 18 of 59 rows

Auto-derived from A1: 135 equipment instances grouped by class, location, panel, and primary supplier.

Tier 2 — A4 Panel Schedule

A4 — Panel Schedule

Tier 2 — derived from A1 (18 panels with I/O density + controller estimates) · showing field: panels · 11 record(s)

project: Kingsford Hotel Bacolod — BMS (AB-Run-2)

id	location	system_scope	equipment_served	io_summary	controller_estimate	power_estimate_w	enclosure_assumption
PNL-AIR-2F	2F Common Public	['Air Conditioning', 'Exhaust', 'Power Monitorin…	{'instance_count': 7, 'instances': ['AHU-2F-A', …	{'physical_io': 70, 'hli_subpoints': 4, 'network…	{'ddc_controllers': 2, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
PNL-AIR-3F	3F Amenity	['Air Conditioning', 'Exhaust']	{'instance_count': 3, 'instances': ['AHU-3F-AM',…	{'physical_io': 20, 'hli_subpoints': 0, 'network…	{'ddc_controllers': 1, 'network_gateway': 0, 'to…	25	Wall-mount IP54 metal cabinet, sized per control…
PNL-AIR-BSMT	Basement BOH	['Exhaust', 'Ventilation']	{'instance_count': 3, 'instances': ['EAS-GEN-BSM…	{'physical_io': 18, 'hli_subpoints': 0, 'network…	{'ddc_controllers': 1, 'network_gateway': 0, 'to…	25	Wall-mount IP54 metal cabinet, sized per control…
PNL-AIR-GF	Ground Floor Lobby / Ground Floor Restaurant	['Air Conditioning', 'Exhaust', 'Power Monitorin…	{'instance_count': 5, 'instances': ['AHU-GF-LOB'…	{'physical_io': 34, 'hli_subpoints': 4, 'network…	{'ddc_controllers': 1, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
PNL-AIR-ROOF	Roofdeck DOAS	['Exhaust', 'Hot Water', 'Ventilation']	{'instance_count': 7, 'instances': ['CALOR-ROOF'…	{'physical_io': 70, 'hli_subpoints': 0, 'network…	{'ddc_controllers': 2, 'network_gateway': 0, 'to…	50	Wall-mount IP54 metal cabinet, sized per control…
PNL-BLR-LG	Lower Ground Boiler Room	['Boiler', 'Power Monitoring']	{'instance_count': 3, 'instances': ['BLR-1', 'BL…	{'physical_io': 32, 'hli_subpoints': 4, 'network…	{'ddc_controllers': 1, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
PNL-CASINO-GF	Ground Floor Casino / Ground Floor Casino Lobby	['Air Conditioning', 'Casino Air Conditioning', …	{'instance_count': 5, 'instances': ['AHU-CASINO-…	{'physical_io': 45, 'hli_subpoints': 4, 'network…	{'ddc_controllers': 2, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
PNL-CH-PLANT-2F	2F Chiller Plant Room	['Chilled Water Plant', 'Condenser Water Loop', …	{'instance_count': 13, 'instances': ['BTU-CHW-MA…	{'physical_io': 59, 'hli_subpoints': 44, 'networ…	{'ddc_controllers': 2, 'network_gateway': 1, 'to…	70	Wall-mount IP54 metal cabinet, sized per control…
PNL-CT-ROOF	Roofdeck Cooling Tower	['Condenser Water Loop', 'Power Monitoring']	{'instance_count': 5, 'instances': ['CT-1', 'CT-…	{'physical_io': 22, 'hli_subpoints': 4, 'network…	{'ddc_controllers': 1, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
PNL-PL-LG	Lower Ground Boiler Room / Lower Ground Calorifi…	['Hot Water', 'Power Monitoring']	{'instance_count': 7, 'instances': ['CALOR-LG', …	{'physical_io': 13, 'hli_subpoints': 8, 'network…	{'ddc_controllers': 1, 'network_gateway': 1, 'to…	60	Wall-mount IP54 metal cabinet, sized per control…
PNL-PM-LG	Lower Ground Main Switchgear	['Power Monitoring']	{'instance_count': 1, 'instances': ['PM-MAIN-LG'…	{'physical_io': 0, 'hli_subpoints': 7, 'network_…	{'ddc_controllers': 1, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…

Auto-derived from A1: 18 BMS panels with I/O density, controller estimate, power consumption.

Tier 2 — C1 Contractor / Owner Matrix

C1 — Contractor / Owner Matrix

Tier 2 — supplier responsibility per equipment class (BMS / ME / EE / Equipment Supplier / Owner)

C1 — Contractor / Owner-Supplied Matrix

Project: Kingsford Hotel Bacolod — BMS (AB-Run-2) **Generated from:** A1-io-list.yaml **Generator:** `_playbook/tools/generate-c1-co-matrix.py`

This matrix shows, per equipment class, which **BMS-side field devices** are supplied by which party. It is the contractual-scope-boundary view derived from the points list `C/O` column.

Suppliers: - **BMS Contractor** — we (the proposing party) supply - **ME Contractor** — Mechanical contractor supplies (typically valves, dampers, motorized actuators) - **EE Contractor** — Electrical contractor supplies (power metering related — varies by project) - **Equipment Supplier** — Manufacturer / Equipment vendor supplies (auxiliary contacts on motors/pumps, native equipment data via BACnet/Modbus, VFDs) - **Owner** — Customer / building owner supplies

Overall Summary

Supplier	Total BMS I/O Points	Share
Equipment Supplier	253	53.4%
BMS Contractor	165	34.8%
ME Contractor	56	11.8%
Total	**474**	**100%**

Per-Equipment-Class Breakdown

DOAS Unit · 3 units, 72 I/O points

Instances: DOAS-2F, DOAS-RD1, DOAS-RD2

Supplier	I/O Count	Provides
Equipment Supplier	42	Auxiliary Contact (24×), VFD (12×), Temperature Sensor (3×), Humidity Sensor (3×)
BMS Contractor	18	Temperature Sensor (9×), Humidity Sensor (6×), Flow Sensor (3×)
ME Contractor	12	Damper Controller (6×), Electric Valve Actuator (6×)

AHU (Chilled-Water-Served) · 5 units, 70 I/O points

Auto-derived from A1: per-equipment-class supplier responsibility — BMS / ME / EE / Equipment Supplier / Owner — with I/O counts.

Tier 3

Derived working documents

Cable schedule, network architecture, commissioning inventory — built on Tier 2

Tier 3 — A3 Cable Schedule

A3 — Cable Schedule

Tier 3 — derived from A1+A2+A4 (200 cables, 6,810 m total, with cable types and lengths per A-001) · showing field: field_cables · 96 record(s)

project: Kingsford Hotel Bacolod — BMS (AB-Run-2)

id	from	to	equipment_class	system	location	cable_type	conductor_count_required
C0001	PNL-AIR-2F	AHU-2F-A (BMS Contractor)	AHU (Chilled-Water-Served)	Air Conditioning	2F Common Public	4C × 1.5 mm² shielded FRLS (BMS signal — sensors)	6
C0002	PNL-AIR-2F	AHU-2F-A (Equipment Supplier)	AHU (Chilled-Water-Served)	Air Conditioning	2F Common Public	4C × 1.5 mm² FRLS (equipment aux contacts — stat…	8
C0003	PNL-AIR-2F	AHU-2F-A (ME Contractor)	AHU (Chilled-Water-Served)	Air Conditioning	2F Common Public	4C × 1.5 mm² FRLS (ME-supplied valves/dampers — …	6
C0004	PNL-AIR-2F	AHU-2F-B (BMS Contractor)	AHU (Chilled-Water-Served)	Air Conditioning	2F Common Public	4C × 1.5 mm² shielded FRLS (BMS signal — sensors)	6
C0005	PNL-AIR-2F	AHU-2F-B (Equipment Supplier)	AHU (Chilled-Water-Served)	Air Conditioning	2F Common Public	4C × 1.5 mm² FRLS (equipment aux contacts — stat…	8
C0006	PNL-AIR-2F	AHU-2F-B (ME Contractor)	AHU (Chilled-Water-Served)	Air Conditioning	2F Common Public	4C × 1.5 mm² FRLS (ME-supplied valves/dampers — …	6
C0007	PNL-AIR-3F	AHU-3F-AM (BMS Contractor)	AHU (Chilled-Water-Served)	Air Conditioning	3F Amenity	4C × 1.5 mm² shielded FRLS (BMS signal — sensors)	6
C0008	PNL-AIR-3F	AHU-3F-AM (Equipment Supplier)	AHU (Chilled-Water-Served)	Air Conditioning	3F Amenity	4C × 1.5 mm² FRLS (equipment aux contacts — stat…	8
C0009	PNL-AIR-3F	AHU-3F-AM (ME Contractor)	AHU (Chilled-Water-Served)	Air Conditioning	3F Amenity	4C × 1.5 mm² FRLS (ME-supplied valves/dampers — …	6
C0010	PNL-CASINO-GF	AHU-CASINO-1 (BMS Contractor)	AHU (Modulating CHW-served)	Casino Air Conditioning	Ground Floor Casino	4C × 1.5 mm² shielded FRLS (BMS signal — sensors)	6
C0011	PNL-CASINO-GF	AHU-CASINO-1 (Equipment Supplier)	AHU (Modulating CHW-served)	Casino Air Conditioning	Ground Floor Casino	4C × 1.5 mm² FRLS (equipment aux contacts — stat…	8
C0012	PNL-CASINO-GF	AHU-CASINO-1 (ME Contractor)	AHU (Modulating CHW-served)	Casino Air Conditioning	Ground Floor Casino	4C × 1.5 mm² FRLS (ME-supplied valves/dampers — …	6
C0013	PNL-CASINO-GF	AHU-CASINO-2 (BMS Contractor)	AHU (Modulating CHW-served)	Casino Air Conditioning	Ground Floor Casino	4C × 1.5 mm² shielded FRLS (BMS signal — sensors)	6
C0014	PNL-CASINO-GF	AHU-CASINO-2 (Equipment Supplier)	AHU (Modulating CHW-served)	Casino Air Conditioning	Ground Floor Casino	4C × 1.5 mm² FRLS (equipment aux contacts — stat…	8
C0015	PNL-CASINO-GF	AHU-CASINO-2 (ME Contractor)	AHU (Modulating CHW-served)	Casino Air Conditioning	Ground Floor Casino	4C × 1.5 mm² FRLS (ME-supplied valves/dampers — …	6
C0016	PNL-CASINO-GF	AHU-GF-CASINO (BMS Contractor)	AHU (Modulating CHW-served)	Air Conditioning	Ground Floor Casino Lobby	4C × 1.5 mm² shielded FRLS (BMS signal — sensors)	6
C0017	PNL-CASINO-GF	AHU-GF-CASINO (Equipment Supplier)	AHU (Modulating CHW-served)	Air Conditioning	Ground Floor Casino Lobby	4C × 1.5 mm² FRLS (equipment aux contacts — stat…	8
C0018	PNL-CASINO-GF	AHU-GF-CASINO (ME Contractor)	AHU (Modulating CHW-served)	Air Conditioning	Ground Floor Casino Lobby	4C × 1.5 mm² FRLS (ME-supplied valves/dampers — …	6

… showing 18 of 96 rows

Auto-derived from A1+A2+A4 with cable-length assumption A-001. 200 cable runs; 6,810 m total.

Tier 3 — A5 Network Architecture (formatted MD)

A5 — Network Architecture

Tier 3 — topology (1 core + 6 edge switches), riser fiber, IP plan, switch schedule

A5 — BMS Network Architecture

Project: Kingsford Hotel Bacolod — BMS **Date:** 2026-04-28 **Status:** draft (pending Q-007/Q-008/Q-011) **Sources:** A4 panel schedule (11 panels) · EE-24 Part 1 riser · BMS-01 general spec · A-005, A-013

Topology summary

- **Backbone:** BACnet/IP star-and-tree on dedicated BMS LAN (per BMS-01 spec).
- **Core:** Single managed core switch in the **central control room** (BMS server room — head-end siting per Q-011, assumed at Lower Ground per `A-013`). Redundant power via local UPS (per A6 inventory).
- **Edge:** One floor switch per floor band serving the floor's BMS field panels. Connected back to core over fiber (single-mode) for risers, copper Cat6 within rack rooms.
- **Field network:** Two field protocols mixed:
  - **BACnet/IP** — to native-IP equipment (Chillers via gateway, DOAS units).
  - **BACnet MS/TP daisy-chain** — back from BMS field panel controllers to floor switches via gateway.
  - **Modbus RTU/TCP** — to power meters (PM-MAIN-LG main + 7 feeder meters) and BTU meter (BTU-CHW-MAIN).
- **Standalone vs integrated:** Standalone BMS LAN with single uplink for off-network reporting (per `A-013`). FDAS / Security / IT integrations excluded (per `A-017` / Q-012).

Switch schedule

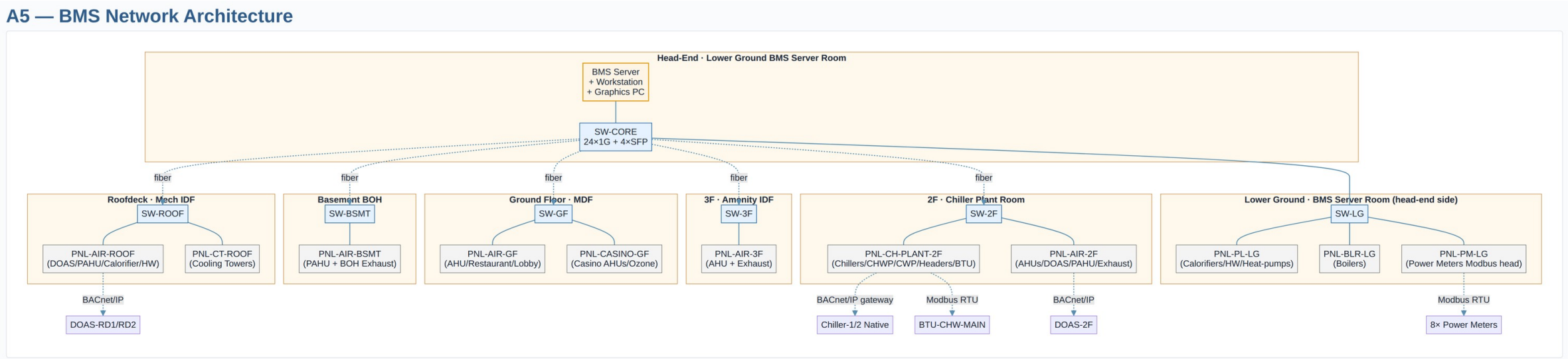
Switch	Location	Type	Ports	Uplinks	Connected panels
SW-CORE	Lower Ground BMS Server Room	Managed L2 (PoE+ optional)	24× 1 GbE + 4× 1/10G SFP	n/a (root)	All edge switches via fiber
SW-LG	Lower Ground BMS Server Room	Managed L2	8× 1 GbE	1× SFP to SW-CORE (10 m)	PNL-PL-LG, PNL-BLR-LG, PNL-PM-LG
SW-BSMT	Basement BOH	Managed L2	8× 1 GbE	1× SFP to SW-CORE (riser)	PNL-AIR-BSMT
SW-GF	Ground Floor MDF	Managed L2	8× 1 GbE	1× SFP to SW-CORE (10 m)	PNL-AIR-GF, PNL-CASINO-GF
SW-2F	2F Chiller Plant Room	Managed L2	8× 1 GbE	1× SFP to SW-CORE (riser)	PNL-CH-PLANT-2F, PNL-AIR-2F
SW-3F	3F Amenity IDF	Managed L2	8× 1 GbE	1× SFP to SW-CORE (riser)	PNL-AIR-3F
SW-ROOF	Roofdeck Mech IDF	Managed L2	8× 1 GbE	1× SFP to SW-CORE (riser)	PNL-AIR-ROOF, PNL-CT-ROOF

Inter-floor riser cabling: OS2 single-mode fiber (4-strand, 2-pair active + 2 spare) following the EE-24 Part 1 riser shaft for Basement→3F. **Pending Q-008** — assume shaft continues to Roofdeck per A-005.

Mermaid diagram

Hand-curated topology and switch schedule. 1 core + 6 edge switches, OM3 fiber backbone, flat /24 IP plan.

Tier 3 — A5 Network Architecture (visual diagram)



uto-rendered from the A5 mermaid block. Star-and-tree centered on the core switch; riser fiber to per-floor edge switches; BACnet/IP equipment direct to the floor switch

Tier 3 — B3 Commissioning Point Inventory

B3 — Commissioning Point Inventory

Tier 3 — 666 test items (P2P + functional + integrated) → 313 hours of T&C · showing field: functional_test_inventory · 59 record(s)

project: Kingsford Hotel Bacolod — BMS (AB-Run-2)

equipment	equipment_class	location
AHU-2F-A	AHU (Chilled-Water-Served)	2F Common Public
AHU-2F-B	AHU (Chilled-Water-Served)	2F Common Public
AHU-3F-AM	AHU (Chilled-Water-Served)	3F Amenity
AHU-CASINO-1	AHU (Modulating CHW-served)	Ground Floor Casino
AHU-CASINO-2	AHU (Modulating CHW-served)	Ground Floor Casino
AHU-GF-CASINO	AHU (Modulating CHW-served)	Ground Floor Casino Lobby
AHU-GF-LOB	AHU (Chilled-Water-Served)	Ground Floor Lobby
AHU-GF-REST	AHU (Chilled-Water-Served)	Ground Floor Restaurant
BLR-1	Steam Boiler	Lower Ground Boiler Room
BLR-2	Steam Boiler	Lower Ground Boiler Room
BTU-CHW-MAIN	BTU Meter	2F Chiller Plant Room
CALOR-LG	Calorifier (Hot Water Storage Tank)	Lower Ground Calorifier Room
CALOR-ROOF	Calorifier (Hot Water Storage Tank)	Roofdeck DOAS
CH-1	Chiller (Package Water-Cooled)	2F Chiller Plant Room
CH-2	Chiller (Package Water-Cooled)	2F Chiller Plant Room
CHW-BYP	CHW Bypass Header	2F Chiller Plant Room
CHW-RET-HDR	CHW Return Main Header	2F Chiller Plant Room
CHW-SUP-HDR	CHW Supply Main Header	2F Chiller Plant Room

... showing 18 of 59 rows

Auto-derived from A1+A2: every physical I/O for P2P, every equipment for functional tests, plus 8 cross-system integrated sequences. 313 hours of T&C.

Tier 4

Integrated outputs and scope modules

Manpower, schedule, risks, and the 11 scope-module instances

Tier 4 — B4 Installation Manhour Takeoff

B4 — Installation Manhour Takeoff

Tier 4 — 3,336 hours derived from A2+A3+A4 with standard production rates · showing field: line_items · 8 record(s)

project: Kingsford Hotel Bacolod — BMS (AB-Run-2)

task	quantity	unit	rate_h_per_unit	hours	notes
Cable pulling (control + network + power feeds)	2832	m	0.33	934.6	Total 2832 m. Includes 1870 m field, 730 m trunk…
Conduit installation (BMS-scope branch conduit)	849	m	0.13	110.4	Assume 30% of cable length runs in BMS-installed…
BMS field panel installation	11	panels	5.0	55.0	Mount, dress, internal verification. Pre-built i…
Field device installation (mounting + initial te…	59	devices	1.0	59.0	59 BMS-monitored equipment instances
Cable termination (both ends per cable)	192	ends	0.25	48.0	96 field cables × 2 ends
Cable continuity / insulation testing	96	cables	0.25	24.0	Pre-terminate continuity + post-terminate insula…
Panel power-up + smoke test (pre-commissioning)	11	panels	1.0	11.0	Initial energization, smoke check, controller bo…
Network drop setup (patch + label + connectivity)	12	drops	0.5	6.0	BACnet/IP and Modbus drops

Auto-derived from A2+A3+A4 using standard production rates. 3,336 hours installation labor; 417 person-days.

Tier 4 — Scope Module Instance (Controller Panels)

Scope Module Instance — Controller Panels

Tier 4 — module template instantiated as 2.3--bms-controller-panel.md

Instance: 2.3 + 3.4 — BMS Controller Panels

Module: bms/controller-panel WBS leaves: 2.3 (supply), 3.4 (installation)

Project-specific values

- **Panel count:** 11 panels (per A4) — see `05-working-docs/A4-panel-schedule.yaml` .
- **Distribution:**
  - Lower Ground: PNL-PL-LG (calorifier/HW), PNL-BLR-LG (boiler), PNL-PM-LG (power meters)
  - Basement BOH: PNL-AIR-BSMT
  - Ground Floor: PNL-AIR-GF (lobby/restaurant), PNL-CASINO-GF (casino)
  - 2nd Floor: PNL-CH-PLANT-2F (chiller plant), PNL-AIR-2F (air-handling)
  - 3rd Floor: PNL-AIR-3F (amenity)
  - Roofdeck: PNL-AIR-ROOF (DOAS/PAHU/HW-roof), PNL-CT-ROOF (cooling towers)
- **Controllers:** 20 DDC controllers total (per A4) — sized at 1 controller per ~25 physical I/O points.
- **I/O modules:** sized to carry ~474 points (per A1: 137 AI + 56 AO + 176 DI + 14 DO + 79 HLI + 12 Network drops).
- **Enclosure:** lockable steel cabinet, IP54 minimum, 800×600×250 mm typical, with 24 V PSU and breaker disconnect.
- **Power:** 1× 20 A 230 V 1-φ per panel from local panelboard (per A7 / A-007).
- **MS/TP termination:** each panel gateways onto floor BACnet/IP via local edge switch.

Quantities driving BOQ

- 11× field panels with enclosures.
- 20× DDC controllers.
- I/O modules per A4 panel-by-panel detail.
- Installation: ~180 hr of B4 manhours (panel mounting + wiring + labelling).

One of 11 scope modules instantiated for Kingsford. Module template + project-specific parameters → BOQ-ready line items.

Tier 4 — D1 Project Schedule

D1 — Project Schedule

Tier 4 — 16-week Gantt reconciled with B4 manhours (peak 11 personnel weeks 9–10)

D1 — Project Schedule

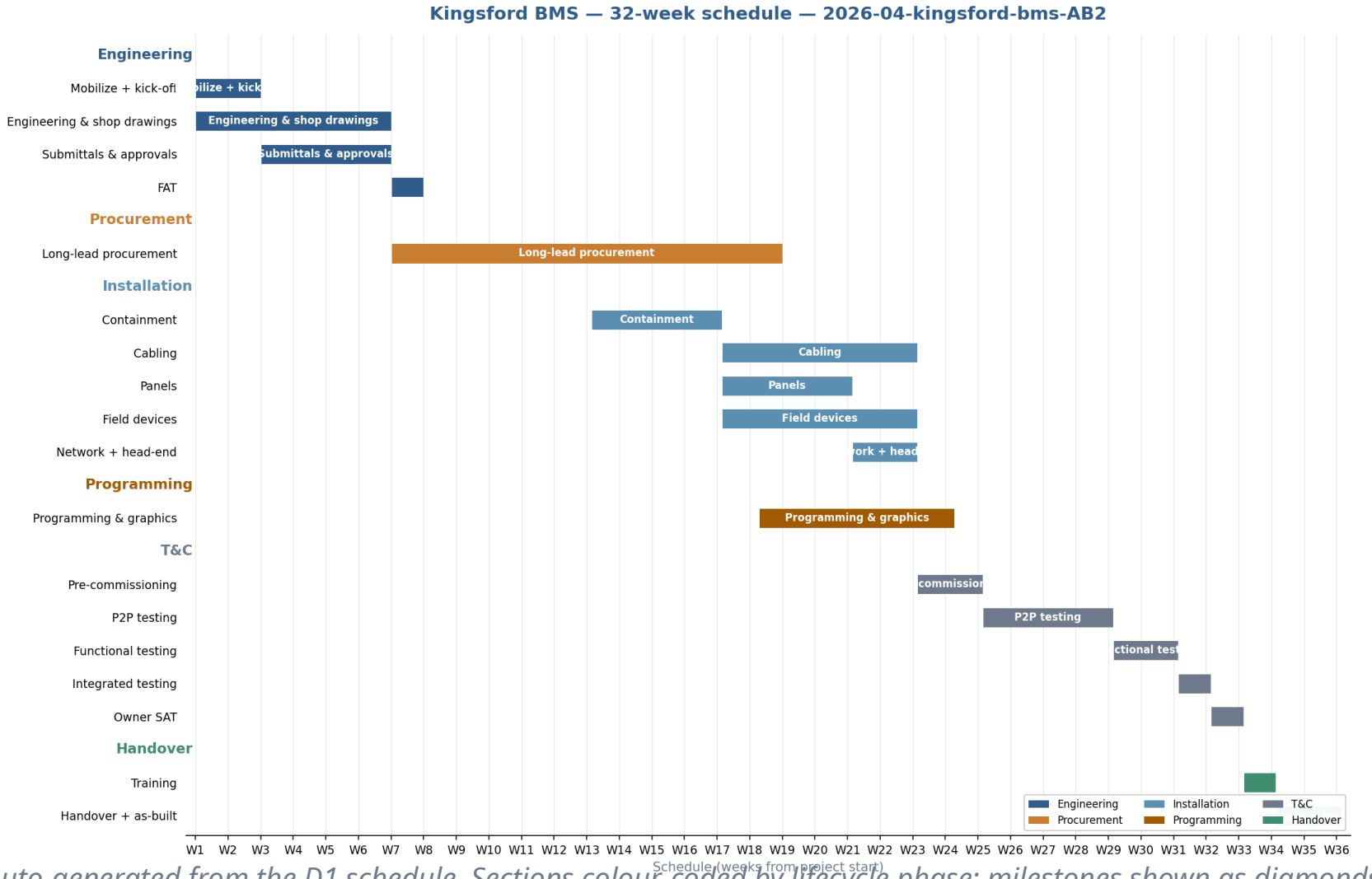
Project: Kingsford Hotel Bacolod — BMS **Date:** 2026-04-28 **Basis:** A-014 — 8-month BMS contractor scope (pending Q-013 customer milestone confirmation) **Source:** A2 / A3 / B4 manhour takeoff (1,435 hr) + B1 programming (174 hr) + B2 graphics (256 hr) + B3 commissioning (178 hr)

Phase plan (working week granularity)

Phase	Duration	Weeks (from PO)	Output
Mobilization & engineering kick-off	2 wk	1–2	Kick-off, mobilization plan, RFI batch sent
Engineering & shop drawings	6 wk	1–8 (parallel)	Approved shop drawings, panel layouts, A1–A7 working docs
Submittals & material approvals	4 wk	3–6 (parallel)	Approved material submittals; long-lead orders placed week 4
Procurement / supply lead	12 wk	4–16 (parallel)	Equipment delivered to site
Factory Acceptance Test (FAT)	1 wk	14–15	Head-end + sample controllers FAT'd
Site installation — containment	4 wk	13–16	Trays + conduits installed (per B4 — ~250 hr containment)
Site installation — cabling	6 wk	15–20	Cables pulled + terminated (per B4 — ~620 hr cabling)
Site installation — panels	4 wk	17–20	11 panels installed and powered (per B4 — ~180 hr panels)
Site installation — field devices	6 wk	17–22	All field devices installed (per B4 — ~310 hr devices)
Site installation — head-end	2 wk	21–22	Server room rack populated and powered
Site installation — network	2 wk	21–22	Backbone fiber/copper terminated, switches configured
Pre-commissioning	2 wk	22–23	Megger, continuity, panel power-up
Programming & graphics development	6 wk	18–23 (offsite parallel)	All controllers loaded, graphics deployed

Hand-curated 16-week schedule reconciled with B4 manhours. Reveals: 4-person crew can't fit; need 6-person.

Tier 4 — D1 Project Schedule (visual Gantt)



Auto-generated from the D1 schedule. Sections colour-coded by lifecycle phase; milestones shown as diamonds.

Tier 6

Bill of Quantities — the costed output

86 line items aggregated from working docs + pricing rate library — PHP 21.98 M grand total

Tier 6 — Bill of Quantities

06 — Bill of Quantities

Tier 6 — 86 line items aggregated from working docs + pricing rate library; PHP 21.98 M grand total

06 — Bill of Quantities (BOQ)

Project: Kingsford Hotel Bacolod — BMS (AB-Run-2) **Currency:** PHP **Total line items:** 86 · **RFQ-required:** 63 (73.3%) **Generated:** by `_playbook/tools/generate-06-boq.py` from working docs A1–B4 + pricing defaults

Pricing structure

- Base subtotal: **PHP 13,609,435**
- Overhead & margin (20%): PHP 2,721,887
- Cost + overhead: PHP 16,331,322
- Contingency (7.5%): PHP 1,224,849
- Cost + contingency: PHP 17,556,171
- VAT (12%): PHP 2,106,741
- **Grand total: PHP 19,662,912**
- *Optional items (7.x), priced separately:* PHP 0 (most TBD per Q-012/Q-015/Q-016)

Section subtotals

Section	Subtotal	% of base
1.0	PHP 1,688,000	12.4%
2.0	PHP 10,204,670	75.0%
3.0	PHP 749,875	5.5%
4.0	PHP 490,160	3.6%
5.0	PHP 385,530	2.8%
6.0	PHP 91,200	0.7%
Base total	**PHP 13,609,435**	**100.0%**

Cost pool breakdown (base, excl. optional)

Mechanical aggregation: the BOQ generator reads working docs A1–B4 and applies the pricing rate library. Every line cites its source.

Tier 7

Customer-facing synthesis

The proposal narrative + supplier RFQ package

Tier 7 — Customer Proposal Draft

10 — Customer Proposal Draft

Tier 7 — synthesizes 01–09 into customer-facing narrative with cover letter, technical proposal, commercial summary

Proposal — Kingsford Hotel Bacolod

Complete Supply, Delivery, Installation, Testing and Commissioning of Building Management System

Date: 2026-04-28 **Validity:** 90 days from date of issue **Currency:** Philippine Peso (PHP), VAT-inclusive

Cover letter

To: **Megaworld Corporation** (Att.: Mr. Rome Amiel P. Gonzales) 9/F Two World Square, 24th Upper Mckinley Road, Taguig City

Subject: **Proposal — Kingsford Hotel Bacolod, Building Management System**

Dear Mr. Gonzales,

Thank you for the opportunity to submit our proposal for the Complete Supply, Delivery, Installation, Testing and Commissioning of the Building Management System (BMS) for the Kingsford Hotel Bacolod project, in accordance with the BMS Construction Bulletin (October 2025) and the Electrical Construction Bulletin No. 8 (5 November 2025) issued by the project consultants.

We have reviewed the project-specific BMS Points list (sheets BMS-01, BMS-02, BMS-03), the Megaworld DRC-004-2024 BMS Standards (Parts B and C — Mechanical and Plumbing), and the issued Electrical drawing set covering Basement 1, Ground Floor, 2nd Floor, 3rd Floor power layouts and the power riser diagram. The proposal covers the complete BMS scope across the chiller plant, cooling tower plant, boiler plant, hot-water system, air-handling systems (DOAS, PAHU, AHU, EAS), the Casino BMS scope, and the power-monitoring head-end.

We confirm a turnkey delivery on a single point-of-contact basis, with a complete project lifecycle of approximately **8 months** from receipt of order, and a total proposal value of **PHP 19,662,912** (Nineteen Million Six Hundred Sixty-Two Thousand Nine Hundred Twelve Pesos), VAT-inclusive.

Yours sincerely,

— BMS Contractor

1. Executive summary

Item	Value
Scope	Complete S+I+P+T&C of BMS — 11 field panels, 20 DDC controllers, ~474 I/O points, 28 graphics pages, dedicated BMS LAN
Building coverage	Lower Ground / Basement / Ground / 2nd / 3rd / Roofdeck — chiller plant, cooling towers, boilers, calorifiers, AHUs/DOAS/PAHU/EAS, hot-water, Casino BMS, power monitoring
Schedule	32 weeks (8 months) from PO

sizes Tiers 1–6 into a customer-facing narrative: cover letter, executive summary, technical proposal, schedule, commercial summary, stated assumptions, inclusions/excl

Tier 8

Final rendered deliverables

13 customer-ready files produced from a single command

Tier 8 — Final Deliverables Package

Mechanical helpers render Tier 7 markdown/YAML into PDF / DOCX / Excel / PPTX

File	Format	Size	Pages / Sheets / Slides
01-Initial-Overview	PDF	80 KB	7 pages
02-Proposal-Draft	PDF	239 KB	30 pages
03-BOQ-Bill-of-Quantities	Excel	29 KB	11 sheets
04-A1-IO-List	Excel	51 KB	2 sheets
05-A2-Equipment-Takeoff	Excel	18 KB	2 sheets
06-A3-Cable-Schedule	Excel	20 KB	4 sheets
07-A4-Panel-Schedule	Excel	10 KB	3 sheets
08-Open-Items-RFI	Word	15 KB	—
09-Stated-Assumptions	Word	16 KB	—
10-Proposal-Comprehensive	PDF + DOCX	1.5 MB + 50 KB	92 pages
11-Customer-Proposal-Presentation	PowerPoint	74 KB	31 slides
12-Internal-Methodology-Presentation	PowerPoint	70 KB	this deck

Tier 8 — Comprehensive Proposal (PDF cover page)

Kingsford Hotel Bacolod — BMS (AB-Run-2)

Comprehensive Technical & Commercial Proposal

Document version: 1.0 (initial issue) **Date of issue:** 2026-04-28 **Prepared for:** Megaworld Corporation **Project reference:** TUEC-PR-AUX-010 — Building Management System **Site:** Manhattan Street, The Upper East, Bacolod City, Negros Occidental **Proposal validity:** 90 days from date of issue **Currency:** Philippine Peso (PHP)

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1. Cover Letter

To Megaworld Corporation

Attention: Mr. Rome Amiel P. Gonzales

Dear Sir,

Subject: Proposal for the Complete Supply, Delivery, Installation, Testing and Commissioning of the Building Management System for the Kingsford Hotel Bacolod Project

We are pleased to submit this comprehensive proposal in response to your enquiry regarding the supply and installation of the Building Management System (BMS) for the Kingsford Hotel Bacolod project. Our proposal has been prepared based on a detailed and structured engineering analysis of the following project documents:

- **BMS Points list (TUEC)** — sheets BMS-01, BMS-02, and BMS-03 (Process and Instrumentation Diagrams), dated October 2025, prepared by R.J. Calpo & Company under the seal of Reynaldo J. Calpo, Professional Mechanical Engineer (License No. 0001784)
- **EE Plan (TUEC)** — Construction Bulletin No.8, dated 5 November 2025, prepared by Mario A. Alix Philippines, Inc., covering revised electrical layouts, load schedules, and power riser diagrams
- **Megaworld MC Standards** — DRC-004-2024 Revised BMS Standards Condotels, including Mechanical and Plumbing Points Lists

The customer-facing PDF. ~92 pages: cover letter, executive summary, technical proposal, schedule, commercial summary, stated assumptions, inclusions/exclusions.

Principles

Why the framework holds together

Five design principles that govern every project

Design Principles A–F

These principles govern when to extend the framework and what to keep adaptive

	Principle	Why it matters
A	Mechanical helpers operate only on standardized agent-prepared data	Customer document interpretation stays adaptive, in agent instructions
B	Engineering judgment lives in agent instructions	Agent CAN write project-specific helpers when needed; permanent tools are mechanical
C	The applicability check is foundational	Phase 5a always begins with 'what we need vs. what's given'
D	Determinism through standard formats — and translation when needed	Customer-provided docs are translated to standard format BEFORE downstream work
E	Document tier classification (the dependency DAG)	Strict tier ordering; no circular references; build order is known
F	Transparency and auditability — never hide weak spots	Auto-generated quantities the team must verify get a verification overlay + sibling audit workbook

Determinism through standard formats

Standard formats are the contract that lets mechanical helpers run reliably

Standard formats (the contract)

Every working-doc type has ONE canonical format:

• I/O list — standard YAML schema (id, system, equipment, location, point description, type, field device, C/O, source, ...)

• BOQ — standard YAML schema (line items with WBS, qty, unit, rate, source, RFQ flag)

• Cable, panel, equipment takeoff — each has a single canonical format

• Pricing rate library + equipment-class defaults — standard YAML, peer-reviewable

Translation at the entry boundary

When the customer supplies a document that covers a working-doc type:

1. The agent transcribes it into our standard format BEFORE proceeding.

2. Each translated row cites the customer's source file for traceability.

3. Schema mismatches surface as assumptions and clarifications.

4. Downstream work always operates on the standardized representation, never on the customer's native format.

Result: regardless of customer format variation, downstream pipeline stays deterministic.

Where mechanical automation ends and judgment begins

We're conservative about what we automate

Mechanical (Python helpers)

Pure data aggregators on standardized YAML — no customer-document interpretation:

- BOQ aggregator
- RFQ packager
- Excel exporters
- PDF / DOCX rendering
- Presentation builders

Why safe:

- No customer-document interpretation
- Input/output formats are fixed
- Every quantity is sourced from agent-prepared data

Agent-driven (sub-routines / instructions)

Adaptive instructions in the playbook — sub-routines the agent follows:

- Customer document extraction protocol
- Project classification (triangulation)
- Required-doc checklist comparison
- WBS scope decomposition
- Working-document applicability matrix
- Working-document content (e.g., interpreting a points list into an I/O list)
- Module instance parameter selection
- Assumption rationale and impact assessment
- Customer clarification framing

When format/scope is genuinely unique, the agent writes a project-specific helper script.

Principle F — Transparency & auditability layer

Some auto-generated quantities are inherently soft. We don't pretend; we make them visible and editable.

The honest framing

The named weakest spot: cable lengths.

Today the agent uses assumption A-001 — 30 m average panel-to-device run, 80 m trunk per floor — because we don't always have scaled drawings or a site walkthrough yet.

Field-verified lengths typically vary ±20% per cable. If we hide that, the BOQ looks more confident than it is.

The fix is a transparency layer that makes weak spots obvious and editable — not buried in a YAML footnote.

The mechanism (Principle F)

How it works:

1. Every team-verifiable working doc (A1, A2, A3, A4, A6, B4, D1) supports a verification: overlay block per row — status / corrected_<field> / verified_by / drawing_ref / notes.

2. Mechanical helpers respect the corrected value when present — corrections flow into B4 manhours, BOQ, and final deliverables automatically.

3. A sibling Excel audit workbook is generated alongside each YAML — that's the team's review surface.

4. Audit workbook is regenerable; canonical YAML is the single source of truth.

The audit workbook — what the team actually opens

XLSX, multi-sheet, filterable. Built for how the proposal team works in Excel daily.

What's in the workbook

Each audit workbook contains:

• Summary — totals, status counts (colour-coded), known weak points, correction workflow

• Per-axis rollups — e.g., A3 cable schedule has By Panel / By Floor / By Cable Type

• Detail — every row with auto-filter + frozen header; status cells colour-coded (green=verified, red=needs correction, yellow=uncertain, grey=unverified)

• Verification schema — copy-pasteable YAML template + priority-ordered verification methods

How the team uses it

Workflow in practice:

• At desk: open A3-cable-schedule-AUDIT.xlsx, filter Detail by panel, cross-check totals against architectural drawings.

• On site: print or open on tablet, walk the building, mark up.

• Back at desk: edit A3-cable-schedule.yaml — add a verification: block with corrected_length_m, status, drawing_ref.

• Re-run the deliverables generator — corrections propagate.

Where this is going — the proposal cockpit (v1+)

v0 surfaces ask the user to think like the agent. The cockpit inverts that.

Where we are

Today (v0):

• Customer drops files in a folder
• Agent runs in a terminal
• Outputs land as XLSX / PDF / DOCX
• Verification = open Excel + edit YAML

Honest, but technical. The user has to think in our shapes.

Where we're going

Tomorrow (v1+ journey-style UX):

1. Drop-zone intake — drag-and-drop with auto-classified document tiles.

2. One 'Generate proposal' button — live phase-by-phase progress.

3. Tier walk — visual timeline Tier 0 → Tier 8, click any node to inspect lineage.

4. Audit cockpit — split-pane: drawing on left ~70%, filterable row list on right ~30%; click a row, drawing pans to the grid reference; inline-edit writes back to YAML.

5. Regen loop — one button refreshes downstream artifacts; diffs are visible per phase.

Quality and Trust

Why this approach delivers a defensible, auditable proposal

- ✓ Every quantity is traceable — each BOQ line cites its working doc; each working doc cites the customer's source document
- ✓ Assumptions are explicit — 19 stated assumptions in the proposal, each with cost-impact-if-wrong
- ✓ The basis is reproducible — re-run the aggregators and the same input produces the same output
- ✓ No hidden magic in labor / rates — pricing defaults are a peer-reviewable rate library
- ✓ Customer questions have documented answers — each clarification has a default assumed and a rationale
- ✓ Audit trail — every change committed with a 'why' message
- ✓ Deliverables are internally consistent — the BOQ in the PDF equals the BOQ in the Excel equals the BOQ in the proposal narrative

Time Savings: before vs. after

What used to take 2–3 weeks now takes 5–7 working days

Phase	Before (hand-rolled)	After (this framework)
Phases 1–4: Intake → WBS	2–3 days, often inconsistent	1 day with structured walkthrough
Phase 5a: Working docs	5–7 days hand-typing	2–3 days (about half are auto-aggregated)
Phase 5b: Module instantiation	Skipped or hand-built	0.5 day (templates)
Phase 6: BOQ	2–3 days hand-Excel	Hours (one command)
Phases 7–8: Assumptions + RFI	Often missed, ad-hoc	Hours (auto-organized)
Phase 9: RFQ to suppliers	Manual emails per category	Hours (12 docs auto-categorized)
Phase 10: Proposal narrative	3–5 days hand-write	1 day (templates + auto-populate)
Total typical	2–3 weeks	5–7 working days

Kingsford BMS Pilot — what we produced

From 5 customer documents (~165 MB) to a 13-file deliverables package

474
BMS I/O points enumerated

59
Equipment instances cataloged

11
Field panels designed

6,810 m
Cable footage estimated

4,648 hr
Project effort calculated

PHP 21.98M
Grand total proposal value

63 / 86
BOQ items / RFQ-flagged

12
Supplier RFQ docs generated

19
Customer clarifications cataloged

This is version 0. It will be the worst version of this system.

Every project from now on patches the agent instructions where edge cases surface

- What v0 IS:
  - A working end-to-end pipeline that produced the Kingsford proposal
  - A baseline of the 17 working-doc types and 11 scope modules for BMS
  - A pricing rate library that's defensible at mid-market
  - A complete deliverables package the customer can act on
- What v0 is NOT yet:
  - Calibrated against won-bid actuals (so pricing defaults will tighten)
  - Tested across customer formats beyond Megaworld's TUEC convention
  - Tracking edge cases that haven't been encountered yet
  - Handling rehab/retrofit scope (modules retired during Kingsford classification will be re-activated)
-
- Every project from here is an opportunity to improve. When an edge case surfaces, we patch the agent's instructions immediately so the next project benefits.

The vision: per-customer × per-discipline tracks

Soon the agent will recognize which 'track' a project belongs to and apply tuned defaults

Tracks the framework will support

Examples of future tracks:

• megaworld-bms
  → Tuned for TUEC points-list convention, Megaworld portfolio standardization, hotel/condotel scope patterns

• san-miguel-electrical
  → Tuned for SMC's switchgear standards, motor-control specifications, plant electrical typology

• dmci-automation
  → Tuned for DMCI's process-automation conventions, PLC + SCADA standards

Each track tunes:
  – the required-docs checklist
  – the equipment-class defaults
  – the pricing rate library
  – the module templates

How tracks emerge from real projects

How tracks emerge:

1. After 2–3 projects on the same (customer × discipline) pair, patterns become clear:
   – Which docs they always supply
   – Which they never supply
   – Their preferred brands
   – Their typical project profile
   – Their commercial term defaults

2. We capture those patterns as a track configuration in the playbook (still markdown / YAML).

3. The agent loads the track at project kickoff and starts with track-tuned defaults instead of framework-wide defaults.

4. Over time, every major customer-discipline combination has its own track, and the agent's first proposal on that pairing is already 80% calibrated.

Next Steps

What we're asking the team to do

- ☐ Review this Kingsford pilot — proposal narrative, BOQ, working documents
- ☐ Validate the pricing defaults against your last 2–3 won bids
- ☐ Provide feedback on module templates (anything missing? anything redundant?)
- ☐ Identify the next project to pilot the framework on
- ☐ Identify 2–3 estimators willing to learn the framework
- ☐ Decide on adoption pace: opt-in pilot, then mandate
- ☐ Approve the pricing rate library for inclusion in the playbook
- ☐ Schedule a follow-up review in 2 weeks after a second pilot
- ☐ Begin curating the first track — likely megaworld-bms, given Kingsford as the seed

Questions, Feedback, Discussion

Let's discuss how we make this stick — and which project to run next.