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-AB4/_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-AB4/00-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-AB4/00-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-AB4/00-customer-inputs/_extracted/pages/M

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

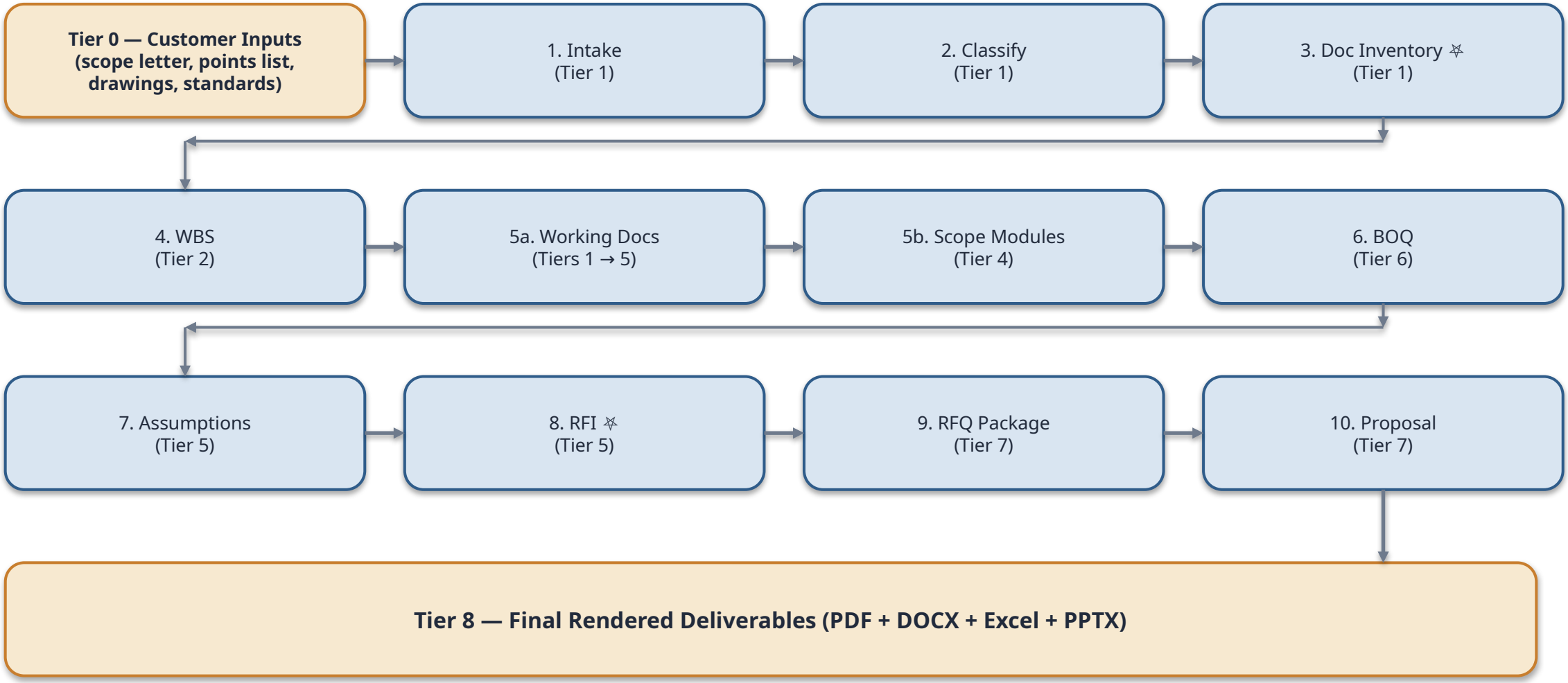
Tier 0 — MC Standards, Plumbing Points List

ojel-rivera/RTRX13-Shared/Proposals/projects/2026-04-kingsford-bms-AB4/00-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 — Building Management System (BMS) Rehabilitation **Customer:** Megaworld Corporation (Kingsford Hotel Bacolod project) **Location:** Bacolod City, Negros Occidental, Philippines (per project name; specific address not stated) **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 **Kingsford Hotel Bacolod** project."

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

Parties

Role	Entity	Notes
Owner / Developer	Megaworld Corporation (Kingsford Hotel brand)	Inferred from Kingsford brand association (Megaworld portfolio)
Consultant (Mechanical / Electrical)	TUEC	Drawing title block reference on BMS Points list and EE Plan
Standards / Spec authority	Megaworld MC Standards (DRC-004-2024 BMS)	"MC Standards - ME Points list.pdf" / "MC Standards - PL Points list.pdf"
Main contractor	(not stated)	

Project context

- Building type: Hotel / Hospitality (Kingsford brand)
- Stage: Cover letter says **rehabilitation**; requires triangulation against drawing evidence in Phase 2 (drawings stamped *Construction Bulletin* — typical greenfield indicator)
- Reference standards mentioned: Megaworld MC Standards (BMS section), TUEC consultant drawings; Philippine BFP IRR (FRLS cable jacket implied)
- Schedule mentioned: (not stated)
- Commercial signals: (not stated — currency, payment, warranty, tax not specified in Requirement.rtf)

Documents in customer inputs

File	Type	One-line description
`Requirement.rtf`	Cover letter	One-line scope request for BMS supply, install, T&C

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 **Customer:** Megaworld Corporation (slug: `megaworld` ; customer-kb entry: yes — STUB, see D-003) **Date:** 2026-04-28

Discipline

- **Primary:** BMS
- **Secondary:** Power monitoring (energy submetering at major load centers per Megaworld MC Standards)

Stage

- **Greenfield (new construction)** — see Decision D-002.
- Cited evidence:
  - Cover letter wording: *"…Rehabilitation of Building Management System…"* (weak evidence — single keyword)
  - Drawing evidence per pilot reads: TUEC-issued **Construction Bulletin** drawings (BMS Points list and EE Plan) — strong greenfield indicator (new-construction permits + design-revision pattern)
  - Absence of existing-system inventory in the input bundle — strong greenfield signal (a rehab would supply existing controller make / model / age and a site survey)
- Triangulation outcome: classify as Greenfield. Add Q-001 asking the customer to confirm the wording mismatch.

Scope type

- [x] Supply
- [x] Installation
- [x] Programming
- [x] Testing & Commissioning
- [ ] Training (assumed in base scope unless customer indicates otherwise)
- [ ] Maintenance / O&M (not stated; assume separate post-handover engagement)

Facility type

- Hotel + Casino (Kingsford brand under Megaworld portfolio)
- Bacolod City. **Casino MVAC scope confirmed** in BMS Points list page BMS-02: dedicated Casino DOAS at 2nd Level, Casino AHUs (AHU-2M.1 / AHU-2M.2), and casino-floor air ionizers. Classification key is therefore `bms-hospitality-casino` (not plain hotel).

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 · 753 record(s)

project: Kingsford Hotel Bacolod — BMS · **date:** 2026-04-28 · **source:** ['00-customer-inputs/BMS Points list (TUEC).pdf … · **status:** draft

id	system	equipment_class	equipment_instance	location	panel	point_description	type
P0001	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Compressor on/off status	HLI
P0002	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Compressor H/O/A status	HLI
P0003	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Compressor trip alarm	HLI
P0004	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Motor load current	HLI
P0005	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Motor consumption (kW)	HLI
P0006	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Motor winding temperature	HLI
P0007	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Oil sump pressure	HLI
P0008	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Oil sump temperature	HLI
P0009	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Oil pump on/off status	HLI
P0010	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Oil pump trip	HLI
P0011	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Evaporator approach delta-T	HLI
P0012	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Evaporator approach delta-P	HLI
P0013	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Evaporator refrigerant pressure	HLI
P0014	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Evaporator refrigerant temperature	HLI
P0015	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Condenser refrigerant pressure	HLI
P0016	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Condenser refrigerant temperature	HLI
P0017	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Condenser approach delta-T	HLI
P0018	chilled_water	Chiller (Package Water-Cooled)	CH-1	2nd Level Mechanical Room	BMS-PNL-LG-CHILLER	Condenser approach delta-P	HLI

… showing 18 of 753 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

05a — Working-Docs Applicability Matrix

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

Working doc	R/N-A	CP/AG	Source if CP / location if AG	Notes
A1 I/O List	R	AG	`05-working-docs/A1-io-list.yaml`	Built from BMS Points list (TUEC) BMS-01/02/03 + ME Points list Part B + PL Points list Part C (hot water only) via `_scripts/build-a1.py`
A2 Equipment Takeoff	R	AG	`05-working-docs/A2-equipment-takeoff.yaml`	Generated by `_playbook/tools/generate-a2-equipment-takeoff.py` from A1
A3 Cable Schedule	R	AG	`05-working-docs/A3-cable-schedule.yaml`	Generated; route lengths from `A3-route-lengths.yaml` ; spec rules from `A3-cable-spec-rules.yaml`
A4 Panel Schedule	R	AG	`05-working-docs/A4-panel-schedule.yaml`	Generated from A1; ~14 BMS field panels (A-024)
A5 Network Architecture	R	AG	`05-working-docs/A5-network-architecture.md`	Mermaid + inventory; isolated BMS LAN per A-010
A6 Head-End Equipment	R	AG	`05-working-docs/A6-head-end-equipment.yaml`	Per A-002 (Siemens/Dell), A-026 (UPS)
A7 Power Provisions	R	AG	`05-working-docs/A7-power-provisions.yaml`	Per A-027 (240V 1ph 20A from EE-21..23 panels)
B1 Programming Objects	R	AG	`05-working-docs/B1-programming-objects.yaml`	Generated from A1+A2 + `B1-trend-strategy.yaml`
B2 Graphics Pages	R	AG	`05-working-docs/B2-graphics-pages.yaml`	Per-floor + per-system + summary structure

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` + `bms-hospitality-casino` add-ons

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	`bms/project-management-engineering`	Standard scope	D1, D2	In scope
1.2	Engineering & design (incl. shop drawings, FAT)	`bms/programming-engineering`	BMS-01/02 spec text	A1..A7, B1, B2	In scope
1.3	Submittals & approvals (3-stage)	(above)	A-035	—	In scope
1.4	Factory Acceptance Test	(above)	A-034	—	In scope

2.0 Material Supply

WBS	Title	Module	Source	Working docs	Status
2.1	BMS head-end equipment (server + workstations + UPS + monitors + rack)	`bms/head-end`	BMS-01 spec	A6	In scope
2.2	BMS network infrastructure (core switch, edge switches, fiber, racks)	`bms/network-infrastructure`	A-010 + A-025	A5	In scope
2.3	BMS controller panels (~14 field panels per A-024)	`bms/controller-panel`	BMS Points list zone tags + EE Plan panel-room siting	A4	In scope
2.4	HVAC field devices	`bms/field-devices-hvac`	BMS Points list + ME Points list	A1, A2	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 · 132 record(s)

project: Kingsford Hotel Bacolod — BMS

id	equipment_class	quantity	location	system	panel	primary_co	io_summary
AHU-2F-1	AHU (Chilled-Water-Served)	1	2nd Floor BOH	common_area	BMS-PNL-2F-CASINO	BMS Contractor	{'physical_io': 15, 'hli_subpoints': 1, 'network…
AHU-2M.1	AHU (Modulating CHW-served)	1	2nd Floor Casino MVAC Room	casino_mvac	BMS-PNL-2F-CASINO	BMS Contractor	{'physical_io': 16, 'hli_subpoints': 1, 'network…
AHU-2M.2	AHU (Modulating CHW-served)	1	2nd Floor Casino MVAC Room	casino_mvac	BMS-PNL-2F-CASINO	BMS Contractor	{'physical_io': 16, 'hli_subpoints': 1, 'network…
AHU-B1-1	AHU (Chilled-Water-Served)	1	Basement 1 BOH	common_area	BMS-PNL-B1	BMS Contractor	{'physical_io': 15, 'hli_subpoints': 1, 'network…
AHU-GF-1	AHU (Chilled-Water-Served)	1	Ground Floor BOH	common_area	BMS-PNL-GF	BMS Contractor	{'physical_io': 15, 'hli_subpoints': 1, 'network…
AHU-GFM-1	AHU (Chilled-Water-Served)	1	Ground Floor Mezzanine BOH	common_area	BMS-PNL-GF	BMS Contractor	{'physical_io': 15, 'hli_subpoints': 1, 'network…
BTU-1	BTU Meter	1	2nd Level Mechanical Room	btu_metering	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 0, 'hli_subpoints': 0, 'network_…
BTU-2	BTU Meter	1	2nd Level Mechanical Room	btu_metering	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 0, 'hli_subpoints': 0, 'network_…
BTU-3	BTU Meter	1	2nd Level Mechanical Room	btu_metering	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 0, 'hli_subpoints': 0, 'network_…
BTU-4	BTU Meter	1	2nd Level Mechanical Room	btu_metering	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 0, 'hli_subpoints': 0, 'network_…
BTU-5	BTU Meter	1	2nd Level Mechanical Room	btu_metering	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 0, 'hli_subpoints': 0, 'network_…
CH-1	Chiller (Package Water-Cooled)	1	2nd Level Mechanical Room	chilled_water	BMS-PNL-LG-CHILLER	Equipment Supplier	{'physical_io': 9, 'hli_subpoints': 18, 'network…
CH-2	Chiller (Package Water-Cooled)	1	2nd Level Mechanical Room	chilled_water	BMS-PNL-LG-CHILLER	Equipment Supplier	{'physical_io': 9, 'hli_subpoints': 18, 'network…
CH-3	Chiller (Package Water-Cooled)	1	2nd Level Mechanical Room	chilled_water	BMS-PNL-LG-CHILLER	Equipment Supplier	{'physical_io': 9, 'hli_subpoints': 18, 'network…
CHW-BYPASS	CHW Bypass Header	1	2nd Level Mechanical Room	chilled_water	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 5, 'hli_subpoints': 0, 'network_…
CHW-HDR-R	CHW Return Main Header	1	2nd Level Mechanical Room	chilled_water	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 2, 'hli_subpoints': 0, 'network_…
CHW-HDR-S	CHW Supply Main Header	1	2nd Level Mechanical Room	chilled_water	BMS-PNL-LG-CHILLER	BMS Contractor	{'physical_io': 2, 'hli_subpoints': 0, 'network_…
CT-1	Cooling Tower	1	Roof Deck Mechanical	condenser_water	BMS-PNL-RD-CT	BMS Contractor	{'physical_io': 12, 'hli_subpoints': 0, 'network…

… showing 18 of 132 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 · 8 record(s)

project: Kingsford Hotel Bacolod — BMS

id	location	system_scope	equipment_served	io_summary	controller_estimate	power_estimate_w	enclosure_assumption
BMS-PNL-2F-CASINO	2nd Floor BOH / 2nd Floor Casino / 2nd Floor Cas…	['casino_mvac', 'common_area', 'power_metering',…	{'instance_count': 11, 'instances': ['AHU-2F-1',…	{'physical_io': 84, 'hli_subpoints': 4, 'network…	{'ddc_controllers': 3, 'network_gateway': 1, 'to…	90	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-3F	3rd Floor Amenity	['power_metering', 'ventilation']	{'instance_count': 26, 'instances': ['PM-LIGHTIN…	{'physical_io': 75, 'hli_subpoints': 0, 'network…	{'ddc_controllers': 2, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-B1	Basement 1 / Basement 1 BOH	['common_area', 'ventilation']	{'instance_count': 17, 'instances': ['AHU-B1-1',…	{'physical_io': 63, 'hli_subpoints': 1, 'network…	{'ddc_controllers': 2, 'network_gateway': 0, 'to…	50	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-GF	Ground Floor / Ground Floor BOH / Ground Floor L…	['common_area', 'power_metering', 'ventilation']	{'instance_count': 16, 'instances': ['AHU-GF-1',…	{'physical_io': 63, 'hli_subpoints': 2, 'network…	{'ddc_controllers': 2, 'network_gateway': 1, 'to…	65	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-LG-CHILLER	2nd Level Mechanical Room	['btu_metering', 'chilled_water', 'power_meterin…	{'instance_count': 20, 'instances': ['BTU-1', 'B…	{'physical_io': 72, 'hli_subpoints': 60, 'networ…	{'ddc_controllers': 2, 'network_gateway': 1, 'to…	105	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-LG-PLUMB	Lower Ground HW Plant / Lower Ground Laundry	['hot_water', 'power_metering', 'steam']	{'instance_count': 13, 'instances': ['HP-LZ-1', …	{'physical_io': 40, 'hli_subpoints': 26, 'networ…	{'ddc_controllers': 1, 'network_gateway': 1, 'to…	55	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-RD-CT	Roof Deck Mechanical	['condenser_water']	{'instance_count': 4, 'instances': ['CT-1', 'CT-…	{'physical_io': 40, 'hli_subpoints': 0, 'network…	{'ddc_controllers': 1, 'network_gateway': 0, 'to…	25	Wall-mount IP54 metal cabinet, sized per control…
BMS-PNL-RD-MECH	Roof Deck / Roof Deck HW Plant / Roof Deck Mecha…	['hot_water', 'power_metering', 'ventilation']	{'instance_count': 25, 'instances': ['DOAS-RD1',…	{'physical_io': 185, 'hli_subpoints': 9, 'networ…	{'ddc_controllers': 5, 'network_gateway': 1, 'to…	175	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 **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	462	61.4%
BMS Contractor	232	30.8%
ME Contractor	59	7.8%
Total	**753**	**100%**

Per-Equipment-Class Breakdown

Exhaust Fan (Toilet) · 53 units, 159 I/O points

Instances: TEF-1.1, TEF-1.2, TEF-1.3, TEF-1.4, TEF-2.1, TEF-2.3, TEF-2B.3, TEF-3A.1, TEF-3A.2, TEF-3B, TEF-3C.1, TEF-3C.2, TEF-3D.1, TEF-3D.10, TEF-3D.11, TEF-3D.12, TEF-3D.13, TEF-3D.14, TEF-3D.15, TEF-3D.16, TEF-3D.17, TEF-3D.18, TEF-3D.19, TEF-3D.2, TEF-3D.20, TEF-3D.3, TEF-3D.4, TEF-3D.5, TEF-3D.6, TEF-3D.7, TEF-3D.8, TEF-3D.9, TEF-B.1, TEF-B.10, TEF-B.11, TEF-B.12, TEF-B.13, TEF-B.14, TEF-B.15, TEF-B.16, TEF-B.2, TEF-B.3, TEF-B.4, TEF-B.5, TEF-B.6, TEF-B.7, TEF-B.8, TEF-B.9, TEF-GS.1, TEF-GS.2, TEF-RD.1, TEF-RD.2, TEF-RD.3

Supplier	I/O Count	Provides
Equipment Supplier	159	Auxiliary Contact (159×)

Precooled Air Handling Unit · 7 units, 112 I/O points

Instances: PAHU-01, PAHU-02, PAHU-03, PAHU-04, PAHU-05, PAHU-06, PAHU-07

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 · 194 record(s)

project: Kingsford Hotel Bacolod — BMS

id	from	to	equipment_class	system	location	cable_type	spec_source
C0001	BMS-PNL-2F-CASINO	AHU-2F-1 (BMS Contractor)	AHU (Chilled-Water-Served)	common_area	2nd Floor BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0002	BMS-PNL-2F-CASINO	AHU-2F-1 (Equipment Supplier)	AHU (Chilled-Water-Served)	common_area	2nd Floor BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0003	BMS-PNL-2F-CASINO	AHU-2F-1 (ME Contractor)	AHU (Chilled-Water-Served)	common_area	2nd Floor BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0004	BMS-PNL-2F-CASINO	AHU-2M.1 (BMS Contractor)	AHU (Modulating CHW-served)	casino_mvac	2nd Floor Casino MVAC Room	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0005	BMS-PNL-2F-CASINO	AHU-2M.1 (Equipment Supplier)	AHU (Modulating CHW-served)	casino_mvac	2nd Floor Casino MVAC Room	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0006	BMS-PNL-2F-CASINO	AHU-2M.1 (ME Contractor)	AHU (Modulating CHW-served)	casino_mvac	2nd Floor Casino MVAC Room	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0007	BMS-PNL-2F-CASINO	AHU-2M.2 (BMS Contractor)	AHU (Modulating CHW-served)	casino_mvac	2nd Floor Casino MVAC Room	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0008	BMS-PNL-2F-CASINO	AHU-2M.2 (Equipment Supplier)	AHU (Modulating CHW-served)	casino_mvac	2nd Floor Casino MVAC Room	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0009	BMS-PNL-2F-CASINO	AHU-2M.2 (ME Contractor)	AHU (Modulating CHW-served)	casino_mvac	2nd Floor Casino MVAC Room	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0010	BMS-PNL-B1	AHU-B1-1 (BMS Contractor)	AHU (Chilled-Water-Served)	common_area	Basement 1 BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0011	BMS-PNL-B1	AHU-B1-1 (Equipment Supplier)	AHU (Chilled-Water-Served)	common_area	Basement 1 BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0012	BMS-PNL-B1	AHU-B1-1 (ME Contractor)	AHU (Chilled-Water-Served)	common_area	Basement 1 BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0013	BMS-PNL-GF	AHU-GF-1 (BMS Contractor)	AHU (Chilled-Water-Served)	common_area	Ground Floor BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0014	BMS-PNL-GF	AHU-GF-1 (Equipment Supplier)	AHU (Chilled-Water-Served)	common_area	Ground Floor BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0015	BMS-PNL-GF	AHU-GF-1 (ME Contractor)	AHU (Chilled-Water-Served)	common_area	Ground Floor BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0016	BMS-PNL-GF	AHU-GFM-1 (BMS Contractor)	AHU (Chilled-Water-Served)	common_area	Ground Floor Mezzanine BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0017	BMS-PNL-GF	AHU-GFM-1 (Equipment Supplier)	AHU (Chilled-Water-Served)	common_area	Ground Floor Mezzanine BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?
C0018	BMS-PNL-GF	AHU-GFM-1 (ME Contractor)	AHU (Chilled-Water-Served)	common_area	Ground Floor Mezzanine BOH	Cat6 4P × 23 AWG U/UTP, FRLS jacket (BACnet/IP)	rule:?

… showing 18 of 194 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 — Network Architecture

Project: Kingsford Hotel Bacolod — BMS **Date:** 2026-04-28 **Source:** A-010 (isolated BMS LAN), A-025 (BACnet/IP backbone + MS/TP field), A4 panel schedule (8 panels per A4 helper output; logical grouping per A-024 = 14 controllers) **Status:** draft

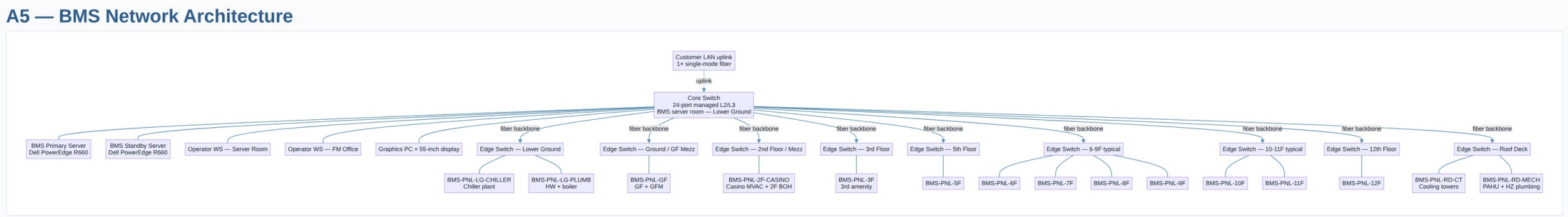
Topology

Isolated BMS LAN with a single uplink to the customer corporate LAN at the BMS server room (Lower Ground IT/telecom room per A-006).

```
graph TD
  CUST[Customer LAN uplink<br/>1× single-mode fiber]
  CORE[Core Switch<br/>24-port managed L2/L3<br/>BMS server room — Lower Ground]
  SVR1[BMS Primary Server<br/>Dell PowerEdge R660]
  SVR2[BMS Standby Server<br/>Dell PowerEdge R660]
  WS1[Operator WS — Server Room]
  WS2[Operator WS — FM Office]
  GFX[Graphics PC + 55-inch display]

  CUST -.uplink.-> CORE
  CORE --- SVR1
  CORE --- SVR2
  CORE --- WS1
  CORE --- WS2
  CORE --- GFX

  CORE -- fiber backbone --> SW_LG[Edge Switch — Lower Ground]
  CORE -- fiber backbone --> SW_GF[Edge Switch — Ground / GF Mezz]
  CORE -- fiber backbone --> SW_2F[Edge Switch — 2nd Floor / Mezz]
  CORE -- fiber backbone --> SW_3F[Edge Switch — 3rd Floor]
  CORE -- fiber backbone --> SW_5F[Edge Switch — 5th Floor]
  CORE -- fiber backbone --> SW_69[Edge Switch — 6-9F typical]
  CORE -- fiber backbone --> SW_1011[Edge Switch — 10-11F typical]
  CORE -- fiber backbone --> SW_12[Edge Switch — 12th Floor]
  CORE -- fiber backbone --> SW_RD[Edge Switch — Roof Deck]

  SW_LG --- PNL_LG_CHILLER[BMS-PNL-LG-CHILLER<br/>Chiller plant]
```

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 · 132 record(s)

project: Kingsford Hotel Bacolod — BMS

equipment	equipment_class	location
AHU-2F-1	AHU (Chilled-Water-Served)	2nd Floor BOH
AHU-2M.1	AHU (Modulating CHW-served)	2nd Floor Casino MVAC Room
AHU-2M.2	AHU (Modulating CHW-served)	2nd Floor Casino MVAC Room
AHU-B1-1	AHU (Chilled-Water-Served)	Basement 1 BOH
AHU-GF-1	AHU (Chilled-Water-Served)	Ground Floor BOH
AHU-GFM-1	AHU (Chilled-Water-Served)	Ground Floor Mezzanine BOH
BTU-1	BTU Meter	2nd Level Mechanical Room
BTU-2	BTU Meter	2nd Level Mechanical Room
BTU-3	BTU Meter	2nd Level Mechanical Room
BTU-4	BTU Meter	2nd Level Mechanical Room
BTU-5	BTU Meter	2nd Level Mechanical Room
CH-1	Chiller (Package Water-Cooled)	2nd Level Mechanical Room
CH-2	Chiller (Package Water-Cooled)	2nd Level Mechanical Room
CH-3	Chiller (Package Water-Cooled)	2nd Level Mechanical Room
CHW-BYPASS	CHW Bypass Header	2nd Level Mechanical Room
CHW-HDR-R	CHW Return Main Header	2nd Level Mechanical Room
CHW-HDR-S	CHW Supply Main Header	2nd Level Mechanical Room
CT-1	Cooling Tower	Roof Deck Mechanical

... showing 18 of 132 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 · 13 record(s)

project: Kingsford Hotel Bacolod — BMS

task	quantity	unit	rate_h_per_unit	hours	notes
Cable pulling (control + network + power feeds)	5033	m	0.33	1660.9	Total 5033 m. Includes 3409 m field, 1480 m trun…
Conduit installation (BMS-scope branch conduit)	1761	m	0.13	228.9	Conduit fraction = 35% of total cable. Basis: Gr…
BMS field panel installation	8	panels	5.0	40.0	Mount, dress, internal verification. Pre-built i…
Field device installation (mounting + initial te…	132	devices	1.0	132.0	132 BMS-monitored equipment instances at LEGACY …
Cable termination (both ends per cable)	388	ends	0.25	97.0	194 field cables × 2 ends
Cable continuity / insulation testing	194	cables	0.25	48.5	Pre-terminate continuity + post-terminate insula…
Panel power-up + smoke test (pre-commissioning)	8	panels	1.0	8.0	Initial energization, smoke check, controller bo…
Network drop setup (patch + label + connectivity)	29	drops	0.5	14.5	BACnet/IP and Modbus drops
Field analog sensor calibration	170	AI points	0.75	127.5	Calibrate 170 analog sensors against reference; …
Fire-stopping / sealed cable penetrations	116	penetrations	0.5	58.0	Estimated 30% of cable ends require sealed penet…
Site safety attendance (toolbox, JHA, HSE briefi…	2415.3	h	0.05	120.8	5% uplift on labor base hours (LEGACY default)
Punch-list / rework allowance	2415.3	h	0.05	120.8	5% of base labor for as-installed deviations and…
As-built documentation (red-line + point DB expo…	2415.3	h	0.04	96.6	4% of base labor for as-built drawings, red-line…

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 2.3-3.4--bms-controller-panel.md

Instance: BMS Controller Panel — Kingsford Hotel Bacolod

WBS leaves served: 2.3, 3.4 **Module ref:** `_playbook/modules/bms/controller-panel.md`

Project-specific parameters

- 8 BMS field panels (per A4 helper) covering 14 logical zones (A-024)
- 19 Siemens Desigo PXC controllers
- Per-panel UPS 500 VA online (A-026)
- Panel feed 240V 1ph 20A NEMA-1 (A-027)
- IO modules per A4 (8-ch AI / 4-ch AO / 16-ch DI / 8-ch DO)

BOQ line items

Per A4 + BOQ generator under 2.3 / 3.4.

Cross-references

A4; A-002, A-024, A-026, A-027; Q-011 (PPCAS-14 markup).

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

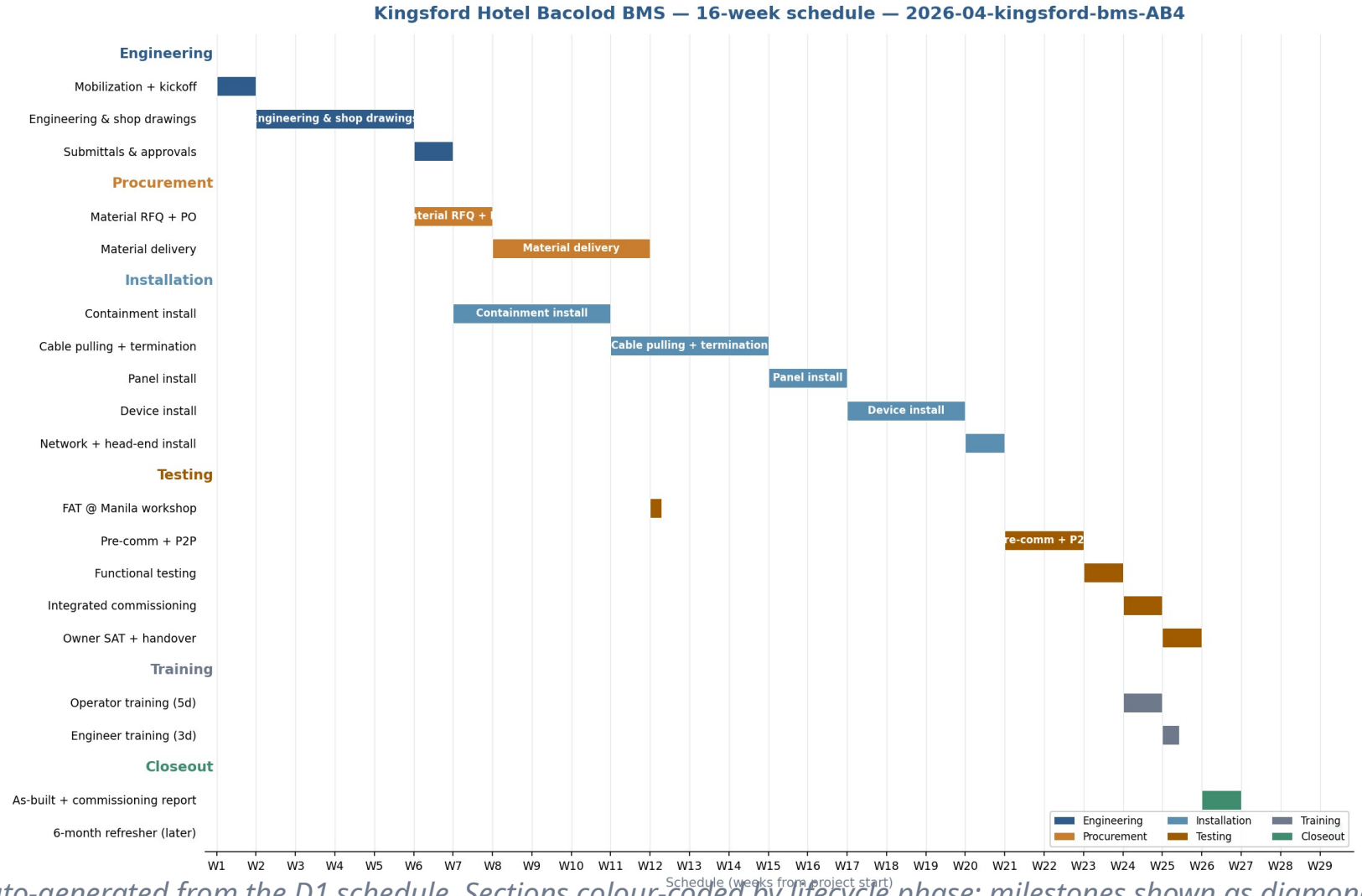
Project: Kingsford Hotel Bacolod — BMS **Date:** 2026-04-28 **Basis:** A-003 (16 weeks total). Pending Q-004 customer confirmation.

```
gantt
    title Kingsford Hotel Bacolod BMS — 16-week schedule
    dateFormat  YYYY-MM-DD
    axisFormat  W%V
    section Engineering
    Mobilization + kickoff      :m1, 2026-06-01, 1w
    Engineering & shop drawings :e1, after m1, 4w
    Submittals & approvals      :s1, after e1, 1w
    section Procurement
    Material RFQ + PO           :p1, after e1, 2w
    Material delivery           :p2, after p1, 4w
    section Installation
    Containment install         :i1, after s1, 4w
    Cable pulling + termination :i2, after i1, 4w
    Panel install               :i3, after i2, 2w
    Device install              :i4, after i3, 3w
    Network + head-end install  :i5, after i4, 1w
    section Testing
    FAT @ Manila workshop       :f1, after p2, 2d
    Pre-comm + P2P              :t1, after i5, 2w
    Functional testing          :t2, after t1, 1w
    Integrated commissioning    :t3, after t2, 1w
    Owner SAT + handover        :h1, after t3, 1w
    section Training
    Operator training (5d)      :tr1, after t2, 1w
    Engineer training (3d)      :tr2, after tr1, 3d
    section Closeout
    As-built + commissioning report :ab1, after h1, 1w
    6-month refresher (later)   :rf1, 2026-12-15, 3d
```

Phase	Weeks	Key deliverables

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 **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 15,236,740**
- Overhead & margin (18%): PHP 2,742,613
- Cost + overhead: PHP 17,979,353
- Contingency (8.0%): PHP 1,438,348
- Cost + contingency: PHP 19,417,701
- VAT (12%): PHP 2,330,124
- **Grand total: PHP 21,747,826**
- *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	11.1%
2.0	PHP 10,829,700	71.1%
3.0	PHP 1,654,530	10.9%
4.0	PHP 486,000	3.2%
5.0	PHP 487,310	3.2%
6.0	PHP 91,200	0.6%
Base total	**PHP 15,236,740**	**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

Building Management System: Supply, Delivery, Installation, Testing and Commissioning

Prepared for: Megaworld Corporation **Project:** Kingsford Hotel Bacolod, Manhattan Street corner Bates, Mandalagan, Bacolod City, Negros Occidental **Date:** 2026-04-28 **Reference:** TUEC-issued BMS Points list (Construction Bulletin Oct 2025); MAAP-issued EE Plan (Construction Bulletin No. 8, 2025-11-05)

1. Executive summary

This proposal covers the complete supply, delivery, installation, testing, and commissioning of a Building Management System for Kingsford Hotel Bacolod. The scope serves the hotel's mechanical plant (3 chillers, 3 cooling towers, 6 calorifiers, 2 steam boilers), Casino MVAC at 2nd Level (DOAS, 2 AHUs with CO sensors, 2 ionizers), 7 Roofdeck PAHUs, hot-water plant for both Lower Ground and Roof Deck zones, and ~68 ventilation fans across the building. The BMS aggregates roughly 753 monitoring and control points, integrates 11 Modbus power meters at the major load centers, and provides a redundant Siemens Desigo CC server platform at the Lower Ground IT room with operator workstations, a graphics display, and a 30-minute UPS.

Total estimated price: **PHP 21.7M** (per BOQ at 06-boq.yaml; final figure subject to RFQ stage and customer clarifications). Schedule: **16 weeks** from contract execution to handover, plus a 6-month refresher visit.

2. Project understanding

The customer brief is to provide complete BMS supply through commissioning for Kingsford Hotel Bacolod. The drawings provided are TUEC-issued BMS Points list (project-stamped Construction Bulletin, October 2025) and a partial MAAP electrical bundle (Construction Bulletin No. 8, November 2025) covering revised power layouts on Basement 1, Ground, 2nd, and 3rd floors plus Load Schedules and Power Riser. The auxiliary set ECE-01..15 covers FDAS and aux-system layouts on every floor.

Although the cover letter uses the word "Rehabilitation," the supporting drawings are Construction Bulletins for new construction and no existing-system inventory is in the package. We have classified the project as **greenfield new construction** and are confirming this with the customer (RFI Q-001).

The project is hospitality with a casino MVAC zone at 2nd Level, including a dedicated casino DOAS, two casino AHUs with return-air CO2 monitoring, and two casino-floor ionizers. Casino-floor return-air CO sensors are scoped as 1 per casino-serving AHU/DOAS pending regulator-driven count confirmation (Q-008).

3. Scope

The 14-leaf work breakdown is:

1. Project Management & Engineering (PM, design engineering, submittals, FAT)
2. Material Supply (head-end, network, panels, HVAC field devices, plumbing field devices, power meters, cabling)
3. Installation (mobilization, containment, cable pulling + termination, panel install, device install, network install, head-end install)
4. Programming & Configuration (controller programming, graphics, reports, integration)

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

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 — Building Management System, Kingsford Hotel Bacolod

This proposal covers the supply, installation, testing, and commissioning of the BMS for the Kingsford Hotel Bacolod project. It is based on the documents you provided:

- **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 project-specific points list governs the scope. The MC Standards serve as the baseline where the project-specific specification is silent. Where the documents are silent or ambiguous, we made the assumptions catalogued in **Section 11 (Stated Assumptions)** with their cost impact. Review those before contract execution.

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

753
BMS I/O points enumerated

132
Equipment instances cataloged

8
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.