HTM02-01 Design Consulting
Specialist in HTM02-01 Design.
+66(0)63 082 9692
kevin@htm02-01designconsult.com
https://htm02-01designconsult.com/

Transitioning from Legacy Design to the Informed Design Process (IDP)

1. Executive Summary

For nearly two decades, Medical Gas Pipeline System (MGPS) design in Scotland followed the prescriptive formulas of the 2006 HTM 02-01. However, environmental mandates and post-pandemic safety reviews have proven these formulas often lead to over-engineered, carbon-heavy systems that may still fail to meet specific high-flow clinical needs. The **Informed Design Process (IDP)** replaces static tables with a dynamic, multidisciplinary approach to engineering.

2. Comparison of Methodologies

The Legacy Approach (HTM 02-01: 2006)

- **Basis:** "Ready Reckoner" tables.
- **Logic:** Designers looked up a department type (e.g., General Ward), counted the beds, and applied a fixed diversity factor.
- **Result:** A "one-size-fits-all" system. This frequently resulted in oversized plant and pipework that exceeded actual clinical demand by up to 400%, leading to high capital costs and excessive energy consumption.

The Informed Design Process (SHTM 02-01: 2025)

- **Basis:** The Master Control Sheet (MCS).
- **Logic:** Design is driven by a **Clinical Briefing**. Engineers and clinicians collaborate to define the specific equipment (e.g., high-flow oxygen devices) and the intended patient acuity for every "Delivery Unit."
- **Result:** A "right-sized" system that prioritizes sustainability (Net-Zero) while ensuring the pipeline can handle specific "peak" events like pandemics.

3. Key Technical Differences

Feature	Legacy Design (2006)	Informed Design Process (2025)
Diversity Factors	Fixed percentages (e.g., 10% for wards).	Calculated based on simultaneous use assumptions.
Oxygen Flow	10 L/min standard per terminal unit.	Variable; accounts for HFNC/CPAP (60-120 L/min).
Source Sizing	Sized for peak diversified flow.	Sized for **Average Continuous Demand**.
Pipe Sizing	Based on legacy flow tables.	Based on **Design Flow Rate** (Peak/Escalation).
Sustainability	Not factored into flow logic.	Designed to minimize embodied and operational carbon.

4. The Master Control Sheet (MCS): The New Standard

The IDP centers on the **Master Control Sheet (MCS)**. This document replaces the informal "design notes" of the past and serves as a legal audit trail.

1. **Stage 1:** Records the Clinical Briefing and equipment flow requirements.

2. **Stage 2:** Documents the engineering assumptions for diversity and simultaneous use.
3. **Stage 3:** Outputs the final Design Flow Rates for each gas type.
4. **Stage 4:** Requires formal sign-off by the Medical Gas Safety Group (MGSG).

5. Clinical Safety & Resilience

A primary driver for the IDP was the **HSIB investigation** into oxygen supply failures. The legacy approach failed to account for the sudden shift to high-flow respiratory support during the COVID-19 pandemic.

- **High-Flow Respiratory (HFR):** The IDP requires designers to "stress test" the system by simulating a percentage of beds using high-flow devices simultaneously.
- **Hypoxia Risk:** The IDP significantly restricts the use of medical air to prevent "never-event" mix-ups, a clinical risk not fully addressed in the 2006 guidance.

6. Conclusion

The shift to IDP represents a move from **Standardization** to **Customization**. For Authorized Persons (APs) and Designers, this requires a higher level of clinical engagement and a move away from "calculating by rote." The SHTM 02-01 IDP ensures that Scottish healthcare facilities are safe for patients, resilient against future pandemics, and aligned with the national goal of Net-Zero carbon emissions.