IRON CORE
FABRICATORS

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## EXCELLENCE IN STRUCTURAL ENGINEERING

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PRECISION, STRENGTH, RELIABILITY
ERBIL, GAZNA ROAD

# Iron Core Fabricators: The Pinnacle of Fabrication

## ENGINEERING EXCELLENCE AND PRECISION MANUFACTURING FOR THE OIL & GAS SECTOR

Iron Core Fabricators stands as the premier industrial fabrication specialist located in Erbil, Iraq, dedicated to providing unparalleled engineering excellence to the global oil and gas sector. Our mission is to transform complex technical designs into durable, high-precision steel structures and piping systems that form the backbone of critical energy infrastructure. By integrating advanced technology with veteran craftsmanship, we ensure every project meets the rigorous demands of international performance and safety standards, establishing a legacy of reliability and engineering integrity that empowers our clients to operate with absolute confidence in the most demanding industrial environments.

# STRATEGIC PROJECT PHASES

## The Lifecycle of High-Performance Fabrication

### 01 MATERIAL PREPARATION

The foundation of quality begins with rigorous receiving inspections, utilizing Positive Material Identification (PMI) and hardness testing to verify metallurgical properties against mill test certificates before any cutting or processing begins in the shop.

### 02 FIT-UP & SPOOL ASSEMBLY

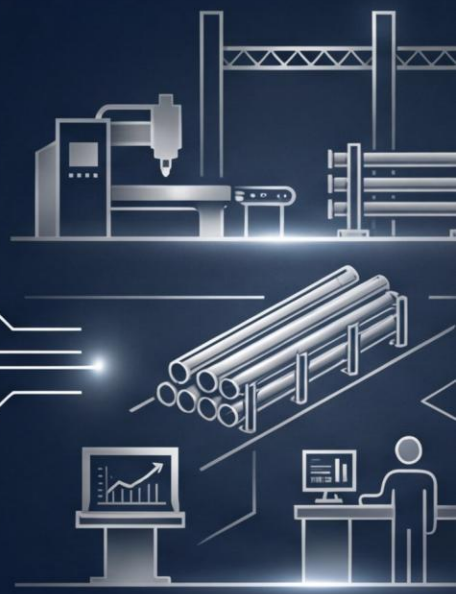
Transitioning from raw material to structural form requires skilled fitters who utilize advanced jigs, fixtures, and alignment tools to ensure pipe spools match isometric drawings with sub-millimeter accuracy for joint gaps and elevations.

### 03 NON-DESTRUCTIVE TESTING

Verification of weld integrity is achieved through a comprehensive suite of NDT methods, including Ultrasonic and Radiographic testing, ensuring full compliance with stringent industry codes such as API 650/653 and ASME B31.3 standards.

### 04 QC HANDOVER & INTEGRATION

The final phase involves the consolidation of all technical data into a complete traceability package, including weld maps, material certifications, and hydrotest records, facilitating a frictionless transition from our facility to the project site.



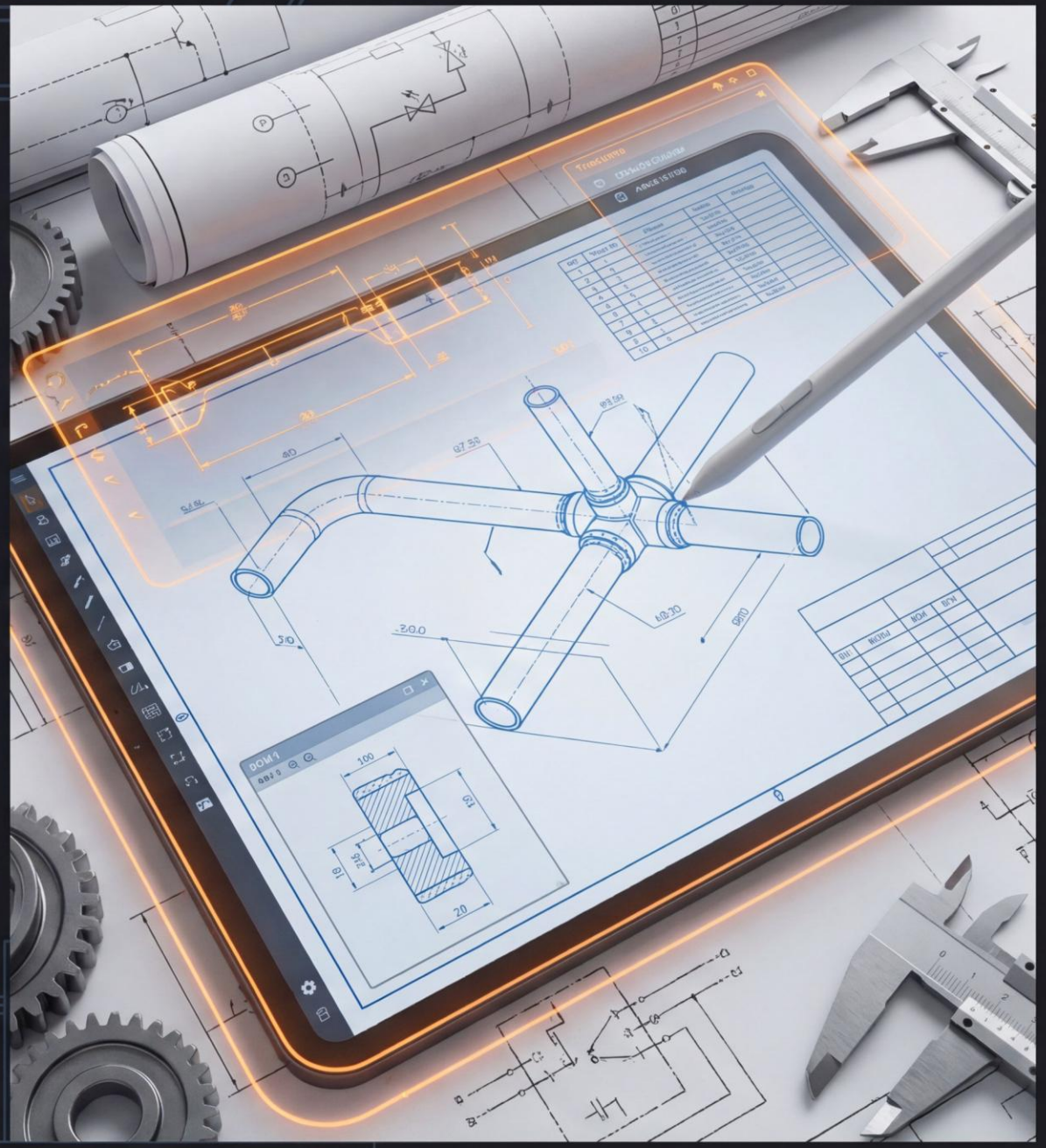
# Drawing Review & Spool Planning

## The Architectural Foundation of Mechanical Accuracy

The fabrication journey at Iron Core Fabricators begins with an exhaustive review of client-provided piping isometric drawings. Our engineering team meticulously identifies every spool, dimension, and weld location to ensure absolute alignment with design specifications such as pipe schedules, elbow radii, and branch orientations.

This phase is critical for generating a precise Bill of Materials (BOM) and identifying necessary fittings early in the process.

By planning the spool sequences with surgical precision before a single piece of steel is cut, we eliminate field errors, optimize material usage, and establish a clear roadmap for the entire production team to follow.



# Material Preparation & Cutting

## Metallurgical Integrity and Dimensional Accuracy

### Receiving Inspection (PMI/Hardness)

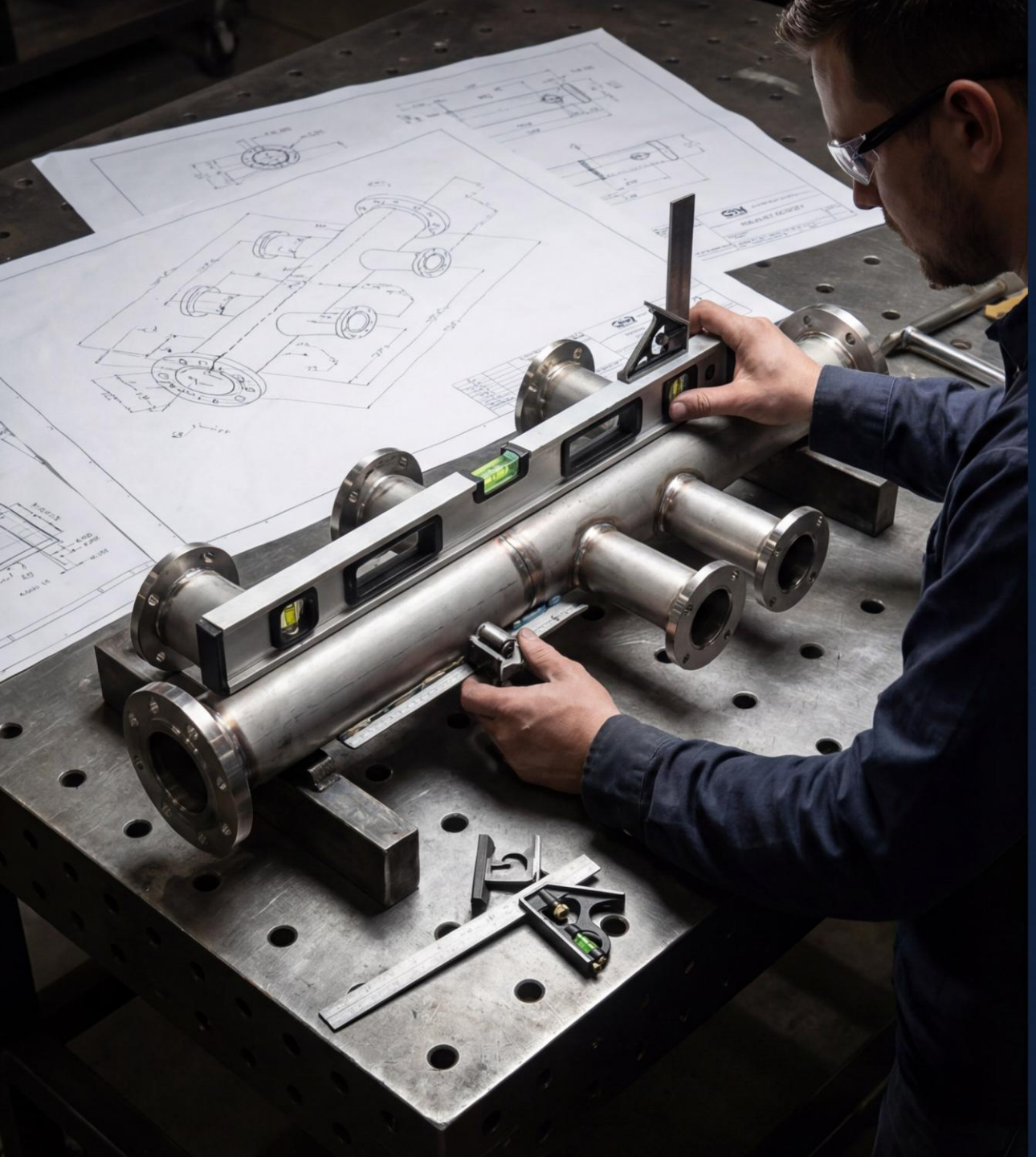
- Every component entering our facility undergoes rigorous validation. We employ Positive Material Identification (PMI) to confirm chemical compositions and hardness testing to ensure the material meets the mechanical specifications required for high-stress industrial applications, eliminating the risk of material substitution.

### Advanced Cutting Technologies

- Our facility utilizes a diverse range of cutting methods, including high-definition plasma for intricate shapes, oxy-fuel for heavy-duty plate thickness, and precision saws for profile accuracy. This versatility ensures clean edges and heat-affected zones that are optimized for subsequent welding processes.

### Isometric Cut List Management

- Before the first cut is made, digital isometric drawings are translated into detailed cut lists. This systemic approach minimizes material waste and ensures that every pipe section, elbow, and flange is dimensionally synchronized with the final design requirements and site routing.



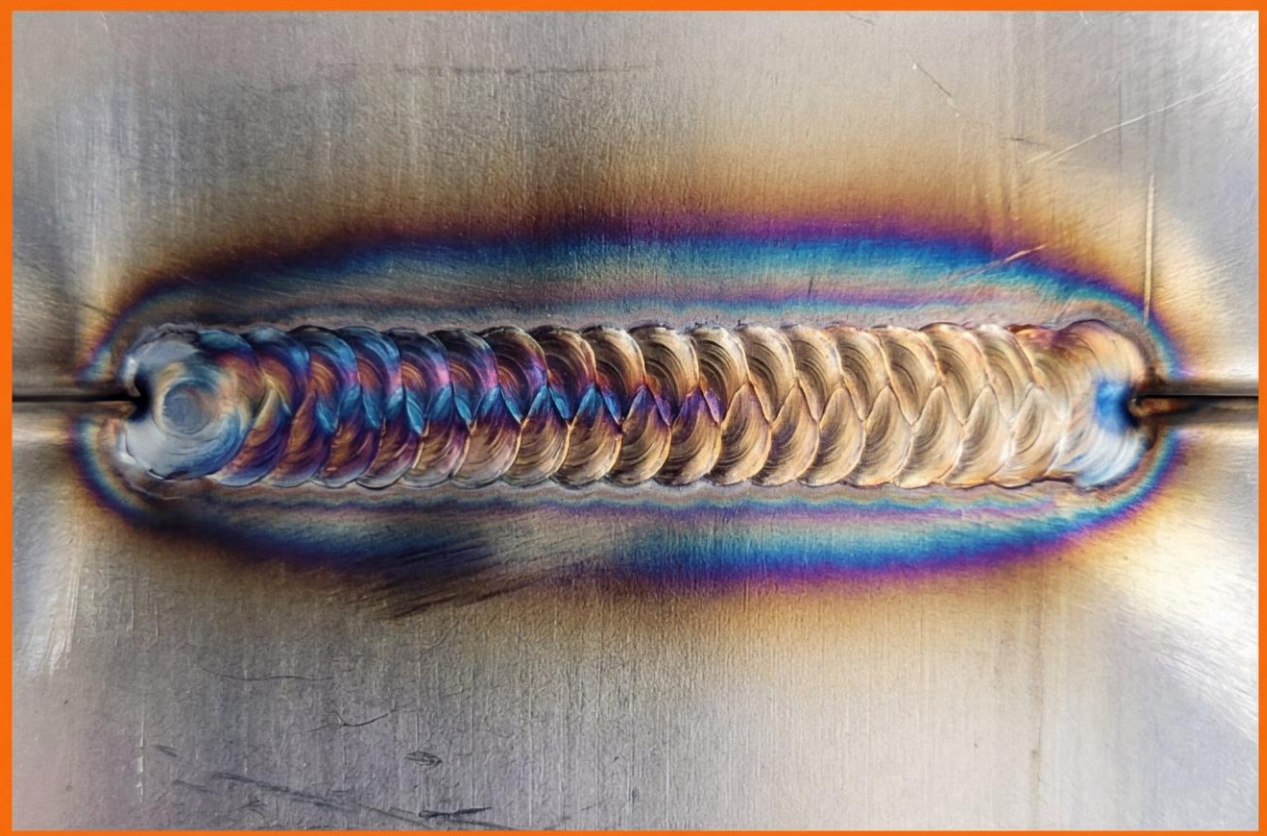
# Fit-Up & Spool Assembly

## Craftsmanship Meeting Engineering Specification

- **Precision Jig & Fixture Alignment:** To maintain exact geometric tolerances, our fitters utilize specialized jigs and alignment tools. This ensures that every spool remains perfectly aligned during the tack welding process, preventing thermal distortion and ensuring that final assemblies match the intended design elevations and coordinates.
- **Technical Tack Welding Protocols:** Tack welding is performed by qualified personnel to temporarily secure joints before final welding. These tacks are executed with the same precision as the root pass, maintaining critical joint gaps and root openings that are essential for full-penetration weld integrity.
- **Isometric Drawing Compliance:** Our assembly process is governed by a “live” interaction with isometric drawings. Fitters verify every orientation, rotation, and nozzle location against the IFC (Issued for Construction) drawings, ensuring that the fabricated spool will integrate perfectly with existing site infrastructure without modification.

# Welding Execution

## ASME Section IX Certified Welding Excellence



### Qualified Procedures

- All welding activities are performed under strictly qualified Welding Procedure Specifications (WPS) supported by Procedure Qualification Records (PQR) that meet the exacting requirements of ASME Section IX for high-pressure systems.

### Advanced Processes

- We utilize a variety of specialized welding processes, including SMAW (Shielded Metal Arc Welding) and GTAW (Gas Tungsten Arc Welding), to achieve superior joint penetration, structural strength, and aesthetic weld quality.

### Thermal Management

- Our technicians implement precise pre-heat and inter-pass temperature controls, along with Post-Weld Heat Treatment (PWHT) when required, to manage the metallurgical properties of the steel and prevent structural stresses or cracking.

### Traceable Joint ID

- Every single weld joint is assigned a sequential number and mapped directly to the piping isometric. This meticulous tracking ensures that every inch of welding is accountable for inspection and long-term maintenance records.

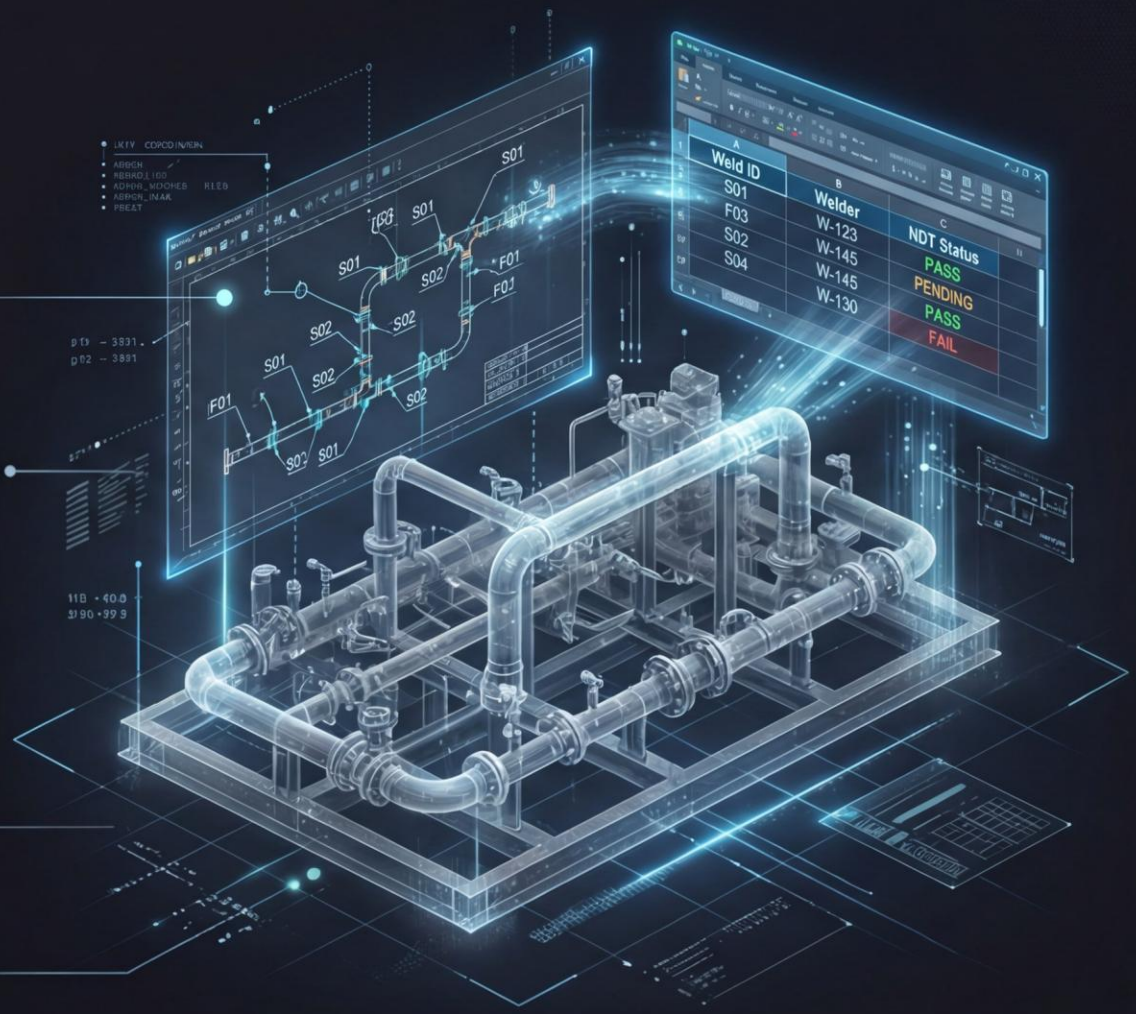
# Weld Mapping & Traceability

## Ensuring Absolute Accountability Through Data Integrity

Traceability is the cornerstone of our quality assurance philosophy at Iron Core. We generate detailed weld maps for every spool isometric, assigning unique identification numbers (such as S01 for shop welds) to every joint.

This systematic approach allows us to track the difference between shop-fabricated and field welds while linking each joint directly to specific welder IDs, material batches,

and NDT results. By maintaining this rigorous digital and physical paper trail, we provide our clients with a “digital twin” of their assets, ensuring that every component is fully compliant with safety regulations and ready for long-term operational integrity and maintenance tracking.



# Non-Destructive Testing (NDT)

## Comprehensive Weld Validation and Code Compliance

### Multi-Modal Inspection Methods

- We employ a comprehensive suite of NDT techniques, including Ultrasonic (UT) and Radiographic (RT) testing for internal volumetric flaws, alongside Magnetic Particle (MPI) and Dye Penetrant (DPI) inspections for surface defects, providing 360-degree assurance of every structural and pressure-retaining weld.

### API and ASME Code Adherence

- All inspections are performed to international standards, specifically API 650/653 for storage tanks and ASME B31.3 for process piping.
- Our Level II and III technicians ensure that every weld meets the stringent acceptance criteria mandated by these critical safety and performance codes.

### Integrated Weld Mapping

- Every inspection result is digitally linked to a unique weld number on our master weld maps. This creates a transparent and searchable history for every joint, allowing for immediate verification of pass/fail status and ensuring that no weld is overlooked during the final handover process.

# FABRICATION COMPLETION

## From Individual Spools to Integrated Industrial Systems

The final stage of fabrication involves the assembly of complex skids, pipe racks, and vessels into their complete configurations. This phase includes meticulous post-weld grinding, precision machining, and dimensional checks to ensure the final product matches the project's spatial constraints. Crucially, we perform rigorous hydro-testing and pressure testing to validate the leak-proof integrity of every system under maximum operational loads.

Once structural and mechanical integrity is confirmed, we apply high-performance industrial coatings according to client specifications, protecting the asset from corrosion and environmental degradation, ensuring it is ready for immediate deployment and long-term service.