Accredited Africa Training Institute for Capacity Development
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COURSE BROCHURE

Structural Steelwork Detail Drawings For Process Plant Fabrication Training

Physical Planning and Construction / Civil Engineering Construction

Unit Standard 114196 · NQF Level 5 · 24 Credits · 21 Days

COURSE OVERVIEW

This course equips learners with the skills to interpret and produce structural steelwork detail drawings specifically for process plant fabrication. It covers the principles of steelwork detailing, including connections, bracing, and erection procedures, ensuring drawings are accurate and compliant with industry standards. The course aims to enhance productivity and safety in fabrication and construction environments.

Category	Physical Planning and Construction
Subfield	Civil Engineering Construction
Unit Standard	114196
Accreditation	SAQA Accredited · NQF Level 5 · 24 Credits
Duration	21 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Interpret structural steelwork drawings and specifications for process plant fabrication.
- Apply detailing principles to produce accurate fabrication and erection drawings.
- Analyze connection details and select appropriate standard connections.
- Evaluate drawings for compliance with relevant standards and codes.
- Demonstrate proficiency in using CAD software for steelwork detailing.
- Design detailed drawings that incorporate bracing, splices, and base plates.

WHO SHOULD ATTEND

- This course is intended for detailers, draftsmen, and engineering technicians involved in structural steelwork for process plants, as well as supervisors and project managers seeking to improve their understanding of steel detailing.

COURSE OUTLINE

Day 1: Introduction to Structural Steelwork in Process Plants

- Overview of process plants: refineries, petrochemical, mining
- Structural steelwork components: columns, beams, bracing, gussets
- Basic terminology: flanges, webs, stiffeners, splices
- Introduction to relevant standards: SANS, ISO, and SAQA
- Safety considerations in steelwork fabrication
- Quality assurance principles

Day 2: Reading and Interpreting Engineering Drawings

- Types of drawings: general arrangement, detail, erection
- Orthographic projection principles
- Sectional views and cutting planes
- Dimensioning standards and tolerances
- Welding symbols per SANS 10163
- Practical example: reading a simple column detail

Day 3: Steel Sections and Material Specifications

- Steel sections: I-beams, H-beams, channels, angles, hollow sections
- Material grades: S355, S275, and equivalents
- Corrosion-resistant materials for process environments
- Material test certificates and traceability
- Selection based on load, environment, and cost

Day 4: Connection Design Principles

- Bolted connections: bolts, nuts, washers, preloading
- Welded connections: fillet, butt, plug welds
- Connection types: shear, moment, bracing
- Load transfer mechanisms
- Introduction to connection design calculations

Day 5: Welding Symbols and Weld Details

- Welding symbol components: arrow, reference line, tail
- Weld types: fillet, groove, plug, slot
- Weld size and length notation
- Weld preparation: bevel angles, root gaps
- Inspection requirements: NDT methods

Day 6: Bolted Connection Detailing

- Bolt grades: 8.8, 10.9
- Tightening methods: torque, tension control
- Bolt layout: pitch, gauge, edge distance
- Connection plates: fin plates, end plates, cleats
- Detailing for shear and moment connections

Day 7: Welded Connection Detailing

- Fillet weld sizing and throat thickness
- Butt weld preparation and reinforcement

- Weld access holes for beams
- Stiffeners and doublers
- Detailing for moment-resisting connections

Day 8: Bracing Systems and Detailing

- Bracing types: cross, K-brace, V-brace, eccentric
- Bracing member selection
- Gusset plate design and detailing
- Buckling considerations
- Detailing for seismic and wind loads

Day 9: Structural Steelwork for Process Equipment Support

- Types of supports: saddles, skirts, brackets
- Load combinations: dead, live, wind, seismic
- Thermal expansion and anchor points
- Vibration control and stiffening
- Detailing for pipe racks and platforms

Day 10: Stairs, Platforms, and Handrails

- Stair geometry: rise, going, pitch
- Platform framing and loading
- Handrail and toeboard requirements
- Grating types and fixing
- Detailing for access and egress

Day 11: Detailing for Corrosion Protection

- Corrosion types: uniform, pitting, galvanic
- Protective coatings: paint systems, metalizing
- Hot-dip galvanizing: design considerations
- Drain holes and vent holes
- Crevice corrosion prevention details

Day 12: Erection and Lifting Details

- Erection sequence planning
- Lifting lugs: design and detailing
- Padeyes and shackle connections
- Temporary bracing requirements
- Erection drawings: marking plans, piece marks

Day 13: Quality Control and Inspection of Steelwork

- QC plan and hold points
- Dimensional inspection
- Weld inspection: visual, MPI, UT, RT
- Coating inspection: thickness, adhesion
- Non-conformance reports and corrective actions

Day 14: Detailing for Fatigue and Dynamic Loading

- Fatigue loading in process plants: vibrations, cranes
- S-N curves and fatigue categories
- Stress concentration factors

- Weld profile improvement
- Detailing for crane runway girders

Day 15: Introduction to 3D Modeling for Steel Detailing

- Overview of 3D modeling software
- Creating columns, beams, and bracing in 3D
- Adding connections and plates
- Clash detection and coordination
- Generating fabrication drawings from models

Day 16: Advanced Detailing Techniques

- Complex intersection detailing
- Parametric modeling techniques
- Material optimization and nesting
- Detailing for curved and tapered members
- Advanced drawing annotation

Day 17: Project Documentation and Bill of Materials

- BOM structure and format
- MTO from drawings
- Revision control and transmittals
- Drawing numbering and registers
- Integration with procurement

Day 18: Industry Standards and Codes

- SANS 10162: limit states design
- SANS 10163: welding
- AISC 360 and EC3 comparisons
- Code compliance checklists
- Detailing for fire resistance

Day 19: Case Studies and Problem Solving

- Case study 1: pipe rack detailing
- Case study 2: vessel support structure
- Case study 3: modifying existing structure
- Group problem-solving sessions
- Presentation and peer review

Day 20: Final Project and Assessment

- Final project: detail a process plant steel structure
- Produce GA, detail, and erection drawings
- Bill of materials and QC plan
- Presentation to assessors
- Course evaluation and certification

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **24 NQF credits** at **NQF Level 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 67,200.00	**R 67,200.00**
1	In-House	R 87,400.00	**R 87,400.00**
1	On-Campus (Pretoria)	R 100,800.00	**R 100,800.00**

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	31 Aug 2026	On-Campus	Johannesburg, South Africa
04 Aug 2026	01 Sep 2026	On-Campus	Mauritius
05 Aug 2026	02 Sep 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	03 Sep 2026	On-Campus	Dubai, UAE
07 Aug 2026	04 Sep 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	04 Sep 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	07 Sep 2026	On-Campus	Durban, South Africa
10 Aug 2026	07 Sep 2026	On-Campus	Mauritius

Contact us if no suitable date is listed — on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit **www.aaticd.co.za**, open the page for this course (Unit Standard 114196) and click **Get A Quote / Apply**. Select your training method and number of delegates — your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to **apply@aaticd.co.za** — our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically — the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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