

Drawn Arc Shear Stud Welding JHA

Worked instructional example

Work and worksite

A specialist welding crew will install specified headed shear connectors on a composite building floor using a selected drawn-arc stud-welding system. Metal decking is already installed and released as the walking platform; conventional fall protection and hot-work controls are maintained. The approved connection detail and stud-welding procedure govern the actual equipment setup and weld acceptance. This fictional learning example describes planned controls; it records no actual inspection or work authorization.

- Shear connectors are laid out and installed after the metal-deck work platform is installed; this operation is not performed from a controlled decking zone.
- The actual stud, ferrule, gun, power source, base/deck configuration, coating condition and welding/inspection procedure are identified for the project.
- This is partial structural field-welding coverage. Generic structural connection welds, deck-panel welding, undecked beam walking, confined-space work and unassessed coatings are excluded.

Questions before work

- What evidence releases the metal deck, openings and fall-protection arrangement as the stud-welding work platform?
- Which approved stud-welding procedure and inspection criteria apply to the actual stud/deck/base configuration?
- How will sparks, heat and fume exposures be controlled on this level and below the weld location?

Task Hazard Control

1 Release the platform and connector detail

Hazard: Installing projecting studs too early creates trip/fall hazards and can violate the required deck-first sequence.

Control: Welding lead confirms the installed deck's accepted work-platform condition, protected openings and conventional fall protection. Review the current connector layout and procedure; do not begin on undecked beam tops or within a controlled decking zone.

Verification: Lead checks platform readiness and the connector documents before layout starts.

Reasoning: Shear-connector installation has a specific work-platform prerequisite.

2 Establish the hotwork and exposure boundary

Hazard: Stud arcs and hot metal can ignite material below or expose nearby people to radiation and fumes.

Control: Complete the actual hot-work review for both sides of the deck and adjacent areas. Remove or protect combustibles, provide the required fire watch and extinguisher readiness, screen others from arc radiation and establish suitable fume controls for the identified material/configuration.

Verification: Hot-work lead and assigned fire watch check both-level protection and response arrangements.

Reasoning: A clear upper surface does not show the concealed ignition or exposure hazards below.

3 Verify the studwelding system

Hazard: An incompatible gun/ferrule or defective electrical circuit can injure workers and produce inadequate welds.

Control: Qualified operator checks the actual power source, gun, cable/return connections, chuck and ferrule selection against the approved procedure and manufacturer instructions. Keep equipment suitable for the conditions and leads clear of routes; isolate before permitted setup changes and remove defective equipment from service.

Verification: Operator records the equipment match and pre-use findings; lead resolves discrepancies.

Reasoning: Drawn-arc setup is specific to the connector and configuration, not a universal setting.

Complete the work and hand over

4 Establish the required initial acceptance

Hazard: An unverified first setup can repeat defective welds throughout a floor.

Control: Carry out the procedure's required preproduction or initial verification with the designated competent inspection roles. Record actual results against the specified criteria and hold production when requirements are unmet. Apply authorized corrective decisions; do not invent a test count, bend angle or acceptance value.

Verification: Designated reviewer confirms actual initial results before releasing continued production.

Reasoning: The verification must demonstrate this setup's performance before it is repeated.

5 Weld the released connector layout

Hazard: Hot ferrules, arc exposure and protruding studs can injure workers as the pattern advances.

Control: Operator welds the specified studs using the released procedure, protected stance and matched equipment. Maintain fire/fume controls and check the required ongoing weld conditions. Control access through completed stud areas and collect cooled ferrule debris with suitable protection; pause for unstable footing or abnormal equipment/weld behavior.

Verification: Welding lead checks production observations and the changing trip/access boundary.

Reasoning: A growing stud pattern changes the walking surface during the operation.

6 Inspect close hot work and hand over

Hazard: Unrecorded rejected welds or early closeout can leave structural defects and a later fire or trip hazard.

Control: Complete the specified inspection and correction records and identify open weld actions. Shut down the equipment safely, maintain the fire watch for the actual required period and clear cooled debris. Hand over connector acceptance and protected routes without removing unrelated frame restraint.

Verification: Responsible reviewer records weld disposition; hot-work lead confirms actual closeout conditions.

Reasoning: A completed stud count is not evidence of accepted welds or a cleared fire hazard.

Pause and reassess

- The deck platform, opening protection or conventional fall-protection arrangement is no longer released for the work.
- Stud, ferrule, base/deck condition or welding setup differs from the approved procedure, or required acceptance results fail.
- Fire watch, electrical condition, fume protection or safe access around projecting studs cannot be maintained.

Improve the controls

Needs improvement: Use the same settings as the last job.

More useful: Qualified operator matches the stud, ferrule and actual deck/base configuration to the approved procedure, then records the required initial verification.

Needs improvement: The studs are all in; the job is done.

More useful: Responsible reviewer records weld acceptance and open corrections; hot-work lead confirms fire-watch closeout and the crew hands over safe routes through the stud pattern.

Decisions that change the analysis

Does ordinary structural field welding or metal-deck installation already cover this operation?

No. The deck example expressly excludes shear studs, and the structural weld example joins ordinary frame connections. This resource teaches the specialized drawn-arc composite-connector workflow, deck-first prerequisite and procedure-specific initial and ongoing acceptance.

What must the crew record for actual use?

Record the platform and access release, connector layout/procedure revisions, stud/ferrule and equipment identities, material/coating findings, operator/inspection roles, hot-work and fume arrangements, actual initial and production inspection results, weld corrections and closeout findings.

Training needs

- Procedure- and equipment-specific drawn-arc stud-welding instruction and the required operator/inspection qualifications, including setup verification and response to a rejected weld.
- Training in electrical equipment checks, arc protection, fire-watch duties and safe access around newly installed projecting studs.

Confirm applicable qualifications and actual training evidence for the people assigned. Related toolbox talks support discussion; they do not establish competence.

References and adaptation

OSHA 1926.754(c) Shear connectors and walking surfaces
<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.754>

STANLEY Engineered Fastening Nelson Stud Welding Systems
<https://www.stanleyengineeredfastening.com/america/en/brands/nelson>

OSHA 1926.351 Arc welding equipment and electrical protection
<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.351>

OSHA 1926.352 Welding fire prevention
<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.352>

OSHA 1926.353 Welding ventilation and protection
<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.353>

References reviewed October 9, 2026. Use actual equipment and product instructions, project design and site requirements. This original draft supplies no fabricated inspection, signature or approval.