	RISK ASSESSMENT FOR PILING WORKS (INJECTION METHOD)
Purpose of risk assessment:	PILING WORKS (INJECTION METHOD))
Name of plant selected:	
Risk assessment written by & date:	
Signed:	
Review date:	
Document registration No:	

ID	Activity / Hazard	At Risk	Potential Harm	Initial Risk (L x S)	Control Measures (Hierarchy of Controls)	Residual Risk (L x S)	Reference Standard
1	**Survey setting out** – Working near open edges, traffic, underground services	Surveyor, assistants	Falls, collision, electric shock, gas explosion	3 x 4 = 12 (High)	• Obtain utility maps and use cable avoidance tool (CAT) before pegging. • Set up exclusion zones if near traffic. • Wear high-visibility clothing, safety boots, helmet. • No surveying alone – buddy system.	2 x 4 = 8 (Medium)	ISO 21815-1:2021 ; BS 6164:2019 cl. 12
2	**Delivery and unloading of piles** – Crushing, falling loads, manual handling	Operators, banksman, labourers	Crush injuries, fractures, back strain	4 x 4 = 16 (High)	• Use mobile crane with valid certificate and competent operator. • Exclude non-essential personnel from lifting zone. • Stack piles on level ground with timber dunnage and chocks. • Mechanical lifting only – no manual handling of heavy piles.	2 x 4 = 8 (Medium)	ISO 12480-1:1997 ; LOLER 1998 (or local equivalent)
3	**Pile machine positioning & setup** – Overturning, contact with overhead power lines	Machine operator, ground crew	Crushing, electrocution	4 x 5 = 20 (Extreme)	• Check ground bearing capacity before moving machine. • Maintain minimum clearance from overhead lines (see local regulations, e.g., 6m for <33kV).	2 x 4 = 8 (Medium)	BS EN 16228-1:2014 ; HSE GS6 (UK) / local

					• Use banksman during manoeuvring. • Install physical barriers or spotters.		electrical safety code
4	**Pile jacking (injection)** – Hydraulic system failure, burst hose, pinch points	Operator, nearby workers	High-pressure injection injury, amputation, bruising	3 x 4 = 12 (High)	• Daily pre-use inspection of hoses, fittings, and pressure gauge. • No hands near chamber door during jacking. • Use remote control or shielded operator cabin. • Lockout/tagout during maintenance.	2 x 3 = 6 (Medium)	ISO 4413:2010 (Hydraulic fluid power); BS EN 982:1996
5	**Pile jointing (mild steel sleeve)** – Manual handling, welding hazards, heavy lifting	Fitters, welders	Crushed fingers, burns, fumes, arc eye	3 x 3 = 9 (Medium)	• Use mechanical lifting aid for sleeves and extension piles. • Welder to wear full PPE: welding shield, leather gloves, apron, respirator if confined. • Fire watch with extinguisher nearby. • Adequate ventilation.	2 x 3 = 6 (Medium)	ISO 15011-1:2009 (Welding fumes); ISO 11611:2015 (Protective clothing for welding)
6	**Pile cutting** – Use of abrasive wheel or hydraulic cutter, flying debris, noise, dust	Cutter operator, nearby workers	Eye injury, cuts, hearing loss, silicosis	3 x 4 = 12 (High)	• Use pile cutter machine with guard and dust extraction. • Operator to wear face shield, ear defenders (≥85 dB), respirator (N95 or higher). • Establish exclusion zone of 5m. • Wet cutting if possible to suppress dust.	2 x 3 = 6 (Medium)	ISO 16063 (Vibration); BS EN 12418:2000 (Masonry saws)
7	**Working near excavated areas / open holes** – Slips, trips, falls into pile hole	All site personnel	Sprains, fractures, drowning (if water-filled)	3 x 4 = 12 (High)	• Cover or guard all pile holes when not actively jacking. • Use warning tape and barriers. • Backfill temporary holes at end of shift. • Provide safe walkways.	2 x 3 = 6 (Medium)	BS 5975:2019 (Temporary works); ISO 21815-2
8	**Mobile crane operations** – Overturn, dropped load, collision	Crane operator, rigger, ground staff	Fatality, crush, amputation	4 x 5 = 20 (Extreme)	• Crane to be certified and inspected monthly. • Lift plan for every pick >80% capacity. • Exclude personnel from radius. • Use tag lines for suspended piles. • Check ground conditions and outrigger pads.	2 x 4 = 8 (Medium)	ISO 4309:2017 (Crane wire ropes); BS 7121-1:2016
9	**Noise and vibration** – Prolonged exposure to jacking and cutting noise	Machine operator, nearby workers	Hearing loss, HAVS (hand-arm	3 x 3 = 9 (Medium)	• Engineering controls: sound-dampened cabin, anti-vibration gloves. • Rotate workers to reduce exposure time.	2 x 2 = 4 (Low)	ISO 5349-1:2001 (Vibration);

			vibration syndrome)		● Provide hearing protection zone signage. ● Conduct noise monitoring if >80 dB LAeq,8h.		Control of Noise at Work Regulations (local)
10	**Manual handling of accessories & tools** – Awkward postures, heavy loads	Labourers, welders	Back injury, strains	3 x 2 = 6 (Medium)	● Use trolleys or lifting aids for pile sleeves, shims, tools. ● Team lifting for items >20 kg. ● Provide manual handling training.	2 x 2 = 4 (Low)	ISO 11228-1:2021 (Lifting); HSE Manual Handling Operations Regulations
11	**Underground services strike** (M&E coordination) – Electric, gas, water	All personnel	Electrocution, explosion, flooding	5 x 5 = 25 (Extreme)	● Obtain service drawings and CAT scan before any ground penetration. ● Use safe digging permit system. ● Locate and expose services by hand digging where required. ● Emergency procedure for service strike.	2 x 4 = 8 (Medium)	ISO 21815-3; PAS 128:2022 (Underground utility detection)
12	**Weather conditions** – Lightning, high winds, heavy rain	Machine operator, crane operator, surveyor	Lightning strike, loss of control, slips	3 x 3 = 9 (Medium)	● Monitor weather forecast (wind >25 mph, lightning within 10 km stops piling and crane work). ● Secure piling rig and crane boom in high winds. ● Stop work during electrical storms. ● Provide dry, non-slip walkways.	2 x 2 = 4 (Low)	BS 6164:2019 Annex C

Severity / Consequence Scale

Rating	Severity	Description
5	**Catastrophic**	Fatality or multiple fatalities; permanent total disability; major environmental damage
4	**Major**	Severe injury requiring hospitalisation; permanent partial disability; significant environmental impact
3	**Moderate**	Lost time injury (LTI); medical treatment required; moderate environmental impact
2	**Minor**	First aid treatment only; no lost time; minor environmental impact
1	**Negligible**	No injury or very minor injury; no environmental impact

Risk Rating = Likelihood × Severity

Likelihood / Severity →	1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 — Almost Certain	5 LOW	10 MEDIUM	15 HIGH	20 HIGH	25 HIGH
4 — Likely	4 LOW	8 MEDIUM	12 MEDIUM	16 HIGH	20 HIGH
3 — Possible	3 LOW	6 LOW	9 MEDIUM	12 MEDIUM	15 HIGH
2 — Unlikely	2 LOW	4 LOW	6 LOW	8 MEDIUM	10 MEDIUM
1 — Rare	1 LOW	2 LOW	3 LOW	4 LOW	5 LOW

HIGH (15–25): Immediate action required — STOP WORK if necessary | MEDIUM (8–12): Action required within 24 hours | LOW (1–6): Manage by routine procedures