Recognize			Assess		Evaluate	
Tasks	**Potential Hazards**	**Risks**	**Risk Rating (FxPxS)**	**Control**	**Residual Risk (FxPxS)**	**Monitor and Review**
Complete HDPE Duct Infill	1. Vehicle movement and traffic hazards 2. Manual handling during loading/unloading 3. Uneven ground conditions	Personal injury, property damage	9	1. Implement traffic management plan 2. Designated walkways 3. Mandatory PPE 4. Speed limit enforcement	4	
Site mobilization and setup of temporary	Passing high-speed public traffic and moving site vehicles	Personal injury, property damage	9	Approved TTM plan, high-visibility clothing (Class 3), physical water-filled/concrete barriers, advanced warning signs, and trained flagmen.	4	
Trench excavation and sub-surface ground preparation	Accidental strike on existing buried live electrical cables or gas utilities	Personal injury, property damage	9	Utility mapping review, CAT & Genny cable avoidance scanning, and manual trial pits (pot-holing) prior to mechanical excavation.	4	
Uncoiling, handling, and positioning HDPE pipe	Sudden release of stored mechanical spring energy in coiled HDPE pipe	Personal injury, property damage	9	Use of specialized pipe reeler/uncoiler frame, controlled strap cutting procedures, and establishing exclusion zones.	4	
HDPE pipe jointing via electrofusion and	High-temperature heating elements, hot molten plastic, and portable electrical generators	Personal injury, property damage	9	Certified welding equipment, RCD-protected generators, heat-resistant safety gloves, and portable fire extinguishers nearby.	4	
Entry into underground chambers and manholes	Hazardous atmosphere (oxygen deficiency, toxic gases like H2S/methane), engulfment, or fall from height	Personal injury, property damage	9	Confined Space Entry Permit, pre-entry 4-gas atmospheric testing, forced air ventilation, and tripod rescue system with harness.	4	
Mechanical winch pulling of HDPE sub-ducts	High-tension winch wire snap, rotating capstans, and pinch/nip points	Personal injury, property damage	9	Properly rated winching wire with calibrated weak-link swivel, emergency stop switches, and safety guards over rotating parts.	4	
Duct proving (mandrel testing) and air	Uncontrolled high-pressure compressed air release and projectile ejection of foam pig or mandrel	Personal injury, property damage	9	Calibrated pressure relief valves, secure containment/catcher cage at receiving duct end, clear exclusion zone enforcement.	4	
Delivery, offloading, and site staging of precast concrete troughs and materials	Heavy vehicle movement, struck by suspended loads, pinch points during offloading	Severe crushing injuries, fractures, structural damage, fatalities	12	Traffic Management Plan enforced, dedicated offloading zone, certified lifting equipment and rigging accessories, trained banksman/slinger	4	
Excavation and trench preparation for concrete trough routing	Underground electrical utilities strike, trench wall collapse, cave-ins	Electrocution, severe arc flash burns, engulfment injuries, fatalities	20	Review utility drawings, perform CAT and Genny ground scan, digging permit system, implement trench shoring or battering back of slopes	5	
On-site cutting, trimming, and modification of concrete troughs	Inhalation of Respirable Crystalline Silica (RCS) dust, tool kickback, flying debris, high noise levels	Silicosis, occupational asthma, severe lacerations, eye injuries, Noise-Induced Hearing Loss (NIHL)	12	Wet-cutting suppression systems or integrated M-class dust extraction, safety guards on cut-off saws, mandatory PPE (FFP3 respirators, impact goggles, ear defenders)	4	

Recognize			Assess		Evaluate	
Tasks	**Potential Hazards**	**Risks**	**Risk Rating (FxPxS)**	**Control**	**Residual Risk (FxPxS)**	**Monitor and Review**
Mechanical lifting and lowering of concrete troughs into the excavation trench	Failure of lifting tackle, dropped loads, encroachment near overhead powerlines	Crushing injuries, electrocution, equipment destruction, fatal strikes	15	Approved Lift Plan, certified lifting beams/slings, safety latches on hooks, clear line-of-sight communication via radio or standard hand signals	4	