

Project Title: PAKAKA Pumping Project.

Total Distance: 6,000 meters (6 km) of pipeline and 1,200 meters of Electrical Cable

Pipe and Cable Specifications: 355 mm HDPE PN16 PE100 SDR11. Qty: 600 Each of 10meters length of 355mm OD. And 185mm² 3 and 4 cores.

1. Executive Summary & Objective

The objective of this project is to construct, install, and commission a 5,400-meters of HDPE 355mm PN16 pipeline and pump system installation for feeding water from the **PAKAKA Pit** to the **UG Concrete and Shaft Dam**. And 600 meters from Shaft concrete to overflow concrete Dam. Pulling the 185mm² HT Electrical cable from Overhead line to minisub and from Minisub to pump. and assist the KGM of the installation of the pump. The Contractor shall supply all necessary labor, supervision, specialized equipment, tools, and consumables required to complete the works safely, on schedule, and in accordance with project specifications.

2. General Scope of Services

The Contractor's scope includes, but is not limited to:

- Receiving, offloading, handling, and stringing of HDPE pipes along the right-of-way (ROW). From PAKAKA pit to Shaft Concrete Dam
- 4,200 meters of 355 mm HDPE pipe to be aligned and segments bolted with HDG bolts Nuts and washers M20x220 mm stub-flanges & stub-flanges from PAKAKA to Vent 2 Concrete Dam, installed 2 HDPE Tee pieces reducer 355x200mm, 200 ND valves class150 and 6"flowmeters around John Steel Road to feed KOMBOKOLO and KMS Dam (John Steel Dam).
- 1200 meters of 355 mm HDPE pipe to be aligned and segments bolted with HDG bolts Nuts and washers M20x220 mm stub-flanges & stub-flanges from Vent 2 Concrete Dam to Shaft concrete Dam, installed 2 HDPE Tee Pieces Reducer 355x160mm, 150 ND Valves class 150 and 6"flowmeters to feed vent2 concrete Dam, paste plant, KCD PB3 and Shaft concrete Dam.
- 600 meters pipes alignment clearance and 355 mm HDPE pipe segments bolted with HDG bolts Nuts and washers M20x220 mm stub-flanges & stub-flanges, valves installed and feed from Shaft concrete Dam to Overflow concrete Dam.
- But fusion welding and/or electrofusion welding of the 355 mm HDPE pipe dimension to be modified.
- Trenching (1,200 mmx12,000mm), bedding, installing the culvert, backfilling, and compaction or assembly of pipe supports/berms on the crossing road
- Testing, Flushing & Tie-Ins (installed and connected the 100 meters of 150 ND Hose pipes and 350 NRV from the pump to 355 mm HDPE pipes in PAKAKA pit.

- Installed of 600 meters of 185 mm² Electrical cable from the Overhead line to Minisub and installed 300 meters of 185mm² Electrical cable from the Minisub to Pump Panel and 300 meters from the panel to the Pump.
- Installed 100 meters of 355 mm HDPE on the pump suction.
- Provide the team (6 technicians) to assist with the installation of the pump, MCC and Minisub and Drive for the overflow concrete Dam

3. Detailed Technical Breakdown

Phase 1: Preparation & Route Clearance

- **Survey & Marking:** Verify the pipeline route coordinates and mark the trench centerline/ROW limits over the full 6,000 meters.
- **Trenching / ROW Preparation:**
 - Excavate trench to specified depth and width (allowing proper clearance around the 355 mm pipe) adhering to soil stability guidelines on the road crossing places (Pamao road, boom gate, paste plant road...

Phase 2: Pipe Handling & Stringing

- Inspect pipe spools/coils upon arrival for damage or defects.
- String pipes alongside the trench/corridor using appropriate lifting equipment (spreader bars, soft slings, cranes or boom truck) to prevent scuffing or gouging.

Phase 3: Butt-Fusion Welding & Assembly

- **Qualification:** All welding must be performed by certified HDPE fusion technicians using calibrated butt-fusion welding machines.
- **Welding Process:**
 - Execute butt-fusion joints in strict compliance with ISO 21307.
 - Record welding parameters (temperature, pressure, soak time, cooling time) for every joint.
 - Perform internal/external bead inspection as required.
- **Fittings & Special Spools:** Install flange adapters, stub ends, backing rings, and electrofusion couplers at valve locations and connection points.

Phase 4: Pipeline Laying & Backfilling

- Lower the welded pipe string into the trench avoiding over-bending or twisting.
- Install padding (select backfill) around the pipe (150–300 mm above pipe crown) to protect against mechanical damage.
- Backfill the remainder of the trench in lifts, compacting to the required relative compaction percentage.

Phase 5: Testing, Flushing & Tie-Ins

- **Flushing:** Flush the 6,000 m pipeline to clear debris, scale, and foreign matter.
- **Tie-Ins:** Complete flanged or mechanical connections, monitor pressure drop/leakage and produce from PAKAKA pit to Shaft Concrete Dam

4. Deliverables & Documentation

The Contractor shall provide:

1. Method Statements & Risk Assessments (RAMS) prior to commencement.
2. Execution proof of similar project
3. HDPE Welder Machine and tools and lifting equipment
4. TLB for trench excavation
5. Daily Progress Reports (meters installed, welded, buried...).

The KGM Shall provide:

1. 355 HDPE 6000 meters pipes, Elbows, Tee pieces reducer, bolt M20x220 with Nut, Hose pipes and culvert
2. 200 and 150 ND valves and flowmeters
3. Cables, pump, Minisub, Pannel
4. Boom truck for pipe transportation...

5. Quality Assurance & Quality Control (QA/QC)

- **Visual Inspection:** 100% visual inspection of all weld beads for width, uniform roll-back, and absence of contamination.
- **Defect Rectification:** Any non-conforming weld shall be cut out (minimum length rules apply) and re-welded at the Contractor's expense.

6. Health, Safety & Environment (HSE)

- **PPE:** Full PPE mandatory for all personnel on site.
- **Safety Procedures:** Adherence to Trenching & Excavation safety, Lifting & Rigging procedures, and Hot Work guidelines (heating elements).
- **Environmental Control:** Minimize ground disturbance along the 6 km corridor and properly dispose of all cut pipe off-cuts, trash, and hydrotest water.

JP KALEND



Bill of Quantities (BOQ)**Pakaka pumping project**

installation of pump, Electrical system and 355 mm HDPE pipeline from Pakaka pit to Shaft concrete Dam.

Item	Description	Unit	Dim MM	Qty	PU\$	PT \$	Comment
1	Installation of 355 mm HDPE PN16 SRD11, with Tee Reducer and valves from PAKAKA to Vent 2 concrete Dam, End Stub and Flange bolte bolted	Meters	355x32,2	4,200		0	to be provide by KGM, boom truck for transportation under KGM. Hand lifting Accessories under contractor
2	Installation of 355 mm HDPE PN16 SRD11, with Tee Reducer and valves from Vent 2 to Shaft concrete Dam, End Stub and Flange bolte bolted	Meters	355x32,2	1,200		0	to be provide by KGM, boom truck for transportation under KGM. Hand lifting Accessories under contractor
3	Installation of 355 mm HDPE PN16 SRD11,and valves from Shaft concrete Dam to overflow concrete Dam, End Stub and Flange bolted	Meters	355x32,2	600		0	to be provide by KGM, boom truck for transportation under KGM. Hand lifting Accessories under contractor
4	355 mm HDPE PN16 SRD11 pipe joints to be welded. Butt fusion welding (include welding machine and Genset)	Ea	355x32,2	150		0	Welding machine and Genset from contractor plus tools and hand lifting accessories
5	pulling HT cable 185 mm2 from the Pamao overhead to Minisub	Meters	185x3 core	600		0	to be provide by KGM, boom truck for transportation under KGM. Hand lifting Accessories under contractor
6	pulling LV cable 185 mm2 from Minisub to Panel and from Panel to the Pump	Meters	185x4 core	600		0	to be provide by KGM, boom truck for transportation under KGM. Hand lifting Accessories under contractor
7	Provide the team (6 technicians) to assist with the installation of the pump, MCC and Minisub and Drive for the overflow concrete Dam	Technicians		6		0	
8	Trench excavation(1,200x12,000) and culvert installation (include the TLB hire)	Ea	1,200x12,000	3		0	TLB under contractor
9	Total					0	
10	Oveahead&Profit and VAT	%		0.25		0	
11	Total G					0	Estimate cost

