

Construction of Gas Transmission Pipelines:

Briefing for the Strategic Environment Assessment for the Phased Gas Pipeline Network

Neville Ephraim, 12 December 2017



Onsite Construction Manpower (per camp site)

> EPC Management onsite:

- > 20 experienced personnel from the contactor
- > 3-10 home office (owner) personnel
- > Onsite construction personnel:
 - ≻ ~550 personnel at peak
 - > Average 300 people during construction (drivers, welders, catering, 24 hour security guards, field joint coating, traffic wardens, specialised welders, workers, cable and communication staff, medical assistance, water management, cathodic protection, third party inspectors, emergency evacuation)

In mapping out the servitudes and construction areas (including lay-down areas) needed, the owner must take into account the following:

- Identification of the bush type and specific trees/bushes of value in servitude areas which go through open terrain and environmentally sensitive areas for rehabilitation as per the Environmental Management Plan.
- > Aerial photographs of the servitudes noting and tagging all buildings and human usage of the areas for record purposes.
- Communications with the provincial governments, noting the sensitivity of the servitudes for future provincial planning.

Construction Phases

- Interaction with neighbouring communities, municipal and provincial authorities for the temporary labour requirements.
- > Agreement with local Government structures as to the type of labour required and the percentage use of local labour and necessary training.
- Information to the surrounding communities (including all formal structures such as provincial) as to the purpose and duration of the construction work.
- > Camp and laydown area/s construction; road construction; and port laydown area construction
- > Identification of borrow pits (for bedding and padding soil) if required and permitting for these pits
- Preparation of construction right of way; ground preparation; dams for hydro-tests water and planning for rehabilitation.
- > Agreement with land-owners about temporary/permanent fencing and access
- Engineering teams and construction teams and the necessary permits including work permits for expatriates and import/export permits for equipment; Construction begins.
- Last few months: team debriefings, temporary workers demobilised, commissioning teams, engineering teams and operating team.

Construction Camp



> All aspects of camp to be signed off prior to occupation

- > Approval of camp design, including the acceptable quartering for all site personnel.
- > Certificate of Compliance 's (COC's) for generators and other site equipment
- Potable water supply
- > Waste disposal and Sewage treatment to be operational
- > Plans for medical care (emergency care, evacuation of patients, nearest medical facilities)
- > Catering facilities and supply (emphasis on local supply and local catering)
- >Ordering of essential items: plan activities to avoid delays
 - > Spare parts for equipment
 - > basic Personal Protection Equipment (PPE) and consumables
- If no mobile coverage
 - > Radio communications on all work fronts
 - > Specify speed of Wi-Fi / internet connection at Camp

Construction Planning



Construction Right of Way



>Nominal Right of Way (ROW) and Work Space

- > Space is needed for soil storage, ditch, pipe, and equipment
- > The overall "footprint" needed for the pipeline includes permanent ROW and temporary working space
- ≻ Typically 30 50m



Construction Camp

Gym



Dining & Recreation

Typical Construction Camp Layout

Pre-Construction: Material Receipt

Receipt of pipe at port and transport to site





Pre-Construction: Stockpile

Stockpile pipe near the ROW



First Steps

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ROW Staking and utility locations

All construction activities must be contained within the boundaries of ROWs and permissible access and working spaces



Start of ROW work



Debushing

Level ROW for Safe Work

Start of Pipe Work

Stringing Pipe Pipe Bending



Welding: Two main Types

Manual (Stick)

- > Typical to pipe under 24" (610mm) and short project (<20Km)</p>
- > Slower production
- > Readily available welding equipment typically mounted on Pick-up Trucks

Mechanized

- > Typical for pipe over 24" and project >20 Km
- > High production
- > Requires specialized welding equipment (rented or imported)

Completed Welding on ROW



Inspection



Non Destructive Examination: As per design code Automatic Ultrasonic Testing



Field Joint Coating



Heat Shrink or painted



Ditch Excavation: Trenchers

Tracked Excavator Wheel or Chain Ditcher







Lowering In





Bedding & Padding



Pipe Cleaning





Hydrostatic Testing



Reinstatement





End of ROW Work



Thank You

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