

Using NetCreate for Wet Utility Master Planning in KSA

Context

In 2020, Atkins was part of a partnership appointed by a confidential client to develop a Concept Master Plan for a 55ha luxurious Wellness and Adventure development in the Kingdom of Saudi Arabia. Given the challenging programme, Atkins digital tool NetCreate was used for the high-level planning of wastewater, potable water and treated sewage effluent networks.

Approach

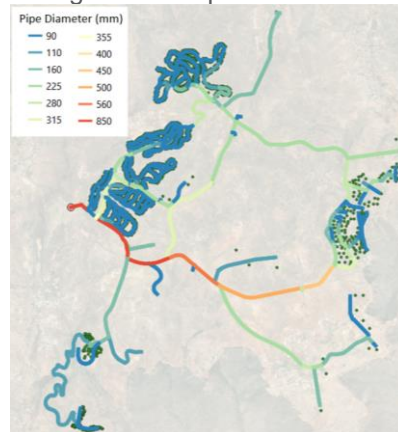
NetCreate is an innovative digital process using global open-source GIS datasets to automatically create outline wet utility networks on a repeatable basis. It brings together topographic, road layout and population distribution data to automatically generate wastewater, potable water and treated sewage effluent networks. Where more accurate or expansive Client datasets are available then these can be incorporated into the analysis. For pumping locations, resiliency or pressures.

For wastewater networks NetCreate assigns the shortest route from each property to the lowest point in the catchment along defined roads where the treatment works would be typically located. Pipe sizes are assigned based on the number of customers; manholes are inserted at junctions and defined intervals on straight pipes. Cover levels are taken from topographic data; minimum gradients and pipe depths are based on good engineering practice.

For potable water and treated sewage effluent, the process is reversed, with flows distributed out from the water supply source or the wastewater treatment works, and similar assumptions made.

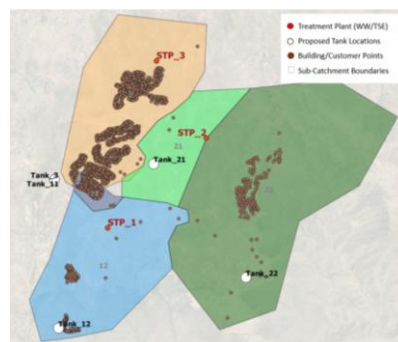
Solutions and Added Value

Initial NetCreate runs allowed high level layouts for the wet utilities to be generated quickly for client feedback. This allowed various scenarios to be considered such as centralised versus decentralised wastewater treatment and pumping versus storage for potable water.



Potable Water network

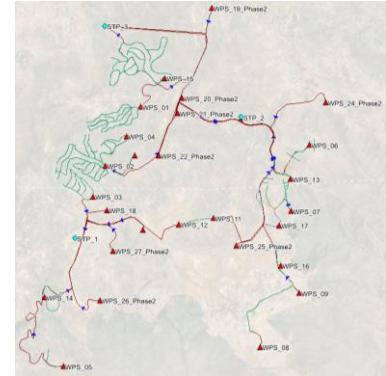
As the wider master plan progressed, the preferred wet utility layouts, were then coordinated with other disciplines to allow storage and pumping station assets to be sited in utility zones help generate an integrated master plan.



Treated sewage effluent network

The layouts for wastewater, potable water and treated sewage effluent networks were all imported InfoWorks ICM / WS to review and rationalise the wastewater pumping stations and ensure adequate pressures for

the water supply and treated sewage effluent networks.



Wastewater network

In total over 250km of wet utility network, together with 32 pumping stations and one storage tank were scoped in just two months.

Key Benefits

- NetCreate offers significant programme benefits compared with the traditional, manual approach for wet utility master planning.
- It accelerates master planning to allow early scope definition for client engagement.
- The standardised approach generates a consistent output easily configurable for scenario planning.
- Validation of the output from NetCreate can be obtained by importing it into proprietary hydraulic modelling software.

Client

Confidential client

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