

ENGINEERING REPORT

POKENO WEST STRUCTURE PLAN POKENO

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1.0 INTRODUCTION

1.1 PROJECT AND BACKGROUND

The purpose of this report is to provide an assessment of infrastructure associated with the development of the future Residential area of West Pokeno ("structure plan area"), identified within Figure 1 Locality Plan (below). This report supports the intended rezoning of the subject site and provides the framework for the required infrastructural upgrades.

The design and layout of the structure plan area (concept plan prepared by Birch Surveyors) has been developed around the proposed zones and land use controls of the Draft Proposed District Plan and has been developed through on-going consultation and collaboration with the Waikato District Council ("WDC").



Figure 1: Locality Plan (site in red) Source: Waikato Council Intramaps

This report provides a high-level analysis of the service infrastructure associated with the future development of the structure plan area and provides comment on matters to be considered pursuant to its development.

The structure plan area is currently zoned as rural under the operative Waikato District Council District Plan – Franklin Section ("WCDP: F"); however, as part of the District Wide Review undertaken by WDC this area is to be re- zoned to Residential.



The structure plan area has been designed around three stages, based on the early consultation with WDC and the then desire to use a combination of live and deferred zones. DWC have since resolved to remove the deferred zones from the District Wide Review. The structure plan area will be subject to a live zoning. In total the residential redevelopment of the structure plan area will provide for approximately 1350 new houses, as per the Birch Surveyors Concept Plan provided within Figure 2, below;



Figure 2: Overall Concept Plan Source: Birch Surveyors

In terms of phasing, the following report and accompanying calculations have been based three 'stages' for the infrastructural assessment. These smaller catchments will provide for the phased growth of the structure plan area and provide a more appropriate means of understanding the progressive infrastructural needs. In summary, the stages have been based on the following assumptions:

Stage 1:

Residential 1 area (assumed 600 residential lots, supporting general residential, medium density nodes, and neighbourhood centre) full service infrastructure required.

Stage 2:

Residential 2 area (assumed 450 residential lots, supporting general residential and medium density nodes) full service infrastructure required.

Stage 3:

Residential 3 area (assumed 300 residential lots) full service infrastructure required.



The information provided herein relates to the stormwater, wastewater, water supply, other service infrastructure and the potential capacity to service future development.

The calculations and assessments included in this report are a 'desktop' analysis and are preliminary in nature based on information available at time of issue.

This report is to be read in conjunction with the other specialist reports and is to accompany the overall structure plan documents for the site which accompany the WDC plan change, inclusive of the GHD draft long-term wastewater and water strategy for Pokeno.

1.2 SITE DESCRIPTION

The structure plan area encompasses a total area of approximately 160ha. The site is located west of the existing Pokeno urban footprint between the existing town centre to the east and the quarry to the west. The site stretches from Helenslee Rd in the north to Munro Rd in the south.

The south-eastern corner of the structure plan area (intersection of Helenslee Road and Pokeno Road) lies 1km from the Pokeno Town Centre's shops and services located on Great South Road.

The structure plan area is bound by the Waikato Expressway to the north and the North Island Main Trunk Railway (NIMTR) to the west.

The structure plan area currently comprises farmland used for cropping and grazing. Vegetation on the site is limited to hedgerow boundaries. A cluster of buildings stand on the site which are typical rural farm homes with no historic characteristics.

Existing services including a wastewater and stormwater drainage network, water main and other services are located adjacent to the structure plan area within the existing urban area identified within Appendix A – Waikato District Council IntraMaps.

Stormwater management is currently provided by natural watercourses and overland flow paths. Stormwater runoff from roads are via swales, infrastructure is limited to culverts at the road and rail crossings.

The low-lying portion of the site located to the south-east is identified as being subject to surface water flooding during large storm events according to the Pokeno Stormwater Catchment Management Plan.

1.3 TOPOGRAPHY

The topography of the study area varies significantly with steep hill country in the upper parts of the catchment to the north and west and low lying flat areas within the valley floors lower in the catchment to the south east.

The structure plan area lies on the south eastern side of a broad ridge. Ground levels within the structure plan area range from approximately RL 125 at the highest point of the catchment to RL 25.

The structure plan area is part of the Tanitewhiora stream catchment. Stormwater runoff from the ridge forms an overland flow path from the west to the east. The flowpaths across the site define the surrounding terrain and form the headwaters of a tributaries of the Tanitewhiora stream.

The Tanitewhiora stream and its tributaries drain around 1,270 hectares. The structure plan area discharges to a low point on Munro Road via a stream under an existing road bridge.



2.0 OVERLAND FLOW AND FLOODING

In terms of overland flow and flooding a preliminary overview to determine the extent of any issues has been undertaken.

2.1 OVERLAND FLOW

The Pokeno Stormwater Catchment Management Plan identifies overland flow paths ("OLFP's") which traverse the site from the west to the east. The flowpaths across the site define the surrounding terrain and form the headwaters of a tributaries of the Tanitewhiora stream.

The majority of all significant OLFP's are localised and confined to existing farm watercourses indicated on Figure 3 OLFP Plan, below.



Figure 3: OLFP Plan Source: Pokeno Catchment Management Plan



The subject site is located within the Tanitewhiora stream catchment area. Stormwater discharge is to a local stream which is a tributary of the Tanitewhiroa stream. The local stream is classified as the immediate receiving environment for stormwater runoff, downstream discharge is to the Mangitawhiri swamp/wetland and ultimately the Waikato River.

The local stream flows to the bridge crossing on Munro Road, from which point OLFP continues to flow east. Further sub-catchments contribute to the OLFP before discharging into the Tanitewhiroa stream.

The Tanitewhiora stream has a waterfall approximately 4m in height, effectively separating the Mangatawhiri swamp/wetland and the Waikato River further downstream hydraulically from the structure plan area catchment.

Future development of the structure plan area is to maintain the entry/ exit points and the capacity of existing OLFPs and not cause an increase in risk or hazard to any upstream or downstream properties.

Future development levels will be designed to direct overland flow ("OLF") within the development area away from proposed buildings and maintain OLF capacity as per WDC requirements.

Future development is to maintain the function of OLFPs to safely convey flood waters and not increase the risk of flooding.

2.2 FLOOD PLAIN & FLOOD SENSITIVE AREAS

Waikato District Council IntraMaps does not identify any flood level, flood limit or flood risk hazard policies for the subject site. However, the Pokeno Stormwater Catchment Management Plan identifies pre-development flood plain/level areas within the low-lying eastern portion of the site.



Figure 4: Flooding area Source: Pokeno Catchment Management Plan



The flood modelling associated with the above Pokeno Catchment Management Plan has been updated by WSP Opus in late 2017. WDC engaged WSP Opus to update the existing Pokeno 1d hydraulic model (HEC-RAS) into a 2d hydraulic model (TUFLOW) to allow more comprehensive assessment of cumulative effects of current and future developments (i.e. filling within the floodplain) on the existing/future drainage networks in the township of Pokeno¹.

The two scenarios assessed in the WSP Opus study were undertaken to assess the changes in the catchment hydrology and flooding through Pokeno resulting from the significant development over the last 5-7 years. The revised scenario represents the current level of development (completed prior to 2017/18). The modelling assumed that potential future developments (currently being completed and areas zoned for development potential) will include stormwater management devices (such as detention basins) to ensure no increase in downstream discharge from the sites.



Figure 5: Updated 1:100 AEP Flood Plain Source: WSP OPUS



In accordance with Regional Infrastructure Technical Specifications ("RITS") requirements, new structures and buildings adjacent to the 1% annual exceedance probability ("AEP") floodplain and the use of these to accommodate vulnerable activities require minimum floor levels ("MFL's") to meet freeboard requirements.

The concept plan has been designed to avoid the revised 100-year AEP flood plain, with all development areas outside of this flood plain, please refer to appended plans within Appendix A.

Future development will, however, require specific MFL assessment to confirm the 100-year flood level and ascertain minimum floor levels in accordance with RITS requirements as per the table below (Figure 6).

		1	1
Minimum Levels	Floor	Freeboard requirements: 100 year ARI event plus minimum freeboard heights as per NZS 4404 Clause 4.3.5.2, as follows:	Always.
		"The minimum freeboard height additional to the computed top water flood level of the 1% AEP design storm	
Criteria		Design Parameter	When Required
		should be as follows or as specified in the district or regional plan:	
		Freeboard	
		 Habitable dwellings (including attached garages) = 0.5m min height; Commercial and industrial buildings = 0.3m min height; 	

Figure 6: Freeboard Requirements Source: RITS

 Non-habitable residential buildings and detached garages = 0.2m min height.

The minimum freeboard shall be measured from the top water level to the building platform level or the underside of the floor joints or underside of the floor slab, whichever is applicable."

Final design will ensure that finished floor levels will have adequate freeboard in accordance with District Plan and Building Code requirements. This will be assessed as part of any future resource consent application made to WDC.



3.0 EARTHWORKS

3.1 RECEIVING ENVIRONMENT

The subject site is located within the Tanitewhiora stream catchment area. Stormwater discharge is to a local stream which is a tributary of the Tanitewhiroa stream. The perennial stream is the immediate receiving environment for stormwater runoff, downstream discharge is to the Mangitawhiri swamp/ wetland and ultimately the Waikato River.

Environment Waikato has stated that wetlands were once widespread throughout the Waikato but now they are some of New Zealand's rarest and most at-risk ecosystems. The Waikato River is also recognised as an area of ecological significance. These receiving environments will need to be protected from the potential adverse effects associated with land development

Runoff from the proposed development area during earthworks will have to be treated to ensure that the receiving water's stormwater quality is not adversely affected.

Parts of the structure plan area are underlain by volcanic soil. Although there are expected to be a range of infiltration capacities, stormwater attenuation via soakage and infiltration is an opportunity to meet retention requirements, subject to further investigation.

The earthworks management method proposed for any future development within the structure plan area is to include a description of how the proposed management will address sediment control during construction.

3.2 EARTHWORKS AND SEDIMENT CONTROL

Earthworks will be undertaken as required throughout the structure plan area and will include excavations for drainage reticulation and formation of building platforms and roading areas.

Construction represents the period when the most significant impact on the downstream receiving environment can occur due to erosion and sedimentation from disturbed land. WDC will seek exemplar erosion and sediment control measures which will mitigate downstream impacts.

Proposed measures for erosion and sediment control are to be designed in accordance with the Waikato Regional Council's ("WRC's") Erosion and Sediment Control Guidelines for soil disturbing activities document and sediment control factsheets.

Silt control measures will need to be installed onsite prior to the earthworks commencing. All silt control measures will be checked and confirmed acceptable by the Engineer before works commence.

3.3 CONSENTING AND MONITORING

Resource consent will be required for all earthwork operations onsite and will require erosion and sediment control measures to be implemented and maintained in accordance with the approved Earthwork Drawings.

Any future earthworks proposed within the existing stream riparian areas or within the existing flood plain will require further resource consent approvals, earthworks design will need to ensure no loss of flood storage is associated with future development.

A geotechnical investigation will be undertaken by a suitably qualified Geotech Engineer to confirm the site is suitable for the development proposals. A completion certificate will be provided at the completion of the earthworks as required.



4.0 STORMWATER

4.1 CATCHMENT MANAGEMENT PLAN

The structure plan area is within the existing Pokeno Stormwater Catchment Management Plan ("PSWMP") area which covers approximately 1500ha.

The Catchment Management Plan ("CMP") will become outdated with the development of the structure plan area with a new CMP required encompassing the new rea of development. However, several key requirements from the existing CMP will be retained:

- Peak flood flows from future land use changes will need to be limited via mitigation measures from pre-development to post-development.
- The runoff from future development areas will have to be treated via water quality improvement measures to ensure that the receiving water's stormwater quality is not adversely affected.

A new CMP will be required in support of any future development application in the area to determine stormwater management requirements. The CMP should be undertaken by WDC or by a suitably qualified private consultancy on behalf of WDC. WDC have confirmed that a new CMP will be implemented in a timely manner to allow future development within the proposed timeframes of the District Wide Review.

The purpose of the new CMP will be to identify stormwater issues within the catchment; identify potential options to address these issues and set out recommendations for the long term stormwater management within the catchment which would form a basis for a stormwater discharge consent in support of the future development.

Future development of the structure plan area will need to be consistent with the new CMP and incorporate stormwater attenuation and stormwater quality methods into the design of the future Residential zone.

This report outlines the likely stormwater management measures to manage the effects of the stormwater environment resulting from the proposed development of the structure plan area. These measures will likely form the basis of any future CMP.

The proposed stormwater management methods are as follows:

- Wetland ponds to provide stormwater treatment of the water quality volume (1/3 of the 2 year, 24-hour rainfall).
- Wetland ponds to provide stormwater attenuation to limit post-development peak discharges for the 2 and 10-year frequency storms to their pre-development peak discharge release rates.
- Wetland ponds located offline from the existing watercourse and streams.
- Streams to be protected through planted riparian areas.
- Streams to be protected from the receiving environment by maintaining flow of the 'first flush' rainfall event (34.5mm or that calculated from first principals) released over a 24-hour period.
- Onsite measures to provide soakage, retention, and detention.
- Raingardens for public roads to provide stormwater treatment and retention.
- Existing flood plain areas to retain existing flood volumes.

Future development will require specific design in accordance with the guidelines of Waikato District Council 's RITS and be in accordance with Waikato Regional Council guidelines.



4.2 STORMWATER RETICULATION

Stormwater management is currently provided by swales within the roading corridors, existing stormwater farm ponds and low-lying areas. Waikato District Council IntraMaps identifies a public stormwater network adjacent to the south-western perimeter of the structure plan area (within the existing urban area), however, the existing network is not designed to cater for the proposed future development.

There is an existing local stream which is a tributary of the Tanitewhiroa stream located within the structure plan described in Section 1.3 Topography. The existing stream will act as the key stormwater discharge point for portions of the development area. Areas which do not fall to the tributaries will require public extensions to the local stream or other tributaries of the Tanitewhiroa stream. The existing stream passes under Munroe Road bridge pictured in Figure 6 below.



Figure 7: Munro Road Bridge Source: Pokeno Catchment Management Plan

The WDC RITS sets out design and construction standards for stormwater and requires all development to be provided with a means of stormwater disposal.

Stormwater disposal will be via a proposed stormwater pipe network which will be designed to have capacity for the 10-year storm from the proposed development and will be subject to Engineering Approval form WDC as part of any future Resource Consent application.

The proposed stormwater network will provide suitable stormwater connection points for the future development of the structure plan area, an indicative stormwater network has been designed and is appended to this Report.

4.3 STORMWATER CAPACITY

WRC requires stormwater hydrology mitigation for all new impervious areas proposed as part of any future development. Specific stormwater controls regarding attenuation and retention are to be detailed with future development and will control stormwater discharge downstream to an acceptable level. The likely stormwater attenuation methods are as follows:

- Wetland ponds to provide stormwater treatment and attenuation
- Onsite measures to provide soakage, retention, and detention.
- Raingardens for public roads to provide stormwater treatment and retention.

It is envisaged by adhering to these controls downstream aquatic biodiversity within streams will be protected. Attenuation will also avoid increasing flood risk to the existing downstream properties.



A full updated CMP will need to accompany any future development of the area to determine stormwater management requirements. It is considered that a combination of the above attenuation methods will provide for future development as required.

Future development will require specific design in accordance with the guidelines of WDC's RITS and be in accordance with WRC guidelines.

4.4 STORMWATER QUALITY

The high risk receiving environment emphasises the importance of how stormwater runoff from development areas is managed. High stormwater discharge quality is required to protect the downstream receiving environment.

Future development is to incorporate Water Sensitive Design approaches focusing on reducing or eliminating stormwater runoff generation through source control and utilising natural systems and processes to manage stormwater quality effects.

All future trafficable surfaces including roading networks, accessways, manoeuvring and carparking areas proposed as part of future development of the structure plan area will require stormwater quality treatment.

Trafficable surfaces will require treatment as per WRC requirements. The primary water quality objective of the treatment is to remove 75% of total suspended solids on a long-term average basis. The likely stormwater quality treatment methods are as follows:

- Wetland ponds to provide stormwater treatment and attenuation.
- Raingardens for public roads to provide stormwater treatment and retention.

It is considered that objectives will be achieved via the utilisation of a combination of wetland ponds, raingardens, and filtration devices to achieve the best practical stormwater management outcome.

Due to the topography of the site, the proposed ponds are in some instances required to be within the 100-year flood plain. The ponds have been located outside of this flood plain where this is practically possible to achieve. In instances where the ponds are located within this flood plain, minor re-contouring will ensure that there is no loss of storage capacity within the flood plain.

Construction of future buildings will require source control of roof runoff with the use of non-zinc roofing materials, the design and construction of which will be subject to future Building Consent approval from WDC.

4.5 STAGE 1

Stage 1 (600 lots) will require full stormwater management as detailed within sections above. Stormwater management for Stage 1 will primarily be via offline stormwater wetland ponds which will provide attenuation and treatment before discharging to the existing watercourse flowing through the southern portion of Stage 1.

Due to the nature of the topography, stormwater runoff from Stage 1 is divided into three subcatchments (Catchments 1, 2 and 3 - in part) and will require three ponds to service the discharge. The engineering drawings identify suitable areas which can accommodate the stormwater wetland ponds and flood storage.

The existing flood plain is contained within the low-lying areas of Stage 1 which accommodate the pre-development flood volume. The flood plain volumes are to be retained with any future development. Areas will likely need to be modified as required to maintain flood volumes and achieve stormwater quality management requirements.

The stormwater wetland ponds will be designed in accordance with WRC requirements and will be vested as a public asset with WDC as part of any future subdivision application. Final design



will be subject to Engineering Approval including operation and maintenance guidelines. Final design will consider pre-development runoff, any downstream flooding issues, climate change and will be in accordance with the full CMP for the structure plan area.

Stormwater management will also incorporate onsite measures to provide soakage, retention and detention as required. Raingardens will also be incorporated to treat runoff from public roads.

The proposed internal stormwater pipe network will be designed to service the proposed residential development and will discharge to the wetland ponds. The proposed network is to have capacity for the 10-year storm and will be subject to Engineering Approval form WDC.

4.6 STAGE 2

Stage 2 (450 lots) will require full stormwater management as detailed within sections above. Stormwater management for Stage 2 will primarily be via offline stormwater wetland ponds which will provide attenuation and treatment before discharging to the existing watercourse flowing south along the eastern boundary of Stage 2.

Stormwater runoff from Stage 2 is divided into two main sub-catchments (Catchments 4 and 5) and will require two ponds to service stormwater discharge. A small portion of Stage 2 is also serviced by ponds within Stage 1 (Catchment 3).

Stormwater quality management will also incorporate onsite measures to provide soakage, retention and detention as required. Raingardens will also be incorporated to treat runoff from public roads.

Proposed larger lots located higher in the catchment may require full onsite stormwater management. A reduction of stormwater attenuation may be applied if the larger lots provide increased tree planting which would decrease stormwater runoff.

4.7 STAGE 3

Stage 3 (300 lots) will require full stormwater management as detailed within sections above. Stormwater runoff from Stage 3 is divided into 2 main sub-catchments (north - Catchment 6, and south – Catchment 7).

Stormwater management for Stage 3 (north) will primarily be via an offline stormwater wetland pond which will provide attenuation and treatment before discharging to the existing watercourse.

Stormwater management for Stage 3 (south) will require full onsite stormwater management, as there is no suitable location for an offline pond, given the topography and location of stream. A reduction of stormwater attenuation may be applied if the larger lots provide increased tree planting which would decrease stormwater runoff.

4.8 CONCLUSION

The stormwater management methods proposed will be in accordance with an updated catchment management plan of the area which will be formed in consultation with Waikato Regional and District councils.

The CMP will identify stormwater issues within the catchment; identify potential options to address these issues; and set out recommendations for the long term stormwater management within the catchment which would form a basis for a stormwater discharge consent and to support rezoning and development.

Future development will incorporate a Water Sensitive Design approach focusing on reducing or eliminating stormwater runoff generation through source control and utilising natural systems and processes to manage stormwater quality effects.



5.0 WASTEWATER

5.1 WASTEWATER RETICULATION

WDC IntraMaps identifies a public wastewater network adjacent to the south-western perimeter of the structure plan area (within the existing urban area). This existing downstream network is not designed to cater for the proposed future development.

Wastewater discharge for existing urban areas of Pokeno is via existing public gravity reticulation to the Market Street Pump station, with ultimate discharge to the Pukekohe Wastewater Treatment Plant via an existing rising main.

The development of the structure plan area will require a new comprehensive wastewater network design including the installation of new infrastructure connecting the structure plan area to the existing downstream network.

The new wastewater network will be consistent with the WDC RITS which sets out design principles for wastewater and requires any development project to be provided with a means of wastewater disposal.

All new infrastructure within the development areas will be designed to have capacity to cater for the Maximum Probable Development ("MPD") of the structure plan area in accordance with WDC RITS guidelines and will be subject to Engineering Approval. The proposed network will provide suitable wastewater connection points for the future development of the structure plan area.

5.2 WASTEWATER NETWORK CAPACITY

Network capacity has been investigated with WDC who have confirmed that there are potential capacity issues (at present) associated with future development of the structure plan area.

The Market Street pump station is currently near maximum capacity, any future development is likely to increase the frequency and volume of the annual overflow from the pump station. Therefore, a new pump station will be required for the development of the structure plan area.

The existing 280mmØ rising main from Pokeno to Tuakau, and the downstream network form Tuakau to the Pukekohe wastewater treatment plant, does not have capacity for wastewater flows from the development of the structure pan area. Upgrades to the downstream network will therefore be required to allow the development of the structure plan area.

The Pukekohe wastewater treatment plant is currently undergoing capacity upgrades which will upgrade the wastewater network capacity for Pokeno and will cater for future development of the structure plan area.

Further investigation is currently being undertaken by WDC and will determine what upgrades are necessary for the future development of the structure plana area, along with the Wider Pokeno area, inclusive of additional Industrial Trade Waste demands. The GHD draft long-term wastewater and water strategy for Pokeno which is to be issued mid July 2018 will outline key upgrades and timings.

For the purpose of this report it is anticipated that the wastewater plant upgrades will be completed prior to the development of the structure plan area. This has been confirmed in correspondence with WDC.

5.3 STAGE 1

The Stage 1 area (600 lots) will require full domestic wastewater disposal as per sections above. Wastewater disposal for the full structure plan area will be via a proposed pump station sized for the MPD of the area.



The engineering drawings identify the location of the pump station. The location of the pump station is at the low point of the catchment and has access from the adjacent public roads for maintenance. The pump station will be vested as a public asset and be operated and maintained by Waikato District Council.

It is envisaged that the pump station will connect to a new rising main on Pokeno Road which will be installed on the same alignment as the existing network rising main (additional rising main) or be a replacement of the existing network rising main.

The pump station will connect to the network rising main at the closest point to the site via Munro Road and 'plug' into the existing network. The pump will have telemetry with the other main pump stations in the area so pumping and discharge would not coincide with other pumps.

The pump station storage tanks will be designed to have capacity to hold peak wet weather flows allowing pumping of wastewater discharge downstream at a decreased average rate during off-peak times.

The design of the pump station and rising main and will be in accordance with the WDC RITS and be subject to Engineering Approval from WDC.

Downstream network capacity is to be confirmed with WDC before any future development is confirmed and alternative solutions investigated where necessary.

5.4 STAGE 2

The Stage 2 area (450 lots) will require full domestic wastewater disposal as per the required upgrades, detailed for Stage 1 above. WDC have informed capacity issues associated with the existing network, Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

5.5 STAGE 3

The Stage 3 area (300 lots) will require full domestic wastewater disposal as per the required upgrades, detailed for Stage 1 above. WDC have informed capacity issues associated with the existing network, Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

5.6 CONCLUSION

The development of the structure plan area will require a new comprehensive wastewater network design including the installation of new infrastructure connecting the structure plan area to the existing network.

WDC have confirmed that there are capacity issues associated with the existing network. Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

The forthcoming GHD report, which outlines the draft long-term wastewater and water strategy for Pokeno will provide guidance around the required upgrades to support the growth of Pokeno, including the structure plan area.



6.0 WATER SUPPLY

6.1 WATER RETICULATION

WDC IntraMaps identifies a public water network adjacent to the eastern perimeter of the structure plan area (within the existing urban area).

There is an existing 150mmØ watermain which runs on the eastern boundary of Helenslee Road which contains Fire Hydrants at regular intervals to service the residential development to the east. There is an existing 300mmØ bulk watermain located at the corner of Helenslee Road and Hillpark Drive approximately 700m from the structure plan area.

The development of the structure plan area will require a comprehensive water network upgrade including the installation of new infrastructure connecting the future urban area to the existing network. The WDC RITS sets out the design principles for potable water supply and firefighting service and requires adequate lot connections for all future development lots.

All new infrastructure will be designed to have capacity to cater for the MPD of the structure plan area in accordance with WDC RITS guidelines and will be subject to Engineering Approval. The proposed network will provide suitable water connection points for the future development of the structure plan area

6.2 WATER NETWORK CAPACITY

Network capacity has been investigated with Waikato District Council who have informed potential capacity issues associated with future development of the structure plan area.

Further investigation is currently being undertaken by WDC and will determine what upgrades are necessary for the future development of the structure plana area. The GHD draft long-term wastewater and water strategy for Pokeno which is to be issued mid July 2018 will outline key upgrades and timings.

6.3 FIRE FIGHTING SERVICE

Firefighting service is currently provided by Fire Hydrants located on the public network and/or via water storage in stormwater ponds where no public network is available, and service required.

The Watercare Code of Practice for Land Development and Subdivision sets out the design principles for potable water and firefighting supply and requires assessment against SNZPAS 4509:2008 NZ Fire Service Fire Fighting Water Supply Code of Practice.

The firefighting water supply classification for residential development in suburban areas is FW2. Any future residential development would need to meet the following water supply requirements:

- A primary water flow of 12.5 litres/sec within a distance of 135m;
- An additional secondary flow of 12.5 litres/sec within a distance of 270m;
- The required flow must be from a maximum two hydrants operating simultaneously; and
- A minimum running pressure of 100kPa

Flow rates and pressures are to be tested to confirm minimum requirements for the water supply classification stipulated in SNZPAS 4509:2008 can be achieved for all future buildings.

6.4 STAGE 1

The Stage 1 area (600 lots) will require full water supply and firefighting service as per sections above. Water supply for the Residential 1 area will likely be via public network extensions from the existing 3000mmØ watermain located on Helenslee Road. It is likely that a new 250mmØ



main will be extended through the Stage 1 area along the principal roads and loop back to Helenslee road.

The proposed 250mmØ primary main will allow for future lot connections and provide a suitable network to extend secondary 150mm and 100mm diameter mains from to service all lots proposed in the residential development.

The proposed water supply network will be designed in accordance with the WDC RITS and be subject to Engineering Approval from WDC.

It is envisaged that the existing network will have capacity for Stage 1; however, network capacity is to be confirmed with WDC before any future development is confirmed and alternative solutions investigated where necessary.

6.5 STAGE 2

The Stage 2 area (450 lots) will require full water supply and firefighting service as per sections above. Further public network extensions from the proposed Stage 1 watermain may be acceptable to service Stage 2 and 3 areas, however, further network upgrades are likely required to service these stages.

WDC have informed capacity issues associated with the existing network. Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

Proposed larger lots located higher in the catchment may require full onsite potable water and/or firefighting supply if hydrant pressure cannot be achieved. A consent notice on each title within these areas will ensure future users and land owners will understand the water supply constraints and requirements, as to ensure SNZPAS 4509:2008 can be achieved.

6.6 STAGE 3

The Stage 3 area (300 lots) will require full water supply and firefighting service as per sections above. Further public network extensions from the proposed Stage 1 watermain may be acceptable to service Stage 2 and 3 areas, however, further network upgrades are likely required to service these stages.

WDC have informed capacity issues associated with the existing network. Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

Proposed larger lots located higher in the catchment may require full onsite potable water and/or firefighting supply if hydrant pressure cannot be achieved. A consent notice on each title within these areas will ensure future users and land owners will understand the water supply constraints and requirements, as to ensure SNZPAS 4509:2008 can be achieved.

6.7 CONCLUSION

The development of the structure plan area will require a new comprehensive water network design including the installation of new infrastructure connecting the structure plan area to the existing network.

WDC have confirmed that there are capacity issues associated with the existing network. Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

The forthcoming GHD report – which outlines the draft long-term wastewater and water strategy for Pokeno – will provide guidance around the required upgrades to support the growth of Pokeno, including the structure plan area.



7.0 OTHER SERVICES

Existing service networks are present in the surrounding area and Telecommunications, Power and Gas are available for the proposed development.

It is anticipated that network upgrades/ extensions may be required to support future residential development which will be undertaken as required.

Services will be connected to the proposed development as per respective Service agreements. Telecommunications in the area are managed by Chorus, Power is managed by Counties Power and there is no known Gas reticulation within the area.

Counties Power and Chorus have been informed of the development. A strategic meeting has been held with Counties Power, who are aware of future timing and demands.



8.0 CONCLUSIONS

This document sets out how the structure plan area of Pokeno West is to be developed and will form the basis for proposed key service infrastructure associated with the future development of the site.

Future development will incorporate a Water Sensitive Design approach focusing on reducing or eliminating stormwater runoff generation through source control and utilising natural systems and processes to manage stormwater quality effects.

The development of the structure plan area will require a new comprehensive wastewater and water supply network design including the installation of new infrastructure connecting the structure plan area to the existing network.

WDC have confirmed that there are capacity issues associated with the existing network. Further investigation with WDC will determine what upgrades are necessary with each stage of the future development.

The forthcoming GHD report – which outlines the draft long-term wastewater and water strategy for Pokeno – will provide guidance around the required upgrades to support the growth of Pokeno, including the structure plan area.



APPENDIX A - ENGINEERING DRAWINGS













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