# WASTE WATER AND PIPE FLOW CALCULATOR

## WATERCARE WASTEWATER CODE OF PRACTICE - COLEBROOK WHITE AND MANNINGS EQUATIONS

**CLIENT:** Hugh Green Group
**PROJECT:** Park Estate Road Overall Catchment
**DETAIL:** Scenario 1 - Currently Developed

**DESIGNER:** RGP
**JOB NO:** 1972-00
**DATE:** 10/03/2021
**REV:** 1

NOTE: This spreadsheet calculates peak flow rates using the Watercare Code of Practice and pipe capacities using the Colebrook-White equation for pipes flowing full, and the Mannings equation for pipes flowing part-full

**Green boxes are user inputs**

**Design Flow Assumptions (Section 5.3.5.1 WWCoP):**

| **Residential** | Residential | High Rise Residential | |
|---|---|---|---|
| Average Dry Weather Flow (ADWF) = | 180 | 180 | l/p/d |
| Peak Factor: Self-Cleansing Design Flow = | 3.0 | 3.0 | |
| Peak Factor: Peak Design Flow = | 6.7 | 5.0 | |
| Self-Cleansing Design Flow (ADWF) = | 540.0 | 540.0 | l/p/d |
| Peak Design Flow (PWWF) = | 1206.0 | 900.0 | l/p/d |
| Number of People per Dwelling = | 3.0 | 5.0 | p |

| **Commercial/Industrial** | Design Flow (l/m²/d) | ADWF (l/m²/d) | PWWF (l/m²/d) |
|---|---|---|---|
| Dry retail (toilets not available to customers) | 1.3 | 2.6 | 6.5 |
| Dry retail (toilets available to customers) / Office Buildings | 4.3 | 8.6 | 21.5 |
| Wet retail (food and beverage retail/preparation) | 15.0 | 30 | 100.5 |
| Industrial: light water use | 4.5 | 22.5 | 30.2 |
| Industrial: medium water use | 6.0 | 30 | 40.2 |
| Industrial: heavy water use | 11.0 | 55 | 73.7 |
| Very heavy water users | | Specific Design Required | |
| Commercial/Industrial Selected Values = | **1.3** | 2.6 | 6.5 |

| **Other Facility Types** | Refer to table, WWCoP pg 33 |
|---|---|
| Peak Factor: Self-Cleansing Design Flow = | **2** |
| Peak Factor: Peak Design Flow = | **6.7** |

**Table 5.2 – Guide to roughness coefficients for *wastewater* lines**

| **Material** | **Colebrook-White coefficient** k (mm) | **Manning roughness coefficient** (n) |
|---|---|---|
| *All pipe material and lining types for gravity systems and low pressure collection systems (PWC), flowing full.* | *1.5* | *0.013* |
| *All pipe material and lining types for pressure rising mains, flowing full* | *0.6* | *0.011* |
| NOTE – (1) These values take into account possible effects of rubber ring joints, slime, and debris. (2) The n and k values apply for pipes up to *and including* DN 300. | | |

**Table 5.3 – Minimum pipe sizes for wastewater reticulation and property connections**

| **Pipe** | **Minimum size** DN (mm) |
|---|---|
| Connection servicing 1 dwelling unit | 100 |
| Connection servicing more than 1 dwelling unit | 150 |
| Connection servicing commercial lots | 150 |
| Connection servicing industrial lots | 225 |
| NOTE – In practical terms, in a *residential development* not exceeding 20 dwelling units, and where no pumping station is involved, DN 150 pipes laid within the limits of table 5.4 and table 5.5 will be adequate without specific hydraulic design *of the pipe network*. | |

| Line | Catchment Details | Increment Number of Residential/ Rural Dwellings | Increment Number of High Density Dwellings | Increment Commercial/ Industrial Area (m²) | Increment Other Facility Type (l/d) | Increment ADWF (l/s) | Cumulative ADWF (l/s) | Increment PDWF (l/s) | Cumulative PDWF (l/s) | Increment PWWF (l/s) | Cumulative PWWF (l/s) | Household Unit Equivalent | Diam (mm) | Ks | n | Grade (%) | Qmax (l/s) | Velocity Flowing Full (m/s) | Check Capacity - % of Qpwwf vs Qmax (must be <100%) | Vpdwf (must be >0.75m/s for self cleansing) | Check flow depth in pipe while carrying PDWF (must be < 50%) | Notes/Conclusions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXISTING (Existing conditions including Hugh Green Development stages 1A - 1D and MOE)** | Refer to sketch plan 1972-00-SK41-1 and 1972-00-SK41-2 for catchment boundaries | | | | | | | | | | | | | | | | | | | | | |
| PUMPED CATCHMENT | | | | | | | | | | | | | | | | | | | | | | |
| SSMH 7 - SSMH 6 | Pumped flows from upstream of Hugh Green Development | 3087 | | | | 19.3 | 19.3 | 57.9 | 57.9 | 129.3 | 129.3 | 3087 | 450 | 1.500 | 0.013 | 0.72 | 243 | 1.53 | 53.1% | 1.20 | 34.3% | |
| SSMH 6 - SSMH 5 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 450 | 1.500 | 0.013 | 0.67 | 235 | 1.48 | 55.0% | 1.17 | 34.9% | |
| SSMH 5 - SSMH 4 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 450 | 1.500 | 0.013 | 0.73 | 245 | 1.54 | 52.7% | 1.21 | 34.1% | |
| SSMH 4 - SSMH 3 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 450 | 1.500 | 0.013 | 0.64 | 230 | 1.44 | 56.3% | 1.15 | 35.3% | |
| SSMH 3 - SSMH 2 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 525 | 1.500 | 0.013 | 0.31 | 240 | 1.11 | 53.9% | 0.88 | 34.4% | |
| SSMH 2 - SSMH 1 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 525 | 1.500 | 0.013 | 0.22 | 202 | 0.93 | 64.1% | 0.78 | 37.7% | |
| | | | | | | | | | | | | | | | | | | | | | | |
| GRAVITY FED CATCHMENT | Assumes pumped catchment flows are off peak | | | | | | | | | | | | | | | | | | | | | |
| SSMH 7 - SSMH 6 | Gravity fed flows from upstream of Hugh Green Developments | 1000 | | | 15820 | 6.4 | 6.4 | 19.1 | 19.1 | 43.1 | 43.1 | 1026 | 450 | 1.500 | 0.013 | 0.72 | 243 | 1.53 | 17.7% | 0.88 | 19.5% | |
| SSMH 6 - SSMH 5 | Gravity fed flows from Hugh Green | 30 | | | 12825 | 0.3 | 6.8 | 0.9 | 20.0 | 2.3 | 45.4 | 51 | 450 | 1.500 | 0.013 | 0.67 | 235 | 1.48 | 19.3% | 0.87 | 20.3% | |
| SSMH 5 - SSMH 4 | Developments Stages 1a - 1d and Stage | 77 | | | | 0.5 | 7.3 | 1.4 | 21.4 | 3.2 | 48.6 | 77 | 450 | 1.500 | 0.013 | 0.73 | 245 | 1.54 | 19.8% | 0.91 | 20.5% | |
| SSMH 4 - SSMH 3 | MOE | 51 | | | | 0.3 | 7.6 | 1.0 | 22.4 | 2.1 | 50.7 | 51 | 450 | 1.500 | 0.013 | 0.64 | 230 | 1.44 | 22.1% | 0.88 | 21.7% | Combined pumped and gravity fed flows do not exceed capacity therefore ok |
| SSMH 3 - SSMH 2 | | | | | | 0.0 | 7.6 | 0.0 | 22.4 | 0.0 | 50.7 | 0 | 525 | 1.500 | 0.013 | 0.31 | 240 | 1.11 | 21.2% | 0.67 | 21.2% | |
| SSMH 2 - SSMH 1 | | | | | | 0.0 | 7.6 | 0.0 | 22.4 | 0.0 | 50.7 | 0 | 525 | 1.500 | 0.013 | 0.22 | 202 | 0.93 | 25.1% | 0.59 | 23.1% | |
| | | | | | | | | | | | | | | | | | | | | | | |
| **Combined Catchment Flow** | | | | | | | **26.9** | | **80.3** | | **180.0** | | **525** | **1.500** | **0.013** | **0.22** | **202** | **0.93** | **89.2%** | **0.86** | **44.8%** | |
| | | | | | | | | | | | | | | | | | | | | | | |
| 1. Pumped Cumulative flows assume all flows are pumped simultaneously | | | | | | | | | | | | | | | | | | | | | | |

# WASTE WATER AND PIPE FLOW CALCULATOR

## WATERCARE WASTEWATER CODE OF PRACTICE - COLEBROOK WHITE AND MANNINGS EQUATIONS

**CLIENT:** Hugh Green Group
**PROJECT:** Park Estate Road Overall Catchment
**DETAIL:** Scenario 2 - Proposed

**DESIGNER:** RGP
**JOB NO:** 1972-00
**DATE:** 10/03/2021
**REV:** 1

NOTE: This spreadsheet calculates peak flow rates using the Watercare Code of Practice and pipe capacities using the Colebrook-White equation for pipes flowing full, and the Mannings equation for pipes flowing part-full
**Green boxes are user inputs**

**Design Flow Assumptions (Section 5.3.5.1 WWCoP):**

| **Residential** | Residential | High Rise Residential | |
|---|---|---|---|
| Average Dry Weather Flow (ADWF) = | 180 | 180 | l/p/d |
| Peak Factor: Self-Cleansing Design Flow = | 3.0 | 3.0 | |
| Peak Factor: Peak Design Flow = | 6.7 | 5.0 | |
| Self-Cleansing Design Flow (ADWF) = | 540.0 | 540.0 | l/p/d |
| Peak Design Flow (PWWF) = | 1206.0 | 900.0 | l/p/d |
| Number of People per Dwelling = | 3.0 | 5.0 | p |

| **Commercial/Industrial** | Design Flow (l/m²/d) | ADWF (l/m²/d) | PWWF (l/m²/d) |
|---|---|---|---|
| Dry retail (toilets not available to customers) | 1.3 | 2.6 | 6.5 |
| Dry retail (toilets available to customers) / Office Buildings | 4.3 | 8.6 | 21.5 |
| Wet retail (food and beverage retail/preparation) | 15.0 | 30 | 100.5 |
| Industrial: light water use | 4.5 | 22.5 | 30.2 |
| Industrial: medium water use | 6.0 | 30 | 40.2 |
| Industrial: heavy water use | 11.0 | 55 | 73.7 |
| Very heavy water users | | Specific Design Required | |
| Commercial/Industrial Selected Values = | **1.3** | 2.6 | 6.5 |

| **Other Facility Types** | Refer to table, WWCoP pg 33 |
|---|---|
| Peak Factor: Self-Cleansing Design Flow = | **2** |
| Peak Factor: Peak Design Flow = | **6.7** |

**Table 5.2 – Guide to roughness coefficients for *wastewater* lines**

| **Material** | **Colebrook-White coefficient** k (mm) | **Manning roughness coefficient** (n) |
|---|---|---|
| *All pipe material and lining types for gravity systems and low pressure collection systems (PWC), flowing full.* | *1.5* | *0.013* |
| *All pipe material and lining types for pressure rising mains, flowing full* | *0.6* | *0.011* |
| NOTE – (1) These values take into account possible effects of rubber ring joints, slime, and debris. (2) The n and k values apply for pipes up to *and including* DN 300. | | |

**Table 5.3 – Minimum pipe sizes for wastewater reticulation and property connections**

| **Pipe** | **Minimum size** DN (mm) |
|---|---|
| Connection servicing 1 dwelling unit | 100 |
| Connection servicing more than 1 dwelling unit | 150 |
| Connection servicing commercial lots | 150 |
| Connection servicing industrial lots | 225 |
| NOTE – In practical terms, in a *residential development* not exceeding 20 dwelling units, and where no pumping station is involved, DN 150 pipes laid within the limits of table 5.4 and table 5.5 will be adequate without specific hydraulic design *of the pipe network*. | |

| Line | Catchment Details | Increment Number of Residential/ Rural Dwellings | Increment Number of High Density Dwellings | Increment Commercial/ Industrial Area (m²) | Increment Other Facility Type (l/d) | Increment ADWF (l/s) | Cumulative ADWF (l/s) | Increment PDWF (l/s) | Cumulative PDWF (l/s) | Increment PWWF (l/s) | Cumulative PWWF (l/s) | Household Unit Equivalent | Diam (mm) | Ks | n | Grade (%) | Qmax (l/s) | Velocity Flowing Full (m/s) | Check Capacity - % of Qpwwf vs Qmax (must be <100%) | Vpdwf (must be >0.75m/s for self cleansing) | Check flow depth in pipe while carrying PDWF (must be < 50%) | Notes/Conclusions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PROPOSED (Existing conditions plus flows from fully completed Hugh Green Developments)** | Refer to sketch plan 1972-00-SK41-1 for proposed Hugh Green Development staged catchments | | | | | | | | | | | | | | | | | | | | | |
| PUMPED CATCHMENT | | | | | | | | | | | | | | | | | | | | | | |
| SSMH 7 - SSMH 6 | Pumped flows from upstream of Hugh Green Development | 3087 | | | | 19.3 | 19.3 | 57.9 | 57.9 | 129.3 | 129.3 | 3087 | 450 | 1.500 | 0.013 | 0.72 | 243 | 1.53 | 53.1% | 1.20 | 34.3% | |
| SSMH 6 - SSMH 5 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 450 | 1.500 | 0.013 | 0.67 | 235 | 1.48 | 55.0% | 1.17 | 34.9% | |
| SSMH 5 - SSMH 4 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 450 | 1.500 | 0.013 | 0.73 | 245 | 1.54 | 52.7% | 1.21 | 34.1% | |
| SSMH 4 - SSMH 3 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 450 | 1.500 | 0.013 | 0.64 | 230 | 1.44 | 56.3% | 1.15 | 35.3% | |
| SSMH 3 - SSMH 2 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 525 | 1.500 | 0.013 | 0.31 | 240 | 1.11 | 53.9% | 0.88 | 34.4% | |
| SSMH 2 - SSMH 1 | | | | | | 0.0 | 19.3 | 0.0 | 57.9 | 0.0 | 129.3 | 0 | 525 | 1.500 | 0.013 | 0.22 | 202 | 0.93 | 64.1% | 0.78 | 37.7% | |
| GRAVITY FED CATCHMENT | Assumes pumped catchment flows are off peak | | | | | | | | | | | | | | | | | | | | | |
| SSMH 7 - SSMH 6 | Gravity fed flows from upstream of Hugh Green Developments | 1000 | | | 15820 | 6.4 | 6.4 | 19.1 | 19.1 | 43.1 | 43.1 | 1026 | 450 | 1.500 | 0.013 | 0.72 | 243 | 1.53 | 17.7% | 0.88 | 19.5% | |
| SSMH 6 - SSMH 5 | Gravity fed flows from fully complete Hugh Green Developments | 102 | | | 12825 | 0.8 | 7.2 | 2.2 | 21.3 | 5.3 | 48.4 | 123 | 450 | 1.500 | 0.013 | 0.67 | 235 | 1.48 | 20.6% | 0.88 | 20.9% | |
| SSMH 5 - SSMH 4 | | 233 | | | | 1.5 | 8.7 | 4.4 | 25.7 | 9.8 | 58.1 | 233 | 450 | 1.500 | 0.013 | 0.73 | 245 | 1.54 | 23.7% | 0.96 | 22.5% | |
| SSMH 4 - SSMH 3 | | 237 | | | | 1.5 | 10.2 | 4.4 | 30.1 | 9.9 | 68.0 | 237 | 450 | 1.500 | 0.013 | 0.64 | 230 | 1.44 | 29.7% | 0.96 | 25.3% | |
| SSMH 3 - SSMH 2 | | 460 | | | | 2.9 | 13.0 | 8.6 | 38.8 | 19.3 | 87.3 | 460 | 525 | 1.500 | 0.013 | 0.31 | 240 | 1.11 | 36.4% | 0.78 | 28.0% | |
| SSMH 2 - SSMH 1 | | 48 | | | | 0.3 | 13.3 | 0.9 | 39.7 | 2.0 | 89.3 | 48 | 525 | 1.500 | 0.013 | 0.22 | 202 | 0.93 | 44.3% | 0.70 | 31.0% | Combined pumped and gravity fed flows exceed capacity therefore pumped flows must be off peak |
| **Combined Catchment Flow** | | | | | | | **32.6** | | **97.5** | | **218.6** | | **525** | **1.500** | **0.013** | **0.22** | **202** | **0.93** | **108.3%** | **0.91** | **49.7%** | |

1. Pumped Cumulative flows assume all flows are pumped simultaneously

# WASTE WATER AND PIPE FLOW CALCULATOR

## WATERCARE WASTEWATER CODE OF PRACTICE - COLEBROOK WHITE AND MANNINGS EQUATIONS

**CLIENT:** Hugh Green Group
**PROJECT:** Park Estate Road Overall Catchment
**DETAIL:** Scenario 3 - Future

**DESIGNER:** RGP
**JOB NO:** 1972-00
**DATE:** 10/03/2021
**REV:** 1

NOTE: This spreadsheet calculates peak flow rates using the Watercare Code of Practice and pipe capacities using the Colebrook-White equation for pipes flowing full, and the Mannings equation for pipes flowing part-full

**Green boxes are user inputs**

**Design Flow Assumptions (Section 5.3.5.1 WWCoP):**

| **Residential** | Residential | High Rise Residential | |
|---|---|---|---|
| Average Dry Weather Flow (ADWF) = | 180 | 180 | l/p/d |
| Peak Factor: Self-Cleansing Design Flow = | 3.0 | 3.0 | |
| Peak Factor: Peak Design Flow = | 6.7 | 5.0 | |
| Self-Cleansing Design Flow (ADWF) = | 540.0 | 540.0 | l/p/d |
| Peak Design Flow (PWWF) = | 1206.0 | 900.0 | l/p/d |
| Number of People per Dwelling = | 3.0 | 5.0 | p |

| **Commercial/Industrial** | Design Flow (l/m²/d) | ADWF (l/m²/d) | PWWF (l/m²/d) |
|---|---|---|---|
| Dry retail (toilets not available to customers) | 1.3 | 2.6 | 6.5 |
| Dry retail (toilets available to customers) / Office Buildings | 4.3 | 8.6 | 21.5 |
| Wet retail (food and beverage retail/preparation) | 15.0 | 30 | 100.5 |
| Industrial: light water use | 4.5 | 22.5 | 30.2 |
| Industrial: medium water use | 6.0 | 30 | 40.2 |
| Industrial: heavy water use | 11.0 | 55 | 73.7 |
| Very heavy water users | | Specific Design Required | |
| Commercial/Industrial Selected Values = | **1.3** | 2.6 | 6.5 |

| **Other Facility Types** | Refer to table, WWCoP pg 33 |
|---|---|
| Peak Factor: Self-Cleansing Design Flow = | **2** |
| Peak Factor: Peak Design Flow = | **6.7** |

**Table 5.2 – Guide to roughness coefficients for *wastewater* lines**

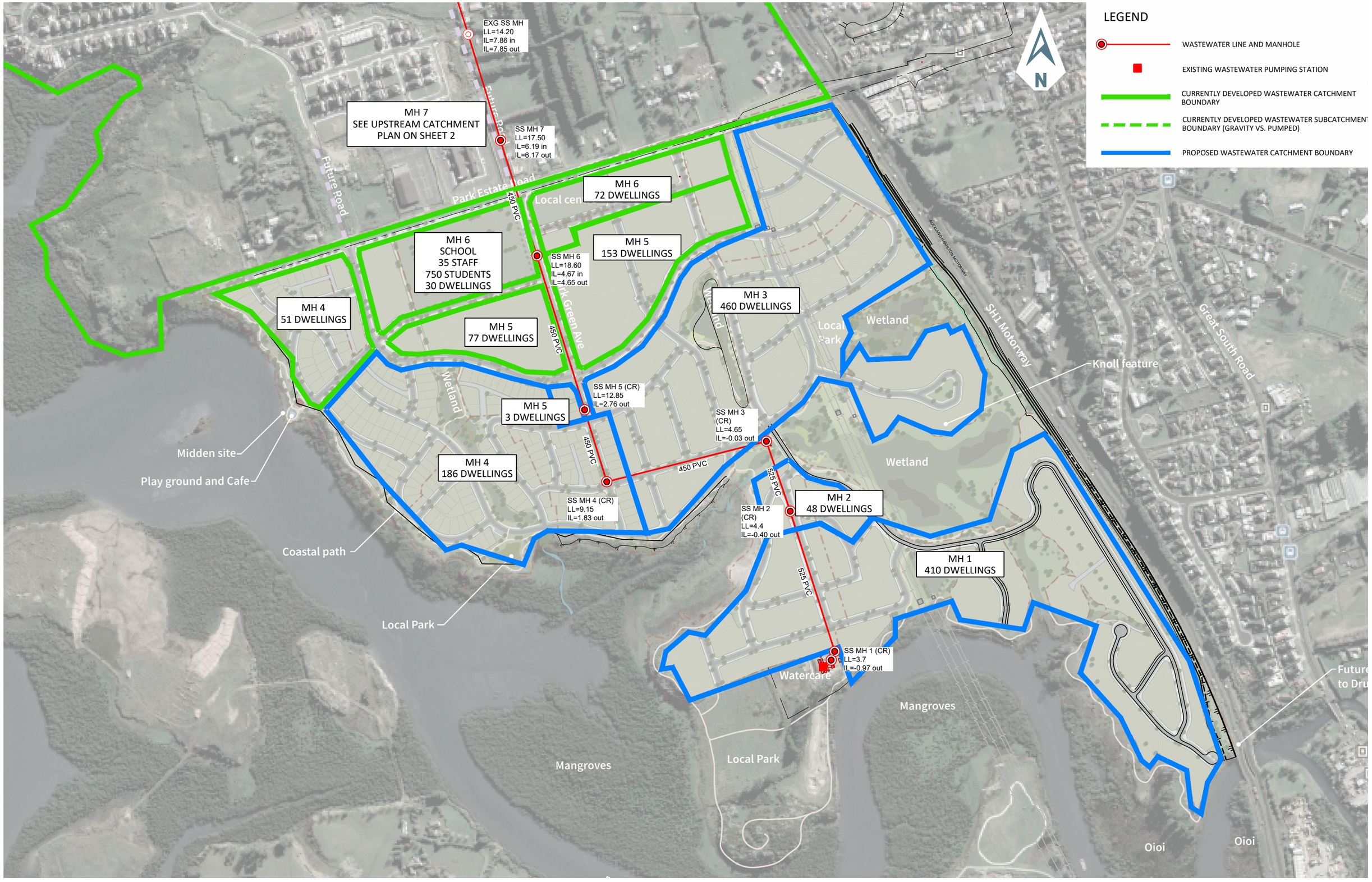
| **Material** | **Colebrook-White coefficient** k (mm) | **Manning roughness coefficient** (n) |
|---|---|---|
| *All pipe material and lining types for gravity systems and low pressure collection systems (PWC), flowing full.* | *1.5* | *0.013* |
| *All pipe material and lining types for pressure rising mains, flowing full* | *0.6* | *0.011* |
| NOTE – (1) These values take into account possible effects of rubber ring joints, slime, and debris. (2) The n and k values apply for pipes up to *and including* DN 300. | | |

**Table 5.3 – Minimum pipe sizes for wastewater reticulation and property connections**

| **Pipe** | **Minimum size** DN (mm) |
|---|---|
| Connection servicing 1 dwelling unit | 100 |
| Connection servicing more than 1 dwelling unit | 150 |
| Connection servicing commercial lots | 150 |
| Connection servicing industrial lots | 225 |
| NOTE – In practical terms, in a *residential development* not exceeding 20 dwelling units, and where no pumping station is involved, DN 150 pipes laid within the limits of table 5.4 and table 5.5 will be adequate without specific hydraulic design *of the pipe network*. | |

| Line | Catchment Details | Increment Number of Residential/ Rural Dwellings | Increment Number of High Density Dwellings | Increment Commercial/ Industrial Area (m²) | Increment Other Facility Type (l/d) | Increment ADWF (l/s) | Cumulative ADWF (l/s) | Increment PDWF (l/s) | Cumulative PDWF (l/s) | Increment PWWF (l/s) | Cumulative PWWF (l/s) | Household Unit Equivalent | Diam (mm) | Ks | n | Grade (%) | Qmax (l/s) | Velocity Flowing Full (m/s) | Check Capacity - % of Qpwwf vs Qmax (must be <100%) | Vpdwf (must be >0.75m/s for self cleansing) | Check flow depth in pipe while carrying PDWF (must be < 50%) | Notes/Conclusions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FUTURE (Flows from entire catchment area calculated at MPD | Refer to sketch plan 1972-00-SK41-1 and 1972-00-SK41-2 for catchment boundaries | | | | | | | | | | | | | | | | | | | | | |
| PUMPED CATCHMENT | | | | | | | | | | | | | | | | | | | | | | |
| SSMH 7 - SSMH 6 | Pumped flows from upstream of Hugh Green Development | 5268 | 18 | | 32680 | 33.5 | 33.5 | 100.1 | 100.1 | 224.1 | 224.1 | 5340 | 450 | 1.500 | 0.013 | 0.72 | 243 | 1.53 | 92.0% | 1.41 | 45.7% | |
| SSMH 6 - SSMH 5 | | | | | | 0.0 | 33.5 | 0.0 | 100.1 | 0.0 | 224.1 | 0 | 450 | 1.500 | 0.013 | 0.67 | 235 | 1.48 | 95.4% | 1.38 | 46.6% | |
| SSMH 5 - SSMH 4 | | | | | | 0.0 | 33.5 | 0.0 | 100.1 | 0.0 | 224.1 | 0 | 450 | 1.500 | 0.013 | 0.73 | 245 | 1.54 | 91.4% | 1.42 | 45.5% | |
| SSMH 4 - SSMH 3 | | | | | | 0.0 | 33.5 | 0.0 | 100.1 | 0.0 | 224.1 | 0 | 450 | 1.500 | 0.013 | 0.64 | 230 | 1.44 | 97.6% | 1.36 | 47.2% | |
| SSMH 3 - SSMH 2 | | | | | | 0.0 | 33.5 | 0.0 | 100.1 | 0.0 | 224.1 | 0 | 525 | 1.500 | 0.013 | 0.31 | 240 | 1.11 | 93.5% | 1.03 | 46.0% | |
| SSMH 2 - SSMH 1 | | | | | | 0.0 | 33.5 | 0.0 | 100.1 | 0.0 | 224.1 | 0 | 525 | 1.500 | 0.013 | 0.22 | 202 | 0.93 | 111.1% | 0.91 | 50.5% | |
| GRAVITY FED CATCHMENT | Assumes pumped catchment flows are off peak | | | | | | | | | | | | | | | | | | | | | |
| SSMH 7 - SSMH 6 | Gravity fed flows from upstream of Hugh Green Developments | 3226 | | | 66890 | 20.9 | 20.9 | 62.0 | 62.0 | 140.3 | 140.3 | 3337 | 450 | 1.500 | 0.013 | 0.72 | 243 | 1.53 | 57.6% | 1.23 | 35.5% | |
| SSMH 6 - SSMH 5 | Gravity fed flows from fully complete Hugh Green Developments | 102 | | | 12825 | 0.8 | 21.7 | 2.2 | 64.2 | 5.3 | 145.5 | 123 | 450 | 1.500 | 0.013 | 0.67 | 235 | 1.48 | 62.0% | 1.21 | 36.8% | |
| SSMH 5 - SSMH 4 | | 233 | | | | 1.5 | 23.2 | 4.4 | 68.6 | 9.8 | 155.3 | 233 | 450 | 1.500 | 0.013 | 0.73 | 245 | 1.54 | 63.3% | 1.27 | 37.3% | Combined pumped and gravity fed flows exceed capacity therefore pumped flows must be off peak |
| SSMH 4 - SSMH 3 | | 237 | | | | 1.5 | 24.7 | 4.4 | 73.1 | 9.9 | 165.2 | 237 | 450 | 1.500 | 0.013 | 0.64 | 230 | 1.44 | 72.0% | 1.23 | 39.9% | |
| SSMH 3 - SSMH 2 | | 460 | | | | 2.9 | 27.5 | 8.6 | 81.7 | 19.3 | 184.5 | 460 | 525 | 1.500 | 0.013 | 0.31 | 240 | 1.11 | 77.0% | 0.97 | 41.2% | |
| SSMH 2 - SSMH 1 | | 48 | | | | 0.3 | 27.8 | 0.9 | 82.6 | 2.0 | 186.5 | 48 | 525 | 1.500 | 0.013 | 0.22 | 202 | 0.93 | 92.4% | 0.86 | 45.4% | |
| **Combined Catchment Flow** | | | | | | | **61.3** | | **182.7** | | **410.6** | | **525** | **1.500** | **0.013** | **0.22** | **202** | **0.93** | **203.5%** | **1.08** | **73.1%** | |

1. Future catchment areas are calculated according to Auckland Unitary Plan at Maximum Probable Development.
2. Pumped Cumulative flows assume all flows are pumped simultaneously

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| REV | REVISION DETAILS | BY | DATE |
|---|---|---|---|
| - | - | - | XX.XX.XX |

| | | |
|---|---|---|
| DRAWN: | RGP | DATE: 03.2021 |
| CHECKED: | --- | DATE: XX.XX.XX |
| APPROVED: | --- | DATE: XX.XX.XX |

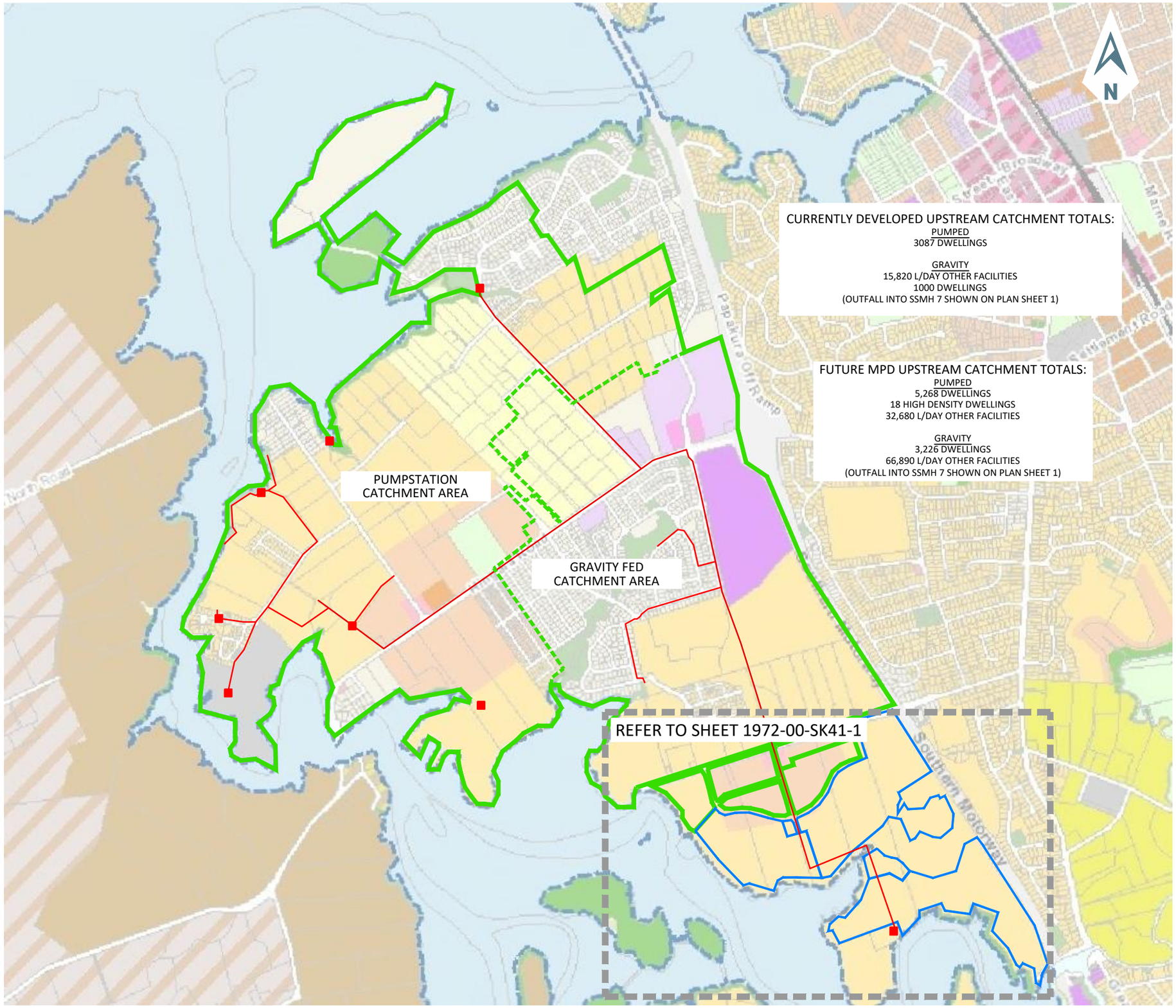


CIVILPLAN CONSULTANTS
Level 9, Laidlaw House, 20 Amersham Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGH GREEN LTD
144, 152, 180, 200, 252 PARK ESTATE ROAD
HINGAIA

SHEET TITLE:
WASTEWATER CATCHMENT PLAN
SHEET 1

| | |
|---|---|
| ISSUE STATUS: | DRAFT@31.03.21 |
| SCALE: (A1/A3) | 1:3000 / 1:6000 |
| SCALE BAR 1:6000@A3 | 0 60 120 180 240 300m |
| DRAWING NUMBER: | 1972-00-SK41-1 |
| REV: | - |




## LEGEND

- WASTEWATER LINE AND MANHOLE
- EXISTING WASTEWATER PUMPING STATION
- CURRENTLY DEVELOPED WASTEWATER CATCHMENT BOUNDARY
- CURRENTLY DEVELOPED WASTEWATER SUBCATCHMENT BOUNDARY (GRAVITY VS. PUMPED)
- PROPOSED WASTEWATER CATCHMENT BOUNDARY

**Unitary Plan Zones**

Zones

- Residential - Large Lot Zone
- Residential - Rural and Coastal Settlement Zone
- Residential - Single House Zone
- Residential - Mixed Housing Suburban Zone
- Residential - Mixed Housing Urban Zone
- Residential -Terrace Housing and Apartment Buildings Zone
- Open Space - Conservation Zone
- Open Space - Informal Recreation Zone
- Open Space - Sport and Active Recreation Zone
- Open Space - Civic Spaces Zone
- Open Space - Community Zone
- Business - City Centre Zone
- Business - Metropolitan Centre Zone
- Business - Town Centre Zone
- Business - Local Centre Zone
- Business - Neighbourhood Centre Zone
- Business - Mixed Use Zone
- Business - General Business Zone
- Business - Business Park Zone
- Business - Heavy Industry Zone
- Business - Light Industry Zone
- Future Urban Zone
- Green Infrastructure Corridor (Operative in some Special Housing Areas)
- Rural - Rural Production Zone
- Rural - Mixed Rural Zone

## NOTES:

1. CURRENTLY DEVELOPED AND FUTURE CATCHMENT BOUNDARIES INCLUDE THE SAME AREA BUT HOUSING DENSITY INCREASES WITH FUTURE MPD

| REV | REVISION DETAILS | BY | DATE |
|---|---|---|---|
| - | - | - | XX.XX.XX |

DRAWN: RGP DATE: 03.2021
CHECKED: --- DATE: XX.XX.XX
APPROVED: --- DATE: XX.XX.XX



CIVILPLAN CONSULTANTS
Level 9, Laidlaw House, 20 Amersham Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGH GREEN LTD
144, 152, 180, 200, 252 PARK ESTATE ROAD
HINGAIA

SHEET TITLE:
WASTEWATER CATCHMENT PLAN
SHEET 2

ISSUE STATUS: DRAFT@31.03.21
SCALE: (A1/A3) NOT TO SCALE
SCALE BAR N.T.S.
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