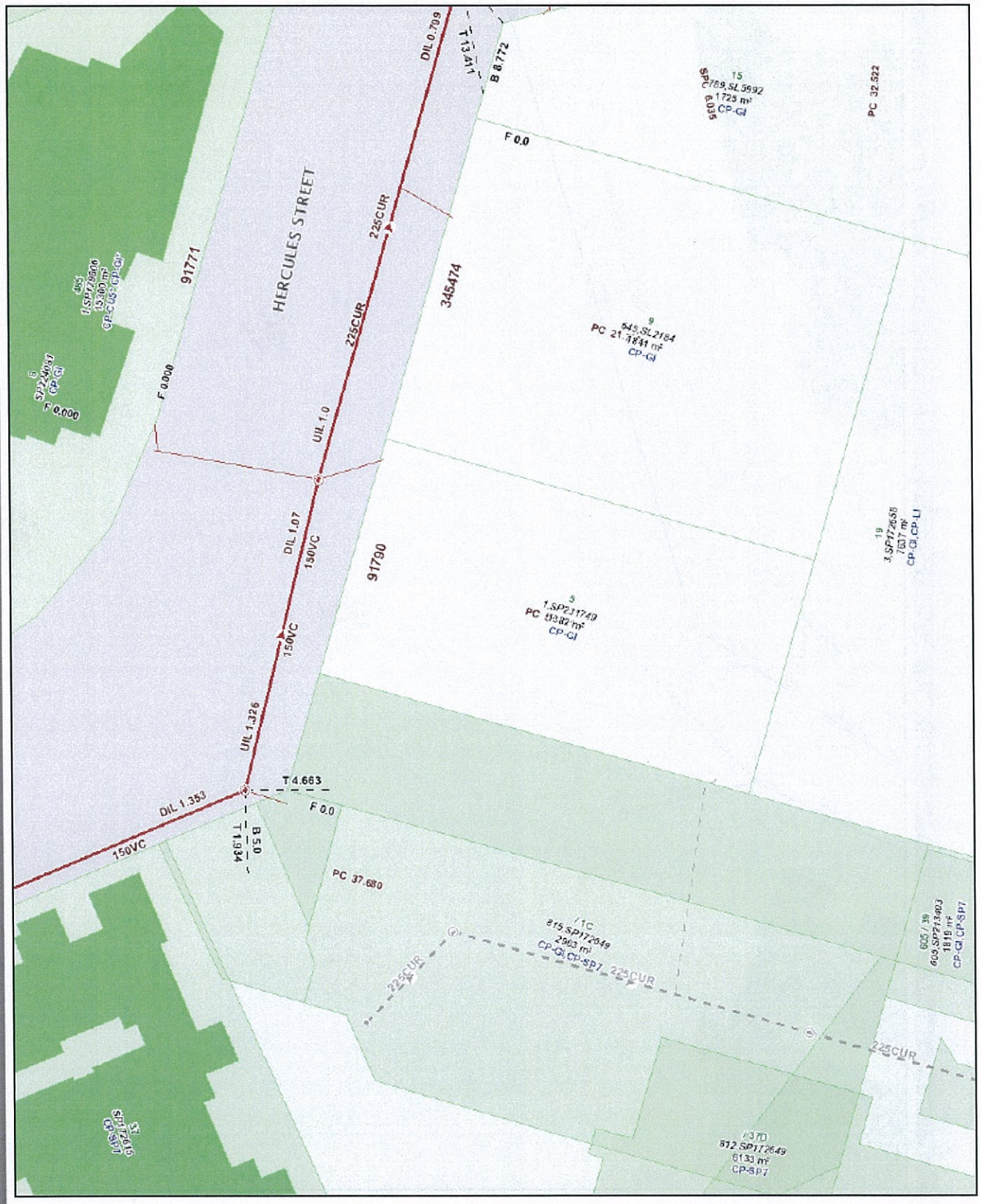
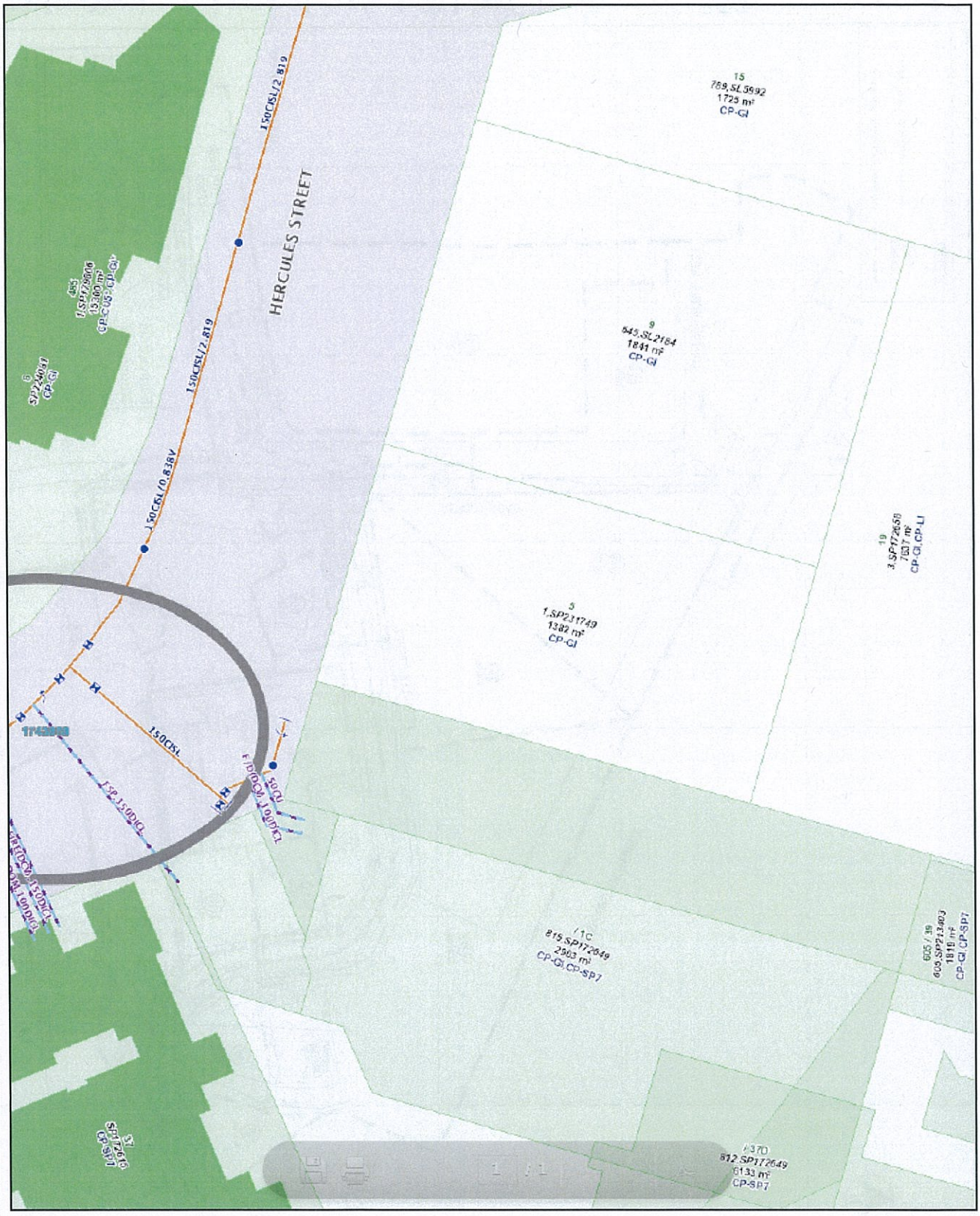
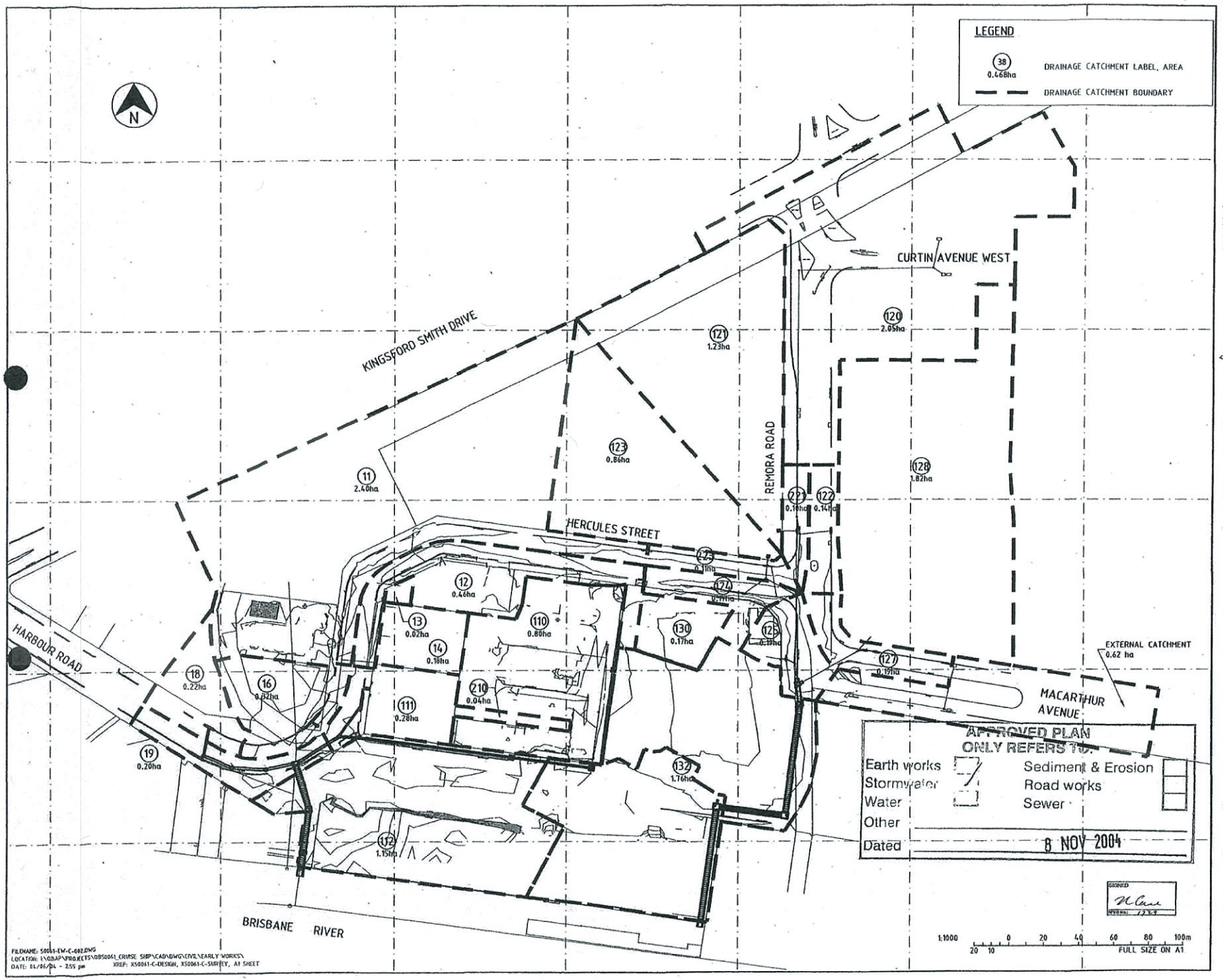
## BCC BIMAP STORMWATER PLAN

## BCC BIMAP SEWER PLAN



## BCC BIMAP WATER PLAN



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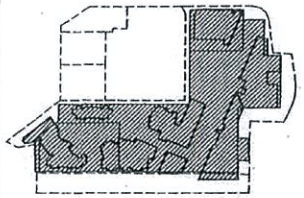
| REV | DATE | ISSUE | DRAWN | CHECKED |
|---|---|---|---|---|
| A | 03.06.04 | TENDER ISSUE | KC | |

**FOR TENDER PURPOSES ONLY**
DATE 4/6/04



KEY PLAN

PORTSIDE WHARF

**MULTIPLEX**

PROJECT
PORTSIDE WHARF
Hercules Street,
Ascot. Q

CLIENT
MULTIPLEX DEVELOPMENTS
Level 24 Waterfront Place
1 Eagle Street
Brisbane. Q

DRAWING NAME
STORMWATER CATCHMENT PLAN

SCALE AS SHOWN

APPROVED PROJECT DIRECTOR
REVIEWED PROJECT MANAGER
DESIGNED KC
DESIGN REVIEW

SKM PROJECT No QB50061

A1

SKM
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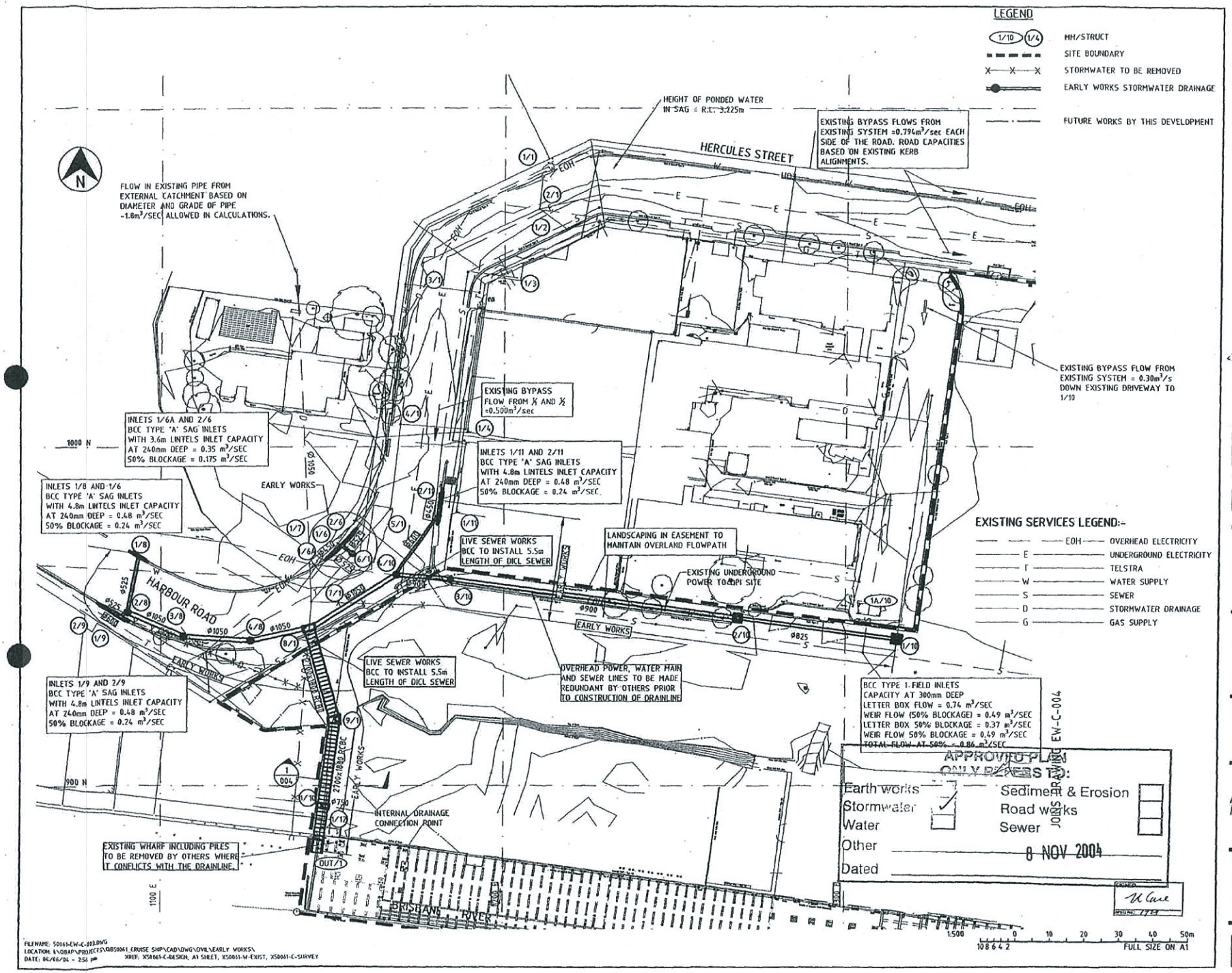
A.C.N. 001 584 665
360 Ann Street
Brisbane QLD 4000 Australia
Telephone (07) 3244 7100
Facsimile (07) 3244 7300

ARCHIEFIELD

| BUILDING | DISCIPLINE | DWG No. | REV. |
|---|---|---|---|
| EW | C | 002 | A |

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| REV | DATE | ISSUE | DRAWN | ENGINEER |
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DATE 4/6/04

KEY PLAN

PORTSIDE WHARF

MULTIPLEX

PROJECT
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Hercules Street,
Ascot. Q

CLIENT
MULTIPLEX DEVELOPMENTS
Level 24 Waterfront Place
1 Eagle Street
Brisbane. Q

DRAWING NAME
STORMWATER DRAINAGE
LAYOUT PLAN
SHEET 1 OF 2

SCALE AS SHOWN

APPROVED PROJECT DIRECTOR
REVIEWED PROJECT MANAGER
DESIGNED KC
DESIGN REVIEW

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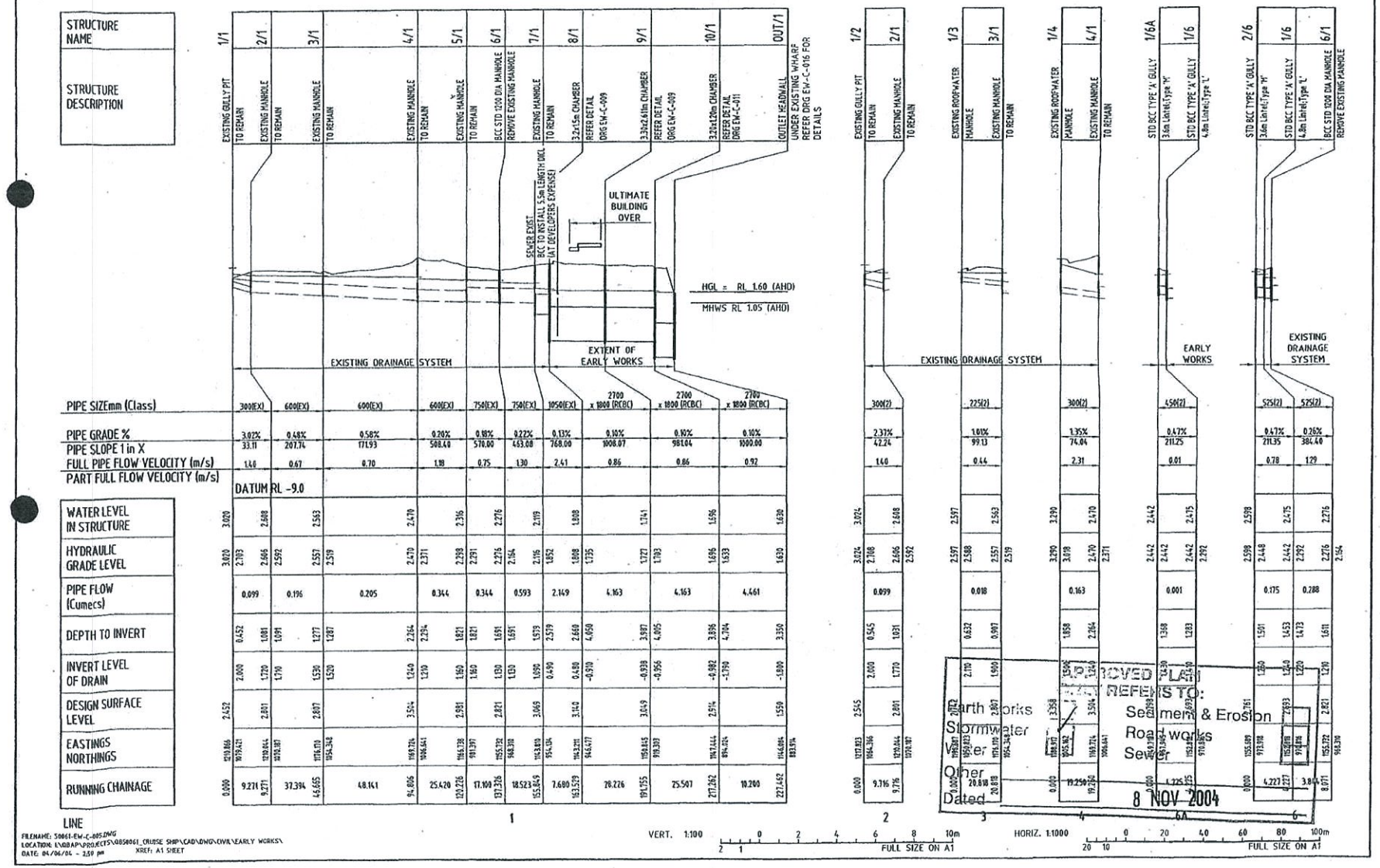
ARCHIFIELD

| BUILDING | DISCIPLINE | DWG No. | REV. |
|---|---|---|---|
| EW | C | 003 | A |

## NOTES

1. ALL PIPES AND BOX CULVERTS AND STRUCTURES WITH ANY SEGMENT BELOW RL 1.63 TO BE CONSTRUCTED WITH
   a) 50MPa CONCRETE
   b) EXPOSURE CLASS C
   c) REINFORCEMENT TO HAVE 50mm COVER
2. ALL PIPES 600 DIA OR SMALLER TO BE RUBBER RING JOINT.
3. PROVIDE TEMPORARY COVERS AT EXISTING GROUND LEVEL TO ALL STRUCTURES ON THE SITE. THESE STRUCTURES TO BE RAISED TO FINAL LEVELS AT APPROPRIATE STAGE DURING PROJECT. STRUCTURES EXTERNAL TO THE SITE TO BE CONSTRUCTED TO FINISHED LEVEL.
4. BASE SLABS TO ALL BOX CULVERTS REFER DRG EW-C-019 FOR DETAILS.
5. ALL STEP IRONS AND LADDERS IN MANHOLES TO BE DESIGNED FOR A MARINE ENVIRONMENT.




APPROVED PLAN
REFERS TO:
Earthworks
Stormwater
Water
Other
Sediment & Erosion
Roadworks
Sewer
Dated 8 NOV 2004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|---|---|---|---|---|
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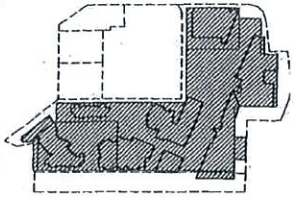
**FOR TENDER PURPOSES ONLY**
DATE 4/6/04



KEY PLAN

PORTSIDE WHARF

**MULTIPLEX**

PROJECT
PORTSIDE WHARF
Hercules Street,
Ascot. Q

CLIENT
MULTIPLEX DEVELOPMENTS
Level 24 Waterfront Place
1 Eagle Street
Brisbane. Q

DRAWING NAME
STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 1 OF 4

SCALE AS SHOWN

APPROVED PROJECT DIRECTOR
REVIEWED PROJECT MANAGER
DESIGNED KC
DESIGN REVIEW

SKM PROJECT No. QB50061
A1

SKM Sinclair Knight Merz Pty Ltd
ARKHEFIELD

| BUILDING | DISCIPLINE | DWG No. | REV. |
|---|---|---|---|
| EW | C | 005 | A |

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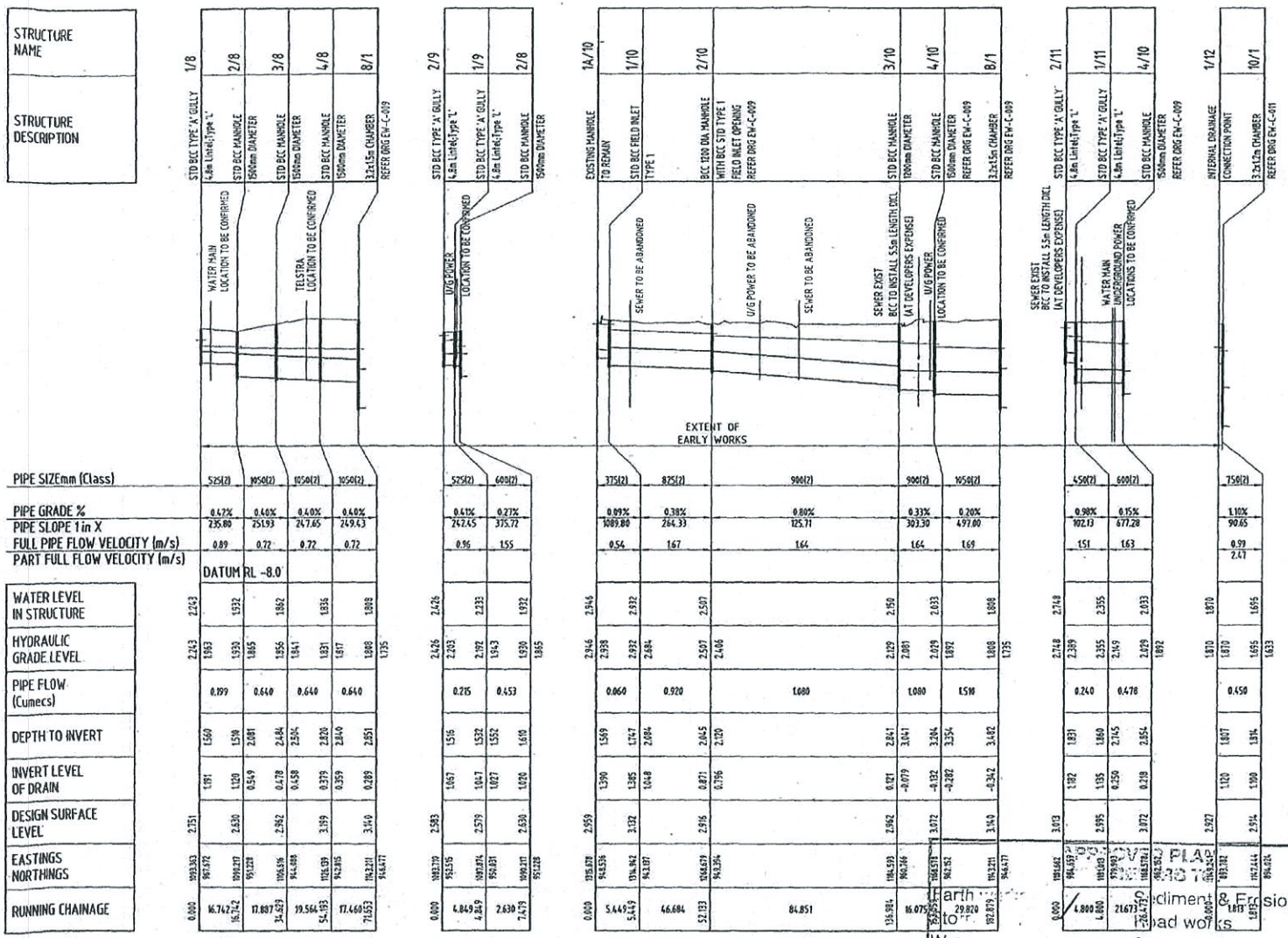
LOCATION: E:\QBAP\PROJECTS\QB50061_CRUISE SHIP\CAD\DWG\CIVIL\EARLY WORKS\
DATE: 04/06/04 - 2:50 pm XREF: A1 SHEET

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| REV. | DATE | ISSUE | DRAWN | CHECKED |
|---|---|---|---|---|
| A | 03.06.04 | TENDER ISSUE | KC | |

**FOR TENDER PURPOSES ONLY**
DATE 4/6/04

KEY PLAN

PORTSIDE WHARF

**MULTIPLEX**

PROJECT
PORTSIDE WHARF
Hercules Street,
Ascot. Q

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Level 24 Waterfront Place
1 Eagle Street
Brisbane. Q

DRAWING NAME
STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 2 OF 4

SCALE AS SHOWN

APPROVED PROJECT DIRECTOR
REVIEWED PROJECT MANAGER
DESIGNED KC
DESIGN REVIEW

SKM PROJECT No. QB50061
A1

SKM Sinclair Knight Merz Pty Ltd
ARKHEFIELD

| BUILDING | DISCIPLINE | DWG No. | REV. |
|---|---|---|---|
| EW | C | 006 | A |

FILENAME: 50061-EW-C-006.DWG
LOCATION: L:\QBAP\PROJECTS\QB50061_CRUISE SHIP\CAD\DWG\CIVIL\EARLY WORKS\
DATE: 04/06/04 - 3:40 pm XREF: A1 SHEET

| LOCATION | | | | | TIME | | SUB-CATCHMENT RUNOFF | | | | | | INLET DESIGN | | | | | | | DRAIN DESIGN | | | | | | | | | | | | | | | | | | | HEADLOSSES | | | | | | | | | | | | | | | | | | |

| LOCATION | | | | | TIME | | SUB-CATCHMENT RUNOFF | | | | | | INLET DESIGN | | | | | | | | DRAIN DESIGN | | | | | | | | | | | | | | | HEADLOSSES | | | | | | | | | | | | PART FULL | | | DESIGN LEVELS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN ARI | STRUCTURE No. | DRAIN SECTION | SUB-CATCHMENTS CONTRIBUTING | LAND USE | SLOPE OF CATCHMENT | SUB-CATCHMENT TIME OF CONC. | RAINFALL INTENSITY | 10yr RUNOFF CO-EFFICIENT | CO-EFFICIENT OF RUNOFF | SUB-CATCHMENT AREA | EQUIVALENT AREA | SUM OF (C x A) | SUB-CATCHMENT DISCHARGE | FLOW IN B.C. (INC. BYPASS) | ROAD GRADE | ALLOWABLE | MINOR FLOW ROAD CAPACITY | INLET TYPE | FLOW INTO INLET | BYPASS FLOW | BYPASS STRUCTURE No. | CRITICAL TIME OF CONC. | RAINFALL INTENSITY | TOTAL (C x A) | MAJOR TOTAL FLOW | MAJOR SURFACE FLOW CAPACITY | MAJOR SURFACE FLOW | PIPE FLOW | REACH LENGTH | PIPE GRADE | PIPE / BOX DIMENSIONS (CLASS) | FLOW VELOCITY FULL (PIPE GRADE VELOCITY) | TIME OF FLOW IN REACH | STRUCTURE CHART No. | STRUCTURE RATIOS FOR 'K' VALUE CALCULATIONS | VELOCITY HEAD | U/S HEADLOSS COEFFICIENT | U/S PIPE STRUCT. HEADLOSS | | | LAT. HEADLOSS CO-EFFICIENT | LAT. PIPE STRUCT. HEADLOSS | M.S.E CO-EFFICIENT | CHANGE IN M.S.E | PIPE FRICTION SLOPE | PIPE FRICTION HEADLOSS (L x Sf) | DEPTH | VELOCITY | CONVERT LEVELS | DRAIN SECTION HGL | UPSTREAM HGL | LAT. HGL | M.S.E. | SURFACE OR R.L. INVERT LEVEL | STRUCTURE No. |
| YYS | | | | | % | min | mm/h | | | ha | ha | ha | L/s | L/s | % | L/s | | | L/s | L/s | | min | mm/h | ha | L/s | L/s | L/s | L/s | m | % | mm | m/s | min | | m | | m | | m | | m | m | % | m | m | m/s | m | m | m | m | m | m | |
| 100 100 | 2/10 | 2/10 Fe 3/10 | 10,210 | | | 5.00 5.00 | 125 125 | 0.88 0.88 | 100 100 | 0.060 0.060 | 0.060 0.060 | 0.060 0.060 | 36 36 FLOW WOULD EXCEED 3.195m | 190 | 160 | 171 | | FIELD INLET SEE BLOCKAGE | 190 | 0 | 0 | 5.47 5.47 | 124 124 | 0.060 0.060 | 7.33 | | | (Pipe flows Sub-critical in flows) | 1000 | 10.824 | 4.84 | 90HDS | 1.46 (2.56) | 4.06 | | | 0.07 | 0.76 | 0.90 | | | | 0.34 | 0.101 | 0.33 | 0.277 | | | 1.696 1.571 | 2.646 2.519 | 2.541 | | 2.501 | 2.596 | 2/10 |
| 200 200 | 3/10 | 3/10 Fe 4/10 | 170,210 | | | | | | | | | | | | | | | 2% | | | | 6.33 6.33 | 298 298 | 0.060 0.060 | 6.95 | | | (Pipe flows Sub-critical in flows) | 1000 | 10.875 | 0.33 | 90HDS | 1.46 (1.03) | 0.16 | | | 0.07 | 0.35 | 0.30 | | | | 0.50 | 0.069 | 0.33 | 0.052 | | | 0.821 0.768 | 2.401 2.829 | 2.121 | | 2.150 | 2.942 | 3/10 |
| 1/4 1/4 | 1.1 | 1.1 Fe 1/10 | | | | | | | | | | | 0 0 | | | | | | | 500 | 2/11 | 0.00 0.00 | 125 125 | 0.000 0.000 | 0 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1.1 |
| 300 300 | 2/11 | 2/11 Fe 1/12 | 210 | | | 5.00 5.00 | 125 125 | 0.88 0.88 | 100 100 | 0.200 0.200 | 0.200 0.200 | 0.200 0.200 | 253 253 FLOW WOULD EXCEED 34.646m | 753 | 0.00 | 260 | | 1195.2N/S SEE BLOCKAGE | 260 | 513 | 1/11 | 5.00 5.00 | 125 125 | 0.200 0.200 | 253 | | | (Pipe flows Grate full) | 260 | 0.000 | 0.04 | 45HDS | 1.51 (0.78) | 0.05 | | | 0.96 | 3.09 | 0.309 | | | | 3.09 | 0.759 | 0.71 | 0.036 | | | 1.632 1.595 | 2.309 2.355 | 2.368 | | 2.368 | 2.013 | 2/11 |
| 400 400 | 1/12 | 1/12 Fe 1/13 | 210,211 | | | 5.00 5.00 | 125 125 | 0.88 0.88 | 100 100 | 0.001 0.001 | 0.001 0.001 | 0.001 0.001 | 1 1 FLOW WOULD EXCEED 22.262m | 556 | 0.00 | 260 | | 1195.2N/S SEE BLOCKAGE | 260 | 236 | 1/9 | 5.05 5.05 | 123 123 | 0.201 0.201 | 252 | | | (Pipe flows Sub-critical in flows) | 470 | 23.673 | 0.15 | 60HDS | 1.63 (0.64) | 0.22 | | | 0.05 | 1.52 | 0.206 | 0.55 | 0.026 | | 1.52 | 0.206 | 0.55 | 0.026 | | | 0.854 0.828 | 2.369 2.629 | 2.355 | | 2.355 | 2.995 | 1/12 |
| 500 500 | 4/10 | 4/10 Fe 5/1 | 110,210,111 | | | | | | | | | | | | | | | 2% | | | | 6.69 6.69 | 296 296 | 1.021 1.021 | 9.12 | | | (Pipe flows Sub-critical in flows) | 650 | 20.829 | 0.30 | 90HDS | 1.63 (1.13) | 0.29 | | | 0.66 | 0.94 | 0.075 | | | | 0.97 | 0.91 | 0.28 | 0.006 | | | 0.760 0.704 | 2.592 2.808 | 2.829 | | 2.633 | 3.072 | 4/10 |
| 600 600 | 2/9 | 2/9 Fe 1/9 | 29 | | | 5.00 5.00 | 125 125 | 0.88 0.88 | 100 100 | 0.001 0.001 | 0.001 0.001 | 0.001 0.001 | 1 1 FLOW WOULD EXCEED 3.826m | 215 | 0.00 | 260 | | 1195.2N/S SEE BLOCKAGE | 215 | 0 | | 5.00 5.00 | 125 125 | 0.001 0.001 | 1 | | | (Pipe flows Grate full) | 215 | 1.619 | 0.11 | 52HDS | 0.96 (1.29) | 0.08 | | | 0.67 | 4.75 | 0.223 | | | | 4.75 | 0.223 | 0.23 | 0.010 | | | 1.592 1.572 | 2.592 2.592 | 2.626 | | 2.626 | 2.583 | 2/9 |
| 700 700 | 1/9 | 1/9 Fe 2/9 | 29,19 | | | 5.00 5.00 | 125 125 | 0.88 0.88 | 100 100 | 0.199 0.199 | 0.199 0.199 | 0.199 0.199 | 184 184 FLOW WOULD EXCEED 10.204m | 454 | 0.00 | 260 | | 1195.2N/S SEE BLOCKAGE | 260 | 276 | 2/9 | 5.00 5.00 | 123 123 | 0.200 0.200 | 179 | | | (Pipe flows Sub-critical in flows) | 453 | 2.830 | 0.27 | 60HDS | 1.55 (1.18) | 0.03 | | | 0.22 | 2.41 | 0.219 | | | | 2.37 | 0.294 | 0.58 | 0.013 | | | 1.637 1.629 | 2.963 2.730 | 2.792 | | 2.330 | 2.579 | 1/9 |
| 800 800 | 1/8 | 1/8 Fe 2/8 | 18 | | | 5.00 5.00 | 125 125 | 0.88 0.88 | 100 100 | 0.229 0.229 | 0.229 0.229 | 0.229 0.229 | 199 199 FLOW WOULD EXCEED 4.251m | 199 | 0.00 | 260 | | 1195.2N/S SEE BLOCKAGE | 199 | 0 | 0 | 5.00 5.00 | 125 125 | 0.229 0.229 | 199 | | | (Pipe flows Grate full) | 199 | 16.362 | 0.42 | 52HDS | 0.89 (1.28) | 0.25 | | | 0.040 | 4.93 | 0.280 | | | | 4.93 | 0.294 | 0.39 | 0.033 | | | 1.776 1.665 | 2.963 2.730 | 2.263 | | 2.263 | 2.351 | 1/8 |
| 900 900 | 2/8 | 2/8 Fe 3/8 | 29,19,18 | | | 5.20 5.20 | 118 118 | 0.88 0.88 | 100 100 | 0.620 0.620 | 0.620 0.620 | 0.620 0.620 | 371 | | | | | 2% | | | | 5.20 5.20 | 118 118 | 0.620 0.620 | 371 | | | (Pipe flows Sub-critical in flows) | 665 | 17.887 | 0.56 | 90HDS | 0.32 (1.00) | 0.30 | | | 0.026 | 2.65 | 0.065 | | | | 2.57 | 0.067 | 0.45 | 0.009 | | | 1.599 1.579 | 2.965 2.856 | 2.739 | | 2.592 | 2.636 | 2/8 |
| 1000 1000 | 3/8 | 3/8 Fe 4/8 | 29,19,18 | | | 5.50 5.50 | 112 112 | 0.88 0.88 | 100 100 | 0.620 0.620 | 0.620 0.620 | 0.620 0.620 | 364 | | | | | 2% | | | | 5.50 5.50 | 112 112 | 0.620 0.620 | 364 | | | (Pipe flows Sub-critical in flows) | 616 | 15.564 | 0.49 | 90HDS | 0.32 (1.02) | 0.33 | | | 0.024 | 0.58 | 0.015 | | | | 0.60 | 0.029 | 0.05 | 0.000 | | | 1.508 1.439 | 2.863 2.831 | 2.856 | | 2.862 | 2.862 | 3/8 |
| 1100 1100 | 4/8 | 4/8 Fe 5/8 | 29,19,18 | | | 5.91 5.91 | 106 106 | 0.88 0.88 | 100 100 | 0.620 0.620 | 0.620 0.620 | 0.620 0.620 | 357 | | | | | 2% | | | | 5.91 5.91 | 106 106 | 0.620 0.620 | 357 | | | (Pipe flows Sub-critical in flows) | 640 | 17.648 | 0.43 | 90HDS | 0.32 (1.02) | 0.29 | | | 0.024 | 0.53 | 0.014 | | | | 0.54 | 0.020 | 0.05 | 0.000 | | | 1.449 1.379 | 2.812 2.808 | 2.831 | | 2.836 | 2.799 | 4/8 |
| 1200 1200 | 5/1 | 5/1 Fe 5/1 | 11 Fe 1/1,29,19,1 8 | | | | | | | | | | | | | | | 2% | | | | 7.48 7.48 | 201 201 | 1.922 1.922 | 3862 | | | (Pipe flows Sub-critical in flows) | 4.63 | 23.226 | 0.38 | 2700 (1999 BOX) | 0.86 (0.48) | 0.43 | | | 0.038 | 1.97 | 0.073 | | | | 1.95 Vel1 1.656 Vel2 2.170 Eq Dia 1.656 Angle 120 Flow 3.125 Baseline 2.12 CHART 4.1 High vel loss Eqv 4/9 & 5/1 Dir: 0.56/Dir: 1.575 Dir=Dir: 1.4 Dir=Dir: 0.7 Cor/Dir: 0.31 & 1.599 Low vel Cor: 1.78 Dir: 0.20 Dir: 0.56 Cor/Dir: 0.9 & 1.59 Cor/Dir: 0.9 & 1.625 H.L: 5.544 No grate flow H.L.=1.2 + 5.544 Ex=Exc: 5.4 CHART 5.1 Dir/Dir: 4.1 Dir/Dir: 4.16 Ex=Exc: 4.26 Interpolated Exc: 1.03 Exc: 1.03 K vals stop pipes at pipe flow Ex 1.03 Ex: 1.03 Average: Ex 1.59 Ex: 1.95 | | | | | | | | | | | | | | | | | | |

# APPENDIX B

## HYDRAULIC CALCULATIONS

# INITIAL PEAK FLOW CALCULATIONS

Based on QUDM (2008) 4.00 'Catchment Hydrology'

Written by BB 31/10/08

BORNHORST + WARD
CONSULTING ENGINEERS
CIVIL AND STRUCTURAL

Job Number: 13256
Job Name: 5 Hercules St, Hamilton

Designed: JD
Checked:

IFD Location: Hamilton

## TOTAL RUNOFF COEFF.

| | Sub Catchment Area (Ha) | | Runoff Coeficients | | Calculated C10 | |
|---|---|---|---|---|---|---|
| No. | Existing | Proposed | Existing | Proposed | Existing | Proposed |
| Roof / Hardstand | 0.126 | 0.103 | 0.90 | 0.90 | | |
| Landscaping | 0.012 | 0.036 | 0.70 | 0.70 | | |
| | 0.1382 | 0.1382 | | | 0.88 | 0.85 |

Raw IFD data has been obtained from the Bureau of Meteorology (BOM) website.

## EXISTING TIME OF CONCENTRATION

| | | |
|---|---|---|
| | Std Inlet Time | 5 |
| SHEET FLOW | Site Slope (%) | 0 |
| | Flow Length (m) | 0 |
| | Horton's "n" | 0 |
| | Travel Time (min) | 0.00 |
| CHANNEL/PIPE FLOW | Travel Length (m) | 0 |
| | Fall (m) | 0 |
| | Travel Time (min) | 0 |
| | Multiplier | 0 |
| | Travel Time (min) | 0 |
| | Total Time (Tc) | 5.0 |

## DEVELOPED TIME OF CONCENTRATION

| | | |
|---|---|---|
| | Std Inlet Time | 5 |
| SHEET FLOW | Site Slope (%) | 0 |
| | Flow Length (m) | 0 |
| | Horton's "n" | 0 |
| | Travel Time (min) | 0.00 |
| CHANNEL/PIPE FLOW | Travel Length (m) | 0 |
| | Fall (m) | 0 |
| | Travel Time (min) | 0 |
| | Multiplier | 0 |
| | Travel Time (min) | 0 |
| | Total Time (Tc) | 5.0 |

## PEAK RUNOFF CALCULATIONS

| | Rainfall Intenciety (mm/hr) | | Coeficient of Runoff | | Peak Runoff Rates (m^3/s) | |
|---|---|---|---|---|---|---|
| ARI Event yr | Existing | Proposed | Existing | Proposed | Existing | Proposed |
| 1 | 119 | 119 | 0.71 | 0.68 | 0.032 | 0.031 |
| 2 | 152 | 152 | 0.75 | 0.72 | 0.044 | 0.042 |
| 5 | 192 | 192 | 0.84 | 0.81 | 0.062 | 0.059 |
| 10 | 214 | 214 | 0.88 | 0.85 | 0.073 | 0.070 |
| 20 | 246 | 246 | 0.93 | 0.89 | 0.087 | 0.084 |
| 50 | 287 | 287 | 1.00 | 0.98 | 0.110 | 0.108 |
| 100 | 319 | 319 | 1.00 | 1.00 | 0.122 | 0.122 |

## PEAK FLOWS FOR FREQUENT EVENTS

| ARI Event | % of Q1 | Peak discharge (m^/s) | |
|---|---|---|---|
| yr | | Existing | Proposed |
| 1mth | 25% | 0.008 | 0.008 |
| 2mth | 40% | 0.013 | 0.012 |
| 3mth | 50% | 0.016 | 0.016 |
| 4mth | 60% | 0.019 | 0.019 |
| 6mth | 75% | 0.024 | 0.023 |
| 9mth | 90% | 0.029 | 0.028 |
| 12mth | 100% | 0.032 | 0.031 |

Job Num: 13256
Designer : JD
24/01/2014 12:58

Description : **5 Hercules Street, Hamilton**

Comments : Section A assumed 0.25m^3/s flow on eastern side of Hercules Street

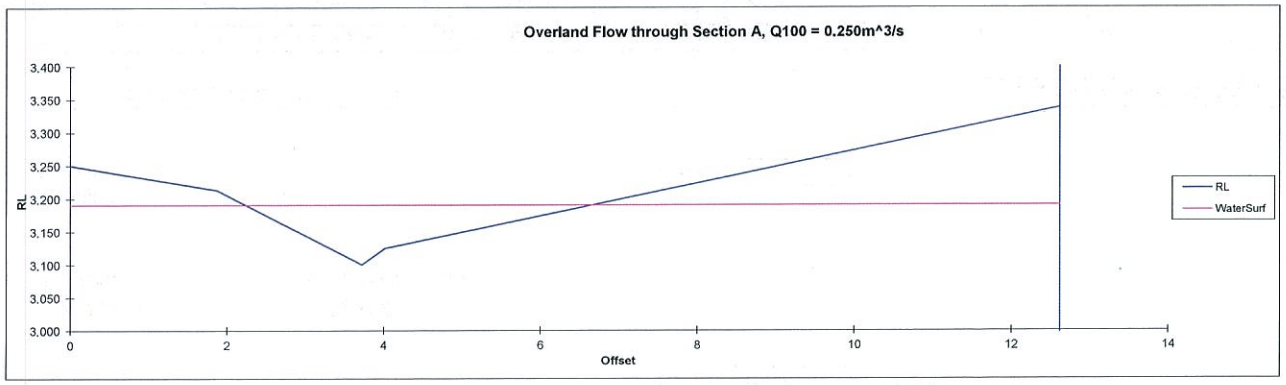
| | | depth | | | | | | |
|---|---|---|---|---|---|---|---|---|
| water lev | 3.190 | 0.065 | | | | | | |
| slope m/m | 0.012 | avg | A | B | P | R | AR2/3 | PR5/3 |
| mann n (const) | 0.035 | | 0.19 | 4.42 | 7.61 | 0.02 | 0.015530426 | 0.01555 |
| V | 0.26 | | | | | | | |

Q compound 0.25 m3/s COMPOUND CROSS SECTION ( ARR 1987 , 4.38) (n varies)

Flow adj = 0.9 0.228

K: 4.41 2.31 0.00

| Pt | location | Offset | RL | n | Z | area | perimeter | Pn^1.5 | B | R | K= A.R^2/3/n | PR^5/3/n | Q-sect (uniform) | Q-sect (compound) | v | Water RL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | prop | 0 | 3.250 | 0.013 | -2.0% | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.077 | 0.077 | 0.000 | 0.01 | 8.426501 | 3.19 |
| 2 | c'over ramp | 1.87 | 3.213 | 0.013 | -6.1% | 0.07 | 1.48 | 0.002 | 1.48 | 0.04 | 0.646 | 0.647 | 0.000 | 0.071 | 1.063665 | 3.19 |
| 3 | bot ramp | 3.72 | 3.100 | 0.013 | 8.3% | 0.02 | 0.30 | 0.000 | 0.30 | 0.08 | 0.324 | 0.324 | 0.000 | 0.036 | 1.526896 | 3.19 |
| 4 | p'ment | 4.02 | 3.125 | 0.015 | 2.5% | 0.09 | 2.64 | 0.005 | 2.64 | 0.03 | 0.581 | 0.582 | 0.000 | 0.064 | 0.742742 | 3.19 |
| 5 | centreline | 12.62 | 3.337 | 0.013 | #DIV/0! | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.077 | 0.077 | 0.000 | 0.008 | 8.426501 | 3.19 |



Job Num: 13256
Designer : JD
24/01/2014 12:59

Description : **5 Hercules Street, Hamilton**

Comments : Section B assumed 0.25m^3/s flow on eastern side of Hercules Street

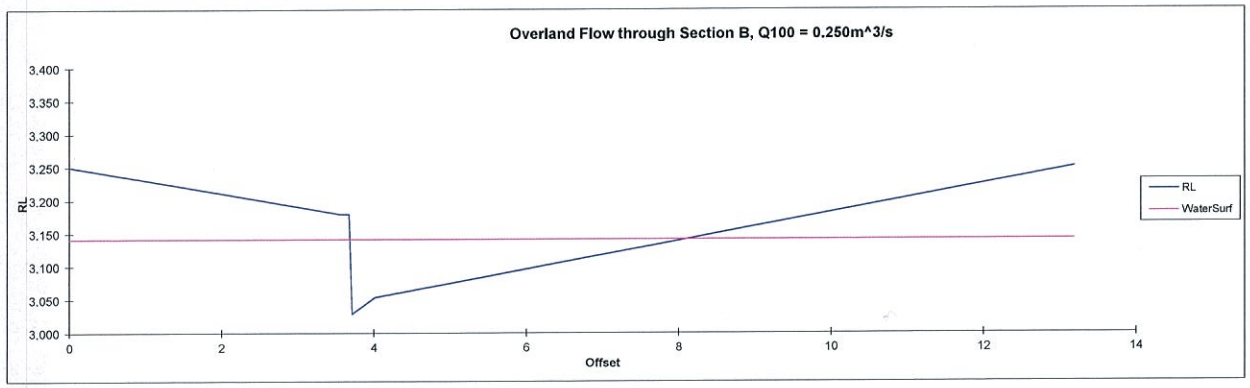
| | | depth | | | | | | |
|---|---|---|---|---|---|---|---|---|
| water lev | 3.141 | -0.038 | | | | | | |
| slope m/m | 0.012 | avg | A | B | P | R | AR2/3 | PR5/3 |
| mann n (const) | 0.035 | | 0.21 | 4.41 | 4.50 | 0.05 | 0.028024 | 0.028053 |
| V | 0.41 | | | | | | | |

Q compound 0.25 m3/s COMPOUND CROSS SECTION ( ARR 1987 , 4.38) (n varies)

Flow adj = 0.9 0.221

K: 5.16 2.24 0.00

| Pt | location | Offset | RL | n | Z | area | perimeter | Pn^1.5 | B | R | K= A.R^2/3/n | PR^5/3/n | Q-sect (uniform) | Q-sect (compound) | v | Water RL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | prop | 0 | 3.250 | 0.035 | -2.0% | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.029 | 0.029 | 0.000 | 0.00 | 3.129843 | 3.14 |
| 2 | start fpath | 0.97 | 3.231 | 0.013 | -2.0% | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.077 | 0.077 | 0.000 | 0.008 | 8.426501 | 3.14 |
| 3 | end fpath | 2.17 | 3.207 | 0.035 | -2.0% | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.029 | 0.029 | 0.000 | 0.003 | 3.129843 | 3.14 |
| 4 | bok | 3.56 | 3.179 | 0.013 | 0.0% | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.077 | 0.077 | 0.000 | 0.008 | 8.426501 | 3.14 |
| 5 | top | 3.67 | 3.179 | 0.013 | -375.0% | 0.00 | 0.12 | 0.000 | 0.03 | 0.01 | 0.008 | 0.008 | 0.000 | 0.001 | 0.498724 | 3.14 |
| | inv | 3.71 | 3.029 | 0.013 | 8.3% | 0.03 | 0.30 | 0.000 | 0.30 | 0.10 | 0.492 | 0.492 | 0.000 | 0.054 | 1.80382 | 3.14 |
| | lip | 4.01 | 3.054 | 0.015 | 2.1% | 0.18 | 4.08 | 0.007 | 4.08 | 0.04 | 1.460 | 1.462 | 0.000 | 0.160 | 0.902207 | 3.14 |
| | centreline | 13.191 | 3.250 | 0.015 | #DIV/0! | 0.00 | 0.00 | 0.000 | 0.00 | 1.00 | 0.067 | 0.067 | 0.000 | 0.007 | 7.302967 | 3.14 |
| | | 13.191 | 3.250 | 0.000 | | | n= | 0.015 | | | | 2.239 | | | 0.01 | |
| | | | | | | | | | | | n= | 0.013 | | | | |



# APPENDIX C

## ADDITIONAL INFORMATION

Brisbane City Council

# FloodWise Property Report

| Report Reference |
|---|
| 2812363 |

27/11/2013 11:09:47

*Dedicated to a better Brisbane*

THIS REPORT IS FOR BUILDING AND DEVELOPMENT PURPOSES ONLY.

The FloodWise Property Report is a free report to inform Brisbane residents and professionals about flood risks for a specified lot or property to plan and build in accordance with Council requirements. A flood level higher than those shown below can occur in any year, although such events are rare.

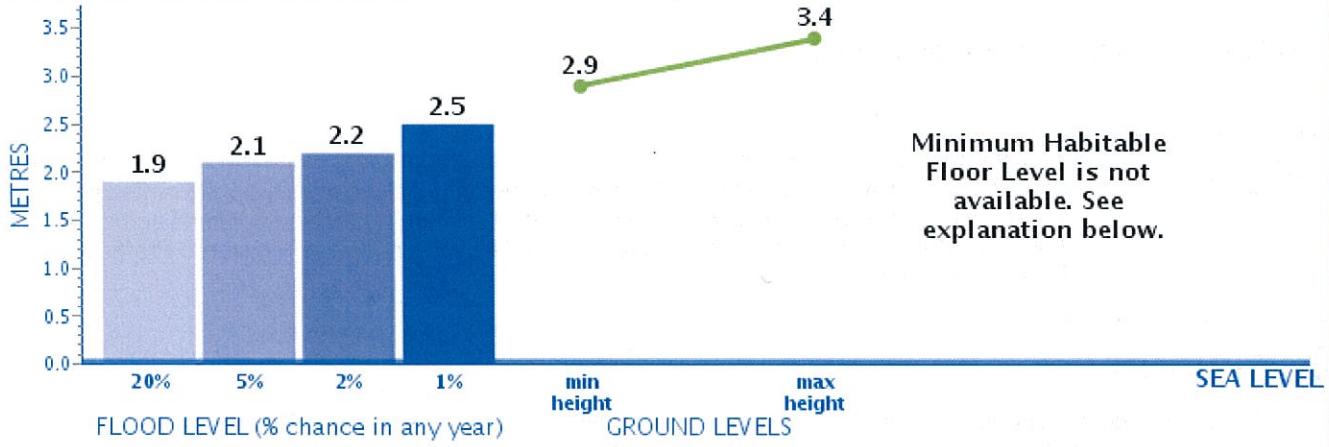
To find out more about how the contents of this report may affect your ability to build or renovate, as well as Council advice on how to protect your property and family by being FloodWise, visit www.brisbane.qld.gov.au, a Customer Service Centre or call (07) 3403 8888.

## PROPERTY DETAILS:

**Address:** 5 HERCULES ST HAMILTON QLD 4007

**Lot Details:** L.1/SP.231749

## FLOOD LEVEL INFORMATION




**Flood Levels**
The bars in the graph above show the percentage chance of that level being reached or exceeded in any year at this address or lot.

**Ground Levels (Min - Max)**
The line above shows this property's lowest and highest ground levels. Confirm with a surveyor.

**Minimum Habitable Floor Level**
If a property is in an overland flow path or a large allotment a minimum habitable floor level cannot be provided. See flood and property flag information over page.

**For a detailed summary of anticipated flood levels and flags see technical summary over page.**

## HIGHEST SOURCE OF FLOODING

STORM TIDE The highest source of flooding affecting this property originates from storm tide.

## FLOOD AND PROPERTY DEVELOPMENT FLAGS

Current records indicate this property may be affected by one or more flood or property development flags. Please review the technical summary over page for more detail.

# Technical Summary

Use this summary to supply information about this property to surveyors, builders, certifiers, architects and engineers who may request this FloodWise Property Report. This summary has been designed to be easily read if scanned or faxed.

## Property Details

**Address:** **5 HERCULES ST HAMILTON QLD 4007**

**Lot Details:** **L.1/SP.231749**

## Property Information

| | |
|---|---|
| Minimum Ground Level (AHD) | 2.9 m |
| Maximum Ground Level (AHD) | 3.4 m |
| Defined Flood Level (DFL) | 2.5 m |
| Defined Flood Level Source | STORM TIDE |
| Minimum Habitable Floor Level (AHD) | N/A |

## Estimated Peak Flooding Levels

| ARI (Years) | % chance | Level (AHD) | Source |
|---|---|---|---|
| 5 | 20% | 1.9 m | STORM TIDE |
| 20 | 5% | 2.1 m | STORM TIDE |
| 50 | 2% | 2.2 m | STORM TIDE |
| 100 | 1% | 2.5 m | STORM TIDE |

## Flood and Property Development Flags

| | |
|---|---|
| Large Allotment | This property is a Large Allotment of over 1000 square metres. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across this site. For more information or advice, it is recommended you engage a Registered Professional Engineer of Queensland. |

# Disclaimer

1 Defined Flood Levels and Interim Residential Flood Levels, and the Minimum Habitable Floor Levels based on them, are determined from the information available to Council at the date of issue. These flood levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating flood levels.

2 Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disclaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.

# Useful Definitions

**Australian Height Datum (AHD)** – The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

**Average Recurrence Interval (ARI) or % Chance** – The probability of experiencing a flood of a particular magnitude. ARI can be interpreted in terms of years (frequency). ARI levels quoted in this report are measured in height above sea level (AHD). ARI can also be described as the percentage chance that a location will flood in any one year. For example, a 5 year ARI flood event corresponds to a 20% likelihood of a flood of this magnitude or greater occurring in any one year.

**Defined Flood Level (DFL)** – The DFL is the minimum flood planning level that development must adhere to in a given location to minimise the risk of potential flooding. The DFL is dependent on the type of development, the source of flooding and the severity of a flood event. Locating development at or above this level does not mean the property is immune to flooding.

**Maximum and Minimum Ground Level** – Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

**Minimum Habitable Floor Level** – The minimum level above sea level at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family and rumpus rooms) must be constructed.

**City Plan 2000** – City Plan 2000 sets out what you can build and where new development should go. Council assesses proposed new development against the City Plan 2000.

# Find Out More

For general information on your flood risk and how to prepare your home or business for potential flooding visit http://www.brisbane.qld.gov.au/beprepared.

If you are planning to renovate or build, Council recommends you engage a Registered Professional Engineer of Queensland to undertake a thorough assessment of all flood risks specific to the property.

## Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit **www.brisbane.qld.gov.au/planning-building**

You can also find Brisbane City Council's City Plan 2000, draft new City Plan, Neighbourhood Plans as well as other information and training videos to help with your building or development plans.

## James Dewhurst

**From:** Sajid Imam Syed [Sajid.Syed@urbanutilities.com.au]
**Sent:** Friday, 24 January 2014 11:41 AM
**To:** James Dewhurst
**Cc:** DevelopmentEnquiries
**Subject:** Completed - 13/4028, Sewer Capacity 5-9 Hercules Street, Hamilton - Sajid
**Attachments:** H204- H2 GROUND SAN_AC2.pdf; H100- COVER SHEET_AC1.pdf; H101- SITE PLAN_AC1.pdf; H104- H1 GROUND SAN_AC2.pdf; 5-9 Hercules St Advice.pdf; Development Advice 5 Hercules Street, Hamilton

Hi James,

I refer to your e-mail of 17 January 2014 requesting revised capacity assessment of the existing sewerage infrastructure servicing a proposed development at 5 Hercules Street, Hamilton.

The development has been assessed as a multi-unit development (1 Bedroom – 42 Units, 2 Bedroom – 88 Units and 3 Bedroom – 14 Units).

The expected PWWF discharge from the proposed development is 3.79 L/s.

The evidence provide by you on 17 January 2014 suggested that only a small portion of the Hamilton Harbour development is discharging to the sewerage network in Hercules Street and most of the Hamilton Harbour development is discharging in to the Kingsford Smith Drive sewer and your intention to connect to the existing 225mm dia. sewer in Hercules Street as stated in your email dated 17/01/2014 (not 150mm dia. sewer in Hercules Street as mentioned in your previous enquiry dated 21/11/2013).

Based on information provided, a hydraulic assessment of the sewerage network servicing the site under peak wet weather flow conditions has been completed. The assessment indicates that the existing 225mm dia. sewer servicing the site has adequate capacity to service the proposed development in accordance with SEQ Water Supply and Sewerage Design and Construction Code.

If you wish to discuss this matter further please e-mail **developmentenquiries@urbanutilities.com.au** with the QUU reference number or call (07) 34322200.

For all new enquiries please e-mail them to **developmentenquiries@urbanutilities.com.au** so the request can be recorded and allocated to an available officer. Request sent directly to officer will not be actioned.

Kind Regards

**Sajid Imam Syed**
Engineer
Development Services

T 07 38556646 |
E sajid.syed@urbanutilities.com.au
**www.urbanutilities.com.au**

QUEENSLAND UrbanUtilities