## ATTACHMENT A

## Water Quantity Model Information

**Existing Conditions**

- DRAINS Information
  (Input & Output 5 year, 100 year, PMF)
  Catchment Figure
  Existing DRAINS Model Screenshot (Labels and worst case 100 year)

**Proposed Conditions**

- DRAINS Information
  (Input & Output 5 year, 100 year, 100 year + 10% rainfall increase, 100 year + 20% rainfall increase, PMF)
  Stage 2 Drainage Plan
  Proposed DRAINS Model Screenshot (Labels and worst case 100 year)

**Flow Comparison**

- At Location C, just downstream of Basin 10 outlet

**Existing Conditions**

- DRAINS Information
  (Input & Output 5 year, 100 year, PMF)
  Catchment Figure
  Existing DRAINS Model Screenshot (Labels and worst case 100 year)

Calculation Sheet

| | | | | | |
|---|---|---|---|---|---|
| Job | MPE Stage 2 | Design | AZ | Office | Sydney |
| | Existing | Date | Oct-16 | Job No | AA009335 |
| | | Checked | BC | | |
| | | Date | Oct-16 | | |

# MPE Stage 2

ARCADIS Design & Consultancy for natural and built assets

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| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | DRAINS | CHECKED | BC | DATE | 13/10/2016 |

**DATA**

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Exg.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Existing |

PIT / NODE DETAILS — Version 13

| Name | Type | Family | Size | Ponding Volume (cu.m) | Pressure Change Coeff. Ku | Surface Elev (m) | Max Pond Depth (m) | Base Inflow (cu.m/s) | Blocking Factor | x | y | Bolt-down lid | id | Part Full Shock Loss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ex SimtaChann | Node | | | | | | | 0 | | 305168.85 | 6241764.1 | | 114765372 | |
| Ex Combined SIMTA | Node | | | | | 10 | | 0 | | 306099.41 | 6241715.3 | | 66886585 | |
| EX G SIM | Node | | | | | | | 0 | | 305766.98 | 6241713.2 | | 66886579 | |
| EX S1 | Node | | | | | | | 0 | | 306156.77 | 6241471.5 | | 66886570 | |
| MPW | Node | | | | | | | 0 | | 305469.44 | 6241555.6 | | 66418913 | |
| EX DNSDC | OnGrade | Special | DNSDC | | 0 | 14 | | 0 | 0 | 306147.21 | 6241966.3 | No | 66418895 | 1 x Ku |
| EX dummy DNSDC | Node | | | | | 20 | | 0 | | 305887.09 | 6241810 | | 65741985 | |
| Ex Mo HW 1 | Headwall | | | | 0.5 | 14.15 | | 0 | | 305631.33 | 6241733.3 | | 66418818 | |
| Ex Top Chan | Node | | | | | 14.2 | | 0 | | 305567.28 | 6241737.2 | | 66354021 | |
| Carpark HW | Headwall | | | | 0.5 | 14.7 | | 0 | | 305545.96 | 6241255.1 | | 66354014 | |
| EX Carpark | Node | | | | | 11 | | 0 | | 305581.48 | 6241255.1 | | 65742025 | |
| EX A2 | Node | | | | | | | 0 | | 306304.17 | 6240616.2 | | 65742001 | |
| EX A1 E | Node | | | | | 10 | | 0 | | 306343.53 | 6241049 | | 65741998 | |
| E Moore | Node | | | | | 10 | | 0 | | 305966.76 | 6241562.7 | | 117904849 | |
| EX E S1 | Node | | | | | 10 | | 0 | | 306237.26 | 6241625.6 | | 117904865 | |
| EX A1 | Node | | | | | 10 | | 0 | | 306549.62 | 6241054.6 | | 119788497 | |
| W Moore | Node | | | | | 10 | | 0 | | 305593.51 | 6241576.7 | | 121800214 | |
| N621911 | Node | | | | | | | 0 | | 305540.68 | 6241015.8 | | 122115309 | |
| N621913 | Node | | | | | 14.2 | | 0 | | 305542.15 | 6241687.5 | | 122115325 | |

DETENTION BASIN DETAILS

| Name | Elev | Volume | Not Used | Outlet Type | K | Dia(mm) | Centre RL | Pit Family | Pit Type | x | y | HED | Crest RL | Crest Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Store A2 | 13.24 | 0 | | None | | | | | | 306059.64 | 6240648.2 | No | | |
| | 13.3 | 0.015 | | | | | | | | | | | | |
| | 13.4 | 0.19 | | | | | | | | | | | | |
| | 13.5 | 4.125 | | | | | | | | | | | | |
| | 13.6 | 22.806 | | | | | | | | | | | | |
| | 13.7 | 74.754 | | | | | | | | | | | | |
| | 13.8 | 171.018 | | | | | | | | | | | | |
| | 13.9 | 342.16 | | | | | | | | | | | | |
| | 14 | 630.48 | | | | | | | | | | | | |
| | 14.1 | 1118.78 | | | | | | | | | | | | |
| | 14.2 | 1926.27 | | | | | | | | | | | | |
| | 14.3 | 3160.4 | | | | | | | | | | | | |
| | 14.4 | 4835.58 | | | | | | | | | | | | |
| | 14.5 | 6964.12 | | | | | | | | | | | | |
| | 14.6 | 9563.34 | | | | | | | | | | | | |
| | 14.7 | 12682.6 | | | | | | | | | | | | |
| | 14.8 | 16390.2 | | | | | | | | | | | | |
| | 14.9 | 20816.7 | | | | | | | | | | | | |
| | 15 | 25941.6 | | | | | | | | | | | | |
| | 15.1 | 31774.6 | | | | | | | | | | | | |
| | 15.2 | 38137.8 | | | | | | | | | | | | |
| | 15.3 | 44975.1 | | | | | | | | | | | | |
| | 15.4 | 52117.8 | | | | | | | | | | | | |
| | 15.5 | 59590.3 | | | | | | | | | | | | |
| | 15.6 | 67356.2 | | | | | | | | | | | | |
| | 15.7 | 75203.2 | | | | | | | | | | | | |
| | 15.8 | 83103.9 | | | | | | | | | | | | |
| | 15.9 | 91063.6 | | | | | | | | | | | | |
| | 16 | 99109.7 | | | | | | | | | | | | |
| | 16 | 99109.7 | | | | | | | | | | | | |
| Store A1 | 12.65 | 0 | | None | | | | | | 306135.26 | 6241275.5 | No | | |
| | 12.9 | 0.03 | | | | | | | | | | | | |
| | 13 | 0.039 | | | | | | | | | | | | |
| | 13.1 | 2.114 | | | | | | | | | | | | |
| | 13.2 | 14.038 | | | | | | | | | | | | |
| | 13.3 | 39.629 | | | | | | | | | | | | |
| | 13.4 | 81.294 | | | | | | | | | | | | |
| | 13.5 | 146.75 | | | | | | | | | | | | |
| | 13.6 | 248.51 | | | | | | | | | | | | |
| | 13.7 | 411.632 | | | | | | | | | | | | |
| | 13.8 | 706.865 | | | | | | | | | | | | |
| | 13.9 | 1251.34 | | | | | | | | | | | | |
| | 14 | 2109.65 | | | | | | | | | | | | |
| | 14.1 | 3230.35 | | | | | | | | | | | | |
| | 14.2 | 4564.46 | | | | | | | | | | | | |
| | 14.3 | 6071.14 | | | | | | | | | | | | |
| | 14.4 | 7765.32 | | | | | | | | | | | | |
| | 14.5 | 9687.54 | | | | | | | | | | | | |
| | 14.6 | 11834.3 | | | | | | | | | | | | |
| | 14.7 | 14174.2 | | | | | | | | | | | | |
| | 14.8 | 16701.3 | | | | | | | | | | | | |
| | 14.9 | 19417.7 | | | | | | | | | | | | |
| | 15 | 22401.9 | | | | | | | | | | | | |
| Ex Sto C1 | 11.579 | 0 | | None | | | | | | 305953.48 | 6241715.7 | No | | |
| | 12 | 2000 | | | | | | | | | | | | |
| | 12.32 | 3640.5 | | | | | | | | | | | | |
| | 12.43 | 4677 | | | | | | | | | | | | |
| | 12.49 | 5700 | | | | | | | | | | | | |
| | 12.52 | 5800 | | | | | | | | | | | | |
| | 12.61 | 6000 | | | | | | | | | | | | |
| | 12.65 | 7000 | | | | | | | | | | | | |
| | 12.7 | 7300 | | | | | | | | | | | | |
| | 13.07 | 10300 | | | | | | | | | | | | |
| | 13.21 | 12000 | | | | | | | | | | | | |
| | 14.315 | 16000 | | | | | | | | | | | | |

SUB-CATCHMENT DETAILS

| Name | Pit or Node | Total Area (ha) | Paved Area % | Grass Area % | Supp Area % | Paved Time (min) | Grass Time (min) | Supp Time (min) | Paved Length (m) | Grass Length (m) | Supp Length (m) | Paved Slope(%) % | Grass Slope % | Supp Slope % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C EX NTH SIM | Ex Combined SIM | 12.28 | 60.7 | 39.3 | 0 | 12 | 15 | 0 | | | | | | |
| C EX S1 | EX S1 | 15.851 | 60.9 | 39.1 | 0 | 15 | 20 | 0 | | | | | | |
| C EX DNSDC | EX DNSDC | 5.28 | 82 | 18 | 0 | 5 | 5 | 0 | | | | | | |
| C EX Carpark | Carpark HW | 2.08 | 61.2 | 38.8 | 0 | 5 | 5 | 0 | | | | | | |
| C EX A2 | Store A2 | 27.45 | 33.4 | 66.6 | 0 | 14.5 | 24 | 0 | | | | | | |
| C EX A1 | Store A1 | 20.9 | 50 | 50 | 0 | 14 | 15 | 0 | | | | | | |
| C EX A1 E | EX A1 E | 0.8585 | 50 | 50 | 0 | 5 | 7 | 0 | | | | | | |
| C E Moore | E Moore | 2 | 80 | 20 | 0 | 5 | 20 | 10 | | | | | | |
| C EX E S1 | EX E S1 | 9.76 | 60.9 | 39.1 | 0 | 15 | 20 | 0 | | | | | | |
| C W Moore | W Moore | 1.85 | 50 | 50 | 0 | 5 | 20 | 10 | | | | | | |
| Ex G06 | N621911 | 7.25 | 5 | 95 | 0 | 15 | 15 | 0 | | | | | | |

| Name | Pit or Node | Total Area | Impervious Area | Avg Slope(%) | Mannings n | Time lag (mins) | Rainfall Multiplier | Hydrological Model |
|---|---|---|---|---|---|---|---|---|
| Ex G04 | MPW | 3.6 | 10 | 0.5 | 0.04 | 0 | 1 | Moorebank RAFTS |

PIPE DETAILS

| Name | From | To | Length (m) | U/S IL (m) | D/S IL (m) | Slope (%) | Type | Dia (mm) | I.D. (mm) | Rough | Pipe Is | No. Pipes | Chg From | At Chg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P EX dummy DNSDC | EX DNSDC | EX dummy DNSD | 10 | 10 | 9.9 | 1 | RCP Class 2 | 600 | 600 | 0.3 | New | 1 | EX DNSDC | 0 |
| P EX UNDER MOORE | Ex Mo HW 1 | Ex Top Chan | 18.15 | 11.58 | 11.4 | 0.99 | Box Culverts | 2W x 1.8H | | 0.3 | Existing | 2 | Ex Mo HW 1 | 0 |
| P EX Carpark | Carpark HW | EX Carpark | 8.77 | 14.31 | 13.87 | 5.02 | RCP Class 2 | 300 | 300 | 0.3 | NewFixed | 1 | Carpark HW | 0 |

DETAILS of SERVICES CROSSING PIPES

| Pipe | Chg | Bottom | Height of Service | Chg | Bottom | Height of S | Chg | Bottom | Height of S | etc | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (m) | Elev (m) | (m) | (m) | Elev (m) | (m) | (m) | Elev (m) | (m) | etc | | | | |
| | | | | | | | | | | | | | | |
| CHANNEL DETAILS | | | | | | | | | | | | | | |
| Name | From | To | Type | Length | U/S IL | D/S IL | Slope | Base Width | L.B. Slope | R.B. Slope | Manning | Depth | Roofed | |
| | | | | (m) | (m) | (m) | (%) | (m) | (1:?) | (1:?) | n | (m) | | |
| | | | | | | | | | | | | | | |
| OVERFLOW ROUTE DETAILS | | | | | | | | | | | | | | |
| Name | From | To | Travel | Spill | Crest | Weir | Cross | Safe Depth | SafeDepth | Safe | Bed | D/S Area | | id |
| | | | Time | Level | Length | Coeff. C | Section | Major Storm | Minor Storm | DxV | Slope | Contributing | | |
| | | | (min) | (m) | (m) | | | (m) | (m) | (sq.m/sec) | (%) | % | | |
| F Ex Comb SIMTA | Ex Combined SIM | Ex Sto C1 | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66886586 |
| F EX G SIM | EX G SIM | Ex Mo HW 1 | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66886581 |
| F EX S1 | EX S1 | Ex Combined SIM | 7 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66886571 |
| F MPW | MPW | N621913 | 4 | | | | West Moorebank | 0.15 | 0.2 | 0.6 | 0.2 | 0 | | 66418872 |
| F EX DNSDC | EX DNSDC | EX G SIM | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 65742028 |
| F EX dummy DNSDC | EX dummy DNSD | Ex Sto C1 | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66418902 |
| F EX OVER MOORE | Ex Mo HW 1 | Ex Top Chan | 0.1 | 14.15 | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66418832 |
| Ex Channel | Ex Top Chan | Ex SimtaChann | 5 | | | | Concrete Channel | 0.3 | 0.3 | 0.6 | 0.1 | 100 | | 65745589 |
| F Ex Carpark Bypass | Carpark HW | N621913 | 10 | 0 | 20 | 1.6 | West Moore CP | 0.2 | 0.2 | 0.6 | 0.2 | 0 | | 121800256 |
| F EX Carpark | EX Carpark | E Moore | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66418914 |
| F EX A2 | Store A2 | EX A2 | 0.1 | 13.24 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 65770283 |
| F EX A1 | Store A1 | EX A1 E | 0.1 | 12.65 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 65770282 |
| F EX A1 E | EX A1 E | EX A1 | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 119788502 |
| F Ex Sto 3 | Ex Sto C1 | EX G SIM | 0.1 | 11.579 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 117017831 |
| F E Moore | E Moore | Ex Combined SIM | 15 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 117904855 |
| F EXE S1 | EX E S1 | Ex Combined SIM | 7 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 117904870 |
| F W Moore | W Moore | Ex Top Chan | 15 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 121800217 |
| F Ex G06 | N621911 | N621913 | 20 | | | | West Moorebank | 0.15 | 0.2 | 0.6 | 0.2 | 0 | | 122115311 |
| OF542838 | N621913 | Ex Top Chan | 0.1 | | | | West Moorebank | 0.15 | 0.2 | 0.6 | 0.2 | 0 | | 122115331 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| PIPE COVER DETAILS | | | | | | | | | | | | | | |
| Name | Type | Dia (mm) | Safe Cover (m) | Cover (m) | | | | | | | | | | |
| P EX dummy DNSDC | RCP Class 2 | 600 | 0.6 | 3.35 | | | | | | | | | | |
| P EX UNDER MOORE | Box Culverts | 0 | 0.6 | 0.62 | | | | | | | | | | |
| P EX Carpark | RCP Class 2 | 300 | 0.6 | -3.2 | Unsafe | | | | | | | | | |
| | | | | | | | | | | | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | 5 YEAR ARI RESULTS | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Exg.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Existing |

**5 Year ARI**

DRAINS results prepared from Version 2016.14

| PIT / NODE DETAILS | | | | Version 8 | | | | | Blocking Factor |
|---|---|---|---|---|---|---|---|---|---|
| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint | | |
| EX DNSDC | 11.14 | | 1.908 | | 2.86 | 0 | None | | |
| EX dummy DNSDC | 10.48 | | 0 | | | | | | |
| Ex Mo HW 1 | 12.43 | | 5.285 | | 1.72 | 0 | None | | |
| Ex Top Chan | 11.75 | | 1.661 | | | | | | |
| Carpark HW | 14.77 | | 0.723 | | -0.07 | 0.618 | Headwall height/system capacity | | |
| EX Carpark | 11 | | 0 | | | | | | |

| SUB-CATCHMENT DETAILS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
| C EX NTH SIM | 2.849 | 2.196 | 0.705 | 12 | 15 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C EX S1 | 3.174 | 2.537 | 0.692 | 15 | 20 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C EX DNSDC | 1.908 | 1.617 | 0.291 | 5 | 5 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C EX Carpark | 0.723 | 0.476 | 0.247 | 5 | 5 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C EX A2 | 4.28 | 2.083 | 2.301 | 14.5 | 24 | 0 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| C EX A1 | 4.299 | 2.42 | 1.893 | 14 | 15 | 0 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| C EX A1 E | 0.278 | 0.16 | 0.118 | 5 | 7 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C E Moore | 0.638 | 0.598 | 0.045 | 5 | 20 | 10 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C EX E S1 | 1.954 | 1.562 | 0.426 | 15 | 20 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C W Moore | 0.443 | 0.324 | 0.128 | 5 | 20 | 10 | AR&R 5 year, 1.5 hours storm, average 33.3 mm/h, Zone 1 |
| Ex G06 | 1.328 | 0.081 | 1.247 | 15 | 15 | 0 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| Ex G04 | 0.275 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 |

Outflow Volumes for Total Catchment (51.9 impervious + 57.2 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| AR&R 5 year, 5 minutes s | 12502.4 | 6040.12 (48.3 | 5414.57 (91.0 | 625.54 (9.5%) |
| AR&R 5 year, 25 minutes | 31369.71 | 21325.52 (68. | 14307.27 (95. | 7018.25 (42.7%) |
| AR&R 5 year, 45 minutes | 41138.58 | 28758.27 (69. | 18977.10 (96. | 9781.17 (45.4%) |
| AR&R 5 year, 1 hour stor | 46457.38 | 32810.76 (70. | 21486.69 (97. | 11324.07 (46.5%) |
| AR&R 5 year, 1.5 hours s | 54597.04 | 38663.17 (70. | 25363.80 (97. | 13299.37 (46.5%) |
| AR&R 5 year, 2 hours sto | 60887.36 | 43115.86 (70. | 28376.95 (97. | 14738.91 (46.2%) |
| AR&R 5 year, 3 hours sto | 70648.03 | 50126.86 (71. | 33079.18 (98. | 17047.68 (46.0%) |
| AR&R 5 year, 4.5 hours s | 81790.48 | 56965.35 (69. | 38332.54 (98. | 18632.81 (43.5%) |
| AR&R 5 year, 6 hours sto | 90766.14 | 62885.70 (69. | 42639.55 (98. | 20246.15 (42.6%) |
| AR&R 5 year, 9 hours sto | 105371.67 | 71913.21 (68. | 49562.66 (98. | 22350.54 (40.5%) |
| AR&R 5 year, 12 hours s | 117422.88 | 79950.55 (68. | 55300.50 (99. | 24650.05 (40.1%) |
| AR&R 5 year, 18 hours s | 137104.33 | 88222.19 (64 | 64671.63 (99. | 23550.56 (32.8%) |

| PIPE DETAILS | | | | | |
|---|---|---|---|---|---|
| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
| P EX dummy DNSDC | 1.913 | 6.77 | 11.142 | 10.5 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| P EX UNDER MOORE | 5.285 | 3.74 | 11.933 | 11.753 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| P EX Carpark | 0.105 | 3.6 | 14.439 | 13.999 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |

| CHANNEL DETAILS | | | |
|---|---|---|---|
| Name | Max Q (cu.m/s) | Max V (m/s) | Due to Storm |

| OVERFLOW ROUTE DETAILS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm |
| F Ex Comb SIMTA | 7.65 | 7.65 | 0 | 0.2 | 0.32 | 43.96 | 1.62 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F EX G SIM | 5.285 | 5.285 | 0 | 0.172 | 0.25 | 38.4 | 1.47 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| F EX S1 | 3.174 | 3.174 | 0 | 0.14 | 0.18 | 31.93 | 1.3 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F MPW | 0.275 | 0.275 | 0 | 0.129 | 0.03 | 45.5 | 0.25 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 |
| F EX DNSDC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| F EX dummy DNSDC | 1.913 | 1.913 | 0 | 0.114 | 0.13 | 26.72 | 1.14 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F EX OVER MOORE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ex Channel | 6.912 | 6.912 | 0 | 1.358 | 2.35 | 4.24 | 1.73 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| F Ex Carpark Bypass | 0.618 | 0.618 | 0 | 0.228 | 0.04 | 45.59 | 0.18 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F EX Carpark | 0.105 | 0.105 | 0 | 0.035 | 0.02 | 11.09 | 0.5 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F EX A2 | 0.499 | 0.499 | 0 | 0.004 | 0 | 699.9 | 0.18 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 |
| F EX A1 | 3.361 | 3.361 | 0 | 0.013 | 0 | 699.9 | 0.37 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| F EX A1 E | 3.426 | 3.426 | 0 | 0.144 | 0.19 | 32.83 | 1.32 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| F Ex Sto 3 | 5.285 | 5.285 | 0 | 0.017 | 0.01 | 699.9 | 0.45 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| F E Moore | 0.743 | 0.743 | 0 | 0.077 | 0.07 | 19.36 | 0.89 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F EXE S1 | 1.954 | 1.954 | 0 | 0.115 | 0.13 | 26.9 | 1.14 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| F W Moore | 0.443 | 0.443 | 0 | 0.062 | 0.05 | 16.48 | 0.76 | AR&R 5 year, 1.5 hours storm, average 33.3 mm/h, Zone 1 |
| F Ex G06 | 1.328 | 1.328 | 0 | 0.168 | 0.08 | 50.07 | 0.45 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| OF542838 | 1.552 | 1.552 | 0 | 0.173 | 0.08 | 50.75 | 0.48 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |

| DETENTION BASIN DETAILS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Max WL | MaxVol | Max Q | Max Q | Max Q | | | | | | | |
| | | | Total | Low Level | High Level | | | | | | | |
| Store A2 | 14.67 | 11742.7 | 0.499 | 0 | 0.499 | | | | | | | |
| Store A1 | 13.8 | 712.7 | 3.361 | 0 | 3.361 | | | | | | | |
| Ex Sto C1 | 12.64 | 6696.8 | 5.285 | 0 | 5.285 | | | | | | | |
| | | | | | | | | | | | | |
| CONTINUITY CHECK for AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 | | | | | | | | | | | | |
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | |
| Ex SimtaChann | 7746.68 | 7746.68 | 0 | 0 | | | | | | | | |
| Ex Combined SIMTA | 5673.05 | 5673.07 | 0 | 0 | | | | | | | | |
| EX G SIM | 6507.23 | 6507.22 | 0 | 0 | | | | | | | | |
| EX S1 | 2143.23 | 2143.23 | 0 | 0 | | | | | | | | |
| MPW | 426.08 | 426.08 | 0 | 0 | | | | | | | | |
| EX DNSDC | 835.28 | 835.29 | 0 | 0 | | | | | | | | |
| EX dummy DNSDC | 835.29 | 835.29 | 0 | 0 | | | | | | | | |
| Ex Mo HW 1 | 6507.22 | 6508.35 | 0 | 0 | | | | | | | | |
| Ex Top Chan | 7747.36 | 7747.34 | 0 | 0 | | | | | | | | |
| Carpark HW | 282.38 | 282.38 | 0 | 0 | | | | | | | | |
| EX Carpark | 239.63 | 239.63 | 0 | 0 | | | | | | | | |
| Store A2 | 2890.34 | 2030.68 | 5160.36 | -148.8 | | | | | | | | |
| Store A1 | 2580.97 | 2580.75 | 1.35 | 0 | | | | | | | | |
| EX A2 | 2029.9 | 2029.9 | 0 | 0 | | | | | | | | |
| EX A1 E | 2686.88 | 2686.9 | 0 | 0 | | | | | | | | |
| Ex Sto C1 | 6508.37 | 6507.24 | 6.83 | -0.1 | | | | | | | | |
| E Moore | 551.48 | 551.49 | 0 | 0 | | | | | | | | |
| EX E S1 | 1319.66 | 1319.66 | 0 | 0 | | | | | | | | |
| EX A1 | 2686.9 | 2686.9 | 0 | 0 | | | | | | | | |
| W Moore | 228.27 | 228.27 | 0 | 0 | | | | | | | | |
| N621911 | 542.15 | 542.15 | 0 | 0 | | | | | | | | |
| N621913 | 1010.74 | 1010.74 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for SIMTA2_Exg_160819.drn run at 16:25:08 on 12/10/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| No water upwelling from any pit. Freeboard was adequate at all pits. | | | | | | | | | | | | |
| The maximum flow in the following overflow routes is unsafe: F Ex Carpark Bypass, F W Moore, F EX A1 E, F EXE S1, F E Moore, Ex Channel | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F Ex Sto 3 F EX A2 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | 100 YEAR ARI RESULTS | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Exg.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Existing |

DRAINS results prepared from Version 2016.14

**100 Year ARI**

PIT / NODE DETAILS

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Version 8 Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| EX DNSDC | 11.30 | | 2.90 | | 2.70 | 0.79 | Inlet Capacity |
| EX dummy DNSDC | 10.48 | | 0.00 | | | | |
| Ex Mo HW 1 | 13.41 | | 9.40 | | 0.74 | 0.00 | None |
| Ex Top Chan | 13.36 | | 3.30 | | | | |
| Carpark HW | 14.80 | | 1.08 | | -0.10 | 0.97 | Headwall height/system capacity |
| EX Carpark | 11.00 | | 0.00 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| C EX NTH SIM | 4.65 | 3.31 | 1.50 | 12.00 | 15.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C EX S1 | 5.24 | 3.93 | 1.60 | 15.00 | 20.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C EX DNSDC | 2.90 | 2.55 | 0.35 | 5.00 | 5.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C EX Carpark | 1.08 | 0.70 | 0.39 | 5.00 | 5.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C EX A2 | 7.94 | 3.24 | 4.70 | 14.50 | 24.00 | 0.00 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 |
| C EX A1 | 7.30 | 4.39 | 3.24 | 14.00 | 15.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C EX A1 E | 0.42 | 0.23 | 0.19 | 5.00 | 7.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C E Moore | 0.98 | 0.94 | 0.04 | 5.00 | 20.00 | 10.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C EX E S1 | 3.23 | 2.42 | 0.99 | 15.00 | 20.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C W Moore | 0.75 | 0.50 | 0.26 | 5.00 | 20.00 | 10.00 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 |
| Ex G06 | 2.30 | 0.14 | 2.17 | 15.00 | 15.00 | 0.00 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| Ex G04 | 0.57 | AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1 |

Outflow Volumes for Total Catchment (51.9 impervious + 57.2 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| AR&R 100 year, 5 minutes st | 20383.72 | 13223.34 (64. | 9158.56 (94.4 | 4064.77 (38.0%) |
| AR&R 100 year, 25 minutes s | 51103.02 | 40596.19 (79. | 23726.57 (97. | 16869.61 (63.0%) |
| AR&R 100 year, 45 minutes s | 67230.42 | 54412.81 (80. | 31399.55 (98. | 23013.27 (65.3%) |
| AR&R 100 year, 1 hour storm | 76134.21 | 62006.03 (81. | 35634.42 (98. | 26371.61 (66.1%) |
| AR&R 100 year, 1.5 hours sto | 89891.04 | 73587.05 (81. | 42199.29 (98. | 31387.76 (66.6%) |
| AR&R 100 year, 2 hours storr | 100620.50 | 82459.17 (82. | 47289.89 (98. | 35169.28 (66.7%) |
| AR&R 100 year, 3 hours storr | 117422.87 | 96111.73 (81. | 55326.39 (99. | 40785.34 (66.3%) |
| AR&R 100 year, 4.5 hours sto | 136787.77 | 111015.46 (8 | 64540.07 (99. | 46475.39 (64.8%) |
| AR&R 100 year, 6 hours storr | 152594.08 | 122514.17 (8 | 72075.96 (99. | 50438.21 (63.1%) |
| AR&R 100 year, 9 hours storr | 178743.22 | 139769.34 (7 | 84533.05 (99. | 55236.29 (59.0%) |
| AR&R 100 year, 12 hours sto | 200766.14 | 156098.35 (7 | 94963.43 (99. | 61134.92 (58.1%) |
| AR&R 100 year, 18 hours sto | 237782.17 | 178674.05 (7 | 112598.11 (9 | 66075.95 (53.0%) |

PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P EX dummy DNSDC | 2.12 | 7.51 | 11.30 | 10.50 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| P EX UNDER MOORE | 9.40 | 1.31 | 13.39 | 13.36 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 |
| P EX Carpark | 0.11 | 3.63 | 14.44 | 14.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |

CHANNEL DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Due to Storm |
|---|---|---|---|

OVERFLOW ROUTE DETAILS

| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm |
|---|---|---|---|---|---|---|---|---|
| F Ex Comb SIMTA | 12.77 | 12.77 | 0.00 | 0.23 | 0.48 | 49.99 | 2.08 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |
| F EX G SIM | 9.40 | 9.40 | 0.00 | 0.22 | 0.37 | 47.38 | 1.71 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 |
| F EX S1 | 5.24 | 5.24 | 0.00 | 0.17 | 0.25 | 38.40 | 1.46 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F MPW | 0.57 | 0.57 | 0.00 | 0.14 | 0.05 | 47.03 | 0.33 | AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1 |
| F EX DNSDC | 0.79 | 0.79 | 0.00 | 0.08 | 0.07 | 19.90 | 0.89 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F EX dummy DNSDC | 2.12 | 2.12 | 0.00 | 0.12 | 0.14 | 27.80 | 1.16 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F EX OVER MOORE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Ex Channel | 12.92 | 12.92 | 0.00 | 1.80 | 3.67 | 7.02 | 2.04 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |
| F Ex Carpark Bypass | 0.97 | 0.97 | 0.00 | 0.26 | 0.05 | 50.23 | 0.20 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F EX Carpark | 0.11 | 0.11 | 0.00 | 0.04 | 0.02 | 11.27 | 0.50 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F EX A2 | 3.00 | 3.00 | 0.00 | 0.01 | 0.00 | 699.90 | 0.36 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| F EX A1 | 3.94 | 3.94 | 0.00 | 0.01 | 0.01 | 699.90 | 0.39 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |
| F EX A1 E | 4.07 | 4.07 | 0.00 | 0.16 | 0.21 | 34.98 | 1.37 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |
| F Ex Sto 3 | 9.40 | 9.40 | 0.00 | 0.02 | 0.01 | 699.90 | 0.56 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 |
| F E Moore | 1.09 | 1.09 | 0.00 | 0.09 | 0.09 | 22.05 | 0.97 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F EXE S1 | 3.23 | 3.23 | 0.00 | 0.14 | 0.18 | 32.11 | 1.30 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F W Moore | 0.75 | 0.75 | 0.00 | 0.08 | 0.07 | 19.54 | 0.88 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 |
| F Ex G06 | 2.30 | 2.30 | 0.00 | 0.19 | 0.11 | 52.42 | 0.55 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |
| OF542838 | 3.08 | 3.08 | 0.00 | 0.21 | 0.13 | 53.02 | 0.61 | AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 |

DETENTION BASIN DETAILS

| Name | Max WL | MaxVol | Max Q | Max Q | Max Q | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Low Level | High Level | | | | | | | |
| Store A2 | 14.78 | 15646.40 | 3.00 | 0.00 | 3.00 | | | | | | | |
| Store A1 | 14.09 | 3099.30 | 3.94 | 0.00 | 3.94 | | | | | | | |
| Ex Sto C1 | 13.09 | 10540.10 | 9.40 | 0.00 | 9.40 | | | | | | | |
| | | | | | | | | | | | | |

| CONTINUITY CHECK for AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | |
| Ex SimtaChann | 20855.01 | 20855.01 | 0.00 | 0.00 | | | | | | | | |
| Ex Combined SIMTA | 14733.37 | 14733.35 | 0.00 | 0.00 | | | | | | | | |
| EX G SIM | 16756.04 | 16755.96 | 0.00 | 0.00 | | | | | | | | |
| EX S1 | 5659.79 | 5659.79 | 0.00 | 0.00 | | | | | | | | |
| MPW | 1171.63 | 1171.63 | 0.00 | 0.00 | | | | | | | | |
| EX DNSDC | 2049.17 | 2049.99 | 0.00 | 0.00 | | | | | | | | |
| EX dummy DNSDC | 2049.99 | 2049.99 | 0.00 | 0.00 | | | | | | | | |
| Ex Mo HW 1 | 16755.88 | 16753.74 | 0.00 | 0.00 | | | | | | | | |
| Ex Top Chan | 20860.05 | 20859.97 | 0.00 | 0.00 | | | | | | | | |
| Carpark HW | 744.11 | 744.19 | 0.00 | 0.00 | | | | | | | | |
| EX Carpark | 436.36 | 436.36 | 0.00 | 0.00 | | | | | | | | |
| Store A2 | 8692.03 | 5761.69 | 8793.15 | -67.50 | | | | | | | | |
| Store A1 | 7130.95 | 7169.47 | 0.00 | -0.50 | | | | | | | | |
| EX A2 | 5760.27 | 5760.27 | 0.00 | 0.00 | | | | | | | | |
| EX A1 E | 7462.52 | 7462.54 | 0.00 | 0.00 | | | | | | | | |
| Ex Sto C1 | 16783.34 | 16756.11 | 81.76 | -0.30 | | | | | | | | |
| E Moore | 1206.47 | 1206.47 | 0.00 | 0.00 | | | | | | | | |
| EX E S1 | 3484.93 | 3484.93 | 0.00 | 0.00 | | | | | | | | |
| EX A1 | 7462.54 | 7462.54 | 0.00 | 0.00 | | | | | | | | |
| W Moore | 631.01 | 631.01 | 0.00 | 0.00 | | | | | | | | |
| N621911 | 1996.21 | 1996.21 | 0.00 | 0.00 | | | | | | | | |
| N621913 | 3475.31 | 3475.31 | 0.00 | 0.00 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for SIMTA2_Exg_160819.drn run at 16:46:15 on 12/10/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| No water upwelling from any pit. Freeboard was adequate at all pits. | | | | | | | | | | | | |
| The maximum flow in the following overflow routes is unsafe: OF542838, F Ex G06, F Ex Carpark Bypass, Ex Channel | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F Ex Sto 3 F EX DNSDC F EX A2 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |
| | | | | | | | | | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | PMF RESULTS | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Exg.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Existing |

**PMF**

DRAINS results prepared from Version 2016.14

PIT / NODE DETAILS — Version 8

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| EX DNSDC | 11.36 | | 12.958 | | 2.64 | 10.848 | Inlet Capacity |
| EX dummy DNSDC | 10.48 | | 0 | | | | |
| Ex Mo HW 1 | 14.58 | | 54.562 | | -0.43 | 43.003 | Headwall height/system capacity |
| Ex Top Chan | 14.5 | | 62.34 | | | | |
| Carpark HW | 14.99 | | 5.062 | | -0.29 | 4.928 | Headwall height/system capacity |
| EX Carpark | 11 | | 0 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| C EX NTH SIM | 23.193 | 15.608 | 8.475 | 12 | 15 | 0 | 15min PMP |
| C EX S1 | 26.503 | 17.151 | 10.024 | 15 | 20 | 0 | 30min PMP |
| C EX DNSDC | 12.958 | 10.77 | 2.262 | 5 | 5 | 0 | 15min PMP |
| C EX Carpark | 5.062 | 3.167 | 1.921 | 5 | 5 | 0 | 15min PMP |
| C EX A2 | 40.382 | 16.334 | 27.525 | 14.5 | 24 | 0 | 30min PMP |
| C EX A1 | 38.029 | 20.278 | 18.351 | 14 | 15 | 0 | 15min PMP |
| C EX A1 E | 1.985 | 1.068 | 0.984 | 5 | 7 | 0 | 15min PMP |
| C E Moore | 4.208 | 3.98 | 0.527 | 5 | 20 | 10 | 15min PMP |
| C EX E S1 | 16.319 | 10.56 | 6.172 | 15 | 20 | 0 | 30min PMP |
| C W Moore | 2.989 | 2.301 | 1.218 | 5 | 20 | 10 | 15min PMP |
| Ex G06 | 12.775 | 0.681 | 12.095 | 15 | 15 | 0 | 15min PMP |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| Ex G04 | 4.492 | 45min PMP |

Outflow Volumes for Total Catchment (51.9 impervious + 57.2 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| 15min PMP | 185571.16 | 176226.40 (95 | 87712.00 (99. | 88514.40 (91.0%) |
| 30min PMP | 272898.78 | 261389.59 (95 | 129244.99 (95 | 132144.59 (92.4%) |
| 45min PMP | 338394.47 | 325278.41 (96 | 160437.78 (95 | 164840.63 (92.9%) |
| 1hr PMP | 392883.25 | 378459.27 (96 | 186384.89 (95 | 192074.38 (93.3%) |
| 1.5hr PMP | 447463 | 430939.25 (96 | 212380.48 (95 | 218558.77 (93.2%) |
| 2hr PMP | 491217.78 | 472800.05 (96 | 233211.48 (95 | 239588.56 (93.1%) |
| 2.5hr PMP | 523965.63 | 503851.84 (96 | 248805.31 (95 | 255046.53 (92.9%) |
| 3hr PMP | 556986.38 | 535222.13 (96 | 264525.28 (95 | 270696.84 (92.7%) |
| 4hr PMP | 600377.31 | 575290.47 (95 | 285183.97 (95 | 290106.50 (92.2%) |
| 5hr PMP | 654957.06 | 626617.47 (95 | 311159.69 (95 | 315457.78 (91.9%) |

PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P EX dummy DNSD | 2.16 | 7.64 | 11.364 | 10.5 | 30min PMP |
| P EX UNDER MOO | 11.559 | 1.61 | 14.52 | 14.5 | 45min PMP |
| P EX Carpark | 0.133 | 3.83 | 14.479 | 14.018 | 15min PMP |

CHANNEL DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Due to Storm |
|---|---|---|---|

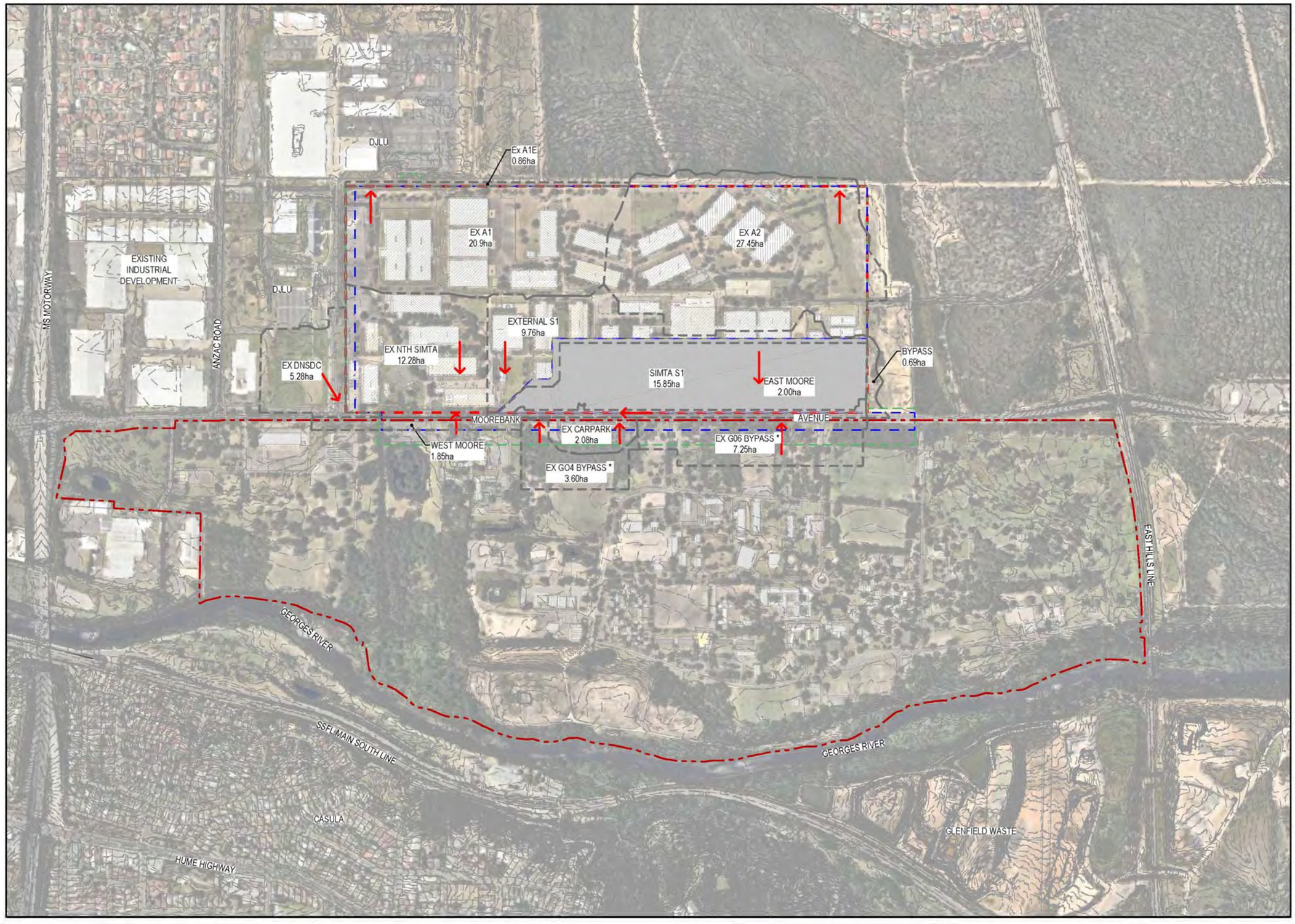
OVERFLOW ROUTE DETAILS

| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm |
|---|---|---|---|---|---|---|---|---|
| F Ex Comb SIMTA | 61.663 | 61.663 | 0 | 0.23 | 2.31 | 49.99 | 10.03 | 30min PMP |
| F EX G SIM | 54.562 | 54.562 | 0 | 0.23 | 2.04 | 49.99 | 8.88 | 45min PMP |
| F EX S1 | 26.503 | 26.503 | 0 | 0.23 | 0.99 | 49.99 | 4.31 | 30min PMP |
| F MPW | 4.492 | 4.492 | 0 | 0.232 | 0.16 | 53.81 | 0.71 | 45min PMP |
| F EX DNSDC | 10.848 | 10.848 | 0 | 0.229 | 0.41 | 49.89 | 1.77 | 15min PMP |
| F EX dummy DNSD | 2.16 | 2.16 | 0 | 0.12 | 0.14 | 27.98 | 1.16 | 30min PMP |
| F EX OVER MOOR | 43.003 | 43.003 | 0 | 0.23 | 1.61 | 49.99 | 7 | 45min PMP |
| Ex Channel | 74.675 | 74.675 | 0 | 2.932 | 2.43 | 120.05 | 0.83 | 45min PMP |
| F Ex Carpark Bypas | 4.928 | 4.928 | 0 | 0.294 | 0.22 | 55.81 | 0.74 | 15min PMP |
| F EX Carpark | 0.133 | 0.133 | 0 | 0.039 | 0.02 | 11.81 | 0.54 | 15min PMP |
| F EX A2 | 15.312 | 15.312 | 0 | 0.032 | 0.02 | 699.9 | 0.68 | 1hr PMP |
| F EX A1 | 22.084 | 22.084 | 0 | 0.04 | 0.03 | 699.9 | 0.79 | 45min PMP |
| F EX A1 E | 22.841 | 22.841 | 0 | 0.23 | 0.85 | 49.99 | 3.72 | 45min PMP |
| F Ex Sto 3 | 52.484 | 52.484 | 0 | 0.067 | 0.07 | 699.9 | 1.11 | 30min PMP |
| F E Moore | 4.34 | 4.34 | 0 | 0.159 | 0.22 | 35.7 | 1.41 | 15min PMP |
| F EXE S1 | 16.319 | 16.319 | 0 | 0.23 | 0.61 | 49.99 | 2.65 | 30min PMP |
| F W Moore | 2.989 | 2.989 | 0 | 0.137 | 0.17 | 31.39 | 1.26 | 15min PMP |
| F Ex G06 | 12.775 | 12.775 | 0 | 0.242 | 0.45 | 54.14 | 1.86 | 15min PMP |
| OF542838 | 17.719 | 17.719 | 0 | 0.242 | 0.62 | 54.14 | 2.58 | 30min PMP |

DETENTION BASIN DETAILS

| Name | Max WL | MaxVol | Max Q | Max Q | Max Q |
|---|---|---|---|---|---|

| | | | Total | Low Level | High Level | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Store A2 | 15.48 | 58022.3 | 15.312 | 0 | 15.312 | | | | | | | |
| Store A1 | 15.04 | 23554.2 | 22.084 | 0 | 22.084 | | | | | | | |
| Ex Sto C1 | 19.12 | 33401.8 | 52.484 | 0 | 52.484 | | | | | | | |
| | | | | | | | | | | | | |
| CONTINUITY CHECK for 15min PMP | | | | | | | | | | | | |
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | |
| Ex SimtaChann | 95595.51 | 95595.51 | 0 | 0 | | | | | | | | |
| Ex Combined SIMT/ | 65446.86 | 65446.84 | 0 | 0 | | | | | | | | |
| EX G SIM | 73215.45 | 73211.96 | 0 | 0 | | | | | | | | |
| EX S1 | 25915.93 | 25915.93 | 0 | 0 | | | | | | | | |
| MPW | 5320.32 | 5320.32 | 0 | 0 | | | | | | | | |
| EX DNSDC | 8810.89 | 8809.8 | 0 | 0 | | | | | | | | |
| EX dummy DNSDC | 2335.61 | 2335.61 | 0 | 0 | | | | | | | | |
| Ex Mo HW 1 | 73208.51 | 72973 | 0 | 0.3 | | | | | | | | |
| Ex Top Chan | 95805.73 | 95802.09 | 0 | 0 | | | | | | | | |
| Carpark HW | 3419.83 | 3419.88 | 0 | 0 | | | | | | | | |
| EX Carpark | 141.95 | 141.95 | 0 | 0 | | | | | | | | |
| Store A2 | 43720.34 | 30865.18 | 12857.77 | 0 | | | | | | | | |
| Store A1 | 33923.74 | 33929.96 | 0 | 0 | | | | | | | | |
| EX A2 | 30860.1 | 30860.1 | 0 | 0 | | | | | | | | |
| EX A1 E | 35328.69 | 35328.7 | 0 | 0 | | | | | | | | |
| Ex Sto C1 | 67782.46 | 66744.65 | 1039.49 | 0 | | | | | | | | |
| E Moore | 3465.66 | 3465.65 | 0 | 0 | | | | | | | | |
| EX E S1 | 15957.33 | 15957.33 | 0 | 0 | | | | | | | | |
| EX A1 | 35328.7 | 35328.7 | 0 | 0 | | | | | | | | |
| W Moore | 2996.32 | 2996.32 | 0 | 0 | | | | | | | | |
| N621911 | 11331.58 | 11331.58 | 0 | 0 | | | | | | | | |
| N621913 | 19922.14 | 19921.93 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for SIMTA2_Exg_160819.drn run at 16:31:10 on 12/10/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The maximum water level in the following storages exceeds the maximum elevation you specified: Ex Sto C1, Store A1. | | | | | | | | | | | | |
| DRAINS has extrapolated the Elevation vs Storage table to a higher Elevation. Please provide accurate values for higher elevations. | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| No water upwelling from any pit. Freeboard was adequate at all pits. | | | | | | | | | | | | |
| The maximum flow in the following overflow routes is unsafe: OF542838, F Ex G06, F Ex Carpark Bypass, F W Moore, F EX A1 E, F EXE S1, F E Moore, F EX DNSDC, Ex Channel, F EX OVE | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F Ex Sto 3 F EX DNSDC F EX A2 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |




| Issue | Description | Date |
|---|---|---|
| 02 | ISSUE FOR SSD APPLICATION | 19/10/2016 |
| 01 | DRAFT ISSUE FOR SSD APPLICATION | 16/09/2016 |

0 50 100 200 300 400 500m

1 : 5000

Client: SIMTA / TACTICAL GROUP

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

| | | Current Issue Signatures | |
|---|---|---|---|
| Scales | 1:5000 | Drawn A.ZHAO | |
| Original Size | A1 | Designed S.MAKIREDDI | |
| Height Datum | AHD | Checked K.MCAREAVEY | |
| Grid | MGA | Approved M.KEEFORD | |

Filename: SSS2-ARC-CV-DWG-0431-ExistingCatchmentPlan.dwg

Project: MOOREBANK PRECINCT EAST (MPE) STAGE 2

Title: EXISTING CATCHMENT PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 5, 141 Walker St
NORTH SYDNEY NSW 2060
ABN 76 104 485 289
Tel No: +61 2 8907 9000
Fax No: +61 2 8907 9001
arcadis.com

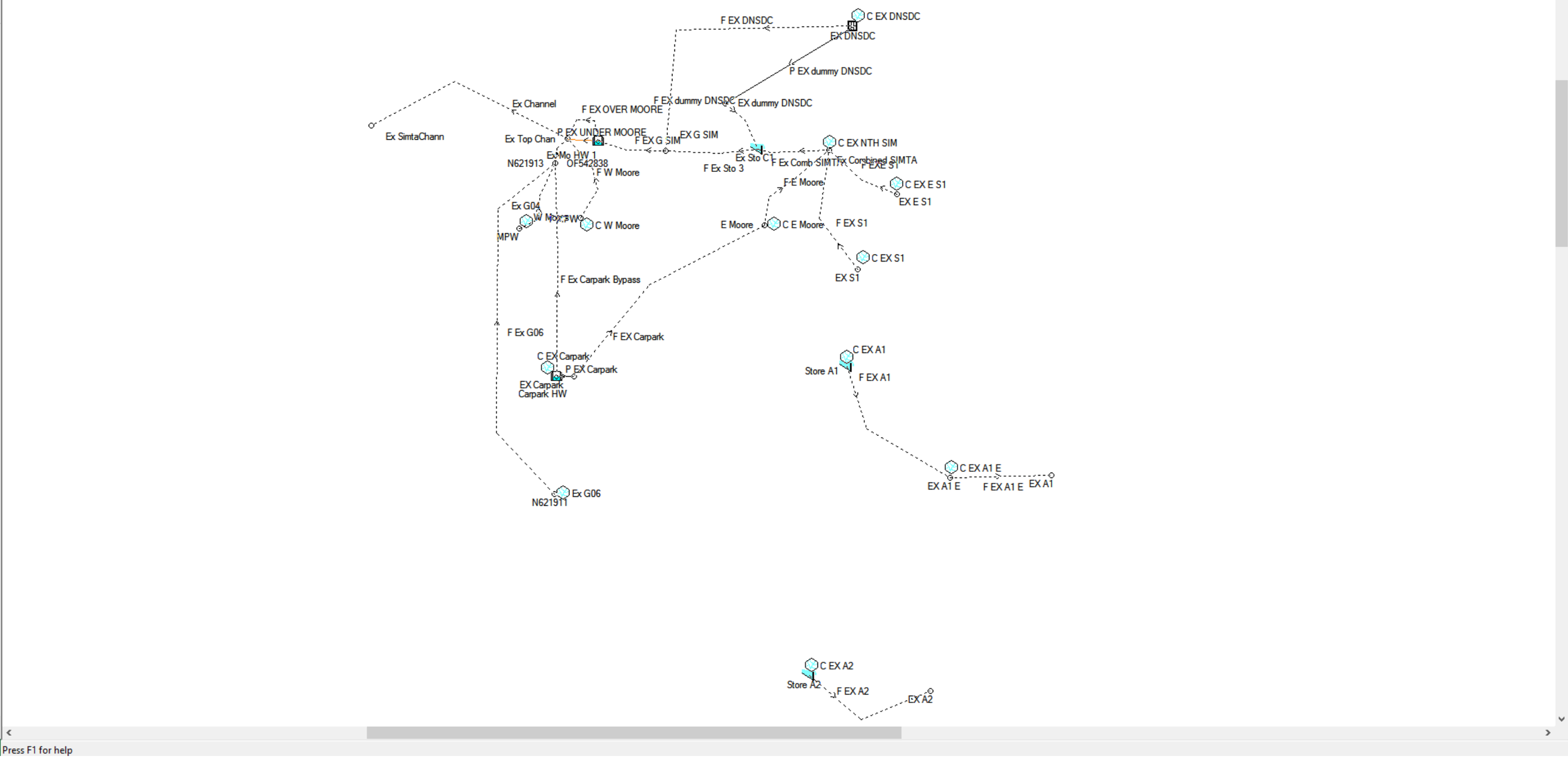
Project No. AA009335

Drawing No: SSS2 -ARC-CV-DWG- 0431- Issue: 02

Date Plotted: 17 Oct 2016 - 02:16PM File Name: F:\AA0093393_SSS2\CV\DWG\SSS2-ARC-CV-DWG-0431-ExistingCatchmentPlan.dwg

MPE_Exg.drn - DRAINS

File Edit Project View Draw Run Help

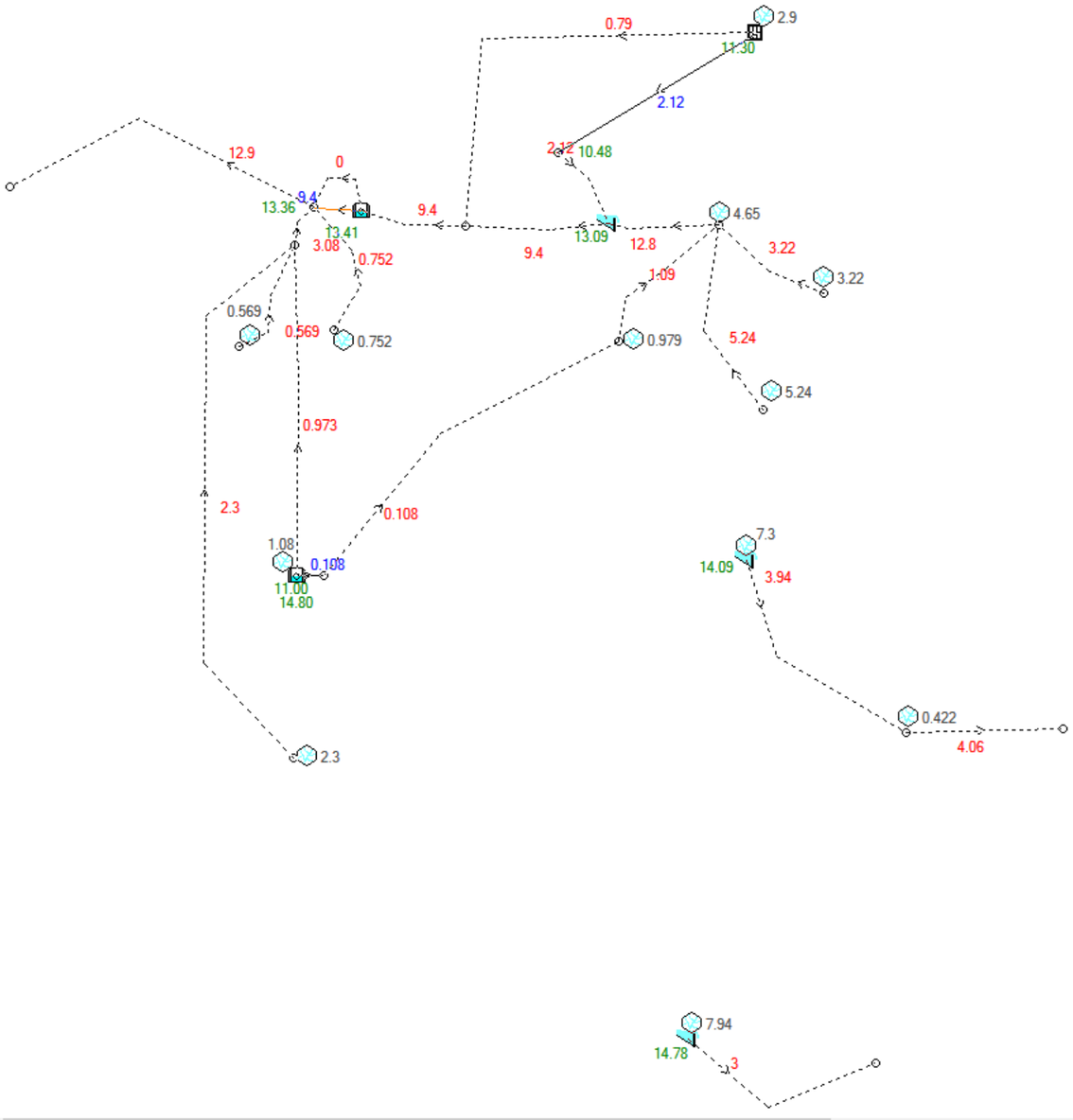



Press F1 for help

MPE_Exg.drn - DRAINS

File Edit Project View Draw Run Help

Worst case major storm




Results of Standard Hydraulic Analysis

**Proposed Conditions**

- DRAINS Information
  (Input & Output 5 year, 100 year, 100 year + 10% rainfall increase, 100 year + 20% rainfall increase, PMF)
  Stage Discharge Tables
  Stage 2 Drainage Plan
  Proposed DRAINS Model Screenshot (Labels and worst case 100 year)

Calculation Sheet

| | | | |
|---|---|---|---|
| Job | MPE Stage 2 | Design | AZ |
| | | Date | Oct-16 |
| | | Checked | BC |
| | | Date | Oct-16 |
| | | Office | Sydney |
| | | Job No | AA009335 |

# MPE Stage 2

ARCADIS Design & Consultancy for natural and built assets

ARCADIS Design & Consultancy for natural and built assets

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | DRAINS Data | CHECKED | BC | DATE | 13/10/2016 |

**DATA**

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Proposed.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Stage 2 Proposed |

PIT / NODE DETAILS — Version 13

| Name | Type | Family | Size | Ponding Volume (cu.m) | Pressure Change Coeff. Ku | Surface Elev (m) | Max Pond Depth (m) | Base Inflow (cu.m/s) | Blocking Factor | x | y | Bolt-down lid | id | Part Full Shock Loss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PR Moore | Node | | | | | 19 | | 0 | | 308538.2 | 6240277.1 | | 66197341 | |
| PR Bypass2 | Node | | | | | 10 | | 0 | | 308320.93 | 6240344.3 | | 66193684 | |
| PR Bypass1 | Node | | | | | 10 | | 0 | | 308037.73 | 6240385.1 | | 66193679 | |
| Simta Rd 6 | Node | | | | | 17 | | 0 | | 308575.46 | 6240558.6 | | 115089051 | |
| S Rd 2 | Node | | | | | 17 | | 0 | | 308658.27 | 6241691.5 | | 118686769 | |
| Simta Rd 4 | Node | | | | | 19 | | 0 | | 308724.78 | 6241491.6 | | 118686780 | |
| S Rd 5 | Node | | | | | 19 | | 0 | | 308583.89 | 6240680.8 | | 118686800 | |
| PR 3 | Node | | | | | 19 | | 0 | | 308640.36 | 6240690.8 | | 118736590 | |
| Simta Rd 7 | Node | | | | | 19 | | 0 | | 308603.27 | 6240551.2 | | 118736630 | |
| PR Combined 2 | Node | | | | | 10 | | 0 | | 308819.6 | 6240451.4 | | 118736648 | |
| A1.1 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 2.3 | 17 | 1 | 0 | 0 | 308691.74 | 6241611.2 | No | 119491536 | 1 x Ku |
| A1.2 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 0.6 | 17.3 | 1 | 0 | 0 | 308681.45 | 6241507.3 | No | 119763654 | 1 x Ku |
| A1.3 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 0.6 | 17.1 | 1 | 0 | 0 | 308685.56 | 6241468.2 | No | 119865990 | 1 x Ku |
| PR Outlet1 | Node | | | | | 10 | | 0 | | 308737.01 | 6241455.9 | | 114927009 | |
| A2.1 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 0.7 | 16 | 1 | 0 | 0 | 308545.28 | 6240406.6 | No | 119831794 | 1 x Ku |
| A2.2 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 0.3 | 16 | 1 | 0 | 0 | 308576.64 | 6240458.1 | No | 119491559 | 1 x Ku |
| A2.3 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 1.5 | 16 | 1 | 0 | 0 | 308632.77 | 6240469 | No | 119729547 | 1 x Ku |
| PR Outlet2 | Node | | | | | 14 | | 0 | | 308703.71 | 6240459.9 | | 65850647 | |
| S Rd 3 | Node | | | | | 17 | | 0 | | 308731.18 | 6241562.4 | | 812 | |
| SimtaChann | Node | | | | | | | 0 | | 308041.42 | 6241703.3 | | 65741915 | |
| Moore HW 1 | Headwall | | | | 0.5 | 14.15 | | 0 | | 308128 | 6241692.1 | | 66418818 | |
| Top Channel | Node | | | | | 14.2 | | 0 | | 308100.93 | 6241696.6 | | 66354021 | |
| PR DNSDC | OnGrade | Special | DNSDC | | 0 | 14 | | 0 | 0 | 308299.17 | 6241833.1 | No | 66418895 | 1 x Ku |
| PR dummy DNSD( | Node | | | | | 20 | | 0 | | 308202.76 | 6241762 | | 65741985 | |
| S6 | Node | | | | | 10 | | 0 | | 308274.73 | 6241576.3 | | 66886579 | |
| S5 | Node | | | | | 17 | | 0 | | 308140.51 | 6241348.3 | | 103017775 | |
| Moore | Node | | | | | 17 | | 0 | | 308086.88 | 6241405.2 | | 103017780 | |
| S Rd 1 | Node | | | | | 10 | | 0 | | 308224.62 | 6241744.2 | | 115088999 | |
| N MPE ST1 | Node | | | | | 10 | | 0 | | 308083.76 | 6241532.7 | | 116991893 | |
| S4 | Node | | | | | 17 | | 0 | | 308137.3 | 6241325.9 | | 118729372 | |
| S3 | Node | | | | | 17 | | 0 | | 308135.7 | 6241298.7 | | 118729400 | |
| S2 | Node | | | | | 17 | | 0 | | 308133.3 | 6241269.1 | | 118729401 | |
| S1 | Node | | | | | 17 | | 0 | | 308131.7 | 6241242.7 | | 118729402 | |
| OutPit 10 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 6 | 17 | 1 | 0 | 0 | 308094.88 | 6241603.9 | No | 119491582 | 1 x Ku |
| N OSD10.1 | Node | | | | | 17 | | 0 | | 308100.93 | 6241662.1 | | 120207863 | |
| N MPW | Node | | | | | 17 | | 0 | | 307985.22 | 6241534.5 | | 119934479 | |
| Pit OSD9 | Sag | Surface Inlet Pits | Unlimited Entry Pit | 5 | 6 | 16.5 | 1 | 0 | 0 | 308186.96 | 6241669.3 | No | 121359148 | 1 x Ku |
| N OSD9.1 | Node | | | | | 17 | | 0 | | 308167.61 | 6241670.1 | | 121492535 | |
| N OSD9.2 | Node | | | | | 12 | | 0 | | 308151.92 | 6241690.5 | | 121492493 | |
| S7 | Node | | | | | 10 | | 0 | | 308297.89 | 6241663.2 | | 122337612 | |
| PR 3.2 | Node | | | | | 17 | | 0 | | 308633.54 | 6240528.2 | | 160856983 | |
| MPE North | Node | | | | | 17 | | 0 | | 308616.59 | 6241614.1 | | 160857019 | |
| MPE South | Node | | | | | 17 | | 0 | | 308464.27 | 6240467.4 | | 160857026 | |
| PR3.3 | Node | | | | | 19 | | 0 | | 308747.27 | 6241469.4 | | 161988154 | |
| Outlet 1 Combined | Node | | | | | 10 | | 0 | | 308796.4 | 6241450.9 | | 162638452 | |

DETENTION BASIN DETAILS

| Name | Elev | Volume | Not Used | Outlet Type | K | Dia(mm) | Centre RL | Pit Family | Pit Type | x | y | HED | Crest RL | Crest Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OSD 10 | 13.5 | 0 | | None | | | | | | 308085.7 | 6241572.6 | No | | |
| | 14.5 | 11600 | | | | | | | | | | | | |
| | 15.5 | 23200 | | | | | | | | | | | | |
| | 16.5 | 34800 | | | | | | | | | | | | |
| OSD 9 | 13.5 | 0 | | None | | | | | | 308186.61 | 6241644.7 | No | | |
| | 14.5 | 3375 | | | | | | | | | | | | |
| | 15.5 | 6750 | | | | | | | | | | | | |
| | 16.5 | 10125 | | | | | | | | | | | | |
| OSD 1 | 14 | 0 | | None | | | | | | 308665.36 | 6241654.4 | No | | |
| | 15 | 16500 | | | | | | | | | | | | |
| | 16 | 33000 | | | | | | | | | | | | |
| | 17 | 49500 | | | | | | | | | | | | |
| OSD 2 | 14.7 | 0 | | None | | | | | | 308529.07 | 6240381.4 | No | | |
| | 14.8 | 1 | | | | | | | | | | | | |
| | 15.8 | 11900 | | | | | | | | | | | | |
| | 16.8 | 23800 | | | | | | | | | | | | |

SUB-CATCHMENT DETAILS

| Name | Pit or Node | Total Area (ha) | Paved Area % | Grass Area % | Supp Area % | Paved Time (min) | Grass Time (min) | Supp Time (min) | Paved Length (m) | Grass Length (m) | Supp Length (m) | Paved Slope(%) | Grass Slope | Supp Slope |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PR C Moor Bypass | PR Moore | 0.28 | 100 | 0 | 0 | 3 | 0 | 0 | | | | | | |
| C S RD 6 | Simta Rd 6 | 0.55 | 100 | 0 | 0 | 2 | 12 | 0 | | | | | | |
| C S RD 2 | S Rd 2 | 2.85 | 100 | 0 | 0 | 7 | 0 | 0 | | | | | | |
| C S RD 4 | Simta Rd 4 | 0.42 | 100 | 0 | 0 | 4 | 0 | 0 | | | | | | |
| C S RD 5 | S Rd 5 | 0.43 | 100 | 0 | 0 | 4.5 | 0 | 0 | | | | | | |
| C PR 3.1 | PR 3 | 0.57 | 20 | 80 | 0 | 4.5 | 12 | 0 | | | | | | |
| C S RD7 | Simta Rd 7 | 0.24 | 100 | 0 | 0 | 7 | 0 | 0 | | | | | | |
| C S RD 3 | S Rd 3 | 0.41 | 100 | 0 | 0 | 2 | 0 | 0 | | | | | | |
| C PR DNSC | PR DNSDC | 4.88 | 82 | 18 | 0 | 5 | 5 | 0 | | | | | | |
| C S6 | S6 | 6 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C S5 | S5 | 3.55 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C MOORE | Moore | 5.4 | 100 | 0 | 0 | 1 | 10 | 0 | | | | | | |
| C S RD 1 | S Rd 1 | 2.73 | 100 | 0 | 0 | 5 | 12 | 0 | | | | | | |
| C S4 | S4 | 6 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C S3 | S3 | 6 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C S2 | S2 | 6 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C S1.1 | S1 | 5.15 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| MPW | N MPW | 10.1 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C S 7 | S7 | 5.91 | 100 | 0 | 0 | 5 | 10 | 0 | | | | | | |
| C PR 3.2 | PR 3.2 | 0.45 | 20 | 80 | 0 | 4.5 | 12 | 0 | | | | | | |
| C MPE North | MPE North | 25.31 | 100 | 0 | 0 | 8 | 0 | 0 | | | | | | |
| C MPE South | MPE South | 14.1 | 100 | 0 | 0 | 8 | 0 | 0 | | | | | | |
| S PR3.3 | PR3.3 | 0.5 | 20 | 80 | 0 | 4.5 | 12 | 0 | | | | | | |

| Name | Pit or Node | Total Area | Impervious Area | Avg Slope(%) | Mannings n | Time lag (mins) | Rainfall Multiplier | Hydrological Model |
|---|---|---|---|---|---|---|---|---|
| C PR Bypass 2 | PR Bypass2 | 0.552 | 0 | 0.3 | 0.06 | 0 | 1 | Moorebank RAFTS |
| C PR Bypass 1 | PR Bypass1 | 0.62 | 0 | 0.2 | 0.06 | 0 | 1 | Moorebank RAFTS |

PIPE DETAILS

| Name | From | To | Length (m) | U/S IL (m) | D/S IL (m) | Slope (%) | Type | Dia (mm) | I.D. (mm) | Rough | Pipe Is | No. Pipes | Chg From | At Chg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P A1.1 | A1.1 | A1.2 | 33 | 12.75 | 12.585 | 0.5 | Box Culverts | 1.2W x 0.6H | | 0.3 | Existing | 4 | A1.1 | 0 |
| P A1.2 | A1.2 | A1.3 | 33 | 12.585 | 12.42 | 0.5 | Box Culverts | 1.2W x 0.6H | | 0.3 | Existing | 4 | A1.2 | 0 |
| P A1.3 | A1.3 | PR Outlet1 | 40 | 12.42 | 12.22 | 0.5 | Box Culverts | 1.2W x 0.6H | | 0.3 | Existing | 4 | A1.3 | 0 |
| P A2.1 | A2.1 | A2.2 | 33 | 13.75 | 13.585 | 0.5 | Box Culverts | 1.5W x 0.9H | | 0.3 | Existing | 3 | A2.1 | 0 |
| P A2.2 | A2.2 | A2.3 | 33 | 13.585 | 13.42 | 0.5 | Box Culverts | 1.5W x 0.9H | | 0.3 | Existing | 3 | A2.2 | 0 |
| P A2.3 | A2.3 | PR Outlet2 | 40 | 13.42 | 13.22 | 0.5 | Box Culverts | 1.5W x 0.9H | | 0.3 | Existing | 3 | A2.3 | 0 |
| P PR UNDER MO( | Moore HW 1 | Top Channel | 18.15 | 11.58 | 11.4 | 0.99 | Box Culverts | 2W x 1.8H | | 0.3 | Existing | 2 | Moore HW 1 | 0 |
| P PR dummy DNS | PR DNSDC | PR dummy DNSI | 10 | 10 | 9.9 | 1 | RCP Class 2 | 600 | 600 | 0.3 | New | 1 | PR DNSDC | 0 |
| Pipe OutPit 10 | OutPit 10 | N OSD10.1 | 140 | 12.05 | 11.35 | 0.5 | Box Culverts | 2.1W x 0.9H | | 0.3 | Existing | 3 | OutPit 10 | 0 |
| P OSD9 | Pit OSD9 | N OSD9.1 | 13 | 11.645 | 11.58 | 0.5 | Box Culverts | 1.5W x 1.2H | | 0.3 | Existing | 1 | Pit OSD9 | 0 |

DETAILS of SERVICES CROSSING PIPES

| Pipe | Chg (m) | Bottom Elev (m) | Height of Service (m) | Chg (m) | Bottom Elev (m) | Height of S (m) | Chg (m) | Bottom Elev (m) | Height of S | etc |
|---|---|---|---|---|---|---|---|---|---|---|

CHANNEL DETAILS

| Name | From | To | Type | Length | U/S IL | D/S IL | Slope | Base Width | L.B. Slope | R.B. Slope | Manning | Depth | Roofed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (m) | (m) | (m) | (%) | (m) | (1:?) | (1:?) | n | (m) | | |
| | | | | | | | | | | | | | | |

OVERFLOW ROUTE DETAILS

| Name | From | To | Travel | Spill | Crest | Weir | Cross | Safe Depth | SafeDepth | Safe | Bed | D/S Area | | id |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Time | Level | Length | Coeff. C | Section | Major Storm | Minor Storm | DxV | Slope | Contributing | | |
| | | | (min) | (m) | (m) | | | (m) | (m) | (sq.m/sec) | (%) | % | | |
| F PR Moore Bypas | PR Moore | OSD 2 | 1.5 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 796 |
| F PR Bypass 2 | PR Bypass2 | PR Outlet2 | 4 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 790 |
| F PR Bypass 1 | PR Bypass1 | PR Outlet2 | 8 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 785 |
| F Simta Rd 6 | Simta Rd 6 | OSD 2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 115089059 |
| F SR2 | S Rd 2 | OSD 1 | 0.1 | | | | 8 m wide road (half section) | 0.3 | 0.15 | 0.4 | 1 | 0 | | 118686764 |
| F SR4 | Simta Rd 4 | OSD 1 | 3 | | | | 8 m wide road (half section) | 0.3 | 0.15 | 0.4 | 1 | 0 | | 118686787 |
| F Simta Rd 5 | S Rd 5 | OSD 2 | 3 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118686803 |
| F PR3 | PR 3 | OSD 2 | 1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118736618 |
| F Simta Rd 7 | Simta Rd 7 | OSD 2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118736632 |
| F A1.1 | A1.1 | A1.2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119491553 |
| F A1.2 | A1.2 | A1.3 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119763662 |
| F A1.3 | A1.3 | PR Outlet1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119866019 |
| F Outlet 1 | PR Outlet1 | Outlet 1 Combine | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 162638446 |
| F A2.1 | A2.1 | A2.2 | 2 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119831815 |
| F A2.2 | A2.2 | A2.3 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119491566 |
| F A2.3 | A2.3 | PR Outlet2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119729595 |
| F PR OUTLET 2 | PR Outlet2 | PR Combined 2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 66193667 |
| F SR3 | S Rd 3 | OSD 1 | 0.1 | | | | 8 m wide road (half section) | 0.3 | 0.15 | 0.4 | 1 | 0 | | 118686773 |
| F PR OVER MOOI | Moore HW 1 | Top Channel | 0.1 | 14.15 | 1 | 1 | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66418832 |
| Channel | Top Channel | SimtaChann | 5 | | | | Concrete Channel | 0.3 | 0.3 | 0.6 | 0.1 | 100 | | 65745589 |
| F PR DNSDC | PR DNSDC | N OSD9.2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 65742028 |
| F PR dummy DNS | PR dummy DNSD | N OSD9.2 | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66418902 |
| F S6 | S6 | OSD 9 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 116991895 |
| F S5 | S5 | N MPE ST1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 103017786 |
| F Moore | Moore | N MPE ST1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 103017785 |
| F S RD 1 | S Rd 1 | N OSD9.2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 115089004 |
| F MPE ST1 | N MPE ST1 | OSD 10 | 0.1 | | | | Dummy used to model flow across r | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66886581 |
| F S4 | S4 | N MPE ST1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118729374 |
| F S3 | S3 | N MPE ST1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118729376 |
| F S2 | S2 | N MPE ST1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118729382 |
| F S1 | S1 | N MPE ST1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 118729389 |
| F OutPit 10 | OutPit 10 | N OSD10.1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119491597 |
| F OSD10.3 | N OSD10.1 | Top Channel | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 121359224 |
| F MPW | N MPW | OSD 10 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 119934499 |
| F Outpit9 | Pit OSD9 | N OSD9.1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 162790046 |
| F OSD9.2 | N OSD9.1 | N OSD9.2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 120921923 |
| F OSD9 | N OSD9.2 | Moore HW 1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 103241658 |
| F S7 | S7 | OSD 9 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 122337617 |
| F PR3.2 | PR 3.2 | PR Outlet2 | 4 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 160856990 |
| F MPE North | MPE North | OSD 1 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 160857007 |
| F MPE South | MPE South | OSD 2 | 0.1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 160857031 |
| F OSD10.1 | OSD 10 | OutPit 10 | 0.1 | 13.8 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 66886586 |
| F OSD9.1 | OSD 9 | Pit OSD9 | 0.1 | 13.8 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 119900328 |
| F OSD 1 | OSD 1 | A1.1 | 3 | 14.3 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 822 |
| F PR A2 | OSD 2 | A2.1 | 2 | 15 | | | Really Long Weir | 0.3 | 0.3 | 0.6 | 1 | 0 | | 815 |
| F PR3.3 | PR3.3 | PR Outlet1 | 1 | | | | Dummy used to model flow across r | 0.2 | 0.05 | 0.6 | 1 | 0 | | 161988158 |
| | | | | | | | | | | | | | | |

PIPE COVER DETAILS

| Name | Type | Dia (mm) | Safe Cover (m) | Cover (m) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P A1.1 | Box Culverts | 0 | 0.6 | 3.6 | | | | | | | | | | |
| P A1.2 | Box Culverts | 0 | 0.6 | 4.03 | | | | | | | | | | |
| P A1.3 | Box Culverts | 0 | 0.6 | -2.87 | Unsafe | | | | | | | | | |
| P A2.1 | Box Culverts | 0 | 0.6 | 1.3 | | | | | | | | | | |
| P A2.2 | Box Culverts | 0 | 0.6 | 1.47 | | | | | | | | | | |
| P A2.3 | Box Culverts | 0 | 0.6 | -0.17 | Unsafe | | | | | | | | | |
| P PR UNDER MO | Box Culverts | 0 | 0.6 | 0.67 | | | | | | | | | | |
| P PR dummy DNS | RCP Class 2 | 600 | 0.6 | 3.35 | | | | | | | | | | |
| Pipe OutPit 10 | Box Culverts | 0 | 0.6 | 3.95 | | | | | | | | | | |
| P OSD9 | Box Culverts | 0 | 0.6 | 3.6 | | | | | | | | | | |
| | | | | | | | | | | | | | | |

ARCADIS Design & Consultancy for natural and built assets

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | 5 YEAR ARI RESULTS | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Proposed.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Stage 2 Proposed |

**5 Year ARI**

DRAINS results prepared from Version 2016.14

PIT / NODE DETAILS — Version 8

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| A1.1 | 13 | 17.19 | 1.371 | 0.4 | 4 | 0 | Inlet Capacity |
| A1.2 | 12.8 | 17.3 | 0 | 0 | 4.5 | 0 | None |
| A1.3 | 12.63 | 17.1 | 0 | 0 | 4.47 | 0 | None |
| PR Outlet1 | 10 | | 0.1 | | | | |
| A2.1 | 13.83 | 16.07 | 0.277 | 0.1 | 2.17 | 0 | Inlet Capacity |
| A2.2 | 13.66 | 16 | 0 | 0 | 2.34 | 0 | None |
| A2.3 | 13.51 | 16 | 0 | 0 | 2.49 | 0 | None |
| PR Outlet2 | 13.28 | | 0.106 | | | | |
| Moore HW 1 | 12.15 | | 2.954 | | 2 | 0 | None |
| Top Channel | 11.64 | | 2.307 | | | | |
| PR DNSDC | 11.04 | | 1.764 | | 2.96 | 0 | None |
| PR dummy DI | 10.48 | | 0 | | | | |
| OutPit 10 | 12.39 | 17.27 | 2.307 | 0.6 | 4.61 | 0 | Inlet Capacity |
| N OSD10.1 | 11.53 | | 0 | | | | |
| Pit OSD9 | 12.12 | 16.62 | 0.701 | 0.3 | 4.38 | 0 | Inlet Capacity |
| N OSD9.1 | 11.81 | | 0 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| PR C Moor By | 0.107 | 0.107 | 0 | 3 | 0 | 0 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 |
| C S RD 6 | 0.21 | 0.21 | 0 | 2 | 12 | 0 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 |
| C S RD 2 | 0.979 | 0.979 | 0 | 7 | 0 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S RD 4 | 0.16 | 0.16 | 0 | 4 | 0 | 0 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 |
| C S RD 5 | 0.164 | 0.164 | 0 | 4.5 | 0 | 0 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 |
| C PR 3.1 | 0.114 | 0.038 | 0.096 | 4.5 | 12 | 0 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| C S RD7 | 0.082 | 0.082 | 0 | 7 | 0 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S RD 3 | 0.157 | 0.157 | 0 | 2 | 0 | 0 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 |
| C PR DNSC | 1.764 | 1.495 | 0.269 | 5 | 5 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S6 | 2.241 | 2.241 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S5 | 1.326 | 1.326 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C MOORE | 2.062 | 2.062 | 0 | 1 | 10 | 0 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 |
| C S RD 1 | 1.02 | 1.02 | 0 | 5 | 12 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S4 | 2.241 | 2.241 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S3 | 2.241 | 2.241 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S2 | 2.241 | 2.241 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S1.1 | 1.924 | 1.924 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| MPW | 3.773 | 3.773 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C S 7 | 2.208 | 2.208 | 0 | 5 | 10 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C PR 3.2 | 0.09 | 0.03 | 0.075 | 4.5 | 12 | 0 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |
| C MPE North | 8.455 | 8.455 | 0 | 8 | 0 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| C MPE South | 4.71 | 4.71 | 0 | 8 | 0 | 0 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 |
| S PR3.3 | 0.1 | 0.033 | 0.084 | 4.5 | 12 | 0 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| C PR Bypass | 0.033 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 |
| C PR Bypass | 0.031 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 |

Outflow Volumes for Total Catchment (106 impervious + 3.27 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| AR&R 5 year, | 12483.02 | 11098.63 (88. | 11052.91 (91. | 45.72 (12.2%) |
| AR&R 5 year, | 31321.08 | 29640.30 (94. | 29271.34 (96. | 368.96 (39.3%) |
| AR&R 5 year, | 41074.8 | 39268.89 (95. | 38707.94 (97. | 560.95 (45.6%) |
| AR&R 5 year, | 46385.36 | 44527.39 (96. | 43865.83 (97. | 661.56 (47.6%) |
| AR&R 5 year, | 54512.4 | 52558.36 (96. | 51756.05 (97. | 802.32 (49.1%) |
| AR&R 5 year, | 60792.97 | 58784.79 (96. | 57874.63 (98. | 910.16 (50.0%) |
| AR&R 5 year, | 70538.52 | 68408.40 (97. | 67342.65 (98. | 1065.75 (50.4%) |
| AR&R 5 year, | 81663.7 | 79354.30 (97. | 78146.57 (98. | 1207.73 (49.3%) |
| AR&R 5 year, | 90625.43 | 88177.24 (97. | 86846.83 (98. | 1330.41 (49.0%) |
| AR&R 5 year, | 105208.32 | 102518.31 (97 | 101014.87 (96 | 1503.44 (47.7%) |
| AR&R 5 year, | 117240.85 | 114289.25 (97 | 112606.61 (96 | 1682.64 (47.9%) |
| AR&R 5 year, | 136891.8 | 133413.26 (97 | 131711.92 (96 | 1701.34 (41.5%) |

PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P A1.1 | 1.371 | 2.95 | 12.847 | 12.8 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 |
| P A1.2 | 1.373 | 1.78 | 12.746 | 12.635 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 |
| P A1.3 | 1.369 | 1.78 | 12.581 | 12.381 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 |
| P A2.1 | 0.282 | 1.17 | 13.804 | 13.657 | AR&R 5 year, 18 hours storm, average 7.0 mm/h, Zone 1 |
| P A2.2 | 0.277 | 1 | 13.646 | 13.506 | AR&R 5 year, 18 hours storm, average 7.0 mm/h, Zone 1 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P A2.3 | 0.286 | 1.35 | 13.467 | 13.283 | AR&R 5 year, 18 hours storm, average 7.0 mm/h, Zone 1 | | | | | | | | |
| P PR UNDER | 2.961 | 3.07 | 11.822 | 11.641 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | | | | |
| P PR dummy | 1.768 | 6.25 | 11.044 | 10.5 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | | | | |
| Pipe OutPit 10 | 2.307 | 2.91 | 12.176 | 11.532 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 | | | | | | | | |
| P OSD9 | 0.701 | 2.67 | 11.82 | 11.805 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 | | | | | | | | |
| | | | | | | | | | | | | | |
| CHANNEL DETAILS | | | | | | | | | | | | | |
| Name | Max Q | Max V | | | Due to Storm | | | | | | | | |
| | (cu.m/s) | (m/s) | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| OVERFLOW ROUTE DETAILS | | | | | | | | | | | | | |
| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm | | | | | |
| F PR Moore E | 0.107 | 0.107 | 0 | 0.035 | 0.02 | 11.09 | 0.51 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 | | | | | |
| F PR Bypass | 0.033 | 0.033 | 0 | 0.023 | 0.01 | 7.63 | 0.38 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 | | | | | |
| F PR Bypass | 0.031 | 0.031 | 0 | 0.023 | 0.01 | 7.63 | 0.36 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 | | | | | |
| F Simta Rd 6 | 0.21 | 0.21 | 0 | 0.046 | 0.03 | 13.25 | 0.62 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 | | | | | |
| F SR2 | 0.979 | 0.979 | 0 | 0.223 | 0.35 | 6.4 | 1.59 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F SR4 | 0.16 | 0.16 | 0 | 0.133 | 0.14 | 3.08 | 1.06 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 | | | | | |
| F Simta Rd 5 | 0.164 | 0.164 | 0 | 0.042 | 0.02 | 12.35 | 0.58 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 | | | | | |
| F PR3 | 0.114 | 0.114 | 0 | 0.036 | 0.02 | 11.27 | 0.52 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 | | | | | |
| F Simta Rd 7 | 0.082 | 0.082 | 0 | 0.033 | 0.02 | 10.56 | 0.46 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F A1.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A1.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F Outlet 1 | 1.381 | 1.381 | 0 | 0.099 | 0.1 | 23.85 | 1.04 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 | | | | | |
| F A2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A2.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F PR OUTLE | 0.318 | 0.318 | 0 | 0.054 | 0.04 | 14.87 | 0.7 | AR&R 5 year, 18 hours storm, average 7.0 mm/h, Zone 1 | | | | | |
| F SR3 | 0.157 | 0.157 | 0 | 0.132 | 0.14 | 3.03 | 1.06 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 | | | | | |
| F PR OVER M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Channel | 4.716 | 4.716 | 0 | 1.112 | 1.74 | 3.77 | 1.56 | AR&R 5 year, 1.5 hours storm, average 33.3 mm/h, Zone 1 | | | | | |
| F PR DNSDC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F PR dummy | 1.768 | 1.768 | 0 | 0.11 | 0.12 | 26 | 1.11 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S6 | 2.241 | 2.241 | 0 | 0.122 | 0.14 | 28.34 | 1.18 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S5 | 1.326 | 1.326 | 0 | 0.097 | 0.1 | 23.49 | 1.04 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F Moore | 2.062 | 2.062 | 0 | 0.117 | 0.14 | 27.44 | 1.16 | AR&R 5 year, 5 minutes storm, average 137 mm/h, Zone 1 | | | | | |
| F S RD 1 | 1.02 | 1.02 | 0 | 0.088 | 0.08 | 21.51 | 0.96 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F MPE ST1 | 11.992 | 11.992 | 0 | 0.23 | 0.45 | 49.99 | 1.95 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S4 | 2.241 | 2.241 | 0 | 0.122 | 0.14 | 28.34 | 1.18 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S3 | 2.241 | 2.241 | 0 | 0.122 | 0.14 | 28.34 | 1.18 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S2 | 2.241 | 2.241 | 0 | 0.122 | 0.14 | 28.34 | 1.18 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S1 | 1.924 | 1.924 | 0 | 0.114 | 0.13 | 26.72 | 1.14 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F OutPit 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F OSD10.3 | 2.307 | 2.307 | 0 | 0.123 | 0.15 | 28.52 | 1.19 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 | | | | | |
| F MPW | 3.773 | 3.773 | 0 | 0.15 | 0.2 | 34.08 | 1.35 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F Outpit9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F OSD9.2 | 0.701 | 0.701 | 0 | 0.075 | 0.07 | 19 | 0.87 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 | | | | | |
| F OSD9 | 2.954 | 2.954 | 0 | 0.136 | 0.17 | 31.21 | 1.26 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F S7 | 2.208 | 2.208 | 0 | 0.121 | 0.14 | 28.16 | 1.17 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F PR3.2 | 0.09 | 0.09 | 0 | 0.034 | 0.02 | 10.74 | 0.48 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 | | | | | |
| F MPE North | 8.455 | 8.455 | 0 | 0.208 | 0.35 | 45.58 | 1.66 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F MPE South | 4.71 | 4.71 | 0 | 0.164 | 0.24 | 36.78 | 1.44 | AR&R 5 year, 25 minutes storm, average 69.0 mm/h, Zone 1 | | | | | |
| F OSD10.1 | 2.307 | 2.307 | 0 | 0.011 | 0 | 699.9 | 0.31 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 | | | | | |
| F OSD9.1 | 0.701 | 0.701 | 0 | 0.005 | 0 | 699.9 | 0.19 | AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 | | | | | |
| F OSD 1 | 1.371 | 1.371 | 0 | 0.008 | 0 | 699.9 | 0.26 | AR&R 5 year, 12 hours storm, average 9.0 mm/h, Zone 1 | | | | | |
| F PR A2 | 0.277 | 0.277 | -1.4272E+18 | 0.003 | 0 | 699.9 | 0.14 | AR&R 5 year, 18 hours storm, average 7.0 mm/h, Zone 1 | | | | | |
| F PR3.3 | 0.1 | 0.1 | 0 | 0.035 | 0.02 | 10.91 | 0.51 | AR&R 5 year, 2 hours storm, average 27.9 mm/h, Zone 1 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| DETENTION BASIN DETAILS | | | | | | | | | | | | | |
| Name | Max WL | MaxVol | Max Q | Max Q | Max Q | | | | | | | | |
| | | | Total | Low Level | High Level | | | | | | | | |
| OSD 10 | 14.7 | 13959.7 | 2.307 | 0 | 2.307 | | | | | | | | |
| OSD 9 | 15.01 | 5087.7 | 0.701 | 0 | 0.701 | | | | | | | | |
| OSD 1 | 15.18 | 19433.2 | 1.371 | 0 | 1.371 | | | | | | | | |
| OSD 2 | 16.05 | 14842.8 | 0.277 | 0 | 0.277 | | | | | | | | |
| | | | | | | | | | | | | | |
| CONTINUITY CHECK for AR&R 5 year, 9 hours storm, average 10.7 mm/h, Zone 1 | | | | | | | | | | | | | |
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | | |
| PR Moore | 44.58 | 44.58 | 0 | 0 | | | | | | | | | |
| PR Bypass2 | 56.33 | 56.33 | 0 | 0 | | | | | | | | | |
| PR Bypass1 | 62.05 | 62.05 | 0 | 0 | | | | | | | | | |
| Simta Rd 6 | 87.57 | 87.57 | 0 | 0 | | | | | | | | | |
| S Rd 2 | 453.77 | 453.77 | 0 | 0 | | | | | | | | | |
| Simta Rd 4 | 66.87 | 66.87 | 0 | 0 | | | | | | | | | |
| S Rd 5 | 68.46 | 68.46 | 0 | 0 | | | | | | | | | |
| PR 3 | 46.94 | 46.94 | 0 | 0 | | | | | | | | | |
| Simta Rd 7 | 38.21 | 38.21 | 0 | 0 | | | | | | | | | |
| PR Combined | 588.13 | 588.13 | 0 | 0 | | | | | | | | | |
| A1.1 | 2427.6 | 2427.82 | 0.1 | 0 | | | | | | | | | |
| A1.2 | 2427.82 | 2424.21 | 0 | 0.1 | | | | | | | | | |
| A1.3 | 2424.21 | 2420.41 | 0 | 0.2 | | | | | | | | | |
| PR Outlet1 | 2461.58 | 2460.5 | 0 | 0 | | | | | | | | | |
| A2.1 | 436.74 | 436.77 | 0.05 | 0 | | | | | | | | | |
| A2.2 | 436.77 | 435.72 | 0 | 0.2 | | | | | | | | | |
| A2.3 | 435.72 | 434.15 | 0 | 0.4 | | | | | | | | | |
| PR Outlet2 | 588.93 | 588.53 | 0 | 0.1 | | | | | | | | | |
| S Rd 3 | 65.28 | 65.28 | 0 | 0 | | | | | | | | | |
| SimtaChann | 8947.69 | 8947.69 | 0 | 0 | | | | | | | | | |
| Moore HW 1 | 2852.91 | 2853.79 | 0 | 0 | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Top Channel | 8955.09 | 8954.95 | 0 | 0 | | | | | | | | |
| PR DNSDC | 692.73 | 692.73 | 0 | 0 | | | | | | | | |
| PR dummy DI | 692.73 | 692.73 | 0 | 0 | | | | | | | | |
| S6 | 955.3 | 955.3 | 0 | 0 | | | | | | | | |
| S5 | 565.22 | 565.22 | 0 | 0 | | | | | | | | |
| Moore | 859.76 | 859.76 | 0 | 0 | | | | | | | | |
| S Rd 1 | 434.66 | 434.66 | 0 | 0 | | | | | | | | |
| N MPE ST1 | 5110.81 | 5110.85 | 0 | 0 | | | | | | | | |
| S4 | 955.3 | 955.3 | 0 | 0 | | | | | | | | |
| S3 | 955.3 | 955.3 | 0 | 0 | | | | | | | | |
| S2 | 955.3 | 955.3 | 0 | 0 | | | | | | | | |
| S1 | 819.97 | 819.97 | 0 | 0 | | | | | | | | |
| OutPit 10 | 6102.55 | 6101.5 | 0.02 | 0 | | | | | | | | |
| N OSD10.1 | 6101.5 | 6101.4 | 0 | 0 | | | | | | | | |
| N MPW | 1608.09 | 1608.09 | 0 | 0 | | | | | | | | |
| Pit OSD9 | 1725.63 | 1725.59 | 0 | 0 | | | | | | | | |
| N OSD9.1 | 1725.59 | 1725.57 | 0 | 0 | | | | | | | | |
| N OSD9.2 | 2852.95 | 2852.93 | 0 | 0 | | | | | | | | |
| S7 | 940.97 | 940.97 | 0 | 0 | | | | | | | | |
| PR 3.2 | 37.06 | 37.06 | 0 | 0 | | | | | | | | |
| MPE North | 4029.77 | 4029.77 | 0 | 0 | | | | | | | | |
| MPE South | 2244.95 | 2244.95 | 0 | 0 | | | | | | | | |
| OSD 10 | 6718.9 | 6102.66 | 3698.02 | -45.9 | | | | | | | | |
| OSD 9 | 1896.27 | 1725.64 | 1023.84 | -45 | | | | | | | | |
| OSD 1 | 4615.7 | 2459.93 | 12937.78 | -233.6 | | | | | | | | |
| OSD 2 | 2530.7 | 444.47 | 12518.65 | -412.2 | | | | | | | | |
| PR3.3 | 41.17 | 41.17 | 0 | 0 | | | | | | | | |
| Outlet 1 Comb | 2459.41 | 2459.41 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for MPE_Proposed.drn run at 17:43:25 on 12/10/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| No water upwelling from any pit. Freeboard was adequate at all pits. | | | | | | | | | | | | |
| The maximum flow in the following overflow routes is unsafe: F Outlet 1, F MPE South, F MPE North, Channel, F S6, F S5, F Moore, F S RD 1, F S4, F S3, F S2, F S1, F OSD10.3, F MPW | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F OSD10.1 F OSD9.1 F OSD 1 F PR A2 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |
| | | | | | | | | | | | | |

ARCADIS Design & Consultancy for natural and built assets

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | 100 YEAR ARI RESULTS | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Proposed.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Stage 2 Proposed |

**100 Year ARI**

DRAINS results prepared from Version 2016.14

PIT / NODE DETAILS

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| | | | | Version 8 | | | |
| A1.1 | 13.31 | 17.23 | 1.84 | 0.50 | 3.69 | 0.00 | Inlet Capacity |
| A1.2 | 13.25 | 17.30 | 0.00 | 0.00 | 4.05 | 0.00 | None |
| A1.3 | 13.23 | 17.10 | 0.00 | 0.00 | 3.87 | 0.00 | None |
| PR Outlet1 | 13.20 | | 0.18 | | | | |
| A2.1 | 14.69 | 16.22 | 1.66 | 0.50 | 1.31 | 0.00 | Inlet Capacity |
| A2.2 | 14.69 | 16.00 | 0.00 | 0.00 | 1.31 | 0.00 | None |
| A2.3 | 14.68 | 16.00 | 0.00 | 0.00 | 1.32 | 0.00 | None |
| PR Outlet2 | 14.66 | | 0.20 | | | | |
| Moore HW 1 | 12.33 | | 4.41 | | 1.82 | 0.00 | None |
| Top Channel | 11.71 | | 3.08 | | | | |
| PR DNSDC | 11.30 | | 2.68 | | 2.70 | 0.57 | Inlet Capacity |
| PR dummy DNSDC | 10.48 | | 0.00 | | | | |
| OutPit 10 | 12.73 | 17.33 | 3.08 | 0.80 | 4.27 | 0.00 | Inlet Capacity |
| N OSD10.1 | 12.56 | | 0.00 | | | | |
| Pit OSD9 | 13.13 | 16.64 | 0.90 | 0.30 | 3.37 | 0.00 | Inlet Capacity |
| N OSD9.1 | 13.06 | | 0.00 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| PR C Moor Bypass | 0.17 | 0.17 | 0.00 | 3.00 | 0.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S RD 6 | 0.34 | 0.34 | 0.00 | 2.00 | 12.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S RD 2 | 1.44 | 1.44 | 0.00 | 7.00 | 0.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C S RD 4 | 0.26 | 0.26 | 0.00 | 4.00 | 0.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S RD 5 | 0.27 | 0.27 | 0.00 | 4.50 | 0.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C PR 3.1 | 0.20 | 0.06 | 0.16 | 4.50 | 12.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C S RD7 | 0.12 | 0.12 | 0.00 | 7.00 | 0.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C S RD 3 | 0.26 | 0.26 | 0.00 | 2.00 | 0.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C PR DNSC | 2.68 | 2.36 | 0.32 | 5.00 | 5.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S6 | 3.54 | 3.54 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S5 | 2.09 | 2.09 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C MOORE | 3.36 | 3.36 | 0.00 | 1.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S RD 1 | 1.61 | 1.61 | 0.00 | 5.00 | 12.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S4 | 3.54 | 3.54 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S3 | 3.54 | 3.54 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S2 | 3.54 | 3.54 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S1.1 | 3.03 | 3.03 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| MPW | 5.95 | 5.95 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C S 7 | 3.48 | 3.48 | 0.00 | 5.00 | 10.00 | 0.00 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| C PR 3.2 | 0.16 | 0.05 | 0.13 | 4.50 | 12.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C MPE North | 12.49 | 12.49 | 0.00 | 8.00 | 0.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| C MPE South | 6.96 | 6.96 | 0.00 | 8.00 | 0.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| S PR3.3 | 0.18 | 0.06 | 0.14 | 4.50 | 12.00 | 0.00 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| C PR Bypass 2 | 0.06 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| C PR Bypass 1 | 0.06 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |

Outflow Volumes for Total Catchment (106 impervious + 3.27 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | 20352.12 | 18880.43 (92. | 18686.96 (94. | 193.48 (31.7%) |
| AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 | 51023.80 | 49270.88 (96. | 48325.47 (97. | 945.41 (61.8%) |
| AR&R 100 year, 45 minutes storm, average 82.1 mm/h, Zone 1 | 67126.20 | 65263.52 (97. | 63938.12 (98. | 1325.40 (65.9%) |
| AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1 | 76016.19 | 74114.85 (97. | 72582.58 (98. | 1532.27 (67.3%) |
| AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 | 89751.69 | 87782.21 (97. | 85938.82 (98. | 1843.39 (68.5%) |
| AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 | 100464.52 | 98434.23 (98. | 96350.78 (98. | 2083.44 (69.2%) |
| AR&R 100 year, 3 hours storm, average 35.9 mm/h, Zone 1 | 117240.84 | 115076.96 (98 | 112643.60 (99 | 2433.36 (69.3%) |
| AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1 | 136575.70 | 134225.46 (98 | 131416.70 (99 | 2808.75 (68.6%) |
| AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1 | 152357.53 | 149810.53 (98 | 146728.34 (99 | 3082.18 (67.5%) |
| AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 | 178466.14 | 175457.46 (98 | 172008.00 (99 | 3449.46 (64.5%) |
| AR&R 100 year, 12 hours storm, average 15.3 mm/h, Zone 1 | 200454.92 | 197171.92 (98 | 193333.67 (99 | 3838.25 (63.9%) |
| AR&R 100 year, 18 hours storm, average 12.1 mm/h, Zone 1 | 237413.56 | 233548.66 (98 | 229294.17 (99 | 4254.49 (59.8%) |

PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P A1.1 | 1.84 | 0.77 | 13.25 | 13.25 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| P A1.2 | 1.84 | 0.64 | 13.24 | 13.23 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| P A1.3 | 1.84 | 0.64 | 13.21 | 13.20 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| P A2.1 | 1.67 | 0.41 | 14.69 | 14.69 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| P A2.2 | 1.65 | 0.41 | 14.69 | 14.68 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| P A2.3 | 1.66 | 0.41 | 14.67 | 14.66 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| P PR UNDER MOORE | 4.44 | 3.53 | 11.90 | 11.71 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 |
| P PR dummy DNSDC | 2.12 | 7.49 | 11.30 | 10.50 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 |
| Pipe OutPit 10 | 3.08 | 0.83 | 12.64 | 12.56 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 |
| P OSD9 | 0.90 | 0.50 | 13.06 | 13.06 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |

CHANNEL DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Due to Storm |
|---|---|---|---|

OVERFLOW ROUTE DETAILS

| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm |
|---|---|---|---|---|---|---|---|---|
| F PR Moore Bypass | 0.17 | 0.17 | 5.38 | 0.04 | 0.03 | 12.53 | 0.60 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F PR Bypass 2 | 0.06 | 0.06 | 0.00 | 0.03 | 0.01 | 9.73 | 0.42 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| F PR Bypass 1 | 0.06 | 0.06 | 0.00 | 0.03 | 0.01 | 9.73 | 0.42 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |
| F Simta Rd 6 | 0.34 | 0.34 | 0.00 | 0.06 | 0.04 | 15.23 | 0.71 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F SR2 | 1.44 | 1.44 | 0.00 | 0.25 | 0.46 | 6.40 | 1.84 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F SR4 | 0.26 | 0.26 | 0.00 | 0.16 | 0.17 | 4.40 | 1.07 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F Simta Rd 5 | 0.27 | 0.27 | 0.00 | 0.05 | 0.03 | 14.15 | 0.67 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 |
| F PR3 | 0.20 | 0.20 | 0.00 | 0.05 | 0.03 | 13.07 | 0.62 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F Simta Rd 7 | 0.12 | 0.12 | 0.00 | 0.04 | 0.02 | 11.45 | 0.53 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 |
| F A1.1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| F A1.2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| F A1.3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| F Outlet 1 | 1.86 | 1.86 | 0.00 | 0.11 | 0.13 | 26.54 | 1.12 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F A2.1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| F A2.2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| F A2.3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| F PR OUTLET 2 | 1.81 | 1.81 | 0.00 | 0.11 | 0.12 | 26.18 | 1.12 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 | | | | |
| F SR3 | 0.26 | 0.26 | 0.00 | 0.16 | 0.17 | 4.28 | 1.07 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F PR OVER MOORE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| Channel | 6.89 | 6.89 | 0.00 | 1.36 | 2.34 | 4.23 | 1.73 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 | | | | |
| F PR DNSDC | 0.57 | 0.57 | 0.00 | 0.07 | 0.06 | 17.92 | 0.81 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F PR dummy DNSDC | 2.12 | 2.12 | 0.00 | 0.12 | 0.14 | 27.80 | 1.16 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 | | | | |
| F S6 | 3.54 | 3.54 | 0.00 | 0.15 | 0.19 | 33.19 | 1.33 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F S5 | 2.09 | 2.09 | 0.00 | 0.12 | 0.14 | 27.62 | 1.16 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F Moore | 3.36 | 3.36 | 0.00 | 0.14 | 0.19 | 32.65 | 1.31 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F S RD 1 | 1.61 | 1.61 | 0.00 | 0.11 | 0.12 | 25.10 | 1.09 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F MPE ST1 | 19.09 | 19.09 | 0.00 | 0.23 | 0.71 | 49.99 | 3.11 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F S4 | 3.54 | 3.54 | 0.00 | 0.15 | 0.19 | 33.19 | 1.33 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F S3 | 3.54 | 3.54 | 0.00 | 0.15 | 0.19 | 33.19 | 1.33 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F S2 | 3.54 | 3.54 | 0.00 | 0.15 | 0.19 | 33.19 | 1.33 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F S1 | 3.03 | 3.03 | 0.00 | 0.14 | 0.18 | 31.39 | 1.28 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F OutPit 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| F OSD10.3 | 3.08 | 3.08 | 0.00 | 0.14 | 0.18 | 31.75 | 1.27 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 | | | | |
| F MPW | 5.95 | 5.95 | 0.00 | 0.18 | 0.27 | 40.19 | 1.51 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F Outpit9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| F OSD9.2 | 0.90 | 0.90 | 0.00 | 0.08 | 0.08 | 20.61 | 0.93 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 | | | | |
| F OSD9 | 4.41 | 4.41 | 0.00 | 0.16 | 0.22 | 36.06 | 1.40 | AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1 | | | | |
| F S7 | 3.48 | 3.48 | 0.00 | 0.15 | 0.19 | 33.01 | 1.33 | AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1 | | | | |
| F PR3.2 | 0.16 | 0.16 | 0.00 | 0.04 | 0.02 | 12.35 | 0.57 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 | | | | |
| F MPE North | 12.49 | 12.49 | 0.00 | 0.23 | 0.47 | 49.99 | 2.03 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 | | | | |
| F MPE South | 6.96 | 6.96 | 0.00 | 0.19 | 0.30 | 42.53 | 1.57 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 | | | | |
| F OSD10.1 | 3.08 | 3.08 | 0.00 | 0.01 | 0.00 | 699.90 | 0.35 | AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1 | | | | |
| F OSD9.1 | 0.90 | 0.90 | 0.00 | 0.01 | 0.00 | 699.90 | 0.22 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 | | | | |
| F OSD 1 | 1.84 | 1.84 | 0.00 | 0.01 | 0.00 | 699.90 | 0.30 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 | | | | |
| F PR A2 | 1.66 | 1.66 | 5.38 | 0.01 | 0.00 | 699.90 | 0.29 | AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1 | | | | |
| F PR3.3 | 0.18 | 0.18 | 0.00 | 0.04 | 0.03 | 12.71 | 0.58 | AR&R 100 year, 25 minutes storm, average 112 mm/h, Zone 1 | | | | |

DETENTION BASIN DETAILS

| Name | Max WL | MaxVol | Max Q Total | Max Q Low Level | Max Q High Level |
|---|---|---|---|---|---|
| OSD 10 | 15.57 | 24023.70 | 3.08 | 0.00 | 3.08 |
| OSD 9 | 15.87 | 7988.10 | 0.90 | 0.00 | 0.90 |
| OSD 1 | 15.66 | 27373.30 | 1.84 | 0.00 | 1.84 |
| OSD 2 | 16.19 | 16591.70 | 1.66 | 0.00 | 1.66 |

CONTINUITY CHECK for AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1

| Node | Inflow (cu.m) | Outflow (cu.m) | Storage Chan (cu.m) | Difference % |
|---|---|---|---|---|
| PR Moore | 75.95 | 75.95 | 0.00 | 0.00 |
| PR Bypass2 | 114.73 | 114.73 | 0.00 | 0.00 |
| PR Bypass1 | 115.93 | 115.93 | 0.00 | 0.00 |
| Simta Rd 6 | 149.18 | 149.18 | 0.00 | 0.00 |
| S Rd 2 | 773.04 | 773.04 | 0.00 | 0.00 |
| Simta Rd 4 | 113.92 | 113.92 | 0.00 | 0.00 |
| S Rd 5 | 116.63 | 116.63 | 0.00 | 0.00 |
| PR 3 | 103.06 | 103.06 | 0.00 | 0.00 |
| Simta Rd 7 | 65.10 | 65.10 | 0.00 | 0.00 |
| PR Combined 2 | 2435.70 | 2435.70 | 0.00 | 0.00 |
| A1.1 | 5593.75 | 5593.18 | 0.11 | 0.00 |
| A1.2 | 5593.18 | 5593.33 | 0.00 | 0.00 |
| A1.3 | 5593.33 | 5593.14 | 0.00 | 0.00 |
| PR Outlet1 | 5683.54 | 5682.43 | 0.00 | 0.00 |
| A2.1 | 2126.84 | 2125.73 | 0.05 | 0.00 |
| A2.2 | 2125.73 | 2128.70 | 0.00 | -0.10 |
| A2.3 | 2128.70 | 2125.17 | 0.00 | 0.20 |
| PR Outlet2 | 2436.54 | 2436.09 | 0.00 | 0.00 |
| S Rd 3 | 111.21 | 111.21 | 0.00 | 0.00 |
| SimtaChann | 15833.63 | 15833.63 | 0.00 | 0.00 |
| Moore HW 1 | 5020.79 | 5021.54 | 0.00 | 0.00 |
| Top Channel | 15844.46 | 15844.30 | 0.00 | 0.00 |
| PR DNSDC | 1224.43 | 1224.46 | 0.00 | 0.00 |
| PR dummy DNSDC | 1224.46 | 1224.46 | 0.00 | 0.00 |
| S6 | 1627.45 | 1627.45 | 0.00 | 0.00 |
| S5 | 962.91 | 962.91 | 0.00 | 0.00 |
| Moore | 1464.71 | 1464.71 | 0.00 | 0.00 |
| S Rd 1 | 740.49 | 740.49 | 0.00 | 0.00 |
| N MPE ST1 | 8706.85 | 8706.83 | 0.00 | 0.00 |
| S4 | 1627.45 | 1627.45 | 0.00 | 0.00 |
| S3 | 1627.45 | 1627.45 | 0.00 | 0.00 |
| S2 | 1627.45 | 1627.45 | 0.00 | 0.00 |
| S1 | 1396.90 | 1396.90 | 0.00 | 0.00 |
| OutPit 10 | 10823.02 | 10823.21 | 0.02 | 0.00 |
| N OSD10.1 | 10823.21 | 10823.08 | 0.00 | 0.00 |
| N MPW | 2739.53 | 2739.53 | 0.00 | 0.00 |
| Pit OSD9 | 3057.46 | 3055.99 | 0.01 | 0.00 |
| N OSD9.1 | 3055.99 | 3055.95 | 0.00 | 0.00 |
| N OSD9.2 | 5020.86 | 5020.82 | 0.00 | 0.00 |
| S7 | 1603.05 | 1603.05 | 0.00 | 0.00 |
| PR 3.2 | 81.36 | 81.36 | 0.00 | 0.00 |
| MPE North | 6865.15 | 6865.15 | 0.00 | 0.00 |
| MPE South | 3824.52 | 3824.52 | 0.00 | 0.00 |
| OSD 10 | 11446.33 | 10823.16 | 3739.87 | -27.20 |
| OSD 9 | 3230.50 | 3057.50 | 1038.06 | -26.80 |
| OSD 1 | 7863.38 | 5626.77 | 13422.47 | -142.30 |
| OSD 2 | 4334.51 | 2134.77 | 13199.12 | -253.80 |
| PR3.3 | 90.40 | 90.40 | 0.00 | 0.00 |
| Outlet 1 Combined | 5681.35 | 5681.35 | 0.00 | 0.00 |

Run Log for MPE_Proposed.drn run at 17:07:05 on 12/10/2016

No water upwelling from any pit. Freeboard was adequate at all pits.

The maximum flow in the following overflow routes is unsafe: F MPE North, Channel, F SR2

The following overflow routes carried water uphill (adding energy): F OSD10.1 F OSD9.1 F OSD 1 F PR A2

These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model.

ARCADIS Design & Consultancy for natural and built assets

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | 100 YEAR ARI + 10% CC F | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Proposed.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Stage 2 Proposed |

**100 Year CC**

DRAINS results prepared from Version 2016.14

PIT / NODE DETAILS — Version 8

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| A1.1 | 13.07 | 17.24 | 1.917 | 0.5 | 3.93 | 0 | Inlet Capacity |
| A1.2 | 12.85 | 17.3 | 0 | 0 | 4.45 | 0 | None |
| A1.3 | 12.69 | 17.1 | 0 | 0 | 4.41 | 0 | None |
| PR Outlet1 | 10 | | 0.201 | | | | |
| A2.1 | 14.01 | 16.22 | 1.746 | 0.5 | 1.99 | 0 | Inlet Capacity |
| A2.2 | 13.83 | 16 | 0 | 0 | 2.17 | 0 | None |
| A2.3 | 13.72 | 16 | 0 | 0 | 2.28 | 0 | None |
| PR Outlet2 | 13.42 | | 0.233 | | | | |
| Moore HW 1 | 12.41 | | 5.098 | | 1.74 | 0 | None |
| Top Channel | 11.75 | | 3.266 | | | | |
| PR DNSDC | 11.3 | | 2.985 | | 2.7 | 0.875 | Inlet Capacity |
| PR dummy DI | 10.48 | | 0 | | | | |
| OutPit 10 | 12.5 | 17.34 | 3.266 | 0.8 | 4.5 | 0 | Inlet Capacity |
| N OSD10.1 | 11.58 | | 0 | | | | |
| Pit OSD9 | 12.22 | 16.65 | 0.935 | 0.3 | 4.28 | 0 | Inlet Capacity |
| N OSD9.1 | 11.85 | | 0 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| PR C Moor By | 0.192 | 0.192 | 0 | 3 | 0 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S RD 6 | 0.377 | 0.377 | 0 | 2 | 12 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S RD 2 | 1.586 | 1.586 | 0 | 7 | 0 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |
| C S RD 4 | 0.288 | 0.288 | 0 | 4 | 0 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S RD 5 | 0.294 | 0.294 | 0 | 4.5 | 0 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C PR 3.1 | 0.23 | 0.068 | 0.186 | 4.5 | 12 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |
| C S RD7 | 0.134 | 0.134 | 0 | 7 | 0 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |
| C S RD 3 | 0.281 | 0.281 | 0 | 2 | 0 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C PR DNSC | 2.985 | 2.606 | 0.378 | 5 | 5 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S6 | 3.908 | 3.908 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S5 | 2.312 | 2.312 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C MOORE | 3.697 | 3.697 | 0 | 1 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S RD 1 | 1.778 | 1.778 | 0 | 5 | 12 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S4 | 3.908 | 3.908 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S3 | 3.908 | 3.908 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S2 | 3.908 | 3.908 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S1.1 | 3.355 | 3.355 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| MPW | 6.579 | 6.579 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C S 7 | 3.85 | 3.85 | 0 | 5 | 10 | 0 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 |
| C PR 3.2 | 0.181 | 0.054 | 0.147 | 4.5 | 12 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |
| C MPE North | 13.74 | 13.74 | 0 | 8 | 0 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |
| C MPE South | 7.654 | 7.654 | 0 | 8 | 0 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |
| S PR3.3 | 0.201 | 0.06 | 0.163 | 4.5 | 12 | 0 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| C PR Bypass | 0.068 | AR&R 101 year, 6 hours storm, average 25.6 mm/h, Zone 1 |
| C PR Bypass | 0.068 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 |

Outflow Volumes for Total Catchment (106 impervious + 3.27 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| AR&R 101 ye | 22387.51 | 20893.71 (93. | 20660.10 (95. | 233.61 (34.8%) |
| AR&R 101 ye | 56127.27 | 54361.91 (96. | 53264.91 (97. | 1097.00 (65.2%) |
| AR&R 101 ye | 73839.11 | 71971.60 (97. | 70446.11 (98. | 1525.49 (68.9%) |
| AR&R 101 ye | 83616.44 | 81710.48 (97. | 79951.62 (98. | 1758.86 (70.2%) |
| AR&R 101 ye | 98729.77 | 96758.21 (98. | 94646.90 (98. | 2111.31 (71.4%) |
| AR&R 101 ye | 110509.78 | 108479.22 (98 | 106096.66 (99 | 2382.55 (71.9%) |
| AR&R 101 ye | 128962.76 | 126797.26 (98 | 124016.48 (99 | 2780.77 (71.9%) |
| AR&R 101 ye | 150226.77 | 147875.55 (98 | 144660.81 (99 | 3214.73 (71.4%) |
| AR&R 101 ye | 167588.94 | 165036.98 (98 | 161508.50 (99 | 3528.48 (70.3%) |
| AR&R 101 ye | 196324.2 | 193369.60 (98 | 189401.84 (99 | 3967.76 (67.4%) |
| AR&R 101 ye | 220503.69 | 217157.66 (98 | 212761.81 (99 | 4395.85 (66.5%) |
| AR&R 101 ye | 261151.61 | 257230.42 (98 | 252321.89 (99 | 4908.52 (62.7%) |

PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P A1.1 | 1.917 | 2.71 | 12.897 | 12.853 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 |
| P A1.2 | 1.917 | 1.99 | 12.786 | 12.688 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 |
| P A1.3 | 1.917 | 1.99 | 12.621 | 12.421 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 |
| P A2.1 | 1.769 | 2.16 | 13.932 | 13.83 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 |
| P A2.2 | 1.752 | 1.88 | 13.792 | 13.723 | AR&R 101 year, 12 hours storm, average 16.9 mm/h, Zone 1 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P A2.3 | 1.77 | 2.16 | 13.602 | 13.419 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | | | | |
| P PR UNDER | 5.119 | 3.7 | 11.931 | 11.745 | AR&R 101 year, 1.5 hours storm, average 60.4 mm/h, Zone 1 | | | | | | | | |
| P PR dummy | 2.122 | 7.5 | 11.296 | 10.5 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | | | | |
| Pipe OutPit 10 | 3.266 | 3.08 | 12.219 | 11.578 | AR&R 101 year, 2 hours storm, average 50.7 mm/h, Zone 1 | | | | | | | | |
| P OSD9 | 0.935 | 2.8 | 11.868 | 11.853 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | | | | |
| | | | | | | | | | | | | | |
| CHANNEL DETAILS | | | | | | | | | | | | | |
| Name | Max Q | Max V | | | Due to Storm | | | | | | | | |
| | (cu.m/s) | (m/s) | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| OVERFLOW ROUTE DETAILS | | | | | | | | | | | | | |
| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm | | | | | |
| F PR Moore E | 0.192 | 0.192 | 5.375 | 0.044 | 0.03 | 12.89 | 0.61 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F PR Bypass | 0.068 | 0.068 | 0 | 0.03 | 0.01 | 10.02 | 0.45 | AR&R 101 year, 6 hours storm, average 25.6 mm/h, Zone 1 | | | | | |
| F PR Bypass | 0.068 | 0.068 | 0 | 0.03 | 0.01 | 10.02 | 0.45 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F Simta Rd 6 | 0.377 | 0.377 | 0 | 0.059 | 0.04 | 15.76 | 0.72 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F SR2 | 1.586 | 1.586 | 0 | 0.257 | 0.49 | 6.4 | 1.91 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| F SR4 | 0.288 | 0.288 | 0 | 0.164 | 0.18 | 4.7 | 1.08 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F Simta Rd 5 | 0.294 | 0.294 | 0 | 0.053 | 0.04 | 14.51 | 0.69 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F PR3 | 0.23 | 0.23 | 0 | 0.048 | 0.03 | 13.61 | 0.63 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| F Simta Rd 7 | 0.134 | 0.134 | 0 | 0.039 | 0.02 | 11.81 | 0.54 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| F A1.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A1.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F Outlet 1 | 1.943 | 1.943 | 0 | 0.115 | 0.13 | 26.9 | 1.14 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F A2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A2.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F PR OUTLET | 1.943 | 1.943 | 0 | 0.115 | 0.13 | 26.9 | 1.14 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F SR3 | 0.281 | 0.281 | 0 | 0.163 | 0.17 | 4.66 | 1.07 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F PR OVER M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Channel | 7.652 | 7.652 | 0 | 1.431 | 2.54 | 4.37 | 1.77 | AR&R 101 year, 1.5 hours storm, average 60.4 mm/h, Zone 1 | | | | | |
| F PR DNSDC | 0.875 | 0.875 | 0 | 0.082 | 0.08 | 20.43 | 0.93 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F PR dummy | 2.122 | 2.122 | 0 | 0.119 | 0.14 | 27.8 | 1.16 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S6 | 3.908 | 3.908 | 0 | 0.152 | 0.21 | 34.44 | 1.36 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S5 | 2.312 | 2.312 | 0 | 0.123 | 0.15 | 28.52 | 1.2 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F Moore | 3.697 | 3.697 | 0 | 0.149 | 0.2 | 33.73 | 1.35 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S RD 1 | 1.778 | 1.778 | 0 | 0.11 | 0.12 | 26 | 1.12 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F MPE ST1 | 21.089 | 21.089 | 0 | 0.23 | 0.79 | 49.99 | 3.43 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S4 | 3.908 | 3.908 | 0 | 0.152 | 0.21 | 34.44 | 1.36 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S3 | 3.908 | 3.908 | 0 | 0.152 | 0.21 | 34.44 | 1.36 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S2 | 3.908 | 3.908 | 0 | 0.152 | 0.21 | 34.44 | 1.36 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F S1 | 3.355 | 3.355 | 0 | 0.143 | 0.19 | 32.65 | 1.31 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F OutPit 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F OSD10.3 | 3.266 | 3.266 | 0 | 0.141 | 0.18 | 32.29 | 1.3 | AR&R 101 year, 2 hours storm, average 50.7 mm/h, Zone 1 | | | | | |
| F MPW | 6.579 | 6.579 | 0 | 0.188 | 0.29 | 41.63 | 1.55 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F Outpit9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F OSD9.2 | 0.935 | 0.935 | 0 | 0.085 | 0.08 | 20.97 | 0.94 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F OSD9 | 5.098 | 5.098 | 0 | 0.169 | 0.25 | 37.86 | 1.46 | AR&R 101 year, 1.5 hours storm, average 60.4 mm/h, Zone 1 | | | | | |
| F S7 | 3.85 | 3.85 | 0 | 0.151 | 0.21 | 34.26 | 1.36 | AR&R 101 year, 5 minutes storm, average 246 mm/h, Zone 1 | | | | | |
| F PR3.2 | 0.181 | 0.181 | 0 | 0.044 | 0.03 | 12.71 | 0.6 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| F MPE North | 13.74 | 13.74 | 0 | 0.23 | 0.51 | 49.99 | 2.24 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| F MPE South | 7.654 | 7.654 | 0 | 0.2 | 0.32 | 43.96 | 1.62 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| F OSD10.1 | 3.266 | 3.266 | 0 | 0.013 | 0 | 699.9 | 0.37 | AR&R 101 year, 2 hours storm, average 50.7 mm/h, Zone 1 | | | | | |
| F OSD9.1 | 0.935 | 0.935 | 0 | 0.006 | 0 | 699.9 | 0.23 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F OSD 1 | 1.917 | 1.917 | 0 | 0.009 | 0 | 699.9 | 0.29 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F PR A2 | 1.746 | 1.746 | 5.375 | 0.009 | 0 | 699.9 | 0.28 | AR&R 101 year, 9 hours storm, average 20.0 mm/h, Zone 1 | | | | | |
| F PR3.3 | 0.201 | 0.201 | 0 | 0.045 | 0.03 | 13.07 | 0.62 | AR&R 101 year, 25 minutes storm, average 124 mm/h, Zone 1 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| DETENTION BASIN DETAILS | | | | | | | | | | | | | |
| Name | Max WL | MaxVol | Max Q | Max Q | Max Q | | | | | | | | |
| | | | Total | Low Level | High Level | | | | | | | | |
| OSD 10 | 15.81 | 26816.6 | 3.266 | 0 | 3.266 | | | | | | | | |
| OSD 9 | 16.06 | 8627.4 | 0.935 | 0 | 0.935 | | | | | | | | |
| OSD 1 | 15.78 | 29432.3 | 1.917 | 0 | 1.917 | | | | | | | | |
| OSD 2 | 16.25 | 17237.1 | 1.746 | 0 | 1.746 | | | | | | | | |
| | | | | | | | | | | | | | |
| CONTINUITY CHECK for AR&R 101 year, 6 hours storm, average 25.6 mm/h, Zone 1 | | | | | | | | | | | | | |
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | | |
| PR Moore | 71.29 | 71.29 | 0 | 0 | | | | | | | | | |
| PR Bypass2 | 110.69 | 110.69 | 0 | 0 | | | | | | | | | |
| PR Bypass1 | 123.39 | 123.39 | 0 | 0 | | | | | | | | | |
| Simta Rd 6 | 140.03 | 140.03 | 0 | 0 | | | | | | | | | |
| S Rd 2 | 725.63 | 725.63 | 0 | 0 | | | | | | | | | |
| Simta Rd 4 | 106.94 | 106.94 | 0 | 0 | | | | | | | | | |
| S Rd 5 | 109.48 | 109.48 | 0 | 0 | | | | | | | | | |
| PR 3 | 105.5 | 105.5 | 0 | 0 | | | | | | | | | |
| Simta Rd 7 | 61.11 | 61.11 | 0 | 0 | | | | | | | | | |
| PR Combined | 2114.61 | 2114.61 | 0 | 0 | | | | | | | | | |
| A1.1 | 4896.05 | 4893.1 | 0.11 | 0.1 | | | | | | | | | |
| A1.2 | 4893.1 | 4891.74 | 0 | 0 | | | | | | | | | |
| A1.3 | 4891.74 | 4888.64 | 0 | 0.1 | | | | | | | | | |
| PR Outlet1 | 4981.18 | 4980.02 | 0 | 0 | | | | | | | | | |
| A2.1 | 1800.41 | 1804.72 | 0.05 | -0.2 | | | | | | | | | |
| A2.2 | 1804.72 | 1798.89 | 0 | 0.3 | | | | | | | | | |
| A2.3 | 1798.89 | 1798.86 | 0 | 0 | | | | | | | | | |
| PR Outlet2 | 2115.45 | 2115.03 | 0 | 0 | | | | | | | | | |
| S Rd 3 | 104.39 | 104.39 | 0 | 0 | | | | | | | | | |
| SimtaChann | 14614.47 | 14614.47 | 0 | 0 | | | | | | | | | |
| Moore HW 1 | 4652.49 | 4652.08 | 0 | 0 | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Top Channel | 14700.16 | 14698.65 | 0 | 0 | | | | | | | | |
| PR DNSDC | 1166.17 | 1165.88 | 0 | 0 | | | | | | | | |
| PR dummy DI | 1165.88 | 1165.88 | 0 | 0 | | | | | | | | |
| S6 | 1527.65 | 1527.65 | 0 | 0 | | | | | | | | |
| S5 | 903.86 | 903.86 | 0 | 0 | | | | | | | | |
| Moore | 1374.89 | 1374.89 | 0 | 0 | | | | | | | | |
| S Rd 1 | 695.08 | 695.08 | 0 | 0 | | | | | | | | |
| N MPE ST1 | 8172.97 | 8172.95 | 0 | 0 | | | | | | | | |
| S4 | 1527.65 | 1527.65 | 0 | 0 | | | | | | | | |
| S3 | 1527.65 | 1527.65 | 0 | 0 | | | | | | | | |
| S2 | 1527.65 | 1527.65 | 0 | 0 | | | | | | | | |
| S1 | 1311.23 | 1311.23 | 0 | 0 | | | | | | | | |
| OutPit 10 | 10052.11 | 10049.24 | 0.07 | 0 | | | | | | | | |
| N OSD10.1 | 10049.24 | 10048.65 | 0 | 0 | | | | | | | | |
| N MPW | 2571.54 | 2571.54 | 0 | 0 | | | | | | | | |
| Pit OSD9 | 2796.04 | 2795.06 | 0.09 | 0 | | | | | | | | |
| N OSD9.1 | 2795.06 | 2794.18 | 0 | 0 | | | | | | | | |
| N OSD9.2 | 4654.26 | 4653.38 | 0 | 0 | | | | | | | | |
| S7 | 1504.74 | 1504.74 | 0 | 0 | | | | | | | | |
| PR 3.2 | 83.29 | 83.29 | 0 | 0 | | | | | | | | |
| MPE North | 6444.14 | 6444.14 | 0 | 0 | | | | | | | | |
| MPE South | 3589.98 | 3589.98 | 0 | 0 | | | | | | | | |
| OSD 10 | 10744.49 | 10052.67 | 4152.49 | -32.2 | | | | | | | | |
| OSD 9 | 3032.4 | 2796.92 | 1415.44 | -38.9 | | | | | | | | |
| OSD 1 | 7381.11 | 4930.86 | 14704.85 | -166 | | | | | | | | |
| OSD 2 | 4077.37 | 1808.46 | 13614.79 | -278.3 | | | | | | | | |
| PR3.3 | 92.54 | 92.54 | 0 | 0 | | | | | | | | |
| Outlet 1 Comb | 4978.85 | 4978.85 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for MPE_Proposed.drn run at 17:42:00 on 12/10/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| No water upwelling from any pit. Freeboard was adequate at all pits. | | | | | | | | | | | | |
| The maximum flow in the following overflow routes is unsafe: F MPE North, Channel, F MPE ST1, F SR2 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F OSD10.1 F OSD9.1 F OSD 1 F PR A2 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

ARCADIS Design & Consultancy for natural and built assets

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009017 | | |
| | | PREPARED | AZ | DATE | 18/11/2016 |
| TITLE | 100 YEAR ARI + 20% CC F | CHECKED | BC | DATE | 18/11/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Proposed20%.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Stage 2 Proposed |

**100 Year CC**

DRAINS results prepared from Version 2016.14

PIT / NODE DETAILS — Version 8

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| A1.1 | 13.16 | 17.29 | 2.6 | 0.7 | 3.84 | 0 | Inlet Capacity |
| A1.2 | 12.91 | 17.3 | 0 | 0 | 4.39 | 0 | None |
| A1.3 | 12.75 | 17.1 | 0 | 0 | 4.35 | 0 | None |
| PR Outlet1 | 10 | | 0.226 | | | | |
| A2.1 | 14.01 | 16.23 | 1.803 | 0.5 | 1.99 | 0 | Inlet Capacity |
| A2.2 | 13.84 | 16 | 0 | 0 | 2.16 | 0 | None |
| A2.3 | 13.73 | 16 | 0 | 0 | 2.27 | 0 | None |
| PR Outlet2 | 13.42 | | 0.263 | | | | |
| Moore HW 1 | 12.46 | | 5.569 | | 1.69 | 0 | None |
| Top Channel | 11.77 | | 3.441 | | | | |
| PR DNSDC | 11.3 | | 3.288 | | 2.7 | 1.178 | Inlet Capacity |
| PR dummy DI | 10.48 | | 0 | | | | |
| OutPit 10 | 12.51 | 17.35 | 3.441 | 0.8 | 4.49 | 0 | Inlet Capacity |
| N OSD10.1 | 11.59 | | 0 | | | | |
| Pit OSD9 | 12.24 | 16.65 | 0.972 | 0.3 | 4.26 | 0 | Inlet Capacity |
| N OSD9.1 | 11.86 | | 0 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| PR C Moor By | 0.209 | 0.209 | 0 | 3 | 0 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S RD 6 | 0.411 | 0.411 | 0 | 2 | 12 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S RD 2 | 1.731 | 1.731 | 0 | 7 | 0 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |
| C S RD 4 | 0.314 | 0.314 | 0 | 4 | 0 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S RD 5 | 0.321 | 0.321 | 0 | 4.5 | 0 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C PR 3.1 | 0.257 | 0.075 | 0.207 | 4.5 | 12 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |
| C S RD7 | 0.146 | 0.146 | 0 | 7 | 0 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |
| C S RD 3 | 0.306 | 0.306 | 0 | 2 | 0 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C PR DNSC | 3.288 | 2.856 | 0.433 | 5 | 5 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S6 | 4.282 | 4.282 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S5 | 2.533 | 2.533 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C MOORE | 4.033 | 4.033 | 0 | 1 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S RD 1 | 1.948 | 1.948 | 0 | 5 | 12 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S4 | 4.282 | 4.282 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S3 | 4.282 | 4.282 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S2 | 4.282 | 4.282 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S1.1 | 3.675 | 3.675 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| MPW | 7.207 | 7.207 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C S 7 | 4.217 | 4.217 | 0 | 5 | 10 | 0 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 |
| C PR 3.2 | 0.203 | 0.059 | 0.164 | 4.5 | 12 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |
| C MPE North | 14.989 | 14.989 | 0 | 8 | 0 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |
| C MPE South | 8.35 | 8.35 | 0 | 8 | 0 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |
| S PR3.3 | 0.226 | 0.066 | 0.182 | 4.5 | 12 | 0 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| C PR Bypass | 0.075 | AR&R 100 year, 2 hours storm, average 55.3 mm/h, Zone 1 |
| C PR Bypass | 0.069 | AR&R 100 year, 3 hours storm, average 43.0 mm/h, Zone 1 |

Outflow Volumes for Total Catchment (106 impervious + 3.27 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| AR&R 100 ye | 24422.91 | 22916.44 (93. | 22622.84 (95. | 293.60 (40.1%) |
| AR&R 100 ye | 61228.02 | 59454.91 (97. | 58206.16 (98. | 1248.75 (68.1%) |
| AR&R 100 ye | 80551.09 | 78676.62 (97. | 76950.88 (98. | 1725.74 (71.5%) |
| AR&R 100 ye | 91219.42 | 89309.50 (97. | 87323.78 (98. | 1985.72 (72.6%) |
| AR&R 100 ye | 107700.55 | 105727.16 (98 | 103347.80 (98 | 2379.37 (73.7%) |
| AR&R 100 ye | 120559.63 | 118526.23 (98 | 115844.10 (99 | 2682.13 (74.2%) |
| AR&R 100 ye | 140684.64 | 138523.23 (98 | 135392.66 (99 | 3130.58 (74.2%) |
| AR&R 100 ye | 163883.25 | 161359.36 (98 | 157737.19 (99 | 3622.17 (73.7%) |
| AR&R 100 ye | 182814.84 | 180041.85 (98 | 176062.56 (99 | 3979.29 (72.6%) |
| AR&R 100 ye | 214144.11 | 209831.90 (98 | 205343.77 (98 | 4488.13 (69.9%) |
| AR&R 100 ye | 240557.91 | 235784.47 (98 | 230816.09 (98 | 4968.38 (68.9%) |
| AR&R 100 ye | 284900.59 | 278530.55 (97 | 272956.06 (98 | 5574.49 (65.3%) |

PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P A1.1 | 2.6 | 2.74 | 12.948 | 12.914 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 |
| P A1.2 | 2.599 | 2.2 | 12.831 | 12.749 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 |
| P A1.3 | 2.597 | 2.2 | 12.666 | 12.466 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 |
| P A2.1 | 1.834 | 2.21 | 13.935 | 13.837 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 |
| P A2.2 | 1.811 | 1.89 | 13.798 | 13.731 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P A2.3 | 1.831 | 2.18 | 13.607 | 13.423 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | | | | |
| P PR UNDER | 5.584 | 3.81 | 11.951 | 11.766 | AR&R 100 year, 1.5 hours storm, average 65.9 mm/h, Zone 1 | | | | | | | | |
| P PR dummy | 2.12 | 7.5 | 11.297 | 10.5 | AR&R 100 year, 1.5 hours storm, average 65.9 mm/h, Zone 1 | | | | | | | | |
| Pipe OutPit 10 | 3.441 | 2.74 | 12.249 | 11.586 | AR&R 100 year, 2 hours storm, average 55.3 mm/h, Zone 1 | | | | | | | | |
| P OSD9 | 0.972 | 2.82 | 11.875 | 11.86 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | | | | |
| | | | | | | | | | | | | | |
| CHANNEL DETAILS | | | | | | | | | | | | | |
| Name | Max Q | Max V | | | Due to Storm | | | | | | | | |
| | (cu.m/s) | (m/s) | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| OVERFLOW ROUTE DETAILS | | | | | | | | | | | | | |
| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm | | | | | |
| F PR Moore E | 0.209 | 0.209 | 0 | 0.046 | 0.03 | 13.25 | 0.62 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F PR Bypass | 0.075 | 0.075 | 0 | 0.032 | 0.01 | 10.38 | 0.45 | AR&R 100 year, 2 hours storm, average 55.3 mm/h, Zone 1 | | | | | |
| F PR Bypass | 0.069 | 0.069 | 0 | 0.031 | 0.01 | 10.2 | 0.43 | AR&R 100 year, 3 hours storm, average 43.0 mm/h, Zone 1 | | | | | |
| F Simta Rd 6 | 0.411 | 0.411 | 0 | 0.061 | 0.05 | 16.12 | 0.75 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F SR2 | 1.731 | 1.731 | 0 | 0.263 | 0.52 | 6.4 | 1.98 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| F SR4 | 0.314 | 0.314 | 0 | 0.168 | 0.18 | 4.9 | 1.1 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F Simta Rd 5 | 0.321 | 0.321 | 0 | 0.054 | 0.04 | 14.87 | 0.71 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F PR3 | 0.257 | 0.257 | 0 | 0.05 | 0.03 | 13.97 | 0.66 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| F Simta Rd 7 | 0.146 | 0.146 | 0 | 0.04 | 0.02 | 11.99 | 0.56 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| F A1.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A1.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F Outlet 1 | 2.638 | 2.638 | 0 | 0.13 | 0.16 | 29.95 | 1.23 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | |
| F A2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A2.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F A2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F PR OUTLET | 1.943 | 1.943 | 0 | 0.115 | 0.13 | 26.9 | 1.14 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | |
| F SR3 | 0.306 | 0.306 | 0 | 0.167 | 0.18 | 4.83 | 1.1 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F PR OVER M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Channel | 8.24 | 8.24 | 0 | 1.487 | 2.68 | 4.48 | 1.81 | AR&R 100 year, 1.5 hours storm, average 65.9 mm/h, Zone 1 | | | | | |
| F PR DNSDC | 1.178 | 1.178 | 0 | 0.093 | 0.09 | 22.59 | 1 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F PR dummy | 2.12 | 2.12 | 0 | 0.119 | 0.14 | 27.8 | 1.16 | AR&R 100 year, 1.5 hours storm, average 65.9 mm/h, Zone 1 | | | | | |
| F S6 | 4.282 | 4.282 | 0 | 0.159 | 0.22 | 35.7 | 1.39 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F S5 | 2.533 | 2.533 | 0 | 0.128 | 0.16 | 29.59 | 1.21 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F Moore | 4.033 | 4.033 | 0 | 0.154 | 0.21 | 34.8 | 1.38 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F S RD 1 | 1.948 | 1.948 | 0 | 0.115 | 0.13 | 26.9 | 1.14 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F MPE ST1 | 23.087 | 23.087 | 0 | 0.23 | 0.86 | 49.99 | 3.76 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F S4 | 4.282 | 4.282 | 0 | 0.159 | 0.22 | 35.7 | 1.39 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F S3 | 4.282 | 4.282 | 0 | 0.159 | 0.22 | 35.7 | 1.39 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F S2 | 4.282 | 4.282 | 0 | 0.159 | 0.22 | 35.7 | 1.39 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F S1 | 3.675 | 3.675 | 0 | 0.149 | 0.2 | 33.73 | 1.34 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F OutPit 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F OSD10.3 | 3.441 | 3.441 | 0 | 0.145 | 0.19 | 33.01 | 1.31 | AR&R 100 year, 2 hours storm, average 55.3 mm/h, Zone 1 | | | | | |
| F MPW | 7.207 | 7.207 | 0 | 0.195 | 0.31 | 43.07 | 1.59 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F Outpit9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| F OSD9.2 | 0.972 | 0.972 | 0 | 0.086 | 0.08 | 21.15 | 0.95 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | |
| F OSD9 | 5.569 | 5.569 | 0 | 0.176 | 0.26 | 39.11 | 1.5 | AR&R 100 year, 1.5 hours storm, average 65.9 mm/h, Zone 1 | | | | | |
| F S7 | 4.217 | 4.217 | 0 | 0.157 | 0.22 | 35.34 | 1.4 | AR&R 100 year, 5 minutes storm, average 269 mm/h, Zone 1 | | | | | |
| F PR3.2 | 0.203 | 0.203 | 0 | 0.045 | 0.03 | 13.07 | 0.62 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| F MPE North | 14.989 | 14.989 | 0 | 0.23 | 0.56 | 49.99 | 2.44 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| F MPE South | 8.35 | 8.35 | 0 | 0.207 | 0.34 | 45.4 | 1.65 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| F OSD10.1 | 3.441 | 3.441 | 0 | 0.013 | 0 | 699.9 | 0.37 | AR&R 100 year, 2 hours storm, average 55.3 mm/h, Zone 1 | | | | | |
| F OSD9.1 | 0.972 | 0.972 | 0 | 0.006 | 0 | 699.9 | 0.22 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | |
| F OSD 1 | 2.6 | 2.6 | 0 | 0.011 | 0 | 699.9 | 0.33 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | |
| F PR A2 | 1.803 | 1.803 | 0 | 0.009 | 0 | 699.9 | 0.29 | AR&R 100 year, 9 hours storm, average 21.8 mm/h, Zone 1 | | | | | |
| F PR3.3 | 0.226 | 0.226 | 0 | 0.047 | 0.03 | 13.43 | 0.64 | AR&R 100 year, 25 minutes storm, average 135 mm/h, Zone 1 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| DETENTION BASIN DETAILS | | | | | | | | | | | | | |
| Name | Max WL | MaxVol | Max Q | Max Q | Max Q | | | | | | | | |
| | | | Total | Low Level | High Level | | | | | | | | |
| OSD 10 | 16.06 | 29640.4 | 3.441 | 0 | 3.441 | | | | | | | | |
| OSD 9 | 16.25 | 9284.4 | 0.972 | 0 | 0.972 | | | | | | | | |
| OSD 1 | 15.88 | 31016 | 2.6 | 0 | 2.6 | | | | | | | | |
| OSD 2 | 16.34 | 18286.5 | 1.803 | 0 | 1.803 | | | | | | | | |
| | | | | | | | | | | | | | |
| CONTINUITY CHECK for AR&R 100 year, 2 hours storm, average 55.3 mm/h, Zone 1 | | | | | | | | | | | | | |
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | | |
| PR Moore | 306.92 | 306.92 | 0 | 0 | | | | | | | | | |
| PR Bypass2 | 458.42 | 458.42 | 0 | 0 | | | | | | | | | |
| PR Bypass1 | 496.39 | 496.39 | 0 | 0 | | | | | | | | | |
| Simta Rd 6 | 602.88 | 602.88 | 0 | 0 | | | | | | | | | |
| S Rd 2 | 3124.02 | 3124.02 | 0 | 0 | | | | | | | | | |
| Simta Rd 4 | 460.38 | 460.38 | 0 | 0 | | | | | | | | | |
| S Rd 5 | 471.34 | 471.34 | 0 | 0 | | | | | | | | | |
| PR 3 | 487.87 | 487.87 | 0 | 0 | | | | | | | | | |
| Simta Rd 7 | 263.08 | 263.08 | 0 | 0 | | | | | | | | | |
| PR Combined | 4709.77 | 4709.77 | 0 | 0 | | | | | | | | | |
| A1.1 | 15072.26 | 15064.52 | 0.13 | 0.1 | | | | | | | | | |
| A1.2 | 15064.52 | 15054 | 0 | 0.1 | | | | | | | | | |
| A1.3 | 15054 | 15033.76 | 0 | 0.1 | | | | | | | | | |
| PR Outlet1 | 15461.72 | 15460.26 | 0 | 0 | | | | | | | | | |
| A2.1 | 3399.69 | 3396.03 | 0.05 | 0.1 | | | | | | | | | |
| A2.2 | 3396.03 | 3391.88 | 0 | 0.1 | | | | | | | | | |
| A2.3 | 3391.88 | 3376.1 | 0 | 0.5 | | | | | | | | | |
| PR Outlet2 | 4710.77 | 4710.27 | 0 | 0 | | | | | | | | | |
| S Rd 3 | 449.42 | 449.42 | 0 | 0 | | | | | | | | | |
| SimtaChann | 54422.71 | 54422.71 | 0 | 0 | | | | | | | | | |
| Moore HW 1 | 17367.46 | 17362.23 | 0 | 0 | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Top Channel | 55048.99 | 55036.93 | 0 | 0 | | | | | | | | |
| PR DNSDC | 5087.59 | 5089.36 | 0 | 0 | | | | | | | | |
| PR dummy DI | 4907.98 | 4907.98 | 0 | 0 | | | | | | | | |
| S6 | 6576.92 | 6576.92 | 0 | 0 | | | | | | | | |
| S5 | 3891.33 | 3891.33 | 0 | 0 | | | | | | | | |
| Moore | 5919.2 | 5919.2 | 0 | 0 | | | | | | | | |
| S Rd 1 | 2992.49 | 2992.49 | 0 | 0 | | | | | | | | |
| N MPE ST1 | 35186.13 | 35186.49 | 0 | 0 | | | | | | | | |
| S4 | 6576.92 | 6576.92 | 0 | 0 | | | | | | | | |
| S3 | 6576.92 | 6576.92 | 0 | 0 | | | | | | | | |
| S2 | 6576.92 | 6576.92 | 0 | 0 | | | | | | | | |
| S1 | 5645.17 | 5645.17 | 0 | 0 | | | | | | | | |
| OutPit 10 | 37812.58 | 37707.78 | 0.5 | 0.3 | | | | | | | | |
| N OSD10.1 | 37707.78 | 37697.28 | 0 | 0 | | | | | | | | |
| N MPW | 11071.08 | 11071.08 | 0 | 0 | | | | | | | | |
| Pit OSD9 | 9296.33 | 9291.84 | 0.14 | 0 | | | | | | | | |
| N OSD9.1 | 9291.84 | 9290.28 | 0 | 0 | | | | | | | | |
| N OSD9.2 | 17370.59 | 17369.03 | 0 | 0 | | | | | | | | |
| S7 | 6478.23 | 6478.23 | 0 | 0 | | | | | | | | |
| PR 3.2 | 385.16 | 385.16 | 0 | 0 | | | | | | | | |
| MPE North | 27743.54 | 27743.54 | 0 | 0 | | | | | | | | |
| MPE South | 15455.73 | 15455.73 | 0 | 0 | | | | | | | | |
| OSD 10 | 46257.71 | 37823.01 | 8439.72 | 0 | | | | | | | | |
| OSD 9 | 13055.2 | 9297.89 | 3758.03 | 0 | | | | | | | | |
| OSD 1 | 31776.78 | 15113.85 | 16664.22 | 0 | | | | | | | | |
| OSD 2 | 17587.66 | 3407.9 | 14180.11 | 0 | | | | | | | | |
| PR3.3 | 427.96 | 427.96 | 0 | 0 | | | | | | | | |
| Outlet 1 Comb | 15458.79 | 15458.79 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for MPE_Proposed20%.drn run at 10:43:43 on 18/11/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| No water upwelling from any pit. Freeboard was adequate at all pits. | | | | | | | | | | | | |
| The maximum flow in the following overflow routes is unsafe: F MPE South, F MPE North, Channel, F MPE ST1, F SR2 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F OSD10.1 F OSD9.1 F OSD 1 F PR A2 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

ARCADIS Design & Consultancy for natural and built assets

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | MPE Stage 2 | JOB No | AA009335 | | |
| | | PREPARED | AZ | DATE | 13/10/2016 |
| TITLE | PMF RESULTS | CHECKED | BC | DATE | 13/10/2016 |

| | |
|---|---|
| **DRAINS File Path:** | F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2\MPE_Proposed.drn |
| **DRAINS Version:** | DRAINS results prepared 6 July, 2016 from Version 2016.07 |
| **Modeller's Name:** | AZ |
| **Description:** | MPE Stage 2 Proposed |

**PMF**

DRAINS results prepared from Version 2016.14

PIT / NODE DETAILS

| Name | Max HGL | Max Pond HGL | Max Surface Flow Arriving (cu.m/s) | Max Pond Volume (cu.m) | Min Freeboard (m) | Overflow (cu.m/s) | Constraint |
|---|---|---|---|---|---|---|---|
| A1.1 | 17.79 | 18 | 31.278 | 4.3 | -0.79 | 29.656 | Outlet System |
| A1.2 | 17.74 | 18.3 | 29.656 | 4.3 | -0.44 | 22.751 | Outlet System |
| A1.3 | 17.28 | 18.1 | 22.751 | 4.3 | -0.18 | 7.42 | Outlet System |
| PR Outlet1 | 10 | | 7.934 | | | | |
| A2.1 | 16.59 | 17 | 22.286 | 4.3 | -0.59 | 15.227 | Outlet System |
| A2.2 | 16.53 | 17 | 15.227 | 4.3 | -0.53 | 9.866 | Outlet System |
| A2.3 | 16.41 | 17 | 9.866 | 4.3 | -0.41 | 0.443 | Outlet System |
| PR Outlet2 | 14.12 | | 1.768 | | | | |
| Moore HW 1 | 16.29 | | 41.329 | | -2.14 | 3.124 | Headwall height/system capacity |
| Top Channel | 12.87 | | 82.798 | | | | |
| PR DNSDC | 11.35 | | 11.977 | | 2.65 | 9.867 | Inlet Capacity |
| PR dummy DI | 10.48 | | 0 | | | | |
| OutPit 10 | 17.13 | 18 | 79.516 | 4.3 | -0.13 | 60.124 | Outlet System |
| N OSD10.1 | 12.25 | | 60.124 | | | | |
| Pit OSD9 | 16.96 | 17.5 | 25.616 | 4.3 | -0.46 | 19.006 | Outlet System |
| N OSD9.1 | 12.78 | | 19.006 | | | | |

SUB-CATCHMENT DETAILS

| Name | Max Flow Q (cu.m/s) | Paved Max Q (cu.m/s) | Grassed Max Q (cu.m/s) | Paved Tc (min) | Grassed Tc (min) | Supp. Tc (min) | Due to Storm |
|---|---|---|---|---|---|---|---|
| PR C Moor By | 0.698 | 0.698 | 0 | 3 | 0 | 0 | 15min PMP |
| C S RD 6 | 1.372 | 1.372 | 0 | 2 | 12 | 0 | 15min PMP |
| C S RD 2 | 6.817 | 6.817 | 0 | 7 | 0 | 0 | 15min PMP |
| C S RD 4 | 1.048 | 1.048 | 0 | 4 | 0 | 0 | 15min PMP |
| C S RD 5 | 1.073 | 1.073 | 0 | 4.5 | 0 | 0 | 15min PMP |
| C PR 3.1 | 1.025 | 0.284 | 0.903 | 4.5 | 12 | 0 | 15min PMP |
| C S RD7 | 0.574 | 0.574 | 0 | 7 | 0 | 0 | 15min PMP |
| C S RD 3 | 1.023 | 1.023 | 0 | 2 | 0 | 0 | 15min PMP |
| C PR DNSC | 11.977 | 9.954 | 2.091 | 5 | 5 | 0 | 15min PMP |
| C S6 | 14.926 | 14.926 | 0 | 5 | 10 | 0 | 15min PMP |
| C S5 | 8.831 | 8.831 | 0 | 5 | 10 | 0 | 15min PMP |
| C MOORE | 13.47 | 13.47 | 0 | 1 | 10 | 0 | 15min PMP |
| C S RD 1 | 6.791 | 6.791 | 0 | 5 | 12 | 0 | 15min PMP |
| C S4 | 14.926 | 14.926 | 0 | 5 | 10 | 0 | 15min PMP |
| C S3 | 14.926 | 14.926 | 0 | 5 | 10 | 0 | 15min PMP |
| C S2 | 14.926 | 14.926 | 0 | 5 | 10 | 0 | 15min PMP |
| C S1.1 | 12.811 | 12.811 | 0 | 5 | 10 | 0 | 15min PMP |
| MPW | 25.125 | 25.125 | 0 | 5 | 10 | 0 | 15min PMP |
| C S 7 | 14.702 | 14.702 | 0 | 5 | 10 | 0 | 15min PMP |
| C PR 3.2 | 0.809 | 0.225 | 0.713 | 4.5 | 12 | 0 | 15min PMP |
| C MPE North | 59.783 | 59.783 | 0 | 8 | 0 | 0 | 15min PMP |
| C MPE South | 33.305 | 33.305 | 0 | 8 | 0 | 0 | 15min PMP |
| S PR3.3 | 0.899 | 0.249 | 0.792 | 4.5 | 12 | 0 | 15min PMP |

| Name | Max Flow (cu.m/s) | Due to Storm |
|---|---|---|
| C PR Bypass | 0.513 | 1Hr PMP |
| C PR Bypass | 0.483 | 1Hr PMP |

Outflow Volumes for Total Catchment (106 impervious + 3.27 pervious = 109 total ha)

| Storm | Total Rainfall cu.m | Total Runoff cu.m (Runoff | Impervious Ru cu.m (Runoff | Pervious Runoff cu.m (Runoff %) |
|---|---|---|---|---|
| 15min PMP | 185283.48 | 183503.32 (99 | 178490.95 (99 | 5012.37 (90.3%) |
| 30min PMP | 272475.72 | 270548.75 (99 | 263015.63 (99 | 7533.12 (92.2%) |
| 45min PMP | 337869.91 | 335928.17 (99 | 326507.16 (99 | 9421.02 (93.0%) |
| 1Hr PMP | 392274.19 | 390318.34 (99 | 379325.56 (99 | 10992.78 (93.5%) |
| 1.5Hr PMP | 446769.34 | 444786.19 (99 | 432256.31 (99 | 12529.88 (93.6%) |
| 2Hr PMP | 490456.28 | 488394.80 (99 | 474651.91 (99 | 13742.89 (93.5%) |
| 2.5Hr PMP | 523153.38 | 521041.22 (99 | 506394.44 (99 | 14646.78 (93.4%) |
| 3Hr PMP | 556122.94 | 553972.31 (99 | 538413.38 (99 | 15558.94 (93.4%) |
| 4Hr PMP | 599446.56 | 597158.32 (99 | 580453.88 (99 | 16704.45 (93.0%) |
| 5Hr PMP | 653941.75 | 651533.72 (99 | 633346.19 (99 | 18187.54 (92.8%) |
| 6Hr PMP | 686366.38 | 683831.33 (99 | 664827.69 (99 | 19003.65 (92.4%) |

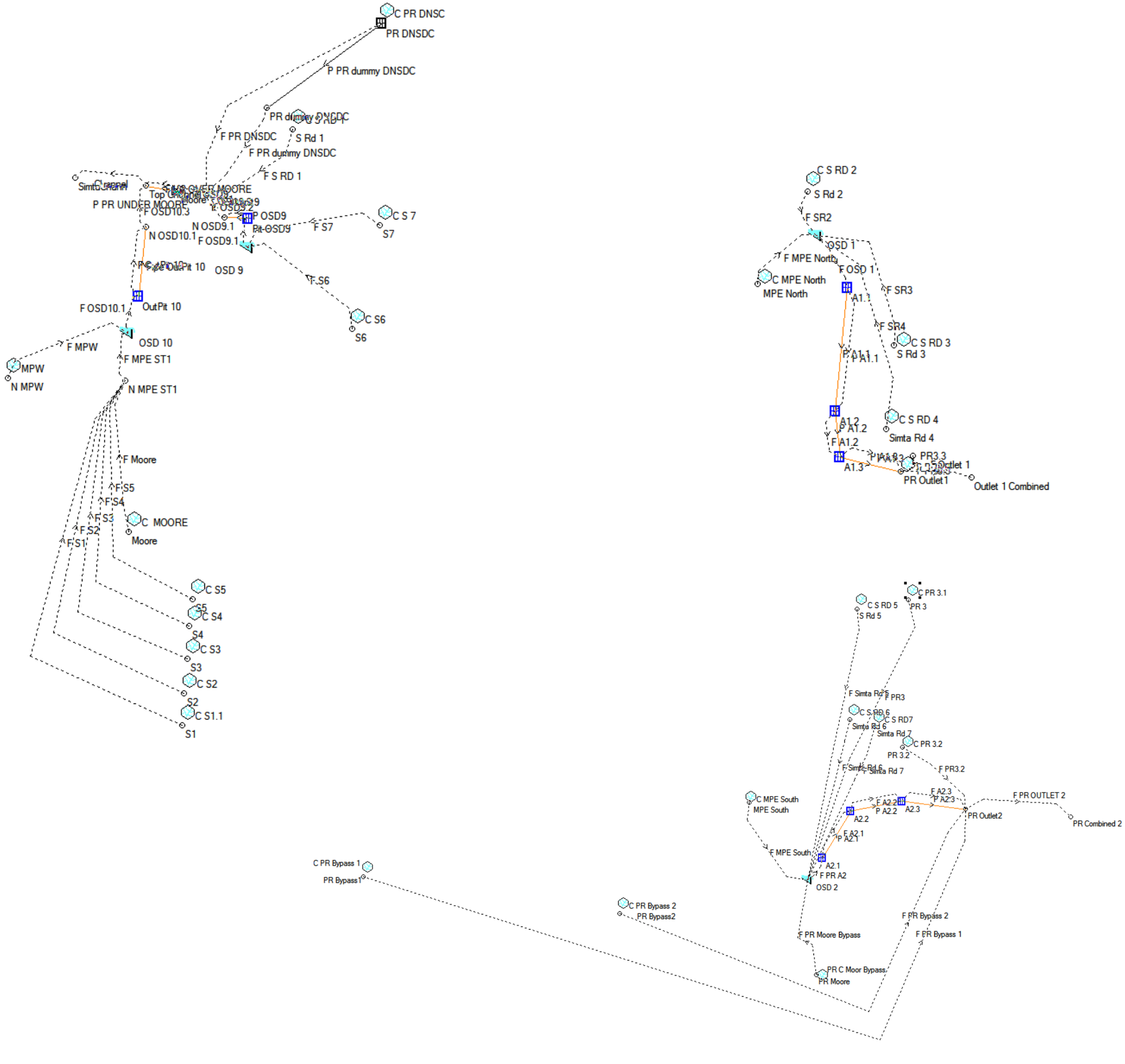
PIPE DETAILS

| Name | Max Q (cu.m/s) | Max V (m/s) | Max U/S HGL (m) | Max D/S HGL (m) | Due to Storm |
|---|---|---|---|---|---|
| P A1.1 | 11.726 | 4.07 | 17.751 | 17.743 | 6Hr PMP |
| P A1.2 | 19.611 | 6.81 | 17.474 | 17.28 | 30min PMP |
| P A1.3 | 23.874 | 8.29 | 15.536 | 12.82 | 45min PMP |
| P A2.1 | 13.531 | 3.34 | 16.551 | 16.53 | 30min PMP |
| P A2.2 | 16.719 | 4.13 | 16.442 | 16.41 | 45min PMP |
| P A2.3 | 19.128 | 4.72 | 15.051 | 14.12 | 45min PMP |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P PR UNDER | 38.258 | 6.49 | 13.064 | 12.873 | 15min PMP | | | | | | | |
| P PR dummy | 2.176 | 7.7 | 11.354 | 10.5 | 15min PMP | | | | | | | |
| Pipe OutPit 10 | 22.125 | 3.9 | 16.555 | 12.25 | 1Hr PMP | | | | | | | |
| P OSD9 | 6.61 | 3.67 | 12.952 | 12.78 | 1.5Hr PMP | | | | | | | |
| | | | | | | | | | | | | |
| CHANNEL DETAILS | | | | | | | | | | | | |
| Name | Max Q | Max V | | | Due to Storm | | | | | | | |
| | (cu.m/s) | (m/s) | | | | | | | | | | |
| | | | | | | | | | | | | |
| OVERFLOW ROUTE DETAILS | | | | | | | | | | | | |
| Name | Max Q U/S | Max Q D/S | Safe Q | Max D | Max DxV | Max Width | Max V | Due to Storm | | | | |
| F PR Moore B | 0.698 | 0.698 | 0 | 0.075 | 0.07 | 19 | 0.87 | 15min PMP | | | | |
| F PR Bypass | 0.513 | 0.513 | 0 | 0.066 | 0.05 | 17.2 | 0.8 | 1Hr PMP | | | | |
| F PR Bypass | 0.483 | 0.483 | 0 | 0.064 | 0.05 | 16.84 | 0.79 | 1Hr PMP | | | | |
| F Simta Rd 6 | 1.372 | 1.372 | 0 | 0.099 | 0.1 | 23.85 | 1.04 | 15min PMP | | | | |
| F SR2 | 6.817 | 6.817 | 0 | 0.445 | 1.49 | 6.4 | 3.35 | 15min PMP | | | | |
| F SR4 | 1.048 | 1.048 | 0 | 0.227 | 0.37 | 6.4 | 1.63 | 15min PMP | | | | |
| F Simta Rd 5 | 1.073 | 1.073 | 0 | 0.089 | 0.09 | 21.87 | 0.98 | 15min PMP | | | | |
| F PR3 | 1.025 | 1.025 | 0 | 0.088 | 0.08 | 21.51 | 0.97 | 15min PMP | | | | |
| F Simta Rd 7 | 0.574 | 0.574 | 0 | 0.07 | 0.06 | 17.92 | 0.82 | 15min PMP | | | | |
| F A1.1 | 29.656 | 29.656 | 0 | 0.23 | 1.11 | 49.99 | 4.82 | 1Hr PMP | | | | |
| F A1.2 | 22.751 | 22.751 | 0 | 0.23 | 0.85 | 49.99 | 3.7 | 1Hr PMP | | | | |
| F A1.3 | 7.42 | 7.42 | 0 | 0.197 | 0.32 | 43.42 | 1.61 | 1Hr PMP | | | | |
| F Outlet 1 | 31.8 | 31.8 | 0 | 0.23 | 1.19 | 49.99 | 5.17 | 1Hr PMP | | | | |
| F A2.1 | 15.227 | 15.227 | 0 | 0.23 | 0.57 | 49.99 | 2.48 | 45min PMP | | | | |
| F A2.2 | 9.866 | 9.866 | 0 | 0.221 | 0.38 | 48.27 | 1.72 | 45min PMP | | | | |
| F A2.3 | 0.443 | 0.443 | 0 | 0.062 | 0.05 | 16.48 | 0.76 | 45min PMP | | | | |
| F PR OUTLET | 20.805 | 20.805 | 0 | 0.23 | 0.78 | 49.99 | 3.38 | 45min PMP | | | | |
| F SR3 | 1.023 | 1.023 | 0 | 0.226 | 0.36 | 6.4 | 1.61 | 15min PMP | | | | |
| F PR OVER M | 3.124 | 3.124 | 0 | 0.139 | 0.18 | 31.75 | 1.29 | 15min PMP | | | | |
| Channel | 120.076 | 120.076 | 0 | 3.272 | 3 | 120.07 | 0.92 | 15min PMP | | | | |
| F PR DNSDC | 9.867 | 9.867 | 0 | 0.221 | 0.38 | 48.27 | 1.72 | 15min PMP | | | | |
| F PR dummy | 2.176 | 2.176 | 0 | 0.12 | 0.14 | 27.98 | 1.17 | 15min PMP | | | | |
| F S6 | 14.926 | 14.926 | 0 | 0.23 | 0.56 | 49.99 | 2.43 | 15min PMP | | | | |
| F S5 | 8.831 | 8.831 | 0 | 0.211 | 0.36 | 46.3 | 1.68 | 15min PMP | | | | |
| F Moore | 13.47 | 13.47 | 0 | 0.23 | 0.5 | 49.99 | 2.19 | 15min PMP | | | | |
| F S RD 1 | 6.791 | 6.791 | 0 | 0.191 | 0.3 | 42.17 | 1.56 | 15min PMP | | | | |
| F MPE ST1 | 79.705 | 79.705 | 0 | 0.23 | 2.98 | 49.99 | 12.97 | 15min PMP | | | | |
| F S4 | 14.926 | 14.926 | 0 | 0.23 | 0.56 | 49.99 | 2.43 | 15min PMP | | | | |
| F S3 | 14.926 | 14.926 | 0 | 0.23 | 0.56 | 49.99 | 2.43 | 15min PMP | | | | |
| F S2 | 14.926 | 14.926 | 0 | 0.23 | 0.56 | 49.99 | 2.43 | 15min PMP | | | | |
| F S1 | 12.811 | 12.811 | 0 | 0.23 | 0.48 | 49.99 | 2.08 | 15min PMP | | | | |
| F OutPit 10 | 60.124 | 60.124 | 0 | 0.23 | 2.25 | 49.99 | 9.78 | 15min PMP | | | | |
| F OSD10.3 | 79.978 | 79.978 | 0 | 0.23 | 2.99 | 49.99 | 13.01 | 15min PMP | | | | |
| F MPW | 25.125 | 25.125 | 0 | 0.23 | 0.94 | 49.99 | 4.09 | 15min PMP | | | | |
| F Outpit9 | 19.006 | 19.006 | 0 | 0.23 | 0.71 | 49.99 | 3.09 | 15min PMP | | | | |
| F OSD9.2 | 25.616 | 25.616 | 0 | 0.23 | 0.96 | 49.99 | 4.17 | 15min PMP | | | | |
| F OSD9 | 41.329 | 41.329 | 0 | 0.23 | 1.55 | 49.99 | 6.72 | 15min PMP | | | | |
| F S7 | 14.702 | 14.702 | 0 | 0.23 | 0.55 | 49.99 | 2.39 | 15min PMP | | | | |
| F PR3.2 | 0.809 | 0.809 | 0 | 0.079 | 0.07 | 19.9 | 0.91 | 15min PMP | | | | |
| F MPE North | 59.783 | 59.783 | 0 | 0.23 | 2.24 | 49.99 | 9.72 | 15min PMP | | | | |
| F MPE South | 33.305 | 33.305 | 0 | 0.23 | 1.25 | 49.99 | 5.42 | 15min PMP | | | | |
| F OSD10.1 | 79.516 | 79.516 | 0 | 0.087 | 0.11 | 699.9 | 1.31 | 15min PMP | | | | |
| F OSD9.1 | 25.616 | 25.616 | 0 | 0.044 | 0.04 | 699.9 | 0.83 | 15min PMP | | | | |
| F OSD 1 | 31.278 | 31.278 | 0 | 0.05 | 0.04 | 699.9 | 0.9 | 1Hr PMP | | | | |
| F PR A2 | 22.286 | 22.286 | 0 | 0.041 | 0.03 | 699.9 | 0.78 | 30min PMP | | | | |
| F PR3.3 | 0.899 | 0.899 | 0 | 0.083 | 0.08 | 20.61 | 0.93 | 15min PMP | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| DETENTION BASIN DETAILS | | | | | | | | | | | | |
| Name | Max WL | MaxVol | Max Q | Max Q | Max Q | | | | | | | |
| | | | Total | Low Level | High Level | | | | | | | |
| OSD 10 | 17.5 | 46350 | 79.516 | 0 | 79.516 | | | | | | | |
| OSD 9 | 16.71 | 10847.7 | 25.616 | 0 | 25.616 | | | | | | | |
| OSD 1 | 17.82 | 62949.1 | 31.278 | 0 | 31.278 | | | | | | | |
| OSD 2 | 17.12 | 27561.9 | 22.286 | 0 | 22.286 | | | | | | | |
| | | | | | | | | | | | | |
| CONTINUITY CHECK for 1Hr PMP | | | | | | | | | | | | |
| Node | Inflow | Outflow | Storage Chan | Difference | | | | | | | | |
| | (cu.m) | (cu.m) | (cu.m) | % | | | | | | | | |
| PR Moore | 1004.97 | 1004.97 | 0 | 0 | | | | | | | | |
| PR Bypass2 | 1805.1 | 1805.1 | 0 | 0 | | | | | | | | |
| PR Bypass1 | 1968.7 | 1968.7 | 0 | 0 | | | | | | | | |
| Simta Rd 6 | 1974.04 | 1974.04 | 0 | 0 | | | | | | | | |
| S Rd 2 | 10229.12 | 10229.12 | 0 | 0 | | | | | | | | |
| Simta Rd 4 | 1507.45 | 1507.45 | 0 | 0 | | | | | | | | |
| S Rd 5 | 1543.34 | 1543.34 | 0 | 0 | | | | | | | | |
| PR 3 | 1941.75 | 1941.75 | 0 | 0 | | | | | | | | |
| Simta Rd 7 | 861.4 | 861.4 | 0 | 0 | | | | | | | | |
| PR Combined | 37076.46 | 37076.46 | 0 | 0 | | | | | | | | |
| A1.1 | 46299.89 | 46313.21 | 0 | 0 | | | | | | | | |
| A1.2 | 46313.23 | 46397.31 | 0 | -0.2 | | | | | | | | |
| A1.3 | 46397.23 | 46431.09 | 0 | -0.1 | | | | | | | | |
| PR Outlet1 | 48134.42 | 48134.38 | 0 | 0 | | | | | | | | |
| A2.1 | 31752.74 | 31763.55 | 0 | 0 | | | | | | | | |
| A2.2 | 31763.51 | 31774.15 | 0 | 0 | | | | | | | | |
| A2.3 | 31774.14 | 31793.49 | 0 | -0.1 | | | | | | | | |
| PR Outlet2 | 37077.04 | 37076.84 | 0 | 0 | | | | | | | | |
| S Rd 3 | 1471.56 | 1471.56 | 0 | 0 | | | | | | | | |
| SimtaChann | 167121.22 | 167121.22 | 0 | 0 | | | | | | | | |
| Moore HW 1 | 59743.33 | 59755.41 | 0 | 0 | | | | | | | | |
| Top Channel | 167121.17 | 167121.22 | 0 | 0 | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PR DNSDC | 17318.84 | 17319.87 | 0 | 0 | | | | | | | | |
| PR dummy DI | 7464.67 | 7464.67 | 0 | 0 | | | | | | | | |
| S6 | 21534.98 | 21534.98 | 0 | 0 | | | | | | | | |
| S5 | 12741.53 | 12741.53 | 0 | 0 | | | | | | | | |
| Moore | 19381.49 | 19381.49 | 0 | 0 | | | | | | | | |
| S Rd 1 | 9798.42 | 9798.42 | 0 | 0 | | | | | | | | |
| N MPE ST1 | 115212.77 | 115212.27 | 0 | 0 | | | | | | | | |
| S4 | 21534.98 | 21534.98 | 0 | 0 | | | | | | | | |
| S3 | 21534.98 | 21534.98 | 0 | 0 | | | | | | | | |
| S2 | 21534.98 | 21534.98 | 0 | 0 | | | | | | | | |
| S1 | 18484.21 | 18484.21 | 0 | 0 | | | | | | | | |
| OutPit 10 | 107382.84 | 107366.27 | 0 | 0 | | | | | | | | |
| N OSD10.1 | 107365.94 | 107365.89 | 0 | 0 | | | | | | | | |
| N MPW | 36250.54 | 36250.54 | 0 | 0 | | | | | | | | |
| Pit OSD9 | 32621.97 | 32625.07 | 0 | 0 | | | | | | | | |
| N OSD9.1 | 32624.84 | 32625 | 0 | 0 | | | | | | | | |
| N OSD9.2 | 59743.62 | 59743.33 | 0 | 0 | | | | | | | | |
| S7 | 21211.97 | 21211.97 | 0 | 0 | | | | | | | | |
| PR 3.2 | 1532.96 | 1532.96 | 0 | 0 | | | | | | | | |
| MPE North | 90841.87 | 90841.87 | 0 | 0 | | | | | | | | |
| MPE South | 50607.25 | 50607.25 | 0 | 0 | | | | | | | | |
| OSD 10 | 151462.98 | 107382.84 | 44079.37 | 0 | | | | | | | | |
| OSD 9 | 42746.97 | 32621.97 | 10125 | 0 | | | | | | | | |
| OSD 1 | 104049.56 | 46299.89 | 57750.02 | 0 | | | | | | | | |
| OSD 2 | 57933.22 | 31752.74 | 26180.02 | 0 | | | | | | | | |
| PR3.3 | 1703.29 | 1703.29 | 0 | 0 | | | | | | | | |
| Outlet 1 Comb | 48134.38 | 48134.38 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | | | |
| Run Log for MPE_Proposed.drn run at 12:48:48 on 13/10/2016 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The maximum water level in the following storages exceeds the maximum elevation you specified: OSD 2, OSD 1, OSD 9, OSD 10. | | | | | | | | | | | | |
| DRAINS has extrapolated the Elevation vs Storage table to a higher Elevation. Please provide accurate values for higher elevations. | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Upwelling occurred at A2.2 | | | | | | | | | | | | |
| Freeboard was less than 0.15m at Pit OSD9 OutPit 10 A2.3 A2.1 A1.3 A1.2 A1.1 | | | | | | | | | | | | |
| maximum<br>flow in the | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| The following overflow routes carried water uphill (adding energy): F OSD10.1 F OSD9.1 F OSD 1 F A1.1 | | | | | | | | | | | | |
| These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model. | | | | | | | | | | | | |
| | | | | | | | | | | | | |

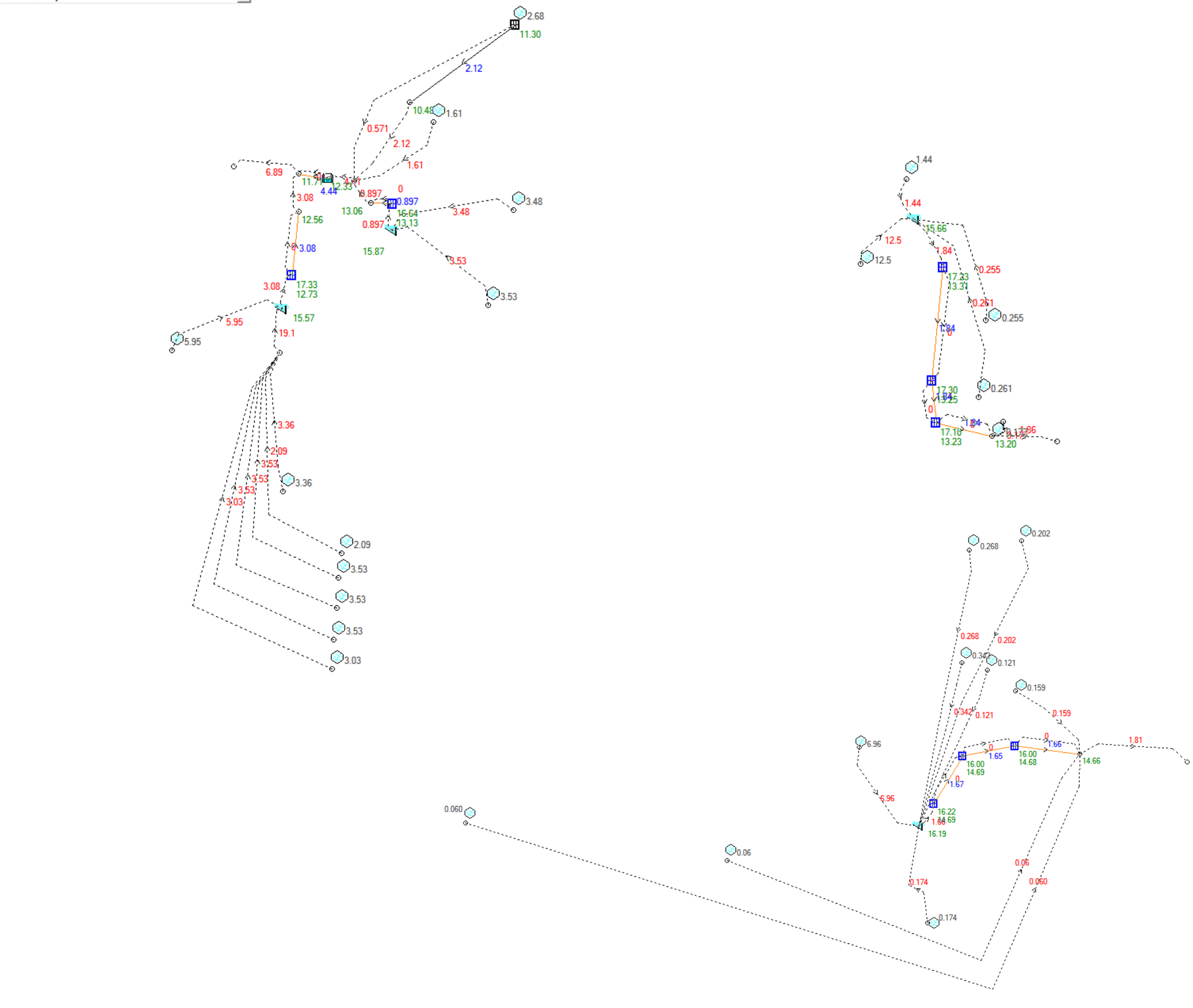
File Edit Project View Draw Run Help



MPE_Proposed.drn - DRAINS

File Edit Project View Draw Run Help

Worst case major storm



**Flow Comparison**

- At Location C, just downstream of Basin 10 outlet

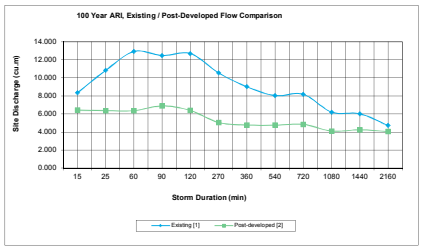
ARCADIS

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | Moorebank MPE Stage 2 | PAGE No | 1 | | |
| | | JOB No | AA009335 | | |
| TITLE | FLOW COMPARISON - EXISTING VS. POST-DEVELOPED OSD 9 and 10 | PREPARED | AZ | DATE | 13/10/16 |
| | | CHECKED | BC | DATE | 13/10/16 |

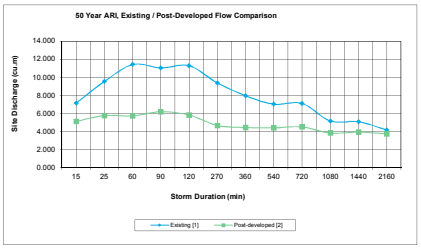
**DRAINS Models (existing and proposed):** F:\AA003760\D-Calculations\Civil\A-Stormwater\E0-SIMTA STAGE 2

**DRAINS Version:** DRAINS Version 2016.07 - 7 June 2016

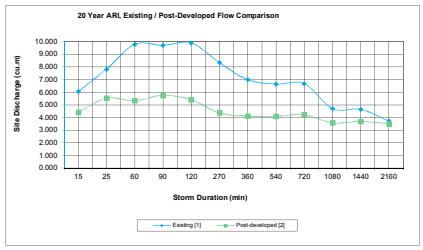
| | 100yr ARI Total | | |
|---|---|---|---|
| Storm Dur. (min) | Existing [1] | Post-developed [2] | [2] - [1] |
| 15 | 8.349 | 6.415 | -1.934 |
| 25 | 10.818 | 6.359 | -4.459 |
| 60 | ***12.921*** | 6.367 | -6.554 |
| 90 | 12.475 | ***6.886*** | -5.589 |
| 120 | 12.686 | 6.383 | -6.303 |
| 270 | 10.549 | 5.043 | -5.506 |
| 360 | 9.007 | 4.777 | -4.230 |
| 540 | 8.038 | 4.754 | -3.284 |
| 720 | 8.172 | 4.851 | -3.321 |
| 1080 | 6.199 | 4.105 | -2.094 |
| 1440 | 6.020 | 4.248 | -1.772 |
| 2160 | 4.722 | 4.053 | -0.669 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| ***Max*** | ***12.921*** | ***6.886*** | |
| **Total OSD Volume, 1000 m3** | **32.01** | | |



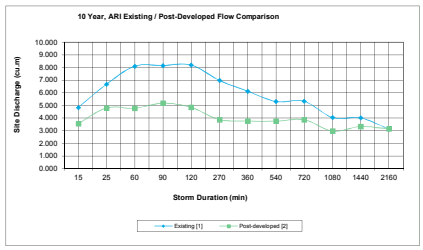

| | 50yr ARI Total | | |
|---|---|---|---|
| Storm Dur. (min) | Existing [1] | Post-developed [2] | [2] - [1] |
| 15 | 7.153 | 5.126 | -2.027 |
| 25 | 9.546 | 5.780 | -3.766 |
| 60 | ***11.425*** | 5.744 | -5.681 |
| 90 | 11.059 | ***6.196*** | -4.863 |
| 120 | 11.291 | 5.828 | -5.463 |
| 270 | 9.387 | 4.675 | -4.712 |
| 360 | 7.965 | 4.451 | -3.514 |
| 540 | 7.036 | 4.420 | -2.616 |
| 720 | 7.107 | 4.513 | -2.594 |
| 1080 | 5.173 | 3.834 | -1.339 |
| 1440 | 5.084 | 3.944 | -1.140 |
| 2160 | 4.175 | 3.746 | -0.429 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| ***Max*** | ***11.425*** | ***6.196*** | |



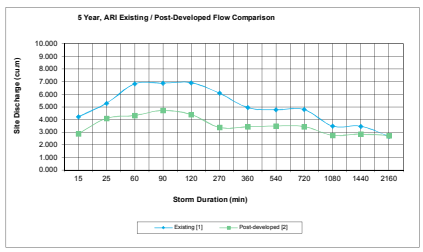

| | 20yr ARI Total | | |
|---|---|---|---|
| Storm Dur. (min) | Existing [1] | Post-developed [2] | [2] - [1] |
| 15 | 6.057 | 4.414 | -1.643 |
| 25 | 7.822 | 5.523 | -2.299 |
| 60 | 9.789 | 5.325 | -4.464 |
| 90 | 9.703 | ***5.749*** | -3.954 |
| 120 | ***9.901*** | 5.398 | -4.503 |
| 270 | 8.343 | 4.358 | -3.985 |
| 360 | 6.993 | 4.105 | -2.888 |
| 540 | 6.639 | 4.099 | -2.540 |
| 720 | 6.683 | 4.220 | -2.463 |
| 1080 | 4.704 | 3.582 | -1.122 |
| 1440 | 4.645 | 3.685 | -0.960 |
| 2160 | 3.725 | 3.493 | -0.232 |
| | | | |
| | | 0.000 | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| ***Max*** | ***9.901*** | ***5.749*** | |




| | 10yr ARI Total | | |
|---|---|---|---|
| Storm Dur. (min) | Existing [1] | Post-developed [2] | [2] - [1] |
| 15 | 4.834 | 3.559 | -1.275 |
| 25 | 6.672 | 4.800 | -1.872 |
| 60 | 8.104 | 4.777 | -3.327 |
| 90 | 8.141 | ***5.172*** | -2.969 |
| 120 | ***8.197*** | 4.841 | -3.356 |
| 270 | 6.972 | 3.870 | -3.102 |
| 360 | 6.119 | 3.765 | -2.354 |
| 540 | 5.307 | 3.752 | -1.555 |
| 720 | 5.321 | 3.864 | -1.457 |
| 1080 | 4.042 | 2.971 | -1.071 |
| 1440 | 4.003 | 3.324 | -0.679 |
| 2160 | 3.131 | 3.143 | 0.012 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| ***Max*** | ***8.197*** | ***5.172*** | |




| | 5yr ARI Total | | |
|---|---|---|---|
| Storm Dur. (min) | Existing [1] | Post-developed [2] | [2] - [1] |
| 15 | 4.218 | 2.869 | -1.349 |
| 25 | 5.289 | 4.092 | -1.197 |
| 60 | 6.828 | 4.327 | -2.501 |
| 90 | 6.880 | ***4.716*** | -2.164 |
| 120 | ***6.912*** | 4.398 | -2.514 |
| 270 | 6.085 | 3.370 | -2.715 |
| 360 | 4.946 | 3.432 | -1.514 |
| 540 | 4.771 | 3.490 | -1.281 |
| 720 | 4.788 | 3.444 | -1.344 |
| 1080 | 3.483 | 2.755 | -0.728 |
| 1440 | 3.469 | 2.847 | -0.622 |
| 2160 | 2.673 | 2.731 | 0.058 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| ***Max*** | ***6.912*** | ***4.716*** | |




| | 2yr ARI Total | | |
|---|---|---|---|
| Storm Dur. (min) | Existing [1] | Post-developed [2] | [2] - [1] |
| 15 | 2.880 | 2.094 | -0.786 |
| 25 | 3.892 | 2.650 | -1.242 |
| 60 | 4.671 | 3.161 | -1.510 |
| 90 | ***4.749*** | ***3.783*** | -0.966 |
| 120 | 4.684 | 3.452 | -1.232 |
| 270 | 3.994 | 2.854 | -1.140 |
| 360 | 3.529 | 2.734 | -0.795 |
| 540 | 3.596 | 2.696 | -0.900 |
| 720 | 3.645 | 2.768 | -0.877 |
| 1080 | 2.443 | 2.393 | -0.050 |
| 1440 | 2.490 | 2.377 | -0.113 |
| 2160 | 1.898 | 2.139 | 0.241 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| | | | 0.000 |
| ***Max*** | ***4.749*** | ***3.783*** | |