

## TECHNICAL NOTE

JBA Project Code: 2024s0202

Client: Ameresco Ltd

Date: July 2024

Produced by: George Williams BSc (Hons), MSc

Reviewed by: John Panesar BEng (Hons) CEng MICE

Title: C&S Energy BESS Drainage Maintenance Schedule

|                  |                                                                            |                                                                                                                       |
|------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                  | Prune and trim any trees and remove cuttings                               | Every 2 years, or as required                                                                                         |
|                  | Remove sediment from inlets, outlets, forebay and main basin when required | Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided) |
| Remedial actions | Repair erosion or other damage by reseedling or re-turfing                 | As required                                                                                                           |
|                  | Realignment of rip-rap                                                     | As required                                                                                                           |
|                  | Repair/rehabilitation of inlets, outlets and overflows                     | As required                                                                                                           |
|                  | Relevel uneven surfaces and reinstate design levels                        | As required                                                                                                           |

### 2.5 Transformer Sump Pumps

- Where private pumping stations or pumps in tanks form part of the drainage system, Ameresco are responsible for the management and maintenance of the system, and it is recommended they enter into a maintenance agreement with a pump maintenance company. Ameresco are also responsible for the creation and implementation of any emergency requirements should the pump fail.
- The pumping facility on this site will include 2No. sump pumps, individually serving the 2No. transformer bays and these should be serviced at a minimum annually (once every 12 months).
- Maintenance shall involve removing the pumps and carrying out any routine maintenance or repairs to the pumps.
- Control system including any alarms shall be checked to ensure they are in fully working order.
- The wet wells shall be visually inspected from ground level to assess if any repairs are necessary. If repairs to the benching or the chamber are required, this should be carried out as soon as possible.  
All pumping stations should be connected to a monitoring/telemetry system which activates an alarm upon failure.
- The pumped system alarm will vary to suit the development and how this is maintained overall. Ideally, the alarm would be located on-site in a facilities manager's office or in a staffed office (this could be a gatehouse for example that is staffed 24 hours a day). If there is to be no on-site facilities management then a remote type of alarm should be installed connected to the landlord's offices/premises, or to the facilities management company, or appointed pump maintenance company.

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**JBA**  
consulting

- For the transformer sump pumps, the sump shall be emptied of any silt that may have accumulated in the sump. The sump shall be inspected every six months. Any silt removed shall be disposed of offsite at a licenced facility.
- The transformer sump pumps are to be monitored on the Supervisory Control and Data Acquisition (SCADA) system.
- Oil and water separators have been proposed in the bunded transformer areas. As the facility will be visited relatively infrequently by a small number of maintenance vehicles spill kits should be sufficient and used in the event of petrol spills from the maintenance vehicles in other areas of the site. The responsible parties outlined in Section 1 will be liable for maintaining these on the site
- An emergency back-up pumping plan should be documented, covering access, operation, storage and maintenance of the assets. The enactment of the emergency pumping plan should be "dry run" and disseminated and practiced through the operational lifetime. Portable submersible pumps will be used in an emergency event and is pertinent to the transformer sump bays only.
- Adequacy of pump rate and system alarm freeboard shall be incorporated and documented to provide a sufficient period to enact emergency pumping. Pertinent to the transformer sump bays only.

## Document Information

|                    |                                                                 |
|--------------------|-----------------------------------------------------------------|
| Project            | C&S Energy BESS                                                 |
| BIM Reference      | MJF-JBA-XX-XX-RP-D-0003-InfoDrainage_Modelling_Outputs_Option_1 |
| Status             | A2                                                              |
| Revision           | P04                                                             |
| Calculation Title  | InfoDrainage Modelling Outputs                                  |
| No. of Calc Sheets | 22                                                              |

## Purpose of Calculations

This report is an export of the InfoDrainage modelling. InfoDrainage is a drainage system design software program that was used to both design and audit the proposed network for the C&S Energy BESS.

Included in the report are:

- Summary of Pipes in the Critical Storm
- Half Drain Down Times for Stormwater Controls
- Summary of Inflows in Critical Storm
- Pond Flow Graphs in Critical Storm
- Rainfall Analysis Criteria
- Junctions Details
- Stormwater Control Details
- Connections Summary

## Calculation Control & Revisions

| Revision | Date       | Description                     | Originator | Checker | Approver |
|----------|------------|---------------------------------|------------|---------|----------|
| P01      | 06.08.2024 | Calculation Export              | SC         | WD      | JP       |
| P02      | 14.08.2024 | Additional Information Provided | SC         | WD      | JP       |
| P03      | 27.09.2024 | Updated Following Layout Change | SC         | WD      | JP       |
| P04      | 17.04.2025 | Updated Following Layout Change | LF         | WD      | JP       |

|                                                            |                             |             |              |
|------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                   | Date:<br>26/03/2024         |             |              |
|                                                            | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Junctions<br>Storm Phase: Gravity | Company Address:            |             |              |



| Name    | Junction Type | Easting (m) | Northing (m) | Cover Level (m) | Depth (m) | Invert Level (m) | Sump Depth (m) | Chamber Shape |
|---------|---------------|-------------|--------------|-----------------|-----------|------------------|----------------|---------------|
| 4.02    | Manhole       | 394866.905  | 349581.615   | 240.400         | 2.100     | 238.300          | 0.300          | Circular      |
| 2.03    | Manhole       | 394936.420  | 349609.747   | 240.220         | 2.285     | 237.935          | 0.300          | Circular      |
| 2.04    | Manhole       | 394954.956  | 349563.670   | 239.360         | 2.260     | 237.100          | 0.500          | Circular      |
| 5.01    | Manhole       | 394830.223  | 349524.720   | 240.300         | 1.900     | 238.400          | 0.300          | Circular      |
| 5.02    | Manhole       | 394838.710  | 349520.243   | 240.180         | 1.880     | 238.300          | 0.300          | Circular      |
| 5.03    | Manhole       | 394891.402  | 349540.437   | 239.900         | 2.000     | 237.900          | 0.300          | Circular      |
| 2.05    | Manhole       | 394972.001  | 349519.925   | 238.300         | 2.320     | 235.980          | 0.300          | Circular      |
| 6.03    | Manhole       | 394908.759  | 349495.629   | 238.930         | 1.980     | 236.950          | 0.300          | Circular      |
| 6.02    | Manhole       | 394853.433  | 349475.900   | 239.200         | 1.900     | 237.300          | 0.300          | Circular      |
| 7.02    | Manhole       | 394874.071  | 349433.176   | 239.080         | 1.730     | 237.350          | 0.300          | Circular      |
| 7.01    | Manhole       | 394864.414  | 349434.978   | 239.080         | 1.650     | 237.430          | 0.300          | Circular      |
| 7.03    | Manhole       | 394926.684  | 349453.048   | 239.080         | 2.205     | 236.875          | 0.300          | Circular      |
| 1.02    | Manhole       | 395112.635  | 349705.762   | 238.502         | 1.725     | 236.777          | 0.300          | Circular      |
| 1.01    | Manhole       | 395025.966  | 349673.332   | 239.651         | 1.425     | 238.226          | 0.000          | Circular      |
| 2.01    | Manhole       | 394941.383  | 349642.302   | 240.200         | 1.650     | 238.550          | 0.300          | Circular      |
| 2.02    | Manhole       | 394931.177  | 349633.010   | 240.200         | 1.815     | 238.385          | 0.300          | Circular      |
| 4.01    | Manhole       | 394838.410  | 349571.741   | 240.800         | 2.100     | 238.700          | 0.300          | Circular      |
| 1.03    | Manhole       | 395152.053  | 349615.386   | 236.359         | 1.159     | 235.200          | 0.300          | Circular      |
| 2.07    | Manhole       | 395041.305  | 349461.468   | 237.691         | 3.091     | 234.600          | 0.300          | Circular      |
| 6.01    | Manhole       | 394847.637  | 349480.198   | 239.330         | 1.425     | 237.605          | 0.300          | Circular      |
| Outfall | Manhole       | 395181.228  | 349552.400   | 234.606         | 1.606     | 233.000          | 0.000          | Circular      |
| 3.01    | Manhole       | 394854.012  | 349609.431   | 234.700         | 1.400     | 233.300          | 0.300          | Circular      |
| 3.03    | Manhole       | 394863.723  | 349586.522   | 234.700         | 2.700     | 232.000          | 1.400          | Circular      |
| 2.06    | Manhole       | 394988.076  | 349475.813   | 236.980         | 2.025     | 234.955          | 0.300          | Circular      |

| Name    | Diameter (m) | Lock |
|---------|--------------|------|
| 4.02    | 1.200        | None |
| 2.03    | 1.350        | None |
| 2.04    | 1.350        | None |
| 5.01    | 1.200        | None |
| 5.02    | 1.200        | None |
| 5.03    | 1.200        | None |
| 2.05    | 1.500        | None |
| 6.03    | 1.200        | None |
| 6.02    | 1.200        | None |
| 7.02    | 1.200        | None |
| 7.01    | 1.200        | None |
| 7.03    | 1.200        | None |
| 1.02    | 1.200        | None |
| 1.01    | 1.200        | None |
| 2.01    | 1.200        | None |
| 2.02    | 1.200        | None |
| 4.01    | 1.200        | None |
| 1.03    | 1.200        | None |
| 2.07    | 1.500        | None |
| 6.01    | 1.200        | None |
| Outfall | 1.200        | None |
| 3.01    | 1.200        | None |
| 3.03    | 2.100        | None |
| 2.06    | 1.200        | None |

|                                                            |                             |             |              |                                                                                     |
|------------------------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                                   | Date:<br>26/03/2024         |             |              |  |
|                                                            | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:<br>Type: Junctions<br>Storm Phase: Gravity | Company Address:            |             |              |                                                                                     |

### Inlets

| Junction | Inlet Name | Incoming Item(s)                                 | Bypass Destination | Capacity Type  |
|----------|------------|--------------------------------------------------|--------------------|----------------|
| 4.02     | Inlet      | P4.01<br>Rising Main.01                          | (None)             | No Restriction |
| 2.03     | Inlet      | P2.02<br>P4.02<br>PAT.02<br>PSA.01               | (None)             | No Restriction |
| 2.04     | Inlet      | P2.03<br>P5.04<br>CA5.04<br>PBS.02               | (None)             | No Restriction |
| 5.01     | Inlet      | PAT.03                                           | (None)             | No Restriction |
| 5.02     | Inlet      | P5.02<br>PAT.04                                  | (None)             | No Restriction |
| 5.03     | Inlet      | P5.03<br>CA5.03<br>PAT.05<br>PBS.01              | (None)             | No Restriction |
| 2.05     | Inlet      | P6.04<br>CA.BS.06<br>Pipe (2)<br>P2.04<br>PBS.04 | (None)             | No Restriction |
| 6.03     | Inlet      | P6.03<br>CA6.03<br>PBS.03                        | (None)             | No Restriction |
| 6.02     | Inlet      | P6.02<br>PAT.07                                  | (None)             | No Restriction |
| 7.02     | Inlet      | P7.02                                            | (None)             | No Restriction |
| 7.01     | Inlet      | PAT.09                                           | (None)             | No Restriction |
| 7.03     | Inlet      | P7.03<br>PBS.05<br>PAT.10                        | (None)             | No Restriction |
| 1.02     | Inlet      | P1.01                                            | (None)             | No Restriction |
|          | Inlet (1)  | CA1.02                                           | (None)             | No Restriction |
| 1.01     | Inlet      | CA1.01                                           | (None)             | No Restriction |
| 2.01     | Inlet      | CA2.01                                           | (None)             | No Restriction |
| 2.02     | Inlet      | P2.01<br>PAT.01                                  | (None)             | No Restriction |
| 4.01     | Inlet      | CA4.02                                           | (None)             | No Restriction |
| 1.03     | Inlet      | P1.02                                            | (None)             | No Restriction |
| 2.07     | Inlet      | P2.06                                            | (None)             | No Restriction |
| 6.01     | Inlet      | PAT.06                                           | (None)             | No Restriction |
| Outfall  | Inlet      | Outlet                                           | (None)             | No Restriction |
| 3.01     | Inlet      | CA3.01<br>CA3.02<br>GIS Sub<br>CA3.03            | (None)             | No Restriction |
| 3.03     | Inlet      | P3.01                                            | (None)             | No Restriction |
| 2.06     | Inlet      | CA7.04<br>P2.05<br>PBS.06<br>P7.04               | (None)             | No Restriction |

### Outlets

| Junction | Outlet Name | Outgoing Connection | Outlet Type    |
|----------|-------------|---------------------|----------------|
| 4.02     | Outlet      | P4.02               | Free Discharge |
| 2.03     | Outlet      | P2.03               | Free Discharge |

|                                                            |                             |             |              |                                                                                     |
|------------------------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                                   | Date:<br>26/03/2024         |             |              |  |
|                                                            | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:<br>Type: Junctions<br>Storm Phase: Gravity | Company Address:            |             |              |                                                                                     |

| Junction         | Outlet Name | Outgoing Connection | Outlet Type    |
|------------------|-------------|---------------------|----------------|
| 2.04             | Outlet      | P2.04               | Free Discharge |
| 5.01             | Outlet      | P5.02               | Free Discharge |
| 5.02             | Outlet      | P5.03               | Free Discharge |
| 5.03             | Outlet      | P5.04               | Free Discharge |
| 2.05             | Outlet      | P2.05               | Free Discharge |
| 6.03             | Outlet      | P6.04               | Free Discharge |
| 6.02             | Outlet      | P6.03               | Free Discharge |
| 7.02             | Outlet      | P7.03               | Free Discharge |
| 7.01             | Outlet      | P7.02               | Free Discharge |
| 7.03             | Outlet      | P7.04               | Free Discharge |
| 1.02             | Outlet (1)  | P1.02               | Free Discharge |
| 1.01             | Outlet      | P1.01               | Free Discharge |
| 2.01             | Outlet      | P2.01               | Free Discharge |
| 2.02             | Outlet      | P2.02               | Free Discharge |
| 4.01             | Outlet      | P4.01               | Free Discharge |
| 1.03             | Outlet      | P1.03               | Free Discharge |
| 2.07             | Outlet      | P2.07               | Free Discharge |
| 6.01             | Outlet      | P6.02               | Free Discharge |
| 3.01             | Outlet      | P3.01               | Free Discharge |
| Outlet           |             | Rising Main.01      | Pump           |
| Invert Level (m) |             | 232.000             |                |
| Depth (m)        |             | Outflow (L/s)       |                |
| 0.100            |             | 75.0                |                |
| 0.200            |             | 75.0                |                |
| 0.300            |             | 75.0                |                |
| 0.400            |             | 75.0                |                |
| 0.500            |             | 75.0                |                |
| 0.600            |             | 75.0                |                |
| 0.700            |             | 75.0                |                |
| 0.800            |             | 75.0                |                |
| 0.900            |             | 75.0                |                |
| 1.000            |             | 75.0                |                |
| 1.100            |             | 75.0                |                |
| 1.200            |             | 75.0                |                |
| 1.300            |             | 75.0                |                |
| 1.400            |             | 75.0                |                |
| 1.500            |             | 75.0                |                |
| 1.600            |             | 75.0                |                |
| 1.700            |             | 75.0                |                |
| 1.800            |             | 75.0                |                |
| 1.900            |             | 75.0                |                |
| 2.000            |             | 75.0                |                |
| 2.100            |             | 75.0                |                |
| 2.200            |             | 75.0                |                |
| 2.300            |             | 75.0                |                |
| 2.400            |             | 75.0                |                |
| 2.500            |             | 75.0                |                |
| 2.600            |             | 75.0                |                |
| 2.700            |             | 75.0                |                |
| 2.800            |             | 75.0                |                |
| 2.900            |             | 75.0                |                |
| 3.000            |             | 75.0                |                |
| 3.100            |             | 75.0                |                |
| 3.200            |             | 75.0                |                |
| 3.300            |             | 75.0                |                |
| 3.400            |             | 75.0                |                |
| 3.500            |             | 75.0                |                |
| 3.600            |             | 75.0                |                |
| 3.700            |             | 75.0                |                |
| 3.800            |             | 75.0                |                |
| 3.900            |             | 75.0                |                |
| 4.000            |             | 75.0                |                |
| 4.100            |             | 75.0                |                |
| 4.200            |             | 75.0                |                |
| 4.300            |             | 75.0                |                |
| 4.400            |             | 75.0                |                |
| 4.500            |             | 75.0                |                |
| 4.600            |             | 75.0                |                |

|                                         |                             |             |              |                                                                                     |
|-----------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                | Date:<br>26/03/2024         |             |              |  |
|                                         | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:                         | Company Address:            |             |              |                                                                                     |
| Type: Junctions<br>Storm Phase: Gravity |                             |             |              |                                                                                     |

| Junction | Outlet Name | Outgoing Connection | Outlet Type    |
|----------|-------------|---------------------|----------------|
| 3.03     | 4.700       | 75.0                |                |
|          | 4.800       | 75.0                |                |
|          | 4.900       | 75.0                |                |
|          | 5.000       | 75.0                |                |
|          | 5.100       | 75.0                |                |
|          | 5.200       | 75.0                |                |
|          | 5.300       | 75.0                |                |
|          | 5.400       | 75.0                |                |
|          | 5.500       | 75.0                |                |
|          | 5.600       | 75.0                |                |
|          | 5.700       | 75.0                |                |
|          | 5.800       | 75.0                |                |
|          | 5.900       | 75.0                |                |
|          | 6.000       | 75.0                |                |
|          | 6.100       | 75.0                |                |
|          | 6.200       | 75.0                |                |
|          | 6.300       | 75.0                |                |
|          | 6.400       | 75.0                |                |
|          | 6.500       | 75.0                |                |
|          | 6.600       | 75.0                |                |
|          | 6.700       | 75.0                |                |
|          | 6.800       | 75.0                |                |
|          | 6.900       | 75.0                |                |
|          | 7.000       | 75.0                |                |
|          | 7.100       | 75.0                |                |
|          | 7.200       | 75.0                |                |
|          | 7.300       | 75.0                |                |
|          | 7.400       | 75.0                |                |
|          | 7.500       | 75.0                |                |
|          | 7.600       | 75.0                |                |
|          | 7.700       | 75.0                |                |
|          | 7.800       | 75.0                |                |
|          | 7.900       | 75.0                |                |
|          | 8.000       | 75.0                |                |
|          | 8.100       | 75.0                |                |
|          | 8.200       | 75.0                |                |
|          | 8.300       | 75.0                |                |
|          | 8.400       | 75.0                |                |
|          | 8.500       | 75.0                |                |
|          | 8.600       | 75.0                |                |
|          | 8.700       | 75.0                |                |
|          | 8.800       | 75.0                |                |
|          | 8.900       | 75.0                |                |
|          | 9.000       | 75.0                |                |
|          | 9.100       | 75.0                |                |
|          | 9.200       | 75.0                |                |
|          | 9.300       | 75.0                |                |
|          | 9.400       | 75.0                |                |
|          | 9.500       | 75.0                |                |
|          | 9.600       | 75.0                |                |
|          | 9.700       | 75.0                |                |
|          | 9.800       | 75.0                |                |
|          | 9.900       | 75.0                |                |
|          | 10.000      | 75.0                |                |
| 2.06     | Outlet      | P2.06               | Free Discharge |

|                                             |                             |             |              |                                                                                     |
|---------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                    | Date:<br>26/03/2024         |             |              |  |
|                                             | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Title:<br>Rainfall Analysis Criteria | Company Address:            |             |              |                                                                                     |

|                                 |                          |
|---------------------------------|--------------------------|
| Runoff Type                     | Dynamic                  |
| Output Interval (mins)          | 5                        |
| Time Step                       | Default                  |
| Urban Creep                     | Apply Global Value       |
| Urban Creep Global Value (%)    | 0                        |
| Junction Flood Risk Margin (mm) | 300                      |
| Prefill Manhole Sumps           | <input type="checkbox"/> |
| Perform No Discharge Analysis   | <input type="checkbox"/> |

|                  |                                     |           |
|------------------|-------------------------------------|-----------|
| Rainfall         |                                     |           |
| FEH              |                                     | Type: FEH |
| Site Location    | GB 395700 350000 SJ 95700 50000     |           |
| Rainfall Version | 2022                                |           |
| Summer           | <input checked="" type="checkbox"/> |           |
| Winter           | <input checked="" type="checkbox"/> |           |

Return Period

| Return Period (years) | Increase Rainfall (%) |
|-----------------------|-----------------------|
| 100.0                 | 40.000                |
| 30.0                  | 0.000                 |
| 2.0                   | 0.000                 |

Storm Durations

| Duration (mins) | Run Time (mins) |
|-----------------|-----------------|
| 15              | 30              |
| 30              | 60              |
| 60              | 120             |
| 120             | 240             |
| 240             | 480             |
| 360             | 720             |
| 480             | 960             |
| 960             | 1920            |
| 1440            | 2880            |

|                                                   |                             |             |              |                                                                                     |
|---------------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                          | Date:<br>26/03/2024         |             |              |  |
|                                                   | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:                                   | Company Address:            |             |              |                                                                                     |
| Type: Stormwater Controls<br>Storm Phase: Gravity |                             |             |              |                                                                                     |



Pond

Type : Pond

Dimensions

|                      |         |
|----------------------|---------|
| Exceedance Level (m) | 235.500 |
| Depth (m)            | 1.200   |
| Base Level (m)       | 234.300 |
| Freeboard (mm)       | 300     |
| Initial Depth (m)    | 0.000   |
| Porosity (%)         | 100     |
| Average Slope (1:X)  | 8.41    |
| Total Volume (m³)    | 830.776 |

| Depth (m) | Area (m²) | Volume (m³) |
|-----------|-----------|-------------|
| 0.000     | 500.00    | 0.000       |
| 0.500     | 1000.00   | 367.851     |
| 1.100     | 1500.00   | 1112.800    |
| 1.200     | 2011.76   | 1287.763    |
| 1.500     | 2000.00   | 1889.526    |

Advanced

|                 |             |
|-----------------|-------------|
| Perimeter       | Circular    |
| Length (m)      | 117.897     |
| Friction Scheme | Manning's n |
| n               | 0.033       |

|                                                                      |                             |             |              |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |





BS.01

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.940 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 240.640 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 70.989  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 35.980  |
| Total Volume (m³)           | 230.223 |

| Under Drain           |                           |
|-----------------------|---------------------------|
| Height Above Base (m) | 0.000                     |
| Diameter (mm)         | 150                       |
| No. of Barrels        | 4                         |
| Release Height (m)    | 0.000                     |
| Friction Scheme       | Colebrook-White Roughness |
| Roughness (mm)        | 1.5                       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |



BS.02

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.400 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 240.100 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 84.504  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 36.963  |
| Total Volume (m³)           | 281.288 |

| Under Drain           |                           |
|-----------------------|---------------------------|
| Height Above Base (m) | 0.000                     |
| Diameter (mm)         | 150                       |
| No. of Barrels        | 4                         |
| Release Height (m)    | 0.000                     |
| Friction Scheme       | Colebrook-White Roughness |
| Roughness (mm)        | 1.5                       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |

|                                                                      |                             |             |              |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |





BS.05

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 239.110 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 238.810 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 75.203  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 37.097  |
| Total Volume (m³)           | 250.521 |

Under Drain

|                       |                           |
|-----------------------|---------------------------|
| Height Above Base (m) | 0.000                     |
| Diameter (mm)         | 150                       |
| No. of Barrels        | 1                         |
| Release Height (m)    | 0.000                     |
| Friction Scheme       | Colebrook-White Roughness |
| Roughness (mm)        | 1.5                       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|



BS.03

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.000 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.700 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 70.164  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 36.061  |
| Total Volume (m³)           | 227.237 |

Under Drain

|                       |                           |
|-----------------------|---------------------------|
| Height Above Base (m) | 0.000                     |
| Diameter (mm)         | 150                       |
| No. of Barrels        | 1                         |
| Release Height (m)    | 0.000                     |
| Friction Scheme       | Colebrook-White Roughness |
| Roughness (mm)        | 1.5                       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|

|                                                                      |                             |             |              |                                                                                     |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |  |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |                                                                                     |
|                                                                      |                             |             |              |                                                                                     |



BS.06

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 238.810 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 238.510 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 79.643  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 36.275  |
| Total Volume (m³)           | 259.424 |

Under Drain

|                       |                           |
|-----------------------|---------------------------|
| Height Above Base (m) | 0.000                     |
| Diameter (mm)         | 150                       |
| No. of Barrels        | 1                         |
| Release Height (m)    | 0.000                     |
| Friction Scheme       | Colebrook-White Roughness |
| Roughness (mm)        | 1.5                       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|



BS.04

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 239.800 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.500 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 84.641  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 37.187  |
| Total Volume (m³)           | 282.612 |

Under Drain

|                       |                           |
|-----------------------|---------------------------|
| Height Above Base (m) | 0.000                     |
| Diameter (mm)         | 150                       |
| No. of Barrels        | 1                         |
| Release Height (m)    | 0.000                     |
| Friction Scheme       | Colebrook-White Roughness |
| Roughness (mm)        | 1.5                       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|

|                                                                      |                             |             |              |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |





AT.02

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.970 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 240.670 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 121.660 |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 4.009   |
| Total Volume (m³)           | 46.521  |

| Under Drain           |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 5           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |



AT.03

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.970 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 240.670 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 41.602  |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 4.371   |
| Total Volume (m³)           | 18.282  |

| Under Drain           |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 4           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |

|                                                                      |                             |             |              |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |





**AT.04**

Type : Porous Paving

#### Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.300 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 240.000 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 21.005  |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 6.721   |
| Total Volume (m³)           | 13.184  |

#### Under Drain

|                       |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 2           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

#### Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|



**AT.05**

Type : Porous Paving

#### Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.200 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.900 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 123.568 |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 3.998   |
| Total Volume (m³)           | 44.313  |

#### Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|

|                                                                      |                             |             |              |                                                                                     |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |  |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |                                                                                     |



AT.06

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 239.860 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.560 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 28.003  |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 3.946   |
| Total Volume (m³)           | 10.259  |

| Under Drain           |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 1           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |



AT.07

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 239.330 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.030 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 21.340  |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 6.711   |
| Total Volume (m³)           | 13.373  |

| Under Drain           |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 2           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |

|                                                                      |                             |             |              |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |





AT.08

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 239.120 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 238.820 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 123.568 |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 3.988   |
| Total Volume (m³)           | 46.425  |

Under Drain

|                       |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 4           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|



AT.09

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 239.200 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 238.900 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 40.297  |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 4.133   |
| Total Volume (m³)           | 15.903  |

Under Drain

|                       |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 2           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|

|                                                                      |                             |             |              |
|----------------------------------------------------------------------|-----------------------------|-------------|--------------|
| Project:                                                             | Date:<br>26/03/2024         |             |              |
|                                                                      | Designed by:<br>LukeFalgate | Checked by: | Approved By: |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Gravity | Company Address:            |             |              |





AT.10

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 238.700 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 238.400 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 123.727 |
| Long. Slope (1:X)           | 200.00  |
| Width (m)                   | 3.937   |
| Total Volume (m³)           | 44.801  |

Under Drain

|                       |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 2           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|



AT.01

Type : Porous Paving

Dimensions

|                             |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.170 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.870 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 34.160  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 7.394   |
| Total Volume (m³)           | 23.211  |

Under Drain

|                       |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 2           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

Advanced

|                     |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |
|---------------------|-------|

|                                                   |                             |             |              |                                                                                     |
|---------------------------------------------------|-----------------------------|-------------|--------------|-------------------------------------------------------------------------------------|
| Project:                                          | Date:<br>26/03/2024         |             |              |  |
|                                                   | Designed by:<br>LukeFalgate | Checked by: | Approved By: |                                                                                     |
| Report Details:                                   | Company Address:            |             |              |                                                                                     |
| Type: Stormwater Controls<br>Storm Phase: Gravity |                             |             |              |                                                                                     |



### Storage area

Type : Porous Paving

| Dimensions                  |         |
|-----------------------------|---------|
| Exceedance Level (m)        | 240.270 |
| Depth (m)                   | 0.300   |
| Base Level (m)              | 239.970 |
| Paving Layer Depth (mm)     | 1       |
| Membrane Percolation (m/hr) | 1000.0  |
| Porosity (%)                | 30      |
| Length (m)                  | 73.762  |
| Long. Slope (1:X)           | 100.00  |
| Width (m)                   | 25.494  |
| Total Volume (m³)           | 169.791 |

| Under Drain           |             |
|-----------------------|-------------|
| Height Above Base (m) | 0.000       |
| Diameter (mm)         | 150         |
| No. of Barrels        | 4           |
| Release Height (m)    | 0.000       |
| Friction Scheme       | Manning's n |
| n                     | 0.015       |

| Advanced            |       |
|---------------------|-------|
| Conductivity (m/hr) | 300.0 |