

SURFACE WATER STRATEGY REPORT

**MFG LEVENSHULME
STOCKPORT ROAD
CRINGKLE ROAD
MANCHESTER
M19 2RE**

MARKS HEELEY LTD

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The Stables, Cannons Mill Lane, Bishops Stortford, Hertfordshire, CM23 2BN
Tel: 01279 465900 Fax: 01279 465999

MARKS HEELEY

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1.0 INTRODUCTION

1.1 Marks Heeley UK have been instructed by MFG Ltd to prepare a drainage strategy in respect of surface water drainage for the proposed electoral charging and jet bays at the petrol filling station known as MFG Levenshulme.

1.2 This report incorporates the following:

- Details of the strategy for the disposal of surface water on the site.
- An appropriate run-off rate and storage provision has been chosen.
- Demonstrate how surface water generated during events up to the 1 in 100 year event plus an allowance for climate change are managed.
- Details of the maintenance of SuDS features to demonstrate that all components will remain fully operational throughout the lifetime of the development.
- Construction details of SuDS features.

This report provides response to comments received from the LLFA.
Comments are shown below.

Responses to these comments are highlighted in red.

Development shall not begin until a surface water drainage scheme for the site, based on sustainable drainage principles has been submitted to and approved in writing by the local planning authority. The development shall be constructed and completed in accordance with the approved details.

The scheme shall also include:

Surface water drainage layout including discharge points, proposed attenuation and proposed overland flow routes for extreme events (up to a 1 in 100 year including 40% climate change allowance).

Proposed drainage plan appended to this report indicates the above.

Details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment.

Proposed attenuation details are provided within the drainage plan appended to this report.

Discharge rates should be restricted to greenfield discharge rates and should not exceed the existing rates, as the site is located within Conurbation Core Critical Drainage Area.

We have applied a greenfield runoff rate to the extended forecourt area. Due to levels this attenuated area extends beyond the increase in hardstanding (320m²). This provides an overall reduction from the wider site of 12%.

Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.

Connection application has been arranged, we are awaiting a response from UU, will forward once in receipt.

Hydraulic calculations to support the drainage proposal.

Attenuation calculations appended.

Details of how the scheme shall be maintained and managed after completion.

Maintenance schedule appended to this report.

2.0 EXISTING SITE

- 2.1 The existing site is located adjacent Stockport road (A4600) and Cringle Road. The site is currently a petrol filling station, comprising of forecourt and shop. The proposed works are isolated to the north of the site, this is currently a tanker stand, LPG storage and grassed verge.
- 2.2 The existing ground is generally flat across the site. There is a slight fall of up to 500mm from east to west towards Stockport road.

3.0 SITE GEOLOGY

- 3.1 From drift maps and local boreholes it has been established that the sites geology, consists of silty sand clay.
- 3.2 Infiltration testing has not been completed on site, however boreholes carried out within the vicinity of the site confirm the BGS mapping, suggesting that infiltration on site would not be possible, considering this and that the existing site is currently served by public mains sewers we are proposing to follow this principle associated with the forecourt extension.

Data Completed: 13/1/2024

Description of Strata	Legend	Depth below G.L.	O.D. Level	Sampling	Casing Depth	() & 'N'
MADE GROUND: Black silty clay with occasional brick, ash and cinder fragments.		0.00	52.09	D 0.00 1.50		
MADE GROUND: Brown clay with some ash and cinders.		1.50	51.19	S 1.00		*5*
Stiff brown slightly silty CLAY with occasional fine rounded gravel.		1.80	50.89	DS 1.80 2.80		*24*
Stiff to very stiff dark brown and grey slightly silty CLAY with occasional fine rounded gravel.		3.10	49.59	D 3.10 3.40		
Dense becoming very dense reddish brown silty fine SAND.		3.40	49.29			
Borehole Complete at 3.40m.						

Description of Strata	Red. (Lvl)	Legend	Thick. (m)	Depth #	Sample Depth	Sample Types	N Value	Cu #	Water Level	Pie. -Rd	Belly Prag.
MADE GROUND (grass over topsoil/clayey/brick fill.)			(1.30)	0.00							
Stiff becoming very stiff brown silty slightly sandy fine to medium gravelly CLAY with occasional boulders at 5.0m. (Boulder clay)				1.30							
				1.50 - 1.95	U ₁		136	0			
				2.10	D ₁						
				2.50 - 2.95	U ₂		166	14			
				3.10	D ₂						
				3.50 - 3.95	U ₃		196	6			
				4.10	D ₃						
				4.50 - 5.10	U ₄						
											23/1

4.0 PROPOSED DEVELOPMENT

- 4.1 The proposal is to construct EV charging bays, associated canopies and two jet wash bays.
- 4.2 The Extent of existing hardstanding to the overall site is 2070m² (0.20 Ha). Refer to Appendix A.
- 4.3 The proposals extend this impermeable area to a total of 2108m² (0.21 Ha), an increase of 38m². Refer to Appendix B.
- 4.4 Due to levels, the new treated and attenuated drainage catchment area will include 320m² (0.3 Ha). Refer to Appendix C.
- 4.5 New surface water drainage will be required to service this increased impermeable area created on site. The purpose of this document is to discuss these proposals.

5.0 PROPOSED SURFACE WATER DRAINAGE STRATEGY

- 5.1 Surface water run-off created by the proposals will need to be disposed of in the most appropriate way. This is to ensure the proposed development does not create additional run-off that could affect surrounding sites or put additional load on the existing sewer system which could cause surcharging in peak storm events.
- 5.2 Following the SuDS hierarchy, we have determined the most suitable method of providing surface water drainage to the proposed development.
- 5.3 Due to the bedrock geology, it is not feasible to infiltrate on site and as such this should be avoided. As there are no existing water courses in the vicinity, the surface water should be discharged to the surface water network
- 5.4 The PFS Design-Life is based on 50 years. As such climate change allowance is based on “Total Potential Change Anticipated for the 2050’s” (2040 to 2069) from table 2 within the government guidance of flood risk assessments. This demonstrates that a 10% climate change is required. This proposed scheme however provides a betterment to the requirement as it allows for 40% climate change.
- 5.5 As such, the drainage proposals have been based on provision of attenuation designed for a 1 in 100 year return period plus 40% additional allowance for climate change in accordance with Environment Agency guidelines. These will discharge to the existing surface water connection.
- 5.6 It is proposed that the storm water from the EV canopy and hard-standings will discharge through either gullies or drainage channel, on to an offline attenuation tank, hydro-brake at 1L/S and SDS Aquaswirl, before connecting back onto the existing on site SW network site where it will pass through the existing petrol interceptor and onto the public SW drain. We await a response from UU regarding the additional surface area being served.
- 5.7 It is proposed that the jetwash bays are connected to the foul water network, via a wash separator. Again UU have been notified, we await their response.
- 5.8 Incorporating the attenuation and restricted outflow to 1l/s across the 320m² area, the wider site benefits from a 12% reduction in discharge rate. This is demonstrated on the catchment appendix C.

- 5.9 Mirco Drainage calculations for the attenuation is included within Appendix 'D'.
- 5.10 Proposed drainage drawings are included within Appendix 'E'.

6.0 STORM WATER DRAINAGE COMPONENTS

- 6.1 Mirco Drainage calculations included in Appendix 'D' show the required attenuation size, based on a 1:100 year event +40% climate change.
- 6.2 It is proposed to install Hydro Stormblobs (or SDS Geolight), wrapped in an impermeable membrane and surrounded in a single sized stone.
- 6.3 Construction details of the SuDS features are included in Appendix 'E'.
- 6.4 Discharge to the existing surface water network will be provided using a hydro-brake at 1L/S.

7.0 MAINTENANCE REQUIREMENTS

- 7.1 The MFG Site and all of its drainage is privately owned and maintained by MFG. It is the store managers responsibly to ensure that the drainage system is regularly inspected and maintained, in accordance with this plan. Appendix 'E' shows the layout of the drainage system including the location of each of the items requiring maintenance, listed in this plan and a summary of the maintenance requirements.
- 7.2 The majority of tasks can be completed by MFG's staff trained for each specific task. Training should include manual handling, for lifting manhole covers. Manholes & chambers can be dangerous due to trapped harmful gases and should not be entered unless staff are confined space trained and issued with appropriate equipment. Entering confined spaces should not normally be required and should be controlled by a permit to enter system administered by the store manager. It may be appropriate to rely on non-store based, specialist staff, on the rare occasions when confined space entry is required.
- 7.3 Maintenance of SuDS fits within an overall asset management process:
 - Mapping of SuDS assets
 - Inspection / monitoring

- Routine light (regular) maintenance
- Routine heavy (infrequent) maintenance
- Remedial maintenance

There should also be regular reviews of maintenance regimes to ensure that they are being effective and the performance of the systems are being maintained. Such regular reviews may also allow maintenance to be reduced.

- 7.4 Most Manufactures provide guidance on the maintenance requirements for Engineered solutions. These include the following for this site; Premier Tech Aqua Forecourt separators, Hydro Stormbloc, Hydro-Brake, SDS Aqua-Swir. Refer to Appendix 'F' for the specific maintenance guides.

Catchpit Manholes and Gullies

- 7.5 Catchpit manholes and gullies need to be inspected on a monthly basis except during the autumn leaf fall when they may require inspections to be increased to fortnightly.
- 7.6 Equipment required for inspection includes, moveable barriers and cones to guard openings, manhole keys, gloves and a torch. A minimum of two people are required.
- 7.7 Catchpit manholes and gullies need to be emptied once the sump becomes half full. Emptying should be performed using a gulley emptying vacuum truck or similar device which does not require man entry.

Foul Water Manholes and Inspection Chambers

- 7.8 Foul water manholes and inspection chambers need to be inspected on a monthly basis or immediately if foul odours are present or there is a suspected blockage.
- 7.9 Equipment required for inspection includes moveable barriers and cones to guard openings, manhole keys, gloves and a torch. A minimum of two people are required.
- 7.10 If manholes show any signs of blockage, specialist contractors should be called for clearance work, without delay.

Drainage Channel Outlets

- 7.11 Drainage channel outlets need to be inspected on a monthly basis except during the autumn when leaf fall, may require inspections to be increased to fortnightly.
- 7.12 Equipment required for inspection includes moveable barriers and cones to guard openings, lifting tools, gloves and a torch. A minimum of two people are required.
- 7.13 Silt, leaves and debris should be cleared from the channel outlets during each inspection.

Surface Water Treatment

- 7.14 The Aqua-Swirl maintenance regime will be carried out in accordance with Appendix 'F'.
- 7.15 Inspection and maintenance of the attenuation crates is to be carried out in accordance with the manufacturer's recommendations, see Appendix 'F'.
- 7.16 Maintenance will also be required for the pump. This maintenance will include a service every 6 months to check for blockages as well as checking the impeller and control floats/ ultrasonic head. This should be agreed by the pump provider.

Drainage Inspection and Maintenance Records

- 7.17 Appendix 'G' includes the annual drainage record log sheet. Copies should be taken of the log sheet for use for each year's records. Each inspection should be recorded on the log sheet for that year by the store manager. The log sheet shall be kept with this maintenance plan in the store manager's office for inspection.

8.0 MAINTENANCE RESPONSIBILITY

- 8.1 The responsibility for the enacting of this SuDS Maintenance Plan is entrusted to the owner of the property. The developer will provide this SuDS Maintenance Plan in addition to an Operation and Maintenance Manual to the onsite PFS management.
- 8.2 The Operation and Maintenance Manual shall be passed on to subsequent future owners of the PFS. This will include engineering drawings that detail the design and installation of the SuDS components so that persons undertaking any maintenance works will have a point of reference for the required specification of each of these.

Where applicable, the engineering drawings shall make reference to this SuDS Maintenance Plan

- 8.3 Following construction but prior to practical completion, the responsibility for maintenance shall lie with the developer.

9.0 TIMESCALE FOR IMPLEMENTATION

- 9.1 The duties of maintenance will come into effect prior to occupation of the PFS, following practical completion and handover
- 9.2 Installation to be inspected immediately following the first storm event, whenever this should occur post installation.
- 9.3 Maintenance to be no less frequent than at monthly intervals for the first three months and thereafter:
- | | |
|----------------------------|---------------------|
| A. Inspection / Monitoring | Monthly |
| B. Regular Maintenance | 2 Monthly Intervals |
| C. Infrequent Maintenance | 6 Monthly Intervals |

10.0 CONCLUSION

- 10.1 The drainage scheme has been based upon disposal of surface water runoff via the existing surface water connections on site, ensuring that no increase of flood risk will result from the proposed redevelopment.
- 10.2 The proposed attenuation storage is to accommodate run-off from a 1:100-year rainfall event plus a 40% additional allowance for climate change, in accordance with Environment Agency guidelines.
- 10.3 The proposed drainage network incorporates storm water pollution prevention measures such as, SDS Aqua-Swirl, and a Class 1 petrol interceptor.
- 10.4 Therefore, we consider the proposals acceptable from a surface water flooding and SuDS point of view.

Author:



Josh Newman
MEng (Hons)

Co-Author/Checked:



Mark Newman
BSc (hons) (Eng.)