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FLOOD AND WATER MANAGEMENT ACT 2010 (Schedule 3 – Sustainable Drainage)
PRE-APPLICATION REVIEW AND ADVICE

Application Number: SAB/PRE/21/0009

Proposal: Surface water management at plastic recycling and processing facility

Location: Land off Goatmill Road, Merthyr Tydfil. E306140 N206982

Dear Emma,

Further to your valid submission for SAB pre-application advice made on 25-10-21, please find enclosed the pre-application informative report and details of what further information may be deemed acceptable to the MTCBC SAB.

Huw Williams is your case officer and we would be grateful if you would quote the application reference number SAB/PRE/21/0009 in any future correspondence.

Yours sincerely,



Huw Williams

Senior SAB and Land Drainage Engineer

Background

The Flood and Water Management Act 2010 (Schedule 3) came into effect in Wales on 7th January 2019, requiring new developments to include Sustainable Drainage Systems (SuDS) that comply with national standards (*Statutory Standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems (2018)*).

From 7th January 2019, new developments of more than one dwelling or where the area covered by construction work equals or exceeds 100 square metres require approval before construction can commence. Approval is considered by the Sustainable Drainage Approval Body (SAB).

Adoption and management arrangements, including funding mechanisms for maintenance of SuDS infrastructure and all drainage elements are to be agreed by the SAB as part of this approval. The objective being to ensure SuDS infrastructure is correctly maintained and functions effectively for its design life.

An application for Sustainable Drainage Approval is required to comply with:

- Flood and Water Management Act 2010 (Schedule 3)
- Statutory Standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems (2018)

The SuDS approach mimics natural drainage, managing surface runoff at or close to the surface and as close to its source as practicable, controlling the flow (volume and rate of runoff) and providing a range of additional benefits. It contrasts with traditional drainage techniques, which are based on underground pipes to convey rainwater away from properties as quickly as possible. The use of SuDS is a way of helping to achieve sustainable development in both new and existing developments.

Key elements of the SuDS design approach include:

- Drainage systems should be considered at the earliest stages of site design to influence the layout of roads, buildings and public open spaces.
- Planning of a new site layout should be informed by the topography and the requirements of surface water management systems to both effectively drain and treat the runoff.
- Any existing watercourse, ditches, and other drainage features both within and adjoining the site should help inform proposals.
- SuDS should work as a management train to control flow rates and reduce volumes of runoff, providing treatment to protect water quality and opportunities to encourage biodiversity and amenity.
- Well designed, easy to maintain SuDS will deliver a range of important benefits for the local environment, the development and local communities.
- Surface based sustainable drainage components are visible in their operation and performance and are generally simpler and easier to operate, monitor and maintain.
- Take account of existing flood risk management policies and procedures.

Documentation

KRS.0297.021.R.001.C - Land off Goats Mill Road, Merthyr Tydfil - SuDS Design

KRS.0297.021.R.002.A - Land off Goat Mill Road, Merthyr Tydfil_FCA

SUds-pre-application-approval-form

Overall Summary

MTCBC have received an application for pre full application advice for drainage requirements to facilitate the development of a plastic recycling facility at land to the north of Goatmill Road, Merthyr Tydfil. E306140 N206982.

The development site is currently green, open space and the site of a former tip and historically used for the disposal of colliery spoil and waste material from the local iron works. The site was reclaimed and levelled in the 1980's and is currently relatively unusable marsh land supporting a wide variety of habitats.

The site is identified as High risk of surface water flooding limited to two small zones to the north and south of the site. Surface water flooding is likely to be generated from two unnamed watercourses to the northern and southern extremities of the red line boundary. The watercourses currently serve the Fos o Fran open cast mining operation to the east of the A4060 dual carriageway. There are known ground water issues on the site and the site is not categorised at any risk from river flooding leaving it open for development under current TAN 15 regulations.

In summary, the current drainage strategy is for the surface water generated by the site to be simply managed by a series of surface water gully's and drains falling from north to south, attenuated in large permanently filled lagoon. The proposal is to discharge excess surface from the site to an unnamed watercourse to the south of the site with flow control limiting the discharge to greenfield run off rates. Due to the industrial nature of the development, surface water will be treated prior to discharge to the lagoon by the use of a series of below ground proprietary treatment systems. Rain water harvesting will be used to manage some surface water generated by Building B and be re-used for vehicle washing purposes.

Standard S1 – Surface water destination

Level 1 – Rainwater collected for use

- G1.4 Water is a valuable resource and rainwater should be collected (harvested) for non-potable use where practicable. This not only reduces potable water demand, but it can also reduce the volume of surface water runoff requiring disposal. One or more of the following **exception criteria** needs to be demonstrated if rainwater harvesting (RWH) is not used:
 1. There is no foreseeable demand for non-potable water on the site throughout its design life;
 2. There is no foreseeable need to harvest water at the site as the relevant water undertaker's water resources and drought management plans do not identify potential stresses on mains water supplies;
 3. The use of rainwater harvesting is not a viable/ cost-effective part of the solution for managing surface water runoff on the site, taking account of the potential water supply benefits of such a system.
- G1.5 Rainwater harvesting tanks can be sized for capturing the runoff from large rainfall events as well as water supply. The design of rainwater harvesting systems for management of large events should be in accordance with BS 8515 appendix A (2009, revision 2013)6. This can contribute to a significant reduction in runoff volume, helping to meet the requirements of volume control of runoff (Standard S2).
- G1.6 In most cases, rainwater harvesting alone will not be adequate to deal with the site drainage and provision will be required for an overflow to a Level 2 or lower priority destination.
- G1.7 RWH systems, whether designed for water supply or surface water management as well, will contribute effectively to meeting the criterion on Interception (Standard S2).

Summary

The proposal indicates rainwater harvesting is to be used on building B and is commended – not for the purpose of toilet and shower facilities but for use on a vehicle wash down facility. Little detail has been provided on the type of system intended for use and full details/specification should be provided to the SAB at full application stage.

Level 2 – Discharge of surface water to the ground

- G1.8 Surface runoff not collected for use in accordance with Level 1 should be discharged by infiltration (a process that allows water to percolate into the ground) to the maximum extent possible at any location across the site. A lower priority destination should only be used for any residual runoff that cannot be served by infiltration provided one or more of the following **exception criteria** can be demonstrated:
 - **Permeability:** the use of infiltration drainage is not practicable due to the lack of permeability of the soil for disposing of runoff;
 - **Ground Instability:** the use of infiltration drainage would result in a risk of instability through ground movement or subsidence;

- **Pollution of groundwater or receiving surface waters:** the use of infiltration drainage would pose an unacceptable risk of pollution of groundwater or surface water bodies:
 - as a result of existing contaminants on the site being mobilised; or
 - as a result of activities in the area draining to the infiltration device (for example an area where there is the storage or handling of chemicals or fuels); or
 - as a result of the sensitivity of the groundwater or surface waterbody;
 - **Groundwater flooding:** the use of infiltration drainage would result in an unacceptable risk of flooding from groundwater;
 - **Infiltration into a combined sewer:** the use of infiltration may cause ingress of flow into a combined sewer which might result in an increased risk of flooding or pollution on the site or downstream.
- Guidance on meeting the exception criteria can be found within the clauses from page 9 within the statutory national standards for SuDS at:
<https://gov.wales/national-standards-sustainable-drainage-systems-suds>

Summary

Report “*KRS.0297.021.R.001.C - Land off Goats Mill Road, Merthyr Tydfil - SuDS Design*” states that infiltration testing has not been carried out as part of the ground investigation for the site and has been discounted as a suitable method of discharge. Whilst the MTCBC SAB understands that likely run-off volumes for a site of this area cannot be managed by infiltration alone, there is potential for its use within certain areas of the site. i.e. staff parking amenity areas. Where suitable, the use of some infiltration on the site not only provides recharge to water tables but can deal with minor pollutants and limit the impact on any level 3 or 4 requirements. The full application should evidence that infiltration testing has been carried out to the relevant standards and its use as a partial method of surface water discharge considered where appropriate. If deemed an unviable option, one or more of the exception criteria detailed must be demonstrated in within the full application report.

Level 3 – Discharge to a surface water body

G1.31 Surface runoff not collected for use in accordance with Level 1 or discharged to ground in accordance with Level 2 should be discharged to a receiving surface water body. A lower priority destination should only be used provided one or more of the following **exception criteria** can be shown to apply:

- **Access:** It is not reasonably practicable to convey the surface runoff to the water body – See Box 1 for further guidance;
- **Drainage by use of pumps:** Discharge to a surface water body would require the use of pumping, and discharge to a lower level destination would not require pumping and could be delivered more cost-effectively.– see Box 2 for further guidance;
- **Increase in flood risk:** The discharge would result in an unacceptable increase in the risk of flooding – see Box 3 for further guidance.

Summary

The primary method of discharging surface water from the site is to an existing unnamed watercourse situated within the southern portion of the site. The watercourse serves the Ffos o Fran opencast mining operation and whilst the majority of run-off from the open cast site excavations is directed via 2 lagoons to an unnamed watercourse to the north of the development site, during the winter months, the southern watercourse is active and manages run-off for the lower reaches of the Ffos o Fran catchment. The watercourse is culverted from the site underneath Goat Mill Road and water is then conveyed to a block stone lined, open channel through a nearby residential area, Bradley Gardens. Historically there have known flooding incidents within Bradley Gardens from the watercourse due to blockages to a highway culvert underneath the access road to the residential area. A full hydrology assessment will need to be undertaken prior to any agreement of site discharge to this watercourse and the study should either identify if there are potential capacity/structural issues and where, if any, improvement works need to be undertaken in order to facilitate the additional flows. Additionally, a site management plan should be provided identifying measures to reduce downstream flood risk whilst the construction phase is ongoing and full details of the proposed watercourse diversion should be provided. The LLFA will need to be consulted throughout, via the Ordinary Watercourse consenting process.

Under the current proposal, the 9.75Ha impermeable surface areas of the development site are managed by a series of surface water sewers discharging to a storage lagoon. Outflows are controlled by a vortex flow control device limiting outflows to greenfield rates at 308 l/s for a Q100 storm event.

Provided that an agreement is reached with LLFA on the comments above, the discharge proposals should be satisfactory.

Level 4 – Discharge to a surface water sewer or highway drain

Summary

The proposal does not indicate any site discharge to a surface water sewer or highway drain.

Level 5 – Discharge to combined sewer

Summary

The proposal does not indicate any site discharge to a combined sewer.

Standard S2 – Surface water runoff hydraulic control

The aim of Standard S2 is to manage the surface water runoff from and on a site to protect people on the site from flooding from the drainage system for events up to a suitable return period, to mitigate any increased flood risk to people and property downstream of the site as a result of the development, and to protect the receiving water body from morphological damage.

S2 Surface water runoff hydraulic control:

1. Surface water should be managed to prevent, so far as possible, any discharge from the site for the majority of rainfall events of less than 5mm.
2. The surface water runoff rate for the 1 in 1 year return period event (or agreed equivalent) should be controlled to help mitigate the negative impacts of the development runoff on the morphology and associated ecology of the receiving surface water bodies.
3. The surface water runoff (rate and volume) for the 1% (1 in 100 year +30%) return period event (or agreed equivalent) should be controlled to help mitigate negative impacts of the development on flood risk in the receiving water body.
4. The surface water runoff for events up to the 1% (1 in 100 year) return period (or agreed equivalent) should be managed to protect people and property on and adjacent to the site from flooding from the drainage system.
5. The risks (both on site and off site) associated with the surface water runoff for events greater than the 1% (1 in 100 year) return period should be considered. Where the consequences are excessive in terms of social disruption, damage or risk to life, mitigating proposals should be developed to reduce these impacts.
6. Drainage design proposals should be examined for the likelihood and consequences of any potential failure scenarios (e.g. structural failure or blockage), and the associated flood risks managed where possible.

Clauses relating to the Guidance related to the guidance for hydraulic control can be found on page 20 of the Statutory Standards for Sustainable Drainage Systems at:
<https://gov.wales/national-standards-sustainable-drainage-systems-suds>

Summary

The hydraulic control arrangements appear to be satisfactory provided Surface Water destination Level 3 comments are actioned accordingly. Little detail has been provided on flow control device/overflow arrangements within this pre-application and full details should be provided at full application stage.

Standard S3 - Water Quality

Standard S3 addresses the drainage design requirements to minimise the potential pollution risk posed by the surface water runoff to the receiving water body.

S3 Surface water quality management

Treatment for surface water runoff should be provided to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

Guidance for S3 can be found from page 29 of the Statutory Standards for Sustainable Drainage Systems at:

<https://gov.wales/national-standards-sustainable-drainage-systems-suds>

Summary

Due to site constraints and usage, the use of green SuDS or permeable paving in some areas has not been considered for improving water quality although should not be discounted and further consideration should be made to incorporating these types of features where possible. That said, water quality has been considered by the applicant and it is recognised. Greener, surface managed SuDS would provide natural pollution removal with fewer, less costly maintenance burdens.

It is currently proposed that water quality for surface water leaving the site is achieved in 3 stages.

Stage 1 treatment is via a Hydro International Up-flow filter

Stage 2 treatment is via a Hydro International downstream defender

Stage 3 is via settlement in the lagoon.

No indication has been given to the strategic positioning of the silt traps and details of this will need to be provided at full application stage. Due to the type of traffic that will be used on the site, the likely heavy pollutants generated and the proposed lengths of pipe runs, consideration should be given to increasing the number of inspection chambers and silt removal devices should be considered to reduce the risk of silts entering the long pipe runs.

Standard S4 – Amenity

Standard S4 addresses the design of SuDS components to ensure that, where possible, they enhance the provision of high quality, attractive public space which can help provide health and wellbeing benefits, they improve liveability for local communities and they contribute to improving the climate resilience of new developments.

S4 - Amenity

The design of the surface water management system should maximise amenity benefits.

Guidance on standard S4 can be found from page 38 of the Statutory Standards for Sustainable Drainage Systems at:

<https://gov.wales/national-standards-sustainable-drainage-systems-suds>

Summary

Due to site constraints, Standard S4 has been discounted as part of this application. Green SuDS should be used where possible with components such vegetated swales considered for surface water conveyance. Incorporation of these types of systems will help to achieve the benefits that Standard S4 has to offer. It is noted that the overall landscaping strategy for the site will add to amenity benefits where vegetated SuDS components are not possible.

Standard S5 – Biodiversity

Standard S5 addresses the design of SuDS to ensure, where possible, they create ecologically rich green and blue corridors in developments and enrich biodiversity value by linking networks of habitats and ecosystems together. Biodiversity should be considered at the early design stage of a development to ensure the potential benefits are maximised.

S5 - Biodiversity

The design of the surface water management system should maximise biodiversity benefits.

Guidance on standard S5 can be found from page 41 of the Statutory Standards for Sustainable Drainage Systems at:

<https://gov.wales/national-standards-sustainable-drainage-systems-suds>

Summary

Due to site constraints, Standard S5 has been discounted as part of this application although the lagoon will bring some bio-diversity benefits. Green SuDS should be used where possible with components such vegetated swales considered for surface water conveyance. Incorporation of these types of systems will help to achieve the benefits that Standard S5 has to offer. It is noted that the overall landscaping strategy for the site will add to bio-diversity benefits where vegetated SuDS components are not possible.

Structural Integrity

Standard S6 deals with designing robust surface water drainage systems so they can be easily and safely constructed, maintained and operated, taking account of the need to minimise negative impacts on the environment and natural resources.

S6 – Design of drainage for Construction, Operation and Maintenance

- All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).
- All elements of the surface water drainage system should be designed to ensure maintenance and operation can be undertaken (by the relevant responsible body) easily, safely, cost effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).
- The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

Guidance on standard S6 can be found from page 44 of the Statutory Standards for Sustainable Drainage Systems at:

<https://gov.wales/national-standards-sustainable-drainage-systems-suds>

Summary

The provision of the maintenance plan at this stage is commended and acceptable for the current drainage strategy. Under current proposals, drainage runs need to be split up further to improve accessibility in the event of pipe blockages. Although locations are yet to be confirmed, additional strategically placed treatment systems may be required to reduce the risk of pipe blockages. It is also worth noting, the incorporation of greener SuDS for conveying surface water, significantly reduces maintenance requirements and reduces costs for the owner.

Conclusion

This proposal would in reality satisfactorily manage the surface water on the site however, in its basic form, it is a “pipe to pond” solution. It appears, minimal consideration has been given to the statutory national standards when looking to integrate a number SuDS components through the site via a treatment train and managing run off and pollution at source. The use of a rain water harvesting system is commended and thought has been given to vastly reducing pollutants entering the lagoon and downstream system however, under current proposals, the maintenance burden is apparent.

Based on the current layout, the constraints on the site are evident but limitations only appear to be in the form of stored recycled materials. Given the scale of the site, there should be ample opportunity to incorporate a greener, lower maintenance approach particularly along the site parameter. The introduction such systems to manage run off and pollutants from roadways and storage areas will ensure greater compliance with the statutory national standards and result in fewer maintenance requirements and costs to the owner long term. It is noted that landscaping as part of the overall development will contribute to the biodiversity and amenity value, however, it is preferable incorporate surface water drainage in to these features. If for whatever reason this cannot be achieved, the SAB will require substantive evidence or reasoning for omissions from the strategy.

Full application stage should take in to account the previous comments as well as consideration for the points below:

- Infiltration testing should be carried out to standard BRE365 and results provided.
- Full details of the rain water harvesting system should be provided.
- Strategic locations of proprietary treatment systems should be provided.
- Where pipe runs are required, they should be broken down in to shorter sections and necessary treatment systems incorporated where applicable.
- Long sections, section details for all pipework, chambers, proprietary treatment systems, rainwater harvesting system, lagoon, outfalls.
- Details of overflow arrangement from the lagoon.
- Catchment/capacity assessment of the unnamed watercourse.
- Evidence of the Ordinary watercourse consent from the LLFA for watercourse diversions and connection to the watercourse.

Consultee Responses

No external organisations or statutory consultees were consulted in the preparation of this pre-application report.

Non-Performance bond

The applicant should be made aware that a Non-Performance bond could be required for the proposed development. Accurate construction estimates should be included in support of a full application for sustainable drainage approval.

Adoption criteria

The drainage system is not subject to mandatory adoption and will remain under the ownership of the site owner.