



Strata Homes

Surface Water Management Plan: Westgate, Cleckheaton

302574

Revision control sheet				
Revision ref.	Date	Reason for revision	Author	Reviewer
Rev 00	25.07.23	First issue	Victoria Lebon / Lucy Blain	Melanie Rowley
Rev 01	17.10.2023	Updated in line with remediation / planned removal of vegetation	Victoria Lebon	Melanie Rowley

1. PREFACE

This document presents a strategy to manage surface water and run-off occurring during the construction phases of development. The strategy is designed to mitigate silt-laden surface water entering the on-site surface water drainage system (when constructed), and silt laden run-off impacting down gradient sensitive receptors such as watercourses and neighbouring properties.

This Surface Water Management Plan (SWMP) for the proposed residential development by Strata Homes includes a detailed assessment of potential risk to the identified sensitive surface water receptors. It makes recommendations for appropriate silt mitigation measures to be undertaken by the developer and associated contractors.

The recommendations made within this report have been made for the 'Construction Phase' of this residential project. RSK have not been provided with an Earthworks Design and this report is based on the Earthworks Specification detailed below. Once an Earthworks Design has been finalised and new site levels determined, it is recommended that this report is reviewed by RSK. The drainage strategy for the development has been designed by the infrastructure design engineer. The final surface water drainage strategy is referenced in this SWMP.

The recommendations for mitigation measures are shown schematically on Figure 01. This report is to be read in conjunction with the following:

- Figure 01: Surface Water Management Plan Schematic (drawing no. 302574-DE-276-SS-D-C-27601-C02)
- Figure 02: Silt Mitigation Measures – Standard Designs (drawing no. 302574-DE-249-SS-D-C-24901-C01)
- Appendix A: Inspection and Monitoring Proformas
- Appendix B: Installation Examples
- Appendix C: Example Manufacturers and Product Sheets

This plan has been produced by RSK with reference to available online information (MAGIC Maps, Google earth, www.gov.uk), a site walkover undertaken on 06 June 2023, and the following documents supplied by the client:

- Drawing Ref. QD1776-03-01 B, Engineering Layout, Queensberry Design Limited (dated October 2021)
- Drawing Ref. 18-CL2-SEGB-WE-01, Planning Layout, Strata Homes (dated June 2022)
- Drawing Ref: BY0999-PMP-001, Production Management Plan, Strata Homes (dated December 2022)
- Report Ref. QD1776 FRA, Flood Risk Assessment / Drainage Strategy, Queensberry Design Limited (dated February 2023)
- Report Ref 3043/2C Geoenvironmental Appraisal, Land at Westgate, Cleckheaton, Lithos Consulting (dated May 2021)
- Report Ref. ER-4666-01A, Land off Westgate, Cleckheaton, Preliminary Ecological Appraisal Report, Brooks Ecological (dated August 2020)

- Report Ref. 3043/7, Earthworks Specification, Land at Westgate, Cleckheaton, Lithos Consulting (dated November 2021)
- Report Ref. 3043/4B Remediation Strategy, Land at Westgate, Cleckheaton, Lithos Consulting (dated November 2021)

As a result of global warming it is generally accepted that extreme weather events, including increased intensity and frequency of heavy rainfall events is likely to be more common during the proposed construction period of this development. Therefore, it is considered that a consistent implementation of a coherent SWMP will help reduce the risk of silt pollution to controlled waters from the construction of the proposed development and thus lessen the environmental impact and increase the sustainability of the construction project as a whole.

1. SITE PERSONNEL AND DOCUMENTATION

The following measures are to be implemented to increase awareness and bring existing site documentation up to date:

1. Undertake site-based awareness training (Site Safety briefing / Toolbox Talks) on silt management and protection for all site staff including the ground workers;
2. Include a detailed section within the site induction folder relating to silt protection; and
3. Undertake a daily site inspection of key areas and a weekly site audit; maintain a written and photographic record of the audits and obtain support from the appointed environmental consultant if or when required.

Note: This document is intended as a live document, to be continually reviewed and updated as the development progresses. RSK may provide support with supplementary site visit audits or attendance at meetings ahead of key stages of the development in relation to silt management

2. SITE DESCRIPTION

The site is located to the south of Westgate Road, Cleckheaton, BD19 5DS and is centred on National Grid Reference SE 18400 25000.

The Westgate development site is irregular in shape and approximately 6.45 hectares in size. Prior to development comprises a number of industrial units including warehouses with mixed cover of hardstanding across the site. The site is brownfield and consists of multiple occupancies some still operating. The site has had a heavy industrial past, consisting of Chemical Works, Rolling Mill, scrap yard, brickworks and quarry. A watercourse named Blacup Beck forms part of the southern boundary.

Current development boundary demarcation and adjacent land uses are described below:

- **North:** The northwest boundary of the site is predominantly industrial units with a road named Westgate located approximately 90m north. Westgate continues eastwards and bounds the site to the north and to the northwest are additional industrial units, with Westgate beyond. Beyond Westgate to the north is a residential development.
- **East:** The Site is bound by Quarry Road with residential properties to the east.
- **South:** Approximately 35m west of the site's southwestern boundary is a sluice/pond which flows westwards. The Beck is culverted under Brick Road and then flows along the site's southwestern boundary with a densely vegetated track and fields beyond. The Beck is culverted beneath the southern/central portion of the site. To the southeast of the Site, the Beck is no longer culverted and flows eastwards along the site's boundary with agricultural fields beyond.
- **West:** Brick Street lies immediately to the west of the Site with industrial units beyond.

The current site levels generally falls toward the southeast, from elevations of approximately 106m AOD at the western boundary to approximately 92m AOD beyond the eastern boundary. At the time of the walkover, the site's cover comprised mixed hardstanding and overgrow vegetation as development has not yet commenced onsite.

The Blacup Beck is located along the site's southern boundary with a culverted section across the central-southern portion of the Site. During the walkover it was noted that the Beck was clear of silt and free flowing. The Beck is a tributary of the River Spen and continues to flow eastwards towards

the Spen Brook over 1km to the east. Due to the presence of overgrown dense vegetation the headwall to the culverted section was not visible.

BGS mapping indicates that the site is mostly underlain by Made Ground with the Clifton Sandstone Rock Member below, comprising fine-grained sandstone and includes thin coal. However the Lithos Site Investigation report (ref: 3043/2C) indicates that the majority of pits excavated beyond the deep quarry backfill encountered “residual soils (gravelly clays and clayey gravels) with sandstone/mudstone (coal measures) below around 2.5m.”

The Flood Risk Assessment indicates that the majority of the Site is classified as Flood Zone 1, with Flood Zone’s 2 and 3 reported adjacent to the Beck. The Beck itself and an irregular-shaped portion of the southern part of the Site is classified as Flood Zone 3, however the proposed development design does not incorporate new properties in this area. Flood Zone 2 areas are noted across the entirety of the Site’s southern boundary and to the west of the culverted section of the Beck. The extent of flooding risk from rivers and seas is classified as Medium to High across the southern boundary.

3. SITE DEVELOPMENT

The Strata Homes residential development comprises the construction of 180 houses with private gardens and associated infrastructure with an area of Public Open Space (POS) located in the south of the Site. Prior to construction and to facilitate the sites development, it is understood that a phase of earthworks will be undertaken involving the site being plateaued from existing ground levels in the north (approx. 105mAOD) to tie into the level of the Blacup Beck in the south (95mAOD) (as per the Earthworks Specification report). Additional works will be undertaken to remove obstructions and anticipated contamination. The Blacup Beck to the south of the site is expected to remain open in the southwest and culverted in the southeast section as it currently is.

An existing combined sewer is present running from north to south across the centre of the site, which will be ‘abandoned’ as part of the proposed development. The proposed new drainage strategy incorporates combined sewer which will flow southwards, adopting an existing section towards the southwest, across the Site towards an existing foul connection located approximately beneath the track to the south of the Site. This connection continued westwards into Brick Street, and eastwards (however this is not shown on current plans).

The proposed storm water drainage is also housed within the Site’s roadways and will flow southwards towards the Blacup Beck. Storm water will be discharged via connection S23 into the proposed attenuation tank S24, which can hold a total volume 1410m³. Water will then discharge through a Hydrobrake (S25) at a rate of 26.5 l/s to the outfall within the Blacup Beck, located just downstream of the culverted section of the watercourse which will continue to flow east.

4. SENSITIVE RECEPTORS TO SURFACE WATER RUN OFF

The following sources, pathways and sensitive receptors on site and off site have been identified. Consideration of these along with additional factors can be used to determine a potential pollution risk rating.

Sources of silt pollution:

The principal sources of potential soil pollution to the surface water receptors will be from the on-site

earthworks, infrastructure and housing plot activities. Particular point sources will occur when any works are undertaken in the immediate vicinity of the central watercourse (e.g. construction of surface water drainage headwalls) or dewatering of any excavations.

The Lithos site investigation report (ref: 30246/2C) indicates that made ground including; hardcore, burnt shale, cohesive made ground, granular made ground, brick fill, filter sand, ash and clinker may be present between 0.4m to 12.0m below ground level across the Site. Natural soils are generally clayey gravels and gravelly clays with alluvium noted adjacent to the Blacup Beck.

Pathways:

Plausible pathways for silt pollution to impact the identified receptors include direct surface run-off, and run-off via historical land drains and the newly constructed surface water drainage network (road gulleys, road sewer network and attenuation tank).

Sensitive Receptors:

On-site:

- The Blacup Beck located along the southern boundary with culverted section across the centre of the Site
- The proposed gulleys and surface water sewers of the constructed drainage system
- Attenuation tank (S24) located in the south of the Site

Off-site:

- Watercourses downstream of the Blacup Beck
- Westgate road to the north of the site (to be used for site access)
- Brick Road to the west of the site (depending on final site levels)
- Quarry Road to the east of the site (depending on final site levels)

5. RISK RATING AND ASSESSMENT

A risk rating is provided as guidance to the level of risk associated with silt pollution to the surrounding water environment receptors from the identified sources of pollution occurring from the proposed development. The risk rating assesses a number of risk factors in line with the source-pathway-receptor model. It assesses the sensitivity of any identified receptor and combines that with hazard consequence and probability to classify the risk rating as high, medium or low.

High: Indicates the positive identification of a sensitive receptor and / or the likelihood of a potential risk to the surrounding environment.

Medium: Indicates the potential identification of a sensitive receptor or the likelihood of a potential risk to the surrounding environment.

Low: Indicates the negative identification of a sensitive receptor or the likelihood of a potential risk to the surrounding environment.

Based on the identified risk rating, plans will be developed and implemented to treat, control and minimise risk.

RISK RATING AND ASSESSMENT			
Risk Factor	Identified	Detail	Risk Rating
Sensitive Receptors			
Visible flowing water course within 100 metres of site boundary and category of watercourse.	Yes	The Blacup Beck is present onsite flowing from west to east across the southern boundary and culverted beneath the central-southern portion of the Site.	Red
Discharge from site flows directly into a water course	Yes	Surface water will discharge in the Blacup Beck via surface runoff. Following this construction of Attenuation Tank (S24), surface water sewers will be discharged through a hydrobrake into the Blacup Beck.	Red
Water course contains visible aquatic life (fish etc.) or has been assessed as environmentally sensitive	Yes	The Ecological appraisal report for the Site classifies the minor watercourse of value with a Defra Metric Condition Assessment of Moderate	Yellow
Local water course used as local amenity, fishing, canoeing, boating, swimming	No	Due to the size of the Blacup Beck tributary, it is not anticipated that the watercourse is used for fishing, canoeing, boating or swimming.	Green
Likely volumes of temporary discharge will exceed those designed for the final discharge consent	Yes	Temporary run-off to the proposed surface water drainage system may well exceed calculated final discharge rates during storm events during the construction phase due to unsurfaced areas increasing run-off rates due to temporary discharge.	Red
Consortium site with shared collection and discharge outlets	No	Site is not a consortium development	Green
Treatment of water discharge is likely to be required to achieve the quality standard of acceptability	No	Treatment of site discharge surface water is not currently anticipated at this stage	Green
SSSI and Sensitive Receptors located downstream from the development.	No	No downstream SSIs have been identified	Green
Ground Conditions and Topography			
Soils investigation identifies clay / silt (impermeable materials)	Yes	British Geological Survey (BGS) mapping indicates that the Site is underlain Made Ground with the underlying natural strata comprising sandstone or mudstone. The Lithos site investigation report (ref: 3043/2C) indicates that natural soils beneath the site comprise gravelly clays and clayey gravels. Made ground is reported to vary across the site and includes; hardcore, burnt shale, cohesive made ground, granular made ground, brick fill, filter sand, ash and clinker.	Yellow
Site exposed, or at high altitude, or steep gradient.	Yes	It is understood that Earthworks are proposed to facilitate the Site's development and will involve plateauing the Site area to gently slope from the north towards the Blacup Beck in the south.	Yellow
Soils investigation identifies on-site contamination that may pose as risk to controlled waters		The Lithos Remediation Strategy report (ref: 3043/2C) indicates that there is a potential risk to controlled waters, predominantly within areas A and B (west and south of the Site)	Red
Groundwater level detected at installed drainage pipework depths		The Lithos site investigation report (ref: 3043/2C) reports groundwater encountered within the majority of exploratory holes, particularly in the south of the site (known as Area B) with seepages and inflows reported from around 2.0m. It is indicated that perched groundwater is largely encountered within backfill features present onsite.	Red
Rainfall and Flooding			
Historical evidence indicates site suffers from seasonal flooding	Yes	The majority of the Site is reported as Flood Zone 1, however along the southern boundary (including an irregular-shaped portion of the southern area of the Site) are classified as Flood Zones 2 and 3 adjacent to the Blacup Beck. The risk from Tidal and Fluvial Flooding and Overland Flooding is described as High within the Flood Risk Assessment report (ref: QD1776 FRA)	Red
Development Constraints			
Does the development require a programme of earthworks to change / modify site levels	Yes	A programme of earthworks is planned prior to the construction phase to facilitate development. Current level changes have not been issued to RSK, however the Site will generally be plateaued to gently slope from north to south.	Red
Construction of attenuation basins programmed for construction within 3 months of development commencement.	No	No attenuation basin is currently proposed within the development however an attenuation tank (S24) is to be constructed in the south of the site.	Red
Potential Pollution Risk Rating			
It is considered that Site should be classed as 'high risk' prior to the construction of attenuation basins and temporary silt protection measures, given:			
<ol style="list-style-type: none"> 1. The topography of the Site (generally sloping southwards) and the requirement for a programme of earthworks prior to the construction phase of the development. 2. The Blacup Beck present along the Site's southern boundary which flows eastwards towards the Spen Brook over 1km away (a tributary of the River Spen.) 3. The proximity and presence of Flood Zone 2 and 3 onsite, along the site's southern boundary 			
The risk rating may be considered to be a 'High risk' after the construction of the attenuation basins and silt protection measures upgradient of the outfall into the watercourse.			

6. PREVENTATIVE MEASURES WITHIN EACH ACTIVE DEVELOPMENT AREA / PHASE

The following specific protection measures should be implemented within the active development areas of the site to protect the surface water system. The protection measures are shown in Figure 1. Further detail of proposed installation measures are provided within Figure 2, installation examples are shown within Appendix B and manufacturers product sheets are provided within Appendix C.

It is assumed earthworks will precede the construction phase. The production management plan indicates that construction will begin in the west of the site, then southwards towards the Blacup Beck. Construction will then continue northwards along the eastern boundary of the Site, before the final build phases across the centre, ending with the construction compound. A phased topsoil strip plan should be utilised to help prevent a wholesale topsoil and vegetation strip of the Site. Recommendations are summarised below:

- Access roads should be constructed followed by the attenuation tank (S24) at the earliest convenience to limit surface runoff towards the Blacup Beck.
- Temporary compounds should be stoned up at the earliest opportunity with designated vehicle tracking routes lined with stone.
- A minimum of 10 m should be retained as a vegetated buffer zone around the perimeter of the Site.
- Silt protection measures should be installed at all headwalls. Protection measures should constitute a minimum of a minimum of timber framed silt fencing as described in Section 6.
- Soil bunding should be built upgradient and along the length of the Blacup Beck.
- Silt fencing should be installed upgradient and along the length of the Blacup Beck. **It is assumed that Strata Homes will maintain any appropriate buffer with regards to construction in the vicinity of flood plains as determined by the EA.**
- Specific monitoring points (shown schematically in Figure 1) should be established and monitored at regular intervals and periods of heavy rain.

For each construction phase the additional following protection measures should be implemented –

Site Set Up:

Control of site surface strip: it is imperative that the wholesale stripping of surface vegetation and associated topsoil should be minimised. For the effective management of run-off it is critical that the site strip should be carefully managed in accordance with a site strip plan that phases the site strip to enable specific areas to be developed whilst maintaining surface vegetation to promote infiltration and minimising run-off. A suitable standoff distance (at least 6m) should be established from the top of any ditch or watercourse which is in turn protected by silt fencing. Where vegetation retention is not possible up gradient of a ditch or watercourse, soil bunding and silt fencing should be installed. Where possible the site strip phasing plan should be incorporated into the SWMP for each development phase as follows:

1. Prioritisation should be given to the construction of drainage runs connecting to the constructed attenuation ponds located to the north and east of the site red line boundary. Prompt construction will enable their use in the control of surface water run-off and silt management and will greatly

6. PREVENTATIVE MEASURES WITHIN EACH ACTIVE DEVELOPMENT AREA / PHASE

increase the temporary run-off storage capacity. This should enable more efficient and reliable silt management.

Appropriate silt protection methods will be utilised at each headwall and outfall. The general methods that should be adopted are outlined in Section 6.

2. The maintenance and repair of existing drainage infrastructure that is to be retained: ditches or culverts that are to be retained in the proposed development should be repaired and suitably maintained to ensure their effective function.
3. Any temporary surface water discharge undertaken during the construction phase should comply with any discharge permit (gained from the Environment Agency EA) or discharge consent (gained from the lead local flood authority LLFA) and may be subject to be undertaken under a bespoke EA permit application. It is recommended that liaison is undertaken with the EA to ascertain the EA regional approach on this matter.
4. The Site may temporarily discharge dewatering waters under the appropriate EA Regulatory Positional Statement (RPS) for a period of 3 months subject to the strict conditions of the EA positional statement. Any unconsented discharge or discharge not meeting the requirements of the EA RPS may be liable to enforcement action.
5. Consideration should be given to the location of stockpiled materials (topsoil / subsoil) within designated areas to be located as far as practicably possible from any identified surface water receptors (ditches) or any road gullies. The placement of a silt fence at the base of any stockpile should be considered in order to control silty run-off.
6. Consideration as to the placement of materials storage areas where they can be accessed directly from a surfaced road, and placement of hardstanding or stoning up of the storage areas, to prevent tracking on unsurfaced ground to access materials.
7. The installation of hard standing areas to the front of all plots to enable 'clean' forklift access.
8. General good housekeeping of the site.

Plant and machinery operation:

9. Avoid tracking or washing out next to any attenuation pond, ditch or any gully.
10. Avoid tracking in the vicinity of any attenuation pond or any area of standing water that may be present.
11. Use designated separate machine and dumper tracking routes that avoid surfaced roads (that may be used by road-going vehicles). Designate specific machine crossing points of surfaced roads.

Protection measures to install / maintain throughout construction:

12. Existing access tracks / haul roads: where run-off is channelled along existing haul roads run-off should be intercepted and diverted off the track way by means of suitable French drainage placed across the track way to a grip or ditch downgradient of the track way. Deposition of mud into constructed French drains may be minimised by capping the clean washed stone infill with track-matts.
13. Where haul roads or constructed roads cross retained ditches: suitable measures should be adopted to ensure silt does not enter the ditch. This may include construction of a temporary pipe

6. PREVENTATIVE MEASURES WITHIN EACH ACTIVE DEVELOPMENT AREA / PHASE

culvert with potential run-off from the crossing prevented from impacting the ditch with either bunding or silt fencing. Where permanent constructed roads cross ditches, the ditch headwalls either side of the crossing should be protected with tightly fitting timber framed silt fence placed across the headwall apron with tightly fitting silt mats (weighted with sandbags) packed between the headwall wingwalls. The protection measures should be suitably tight fitting within the headwall to ensure water cannot bypass the measures. Silt matting should be frequently checked to ensure it is sufficiently weighted to remain in place. Installation of silt entrapment materials within retained ditches at suitable intervals along the length of the ditches.

14. Placement of stockpiled materials (topsoil / subsoil) away from all attenuation features, watercourses and any ditch identified across the Site area.
15. 5m wide retained vegetation strip along banks of the on site drainage ditches.
16. Installation of silt fencing and soil bunds immediately upgradient of any sensitive surface water feature (namely the Blacup Beck but any additional ditches identified onsite).

Road and sewer maintenance:

17. Minimise the movement of plant on and off roads to prevent the tracking of excess soil onto surfaced roads (i.e. planning of the working day and work areas, utilising designated machine and dumper road crossing points).
18. Regular scraping of roads to remove significant silt build-up.
19. The placement of gully protection (gully bags) in all gullies during construction and for these to be inspected and replaced / cleaned on a regular basis.
20. Provision of a road sweeper on site and on the adjacent road network during periods of inclement weather (frequency to be continually assessed by site management), but particularly during bulk soil movements.
21. If required, construction of speed ramps to slow traffic down and to help direct surface water to collection areas.

Management of dewatering – excavations:

22. Should dewatering of excavations be required, the following options may be considered:
 - a. Over-pumping into the constructed surface water drainage system i.e., any on-site temporary attenuation pond, permanent attenuation pond or surface water sewer (when constructed). Adequate protection measures should be implemented (potentially comprising, but not limited to; use of filter bags on any pump inlet and outlet and passing water through either a settlement tank or silt capture system) to prevent discharge of silt into the constructed surface water drainage system and subsequently off-site. The implemented measures should be frequently monitored and maintained to prevent discharge of silt into the drainage system.
 - b. Any proposed pumping to ditches or water courses will need to be conducted under an EA RPS – <https://www.gov.uk/government/publications/temporary-dewatering-from-excavations-to-surface-water>. Following commencement of pumping the RPS is applicable for a period of 3 months and careful treatment of the water MUST occur to ensure the

6. PREVENTATIVE MEASURES WITHIN EACH ACTIVE DEVELOPMENT AREA / PHASE

requirements of the Positional Statement are met. Records should be maintained to demonstrate compliance. Non-compliance and/or discharge of silt water is likely to result in enforcement action being undertaken.

Re-instatement of completed areas:

23. The placement of topsoil and planting / seeding at the earliest opportunity to stabilise soils and control surface run-off from completed areas and areas which are not proposed for construction of plots within the current growing season (if possible).

7. ATTENUATION TANKS AND OUTFALLS TO WATERCOURSES

Drainage infrastructure and outfall headwalls should be programmed to be completed as soon as possible to enable their use to store and control run-off.

It is recommended that a tightly fitting timber framed silt fence should be placed across each headwall apron, with tightly fitting silt mats (weighted with sandbags) packed between the headwall wingwalls to ensure water cannot bypass the measures. Silt matting should be frequently checked to ensure it is sufficiently weighted to remain in place.

At inflow or outfall headwalls, to withstand peak water flows, a more robust alternative may be adopted: silt fence material lined wire gabion baskets. The wire baskets should be formed to tightly fit between the headwall wingwalls to act as a check-dam, with suitably weighted silt mats placed behind the gabion baskets to capture silt. At inflow headwalls Rip Rap stone may be placed immediately downgradient of the headwall concrete apron to prevent scouring during peak flow events.

8. ON-GOING SITE MAINTENANCE

- On site storage / availability of silt fencing, silt matting and straw bales to enable deployment at short notice if required (i.e., during inclement weather) and to facilitate on-going maintenance of potential installations.
- Removal of residual silt held back by installed protection measures (i.e., at headwalls, behind silt fencing etc).
- Fuel storage: fuel stored on-site in above ground oil storage tanks should be handled and stored safely to minimise the risk of causing pollution in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001. Best practices of on-site fuel storage may be gained from The Oil Storage Regulations for Businesses (on GOV.UK). Failure to adequately secure and store fuel in a manner to avoid pollution may be prosecutable under the 1990 Environmental Protection Act.

9. MONITORING PROCEDURES AND RECORDS

Depending on site conditions as development progresses and as site levels change, other measures may be required to be implemented. These should be identified through regular monitoring and at key milestones during the development and the SWMP for that particular phase undated accordingly.

For each phase the following monitoring procedures should be carried out by the site construction team to enable continuous review of the measures prescribed in the SWMP and a regular written / photographic record kept. A comprehensive record of the effectiveness of the system will then be documented to enable review by any statutory authorities attending site:

1. Inspection of the primary monitoring locations (as described on Figure 1 - Surface Water and Silt Management Plan Schematic) on a **daily basis during periods of heavy / prolonged rainfall**, and at a suitable (weekly) frequency during periods of dry weather.
2. Inspection of the secondary monitoring locations (as described on Figure 1 - Surface Water and Silt Management Plan Schematic) on a **daily basis during periods of heavy / prolonged rainfall**, and at a suitable frequency during periods of dry weather.
Records of monitoring may be kept using the monitoring point inspection form within Appendix A.
3. Inspection of all gullies and manholes to monitor the discharge entering the constructed surface water system using the gulley inspection form within Appendix A.
4. Maintenance, cleaning and replacement of gully protection and all silt entrapment materials (whichever are utilised) as required
5. Maintain a photographic log and written record of monitoring using the site inspection form within Appendix A on a weekly basis (as a minimum), which will assist in documenting changes on site and identifying any changes needed to the protection systems as the development progresses.
6. All records should be reviewed on a quarterly basis by the HSE team or appointed environmental consultant. Advice can be obtained by the site team at any time from the appointed environmental consultant.

10. EMERGENCY / ADDITIONAL MEASURES

In the event of heavy rainfall breaching protective measures, the appointed Strata Homes staff member should be contacted for advice. Further advice may be gained by the appointed environmental consultant. Contact details are provided below.

It may be necessary to fit a suitably sized bung or flow reducing plate within the outlet headwalls of the attenuation ponds to prevent discharge of water with an unacceptably high level of suspended solids into the surface water system beyond. Retained silty water should be retained within the attenuation pond until silt settles out to an acceptable level, whereupon the bung / flow restrictor plate may be removed and the clean silt free water may be discharged.

To enable a prompt response to changing site conditions, it is advisable to ensure a supply of silt fencing / silt matting and suitably sized pipe bungs and flow reducing plates are readily available on-site to implement emergency measures.

11. CONTACT DETAILS

Strata Homes	Nathan Eastwood	07534 210557
RSK Environment Ltd (appointed Environmental Consultants)	Victoria Lebon	01332 542747 / vlebon@rsk.co.uk
	Melanie Rowley	01332 542745 / mrowley@rsk.co.uk

Enclosed:

Figure 01: Surface Water Management Plan Schematic (drawing no. 302574-DE-276-SS-D-C-27601-C02)

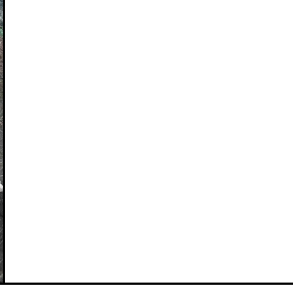
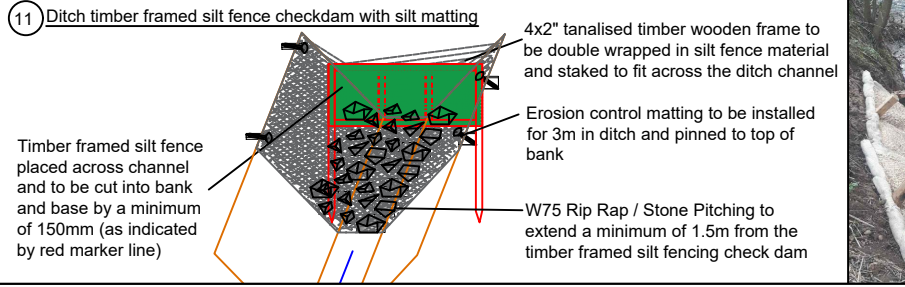
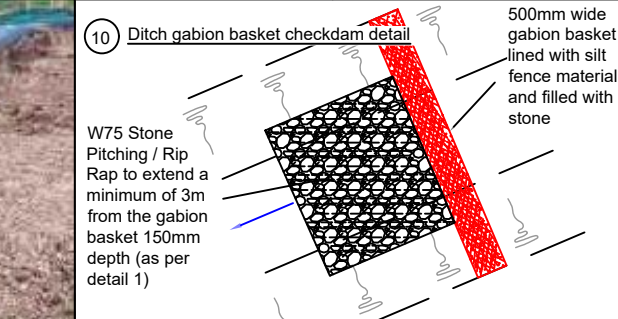
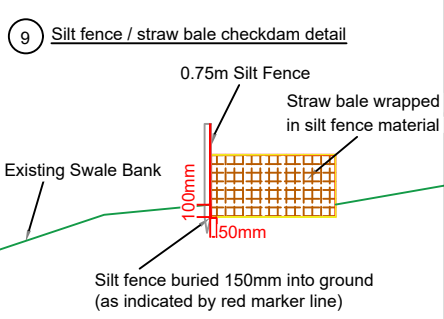
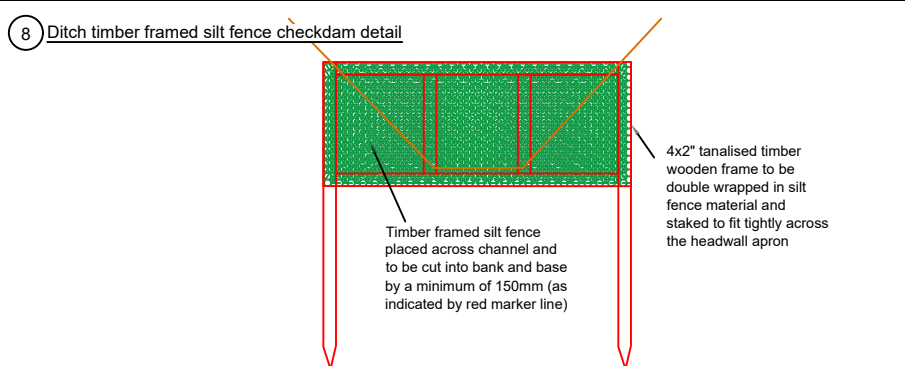
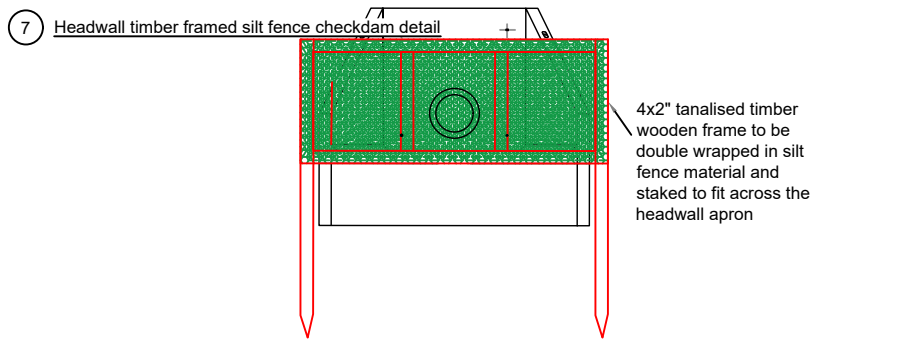
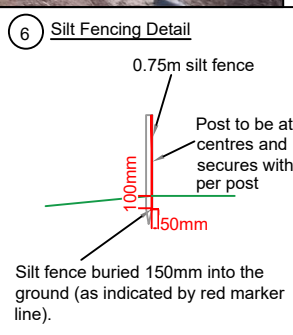
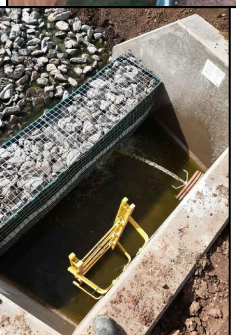
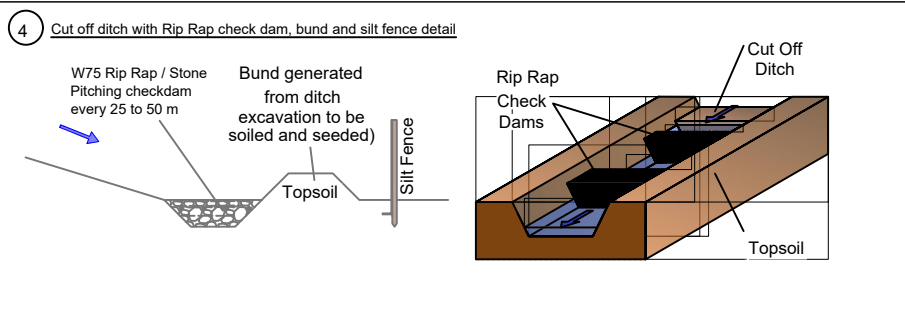
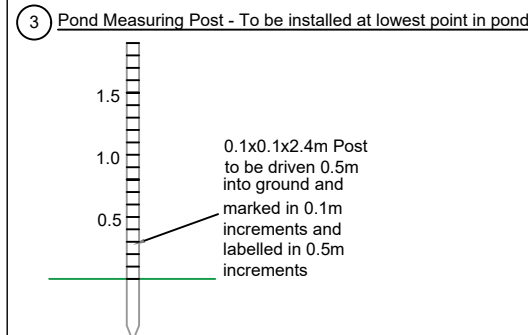
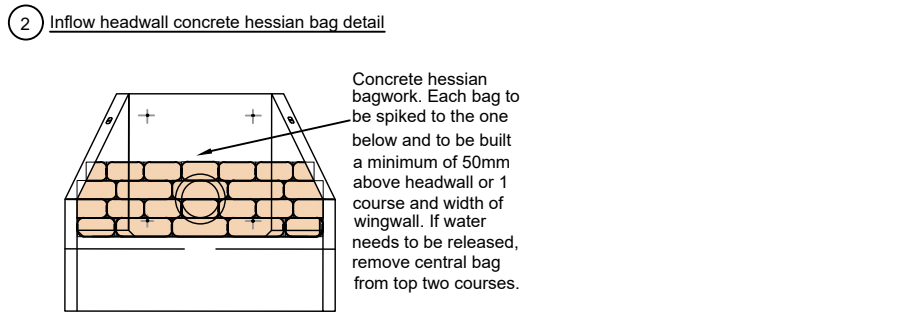
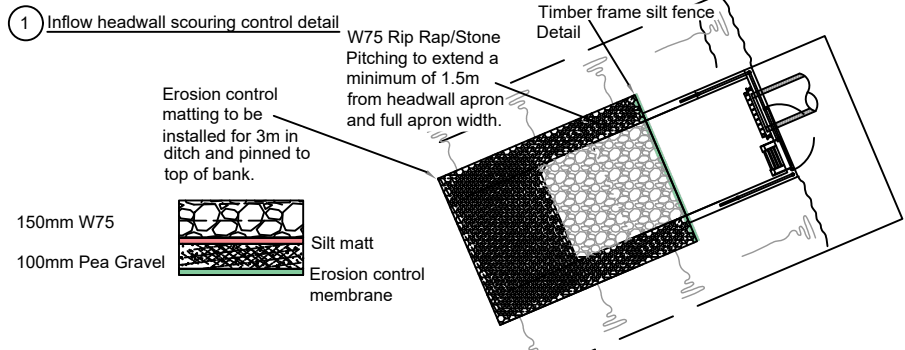
Figure 02: Silt Mitigation Measures – Standard Designs (drawing no. 302574-DE-249-SS-D-C-24901-C01)

Appendix A: Inspection and Monitoring Proformas

Appendix B: Installation Examples

Appendix C: Example Manufacturers and Product Sheets

FIGURES



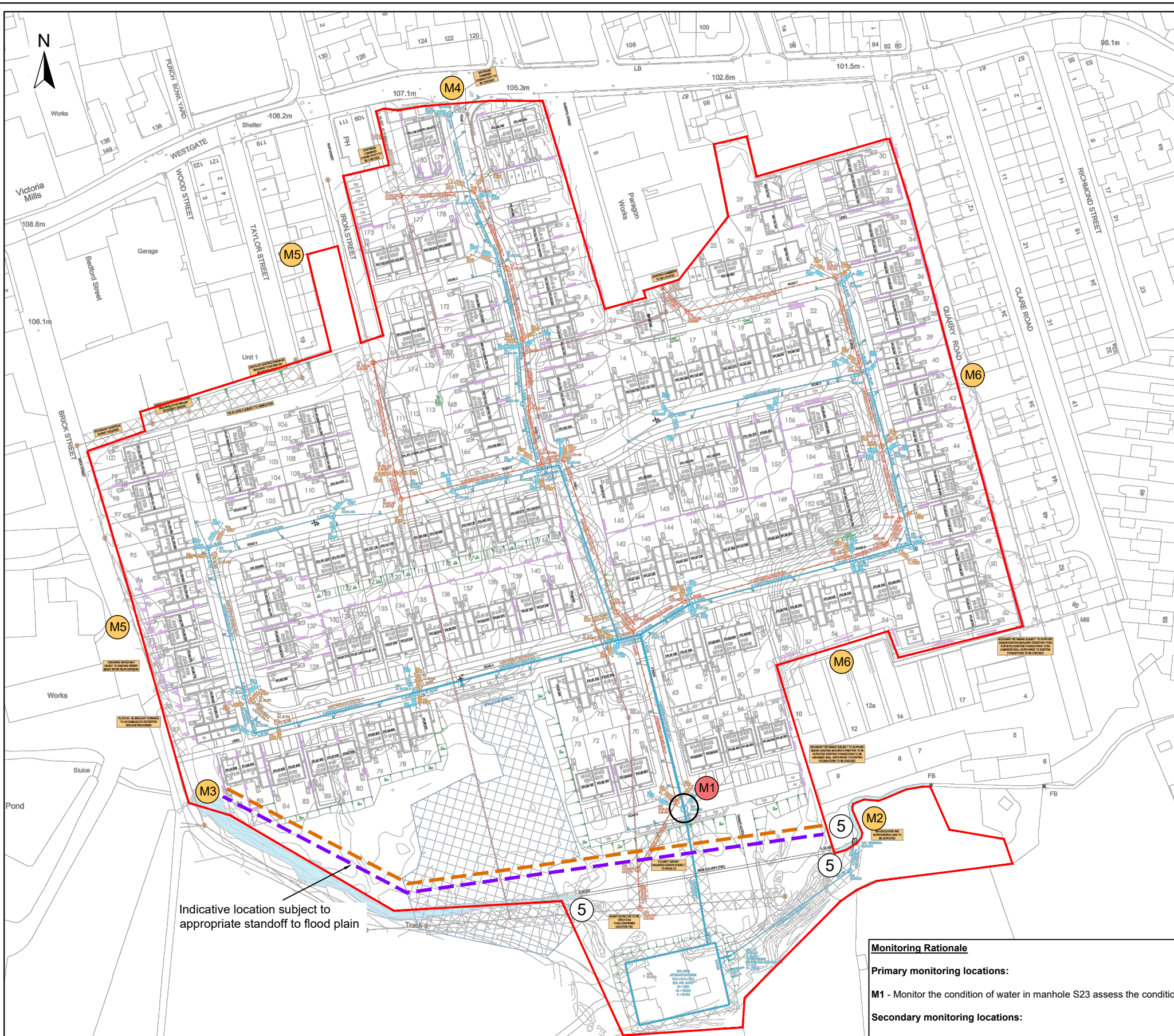
Client	Strata Homes					
Project Name	Westgate Cleckheaton					
Description	Silt Mitigation measures - Standard designs					
Dimension	Scale	Size	Project ID	Drawing no.	Revision	File name
m	NTS	A3	302574	24901	C01	302574-DE-249-SS-D-C-24901-C01

C01	26.07.23	First Issue	LS	LB	LB
Rev	Date	Amendment	Drawn	Chkd	Appd

DO NOT SCALE FROM THIS DRAWING

LEGEND

- Site boundary
- Surface water drainage
- Foul water drainage
- Combined water drainage
- Recommended line of silt fencing
- Recommended line of soil bunding
- M1 Primary monitoring location
- M2 Secondary monitoring location
- 5 Gabion Terrastop detail as per PPP Standard Detail



Notes:

Base plan provided by the Client.
Drawing Ref: 'QD1776-03-01 B - Engineering Layout'

Rev	Date	Amendment	Drawn	Chkd	Appd
C02	16.10.23	Second Issue	LS	LB	LB
C01	21.06.23	First Issue	LS	LB	LB

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Web: www.rsk.co.uk

Client
Strata Homes

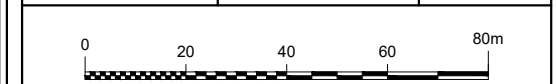
Project Name
Westgate Cleckheaton

Description
Surface Water & Silt Management Plan Schematic

Project ID 302574	Drawing no. 27601	Revision C02
-----------------------------	-----------------------------	------------------------

File name
302574-DE-276-SS-D-C-27601-C02

Dimensions m	Scale 1:1500	Size A3
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Monitoring Rationale

Primary monitoring locations:

M1 - Monitor the condition of water in manhole S23 assess the condition of water entering attenuation tank and discharging off site

Secondary monitoring locations:

M2 - Monitor condition of water discharging from site in to the Blackup Beck

M3 - Monitor the condition of water as it enters the site

M4 - Monitor the condition of Westgate Road at site entrance, ensuring silt is not being tracked off site

M5 - Monitor the condition of the western site boundary for potential run-off onto Brick Street, Iron Street or neighbouring industrial properties

M6 - Monitor the condition of the eastern site boundary for potential run-off onto Quarry Street and neighbouring industrial properties

Excavations:

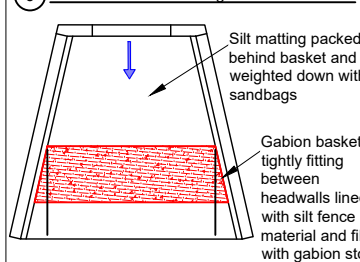
Monitor each excavation to ascertain whether water has begun to flood the excavation or if they are already flooded and at risk of over-topping, and therefore whether there is any requirement for the placement of bunds or silt fencing down-gradient of the excavation to control run-off.

Stockpiles:

Monitor the conditions of each stockpile to ensure no surface water run-off is occurring. Assess the requirement for placement of silt fencing or soil bunds at the base of the stockpile to control run-off

Indicative location subject to appropriate standoff to flood plain

5 Inflow / outfall headwall gabion basket detail



APPENDIX A

INSPECTION AND MONITORING PROFORMAS

SITE INSPECTION CHECKLIST
SITE: Westgate, Cleckheaton

Name of person undertaking inspection:

Date:

Current weather conditions:

Description	Comments	Action	Initial
<p>1) What is the current condition of the gully protection measures within the active areas of the site?</p> <p><i>Note any gullies requiring maintenance measures</i></p>			
<p>2) Are site roads clean and relatively free of mud? Is the frequency of visits by the road sweeper adequate?</p> <p><i>Consider whether additional visits should be scheduled.</i></p>			
<p>3) Are there currently unsurfaced areas being trafficked which may be causing silt to enter the site drainage?</p> <p><i>Note if additional measures are required to reduce the run-off from these unsurfaced areas.</i></p>			
<p>5) Are control measures in place to prevent silt run-off from unsurfaced areas and soil stockpiles?</p> <p><i>Note if the control measures are adequate and whether the increased runoff requires an increase in the frequency of inspection of any control measures.</i></p>			

<p>6) What is the current condition of run-off?</p> <p><i>Note any discolouration of the water or obvious sign of sediment within the water.</i></p>			
<p>7) What is the current water condition at the at monitoring locations?</p> <p><i>Note any discolouration of the water or obvious sign of sediment within the water.</i></p>			
<p>8) Is any off-site run-off occurring?</p> <p><i>Note whether any run-off is occurring – especially in the vicinity of any boundaries.</i></p> <p><i>Note any control measures in place.</i></p>			
<p>9) Is there any dewatering of excavations taking place on site?</p> <p><i>Note what activities are taking part and their location.</i></p> <p><i>Note any control measures in place.</i></p>			
<p>Further notes and actions to be taken:</p>			

Completed by	Name	Signature	Date
Site Manager			