

**CONSTRUCTION AND OPERATIONAL
MANAGEMENT PLAN**

CONSTRUCTION OF SNRHW CELL

TRECATTI LANDFILL SITE



Prepared for
BIFFA WASTE SERVICES LIMITED



Stratus Environmental Limited
Red Hill House
Hope Street
Chester
CH4 8BU

**Project Quality Assurance
Information Sheet**

**Construction and Operational Management Plan for SNRHW Cell
TRECATTI LANDFILL SITE**

Report Number : BF4858/01 Rev 0 **Report Status** : Final

Report Date : May 2014

Prepared for : Biffa Waste Services Limited
Trecatti Landfill Site
Fochriw Road
Merthyr Tydfil
CF48 4AB

Issued by : Stratus Environmental Limited
Red Hill House
Hope Street
Chester
CH4 8BU

Prepared by :

Richard Clarke
Principal Engineer

Approved by :

Richard Hanley
Technical Director

CONTENTS

1	INTRODUCTION	1
1.1	General	1
1.2	Construction of Existing Liner System.....	2
2	INSTALLATION OF PROTECTION LAYER	2
3	CONSTRUCTION OF SEPARATION BUND	2
3.1	Location and Dimensions	2
3.2	Material Selection.....	3
3.3	Placement and Compaction.....	3
3.4	Adverse Conditions.....	3
3.5	Record-Keeping	3
3.6	Placement of Inert Fill to Cell Base	4
3.7	Placement of Supporting Non-Hazardous Wastes	4
4	SURFACE WATER DRAINAGE	4
4.1	Surface Water Drainage – Installation of Side-riser	4
4.2	Installation of Additional Rain Deflection Flap.....	5
4.3	Surface Water Drainage – Operation of SNRHW Cell	5
5	FUTURE WORKS	6
5.1	Cell Completion	6
5.2	Gas Collection.....	6

APPENDIX 1 : DRAWINGS

APPENDIX B : OPERATIONAL TECHNIQUES

1 INTRODUCTION

1.1 General

- 1.1.1 Stratus Environmental Limited (Stratus) was commissioned by Biffa Waste Services Limited (Biffa) to undertake the design and stability analysis for the adaption of an existing sidewall cell at Trecatti Landfill to be able to receive stabilised non-reactive hazardous waste (SNRHW), to prepare and submit an application to vary the site's Environmental Permit to include the SNRHW cell, and to provide an operational management plan to cover the construction of a separation bund in conjunction with the placement of wastes.
- 1.1.2 The design and stability risk assessment for the proposed bund is reported in document reference BF4857/SRA, dated April 2014.
- 1.1.3 The application to vary the site's Environmental Permit will be submitted in conjunction with the stability risk assessment and this report.
- 1.1.4 This document, the Construction and Operational Management Plan, covers the proposed works to adapt the sidewall cell in preparation for filling with SNRHW, together with provision of a drainage system and the construction of a vertical bund to separate the SNRHW from the adjacent non-hazardous waste.
- 1.1.5 This management plan will be reviewed periodically and at least annually in accordance with the requirements for continuous improvement as part of the environmental management system maintained at the site and as part of the process of reviewing the appropriate measures employed at the site in relation to asbestos management including taking account of observations made by Natural Resources Wales.
- 1.1.6 Biffa operates all facilities to high management standards and internal quality procedures are employed and regularly audited for compliance. Part of the Environmental Permitting (EP) process requires relevant management plans covering specific elements of environmental control such as litter, pest and particulate management.
- 1.1.7 The operational techniques detailed in Appendix B focus on a two-stage approach to particulate management. Techniques and methods to be utilised will be deemed either *Essential* or *Supplementary*.
- 1.1.8 Essential methods and techniques are those deemed imperative to the continued and ongoing management of the site, ensuring that emissions from the activities shall be free from particulate matter and asbestos fibres at levels so not to cause pollution and will be maintained below the limits detailed within the Permit.
- 1.1.9 Supplementary items are those that will not be required at all times or during normal operating conditions; they will be specific controls employed following on-site evaluation of essential methods and techniques where current controls are deemed inadequate.

1.2 Construction of Existing Liner System

1.2.1 The existing sidewall cell was constructed by P J Hegarty (UK) Ltd during 2012 in accordance with a Specification and CQA Plan prepared by SLR and approved by the Environment Agency Wales.

1.2.2 Cell construction comprised the following sequence of operations:-

- (i) Excavation of existing in-situ rock to design formation levels;
- (ii) Installation of gravel drainage blanket, groundwater toe drain and associated side-riser pipework;
- (iii) Installation of support layer, comprising 600mm thickness of compacted excavated material, with two layers of 40kN biaxial geogrid incorporated within the layer;
- (iv) Installation of a medium-duty protection geotextile on the surface of the support layer;
- (v) Installation of a 2.5mm thick HDPE welded geomembrane.

1.2.3 Following completion of construction, a Validation Report covering the materials and methods of construction was prepared by SLR and submitted for review by the Environment Agency Wales (EAW). Formal approval of the works was received from EAW via letter dated 11 December 2012.

2 INSTALLATION OF PROTECTION LAYER

2.1.1 The protection layer shall be installed, monitored and validated in accordance with the existing agreed procedures.

3 CONSTRUCTION OF SEPARATION BUND

3.1 Location and Dimensions

3.1.1 The proposed separation bund shall comprise a minimum continuous thickness of 2m with 1:1 side-slopes, and will be constructed in incremental lifts of 1.4m (to give an approximate basal width of 4.8m). The bund shall be constructed on the bench which exists on the northern boundary of the proposed cell, and which has already been constructed and lined in accordance with the approved CQA Plan.

3.2 Material Selection

3.2.1 Materials delivered for incorporation into the separation bund shall be free from any deleterious materials, which should be removed and deposited as appropriate. Unsuitable material shall include, but not be limited to the following:

- (i) Materials susceptible to spontaneous combustion;
- (ii) Domestic, commercial or industrial waste (including timber, cardboard, plastics, pipework, contaminated materials, biodegradable material;
- (iii) Frozen matter;
- (iv) Materials with a significant proportion of oversize particles ($>125\text{mm}$).

3.2.2 Suitable material shall be generally cohesive in nature, and at a moisture content capable of adequate compaction. The shear strength of the material shall be assessed by empirical methods to ensure it has a strength in excess of 40kN/m^2 .

3.2.3 The Site Manager shall be responsible for the inspection and acceptance of materials delivered for bund construction.

3.3 Placement and Compaction

3.3.1 Materials being used to form the separation bund shall be placed and compacted under the supervision of the Site Manager, using a hydraulic excavator to shape the bund and to track in the material.

3.4 Adverse Conditions

3.4.1 During and immediately following rainfall, or in the presence of frozen ground, frost or snow, no placement or compaction of fill materials shall take place, in order that the quality of the work shall not be adversely affected. After any operation has been stopped due to adverse conditions it shall not be re-started without the approval of the Site Manager.

3.5 Record-Keeping

3.5.1 The Site Manager shall ensure that records are made of all materials delivered for construction of the separation bund, and a sketch plan shall be developed showing the extent of construction works undertaken in any one day.

3.5.2 The location and extent of the bund shall be periodically surveyed (during routine surveying operations on the landfill) to ensure an ongoing record of its position is maintained and developed (to ensure the future installation of gas wells in its vicinity is

correctly controlled). The extents of the separation bund shall be marked out with pegs to provide visual markers during construction of the bund to maintain verticality, and during operation of the SNRHW cell to ensure waste placement is fully within the limit of the separation bund.

3.6 Placement of Inert Fill to Cell Base

- 3.6.1 Once placement of the first basal section of the separation bund has been completed, it will be necessary to place and compact additional inert fill within the bund footprint in order to form a horizontal base to the SNRHW cell.
- 3.6.2 The surface of the inert fill shall be profiled at a nominal grade of 1:50 towards the surface water side-riser (see Section 4.3.1 below).

3.7 Placement of Supporting Non-Hazardous Wastes

- 3.7.1 To maintain stability of the separation bund, it is necessary to manage the placement of adjacent non-hazardous wastes so that a minimum level of lateral constraint is provided. Prior to loading any section of the separation bund with SNRHW, a berm of non-hazardous waste shall have been placed and compacted to the outside of the separation bund. Where the level of this horizontal waste berm is above the existing waste profile within the main body of the landfill, supporting waste shall be placed at a maximum gradient of 1:3 to support the berm. Stability analysis undertaken indicates that the minimum horizontal width of the berm shall be 40 metres. Incremental profiles are shown in Section 1 of Drawing BF4858/2/002.

4 SURFACE WATER DRAINAGE

4.1 Surface Water Drainage – Installation of Side-riser

- 4.1.1 The surface water collection side-riser shall be constructed in accordance with the details shown on Drawing BF4858/2/002, and shall be formed using 450mm SDR11 PE80 pipework, perforated with 8mm Ø holes to provide 3% open area.
- 4.1.2 After the installation of the two lower sections of pipework prior to the deposition of waste within the cell, subsequent sections shall be installed in parallel with incremental lifts of the separation bund. The pipework sections shall be welded using either butt-fusion or electrofusion techniques; if butt-fusion is used for the side-riser, internal de-beading will be required to allow proper future deployment of submersible pumping equipment by site personnel.
- 4.1.3 The side-riser shall be installed on top of the geomembrane protection layer, and shall be surrounded by 20–40mm gravel, with a filtration geotextile being used to prevent intrusion of the protection layer and cover materials into the gravel surround.

- 4.1.4 The top of the side-riser shall be sealed with a Flex-seal end-cap to prevent foreign objects being dropped into the side-riser.

4.2 Installation of Additional Rain Deflection Flap

- 4.2.1 As part of the cell construction works undertaken, two deflection flaps (rain flaps) formed from geomembrane liner material were installed to divert clean surface water runoff from the cell base. These run at a shallow gradient across the liner side-slope, discharging at the eastern end of the lined area into the site water management system. These were originally located on the sidewall in relation to the expected input rates of non-hazardous general waste. In the event that the input rate of SNRHW is significantly lower, the installation of additional rain-flaps shall be considered.
- 4.2.2 Where additional flaps are considered necessary, these shall be installed by certified geomembrane welding technicians, in accordance with the original approved CQA Plan, and shall comprise strips of geomembrane continuously extrusion-welded to the liner geomembrane, looped over a 150mm diameter pipework former, and then 'hit and miss' extrusion-welded above the former.
- 4.2.3 Care shall be taken when preparing for extrusion welding not to over-grind the liner geomembrane; should any damage occur to the liner geomembrane during installation of the rain-flap, repairs required to the geomembrane shall be undertaken in accordance with the original approved CQA Plan, supervised by an independent CQA Engineer and reported to Natural Resources Wales.

4.3 Surface Water Drainage – Operation of SNRHW Cell

- 4.3.1 Once installed, the separation bund will impound any surface water runoff reaching the base of the SNRHW cell (i.e. not otherwise diverted at higher levels by the rain-flaps). The inert fill material to be placed inside the separation bund (to form the initial working area) shall be profiled to falls at a nominal 1:50 gradient to the base of the side-slope riser, from where a submersible pump will remove the accumulated runoff.
- 4.3.2 The pump shall discharge the runoff via a sand filtration system to an isolation lagoon, where it will be tested for contamination prior to discharge to the site water management system. In the event that contamination is found, the water shall be re-filtered prior to discharge.
- 4.3.3 Regular maintenance of the sand filtration system shall be undertaken, in accordance with the volume of runoff and quantities of SNRHW and cover materials placed, with the potentially-contaminated sand removed from the filter being used as cover materials within the SNRHW cell.

5 FUTURE WORKS

5.1 Cell Completion

- 5.1.1 Within the footprint of the SNRHW cell, it is envisaged that waste placement will continue to the vertical limit of the cell. The cell shall be tipped to the agreed post-settlement level for the landfill, with an allowance for restoration soils and the future capping system deducted from this level. Once the final SNRHW has been placed, a final cover layer of inert soils shall be placed to a depth of 2m above the waste, prior to installation of the capping system.

5.2 Gas Collection

- 5.2.1 The evolution of landfill gas is not expected within the SNRHW cell mass, and the presence of the separation bund is expected to exclude migration of landfill gas from the non-hazardous wastes placed adjacent to the bund. Due to the nature of the waste contained, there shall be no vertical gas wells constructed (drilled) within the cell.
- 5.2.2 In the event of any suspected gas migration into the SNRHW, consideration will be given to the installation of a cut-off 'curtain' of wells drilled at a minimum distance of 10m outside the separation bund. This could be augmented by the installation of a gas collection geocomposite above the final inert cover layer.

APPENDIX 1 : DRAWINGS

BF4858/2/001 – General Arrangement

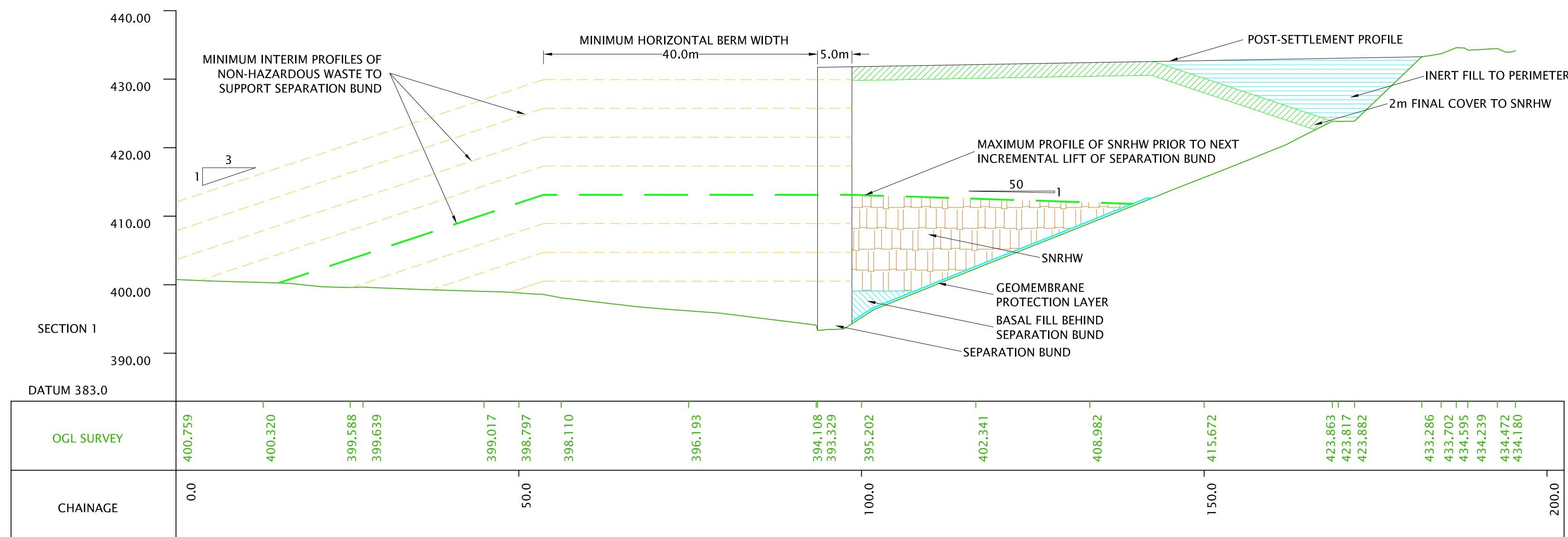
BF4858/2/002 – Section Details

NOTES

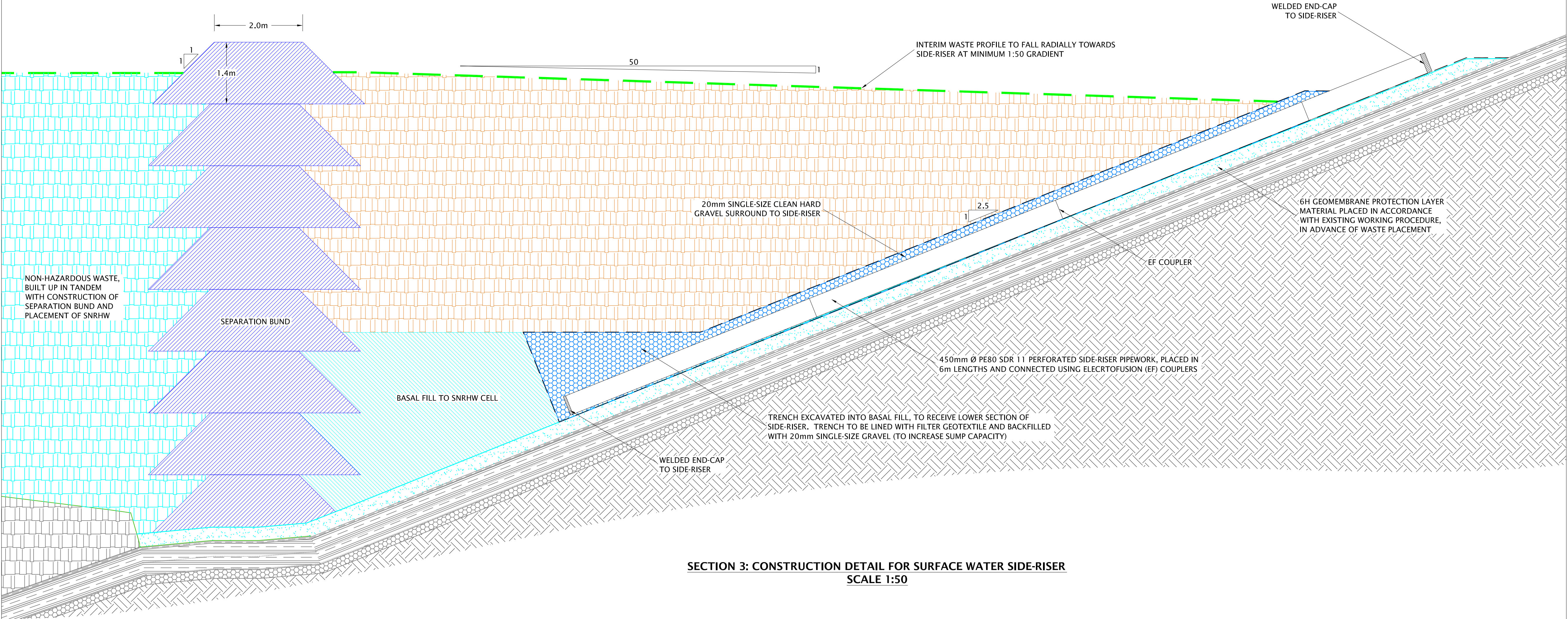
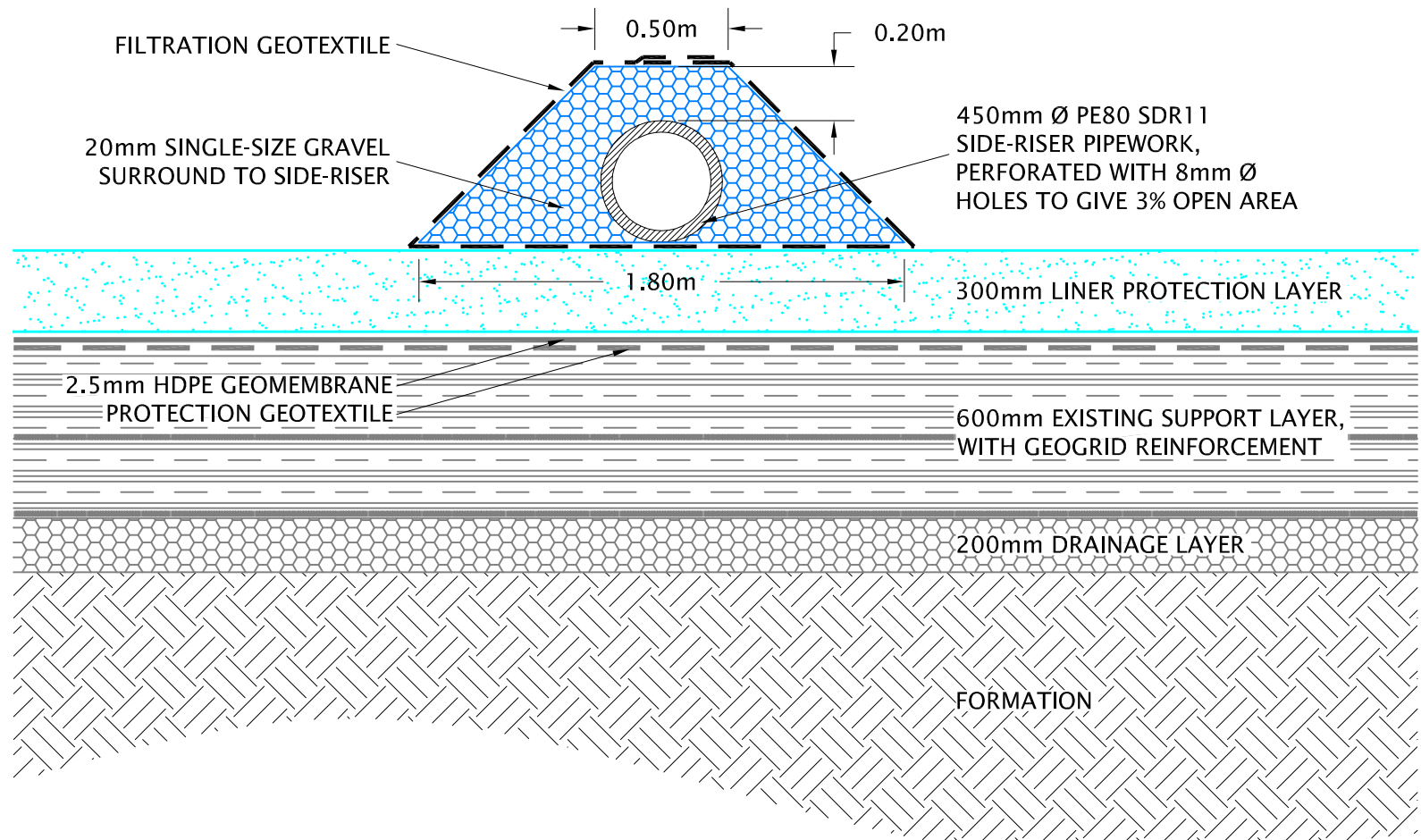
1. ALL LEVELS TO mAOD
2. DO NOT SCALE FROM THIS DRAWING
3. FOR SECTION POSITIONS, SEE DRAWING BF4858/2/001

KEY

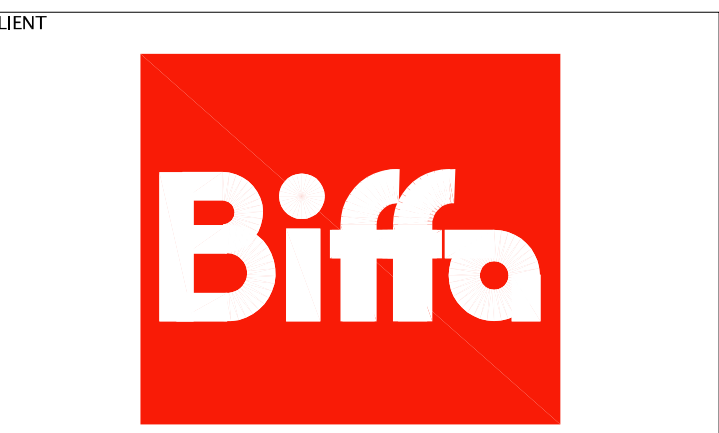
---	PROPOSED FILTER GEOTEXTILE
	SEPARATION BUND
	BASAL FILL TO SNRHW CELL
	FINAL COVER TO SNRHW
	STABILISED NON-REACTIVE HAZARDOUS WASTE (SNRHW)
	NON-HAZARDOUS WASTE
	FORMATION



SECTION 1 : SECTION THROUGH PROPOSED SNRHW CELL
SCALE 1:500



REV	DESCRIPTION	DATE	BY
1	HATCH PATTERNS ADDED; NOTE REMOVED	2/5/14	RC



PROJECT
TRECATTI LANDFILL SITE
SNRHW CELL CONSTRUCTION

DRAWING TITLE
SECTION DETAILS

DRAWN	DATE	APPROVED	DATE
R.C.	1/04/2014	R.H.	3/04/2014
SCALE	SHEET	DRAWING NUMBER	REVISION
AS SHOWN	A1	BF4858/2/002	1

APPENDIX B : OPERATIONAL TECHNIQUES

Hazard	Risk Management/ Control Measures	Receptor	Consequence	Essential	Supplementary
Vehicles Entering & Leaving Site	All vehicles entering the site are to be sheeted and asbestos containing vehicles are to be fully contained.	Localised Fochriw Road	Low potential	√	
Waste Acceptance	The waste will be disposed of in the dedicated stable non-reactive hazardous waste (SNRHW) cell only, and directed via the two way radios utilised on site.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	Segregation bunding will be constructed around the cell, where there is potential for biodegradable non-hazardous to come into contact with the asbestos waste. An odour control system shall spray a water mist around the perimeter of the cell to suppress any airborne particulates.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	The bunding will be constructed of inert wastes, with each 2m bund being placed on top of the bund below as the waste increases in height.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	A weather station is situated on site, which provides data 24/7 direct to the site manager's computer. This information will be utilised to ensure placement of asbestos is undertaken downwind of any personnel.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	A wind sock will be placed on the top of the cell to provide the operatives with a continuous view of wind direction and enable operations to move if required to ensure the safety of all staff on site.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	

	Upon delivery to the site all wastes are checked for their acceptability. Using the site radios the weighbridge operator will advise operational staff of the delivery.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	During the enquiry stage for the acceptance of asbestos from customers, any demolition customers will be made aware that there are to be no large sharp objects included within the waste for the first layer along the base of the cell.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	The asbestos must be booked in by the customer to the weighbridge 24 hours prior to disposal.	Customers	Potential particulate dispersal possible	√	
	The location of the asbestos will be recorded on the weighbridge ticket showing cell and lift number.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	Asbestos will only be accepted onto site between 07.30 and 15.30 Monday-Friday and 07.30-10.00 on Saturday to ensure sufficient material and resource is available to handle the material.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
Waste Disposal	The asbestos waste will be disposed of in the dedicated cell and covered immediately with wastes acceptable in the permit to a minimum of 0.5m thick.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	A stockpile of soil will be available at all times outside of the cell to ensure covering of the waste is completed.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	
	Once the asbestos has been covered an excavator will compact the waste to allow further placement.	Customer drivers Plant operatives	Potential particulate dispersal possible	√	

	Traction material may be placed over the soils to allow vehicles to reverse into the correct disposal point. It will be important to ensure vehicles do not become stuck on the soils and whilst trying to free themselves churn up the soil. It is also important that the loads are not pushed any distance and therefore the load must be placed in the correct position in the cell.	Customer drivers Plant operative	Potential particulate dispersal possible		√
	All drivers delivering waste will have to wear a white overall suit (without high viz) and dust mask during unloading if manual operation is required. The white suit will be disposed of in the SNRHW cell.	Customer drivers	Potential particulate – dispersal possible	√	
	Asbestos filters are installed on the excavator working within the SNRHW cell and the operator will wear a white overall suit at all times.	Employees	Potential particulate – dispersal possible	√	
Environmental Monitoring	Asbestos monitoring will be undertaken monthly (whilst the disposal of asbestos waste is on-going). Asbestos fibre monitoring will be undertaken upwind and downwind of the SNRHW cell as detailed in the site Particulate Monitoring and Action Plan. The monitoring method should be in accordance with Environment Agency Guidance note M17 and associated HSE Guidance Notes.	Customer drivers Plant operative Public using the southern access road and common land	Potential particulate – dispersal possible	√	
	Directional and suspended dust monitoring is also undertaken around the boundary of the site. The locations and monitoring techniques are detailed within the Particulate Monitoring and Action Plan.	Customer drivers Plant operative Public using the southern access road and common land	Potential particulate – dispersal possible	√	