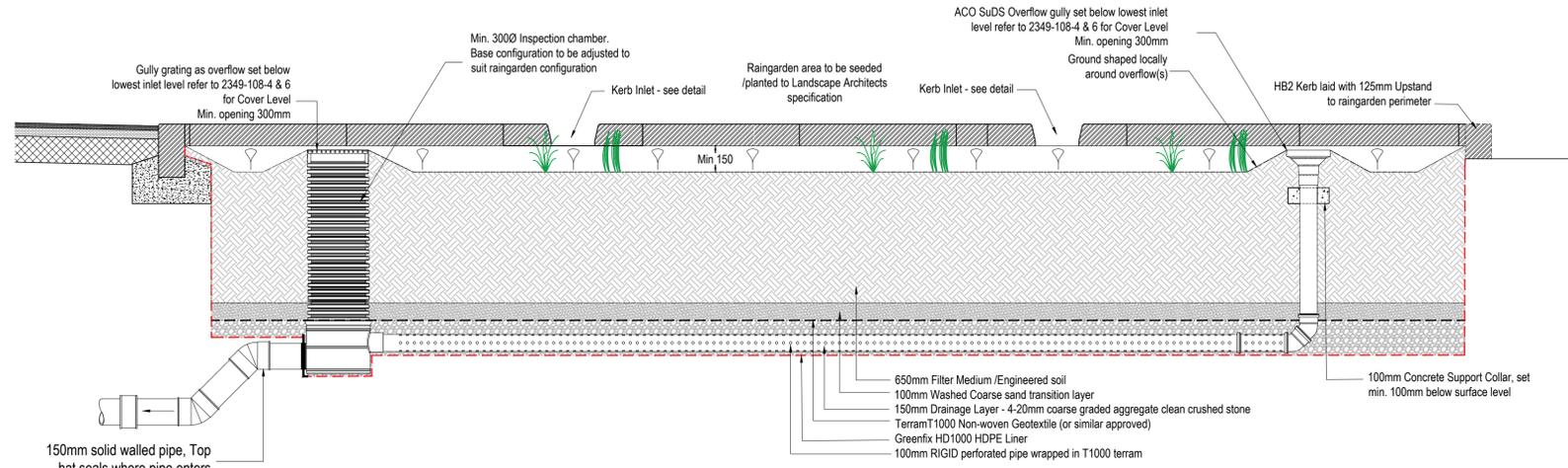
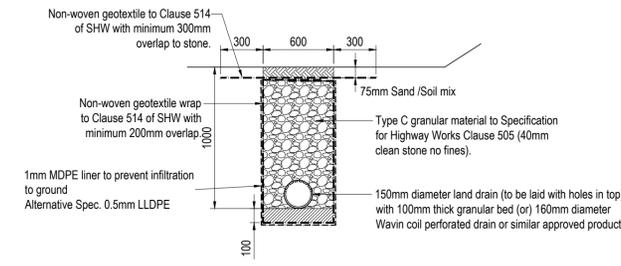


TYPICAL SECTION THROUGH BIORETENTION AREA ADJACENT TO HIGHWAY



TYPICAL SECTION THROUGH HIGHWAY BIORETENTION AREA INLETS AND OUTLETS



FILTER DRAIN DETAILS

**BIORETENTION NOTES**

- The depth of the raingarden excavation should be 650mm (minimum). This depth is composed of a "drainage layer", "transition layer", "filter media" and "extended detention area", which are described in more detail below.
- Terram 1000 (or similar approved), Non-Woven Geotextile fabric lining must be provided in the base of the bioretention area and all sides, to prevent fines migration from surrounding soil.
- Drainage Layer to be overlaid in Terram 1000 Non-Woven Geotextile (or similar approved), fabric lining.
- No Geotextile to be provided between layers Filter Medium & Transition Layer as it increases the risk of clogging, stopping the system from functioning properly.

**Drainage**

- A sub-soil drain in the base of the bioretention areas and one flushing point/rodding access (minimum) must be provided.
- The sub-soil drain/filter drain size is as specified on drawing. A perforated pipe is preferred as it is easier to clean whilst ribbed pipes retain moisture which may attract plant roots into the pipes.
- The base of the bioretention area must fall towards the sub-soil drain.
- The sub-soil drain must connect to the overflow, positions may be altered to suit site conditions, overflow sizes as shown.
- The surface level of the overflow should be set min. 25mm below any external surface level to prevent flooding beyond the bioretention area to allow for extended detention.

**Drainage (Bottom) Layer**

- This layer is 100-150mm Deep (minimum). This layer must consist of clean, non-angular clean stone such as a 6mm pea gravel.
- This layer will provide 50mm of cover over the sub-soil drain.
- The purpose of this layer is to collect and drain the treated stormwater that has passed through the "filter media" and "transition layer".

**Transition (Middle) Layer**

- This layer is 100mm deep (minimum).
- This layer must be placed on top of the "drainage layer".
- This layer must consist of clean, well-graded sand/ coarse sand material containing little or no fines.
- The purpose of the transition layer is to stop the downward migration of smaller particles between the "filter media" and "drainage layer".

**Filter Media (Top Layer) - THIS IS NOT TOP-SOIL**

- This layer is where the majority of the water quality treatment occurs and so the sourcing and placement of this material is critical to the effective operation of the system.
- This layer is 400mm deep (minimum), up to 750mm where Trees have been specified.
- This layer must be placed on top of the "transition layer".
- The material used must comply with the following requirements:
  - This layer must have a loamy sand texture.
  - The filter media must be free of rubbish, deleterious material and toxicants and is not hydrophobic.
  - Saturated hydraulic conductivity (permeability) of 100mm/hr.
  - Particle size distribution:

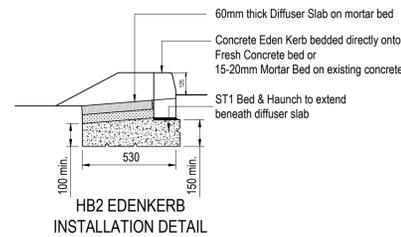
- Clay and silt (<5%) (<0.063mm)
  - Fine sand (<20%) (0.063mm to 0.2mm)
  - Medium sand (35% to 65%) (0.2mm to 0.6mm)
  - Coarse sand (50% to 60%) (0.6mm to 2.0mm)
  - Fine gravel (<10%) (2.0mm to 6mm)
- The filter medium should be well-graded, and the composition should contain limited particle size range.
- The organic matter content must be less than 5% (weight to weight).
  - pH as for "natural soils and soil blends" of 5.5 to 8.5 (pH of 1:2.5 soil /water extract).
  - Electrical Conductivity (EC) as for "natural soils and soil blends" < 1.2.5dS/m
- Once placed this layer must be lightly compacted to prevent the migration of fine particles (90% standard compaction).

**Earthworks**

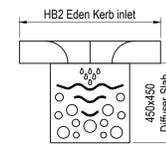
- The sides of the rain garden must be battered at 1(V):3(H), to base levels.
- Where there is to be a delay between the minimum level of completion (above) and the landscaping (below), an additional layer of geotextile fabric lining must be provided over the rain garden extending to the top of the batter to protect the "filter media" from sediment and gross pollutants.

**Landscaping**

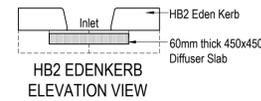
- Mulch reduces weed growth and moisture loss from soils. Mulch used in a rain garden must be non-floating.
- Planting within the rain garden must be able to withstand periods of inundation, longer boggy wet periods as well as long dry periods. The free draining nature of rain gardens means that they can dry out quickly.
- Plant selection is critical for nutrient removal and hydraulic conductivity. Refer to Landscape Architects drawings for planting layouts.
- Turf MUST NOT be used as it requires a thick layer of heavy topsoil to which will stop the rain garden from being free draining. Turf is also incapable of withstanding periods of inundation or longer boggy wet periods.
- SuDS wildflower Turf (WFT-SUD-37) to be used, refer to landscape architects planting schedule 6904-T-3700A for details.
- The rain garden should be separated from any adjacent turfed area by a timber edge strip or similar located at the top of the batter.
- Intensive initial planting will reduce the establishment period and make maintenance of the rain garden easier by reducing the risk of weed invasion.



HB2 EDENKERB INSTALLATION DETAIL

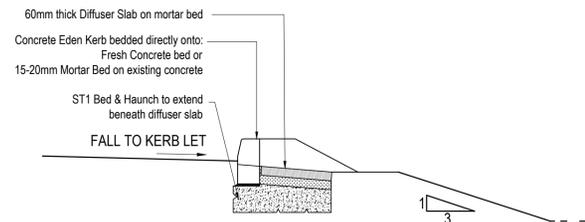


HB2 EDENKERB PLAN VIEW

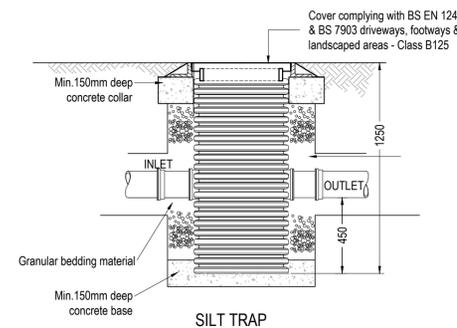


HB2 EDENKERB ELEVATION VIEW

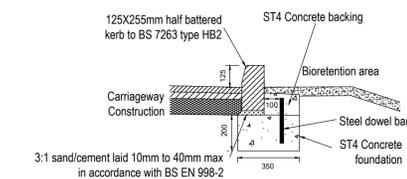
**KERB INLET TO BIORETENTION AREAS**



SECTION THROUGH KERB INLET TO BIORETENTION AREA



SILT TRAP



HB2 KERB ADJACENT TO HIGHWAY BIORETENTION

**GENERAL NOTES**

- Do Not Scale
- The contractor is to check and verify all buildings and site dimensions and levels, including sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
- Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work.
- This drawing is to be read in conjunction with and checked against all other drawings, Engineering Details, Specification and any structural, geotechnical or other specialist document provided.
- Any anomaly or contradiction between any of the above is to be reported to Engineer.
- This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.

**DRAINAGE NOTES**

- This drawing is to be read in conjunction with all other relevant project drawings and specifications.
- All levels are in metres above ordnance datum based on the topographical survey drawing supplied by the client.
- All existing drainage levels and outfall points shall be surveyed and verified by the contractor prior to the commencement of the works. Any discrepancies shall be reported to the engineer immediately.
- Pipework under roads with less than 1.2m cover, and other trafficked areas with less than 0.9m cover to receive concrete encasement. Compressible fillerboard (18mm thick) to be placed at pipe joints at least the width of the concrete surround. Cover slabs/concrete protection to pipes where damage from garden implements is possible is to be provided via concrete grade gen 1.
- Large radius bends to be used at the foot of vertical discharge pipes/svps.
- Manhole covers should not bridge different surfaces.
- Where two pipelines (other than plastic pipes) cross with less than 300mm separation pipes are to be surrounded with class z concrete surround for not less than 1m centred on the crossing point. Concrete surround to be extended as necessary to within 150mm of nearest flexible joints.
- All foul outlet and rainwater pipe positions are to be confirmed by the architect.
- All below slab foul drainage to be 100mm diameter laid to a minimum gradient of 1:80.
- All pipework to be clay or pvcu with flexible joints all fully in compliance with the Building Regulations 2010.
- All pipework to be laid with soffit to soffit connections unless noted otherwise.
- All redundant pipework to be removed/grubbed-up to the satisfaction of the Building Control Officer.

REV.	DATE	DETAILS	AMENDMENTS	BY	CHK.

CLIENT:

**LOVELL**

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PROJECT:

**Lovell Homes  
West Carmarthen**

DRAWING TITLE:

**SUDS Construction Details  
Sheet 1**

DRAWN:	CHK:	STATUS:	SCALE:
TJP	SD	Information	NTS @ A1
DATE:	JOB NO:	DWG. NO:	REV.:
Nov 25	2262	105-1	-