

Chandlers BMW, Worthing
SuDS Operation and Maintenance Requirements

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Revision: 1
Date: 4 August 2014

Prepared: Toby Crayden
Director



Checked: Toby Crayden
Director



Project Revision Sheet

Revision No	Date	Status	Changes	Author	Approved
1	04.08.14		Rainwater recycling, car wash and watercourse maintenance requirements added. Detail drawings added to Appendix.	T.Crayden	T.Crayden

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Appendices

Appendix 1: Drawings

SuDS Operation and Maintenance Requirements

The following sets out the requirements for the operation and maintenance of the private surface water sewerage system, in particular the SuDS features which are incorporated in to the design.

The private surface water system includes all pipes, tanks, flow controls etc which collect, restrict, store and outfall private surface water runoff from the Chandlers BMW development. It does not include any adoptable surface water drainage, land drainage or surface water run off from the adjacent adoptable areas.

The surface water design incorporates permeable paving with below ground storage, with flow control devices to limit the discharge to the water course to Greenfield Runoff rates.

The drainage proposals are as indicated on the MLM Consulting Engineers drawings as attached. The drawings contained in the Appendix are design drawings and may not reflect the as-built situation. Checks to be made on Site before any remedial works are undertaken.

Details for the long-term maintenance arrangements shall be in accordance with the requirements of the CIRIA report C697, the manufacturer's recommendations and as required based on operational needs, as summarised below. The recommended maintenance regime should be seen as the minimum recommended frequency and operational / site needs may dictate a greater frequency of inspection / action.

It is expected that a Pollution Incident Response Plan (PIRP) will be available, and in the event of a Pollution Incident the contents of the PIRP take precedence over the contents of this report.

It is recommended that all oil deliveries to the Site are supervised.

Should any spillage / contamination etc occur to the Watercourse then the Environment Agency and the Local Environmental Health Officer should be informed without delay.

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Gutters and downpipes are to be inspected annually to ensure they are free of leaves, silt and debris etc that water flows freely throughout the gutter and downpipe system.	Annually
The storage tank will be made from maintenance free materials (GRP or Polyethylene, depending on model). The water in the tank may build some visual sediment over time and this should be removed if excessive, but generally this is entirely normal and does not compromise the system's safe operation.	As required
The pump unit within the rainwater harvesting system is a maintenance free, sealed unit. It does not require any maintenance, apart from the filter which is to be inspected and cleaned annually.	Annually
The primary filter that requires maintenance is the leaf filter. This is located in the top of the tank 'turret'. The filter is lifted out and cleaned under a hose or tap and then slotted back into place. This is to be done every three months.	3 months
If an in line filter is installed this should be inspected and cleaned annually.	Annually
Car Wash: The Car Wash (water recovery) system is as provided by Bywater Ltd. The car wash equipment is to be maintained as per Bywater's recommendations. The drain down gully/surplus water is to be directed to the foul drainage system. No runoff or overspill shall be directed to the surface water system or the watercourse. Sufficient measures are to be put in place to prevent any wash down water entering the surface water drainage system.	As per suppliers recommendations
Watercourse Maintenance: The existing headwall at the head of the watercourse (South East corner of the Site) is to be visually checked to ensure it is clear from debris and appears structurally sound. The existing watercourse is to be visually checked where it runs adjacent to the development to ensure it remains free flowing and clear of debris. The watercourse should flow without impediment and the banks should be free of signs of localised collapse or change of direction. With the permission of the landowner foreign objects are to be removed and disposed of as appropriate, and the watercourse bed is to be de-silted and vegetation cleared if this starts to significantly affect the flow and direction of the watercourse. The existing topographical survey of the watercourse should be used as a reference for bed levels and watercourse extents and the watercourse should be de-silted and re-profiled if significant loss of	Annually and after intense storms Annual visual inspection of the watercourse generally and visual inspection after intense storms. Remedial works as necessary following visual inspection

flow is noted. Note that mammals may well be present in the Banks and watercourse and they are not to be disturbed or the burrows etc mistaken for structural issues with the watercourse. A qualified Ecologist and Arun DC are to be consulted prior to any works being carried out.	
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Appendices

Appendix 1

Drawings

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.
2. **DO NOT SCALE** FROM THIS DRAWING MANUALLY OR ELECTRONICALLY. WRITTEN PERMISSION MUST BE OBTAINED FROM MLM PRIOR TO SCALING ELECTRONICALLY OR USING THIS ELECTRONIC FILE.
3. SURVEY BASED ON DRAWING 615823/000. EXISTING DMS, REFER TO SITE SURVEY FOR LOCATIONS AND VALUES OF GROUND CONTROL STATIONS.
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL DRAWINGS LISTED IN THE SCHEDULE.
5. PRIOR TO COMMENCEMENT OF ANY WORKS, THE CONTRACTOR SHALL Liaise WITH ALL RELEVANT AUTHORITIES TO ENSURE THAT ALL EXISTING SERVICES AND UTILITIES IN THE AREA OF THE WORKS ARE LOCATED, PROTECTED AND WHERE NECESSARY DIVERTED.
6. ALL PRIVATE PAVED AREAS SHALL BE CONSTRUCTED USING GULLIES OR MANHOLES TO DRAIN SURFACE WATER INTO THE EXISTING OR PROPOSED PUBLIC HIGHWAY.

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2007

DESIGNERS HAZARD INFORMATION FOR CONSTRUCTION

1. IF YOU DO NOT FULLY UNDERSTAND THE RISKS INVOLVED DURING THE CONSTRUCTION OF THE ITEMS INDICATED ON THIS DRAWING ASK YOUR MANAGER, HEALTH & SAFETY ADVISOR OR A MEMBER OF THE DESIGN TEAM BEFORE PROCEEDING.
 2. EXISTING SERVICES ON SITE. CONTRACTOR TO LIAISE WITH ALL RELEVANT SERVICE COMPANIES AND ARRANGE FOR ALL SERVICES TO BE LOCATED, MARKED AND PROTECTED.
 3. DRAINAGE AND HIGHWAY WORKS INVOLVE DEEP EXCAVATION, HOT MATERIALS AND/OR HEAVY PLANT/MATERIALS.
 4. THE CONTRACTOR SHALL READ AND UNDERSTAND THE SOILS REPORT. BE AWARE OF POTENTIAL VARIATIONS IN SOIL CONDITIONS OVER THE SITE.
 5. WORKS WITHIN THE PUBLIC HIGHWAY MUST ENSURE THE SAFETY OF ALL PARTIES.
 6. PROTECTION FOR DISEASE REQUIRED FOR WORKS WITHIN EXISTING SEWERS.
- THE ABOVE NOTES REFER SPECIFICALLY TO THE INFORMATION SHOWN ON THIS DRAWING.
- REFER TO THE HEALTH AND SAFETY PLAN FOR FURTHER INFORMATION.

Issue	Date	Description	Made	Checked

APPROVAL

MLM

Multidisciplinary Consulting

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Client

GROUP 1 AUTOMOTIVE

Project

CHANDLERS BMW WORTHING

Drawing Title

SCHEME PLAN

Drawn/Design	Checked	Approved	Date
Swf/kwl		...	07.07.2014
Scale	Drawing No.	Rev	
1:500 @ A1 1:1000 @ A3	615823/001	.	

SCHEDULE OF DRAINAGE AND EXTERNAL WORKS DRAWINGS

NUMBER	TITLE
615823/001	SCHEME PLAN (THIS DRAWING)
615823/002	DRAINAGE AND FINISHED LEVELS LAYOUT - SHEET 1 OF 4
615823/003	DRAINAGE AND FINISHED LEVELS LAYOUT - SHEET 2 OF 4
615823/004	DRAINAGE AND FINISHED LEVELS LAYOUT - SHEET 3 OF 4
615823/005	DRAINAGE AND FINISHED LEVELS LAYOUT - SHEET 4 OF 4
615823/006	DRAINAGE CONSTRUCTION DETAILS - SHEET 1 OF 3
615823/007	DRAINAGE CONSTRUCTION DETAILS - SHEET 2 OF 3
615823/008	DRAINAGE CONSTRUCTION DETAILS - SHEET 3 OF 3
615823/009	EXTERNAL SURFACING CONSTRUCTION DETAILS - SHEET 1 OF 2
615823/010	EXTERNAL SURFACING CONSTRUCTION DETAILS - SHEET 2 OF 2

UPPER PARKING AREA SHADED THUS TO BE CONSTRUCTED WITH PERMEABLE PAVING WITH ATTENUATION STORAGE IN SUB-BASE (MEMBRANE LINING TO STOP INFILTRATION DUE TO POTENTIAL CONTAMINATION). RESTRICTED DISCHARGE FROM STORAGE TO DRAIN TO STORAGE CRATES SERVING LOWER CAR PARK AREA.

SEE DRAWING 615823/003 FOR DETAILS OF DRAINAGE AND FINISHED LEVELS IN THIS AREA

SEE DRAWING 615823/002 FOR DETAILS OF DRAINAGE AND FINISHED LEVELS IN THIS AREA

SEE DRAWING 615823/004 FOR DETAILS OF DRAINAGE AND FINISHED LEVELS IN THIS AREA

SEE DRAWING 615823/005 FOR DETAILS OF DRAINAGE AND FINISHED LEVELS IN THIS AREA

PROPOSED HIGHWAY WORKS (INCLUDING DRAINAGE) TO DETAILS BY OTHERS

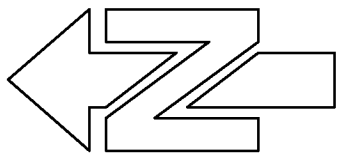
FOUL WATER PUMPING STATION TO DETAILS BY OTHERS

ROOF DRAINAGE TO SEPARATE ATTENUATION SYSTEM

CAR PARK DRAINAGE TO SEPARATE ATTENUATION SYSTEM

OIL INTERCEPTOR TO LOWER CAR PARK AREA

PROPOSED FOUL WATER RISING MAIN TO DETAILS BY OTHERS



PRIVATE DRAINAGE NOTES

- All private drainage works shall be in accordance with 'The Building Regulations Approved Document H' and British Standard EN 752.
- Prior to commencement of the works the Contractor shall liaise with all relevant authorities to obtain their requirements and to obtain approval for his method of working and where appropriate his intended choice of materials.
- Refer to site survey for details of existing site conditions and bench marks.
- Prior to commencement of the works the Contractor shall liaise with all relevant authorities to locate, protect and where necessary divert all existing services affected by the works.
- Any excavations shall be kept free of standing water.
- The Contractor shall ensure the stability of all excavations is maintained at all times.
- All works in or adjacent to the public highway shall be in accordance with the requirements of the Highway Authority. The Contractor shall obtain all necessary licences to carry out works within the public highway.
- All works to new or existing public sewers shall be to the approval of the Water Authority and in accordance with 'Sewers for Adoption' - latest edition.
- Any works within 9m of a watercourse shall be to the approval of the Environment Agency.
- Prior to commencement of the works all drainage outfall points, whether existing sewer, drain or watercourse, shall be verified on site by the Contractor. If the outfall point is not as shown on the drawings, the Contractor shall immediately inform the Engineer. The Administrator shall be notified immediately. (Significant redesign of drainage and levels may be necessary). Prior to commencement of construction on-site the Contractor shall install all off-site drainage connections, or satisfy himself that there are no obstructions or other reasons why, the drain connections can not be made.
- All private chambers in block paved / paving slab areas to have recessed covers. All covers, whether recessed or not, are to be placed entirely within paved or landscaped areas.

- All cover levels shown on this drawing are approximate. Exact levels of new covers and frames to be determined on site to match level and profile of finished surface.
- The construction of all existing chambers, gullies etc. and their covers, gratings and frames to be improved, repaired or replaced as necessary to suit their location within the finished development.
- All covers, gratings and frames to chambers, gullies, channels etc. shall be of the correct load class to suit their location.

Load Class A15 Pedestrian areas (not accessible by vehicles)
 Load Class C250 Lightly trafficked roads.
 Load Class D400 Main roads.

Gratings in pedestrian areas to be designed for pedestrian use.

- All existing chambers, gullies channels, pipes and other drainage apparatus shall be protected from damage during the works. The Contractor shall take all necessary measures to ensure that no material enters the drains (other than that which they are designed to carry).

- Refer to Site Investigation Report for existing ground conditions and any special requirements for the construction of the drains. The Contractor shall ensure that all pre-cast and in-situ concrete and masonry, Where appropriate refer to contamination reports for details of chemicals affecting choice of materials and other additional requirements.

- All pre-cast and in-situ concrete and masonry used in the construction of foul drains and sewers shall be made from sulphate resisting cement.

- Unless noted otherwise all pipework shall be 100mm diameter laid to a fall of 1 in 80 or steeper for surface water and 1 in 40 or steeper for foul water. Foul drains with one or more W.C. connected may be laid at 1 in 80 or steeper. Where appropriate road gully connections shall be 150mm dia at 1 in 150 or steeper.

- Unless noted otherwise all pipework shall be constructed from 'super strength' verified clay to BS 65.85 EN 295 or uPVC to BS EN 1201 bedded and backfilled as per the manufacturers recommendations and the above listed publications.

- The Contractors attention is drawn to Diagrams 7 and 8 of 'The Building Regulations Approved Document H' showing details of drains laid below and near to buildings. Where ground beams are used, their level shall be set to avoid clashing with drain connections.

- Exact location of gullies to be determined on site to suit low points. The Contractor shall ensure that all finished surfaces are laid to falls that are sufficient for all surface water to drain without surface ponding.

- For the exact location of soil pipes, substacks, W.C.'s and other drainage connections refer to the large scale architectural building plans.

- Rainwater downpipes that do not connect directly to an access point, shall be fitted with a rodding access.

- All drainage channels to be by ACO or similar and to be of a type size and capacity suitable for their location.

- Access fittings, inspection chambers and manholes shall be constructed to the dimensions shown in Tables 11 and 12 of 'The Building Regulations Approved Document H'. All access fittings, inspection chambers and manholes shall be constructed from products designed/rated for the location in which they are to be used. They shall be installed in accordance with the manufacturers/suppliers recommendations.

- Prior to commencement of any works the existing drainage must be traced to ensure that no 'live' connections remain. Any such connections must be reported to the Contract Administrator, prior to diversion into the new drains.

- Unless noted otherwise all drains and sewers to connect with soffits level. Chamber invert levels shown on this drawing are to outgoing pipe.

- Small areas of black paving around the adaptable 'Mowr' areas that have no positive drainage, shall be constructed from concrete blocks paving to ensure no surface water or private areas drains on to the public highway. Alternatively careful profiling of finished surfaces together with additional gullies/drainage channels may be utilized.

- Unless noted otherwise invert levels shown at catchpits (silt traps) are the invert level of the outgoing pipework, as with other chambers, unless noted otherwise, all pipes shall be laid with soffits level.

- All Aquacell storage crates (or similar) shall be installed strictly in accordance with the manufacturers instructions (including vent), crates to be suitable for use in areas subject to vehicular loading.

- All catchpits are to be regularly cleaned out during the construction period (especially after heavy rainfall) to ensure no silt passes the traps to be deposited in the equal storage/attenuation/seaway tanks. Before final hand over of the site, silt to the aquacell tanks is to be plugged, all s/w pipework is to be jetted, catchpits cleaned, then be removed and aquacell tanks inspected to ensure no silt has been deposited in them.

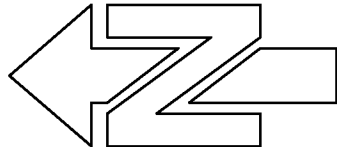
PRIVATE DRAINAGE LEGEND

Pipework other than that covered by the notes shall be identified thus:-

1500 1/125  Shows approximate gradient eg. 1 in 125
 Shows internal diameter of pipe in mm
 At manholes and inspection chambers show Cover Level
 IL = Invert Level (of outgoing pipe)
 BD = Backdrop, UIL = Upper Invert Level

FOUL WATER:-  Foul water drain
 Private manhole  Private manhole
 Inspection chamber 4500  Inspection chamber 4500 (1.2m max depth)
 Access fitting 2250  Access fitting 2250 (0.6m max depth)
 Foul connection  Foul connection
 av=air admittance valve  av=air admittance valve
 big-back inlet gully  big-back inlet gully
 wc=W.C.  wc=W.C.
 fg=floor gully  fg=floor gully
 ss=stub stack  ss=stub stack

SURFACE WATER:-  Surface water drain
 Private manhole  Private manhole
 Inspection chamber 4500  Inspection chamber 4500 (1.2m max depth)
 Access fitting 2250  Access fitting 2250 (0.6m max depth)
 Rodding eye  Rodding eye
 Rainwater downpipe  Rainwater downpipe
 Yard gully (trapped and roddable)  Yard gully (trapped and roddable)
 Road Gully (trapped and roddable)  Road Gully (trapped and roddable)
 Drainage Channel  Drainage Channel
 Private Catchpit  Private Catchpit



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Issue	Date	Description	Made	Checked
A	02.08.2014	FURTHER DETAIL ADDED	kwl	-

APPROVAL

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 Website: www.mlm.uk.com

Client

GROUP 1 AUTOMOTIVE

Project

CHANDLERS BMW WORTHING

Drawing Title

DRAINAGE AND FINISHED LEVELS LAYOUT
SHEET 1 OF 4

Drawn/Design	Checked	Approved	Date
1:200 @ A1	1:400 @ A3	615823/002	July 2014
Rev			

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- All works in or adjacent to the public highway shall be in accordance with the requirements of the Highway Authority. The Contractor shall obtain all necessary licences to carry out works within the public highway.
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- All pre-cast and in-situ concrete and masonry used in the construction of foul drains and sewers shall be made from sulphate resisting cement.

- Unless noted otherwise all pipework shall be 100mm diameter laid to a fall of 1 in 80 or steeper for surface water and 1 in 40 or steeper for foul water. Foul drains with one or more W.C. connected may be laid at 1 in 80 or steeper. Where appropriate road gully connections shall be 150mm dia at 1 in 150 or steeper.

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- Foul water drain
 - Private manhole
 - Inspection chamber 4500 (1.2m max depth)
 - Access fitting 2250 (0.6m max depth)
 - Foul connection
 - asw=air admittance valve
 - big-back inlet gully
 - asw=air admittance valve
 - WC=W.C.
 - fg=floor gully
 - ss=stub stack
- SURFACE WATER:-
- Private manhole
 - Inspection chamber 4500 (1.2m max depth)
 - Access fitting 2250 (0.6m max depth)
 - Rodding eye
 - Rainwater downpipe
 - Yard gully (trapped and roddable)
 - Road Gully (trapped and roddable)
 - Drainage Channel
 - Private Catchpit

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APPROVAL

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Client

GROUP 1 AUTOMOTIVE

Project

CHANDLERS BMW WORTHING

Drawing Title

DRAINAGE AND FINISHED LEVELS LAYOUT
SHEET 2 OF 4

Drawn/Design	Checked	Approved	Date
1:200 @ A1	1:400 @ A3	615823/003	July 2014
Rev			
A			

