DEMOLITION OF INDUSTRIAL BUILDINGS, CONSTRUCTION OF 28 DWELLINGS, INCLUDING ACCESS ROAD, AT LAND OFF MAIN ROAD, ROOKLEY, NEWPORT, ISLE OF WIGHT. – DRAINAGE STRATEGY.

1. This application seeks to gain consent for the construction of twenty-eight residential dwelling houses on a parcel of land to the north of the main settlement of Rookley. A main spine road, paths, footways, driveways, and garages are included in the proposal. The site already has planning consent for twenty-one units, granted in 2017 under reference P/01392/16. That consent is extant.

2. Mayer Brown have been instructed to investigate and comment on the provision of suitable facilities to allow the disposal of foul and surface water flows arising from this revised development proposal.

3. The site is situated on the eastern side of Main Road, Rookley with the main village to the south. An existing ditch bounds the southern flank of the site and continues around the eastern boundary of an adjacent field. This likely ends up draining to the head of the River Medina in the Blackwater area of the Island.

4. To establish ground conditions at the site the Institute of Geological Sciences Isle of Wight Drift Edition map has been consulted. Geologically, Rookley is a relatively complex area and where this site is located, we see seams of both Gault and Carstone. Gault is locally better known as Blue Slipper and is a thick clay (often used for making bricks) and not generally permeable. Carstone (Carrstone) is a type of sandstone, which will usually allow some percolation of water and often forms aquifer layers. As such, permeability at the site is likely to be highly variable.

5. All relevant bodies, design guidance and current planning policies for surface water drainage from buildings and paved areas in new development strongly encourage the use of sustainable urban drainage systems (SUDS). These systems attempt to replicate, as far as possible, the natural drainage characteristics of an undeveloped site. Clearly, part of this site has an existing level of impact on the surrounding area that is developed and unnatural. However, through the use of such simple techniques as continuing to allow surface water to naturally percolate into the ground within the site, the aim is to limit the rate of surface water flow entering formal drainage systems to that in the undeveloped state.

6. The site falls on the edge of a Zone 3 groundwater source protection zone as identified within the Environment Agency's online mapping. Such areas are defined as 'the area around a source within which all groundwater recharge is presumed to be discharged at the source'. Considering the position of the site and topography of the surrounding land it is unlikely that any activities within the site will have any impact on this outer zone. The closest registered Water Abstraction Licence in operation is to the north of the site, where various licences are registered, mainly related to agricultural uses.

7. Where available, the easiest method for the disposal of foul flows is to a public sewer. It has been confirmed that there is a public foul sewer in the vicinity of the site at Main Road, Rookley. However, the invert level of this sewer is higher than prevailing ground levels across the site.

8. With the above information in mind it is intended to deal with drainage flows arising from the site in the following manner:

SURFACE WATER

9. Whilst, with permeability testing, drainage of surface water flows via direct infiltration may work acceptability, the areas within the site where this may be possible could be limited. Drainage over a larger surface area, such as the use of permeable surfacing, is more likely to be effective, as it apes the natural drainage characteristics of undeveloped land. However, considering the prevailing ground conditions, whilst permeability testing would be required to allow a fully informed final decision on this method of disposal (at detailed design stage), it is likely that small/narrow areas of impermeable surfacing would drain acceptability to adjacent verges and open areas of grassland.

10. With this in mind and still according to SUDS advice, the existing ditch that bounds the site is to be utilised to allow disposal of the majority of surface water flows.

11. The existing impermeable roof area of the industrial building and hardstanding (which housed the recently demolished industrial buildings) at the site is around 577 m². Whilst in the strictest terms the external access, loading and turning areas are not hard surfaced, the prevailing ground conditions, compaction and use of 'hoggin' type material for surfacing means that runoff characteristics are similar to an installed impermeable surface. As such, these areas should be included in any calculation of existing runoff from the site. This gives an existing hard surfaced area of around 1325m² and a total 1900 m² of impermeable surfaces.

12. As agreed within the previous application and condition compliance undertaken for that proposal, the HR Wallingford designed Greenfield Runoff Estimation Tool on the UKSuds site (www.uksuds.com) was used to ascertain existing runoff rates. This gives us a $QBar_{rural}$ value of 1.81 l/s. However, this tool recognises that, when used as a baseline, it is very difficult to use vortex control devices and practical minimum pipe sizes to control and match discharge rates below 5 l/s. As such, the estimation of existing runoff is around 5l/s, as previously stated.

13. Clearly the development proposal will introduce additional impermeable areas that will increase runoff rates. One of the key principles of SUDS guidance is to ensure that post-development flow rates match the existing surface water flow rates or result in some improvement. As such, it is proposed to utilise on-site attenuation and a suitable flow control device to achieve this. Relevant guidance seeks betterment (i.e. reduction) to runoff rates from new development sites, where possible. With this in mind, we have decided to ignore the runoff from the existing hard surfaced areas in our design, to ensure significant betterment for downstream receptors.

14. Condition 8 of the aforementioned planning consent was previously discharged in terms of foul and surface water disposal. This application is accompanied by a copy of Microdrainage calculations proving the satisfactory operation of the revised proposed surface water drainage system, as shown indicatively on drawing referenced **19440/2020/2** (See **Appendix A**). As in the previous proposal, the footpaths in the north of the site will drain to adjacent grassed areas (which works acceptability in the existing situation). See drawing no. **19440/2020/1** for contributing areas (included in **Appendix B**). All other areas will drain to the piped network, via a pond providing attenuation storage, to the existing ditch, as in the previous proposal. This site is rather flat at its eastern side, so adjustments to the previously agreed scheme were challenging. The accompanying design is not a final detailed design at this planning stage, but it is very detailed for these reasons: The previous scheme had approximately 0.442 hectare of contributing impermeable area and provided 284 cubic metres of attenuation storage. This scheme proposes 0.521 ha of contributing area and requires 312 cubic metres of attenuation storage. Flows are restricted via the use of a bespoke Hydrobrake, limiting surface water peak flow rate to 5 l/s, in line with the QBAR rate

established and previously agreed. The previously agreed pond on the eastern side of the site has been adjusted to accept this level of storage (See drawing no. 19440/2020/2, which accompanies this application). It is worthy of note that other forms of attenuation may also be acceptable (various proprietary crates, oversized pipes, sub-base storage).

15. The use of a 'Hydrobrake' Flow Control to restrict discharge rates is preferable to a simple orifice plate as they allow the use of a larger aperture in normal low flow conditions. The design of the Hydrobrake uses back pressure from trapped air and the creation of a vortex at higher flow rates to restrict the cross-sectional area available for outfall. This larger orifice provides easier future maintenance as it is less prone to blocking, amongst other benefits.

16. This SUDS compliant discharge network is fed via a formal piped network providing both road and roof water drainage. A network of gullies will be shown within the access road at detailed design stage, although some areas of grassed verge have been detailed which will also serve to assist in draining low intensity rainfall events.

FOUL WATER

17. Public records indicate that there is public sewerage infrastructure available in the area to allow drainage of foul flows. The following foul flows will result from the construction of the proposed development.

18. The calculated peak foul discharge from the developed site will be 1.3 l/s, calculated in accordance with Sewers for adoption: 7th Edition: 2012, as shown below:

Design peak flow		= 4000 litres/day/dwelling
Litres / second / dwelling		= 4000 / 24 / 3600
		= 0.0463
Total Proposed foul water flow rate for 28 dwellings		= 0.0463 x 28 = 1.2964
	Qfp	= 1.29 l/s

19. Previously, Mayer Brown approached Southern Water with a request for an official Level 2 Foul Capacity Check to ascertain whether the existing foul infrastructure is capable of accepting such flows. This confirmed that sufficient capacity is available at manhole reference SZ50847103. This manhole is located to the south of the site, outside the property known as Oakdene, Main Road, Rookley.

20. Due to the Transfer of Private Sewers Regulations 2011, in the case of piped networks serving more than one building not within the same curtilage, these pipes are generally now public sewers and will have been transferred to the local sewerage undertaker. This may mean that in practice there is a connection point to a public sewer further north and closer to the site.

21. Regardless, the matter of sewer capacity is effectively a moot point nowadays, with the introduction of the Infrastructure Charges, within the document entitled, ''New Connections Services - Charging Arrangements 2018-19,' (later updated). Within this document, introduced on 1 April 2018, various charges for works and proposals are laid out. The most pertinent here is the new infrastructure charge, which is a per unit levy imposed on new development connecting to the public sewer. The aim is to create a pot of money that the local sewerage undertaker (Southern Water in this instance) will use to provide sewer

capacity for new development. This accords with the government's aim of encouraging new development and unstops one of the barriers to this happening, caused by inadequate capacity in existing public sewer systems.

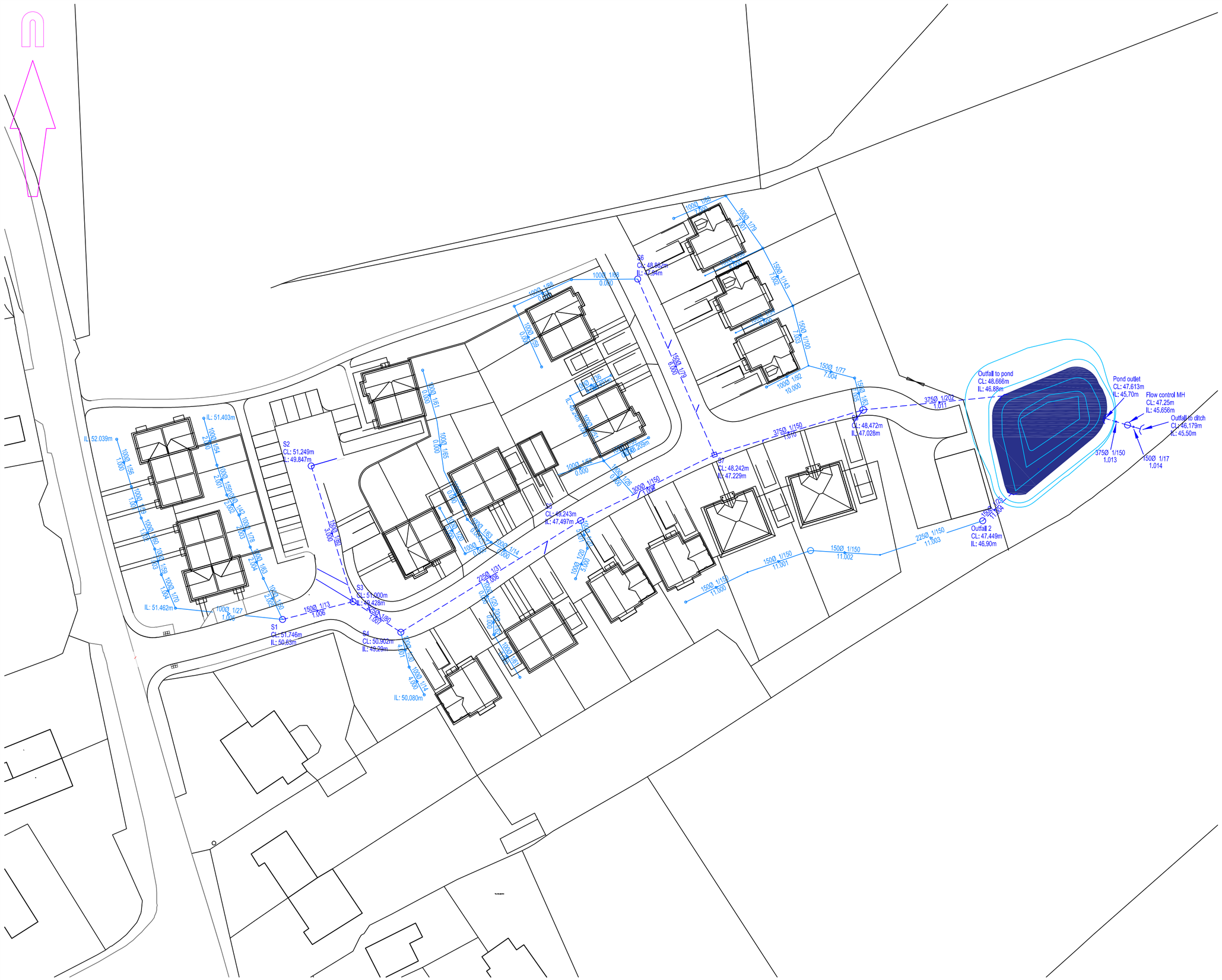
22. In terms of the internal layout of the foul drainage, the existing sewer in Main Road is of insufficient depth to allow foul flows to drain via gravity to the public sewer, so a pumping station is needed within the site to move foul effluent up to the public sewer. The location for such a system is shown on the drawing accompanying this application. This drawing does not detail a full foul sewer network layout, though the previous condition compliance work included a design for such a system. An amendment to this system, to allow for the revised development layout, can be conditioned in the usual manner.

23. In conclusion, surface water from the proposed development can be disposed of to an existing ditch, with the use of appropriate attenuation measures. The local sewerage undertaker has confirmed that there is sufficient capacity to accept foul flows arising from the development within public sewer, and recent legislation underlines this with a per unit levy. Due to the prevailing land levels within the site, such flows will require pumping from the site to the public sewer. The measures outlined above ensure that all surface and foul water is dealt with by the safest, most appropriate means. A scheme to drain twenty units has previously been found acceptable. The measures proposed protect the environment from pollution, ensure no risk of flooding to other users and satisfy all relevant guidelines.

24. Having given due regard to all the above matters it is my considered opinion that the local planning authority would not have any reasonable grounds to object to the proposed development on drainage grounds.

Gavin Toogood EngTech FIHE
December 2020.

APPENDIX A: Drawing No. 19440/2020/2



rev.	amendment	date

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CAPTIVA HOMES (ROOKLEY) LTD

project
PROPOSED RESIDENTIAL DEVELOPMENT
MAIN ROAD, ROOKLEY

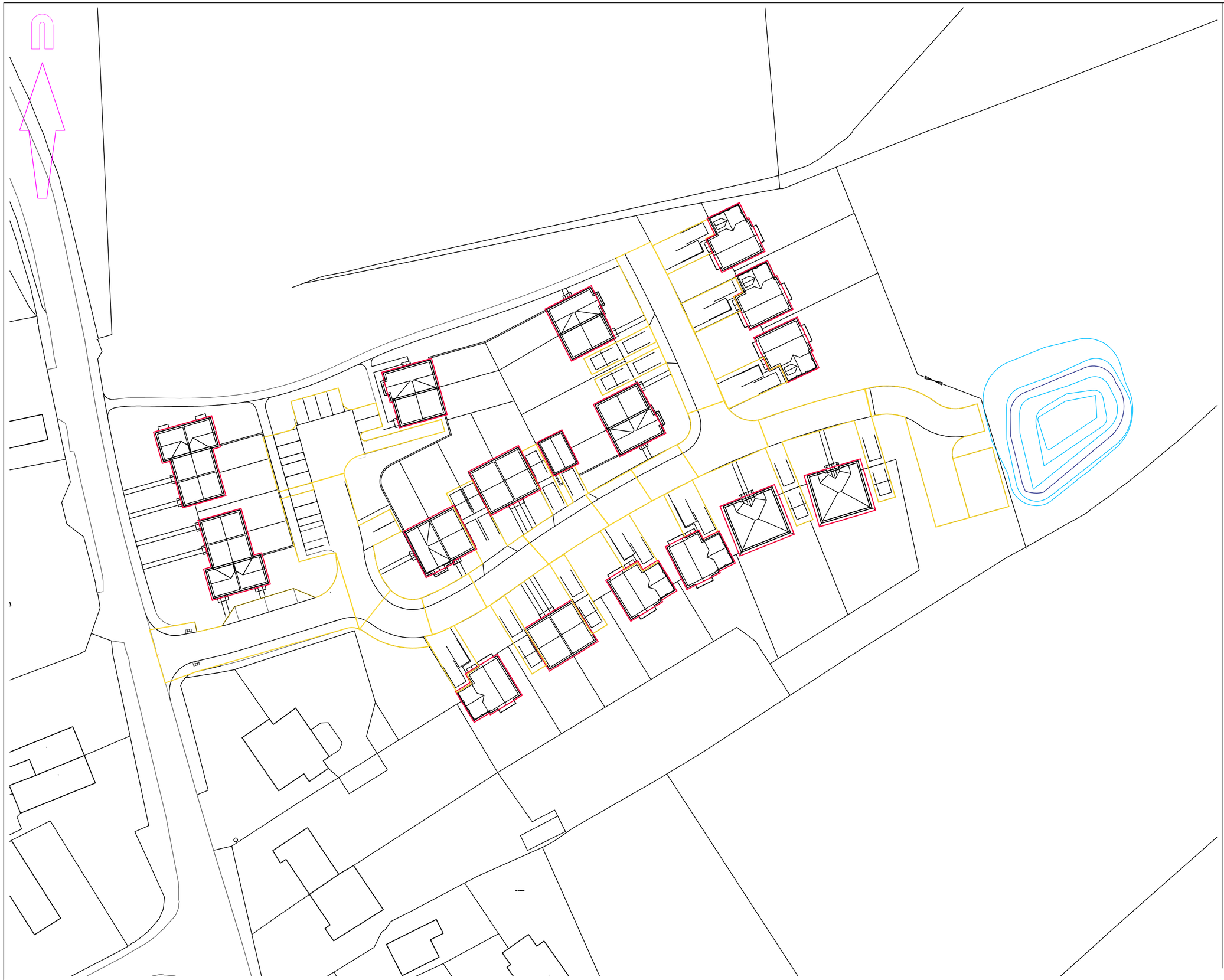
scale	drawn by	checked by
1: 500 @ A2	GRT	KWF

date	cad file
30 NOVEMBER 2020	Rookley 2020.dwg

title
INDICATIVE SURFACE WATER DRAINAGE DESIGN

drawing number	rev.
19440/2020/2	

APPENDIX B: Drawing No. 19440/2020/1



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CONTRIBUTING AREAS
(SURFACE WATER DESIGN)

drawing number	rev.
19440/2020/1	