Your Environment

SURFACE WATER DRAINAGE STRATEGY

STANWAY VILLAGE HALL, VILLA ROAD, COLCHESTER, CO3 0RH

For Stanway Parish Council

Your Environment
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Report Number: YEX1714 Date: May 2021

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Contents

Appendices

	Name	Position	Signature	Date
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Approved:	Colin Hiscock	Director		May 2021
For and on behalf of *Your*Environment				

Issue	Date	Description	Prepared	Reviewed	Approved
00-1	11/05/21	Draft Report for Comment	PT	MG	CH

1.0 Executive Summary

*Your*Environment (YE) was instructed by Stanway Parish Council to provide a Surface Water Drainage Report to identify the source of flood problems occurring within the car park at Stanway Village Hall, Villa Road, Colchester, CO3 0RH

It is recommended that the remediation of the soakaways on site should be explored to provide additional below-ground storage for surface water to reduce the frequency of flooding at the surface. It is noted that this solution would not necessarily be acceptable for new development as the soils are still insufficiently permeable.

Additionally, it has been suggested that rainwater harvesting be explored to enable the re-use of rainwater for non-potable uses. This will have clear environmental and financial benefits by considering the rainwater as a resource rather than a problem.

We trust this is sufficient for your requirements and should you have any questions please do not hesitate to contact the undersigned.

For *Your*Environment

Colin Hiscock

Director

2.0 Introduction

YourEnvironment was instructed by Stanway Parish Council to provide a Surface Water Drainage Report to identify the source of flood problems occurring within the car park at Stanway Village Hall, Villa Road, Colchester, CO3 0RH.

The site is approx. 0.4ha in area and is occupied by three buildings (the Village Hall, Victory Hall and Tollgate Hall) and car parking areas (around 70 spaces) surfaced with asphalt draining to gullies located around the buildings.

An image of the site from Google Earth is provided in Figure 1 below with the area of hardstanding which is assumed to drain to soakaways outlined in red.

Figure 1: Location of the site

The scope of works for YE to investigate the flooding problems were as follows:

1. Carry out infiltration tests to the BRE365 test procedure to determine the infiltration capacity of the soils on the site;
2. Examine the results from the BRE365 tests and provide conclusions;
3. Examine the information contained within the Dynorod survey;
4. Determine likely reasons why flooding occurs;
5. Identify potential solutions which would be sufficient to drain the site in accordance with Building Regulations.

How does flooding occur?

Through discussions with Catherine Clouston (Stanway Town Council Deputy Parish Clerk) it is understood that flooding occurs within the car park close to Victory Hall. A number of parking bays are located at a low point within the car park where surface water ponds after long periods of wet weather or intense storm events. The depth of water is sufficient to be disruptive to the users of the Village Hall who rent out the hall for private and community events. In particular, the flooding can prevent visitors from getting on and out of their cars due to the depth of water. It is understood that flooding occurs every two years and has been increasing in frequency in the past decade.

From previous investigations carried out by Dynorod in 2019, it is understood that the car park should be draining to soakaways located beneath the parking area. The Dynorod survey demonstrated by CCTV survey that at least two gullies drained to soakaways and concluded that more were present on the site. Due to the common construction practice in the 20th century, soakaways of this type were buried and not provided with access for monitoring or maintenance.

What standards should be adhered to?

Currently, the management of surface water drainage has a much more important role within the planning process due to the impact of climate change in recent years. This has led to a greater focus on Sustainable Drainage Systems (SuDs) and has driven innovation and understanding for considering rainfall as a resource rather than a problem.

Local planning authorities have incorporated SuDS-specific policies within their Local Plans to ensure drainage is considered at a much earlier stage in the construction process than in previous decades. Colchester Borough Council's (CBC) Emerging Local Plan 2017-2033 is a good example and refers to the management of surface water runoff in two policies:

> *Policy DM23: Flood Risk and Water Management*
>
> …
>
> *Where proposals that require planning permission include driveways, hardstanding or paving, the use of permeable materials and landscaping will be sought to minimise the cumulative impacts of flooding from such developments.*
>
> *Developments will also be required to comply with the following as indicated in the Colchester Surface Water Management Plan (or updates if appropriate):*
>
> *(i) All developments across the catchment (excluding minor house extensions less than 50m2) which result in a net increase in impermeable area are to include at least one 'at source' SuDS measure e.g. bio-retention planter box, green/brown roofs). This is to help reduce the peak volume of run off discharging from development sites. It is recommended that a SuDS treatment train is utilised to assist in this reduction;*
>
> *(ii) All development proposals are required to reduce post-development runoff rate back to the greenfield 1 in 1 year rate, with an allowance for climate change. On brownfield sites where this is not achievable, then a minimum betterment of 50% should be demonstrated for all flood events.*

This approach accords with the NPPF/PPG and the most up to date UKCIP guidance);

…

Policy DM24: Sustainable Urban Drainage Systems

All new residential and commercial development, car parks and hard standings should incorporate Sustainable Drainage Systems (SuDS) appropriate to the nature of the site. Such systems shall provide optimum water runoff rates and volumes taking into account relevant local or national standards; and shall ensure that the quality of runoff is consistent with the requirements of the Water Framework Directive. SuDS design quality will be expected to conform with standards encompassed in the relevant BRE, CIRIA standards and Essex County Local Planning Authority's SuDS Design Guide (and as updated) to the satisfaction of the Lead Local Flood Authority.

Surface water should be managed as close to its source as possible and on the surface where practicable to do so through the use of green roofs, rain gardens, soakaways and permeable paving. Maximum use should also be made of low land take drainage measures such as rain water recycling, green roofs, permeable surfaces and water butts. Appropriate pollution control measures should be incorporated as part of SuDS to reduce the risk of pollution. Including through reference to the CIRIA SuDS Manual, it must be ensured that sufficient treatment steps are provided prior to any surface water discharge. Regard should be given to both the nature of the proposed development and the sensitivity of the receiving water environment.

Opportunities should be taken to integrate sustainable drainage within the design of the development, to create amenity space, enhance biodiversity and manage pollution. Existing drainage features such as ditches and ponds should be retained on site where possible as part of SuDS schemes.

Only where there is a significant risk of pollution to the water environment, inappropriate soil conditions and/or engineering difficulties, should alternative methods of drainage be considered. It will be necessary to demonstrate why it is not achievable. If alternative methods are to be considered, adequate assessment and justification should be provided and consideration should still be given to pre- and post-runoff rates.

SuDS design should be an integral part of design proposals and clear details of proposed SuDS together with how they will be managed and maintained will be required as part of any planning application. Only proposals which clearly demonstrate that a satisfactory SuDS layout with appropriate maintenance is possible, or compelling justification as to why SuDS should not be incorporated into a scheme, or are unviable, are likely to be successful. Contributions in the form of commuted sums may be sought in legal agreements to ensure that the drainage systems can be adequately maintained into the future. The SuDS should be designed to ensure that the maintenance and operation requirements are economically proportionate.

To ensure that developers adhere to these policies, the key consultee within the planning process is the Lead Local Flood Authority. For CBC, this role falls to the authority, Essex County Council (ECC). The LLFA's requirements are detailed within the Essex SuDS Design Guide[1], however they are only formally consulted on projects that are deemed to be 'major' development or those that are located within a Critical Drainage Area.

For projects that are not consulted upon through the LLFA, the planning policies require the incorporation of SuDS into the development proposals to ensure surface water runoff is no greater than the pre-development scenario for greenfield sites or provide 50% betterment for brownfield sites.

Where new works are proposed which do not require adherence to these policies, then the works are expected to comply with Building Regulations. The requirements for the design of surface water drainage for buildings and paved areas is detailed within Part H of the Building Regulations. It states:

> ***Rainwater Drainage***
> ***H3****… (3) Rainwater from a system provided pursuant to sub-paragraphs (1) and (2) shall discharge to one of the following, listed in order of priority:*
> *a) An adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable,*
> *b) A watercourse, or, where that is not reasonably practicable,*
> *c) A sewer.*

This prioritisation of where surface water should drain to is referred to as the Drainage Hierarchy and is a concept reflected within planning policy as well as Building Regulations. It is a useful tool to determine the most suitable route of discharge for surface water. In other forms it is preceded by management of surface water by source control (such as green roofs, rainwater harvesting etc).

The Drainage Hierarchy identifies infiltration as the preferred method by which surface water is to be drained from hard surfaces (such as roofs and paving). The suitability for soakaways is determined by carrying out a permeability test to confirm that water can soak into the ground. The sizing of the soakaways is dependent on the soil permeability, the area to be drained and the intensity of the storm event to be designed for.

Planning policy commonly requires surface water drainage within new developments to prevent flooding occurring from any site during a 1 in 100 year return period event (plus an allowance for climate change).

Building Regulations require soakaways to be designed to accommodate a storm which occurs once in every 10 years and for drainage systems to not flood during a 1 in 30 year return period event. It may be expected that the drainage system at this site would have been designed to meet these criteria.

[1] https://www.essexdesignguide.co.uk/suds

3.0 Site History and previous investigations

It is understood that the Village Hall was built in 1968, with the adjacent Victory Hall built in 1984 and Tollgate Hall in 2004. No records of the buildings or the drainage system are available on the Colchester Borough Council planning portal or the Building Control portal, but it may be expected that a drainage system would have been constructed to the requirements of Building Regulations. From the findings of the Dynorod survey, it is concluded that all runoff from roof areas and parking areas drain to buried soakaways, the design of which is not known.

The details of two planning applications are available on the CBC planning portal which describe recent works:

Application F/COL/03/0558

This application related to the erection of a two storey rear extension to provide a new hall, committee room and football changing rooms. The new extension appeared to have be built upon an area already surfaced in asphalt and likely to have been drained to the drainage system constructed in 1968. The plans show that the parking area was extended to the south which would have increased the surfaced area.

Condition 9 of the planning permission states that a percolation tests should be carried out to the satisfaction of Building Control to ensure soakaways will work adequately in adverse conditions and that an alternative proposal should be made if soakaways do not work satisfactorily.

Application F/COL/05/1670

This application related to the construction of a new parking area to the south of Tollgate Hall. It seems to have replaced the proposals to extend the surfaced area south of the new extension referred to in application F/COL/03/0558. The new parking area is specified as being surfaced using Turfpave plastic reinforced open grid pavers planted with grass.

This system allows the car park area to respond to a storm event in the same way as the adjacent grassed area. The surface is considered to be a permeable surface which adequately mitigates against the risk of surface flooding during rainfall.

Dynorod CCTV Survey

The Client provided CCTV survey information relating to the site which had been undertaken by Dynorod in September 2019.

From the records obtained by the Dynorod survey in 2019 (see **Appendix A**), it is known that at least two of the gullies within the parking area outside the building drain to buried soakaways and it may reasonably be assumed that other gullies and rainwater pipes from the Village Hall drain to soakaways. Dynorod rightly suggested that these soakaways are likely to be domestic soakaways, which were rubble-filled holes of varying size which were always surfaced over and could not be accessible. Consequently, it is impossible to determine where these are located, how many there are, what dimensions they have and what condition they are in.

4.0 Infiltration Testing

Following the CCTV Survey, it was recommended that investigations should be carried out to determine whether the underlying soils at the site are suitable for infiltration. These tests were carried out by YE in March 2021.

A report (Your Environment Report no. YEX1714 dated 16th March 2021) detailing the testing procedure and the results is included within **Appendix B** of this report.

The report identifies that the site has superficial drift deposits composed of Cover Sand (clay, silt and sand), and bedrock deposits recorded as London Clay. The trial pit logs indicated that the pit was wholly within the Cover Sand and that the London Clay horizon was not reached.

Infiltration tests following the BRE365 test procedure were undertaken to measure the permeability of the soils. This procedure is the current industry standard for determining the suitability for soakaways to be used for any new development. The trial hole recorded 150mm drop in the water level within the test pit over a thirty-hour period, which is a very low amount. The report concluded that the soils are practically impermeable, so infiltration forms of surface water disposal (such as soakaways) are not considered to be suitable for the site.

5.0 Surface Water Drainage Assessment

Following the Drainage Hierarchy, it has been proven that disposal of surface water by infiltration forms of SuDS is not suitable for this site, when assessed against current guidance (such as ECC's SuDS Design Guide).

Additionally, the soakaways which are present on the site already are not performing to standard which may be expected. This lack of capacity within the drainage system results in the observed flooding and is likely to be caused by a combination of the following reasons:

1. Poor permeability of the existing soils
   The primary reason for the failure of the soakaways is due to the poor permeability of the soils. Of course, the permeability of the soils would not have changed in the last fifty years and it is considered likely that the original construction installed soakaways due to the lack of any other feasible route for surface water drainage.

2. Lack of maintenance within the soakaways
   Traditional "domestic" soakaways, which were rubble-filled holes without formal design calculations commonly serve buildings of this age. They have no forms of maintenance access and it is impossible to determine their volumetric capacity once construction is completed.
   Over time, silt and small stones are conveyed into the soakaway and become trapped between the gaps within the rubble, which reduces the available storage for runoff when there is a storm event.

3. Increased drainage area –
   It is considered likely that the soakaways which are present on the site were constructed in 1968 when Victory Hall was completed. Over time, additional surfacing may have been added and these would have been connected into the existing soakaways thus increasing the frequency of flooding.

4. Increasingly wet weather due to climate change
   There has been a significant increase in rainfall intensities and rainfall volume in the past decades due to climate change. This is expected to increase in the coming decades and reduce the capacity of soakaways which as those found at this site.

5. Under-designed soakaways
   It is not possible to verify the soakaways' design nor their construction, due to the lack of any access point. It is possible that they were not correctly sized or filled with unsuitable material.

6. Soakaways at the end of their design life
   It is likely that the soakaways currently draining the site are at the end of their design life. The ingress of silt and stone described above is a normal consequence in the operation of these traditionally built soakaways and having them in operation for fifty years is a reasonable period of time for a construction element to be in operation for.

To determine the most appropriate point of discharge, we assess whether it is possible to drain surface water to a watercourse. Through inspection of local mapping, it is clear that no watercourses are located at or near the site.

Where we cannot drain to watercourses, the third point of discharge are sewers. These are sub-divided again in order of preference:

Sewer Type	Comment
Surface Water sewers	None are located within the local area
Highways Drainage	A Highway drain has been identified within Villa Road. ECC Highways were consulted to ask whether they would consider a new connection into their drainage system. They responded that we could not connect into their system
Combined Sewer	There is no combined sewer drainage system at or near the site
Foul Sewer	Anglian Water have a foul drain located in Villa Road (see mapping in **Appendix C**. Sewerage companies commonly require evidence that all the other points of discharge for surface water (as stated within the Drainage Hierarchy) have been examined and proven to be unsuitable before considering whether to add surface water into their foul sewers. The foul sewers are not designed to carry rainfall runoff as it increases the risk of flooding from their sewers and also increases the volume of water which has to be processed through sewage treatment works, thus reducing the capacity of their assets and increasing their costs. A connection to a foul sewer should only be used as a last resort.

By analysing the above, it may be concluded that the acceptable point of discharge from the site would be to the foul sewer network owned by Anglian Water. As stated, conveying surface water has a clear unsustainable environmental impact on the sewerage network and as such is treated as the very last resort.

As the surface water flooding which occurs within the parking area does not sufficiently threaten persons or property a piped connection to the foul sewer should only be examined in more detail once all other alternatives have been exhausted. A range of solutions which can be explored further are described in outline in the following chapter.

6.0 Surface Water Runoff Disposal

The following items are suggested solutions which may be applied to reduce the risk of flooding which occurs at Stanway Village Hall. These solutions are outline suggestions which are indicative of the technical solutions which can be applied without consideration of their costs.

Solution 1: Remediate the Soakaways

The performance of the soakaways have been adversely affected by the factors identified in the previous chapter. Removal and reconstruction of the soakaways to allow them to be inspected and maintained on a regular basis to reduce the risk of flooding is feasible.

However, the design is not likely to meet with current requirements as we have already demonstrated that the underlying soils are not sufficiently permeable. Certainly, if a similar scheme were to be submitted to the LFA for consideration as part of a planning application, then soakaways by themselves would not be acceptable.

It is noted however, that by replacing the soakaways with new structures, the flooding which currently is understood to occur every two years could be designed to occur with much less probability (say, 1 in 30 years).

Solution 2: Provide more storage for rainfall runoff

Flooding occurs when the soakaways become filled with water and starts to be stored at the surface. It can be seen that the car park forms a slight bowl within the surfacing within which surface water can collect.

It would be possible to connect an overflow pipe from the existing soakaways to divert runoff to a different location (such as the playing field). A new soakaway structure could be provided to prevent flooding occurring at surface within the car park.

The disadvantage to this option is that the new structure can also become filled with water when an extreme rainfall event occurs or if there is an extended period of wet weather. Additionally, it wouldn't address the capacity problem within the existing soakaways.

Solution 3: Re-use of rainwater

The source of flooding is from the roofs of the existing buildings and the surface of the car park. Rainwater should be considered as an important resource, which can be used for a variety of purposes.

At this site, rainwater may be re-used for non-potable uses, such as toilet flushing, laundry washing and irrigation. Commonly, runoff from rainwater downpipes are filtered and diverted to a tank, from where they can be pumped direct to an appliance or to a header tank for distribution. A back-up from the potable water supply can be provided would all stored water be used up.

Of course, the design of the system would be dependant on the intensity of its use, however a clear financial benefit can be gained in replacing potable water for non-potable uses.

7.0 Conclusions and Recommendations

Flooding within the car park of the Stanway Village Hall has been observed on a frequent basis which impacts the users of the site. Flooding is being caused by failure of the soakaways into which hard surfaces within the site drain to. This failure is likely to be caused by a combination of a range of factors, however primarily it is due to low permeability soils, soakaways at the end of their design life and climate change.

No suitable point of discharge for surface water runoff has been identified. The only possible place for surface water to drain to would be the Anglian Water foul sewer located within Villa Road; connecting surface water to the foul sewer would result in the unnecessary treatment of the rainwater at the Anglian Water sewage treatment works, which would entail energy use and is not considered to be a sustainable solution.

It is recommended that the remediation of the soakaways on site should be explored to provide additional below-ground storage for surface water to reduce the frequency of flooding at the surface. It is noted that this solution would not necessarily be acceptable for new development as the soils are still insufficiently permeable. The aim for any solution may simply be to reduce the risk of flooding at the site, rather than meet the current planning guidelines for new developments, but it may be possible to direct the excess flood waters to a less intrusive location.

Additionally, it has been suggested that rainwater harvesting be explored to enable the re-use of rainwater for non-potable uses. This will have clear environmental and financial benefits by considering the rainwater as a resource rather than a problem.

8.0 Limitations

YE have prepared this report with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and has accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, YE reserves the right to review such information and, if warranted, to alter the opinions accordingly.

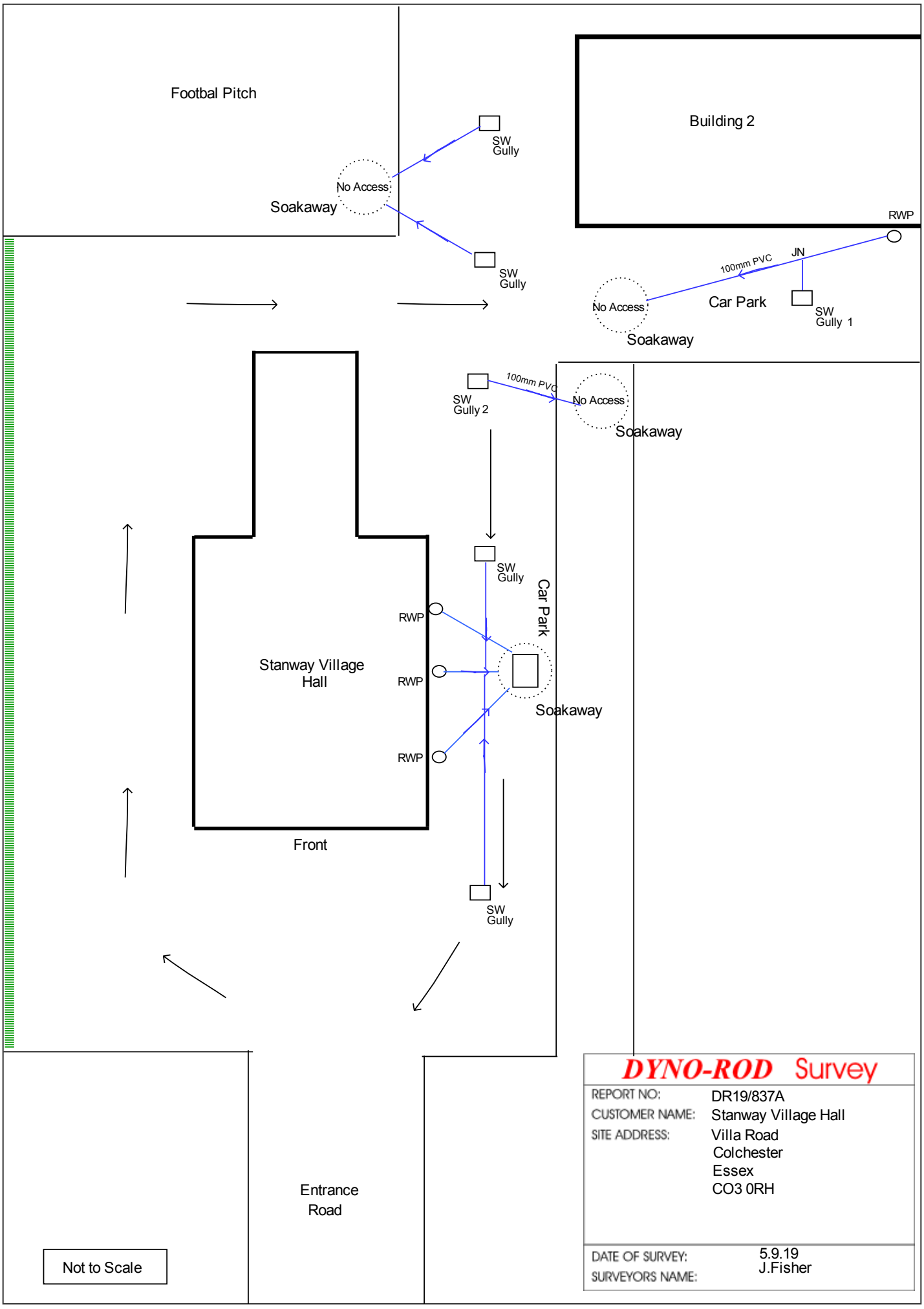
It should be noted that any risks identified in this report are perceived risks based on the information reviewed.

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time and as such are not a guarantee that the study site is free of hazardous conditions.

This report has been prepared solely for the use of the named client, and may not be relied upon by other parties without written consent from YE. YE disclaim any responsibility to the client and others in respect of any matters outside the agreed scope of the work

Appendix A – Dynorod Survey

Untitled Page



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Project

Project Name:	DR19_837A Villa Road
Project Date:	16/09/2019
Project Standard:	MSCC5 Sewers & Drainage GB (SRM5 Scoring)
Wincan Version:	v. 1.1.12.2

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Project Name	Project Number:	Date:
DR19_837A Villa Road		**16/09/2019**

P Bowyer Associates Limited
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Scoring Summary

Project Name:	Project Number:	Project Date:
DR19_837A Villa Road		**16/09/2019**

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
1	SW GULLY 1X	3	Cracks, multiple from 12 o'clock to 12 o'clock

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	SW GULLY 1X	4	Joint displaced, large

Abandoned Surveys

Section	PLR	Description
All inspections complete, none are abandoned.		

Information

These summaries are based on the SRM grading from the WRc.

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Project Information

Project Name:	Client's Ref:	Contractor's Ref:	Project Date:
DR19_837A Villa Road	**David Lines**	**DR19/837A**	**16/09/2019**

Client

Company:	Stanway Parish Council
Contact:	David Lines
Street:	Stanway Village Hall
Town or City:	Villa Road
County:	Colchester
Post Code:	CO3 0RH
Phone:	01206 542 221
Mobile:	07485 151 248
Email:	clerk@stanwaypc.org.uk

Contractor

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Defect Grade Description (Section)

Project Name:	Project Number:	Project Date:
DR19_837A Villa Road		**16/09/2019**

1:

Brick: No structural defects.

Pipe: No structural defects.

Acceptable structural condition.

2:

Brick: Circumferential cracking; single longitudinal crack; surface mortar loss (depth missing < 15mm); surface damage - slight spalling (breaking away of small fragments from the surface); surface damage - slight wear (increased roughness).

Pipe: Circumferential crack; moderate joint defects (i.e. medium open joint or medium displaced joint); surface damage - slight spalling (breaking away of small fragments from the surface) or slight wear (increased roughness).

Minimal collapse likelihood in the short term but potential for further deterioration.

3:

Brick: Medium mortar loss (depth missing 15-50mm) without other defects; more than one longitudinal crack (at a single location); multiple cracking; single bricks displaced; deformation < 5%; no fracture and only moderate mortar loss; surface damage - medium spalling (large areas of chipped brick); surface damage - medium wear (large area of brick surface is missing).

Pipe: Fracture with no deformation or deformation < 5%; longitudinal cracking or multiple cracking; minor loss of level; severe joint defects (i.e. large open joint or large displaced joint); surface damage - partial area of pipe surface is missing or worn.

! Collapse unlikely in the near future but further deterioration likely !

4:

Brick: Total mortar loss (depth missing > 50mm) with deformation > 10%; deformation up to 10% and fractured; displaced or hanging brickwork; small number of missing bricks; dropped invert (drop > 20mm); moderate loss of level; surface damage - large spalling (entire surface of brick is missing); surface damage - large wear (entire surface of brick is missing).

Pipe: Broken; deformation up to 10% and broken; fracture with deformation 5-10%; multiple fractures; serious loss of level; serious joint defects with voids or soil visible (open joint with > 50mm soil or void visible or joint displacement > 25% of diameter); surface damage - entire area of pipe surface is missing or severly worn.

!! Collapse likely in the foreseeable future !!

5:

Brick: Already collapsed; missing Invert; deformation > 10% and fractured; displaced or hanging brickwork and deformation < 10%; extensive areas of missing brickwork.

Pipe: Already collapsed; deformation > 10% and broken; extensive areas of pipe fabric missing; fractures with deformation > 10%

!!! Collapsed or collapse imminent !!!

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Section Inspection - 05/09/2019 - SW GULLY 1X

Section:	Inspection:	Date:	Time:	Client's Ref:	Weather:	Pre Cleaned:	PLR:
1	**1**	**05/09/19**	**15:12**	**David Lines**		**Yes**	**SW GULLY 1X**
Operator:		Vehicle:		Camera:	Preset Length:	Criticality Grade:	Alternative ID:
Jf							

Town or Village:	**COLCHESTER**	Insp Dir:	**SW GULLY 1 >> SOAKAWAY**	US MH:	**SW GULLY 1**
Road:	**Villa Road**	Inspected Length:	**13.10 m**	US Depth:	**0.300 m**
Location:		Total Length:	**13.10 m**	DS MH:	**SOAKAWAY**
Surface Type:		Pipe Length:	**0.00 m**	DS Depth:	

Use:	**Surface water**	Pipe Shape:	**Circular**
Type of Pipe:		Height / Width:	**100 mm**
Year Constructed:		Pipe Material:	**Polyvinyl chloride**
Inspection Purpose:		Lining Type:	**None**
Flow Control:		Lining Material:	**None**

Comment:
Recommendation:

1:116	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 0.30						
SW GULLY 1						
	0.00	OC	Start node type, other special chamber, reference number: SW GULLY 1: .	00:00:00		
	1.10	CC	Crack, circumferential from 12 o'clock to 12 o'clock			2
	2.00	JDL	Joint displaced, large			4
	4.40	CM	Cracks, multiple from 12 o'clock to 12 o'clock			3
	8.00	WL	Water level, 15% of the vertical dimension			
	8.20	LL	Line deviates left: 30 DEGREES			
	8.50	REM	General remark: JN			
	12.40	CC	Crack, circumferential from 12 o'clock to 12 o'clock			2
	13.10	OCF	Finish node type, other special chamber, reference number: SOAKAWAY: .			
SOAKAWAY						
Depth:						

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
4	40.0	4.7	62.0	3.0	4	5.0	0.6	8.0	4.0

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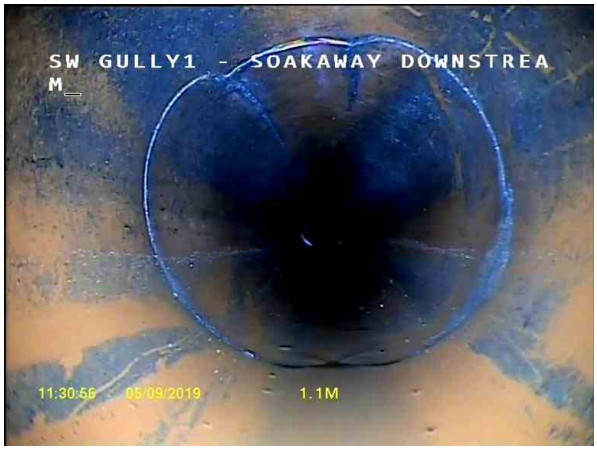
Section Pictures - 05/09/2019 - SW GULLY 1X

Section Number:	Inspection Direction:	PLR:	Client's Ref:	Contractor's Ref:
1	**SW GULLY 1 >> SOAKAWAY**	**SW GULLY 1X**	**David Lines**	**DR19/837A**



SW GULLY
1X_238bee7b-0ef1-40b3-94d9-e45fabb36af1_20190916_151849_054.jpg, , 1.10m
Crack, circumferential from 12 o'clock to 12 o'clock

SW GULLY
1X_14c15926-64c0-4188-8db2-6eada36f77c6_20190916_151855_328.jpg, , 2.00m
Joint displaced, large

SW GULLY
1X_2ca956ba-7540-4b97-a6e8-a268fb3c04a2_20190916_151901_037.jpg, , 4.40m
Cracks, multiple from 12 o'clock to 12 o'clock

SW GULLY
1X_e573fd1b-45e8-46a8-8456-2c3663eb2edc_20190916_151921_263.jpg, , 12.40m
Crack, circumferential from 12 o'clock to 12 o'clock

P Bowyer Associates Limited
Mahoney Green, Green Lane West, Rackheath, Norwich, Norfolk NR13 6JY
Tel. 01603 722 325
admin@bowyer-drains.com

Section Inspection - 16/09/2019 - SW GULLY 2X

Section:	Inspection:	Date:	Time:	Client's Ref:	Weather:	Pre Cleaned:	PLR:
2	**2**	**16/09/19**	**15:15**	**David Lines**		**No**	**SW GULLY 2X**
Operator:		Vehicle:		Camera:	Preset Length:	Criticality Grade:	Alternative ID:
Jf							

Town or Village:	**COLCHESTER**	Insp Dir:	**SW GULLY 2 >> SOAKAWAY**	US MH:	**SW GULLY 2**
Road:	**Villa Road**	Inspected Length:	**5.10 m**	US Depth:	**0.300 m**
Location:		Total Length:	**5.10 m**	DS MH:	**SOAKAWAY**
Surface Type:		Pipe Length:	**0.00 m**	DS Depth:	

Use:	**Surface water**	Pipe Shape:	**Circular**
Type of Pipe:		Height / Width:	**100 mm**
Year Constructed:		Pipe Material:	**Polyvinyl chloride**
Inspection Purpose:		Lining Type:	**None**
Flow Control:		Lining Material:	**None**

Comment:
Recommendation:

1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 0.30						
SW GULLY 2						
	0.00	OC	Start node type, other special chamber, reference number: SW GULLY 2: .			
	0.60	WL	Water level, 10% of the vertical dimension			
	2.80	CUW	Loss of vision, camera under water: 100%			
	5.10	OCF	Finish node type, other special chamber, reference number: SOAKAWAY: .			
SOAKAWAY						
Depth:						

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Appendix B – Permeability Test Results

Our Ref: YEX1714

16th March 2021

For the attention of Stanway Parish Council,

Ref: Stanway Community Centre, Villa Road, Colchester, CO3 0RH

We thank you for your request to undertake permeability testing at the above mentioned site and take pleasure in enclosing the results of this work. The investigation was undertaken on the 11th-12th March 2021 in accordance with your instruction to proceed. This letter describes the work undertaken, presents the data obtained and discusses the results of the tests.

Geology

An examination of the available British Geological Survey data of the area for the site has been examined and indicates that the site has superficial drift deposits composed of Cover Sand (clay, silt and sand), and bedrock deposits recorded as the London Clay Formation (clay, silt and sand).

Fieldworks

The programme of this investigation included the excavation of one trial pit. The location of the soakaway test was selected by the client.

During this work, the soils encountered were logged in general accordance with BS 5930: 1990, as amended in 2007, and full descriptions are given on the borehole records, which are also appended to this letter.

Soakaway Tests

During the soakaway tests the water failed to achieve a fall from 75% to 25% of the effective depth of the storage volume in TP01. The results obtained from the soakaway tests are summarised below:

Table 1: *Soakaway Test Results*

WS	Soakage Area Dimensions (m)	Depth (m)	Soil Description (Base of TP)	Infiltration Rate (m/sec)	Drainage Characteristics
TP01 test1	1.40 x 0.30	1.50	Orangish brown gravelly SAND. Sand is medium - coarse. Gravel is medium - coarse, mixed angular and sub-angular of mixed lithology.	N/A	Practically Impermeable

Discussion

The soils encountered beneath the site were found to be predominantly SAND. The soakage rates obtained during the investigation were found to be poor to practically impermeable. Given the data from the test, it is considered that soakaways are not suitable for this site.

References

Building Research Establishment (BRE) Digest 365, *Soakaway Design*, September 1991.

British Standards Institution (1999) BS5930: *Code of practice for site investigations*, B.S.I., London.

British Standards Institution (2007), Amendment No 1, BS5930: *Code of practice for site investigations*, B.S.I., London.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For and on behalf of

*Your*Environment

Yours Faithfully,

Nick Hammond

Geo-Environmental Engineer

Enc.

Appendix A: Site Investigation Plan
Appendix B: Trial Pit Logs
Appendix C: Soakaway Test Results
Appendix D: Photographs

APPENDIX A: Site Investigation Plan

Your Environment

Ground Investigation Location Plan - Not to Scale

YourEnvironment
Chilgrove Business Centre, Chilgrove, Nr Chichester, PO18 9HU
Tel: 01243 787150
Email: info@yourenvironment.org

Site Name:	Client:	Date:	Job No:
Stanway Village Hall	**Stanway Parish Council**	**Mar-21**	**YEX1714**

APPENDIX B: Trial Pit Logs

Your Environment

www.yourenvironment.org
info@yourenvironment.org
01243 787150

Log of Boring TP1
Sheet 1 of 1

YE Engineer N. Hammond

Location	Stanway Community Centre, Villa Road, Colchester, CO3 0RH
Date	March 11, 2021
Project Reference	YEX1714

Water level data

Completion: Depth NA m
Elevation NA m

24 hour: Depth ____ m
Elevation ____ m

Width 0.3 m
Length 1.4 m
Depth 1.5 m

Method (Trial pit, window etc) Trial Pit - Machine Excavation

Stratum depth (m) From	Stratum depth (m) To	Sample Depth From (m)	Sample Depth To (m)	Sample Type	GW	Install Details	LITHOLOGY
0.00	0.30					NONE	Brown clayey, gravelly SAND. Sand is fine - medium. Gravel is medium - coarse, mixed angular and sub-angular of mixed lithology.
0.30	1.50						Orangish brown gravelly SAND. Sand is medium - coarse. Gravel is medium - coarse, mixed angular and sub-angular of mixed lithology.
							End of TP1

Remarks: .

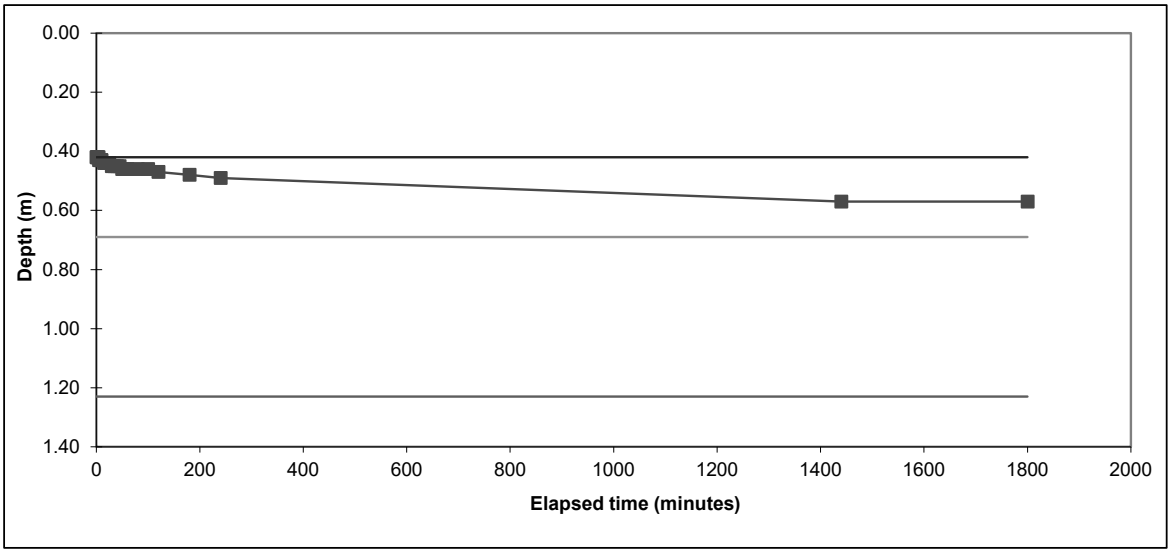
APPENDIX B: Soakaway Test Results

Your Environment

Soakaway Test

Trial Pit No:	TP1	Test No:	1	Date:	11/03/2021
Length (m):	1.400		Datum Height:	0.00	m agl
Width (m):	0.30		Granular infill:	None	
Depth (m):	1.50		Porosity of infill:	1	(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.420	30	0.450
1	0.420	35	0.450
2	0.420	40	0.450
3	0.420	45	0.450
4	0.420	50	0.460
5	0.430	55	0.460
6	0.430	60	0.460
7	0.430	80	0.460
8	0.430	100	0.460
9	0.430	120	0.470
10	0.430	180	0.480
15	0.440	240	0.490
20	0.440	1440	0.570
25	0.440	1800	0.570



Start water depth for analysis (mbgl)	0.42		
75% effective depth (mbgl):	0.69	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	0.96		
25% effective depth (mbgl):	1.23	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.50		
Volume outflow between 75% and 25% effective depth (m^3):			
Mean surface area of outflow (m^2):			2.26
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	**Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.**

Remarks Results processed following BRE 365 (2007).

Client:	Stanway Parish Council	**TP1**
Site:	Stanway Village Hall	

APPENDIX D: Photographs

Site: Stanway Community Centre
Client: Stanway Parish Council
Job Reference: YEX1714, Dated: March 2021

A.

B.

C.

D.

Your Environment

A. TP1

B. TP1

C. TP1

D. TP1

Your Environment

Appendix C – Anglian Water Sewer Network

Data updated: 28/02/21

Scale: 1:1250 | Map Centre: 595319,224541

Date: 16/03/21 | Our Ref: 523174 - 1

Wastewater Plan A2 | Powered by digdat

Foul Sewer
Surface Sewer
Combined Sewer
Final Effluent Sewer
Rising Main*
Private Sewer*
Decommissioned Sewer*

Outfall*
Inlet*
Manhole*

Sewage Treatment Works
Public Pumping Station
Decommissioned Pumping Station

*(Colour denotes effluent type)

paul@timminsconsulting.co.uk

Stanway Village Hall

love every drop anglianwater

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
4810	C	-	-	-
4811	C	-	-	-
0801	F	40.05	38.15	1.9
1701	F	40.504	37.134	3.37
1702	F	40.642	37.182	3.46
1703	F	40.534	37.244	3.29
1704	F	40.916	37.426	3.49
1801	F	40.326	37.486	2.84
1802	F	41.325	38.832	2.493
1803	F	40.904	39.441	1.463
2701	F	40.494	36.924	3.57
2702	F	-	-	-
2703	F	-	-	-
2704	F	-	-	-
2809	F	-	-	-
2810	F	-	-	-
2811	F	-	-	-
3201	F	39.728	37.746	1.982
3701	F	40.329	37.399	2.93
3801	F	40.429	36.65	3.779
3808	F	-	-	-
3809	F	-	-	-
4301	F	39.877	38.063	1.814
4302	F	40.042	38.271	1.771
4401	F	40.441	38.511	1.93
4501	F	40.557	38.877	1.68
4502	F	-	-	-
4601	F	40.58	36.57	4.01
4602	F	40.514	38.094	2.42
4603	F	-	-	-
4701	F	40.329	36.899	3.43
4801	F	40.712	37.512	3.2
5504	F	39.785	-	-
5702	F	40.127	38.152	1.975
5802	F	40.221	38.362	1.859
5803	F	-	-	-
1851	S	-	-	-
1852	S	-	-	-
1853	S	-	-	-

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert