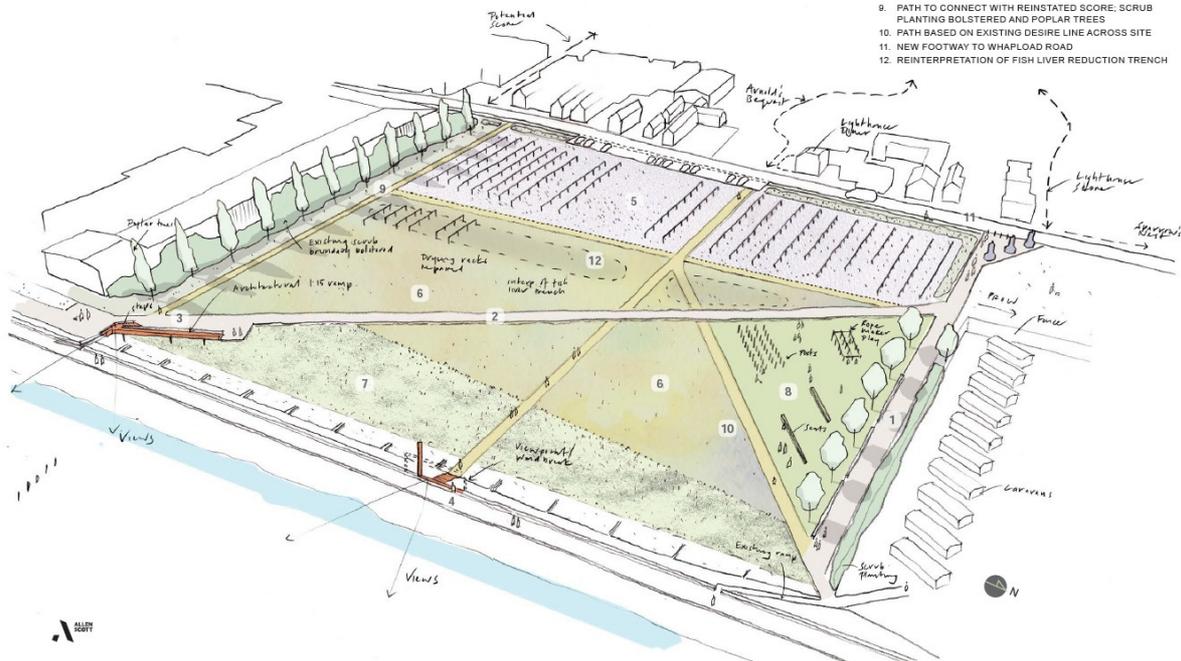


Feasibility of toilet provision for The Ness

June 2019

Kate Ellis, Regeneration Support Officer - East Suffolk Council

Stage C cont...
Concept Masterplan



- KEY
1. SPARROW'S NEST PROMENADE WITH BUOYS RECLAIMED FROM SITE
 2. DIAGONAL AXIS TO NESS - CONCRETE PATH
 3. ARCHITECTURAL RAMP, VIEWPOINT AND BRIDGE
 4. WINDBREAK AND VIEWPOINT
 5. DRYING RACKS REPAIRED/REPLACED
 6. EXISTING ROUGH GRASSLAND IMPROVED
 7. LIME GRASS SWATHE
 8. AMENITY GRASS (PLAY ELEMENTS, SEATING AND INTERPRETATION)
 9. PATH TO CONNECT WITH REINSTATED SCORE, SCRUB PLANTING BOLSTERED AND POPLAR TREES
 10. PATH BASED ON EXISTING DESIRE LINE ACROSS SITE
 11. NEW FOOTWAY TO WHARFLOAD ROAD
 12. REINTERPRETATION OF FISH LIVER REDUCTION TRENCH

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Brief

East Suffolk Council and Lowestoft Town Council are currently working in partnership with Concertus Design and Property Consultants and Allen Scott Architects to deliver a new public park in North Lowestoft, which will incorporate the heritage of the area with a themed play area and shelter which would be suitable for outdoor education and events. Formerly known as the East of England Park in the early design stages, The Ness is situated on the former beach village (also known locally as The Grit) which is steeped in local history and full of character, in part by the presence of the former drying racks which were once used by local fishermen who resided in the village. The site itself is bordered by the North Sea and concrete sea defence (known as the North Wall), a caravan site Ting Dene, Birds Eye, and various industrial and residential buildings. The nearby parks of Sparrows Nest Gardens and Belle Vue Park are home to three local museums which the steering group hope to work in partnership with. Once completed, The Ness will become the most Easterly Park in the UK, and will be subject to increased demand as a destination for tourists.

The proposed landscaping will remain sympathetic to the area, using natural, complimentary materials such as timber and seagrasses. The park will feature a play area, improved accessibility, and improved connectivity to Ness Point. The designs will also use greenery in an attempt to screen some of the neighbouring buildings, which will enhance the visual aspect of the area and encourage wildlife.

The project group felt that due to the significant site improvements and the intention of the project to draw visitors to the area, there was a need to investigate the installation of toilets. This was supported by feedback from a stakeholder consultation event in October 2018 which raised the potential of providing conveniences, but not an issue raised during public consultation in February 2019. The steering group are exploring these options and will make an informed decision supported by this report.

Currently, the nearest public conveniences are located in Sparrows Nest Gardens, approximately 100m from the site. However there are concerns that these are not practical for visitors to the Ness, particularly families and those with mobility difficulties.

There are several options to consider which will be addressed in this report.

Option 1: No toilet provision on site, with visitors directed to the existing public toilets at Sparrows Nest or nearby Caravan Park owned by Tingdene. There are pros and cons to this option including the road safety concerns of visitors crossing the road to Sparrows Nest if we are unable to secure a permanent crossing.

However, Suffolk County Council are carrying out a traffic assessment along this section of Whapload Road and it is anticipated that the assessment will demonstrate that a crossing is a viable proposition and will also serve as a traffic calming measure to slow speeding motorists, which is an issue at present.

School parties and families may be reluctant or even shorten their visit to the site due to lack of public conveniences within the immediate vicinity. However there is an opportunity to review the provision of toilets after a year of the park opening to see if there is any change in the requirement to supply conveniences due to increased site usage.

Option 2: Eco toilets are provided on site, but with an approximate cost of £5000-6000 per unit plus installation and maintenance costs. Pros and cons of this option are cost of provision, cost of maintenance, miss-use, lighting, visitor benefit, positive press as eco-friendly, lack of current onsite utilities, waste needing to be manually extracted and carefully disposed of, and securing funding as this is outside the scope of the allocated budget.

Option 3: Toilets to be provided on site using traditional construction and connection to main main waste and water system which has an unknown cost due to lack of utilities, connection costs and excavation of contaminated land. This type of convenience has less risk and is more hygienic. The implication is that it is not as eco-friendly.

If options 2 or 3 were selected, the group have specified that the facilities would need to:

- be easy to maintain
- have low operational and maintenance costs
- have baby change and disabled access facilities, or the option to add these as an extra
- run on either recycled or no water, or connect to the main supply
- not disturb the site (or have minimal disruption)
- able to cope with intermittent usage by large groups, especially during peak periods
- be sympathetic to the environmental landscape and wildlife

Introduction

In 2018 it was reported that in the last decade that an estimated 40% of public conveniences have disappeared (British Toilet Association, 2018). Ironically, visitors often look at toilet provision when planning a journey and will comment on the cleanliness and facilities available. Therefore any organisations that rely on tourists or a visitor economy need to factor this into their tourism strategies, and perhaps reconsider the removal or closure of conveniences.

As councils have no legal obligation to provide toilets under the Public Health Act 1936, they tend to become one of the first assets to be decommissioned during budget cut reviews. Opting to charge for use to address any shortfalls in order to keep public conveniences open is not possible as The Public Lavatories (Turnstiles) Act 1963 prohibits the use of turnstiles in any part of a local-authority owned or managed public toilet (House of Commons, 2008).

During the Autumn budget 2018, Chancellor of the Exchequer Phillip Hammond, announced that owners of public conveniences would no longer be required to pay business rates. In recent years, emphasis has been placed on the lack of toilet provision in tourist areas and high streets. The exclusion of business rates could, in theory, assist with slowing the decline of public conveniences.

The strongest concerns over the closure of public conveniences have come from disabled access forums, who state that access to toilets are a necessity and whilst not liable for to provide facilities, councils had a moral responsibility to address public health issues and social inclusion. In recent years, increased focus has been placed on improving accessibility for individuals with visible and invisible disabilities. However, anywhere that offers goods or services to the public must make sure disabled people have equal access to their facilities, including toilets – essentially local businesses cannot refuse those with disabilities access to toilet facilities.

In a report compiled by the BBC with data retrieved from a Freedom of Information request, data was supplied by 376 of the 430 councils contacted by the BBC and showed that:

- UK councils stopped maintaining around 13% of public toilets between 2010 and 2018
- The data did not include large regional variations – e.g. Cornwall Council has stopped maintaining 94% of its toilets, on the Isle of Wight it was 92% and 80% in North Ayrshire
- In 2018 there were 4,486 toilets run by major councils in the UK, down from 5,159 in 2010
- In 37 areas, major councils no longer run any public conveniences

(BBC, 2018)

From this study, we can see that the Waveney district had a reduction of 6 toilets in the same period of 2010-2018. We must note though that not all public conveniences are managed and maintained by councils, and have not been included in the report by the BBC.

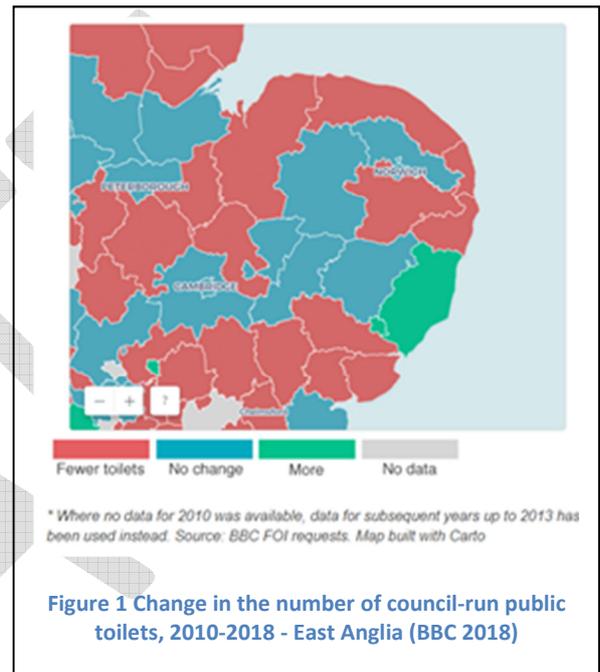
As of 2019, there are 10 public conveniences under Lowestoft Town Council ownership. These are situated at the following locations:

- Denes Oval
- Sparrows Nest
- Triangle Market Place
- Lowestoft Cemetery
- Normanston Park
- Kirkley Cliff
- Kensington Gardens
- Pakefield Street
- Fen Park
- Belle Vue Park – **closed long term to the public.** Lowestoft Town Council currently reviewing the future of this structure.

Other public conveniences in Lowestoft are under various ownership and are situated at the following locations:

- Gordon Road
- Britten Centre Bus Station
- East Point Pavilion
- South Beach Lower Promenade/Jubilee Parade
- Lowestoft Railway Station

The conveniences listed above are connected to the main water and sewage systems and are maintained by various facilities management companies (contracts vary depending on ownership). The existing facilities are generally housed in a brick or concrete structure, with either steel or ceramic fixtures. Most of these facilities are functional but many have either been closed to the public (such as those in Belle Vue Park) or are in a tired state. A breakdown of running costs for toilets historically owned by the former Waveney District Council (now East Suffolk Council) is



available in Appendix 5. None of these toilets are considered to be 'compostable' or 'eco' toilets, and therefore there are no historic records to review running costs or usage of this type of toilet.

Taking this information and the brief into consideration, any public conveniences erected in The Ness need to be able to be suitable for long term use, complimentary of the conservation area with a decision factored not just on cost but the environmental and local impact the provision might have. This document will explore the various concepts and designs of eco toilets that are currently in use in the UK at present, with the aim of identifying the most suitable options for potential placement on a newly established park, whilst addressing the brief, and ensuring that toilet provision is seen as a strategic move to increase the economic and social viability of the area.

Considerations

To ensure that we meet all requirements of the public and the brief, the following questions need to be considered. For technical information, please see Appendix 1.

1. **Maintenance**
2. **Risks**
3. **Disposal of bio-waste**
4. **Opening times, security and anti-social behaviour**
5. **Electricity supply**
6. **Usage charges**
7. **Equality**
8. **Hand sanitation**
9. **Planning & structure**

1. Maintenance

It is envisaged that the landowner would negotiate with the contractor, currently Norse, to include maintenance of The Ness within their public toilets maintenance contract. It would need to include the following maintenance:

- Cleaning (toilets should be checked and cleaned twice daily, dependent on usage)
- Replenishing toilet roll, sanitiser, and soak material (e.g. wood shavings or barley straw)
- Emptying and disposal of bio-waste (bi-monthly – annual depending on use) and litter waste.
- Feminine hygiene and nappy disposal

A case study in Scotland noted that asking the public to add wood shavings lead to too much soak material being used, and the soak scoop disappeared into the vaults – ultimately this causes issues with blockages and overflows, and could damage the overall system if not addressed. There were also reported issues with visitors urinating into the wood shavings box. This was addressed by staff adding the soak themselves at the end of each day.

Another maintenance issue identified that after five years of use, there was a need to replace elements of the toilets, including the toilet chutes and the floor covers. This cost may need to be factored in to future maintenance, and would recommend reviewing the Forth Leader Case study regarding the Provision of Sustainable Toilets in Remote Rural Locations – a link to which is cited in the bibliography.

2. Risks

The Ness is situated in flood zone 2 and 3. The Environment Agency describes these zones as below:

Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year

Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year

(Environment Agency, 2019).

There is a risk that a flood could affect the site, and ultimately damage the toilet facilities or even allow raw sewage to further contaminate the site.

3. Disposal of Bio-Waste

When the compost is emptied, arrangements would need to be made to use or dispose of the compost in accordance with Environment Agency and Local Authority guidelines which could have cost implications.

It is suggested that waste from the toilets can be used as compost. Two composting solutions are outlined below:

Tyre Stack Composters

One method of making secure composters is to use old car tyres to construct a modular composting bin. This idea has been around for some time and was developed at the Centre for Alternative Technology. It makes good use of a waste product.

Pallet Composters

Another approach is to join up four pallets in a square and place the compost inside. It can be covered with a piece of old carpet which encourages worms to work the whole pile. This is an adequate approach if the compost removed from the toilet is already quite well rotted.

Health and safety

Removing rubbish from the upper area exposes staff to fresh waste and pathogens. Therefore staff would need to be provided with face masks and arm length rubber gloves to maintain the waste. In addition, any equipment used by staff to maintain the toilet would need to be sterilised, such as the litter picker, fork and brushes - after use. Disinfectant would need to be provided in a stable container and a means provided for disposing of the disinfectant. Maintenance and health and safety assessments would need to be undertaken, and the establishment of a clear protocol in order to minimise the attendant risks.

4. Opening times, security and anti-social behaviour

Many local authorities have cited anti-social behaviour and vandalism as reasons for closing public toilets. To discourage antisocial behaviour and vandalism, the pods would need to be secured at night. There are options to look at remote closure, but there would be cost implications to this.

Additionally, anti-graffiti paint would need to perhaps be considered being applied to the structure to deter tagging etc. The risk is that at night, particularly during off season, the park is not on a route that is well utilised where passing traffic could deter vandals. In the summer season though, the occupancy of tourists in caravans on the neighbouring Ting Dene site might address this.

5. Electricity supply

In order to supply light on dull days, solar panels or light tunnels would need to be considered. However, this would be subject to an additional cost as this is not factored into the eco-toilet unit cost.

6. Usage charges

Opting to charge for use to address any shortfalls in order to keep public conveniences open is not possible as The Public Lavatories (Turnstiles) Act 1963 prohibits the use of turnstiles in any part of a local-authority owned or managed public toilet (House of Commons, 2008).

7. Accessibility

To comply with the Human Rights Act 1998, toilet provision must be accessible to everyone. The Equality Act 2010 and Human Rights Act 1998 protects disabled individuals, and cites that any toilet facilities offered must provide equal access for disabled customers and visitors to those able bodied. Sanitary accommodation must take into consideration “wheelchair users, ambulant disabled people, people of either sex with babies and small children, or people encumbered by luggage” must also be considered when considering toilet provision (HM Government, 2015). Any toilet provision for disabled individuals must comply with British Standard for accessibility BS8300:2009 and Document M of Building Regulations 2010 (HM Government, 2015).

Another provision that needs to be considered is baby changing facilities which would be an additional cost, approximately £295 +VAT per unit.

It is anticipated that the most common type of visitors would be walkers, families, dog walkers, and school children and therefore facilities would need to accommodate any additional needs they might have.

8. Hand sanitation

The World Health Organisation (WHO), the United Kingdom's National Institute for Clinical Excellence (NICE) / National Patient Safety Agency (NPSA), and the United Kingdom's National Health Service recommend the use of alcohol based hand sanitiser (ABHS) products to help prevent the spread of hospital acquired infections. This addresses the risks associated with a number of activities including the use of public toilets and the changing of nappies. There is a large body of evidence demonstrating that the use of alcohol-based antibacterial hand sanitation (ABHS) products containing between 60% and 95% alcohol reduce the risk of infection in a wide variety of settings (NatSol, 2019).

Norse, the preferred facilities management company operating on behalf of East Suffolk Council and Lowestoft Town Council and operates in Lowestoft, anticipates that the cost of hand sanitiser over the year could total £1200 per annum.

9. Planning & structure

Building Control Department can be consulted about the discharge of urine to the ground, and may require a consultation with the Environment Agency. The manufacturers specify that the urine soakaway should not be closer than 10m from a watercourse or 50m from a well or borehole. Building control can be advised that there is no flush water and that volumes of discharge are small. For instance, a toilet visited by 50 people a day is likely to discharge only 15 litres of urine daily.

Building Control may wish to check the layout of the cubicle for disabled access and any access ramps that require construction, and information about hand cleansing solutions.

The structure that houses the toilet will need to camouflage or compliment the surrounding environment. Structures including the play equipment and shelter on the Ness will be constructed of hard wearing timber, therefore the structure housing the toilet will need to be of a similar material, and be able to withstand a harsh environment and strong winds due to its location. It will also need to be anchored which would be subject to groundworks. Planning permission may need to be sought with regards to any structures, and site investigations may need to take place.

Traditional flush toilet connection

Estimated cost: In excess of £40,000 (x2 units, installation, excavation, solar panels, baby change, building). Breakdown in Appendix 6

The provision of traditional toilets connected via a main sewage and fresh water system could have cost implications due to excavation and connection costs. This option is also not as eco friendly due to the volume of water required to flush, but is likely to be slightly more hygienic as waste is not stored within the unit.

Tingdene, a caravan park that neighbours The Ness site, have verbally offered for any toilet provision on The Ness to connect to their main sewer, allowing the option of providing traditional toilet. This would immediately reduce the cost of installing a completely new sewer system however there would likely be significant disruption to the site – a requirement stipulated in the brief.

In order to address the environmental aspect of the brief, alternative low flush units could be considered. This study briefly covers a case study of PropelAir toilets and the use of repurposed water. If at a later date, further technical details and costs were required about this option, this can be explored as it would likely require the assistance of a quantity surveyor to provide a realistic overview of the site requirements.

Eco & Compostable Toilets

Estimated cost: In excess of £30,000 (x2 units, building, installation, excavation, solar panel, baby change) Breakdown Appendix 6

There are various forms of eco/compostable toilets available on the UK market, ranging from self sufficient with the exception of needing to be emptied on occasion, to some requiring a small amount of water or straw, known as a 'soak' to absorb the waste.

These types of toilets are specifically designed so that they do not require chemicals to break down waste, are eco friendly, and low maintenance. They are especially suitable for sites where there are drainage problems, there is a lack of existing foul drainage and where the water supply is limited or unavailable. In addition, they generally tend not to produce an odour with some companies claiming that the only reasons for compostable toilets to smell are if they are not used or maintained correctly.

How the traditional compost toilet works

In general, the operation of a compost toilet is fairly straight forward; there is little to no water involved, and the waste is manually removed as compost. Therefore this seems like the most appropriate option.

The most common design is a separation system; where liquids and solids are separated. Usually, liquids will either be drained via a dug out soakaway, and others will filter into a basket for manual removal. For solids, these pass into a basket which is also manually removed. Depending on the frequency of use, the basket will normally need to be emptied bi-monthly or annually. The material then needs to be disposed of whilst complying with guidance from Environmental Health.

It is important for not only health and safety, but for composting, that the toilets are well ventilated. Some designs require a pipe, and others have a pedestal that incorporates this. In order to speed up the composting process, some designs will also require the addition of a soak – this is compiled of either wood shavings or straw.

What complicates the simplicity of the toilet is when water, even a minimal amount, is required. Some designs require a small flush. For the purposes of our study, we may have to rule this out as there is no mains water supply or sewage pipe.

Lighting

Due to the cost implications of installing electricity to the toilet provision there are several, lower cost options that could be explored further:

1. A single solar panel for each unit to power LED lighting and a fan (estimated cost approximately £430)
2. Creating a white interior to reflect any light
3. Roof lighting via skylight or light pipe

Case Study: NatSol



Figure 2 Waterless toilet designed for bird watchers.

NatSol provide waterless toilets across the UK to various clients including Natural England, The National Trust, and The Forestry Commission. There are several models that could meet our brief, however none are supplied with lighting and appears that the housing structures are not always included in the price of the toilet. The full access toilet appears to be the most suitable as it has wheelchair accessibility, and is suitable for low to medium site use.

Positioning

NatSol do not specify any particular positioning, however ground works may need to be completed for an underground 'vault', or above ground 'vault' depending on the model that is selected.

With regards to ventilation, NatSol claim that most of the ventilation takes place in the specially designed toilet pedestal. If the structure is fully enclosed then a 1W fan would be required, although taking into account the site on this occasion it is likely that that structure would not be completely sealed.

Disabled Access

The full access model appears to be the most appropriate to accommodate wheelchair access. This would however have to be adapted to comply with building regulations.

Usage

A full access toilet can be used up to 25 times per day, and it appears that there is no limit to the usage for a zero discharge option. However, each model is designed to suit different usage requirements.

Waste removal

NatSol states that their designs require little maintenance, although the zero discharge model requires being emptied by tanker. The full access model features a soak away for urine and compost chamber under the floor.

Cleaning

NatSol recommend using multi surface cleaning solution and flushing with approximately a litre of

clean water. However, due to the lack of on site water this may not be viable unless the cleaning team were able to transport this on site.

Price

FULL ACCESS:

without a building £3950*

with a building and grab rail kit £6450* (an additional £2500)

COMPACT: Urine separating pedestal, with solids collected in a basket for removal.

From £825* per unit

ZERO DISCHARGE PUBLIC TOILET: High use water system for public parks. Suitable for sites of Special Scientific Interest and/or in Groundwater Protection areas. Vault requires emptying by tanker. Does not include building. Approximately £5000-£6000* per unit

*price excludes VAT, installation and carriage

2 year guarantee

Case Study: Woo Woo

Woo Woo are a British company that provide waterless and compostable toilets to the public and private sector. The Kazuba model is recommended for country parks, beaches, allotments, and campsites, is adaptable and appears to be most suitable for our project. A urinal module can be attached to the main toilet. The nearest toilets available to view are situated at Beccles Allotments (KL1) and Thornham Walks (KL3).



Figure 2 Woo Woo KL2

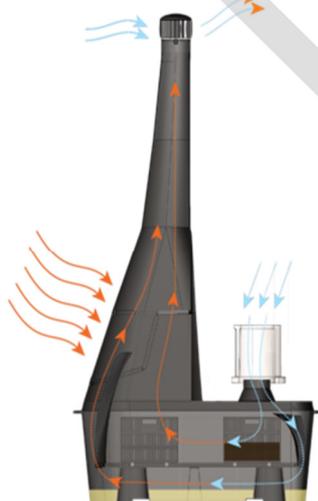


Figure 3 STK Woo Woo System

Positioning

To ensure that the toilet works, there are several considerations as to where the toilet is placed;

- It must be placed in a location which is exposed to sunlight 75% of the day. Additionally, shadows that may occur in the winter need to be taken into account.
- The location must have plenty of wind, unsheltered by trees or large buildings
- Must face South

As an additional note, the KL2 can withstand 100mph winds, which would be suitable for the new park.

Disabled Access

The Kazuba KL2 can be fitted with hand rails at an additional cost, and is already wide enough to accommodate wheelchairs. The KL2 and KL3 are compliant with Section M of Building Regulation 2010.

Usage

No data is available on this as date June 2019.

Waste removal

Like any compostable toilet, solid waste will need to be removed and monitored. According to Woo Woo, the solid waste dries out over a period of approximately a year under average conditions. However, depending on the volume of visitors using it (perhaps in Summer peak season), the toilet may need emptying on a bi-monthly basis. This waste would need to be carefully removed and either disposed of or placed into a compost bin to complete the composting process and be used on non-edible vegetation. It is suggested that 3 ply toilet tissue is not used, and that the overuse of toilet paper would mean that the toilet would be likely to fill quickly. The tank holds approximately 400litres.

Cleaning

Woo Woo suggest using eco-friendly products such as Ecover sprays and not overusing water (if available).

Price

KL2: £7795 +VAT (see appendix 3)

KL3: £9,495 + VAT (see appendix 4)



Figure 4 Woo Woo models

Case Study: Eco Loos

Eco Loos were established in Wales in 2011, providing compostable toilets to camp sites and allotments. Like Woo Woo and NatSol, they have various models available, but the most suitable is likely to be the disabled access toilet and urinal. There is more room for maneuvering and for adding a baby change facility.

Positioning

The unit should be sited on a concrete slab some 45cm wider to both sides and at the back, than the unit and with a solid concrete base to the front, enough to make easy access for a wheelchair if you are purchasing the extra large unit. This is immediately more feasible than those offered by Woo Woo or NatSol. All of Eco Loos toilets are delivered pre assembled, unlike Woo Woo and NatSol.

Disabled Access

Eco Loo have a specially designed disabled access unit, which can be adapted. Unlike NatSol and Woo Woo, the additional accessories are included in the price.

Usage

No data is available on this February 2019.

Waste removal

Solid waste is removed via a bucket, whereas liquids can either be disposed of via an excavated soakaway or directed to a bucket.

Cleaning

No specific cleaning instructions have been identified.

Pricing

Standard – 900mm x 1200mm deep x 2150mm high - £1,395.00

Medium – 1200mm x 1200mm deep x 2150mm high - £1,550.00

Disabled access for wheelchair users – 1550mm x 1550mm deep x 2150mm high - £2350.00

ADDITIONAL FEATURES: Outlined in Appendix 2



Figure 5 Eco Loo disabled access toilet and urinal

Case Study: PropelAir

PropelAir is based on an air flush system and significantly more eco friendly than the function of a traditional toilet, however they do require a small amount of water and electricity and would need to be connected to the main sewer supply.

Current clients include McDonalds and Thames Water.

In 2018, as part of the national Changing Places initiative, Droitwich introduced PropelAir toilets, uses 84%

less water than a traditional toilet system and up to 80% less energy is required for water and waste processing – leading to a reduction of 74% in the carbon footprint of the loos. As the system requires the lid to be shut before flushing to create an air tight seal, this is more hygienic reducing airborne germs by 95%.

However in comparison, as part of its recent refurbishment Norfolk County Council's County Hall installed PropelAir toilets on each floor. There were numerous problems with these including the system backing up across the building due to the underestimation of the size of piping and several reports of toilets 'exploding' were logged. They were subsequently removed as it was evident that the mains sewer and waste pipes could not cope, which contradicted PropelAir's claims of being suitable to connect to existing drains using 2 inch / 50mm flexible waste pipe which the air flush can push the waste through without a gradient. In addition, the maintenance costs outweighed the benefits.

Whilst Propelair reduces water and sewage bills by up to 60%, it is the least practical option for our site due to anticipated groundwork costs, and can therefore rule this out as an option fairly early on in our study.

Pricing

The cost of a single Propelair unit is £675 + VAT, with an additional installation cost of approximately £175 per unit. The toilet is designed to be maintenance free for life (WRAS has independently tested the toilet to 200,000 cycles, which is equivalent to 27 flushes a day for 20 years). We would also need to take into consideration the housing structure and groundwork costs (estimated to be £80,000-£100,000 by East Suffolk Council's Assets team).

An electrical supply is required (battery or mains version), although the cost of this is minimal with 1000 PropelAir flushes costing approximately 4p on a standard tariff, which represents 1/1000th of the potential water saving.



Figure 6 PropelAir

1 Propelair® has a two-section cistern; one for air and one for water.

2 Before flushing, the lid is closed to form a seal.

3 When the flush button is pressed water enters the pan to wash it, followed by air from the unique patented pump. The air cannot escape due to the sealed lid. This pushes out the entire contents of the pan to give a powerful, reliable flush.

4 The remaining water refills the water trap.

5 The flush is completed in 3 seconds with the toilet ready to be re-flushed in around 20 seconds (subject to water supply pressure).

Case Study: Use of repurposed water

Repurposed water from lakes and rainwater is commonly used to flush public conveniences. However as it has not been purified, a process that can be costly, it cannot be used for bathing or handwashing.

Rainwater harvesting tanks can easily filter and store up to 6,500 litres of clean water (Ferguson, 2014) in comparison to a water butt that can store up to 200 litres. Some systems require groundworks, whereas others can sit within the roof structure. However, there is still a requirement to feed into the raw sewage network.

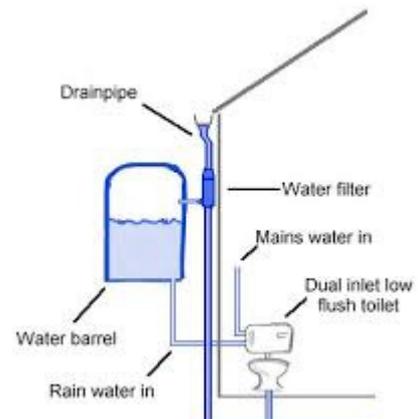


Figure 7 Simple rainwater system for eco toilet

For many years, Chatsworth House and estate have operated on a complex water management system. This consists of using recycled water from their lakes and streams to flush their visitor toilets, and waterless toilets in their outdoor education centre.

The water management system appears to have been in place for centuries, having initially been installed for the estates fountains, working on a gravitational system. This was later adapted to be used in the visitor toilets, which consist of regular porcelain pedestals, although information on the operation is limited.

Upon investigation it would be too expensive to convert rainwater or sea water into a quality suitable for handwashing or even drinking, and there is no guarantee that there would be enough water to flush in a peak period. Access to the main sewer is likely to be the biggest impact and therefore it does not appear that this would be a viable option.

Conclusion

Whilst the project group are keen to explore the option of placing new toilets on site, as determined in the introduction, local councils have no legal obligation under the Public Health Act 1936 to provide public toilets. With budget cuts it is likely that, even as a temporary solution, the public would need to be directed to Sparrows Nest Gardens as these facilities are already established. It may be difficult for councillors to approve or commit to additional costs to the site as this would need to be justified in a business case. There is no guarantee that funding will be secured from the private sector for the build and installation, and with the close proximity of the park to the current existing provisions in Sparrows Nest it could make it difficult to make a case to funders for toilet provision.

In order to create a strong case, many factors would need to be considered. Whilst toilet provision would be beneficial to visitors of the site, it is unlikely that a majority of visitors will stay on the site all day. However, with the park placed within a Historic Action Zone and conservation area surrounded by independent retailers and museums, we want to encourage visitors to explore the area. Therefore retaining the use of the toilets at Sparrows Nest and the Triangle Market Place on the historic High Street instead of introducing new facilities on the Ness could act as a reason for them to move on and explore the area. However, this could also have the opposite effect and encourage people to move on from the area completely.

Other implications that would need to be considered for not including toilet provision include the use of the site by families and school groups. Children cannot be allowed to wander off independently to use the provisions as this would involve being out of sight of parents/guardians and needing to cross Whapload Road (which can be busy, especially during peak season). There are also concerns relating to access from disability groups who may find it difficult to make the journey to the alternative provisions or suffer from incontinence issues. This could be seen as not providing enough access for these groups.

It has been difficult to identify which local authorities have eco toilets, with most of the case studies coming from the private sector such as Royal Parks, National Trust and Forestry Commission. We could therefore assume that there is a very limited amount in the UK under local authority ownership. It is possible that the reason for the difference in public sector ownership of eco toilets over local authorities is that eco toilets not only fit their mission statement, but have fewer restrictions on the way they spend their capital than that of a local authority and as a result allows them to invest in environmentally friendly facilities. We can see from the BBC FOI report, nationally there has been a decline of local authority public conveniences, as owners are opting to close these in order to address budget cuts and increasing maintenance costs. Taking this into consideration, introducing eco toilets on site could set a standard for local authorities, starting with East Suffolk Council and Lowestoft Town Council.

There is a growing trend and need for eco friendly options, accentuated by the increased profile and public awareness of the long term damaging effects of pollution on the environment, but we must be conscious that compostable and eco toilet technology is still being developed. For the development of the park the concept is ideal due to (in most cases) the minimal disruption to the site. Manufacturers insist in their promotional materials that whilst initial costs are high, long term eco toilets are sustainable as long as they are maintained correctly.

Eco or compostable toilets appear to be low maintenance, but when taking into consideration additional factors such as the careful disposal of the compost in line with environmental health and local authority regulations, the cost of non bleached toilet paper, eco friendly cleaning products, soak materials, and ongoing maintenance as identified in some case studies, the costs could be higher than maintaining 'regular' toilet facilities. In terms of installation, it is likely to be the cheapest option. When analysing a full bricks and mortar build to that of a compostable unit there is a significant difference in the price, and based on this alone the eco-friendly option comes out on top. This can be reviewed in Appendix 6.

Previous discussions by the project steering group have explored only providing one unisex toilet on site. However depending on the volume of use, some eco toilets need to have a period of 'rest'. To address the need for additional toilets to cater for events, there is the option to bring in additional portaloos. At this time, as the park has not yet been opened we cannot accurately determine the demand for toilet provision. The option of adding a urinal capsule has been ruled out as this, in comparison to a traditional compostable toilet, is less cost efficient and would not have much benefit.

In conclusion, it appears that the provision of eco toilets on The Ness site could be practical if funding is secured and could pave the way for local authorities. Providing these facilities could make the site a more visitor friendly destination, and encourage people to stay long term in the area.

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Appendices

Appendix 1 – Eco toilet installation information

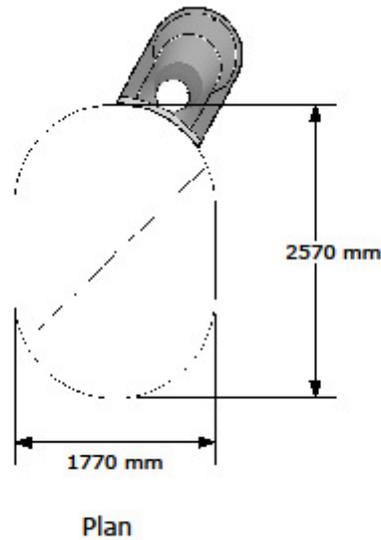
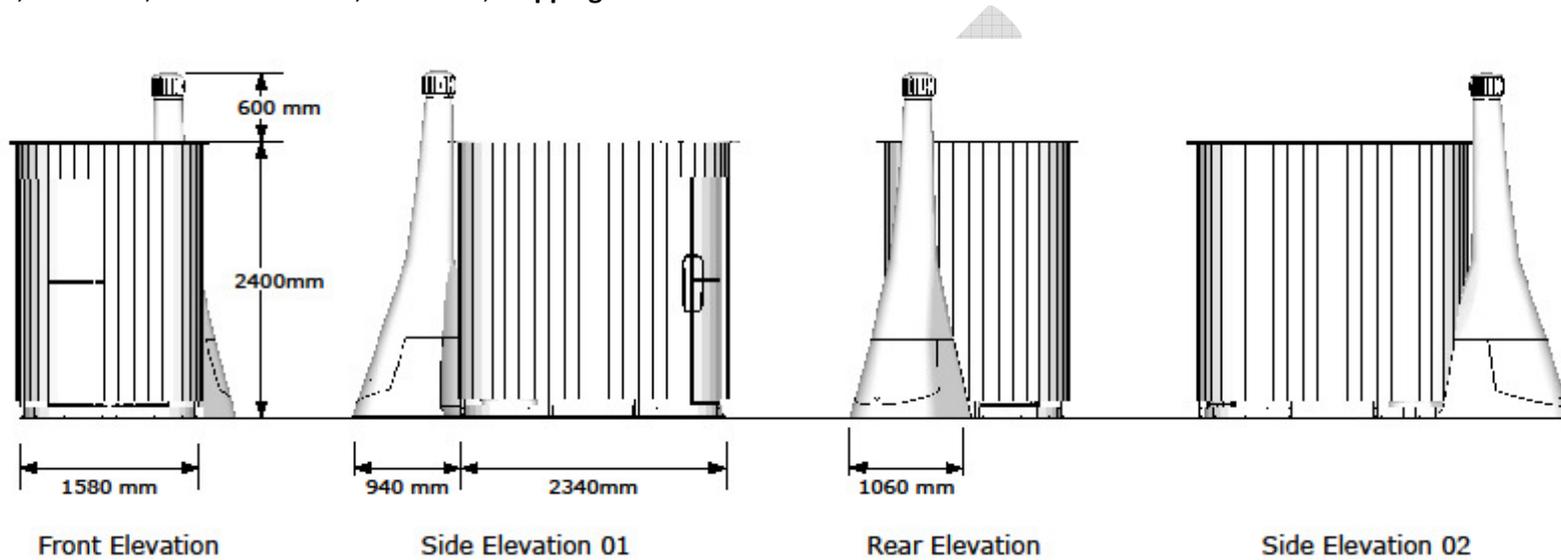
Question	NatSol	Woo Woo	Eco Loos
Is the toilet guaranteed to be odour free in normal operation?	Yes	Yes	Yes
Is a male urinal provided to ensure greater hygiene for all users?	Yes	Optional	Optional
Is a vandal resistant building available?	Yes	Unknown	Unknown
Can the system be installed in a day by an experienced installation team on a typical site?	Yes	Yes	Yes
Can it be installed in all soil types - except bedrock?	Yes	Yes	Yes
Can the toilet be installed entirely by hand without machinery?	No	No	Yes
Does the toilet have full access for wheelchair users without extensive ramps?	Yes	Yes	Yes
Is the pedestal designed to minimise fouling during normal use?	Yes	No	Yes
Is it necessary to add anything to the vaults to promote composting?	Yes	No	Yes
Is the toilet system susceptible to mechanical or electrical breakdown?	No	No	No
Is ventilation achieved without the need for an electricity?	Yes	Yes	Yes
Is urine separated or drained to avoid the need for evaporation?	Yes	Yes	Yes
Is liquid (urine) drained at a high level to avoid the need for pumping on flat sites?	Yes	Unknown	Unknown
Is the system designed to cope with high peak use?	Yes	Yes	Yes
Does it matter if the toilet is not used for lengthy periods?	No	No	No
Is fresh material kept separate from composted material (e.g. by use of twin vault design)?	Yes	Yes	Yes
Is the finished compost unpleasant to remove?	No	No	No
Are there positive testimonials available?	Yes	Unknown	Yes
Does the system require water or soak material?	Soak	None	Soak
Does the system require groundworks?	Yes	Yes	No
Can the system cope with harsh weather including strong winds?	Unknown	Yes	Yes
Does it require connectivity to mains sewer?	No	No	No

Appendix 2 – Comparison of manufacturers

Product	NatSol			Woo Woo		Eco Toilet			
	Compact	Zero Discharge	Toilet only	KL2	KL3	Standard	Medium	Disabled	Toilet Only
	£895	£5000-£6000 +VAT	£3950 +VAT	£7,795 + VAT	£9,495 + VAT	£1,395	£1,625	£2,370	£850.00
Guarantee	2 years	2 years	2 years						
Installation				<£2,100 + VAT	<£2,100 + VAT				
Shipping				<£495 + VAT	<£495 + VAT				
Timber Cubicle	No	No	No	Yes	Yes	Yes	Yes	Yes	No
Toilet seat & separator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Solid waste bins	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Urine waste bins	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Grab rails	No	No	No	No	No	No	No	Yes	No
Non slip flooring	No	No	No	No	No	Yes	Yes	Yes	No
Toilet roll holder	No	No	No	No	No	Yes	Yes	Yes	No
Led light	No	No	No	No	No	Yes	Yes	Yes	No
Coat hook & shelf	No	No	No	No	No	Yes	Yes	Yes	No
Sawdust bin & scoop	No	No	No	No	No	Yes	Yes	Yes	Yes
Sliding internal bolt	No	No	No	No	No	Yes	Yes	Yes	No
Hand sanitiser dispenser	Yes	Yes	Yes	No	No	No	No	No	No
Optional extras									
Solar powered light	No	No	No	Source externally	Source externally	£35	£35	£35	No
Child seat	No	No	No	No	No	£65	£65	£65	No
Men's urinal plus 2 containers	No	No	No	+ £9,115 + VAT	+£9,115 + VAT	No	£350	£350	No
Extra solid waste containers	No	No	No	No	No	£20	£20	£20	£20
Extra urine containers	No	No	No	No	No	£12.50	£12.50	£12.50	£12.50
Baby changing unit	No	No	No	No	No	No	£295	£295	No
Building and grab rail kit	No	No	+ £2500	No	No	No	No	Included	No

Appendix 3 – Woo Woo KL2

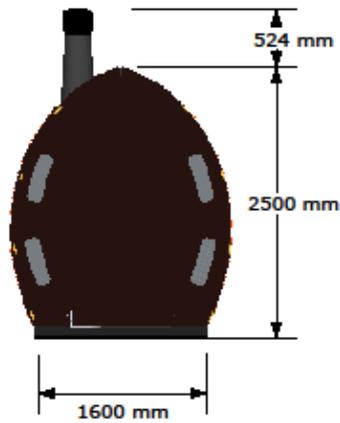
Unit cost: £7,795 + VAT; Installation: <£2,100 + VAT; Shipping: <£495 + VAT



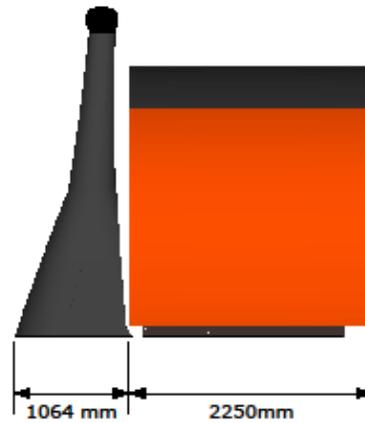
Woo Woo	Kazubaloo 2 prm	
	Date 17.08.2012	1:50
Woo Woo 020 3051 0738 www.waterlesstoilets.co.uk	Drg.no.KL2prm	
	Dm.J.Young	

Appendix 4 – Woo Woo KL3

Unit Cost: £9,495 + VAT; Installation: <£2,100 + VAT; Shipping: <£495 + VAT



front elevation



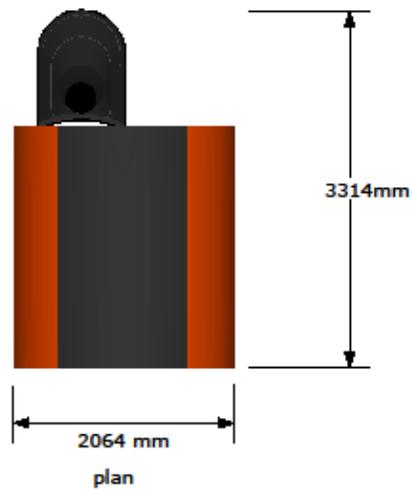
side elevation 01



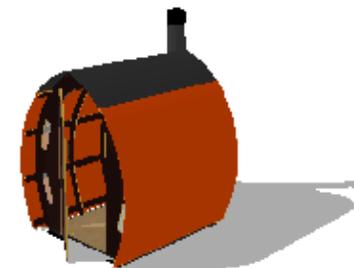
rear elevation



side elevation 02



plan



Woo Woo	Kazubaloo 3	
	Date: 10.07.12	1:50
Woo Woo - Waterless Toilets Tel: 020 3051 0738 www.waterlesstoilets.co.uk	Drg.No.KL3001	
	Dm. J. Young	

Appendix 5 – Recorded usage of public conveniences in Lowestoft 2015/16

Toilet	All Year	Summer Only	Disabled	Summer Count 1/4-31/10	Winter Count 1/11-31/3	Total annual Count
Triangle Market	Yes		Yes	1112	1082	57164
Sparrows Nest	Yes		Yes	574	383	25646
Gordon Road	Yes		Yes	2681	1964	123638
Royal Plain	Yes		Yes	1028	829	49078
Jubilee North		Yes	Yes	1708	N/A	51240
Jubilee South		Yes		889	N/A	26670
Kensington Gardens	Yes			0	971	61742
Kirkley Cliff Road	Yes		Yes	0	828	52626
Pakefield Street	Yes		Yes	0	201	10632
Normanston Park	Yes		Yes	0	240	15270
Lowestoft Cemetery	Yes		Yes	0	139	7348

Costs per user using recorded usage against allocated costs

Toilet	Running costs p/user	Total annual Count	Running cost
Triangle Market	£0.14	57164	£7803.28
Sparrows Nest	£0.21	25646	£5391.96
Kensington Gardens	£0.10	61742	£6221.31
Kirkley Cliff Road	£0.28	52626	£14956.41
Pakefield Street	£0.82	10632	£8760.2
Normanston Park	£0.39	15270	£5926.59
Lowestoft Cemetery	£0.83	7348	£6094.16

Appendix 6 – Breakdown of estimated costs for preferred eco option vs traditional from Norse Facilities Management June 2019

Woo Woo KL2	
Unit Cost	£7,795 + VAT x2
Installation	<£2,100 + VAT x2
Shipping	<£495 + VAT x2
Sawdust bin & scoop	£9.40 (sourced from Amazon)
Remote security locking	Unknown
Hand sanitiser dispenser	£20
Solar powered light	£200
Baby changing unit	£295
Building and grab rail kit	£300
Excavation contingency	£10,000
TOTAL	£34,290 + VAT
Maintenance (per annum)	
Hand sanitiser	£1200
General cleaning/maintenance	£4,586
Soak	Unknown
TOTAL	£5,786 per annum

Traditional bricks and mortar (based on being able to connect to utilities and two cubicles)	
Build & installation	£80,000-£100,000
Maintenance (per annum)	
Water & sewage charges	Unknown
General cleaning/maintenance	£4,586
Soap	Unknown
TOTAL	£4,586+ per annum