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FLOOD RISK ASSESSMENT

On

**Land at Wombwell lane
Barnsley
South Yorkshire
S70 3NS**

For

G & N Properties Ltd.

E15/5434/FR001

July 2015

Prepared by

T. Haigh. B.Sc., C.Eng., M.I.C.E.



INTRODUCTION

This report is commissioned to investigate and report on the Flood Risk for this site in accordance NPPF 2012 and the proposals call for change of use from industrial storage land to industrial warehouse / development. The report is based on information supplied by the client and from relevant authorities in both written and verbal format. Some of this information is in verbal form only. No liability can be accepted for information supplied by third parties which is subsequently found to be inaccurate or incorrect.

THE SITE

The site currently consists of open land that had previously been used for vehicle storage. A survey carried out in 2005 shows the site completely covered in concrete hardstanding and floodlighting. Parts of this surface appear have now been broken up by vegetation but the whole of the site fell towards the watercourse on its northern boundary. The watercourse is named as Dob Sike. This is where the surface water from the hardstanding would run off to. Immediately down stream of the site this runs in culvert beneath existing development. The site is approx. 0.7Ha in total area and as such would not normally require a SSFRA. Its OS Grid ref is SE 37792 05012. It sits adjacent to Caulk Lane and in close proximity to the old canal which forms its southern boundary.

The site is generally flat but with significant falls from south to north. Site levels vary from 51 to 48m AOD across the site, i.e. south to north with only a slight fall from north to south.

To the north there is a small watercourses that discharges to the east across the previously developed site.

FLOODING RISKS

National Planning Policy Framework 2012 requires that Flood Risk Assessments review whether or not the development of a site will not add to and should where practicable reduce the flood risk for both on site and off site properties. The future users of the development must



not be placed in danger from flooding and should remain so throughout the lifetime of the proposed development. It also requires that the effects of climate change are taken into account together with the impacts of extreme events and flood defence failures. To this extent the Sequential Test outlined in NPPF, must be applied to each development site.

Based on the published Environment Agency Flood Risk Maps the development site does not fall within the 1% Flood Risk area (Zone 3) nor does the site fall within the 0.1% Flood Risk area (zone 2). The development site predominantly falls within Zone 1. The proposed development of industrial development falls within the Less Vulnerable Classification in Table 02 of Annex D to NPPF. The site has previously been partially developed for Industrial use. The development is therefore considered appropriate and the sequential test considered as satisfied.

1. NPPF requires that each flooding mechanism is addressed and levels of risk evaluated. We consider there are three main risks of flooding to the site, the alternative mechanisms are not applicable to this site.
2. Inundation from floodwaters leaving watercourses or rivers entering the site. This can include the effects on culverted watercourses and from breach scenarios.
3. Rainwater falling on the site and not being able to leave the site at sufficient rate to prevent flooding on the site.
4. Overland flows from adjacent land sites.
5. The impact of the developed site on the existing drainage systems and off-site surface water systems must also be assessed as part of this flood risk assessment.
6. The speed and impact of any flooding due to breaches should be assessed along with flood warning systems so that there is a safe evacuation route for persons on site or access for emergency vehicles.

Each flood risk source will be discussed and evaluated in turn.



1. Flood Risk from Watercourses, River & Tidal

The nearest watercourse, Dob Sike runs along the northern boundary and its invert levels are up to 1.5m below the lowest site level. The EA maps show that the site is not at risk of flooding for either the 100 year flood or the 1000 year flood. The plans for the risk of flooding from surface water shows some slight encroachment on to the site. The site has not been previously flooded during any of the major events of the last few years. Copies of the EA documents showing the flood outlines are attached to this report.

A copy of the E.A Flood risk map is attached to this report. The development site falls outside the 0.1% Flood risk areas denoted by the maps. We therefore consider the risk of flooding of the site from fluvial sources within Zone 1 but the site may become isolated during flood periods and it would be prudent for owners to subscribe to the E.A flood warning system. The risk of fluvial flooding to this site is considered acceptable for the proposed development.

2. Risk of Flooding from Rainwater Falling on Site

The development site is open land previously completely covered by concrete hardstandings that drained down to Dob Sike. We have limited details of the near surface geology beneath the site which indicate the site to be covered with fills overlying sandy clays up to 2m thick which in turn overlays mudstone. There are no proposals to increase the impermeable surfaces of the site and no new off site surface water drainage is to be provided. Surface water drainage would have to be discharged to the existing surface water systems. This suggests that they all discharged directly to the adjacent watercourse. The development will not therefore present any increase in storm-water flows and all run off from existing roofs will pass into the existing drainage systems. There is little possibility that the site would become waterlogged under sustained rainfall but the use of permeable pavements and hard-standings may help on this site.

Since there is no increase then net run off from the site would be slightly reduced for all storm conditions. The current policy for brownfield sites is to limit discharges to 70 % of the original discharge from the site where possible.



If a direct connection was to be made to the watercourse then on-site drainage may have to be attenuated and flows limited to agreed rates of discharge. This would entail the use of onsite storage tanks and an hydraulic flow control device to limit flows. The volumes of storage required would depend on the allowable discharge from the site but these should be designed to cater for the 100 year storm plus due allowance for climatic change as outlined in Table B.2 of NPPF.

3. Risk of Flooding from overland flows from off Site

Due to the topography of the surrounding land and the flood defences there is a slight risk of overland flows from the land to the west and south. These flows would generally be shallow and slow moving. The former canal on the southern boundary cuts off any overland from the south. The land to the east, west and north is substantially lower than the site and does not therefore present a flood risk.

The catchments to the west into Dob Sike are quite large but the areas are open agricultural land with significant rainwater up take so normal storms would not present a risk. The slight rise in ground levels on the site means it is defended from the watercourse. Any out flows from the watercourse would pass to the north which affords a significant flood plain. The risk is considered acceptable for the proposed development on this site.

We would suggest that by raising floor levels slightly to 200mm above existing ground levels where possible will effectively reduce the level of risk of flooding to the properties without displacing any flood waters.

4. The impact of the developed site on the existing drainage systems and off-site surface water systems

There are known problems with the downstream catchment that has produced significant flooding adjacent to the watercourse in recent years. It is therefore necessary to ensure that stormwater flows from the site are limited to current discharge rates or below. The redevelopment of the site would have a minimal impact on the downstream surface water as the impermeable areas are slightly reduced from the current impermeable areas. Provided the discharges from the site was not increased by redevelopment of the site, and if necessary

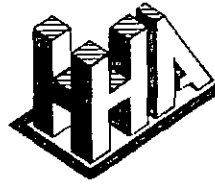


new run off was attenuated, and controlled to agreed current discharge rates, so that existing flows are not exceeded, this would ensure that the development would not increase the flood risk to properties downstream of the site.

5. Speed of flooding and access for emergency vehicles.

The main access road into the development site, through the recently developed areas would not be subject to flooding up to the 100year storm and as such is not liable to become flooded during extreme events. In this condition it is possible that vehicular access could be prohibited during a 1 in 1000year event but it is not considered to be such that the roads would not allow access for emergency vehicles away from the site during normal flood events.

The duration of this flooding could be quite short due to the nature of the catchment. Conversely the probability of rapid flooding would be low. This element of risk is considered acceptable as pedestrian and vehicular egress would still be possible.



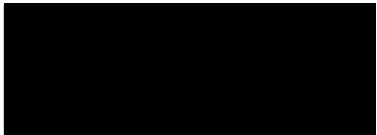
CONCLUSIONS

The development site is not shown to be at risk of flooding from River or tidal water flows for storms up to and above the 1% risk as defined by the Environment Agency Flood Risk Maps. It is shown not to be at risk for the 0.1% storm condition. In our opinion the site falls within zone 1 and as such would be at an acceptable level of risk from fluvial flooding.

There is a very slight risk of overland flows entering the northern section of the site and overland flows from blockages to the culverted watercourse adjacent to the site. The raising of floor level to 300mm above existing ground levels would provide sufficient protection to dwelling against such a scenario.

Storm-water storage elements if required on site could be designed to cater for up to 100 year storm plus an allowance for climate change without increasing run off from the site.

The risk of flooding from fluvial sources would appear to fall outside the current 0.1% risk criteria but the site could become isolated during extreme events and it would be recommended that the occupants subscribe to the EA Flood warning system.



Trevor Haigh B.Sc., C.Eng., M.I.C.E.

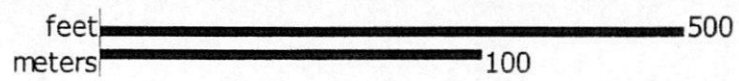
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APPENDIX A

LOCATION PLANS & AERIAL VIEW



Google earth



APPENDIX B

FLOOD RISK MAPS



Enter a postcode or place name:

Other topics for this area...

Flood Map for Planning (Rivers and Sea)



Flood Map for Planning (Rivers and Sea)



Map legend

Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in.

☒ Flood Map for Planning (Rivers and Sea)

☐ Flood Zone 3

Flood Zone 2

☒ Flood defences (Not all may be shown*)

☒ Areas benefiting from flood defences (Not all may be shown*)

☒ Main Rivers

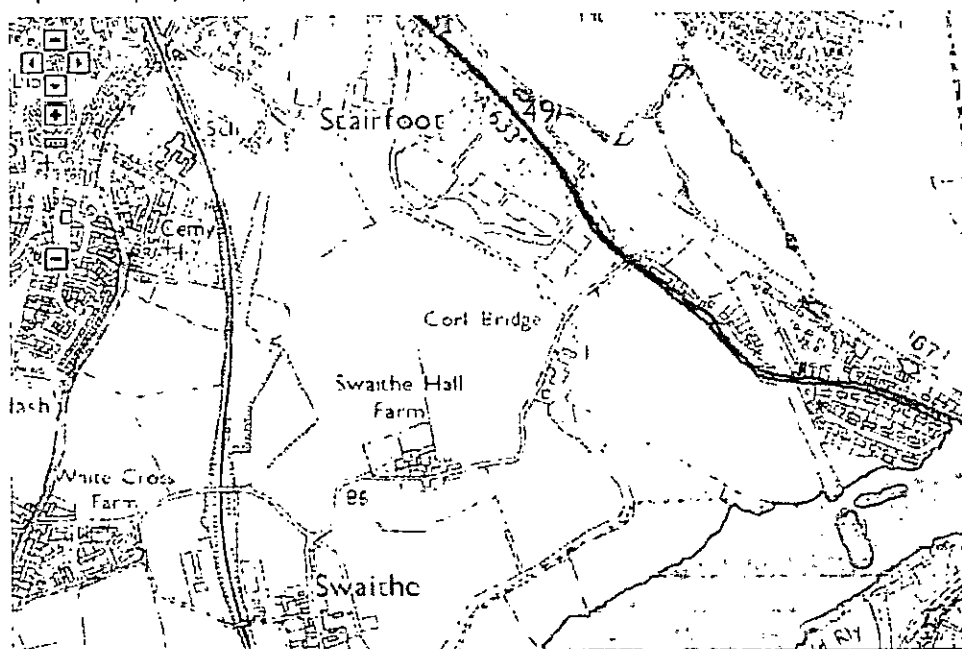
River line

Map of X: 437,610; Y: 404,718 at scale 1:10,000

Other maps

Data search

Text only version



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More about flooding:

Understanding the Flood Map for Planning (Rivers and Sea)

A more detailed explanation to help you understand the flood map shown above.

Current flood warnings

We provide flood warnings online 24 hours a day. Find out the current flood warning status in your local area.

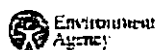
* Legend Information: Flood defences and the areas benefiting from them are gradually being added through updates. Please contact your local environment agency office for further details.

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Risk of Flooding from Rivers and Sea



View other Interactive Maps

Risk of Flooding from Rivers and Sea

River flooding happens when a river cannot cope with the amount of water draining into it from the surrounding land. Sea flooding happens when there are high tides and stormy conditions.

The shading on the map shows the risk of flooding from rivers and the sea in this particular area.

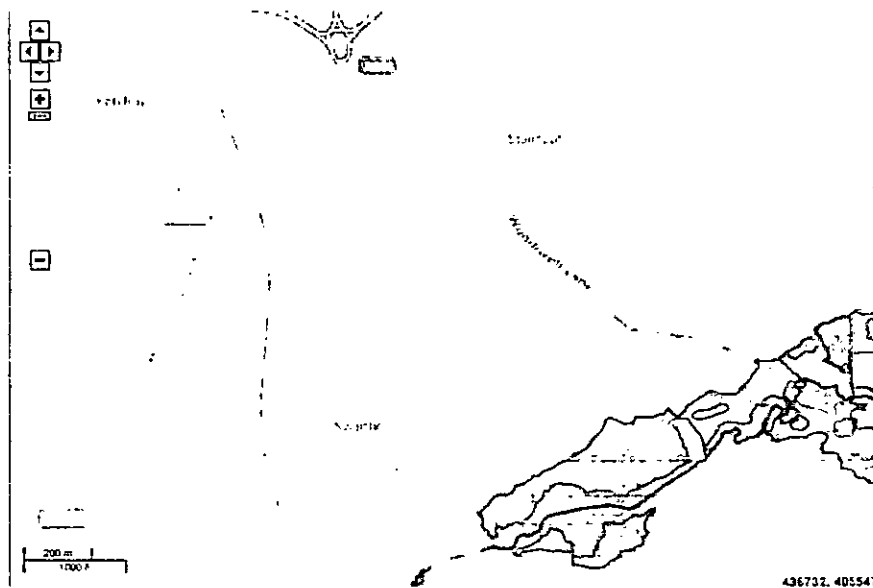
Click on the map for a more detailed explanation.

Map legend

- ☒ Risk of Flooding from Rivers and Sea
- ☒ High
- ☒ Medium
- ☒ Low
- ☒ Very Low

Map of X: 437,610; Y: 404,718 at scale 1:10,000

Data search



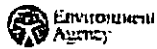
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Risk of Flooding from Reservoirs

View other Interactive Maps

Risk of Flooding from Reservoirs

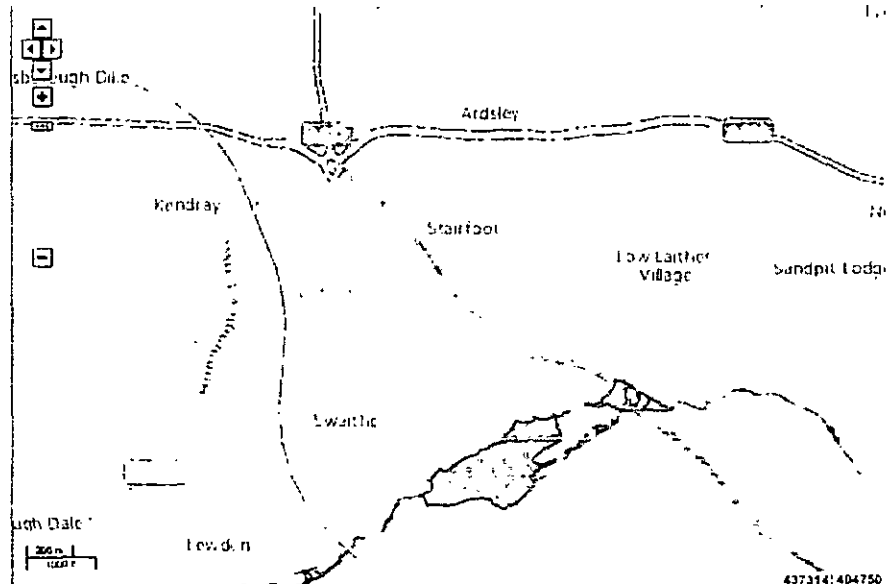
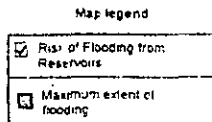
Reservoir flooding is extremely unlikely to happen.

The shading on the map shows the area that could be flooded if a large reservoir were to fail and release the water it holds. A large reservoir is one that holds over 25,000 cubic metres of water, equivalent to approximately 10 Olympic sized swimming pools. Since this is a worst case scenario, it's unlikely that any actual flood would be this large.

Click on the shading to see details of reservoirs that could cause flooding in this area.

Map of X: 437,818; Y: 404,900 at scale 1:15,000

Data search



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Risk of Flooding from Surface Water

[View other interactive Maps.](#)

Risk of Flooding from Surface Water

Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

The shading on the map shows the risk of flooding from surface water in this particular area.

Click on the map for a more detailed explanation.

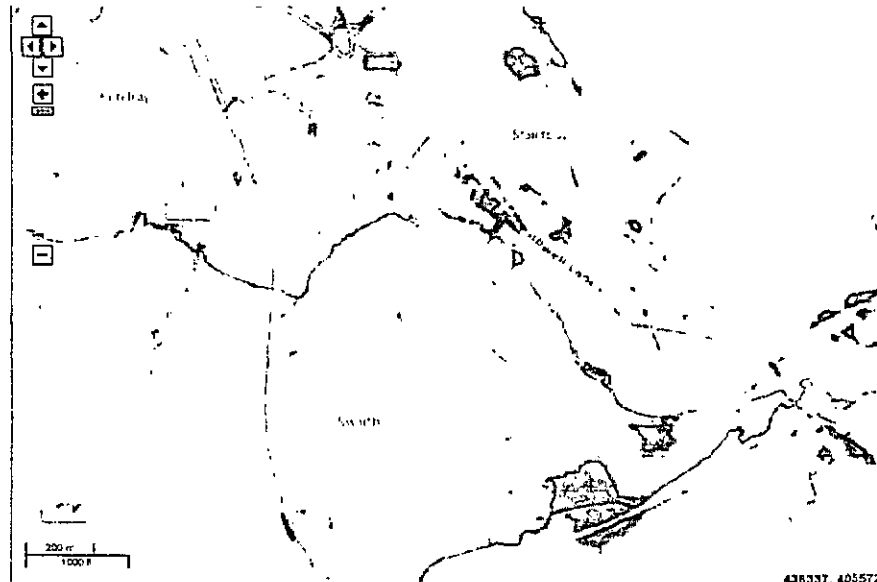
Map of X: 437,610; Y: 404,718 at scale 1:10,000

[Data search](#)

Map legend

☒ Risk of Flooding from Surface Water

- ☒ High
- ☐ Medium
- ☐ Low
- ☐ Very Low



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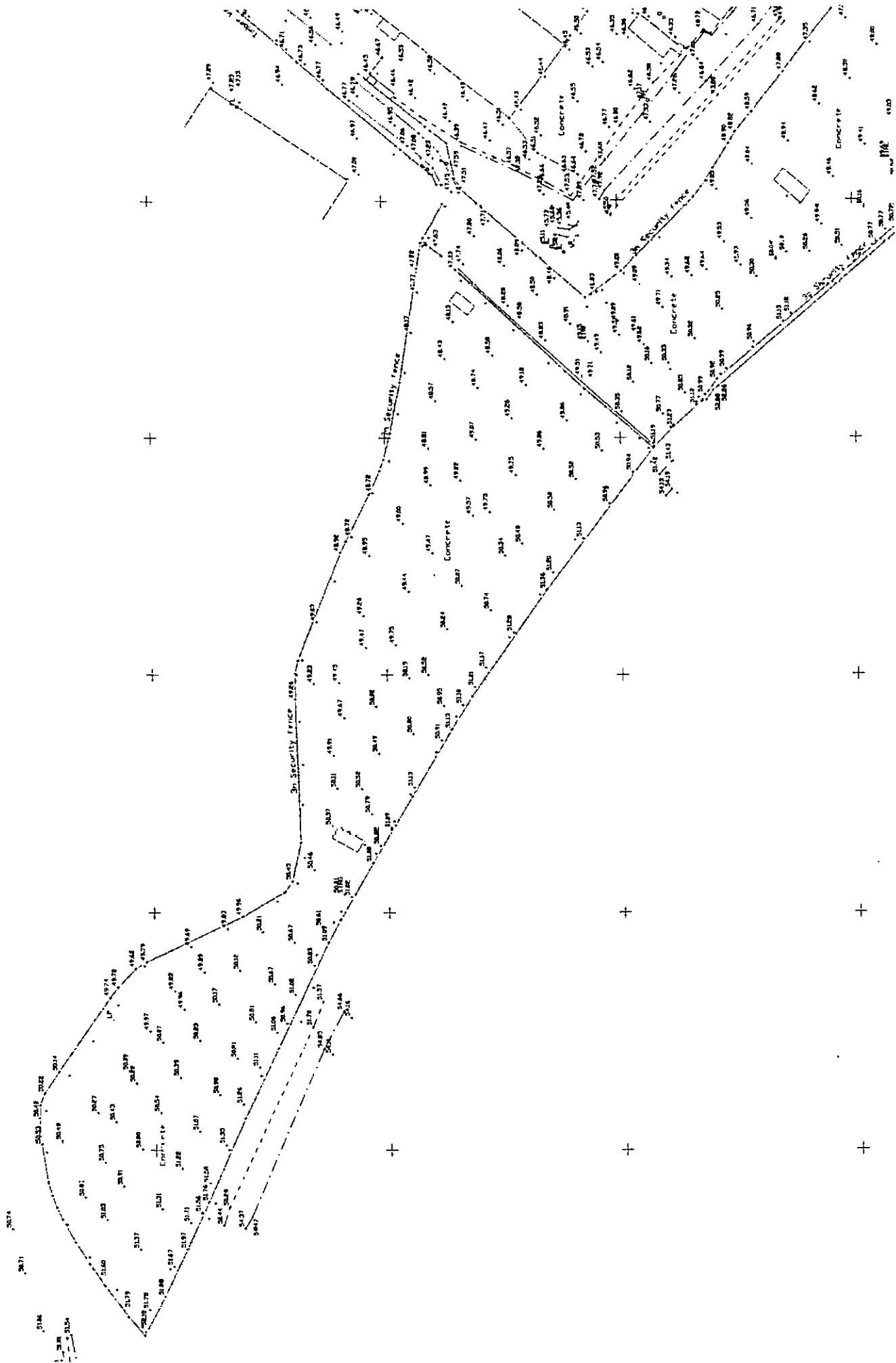
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APPENDIX C

SITE SURVEY



APPENDIX D

DRAINAGE FEASIBILITY

