



## Project 30330: Ambergate Recreation Ground Feasibility Study Report

Client :



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**30330: Amber Valley Borough Council**
**Ambergate Recreation Ground Feasibility Study**
**Report**
**Revision Control Schedule**

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Revision: A

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## **1.0 Introduction**

Alliance Group Solutions were commissioned by Amber Valley Borough Council on 20<sup>th</sup> January 2015 to carry out an investigation and feasibility study into the problems being experienced at the Ambergate Recreation Ground with respect to water logging of the recreation ground surface.

It is our understanding that the primary driver for this project results from concerns raised by the Parish Council that the water logging of the recreation ground prevented its continued use particularly during the summer period.

This report therefore details the investigations carried out, the consultations undertaken with regulatory bodies and the options considered as viable to alleviate the problems being experienced together with subsequent conclusions and recommendations to improve the recreation ground in order to make it more useable as a community amenity during the summer months.

The report will include preliminary option design drawings and indicative target costs for the provision of design and construct services for each option considered.

The recreation ground lies on a narrow piece of land of approximately 1.5 ha to the southern outskirts of Ambergate, Derbyshire. It is situated immediately adjacent to the River Derwent and the A6 Belper to Matlock Trunk Road.

The recreation ground has always been known to suffer a high water table causing a strip midway between the road and river to become very wet during the autumn and winter months. In recent years, this has continued into the spring and summer months resulting in a large area of recreation ground being rendered unusable for its intended purpose.

## **2.0 Executive Summary**

Alliance Group Solutions were commissioned by Amber Valley Borough Council on 20<sup>th</sup> January 2015 to carry out an investigation and feasibility study into the problems being experienced at the Ambergate Recreation Ground with respect to water logging of the recreation ground surface.

It is our understanding that the primary driver for this project results from concerns raised by the Parish Council that the water logging of the recreation ground prevented its continues use particular during the summer period.

Amber Valley Borough Council provided copies of previous topographical survey data carried out by Blue Plan in 2013 and additional surveys were undertaken by 'Alliance Consulting Solutions' staff to supplement the Blue Plan data.

A three dimensional (3D) computer model of the site was then generated from the survey data obtained. Drawing No 30330/0101 in Appendix A shows the results of the surveys and the extent of the water logged ground at the time of the survey.

Following completion of the data gathering and confirmation of the deficiencies that are considered to cause the water logging, the water logging of central area of recreation ground has been confirmed to result from:-

- i) The constant inflow from natural spring at rear of No 109 Derby Road.
- ii) The lack of formal drainage route for flows from natural spring water inflow.
- iii) The local topography of recreation ground allows retained water from natural spring to spread and affect central area of the recreation ground.
- iv) Lack of land drainage system within the recreation ground.

In addition,

- i) It has been confirmed that there are no public sewers draining across the site
- ii) The site is not within an SSSI or other designated area of environmental or conservation interest.
- iii) The recreation ground has been confirmed to lie within Flood Zone 3 and is not protected by any formal flood defenses, therefore any proposed changes to the topography and drainage of the recreation ground will need to take account of the restrictions that the Environment Agency will insist upon to prevent any effect upon the recreation ground's ability to receive the same amount of flood water that it does now and also prevent the flood zone becoming extended elsewhere.

A number of options have been considered to remedy the water logging issues and these have been discussed in detail in Section 4.0 of this report.

Extensive consultations have been undertaken with the Environment Agency to establish an agreement in principal to the preferred option and as a result is is recommended that Option D be implemented to resolve the water logging issues currently being experienced on the Ambergate Recreation Ground.

The layout of proposed Option D is shown on drawing No 30330/0104 in Appendix A.

The preferred Option D will involve the re-shaping/landscaping of the topography of the recreation ground by taking earth from the slightly higher ground adjacent to the river bank and using it to raise the ground level in the centre of the recreation ground where it currently suffers from water logging. The Environment Agency have also requested that a volume of earth equal to 10% of the volume removed from the higher ground is moved to an area outside of the identified flood zone either within the recreation ground or elsewhere.

In addition to the feasibility development and consultations with the EA in relation to Option D, volumetric calculations have been undertaken and cross sections produced to enable these to be presented to the EA to gain their approval of the proposal. These are shown on drawing No 30330/0105 in Appendix A. Further notification of the EA will be required prior to the works commencing on site.

It is considered that the construction of Option D will reduce the water logging of the recreation ground and allow it to be better utilised for a range of amenity uses. However, as the site will remain part of the River Derwent's flood plain and has no formal land drainage, water logging will not be completely eliminated and may still occur during times of rainfall or in the event of a flood.

This option will require extensive works and would cause major disruption across the site whilst works are in progress and the area is re-seeded. This option would prevent the majority of site to be utilised for a period of time.

***The estimated design and construction cost of this option is £12082.00.***

### **3.0 Data Collection**

#### **3.1 Surveys of the Site**

Amber Valley Borough Council provided copies of previous topographical survey data carried out by Blue Plan in 2013.

Additional surveys were undertaken by 'Alliance Consulting Solutions' staff to supplement the Blue Plan data.

An initial visit to the site was made on 27<sup>th</sup> January 2015. The weather at the time of the visit was overcast and dry but the ground was waterlogged in the area identified as being the problem area. A further site visit was made on 12<sup>th</sup> March 2015 to undertake additional level survey of the identified problem area by use of GPS. Again, the ground was found to be waterlogged in the area identified as being the problem area.

A three dimensional (3D) computer model of the site was then generated from the survey data obtained. Drawing No 30330/0101 in Appendix A shows the results of the surveys and the extent of the water logged ground at the time of the survey.

#### **3.2 General Description of the Site**

The recreation ground lies on a narrow piece of land of approximately 1.5 ha centred on SK3491150746 to the southern outskirts of Ambergate, Derbyshire. The site is bounded by the A6 Belper to Matlock trunk road to the east and the River Derwent to the west. A pumping station and a residential garden bound the property to the north. A grazing field bounds the site to the south. Within the site is a children's play area, a football pitch, benches and picnic tables



**Fig 3.2.1 Site Boundary**



**Fig 3.2.2 General View looking South**



**Fig 3.2.3 General View looking North**



**Fig 3.2.3 General View looking South East and Showing the Water Logged Area**

The general topography of the recreation ground is that it forms a very shallow 'trough' with the A6 trunk road forming eastern high side, the centre of the recreation ground forming the bottom of the trough and the eastern bank of the River Derwent forming the western high side. The topographic survey shows that the average ground level at the A6 is 68.50m AOD, the average ground level in the lowest part of the recreation ground is 64.10m AOD and the average ground level of the western boundary of the site is 65.60m AOD.

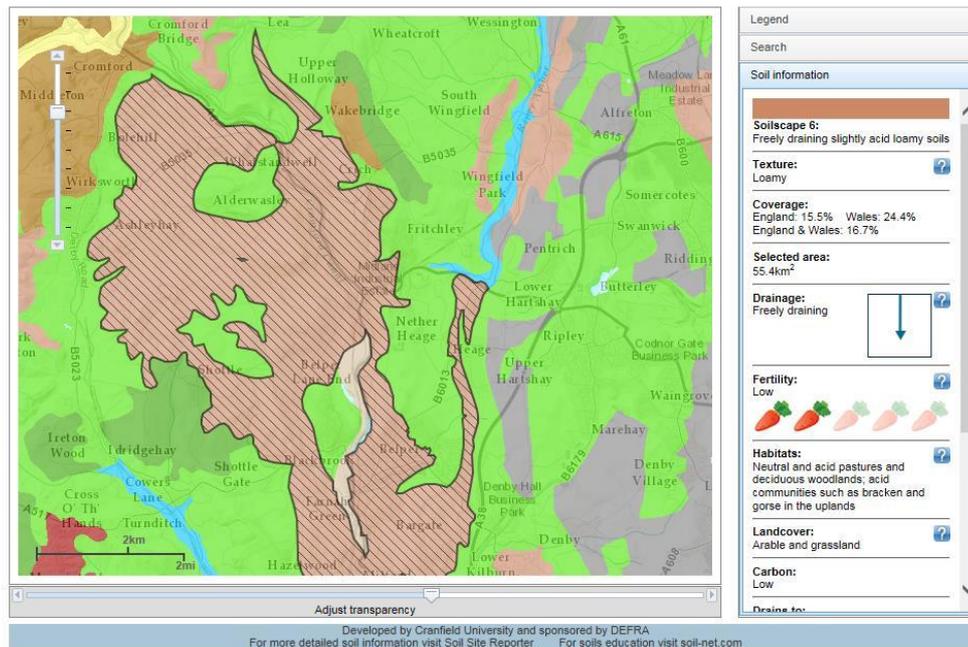
At the time of the initial site visit and subsequent site survey, the ponding and water logged ground occurs at a level of between 64.20m AOD across the centre of the site and 64.50m AOD closer to the source in the southeast corner of the site. The river level of the River Derwent adjacent to the site averages 62.90m AOD.

The recreation ground is not within a Site of Special Scientific Interest (SSSI) or other designated area of environmental or conservation interest.

### 3.3 Local Geology of the Site

Reference to British Geological Society web site indicates that the geology underlying the site consists of superficial alluvium (clays, silts, sand and gravel) over Ashover Grit bedrock (sandstone). The soil underlying the site is classified as deep loam (soils with moderate run-off potential and moderate adsorption potential).

Reference to the Cranfield University Soilscape web site indicates that the geology around Ambergate is a freely draining slightly acid loamy soils as shown in Fig 3.3.1 below.



**Fig 3.3.1 Extract from Soilscape**

### 3.4 Drainage and Hydrology of the Site

It is believed there is no formal land drainage system serving the recreation ground.

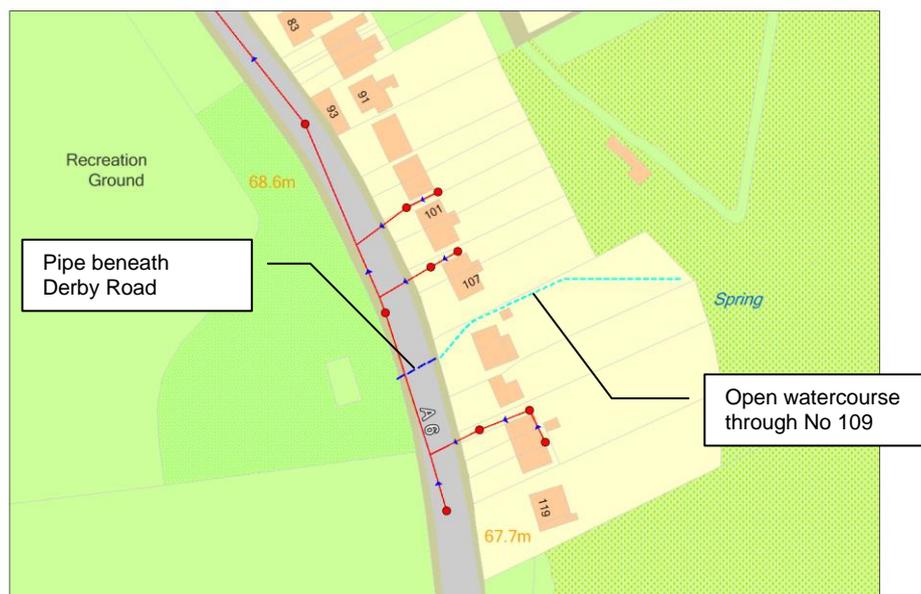
Reference to Severn Trent Water's sewer records shows that there are no public sewers crossing the recreation ground. The records show that there is a public combined sewer of 225mm diameter within the Derby Road that discharges into the Sewage Pumping Station (SPS) situated on the northern boundary of the recreation ground. This SPS pumps all over its received flows to the public sewer at the junction of the A6 and the A610 to the north of the recreation ground. The records also show that the SPS has an overflow pipe that discharges directly into the River Derwent that flows in a southerly direction and forms the western boundary of the recreation ground as shown in Fig 3.4.1 below.



**Fig 3.4.1 Public Sewers**

At the southern boundary of the recreation ground, there is a un-restrained watercourse crossing from the retaining wall supporting the A6 trunk road towards the River Derwent but the topography of the ground in this area means that the water is now retained on the recreation ground and then flows across the neighbouring agricultural land to the south of the recreation ground.

Further investigation of this watercourse has shown that its source appears to be a natural ground water spring at the rear of No 109 Derby Road which then flows through an open channel within the garden of No 109 until it drops into a small chamber in the footpath of Derby Road. From this chamber it flows through a pipe beneath Derby Road that then discharges into the recreation ground as shown in Fig 3.4.2 below.



**Fig 3.4.2 Watercourse & Spring Location**

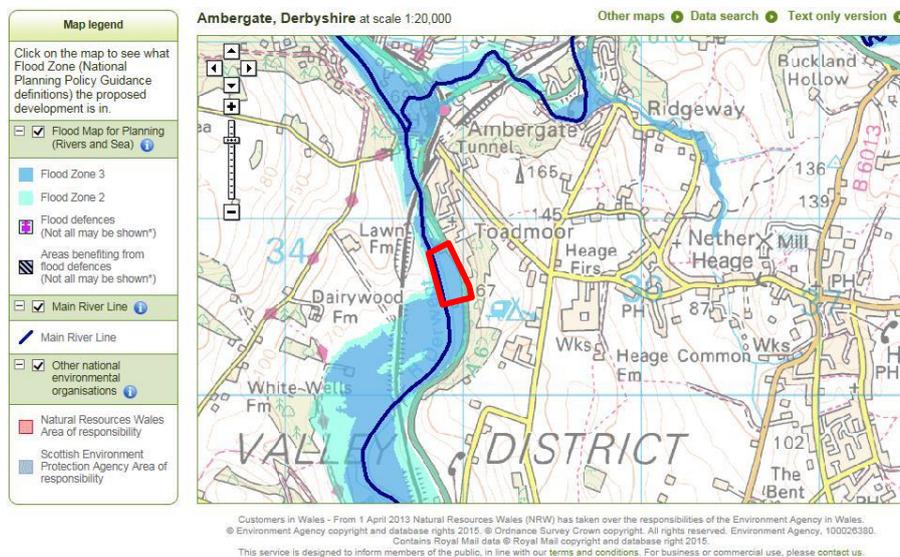
The area where the pipe discharges in south-eastern corner of the recreation ground is overgrown with a number of mature trees. The area is very water logged and contains areas of standing water, the cause of which appears to be the local topography that prevents the water having a direct route to the River Derwent. This water logging and ponding extends north through the centre of the recreation ground which is the main concern of the Parish Council.

It is considered that at some time in the past there may have been a more formal watercourse or pipeline that would have taken the flow from the spring directly to the River Derwent but examination of historical maps as far back as 1916 shows no indication of such a watercourse. It is also considered that previous dredging of the River Derwent may have resulted in the eastern river bank being increased by the deposition of removed silt and so blocking the natural route of flow from the spring. This would have trapped the flow from the spring within the area of the Recreation Ground and so resulted in the water logging currently being experienced.

Differences in topography and vegetation and further waterlogging continuing across the site and in fields to the south of the recreation ground suggest a paleo-channel runs adjacent to the current river channel.

However, it is not possible to prove or disprove either of the above theories but it is considered that the root cause of the water logging of the centre of the recreation ground is the lack of suitable drainage route for the flows emanating from the spring at the rear of No 109 Derby Road and discharging into the south-eastern corner of the recreation ground.

Reference to Environment Agency sources indicate that the majority of the site lies within Flood Zone 3 and could be effected by a fluvial flooding event that has a 1 per cent (1 in 100) or greater chance of happening each year as shown in Fig 3.4.3 below. The sources do not indicate any existing flood defences along the River Derwent in this area. It is assumed that the embankment is the result of historic flood management or dredging.



**Fig 3.4.3 Extract from EA Web Site**

At the time of the initial site visit and subsequent site survey, the ponding and waterlogged ground occurs at a level of between 64.2mAOD across the centre of the site and 64.5mAOD closer to the source in the southeast corner of the site. The river level of the River Derwent adjacent to the site averages 62.9mAOD.

### 3.5 Summary of Data Gathering

Table 3.5.1 below summarises the results of the surveys and data-collection and the problems that need to be resolved.

**Table 3.5.1 Summary of Data Gathering**

<i>Item</i>	<i>Deficiencies to be Resolved</i>	<i>Reason (Risks)</i>
1	Water logging of central area of recreation ground.	Constant inflow from natural spring at rear of No 109 Derby Road.
2		Lack of formal drainage route for flows from natural spring water inflow.
3		Local topography of recreation ground allows retained water from natural spring to spread and affect central area of the recreation ground.
4		Lack of land drainage system within the recreation ground.

#### **4.0 Consideration of Options**

Following completion of the data gathering and confirmation of the deficiencies that are considered to cause the water logging, the next step of the project was to assess the available options to alleviate the problems being experienced. As detailed in section 3.0 the cause of the water logging of central area of recreation ground has been confirmed to result from:-

- v) The constant inflow from natural spring at rear of No 109 Derby Road.
- vi) The lack of formal drainage route for flows from natural spring water inflow.
- vii) The local topography of recreation ground allows retained water from natural spring to spread and affect central area of the recreation ground.
- viii) Lack of land drainage system within the recreation ground.

In addition,

- i) It has been confirmed that there are no public sewers draining across the site
- ii) The site is not within an SSSI or other designated area of environmental or conservation interest.
- iii) The recreation ground has been confirmed to lie within Flood Zone 3 and is not protected by any formal flood defenses, therefore any proposed changes to the topography and drainage of the recreation ground will need to take account of the restrictions that the Environment Agency will insist upon to prevent any effect upon the recreation ground's ability to receive the same amount of flood water that it does now and also prevent the flood zone becoming extended elsewhere.

In view of the above, Table 4.1 below summarises the options considered viable to alleviate the water logging of the site. All drawings referred to are contained in Appendix A.

**Table 4.1 Considerations of Options**

<b>Option</b>	<b>Proposed</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Cost</b>
<b>A</b>	Do nothing.	Zero cost and disruption.	Does not resolve the problem.	<b>Zero</b>
<b>B</b>	Installation of a new land drainage system to drain the central and south-east corner of the recreation ground and discharge directly into the River Derwent at the south-west corner of the site. As Drg No 30330/0102	Will improve the drainage of the central area and the south-eastern corner of the recreation ground reducing waterlogging in the central area.  The overall capacity of the flood plain is not affected.	Minor disruption to the recreation ground whilst works are in progress.  Environment Agency objection to method that results in runoff being discharged into the river at a higher rate than the current/natural conditions.	<b>£26588.00</b>
<b>C</b>	Construction of new open watercourse across the southern boundary of the recreation ground to drain the inflow from the spring directly to the River Derwent. As Drg No 30330/0103	Will improve the drainage of the south-eastern corner of the recreation ground and also reducing waterlogging in the central area.  The overall capacity of the flood plain is not affected.	Some disruption to the recreation ground whilst works are in progress.  Environment Agency objection to method that results in runoff being discharged into the river at a higher rate than the current/natural conditions.	<b>£9580.00</b>
<b>D</b>	Re shaping/landscaping of the recreation ground to raise the ground level in the central area using material removed from the higher adjacent river bank. As Drg No 30330/0104	This will significantly reduce the waterlogging in the problem area and allow the site to be better utilised for a range of amenity uses.  The overall capacity of the flood plain is increased slightly  Environment Agency agreement to method in principal.	Major disruption to the recreation ground whilst works are in progress.  The drainage of the site is not improved therefore waterlogging may still occur during times of heavy rainfall or in the event of a flood.	<b>£12082.00</b>

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Extensive consultations have been undertaken with the Environment Agency throughout this phase of the project to gain an understanding of what works they will permit to be undertaken within the Flood Zone that the recreation ground lies within.

All four of the above options and combinations of the same have been presented to the Environment Agency. The considered preferred option by the authors was a combination of Option B and D as it was considered this would provide the most economical and reliable solution that would almost certainly eliminate the water logging of the ground in the central area of the recreation ground.

However, following the presentation of the options, the Environment Agency raised objections to any proposal that would change the current and natural rate at which water from the ground and the natural spring would be discharged into the River Derwent.

Therefore, the only option considered viable and that the Environment Agency have agreed to in principal, is Option D.

This preferred option will involve the re-shaping/landscaping of the topography of the recreation ground by taking earth from the slightly higher ground adjacent to the river bank and using it to raise the ground level in the centre of the recreation ground where it currently suffers from water logging. The environment Agency have also requested that a volume of earth equal to 10% of the volume removed from the higher ground is moved to an area outside of the identified flood zone either within the recreation ground or elsewhere.

In addition to the feasibility development and consultations with the EA in relation to Option D, volumetric calculations have been undertaken and cross sections produced to enable these to be presented to the EA to gain their approval of the proposal. These are shown on drawing No 30330/0105 in Appendix A. Further notification of the EA will be required prior to the works commencing on site.

## **5.0 Health, Safety & Environment**

In accordance with the requirements of the Construction (Design and Management) Regulations 2015, the hazards to health & safety resulting from this project have been considered.

Any hazards considered during this feasibility stage are detailed in a Design Hazard Elimination Register in Appendix C including any proposed measures to reduce or eliminate the risks.

It is proposed that the register be re-visited during the detailed design phase.

A Principal Designer for this project is not required for this Feasibility phase of the project and it has been estimated that the construction of the preferred option would take less than 4 weeks to complete therefore the project will not be notifiable under the requirements of the regulations and a Principal Designer will not need to be appointed.

The site is not within an SSSI or other designated area of environmental or conservation interest.

The site is within Flood Zone and forms part of the River Derwent's flood plain, therefore, any works will require formal notification of the Environment Agency before they commence on site.

## **6.0 Conclusion and Recommendations**

To comply with the original project brief and requirements as discussed in Section 1.0 of this report, the following conclusions and recommendations are proposed.

A surveys and feasibility study into the cause of the water logging of the Ambergate Recreation Ground has been completed and the following conclusions have been established:

- i) The constant inflow from natural spring at rear of No 109 Derby Road.
- ii) The lack of formal drainage route for flows from natural spring water inflow.
- iii) The local topography of recreation ground allows retained water from natural spring to spread and affect central area of the recreation ground.
- iv) Lack of land drainage system within the recreation ground.

In addition,

- iv) It has been confirmed that there are no public sewers draining across the site
- v) The site is not within an SSSI or other designated area of environmental or conservation interest.
- vi) The recreation ground has been confirmed to lie within Flood Zone 3 and is not protected by any formal flood defenses, therefore any proposed changes to the topography and drainage of the recreation ground will need to take account of the restrictions that the Environment Agency will insist upon to prevent any effect upon the recreation ground's ability to receive the same amount of flood water that it does now and also prevent the flood zone becoming extended elsewhere.

A number of options have been considered to remedy the water logging issues and these have been discussed in detail in Section 4.0 of this report.

Extensive consultations have been undertaken with the Environment Agency to establish an agreement in principal to the preferred option and as a result it is recommended that Option D be implemented to resolve the water logging issues currently being experienced on the Ambergate Recreation Ground.

The layout of proposed Option D is shown on drawing No 30330/0104 in Appendix A.

The preferred Option D will involve the re-shaping/landscaping of the topography of the recreation ground by taking earth from the slightly higher ground adjacent to the river bank and using it to raise the ground level in the centre of the recreation ground where it currently suffers from water logging. The Environment Agency have also requested that a volume of earth equal to 10% of the volume removed from the higher ground is moved to an area outside of the identified flood zone either within the recreation ground or elsewhere.

In addition to the feasibility development and consultations with the EA in relation to Option D, volumetric calculations have been undertaken and cross sections produced to enable these to be presented to the EA to gain their approval of the proposal. These are shown on drawing No 30330/0105 in Appendix A. Further notification of the EA will be required prior to the works commencing on site.

It is considered that the construction of Option D will reduce the water logging of the recreation ground and allow it to be better utilised for a range of amenity uses. However, as the site will remain part of the River Dewent's floodplain and has no formal land drainage, water logging will not be completely eliminated and may still occur during times of rainfall or in the event of a flood.

This option will require extensive works and would cause major disruption across the site whilst works are in progress and the area is re-seeded. This option would prevent the majority of site to be utilised for a period of time.

***The estimated design and construction cost of this option is £12082.00.***



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**Appendix A – Existing and Proposed Drawings**

The schedule below details the drawings showing the existing and the proposed works as discussed in Sections 4.0 and 6.0 above.

<b>Drawing No</b>	<b>Revision</b>	<b>Title</b>
30330/0101	A	Existing Site
30330/0102	A	Proposed Option B
30330/0103	A	Proposed Option C
30330/0104	A	Proposed Option D
30330/0105	A	Proposed Option D Volumetrics and Proposed Cross Sections

**NOTES**

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Drawings are subject to change with confirmation of site levels and dimensions.

The designer cannot be held responsible for any changes made to the design without the designers knowledge or consent or without the requisite approvals as required by Alliance Group Solution's Quality Management System.

**HEALTH & SAFETY GUIDANCE NOTES**

PPE to be worn at all times.  
Temporary access ladders to be secured safely before use  
Confined Space working - ensure all operatives are trained and follow the correct procedures for entering an area that may have an asphyxiating atmosphere. Permit to Work to be enforced and continuous gas monitoring to be in place.  
All Pumps, Wet Wells and Channels to be isolated from main flow prior to access where applicable.  
Open excavations to be fenced securely with appropriate signage and all loose items to be stored away from edge of excavations to prevent slips, trips and falling objects.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.  
Refer to the Completed Design Risk Assessment Document for details of the Residual Hazards relevant to this drawing.

30330/020

**Residual Health and Safety Hazards are listed below.**

1. Existing underground utility apparatus
2. Existing overhead utility apparatus (cables)
3. Existing traffic
4. Open excavations
5. Moving plant and machinery

**ENVIRONMENTAL GUIDANCE NOTES**

The Design of the elements shown on this drawing has taken into account the Waste Hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011  
PPE to be worn at all times.  
Protection of the environment is paramount. All Construction work to be carried out in line with EA Doc PPG6, Working at Construction and Demolition Sites.  
All waste materials to be segregated in accordance with the Site Waste Management Plan where appropriate.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.

**Residual Environmental Risks are listed below.**

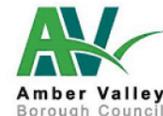
None known

A	Initial Issue	RCD	KRW	RCD	??	17.8.15
REV	AMENDMENTS	ORIG	DRWN	CHKD	APRD	DATE



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CLIENT



**Amber Valley**  
Borough Council

PROJECT  
**Ambergate Recreation Ground Feasibility Study**

PROJECT NUMBER  
**30330**

TITLE  
**Existing Site Plan**

STATUS  
**For Approval**

ORIGINATOR RCD	DRAWN KRW	CHECKED RCD	APPROVED APPBY
DATE 17.08.2015	DATE 17.08.2015	DATE 17.08.2015	DATE APPDATE

DRAWING SCALE 1 : 1000	ORIGINAL DRAWING SIZE 594 x 841 - A3
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DRAWING No <b>30330/0101</b>	REV. <b>A</b>
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**LEGEND**

-  Extent of Recreation Ground
-  Area of Water Logged Ground



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**LEGEND**

- Extent of Recreation Ground**
- Area of Water Logged Ground**
- Proposed Land Drainage System**



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Drawings are subject to change with confirmation of site levels and dimensions.

The designer cannot be held responsible for any changes made to the design without the designers knowledge or consent or without the requisite approvals as required by Alliance Group Solution's Quality Management System.

**HEALTH & SAFETY GUIDANCE NOTES**

- PPE to be worn at all times.
- Temporary access ladders to be secured safely before use
- Confined Space working - ensure all operatives are trained and follow the correct procedures for entering an area that may have an asphyxiating atmosphere. Permit to Work to be enforced and continuous gas monitoring to be in place.
- All Pumps, Wet Wells and Channels to be isolated from main flow prior to access where applicable.
- Open excavations to be fenced securely with appropriate signage and all loose items to be stored away from edge of excavations to prevent slips, trips and falling objects.
- Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.
- Refer to the Completed Design Risk Assessment Document for details of the Residual Hazards relevant to this drawing.

30330/020

**Residual Health and Safety Hazards are listed below.**

1. Existing underground utility apparatus
2. Existing overhead utility apparatus (cables)
3. Existing traffic
4. Open excavations
5. Moving plant and machinery

**ENVIRONMENTAL GUIDANCE NOTES**

The Design of the elements shown on this drawing has taken into account the Waste Hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011

PPE to be worn at all times.  
Protection of the environment is paramount. All construction work to be carried out in line with EA Doc PPG6, Working at Construction and Demolition Sites.  
All waste materials to be segregated in accordance with the Site Waste Management Plan where appropriate.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.

**Residual Environmental Risks are listed below.**

None known

A	Initial Issue	RCD	KRW	RCD	??	17.8.15
REV	AMENDMENTS	ORIG	DRWN	CHK'D	APRD	DATE

**Alliance Consulting Solutions Ltd.**  
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CLIENT

**Amber Valley Borough Council**

PROJECT  
**Ambergate Recreation Ground Feasibility Study**

PROJECT NUMBER  
**30330**

TITLE  
**Proposed Option B Layout Plan**

STATUS  
**For Approval**

ORIGINATOR <b>RCD</b>	DRAWN <b>KRW</b>	CHECKED <b>RCD</b>	APPROVED <b>APPHY</b>
DATE <b>17.08.2015</b>	DATE <b>17.08.2015</b>	DATE <b>17.08.2015</b>	DATE <b>APPDATE</b>

DRAWING SCALE: **1 : 1000** ORIGINAL DRAWING SIZE: **594 x 841 - A3**

DRAWING No: **30330/0102** REV: **A**

**NOTES**

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Drawings are subject to change with confirmation of site levels and dimensions.  
The designer cannot be held responsible for any changes made to the design without the designers knowledge or consent or without the requisite approvals as required by Alliance Group Solution's Quality Management System.

**HEALTH & SAFETY GUIDANCE NOTES**

PPE to be worn at all times.  
Temporary access ladders to be secured safely before use  
Confined Space working - ensure all operatives are trained and follow the correct procedures for entering an area that may have an asphyxiating atmosphere. Permit to Work to be enforced and continuous gas monitoring to be in place.  
All Pumps, Wet Wells and Channels to be isolated from main flow prior to access where applicable.  
Open excavations to be fenced securely with appropriate signage and all loose items to be stored away from edge of excavations to prevent slips, trips and falling objects.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.  
Refer to the Completed Design Risk Assessment Document for details of the Residual Hazards relevant to this drawing.

30330/020

**Residual Health and Safety Hazards are listed below.**

1. Existing underground utility apparatus
2. Existing overhead utility apparatus (cables)
3. Existing traffic
4. Open excavations
5. Moving plant and machinery

**ENVIRONMENTAL GUIDANCE NOTES**

The Design of the elements shown on this drawing has taken into account the Waste Hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011  
PPE to be worn at all times.  
Protection of the environment is paramount. All Construction work to be carried out in line with EA Doc PPG6, Working at Construction and Demolition Sites.  
All waste materials to be segregated in accordance with the Site Waste Management Plan where appropriate.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.

**Residual Environmental Risks are listed below.**

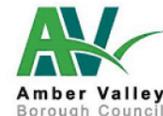
None known

A	Initial Issue	RCD	KRW	RCD	??	17.8.15
REV	AMENDMENTS	ORIG	DRWN	CHKD	APRD	DATE



**Alliance Consulting Solutions Ltd.**,  
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CLIENT



**Amber Valley**  
Borough Council

PROJECT  
**Ambergate Recreation Ground Feasibility Study**

PROJECT NUMBER  
**30330**

TITLE  
**Proposed Option C Layout Plan**

STATUS  
**For Approval**

ORIGINATOR RCD	DRAWN KRW	CHECKED RCD	APPROVED APPBY
DATE 17.08.2015	DATE 17.08.2015	DATE 17.08.2015	DATE APPDATE

DRAWING SCALE 1 : 1000	ORIGINAL DRAWING SIZE 594 x 841 - A3
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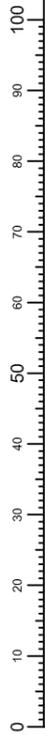
DRAWING No <b>30330/0103</b>	REV. <b>A</b>
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**LEGEND**

-  Extent of Recreation Ground
-  Area of Water Logged Ground



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Drawings are subject to change with confirmation of site levels and dimensions.

The designer cannot be held responsible for any changes made to the design without the designers knowledge or consent or without the requisite approvals as required by Alliance Group Solution's Quality Management System.

**HEALTH & SAFETY GUIDANCE NOTES**

PPE to be worn at all times.  
Temporary access ladders to be secured safely before use  
Confined Space working - ensure all operatives are trained and follow the correct procedures for entering an area that may have an asphyxiating atmosphere. Permit to Work to be enforced and continuous gas monitoring to be in place.  
All Pumps, Wet Wells and Channels to be isolated from main flow prior to access where applicable.  
Open excavations to be fenced securely with appropriate signage and all loose items to be stored away from edge of excavations to prevent slips, trips and falling objects.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.  
Refer to the Completed Design Risk Assessment Document for details of the Residual Hazards relevant to this drawing.

30462/020

**Residual Health and Safety Hazards are listed below.**

1. Existing underground utility apparatus
2. Existing overhead utility apparatus (cables)
3. Existing traffic
4. Open excavations
5. Moving plant and machinery

**ENVIRONMENTAL GUIDANCE NOTES**

The Design of the elements shown on this drawing has taken into account the Waste Hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011  
PPE to be worn at all times.  
Protection of the environment is paramount. All Construction work to be carried out in line with EA Doc PPG6, Working at Construction and Demolition Sites.  
All waste materials to be segregated in accordance with the Site Waste Management Plan where appropriate.  
Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.

**Residual Environmental Risks are listed below.**

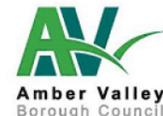
None known

A	Initial Issue	RCD	KRW	RCD	??	17.8.15
REV	AMENDMENTS	ORIG	DRWN	CHKD	APRD	DATE



**Alliance Consulting Solutions Ltd.**,  
Sidings Road,  
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CLIENT



**Amber Valley**  
Borough Council

PROJECT  
**Ambergate Recreation Ground Feasibility Study**

PROJECT NUMBER  
**30330**

TITLE  
**Proposed Option D Layout Plan**

STATUS  
**For Approval**

ORIGINATOR RCD	DRAWN KRW	CHECKED RCD	APPROVED APPBY
DATE 17.08.2015	DATE 17.08.2015	DATE 17.08.2015	DATE APPDATE

DRAWING SCALE 1 : 1000	ORIGINAL DRAWING SIZE 594 x 841 - A3
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DRAWING No <b>30330/0104</b>	REV. <b>A</b>
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**LEGEND**

-  Extent of Recreation Ground
-  Area of Water Logged Ground
-  Area of Fill
-  Area of Cut



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 Drawings are subject to change with confirmation of site visits and dimensions.  
 The designer cannot be held responsible for any changes made to the design without the designer's knowledge or consent or without the explicit approval as required by the client or the local authority.  
**HEALTH & SAFETY GUIDANCE NOTES**  
 PPE to be worn at all times.  
 Temporary access roads to be secured safely before use.  
 Confined Spaces: workers should be trained and follow the correct procedures for entering an area that may have an asphyxiating atmosphere. Permit to Work and additional conditions may be required.  
 All Poles, Wires and Channels to be located from main flow prior to access where applicable.  
 Open excavations to be secured securely with appropriate signage and all access roads to be closed away from edge of excavation to prevent falls, slips and falling objects.  
 Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.  
 Refer to the Completed Design Risk Assessment Document for details of the residual risks relevant to this drawing.

**30330/020**  
**Recreation Ground Safety Health and Environment**  
 1. Existing underground utility services  
 2. Existing overhead utility services  
 3. Open excavations  
 4. Open excavations  
 5. Muck up and masonry

**ENVIRONMENTAL GUIDANCE NOTES**  
 This drawing of the site is based on the information provided on this drawing has been taken into account the Waste Hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.  
 PPE to be worn at all times.  
 Protection of the environment is a priority. All Contractors must be asked to provide a Risk Assessment (RA) and Method Statement (MS) for all activities and work carried out in accordance with the Method Statement.  
 Task Specific Risk Assessments and Method Statements to be produced for all activities and work carried out in accordance with the Method Statement.  
**Recreation Ground Safety Health and Environment**  
 None issued

A	Initial Issue	RCD	KRW	RCD	TBC	5.09.2015
REV	AMENDMENTS	ORIG	DRWN	CHKD	APRD	DATE

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**AV**  
 Amber Valley  
 Borough Council

**PROJECT**  
 Ambergate Recreation Ground  
 Feasibility Study

**PROJECT NUMBER**  
 30330

**TITLE**  
 Proposed Option D  
 Volumetric (Cut & Fill)  
 Calculations Plan and  
 Cross Sections

**STATUS**

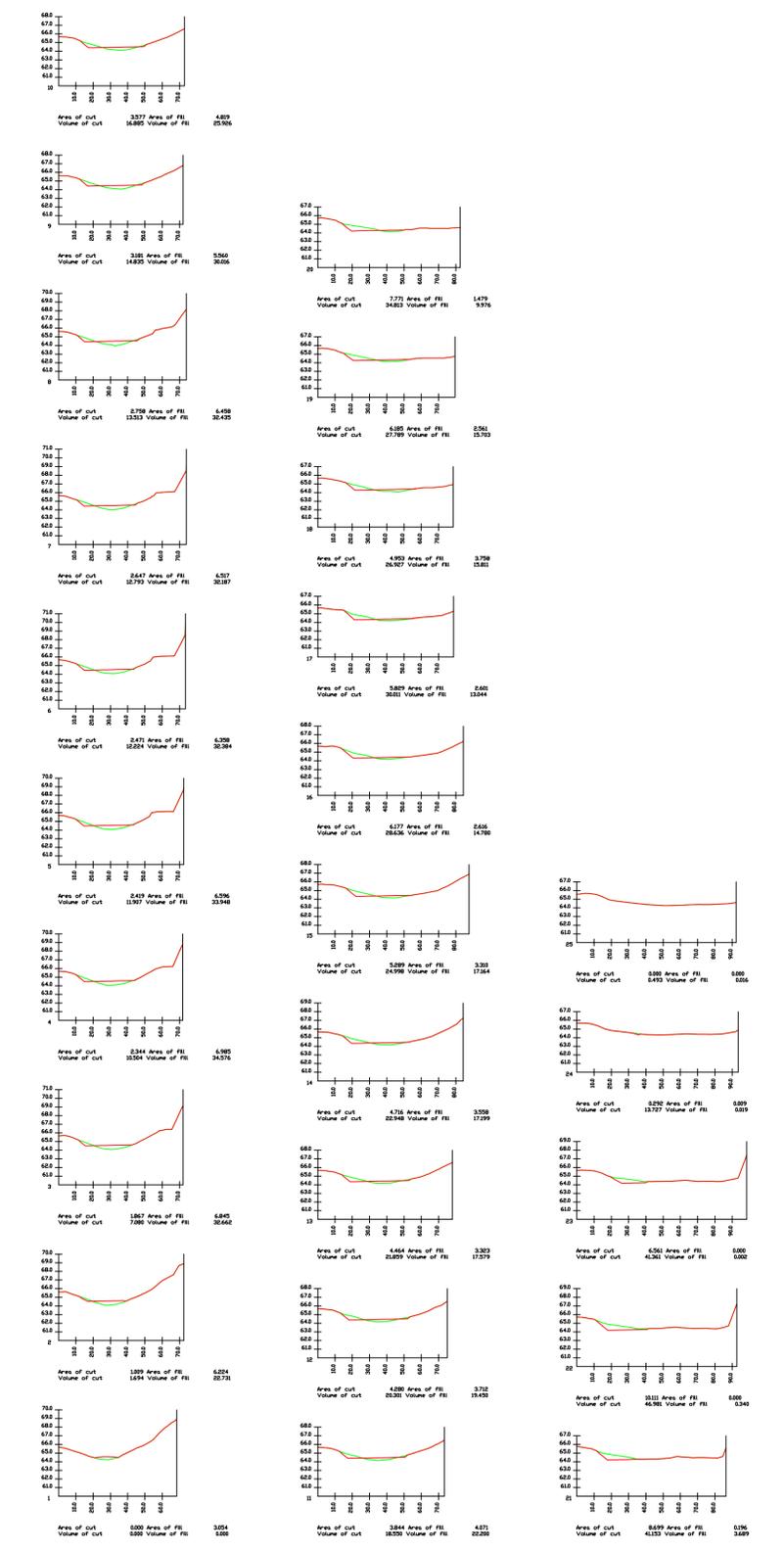
**For Approval**

ORIGINATOR	RCD	DRAWN	KRW	CHECKED	RCD	APPROVED	TBA
DATE	11/09/2015	DATE	11/09/2015	DATE	TBA	DATE	TBA
DRAWING SCALE	As shown				ORIGINAL DRAWING SIZE		
DRAWING No	30330/0105				REV.		
					A		



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**Plan**  
 Scale 1:500



**Cross Sections**  
 Scale Vert 1:1 000 Horiz 1:200

**Appendix B – Proposed Option D Volumetrics Calculations**

Calculation B1 – Quantities of Cut and Fill per Cross Section as Shown on Drawing No 30330/0105.

PROP\_CUT&FILL\_02

PGM Cut & Fill Quantities  
-----

First surface PGM : S:\00 R&K FILING SYSTEM\PRJ  
 PROJECTS\30330\_AVBC\_AMBERGATERECGROUND\_FEAS\PDS\_PROJECT\AMBERGATE\_EXISTING.DGM  
 Second surface PGM: S:\00 R&K FILING SYSTEM\PRJ  
 PROJECTS\30330\_AVBC\_AMBERGATERECGROUND\_FEAS\PDS\_PROJECT\AMBERGATE\_MERGED\_02.DGM

Sec No	Areac	Areaf	Volcut	Volfil
1	0.0	3.1	0.0	0.0
2	1.0	6.2	1.7	22.7
3	1.9	6.8	7.1	32.7
4	2.3	7.0	10.5	34.6
5	2.4	6.6	11.9	33.9
6	2.5	6.4	12.2	32.4
7	2.6	6.5	12.8	32.2
8	2.8	6.5	13.5	32.4
9	3.2	5.6	14.8	30.0
10	3.6	4.8	16.9	25.9
11	3.8	4.1	18.5	22.2
12	4.3	3.7	20.3	19.5
13	4.5	3.3	21.9	17.6
14	4.7	3.6	22.9	17.2
15	5.3	3.3	25.0	17.2
16	6.2	2.6	28.6	14.8
17	5.8	2.6	30.0	13.0
18	5.0	3.8	26.9	15.8
19	6.2	2.6	27.8	15.7
20	7.8	1.5	34.8	10.0
21	8.7	0.2	41.2	3.7
22	10.1	0.0	47.0	0.3
23	6.6	0.0	41.4	0.0
24	0.3	0.0	13.7	0.0
25	0.0	0.0	0.5	0.0
Cut	502.0	Fill	443.8	
Nett Cut	58.1			
Current ratio of fill to cut is	0.884			
To achieve fill to cut ratio of 1.000,	adjust second PGM by 0.006			

## Calculation B2 (Alternative) – Quantities of Cut and Fill by Prismoidal Calculation

## PROP\_CUT&amp;FILL\_02\_PRISMOIDAL

## Volumes of PGM2 model relative to PGM1 model

PGM1 (Existing) model: S:\00 R&K FILING SYSTEM\PRJ  
 PROJECTS\30330\_AVBC\_AMBERGATERECGROUND\_FEAS\PDS\_PROJECT\AMBERGATE\_EXISTING.DGM  
 PGM2 (Proposed) model: S:\00 R&K FILING SYSTEM\PRJ  
 PROJECTS\30330\_AVBC\_AMBERGATERECGROUND\_FEAS\PDS\_PROJECT\AMBERGATE\_MERGED\_02.DGM

Zones of PGM1 included in volume calcs:  
 All zones

Zones of PGM2 included in volume calcs:  
 All zones

## Areas and Perimeters of PGM1:

Zone No.	Surface Area (sq.m.)	Plan Area (sq.m.)	Perimeters	
			Internal (m.)	External (m.)
1 Zone 1	12517.3	12462.0	0.0	507.0
<b>Totals:</b>	<b>12517.3</b>	<b>12462.0</b>		<b>507.0</b>

## Areas and Perimeters of PGM2:

Zone No.	Surface Area (sq.m.)	Plan Area (sq.m.)	Perimeters	
			Internal (m.)	External (m.)
1 Zone 1	12522.3	12462.0	0.0	519.6
<b>Totals:</b>	<b>12522.3</b>	<b>12462.0</b>		<b>519.6</b>

## Total Plan and Surface Areas of Overlap between both PGM models:

	In Cut	In Fill	Balanced
Total Plan Area:	1986.1	2083.0	8392.8
Total Surface Area:	1992.3	2085.2	8392.8

## Volumes of Cut and Fill by Depth Banding listed by zones of PGM1:

Zone No.	Cut Depth Range	Cut Volume (cu.m.)	Fill Depth Range	Fill Volume (cu.m.)
	0.25-0.50	142.5	0.25-0.50	85.8
	0.50-1.00	15.0	0.50-1.00	0.3
	1.00-2.00	0.0	1.00-2.00	0.0
	2.00-4.00	0.0	2.00-4.00	0.0
	4.00-10.00	0.0	4.00-10.00	0.0

PROP\_CUT&FILL\_02\_PRISMOIDAL  
10.00- 0.0 10.00- 0.0

Summary - Totals for all reported zones of PGM1:

Depth Range	Volume (cu.m.)	Depth Range	Volume (cu.m.)
0.00-0.25	351.9	0.00-0.25	364.8
0.25-0.50	142.5	0.25-0.50	85.8
0.50-1.00	15.0	0.50-1.00	0.3
1.00-2.00	0.0	1.00-2.00	0.0
2.00-4.00	0.0	2.00-4.00	0.0
4.00-10.00	0.0	4.00-10.00	0.0
10.00-	0.0	10.00-	0.0
	-----		-----
	509.4		450.8

Notes:  
Volumes are of PGM2 surface relative to PGM1 surface  
Depths are measured from PGM1 surface

Total of Cut and Fill Volumes listed by zones of PGM1:

Zone No.	Volumes		Nett Volumes	
	Cut (cu.m.)	Fill (cu.m.)	Cut (cu.m.)	Fill (cu.m.)
1 Zone 1	509.4	450.8	58.6	
Total Volumes:	Gross: 509.4	450.8		
	Nett: 58.6			

Note:  
Volumes are of PGM2 surface relative to PGM1 surface

Summary of Total Volumes of Cut/Fill:

		PGM2 surface relative to PGM1 surface	
		Cut	Fill
Total	Gross:	509.4	450.8
	Nett:	58.6	

---

**Appendix C – Hazard Elimination and Register**

The following register details the hazards considered during the feasibility stage including the design measures implemented to reduce or eliminate the risks.

It is proposed that the register be re-visited during the detailed design phase.

