

**Manchester City Council
Report for Resolution**

Report to: Governance and Resources Scrutiny Committee – 22 June 2017
Subject: National Speedway Stadium: Update
Report of: Strategic Director (Strategic Development)

Summary

The Committee has requested an update in relation to the National Speedway Stadium at Belle Vue Sports Village following the report to Executive dated 8 March 2017.

This report summarises the position since March 2017 in respect of the arrangements which are now in place to support the occupancy of the National Speedway Stadium to ensure its future and sustainability, and the settlement of the outstanding claim with ISG Plc and BV Arena Limited.

Recommendations

The Committee is requested to note the contents of the Report

Wards Affected:

Gorton North

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Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy please contact one of the contact officers above.

- Report to Executive dated 8th March 2017
- Partnership with Manchester City Football Club and East Manchester, Executive, 13th July, 2011
- Partnership with Manchester City Football Club and East Manchester, Executive, 14th March, 2012
- Belle Vue Sports Village, Executive, 10th April 2013
- Eastlands Community Plan: Update, Executive, 8th March 2014
- Capital Programme – Proposed Increases, 1st July 2015
- Capital Programme Proposed Increase: Belle Vue Sports Village, Executive, 9th September 2015

1.0 Introduction

- 1.1 This report provides an update to the committee following the report to Executive dated 8 March 2017. In particular the reports provides:
- (a) a short update in relation to the Belle Vue Aces Speedway franchise at the National Speedway Stadium since March 2017;
 - (b) confirmation of settlement of the outstanding claim with BV Arena Limited; and
 - (c) a copy of the report obtained by Arup in respect of the track failure.
- 1.2 At this time there is still information which is commercially sensitive relating to the financial or business affairs of certain individuals and parties where the public interest in maintaining the exemption outweighs the public interest in disclosing the information. A verbal update will be provided to the Committee relating to these part B matters.

National Speedway Stadium since March 2017

- 1.3 As noted in the Executive Report, Belle Vue Speedway 2017 limited was established in February 2017 to deliver the speedway franchise. BVS 2017 is led by Tony Rice and Robin Southwell. As previously set out in the Executive Report, Tony was the Global Chief Executive of Cable & Wireless Communications (CWC) until 2013 whilst Robin was the Chief Executive of the aerospace company EADS (now Airbus) until 2014. His role as a global UK Business Ambassador was recently extended by the Government.
- 1.4 The Council and BVS 2017 have entered into a lease arrangement for use of the track and pits, and, ancillary office for a period up until 30th November 2017 in order to deliver the Belle Vue Aces franchise at the National Speedway Stadium for the current season with a view to developing a longer term sustainable business model.
- 1.5 Since March 2017, BVS 2017 has been working alongside the Eastlands Trust and the Council to develop a longer term business plan and business model in order to grow the sport at the National Speedway Stadium and to support the wider sports village. The Council has been in regular dialogue with the franchise and are due to meet with BVS 2017 in July 2017 in order to review current performance with the intention of negotiating a longer term agreement.

Track Failure and Dispute

- 1.6 As noted in the Executive Report, following the track failure in March 2016, the Council instructed Arup in April 2016, as consulting engineers, to provide technical advice to the Council in respect of the track failures.

- 1.7 At the time of the Executive Report, the Council were negotiating a settlement between ISG, BVA and the Council and were unable to disclose the report provided by Arup as this was deemed to be commercially sensitive as it was obtained in contemplation of litigation.
- 1.8 A confidential settlement, however, has now been concluded between the parties and in the interests of transparency the Council wish to make available the full report to the public which is now set out in the Appendix to this Report
- 1.9 In the interests of clarity to create understanding and provide context for the Arup report, set out below are the instructions to Arup in respect of the report:
- (a) Attend site on Friday 8th April 2016 to inspect the works;
 - (b) Advise on the condition of the as-installed construction of the track;
 - (c) Advise on testing requirements to ascertain the extent of the remedial works;
 - (d) Support the Council at meetings to discuss Contractor's proposals for remedial works; and
 - (e) Attend site during remedial and testing works to record findings and monitor progress.
- 1.10 The Arup report did not address the contractual aspects of the construction of the track but was only to advise on the technical aspects only.
- 1.11 It is to be noted, however, contractually, there was some complexity with the delivery of the works due to BVA's twin role as end user and as ISG's track designer. The Council were made aware after the opening event of correspondence between ISG and BVA in February 2016 that referred to a possible change to the sub base material of the track from the material used at turns 1 and 2.
- 1.12 As stated in the Executive Report, the change of materials to turns 3 and 4 were not specified in the original contract, and were not approved as a change by the Council.

Next Steps

- 1.13 The Council will continue to work with BVS 2017, the BSPA and Eastlands Trust to secure a sustainable long term future for Belle Vue Aces and the National Speedway Stadium.

Manchester City Council Report for Resolution

Report to: Executive, 8 March 2017

Subject: Belle Vue Speedway: Update

Report of: The Chief Executive

Summary

This report sets out the issues associated with the National Speedway Stadium at the Belle Vue Sports Village and to detail the matters which have affected the Stadium and its occupancy since late 2015. Specifically this report sets out:

- (a) the original arrangements the Council entered into with Belle Vue Arena Limited to underpin their occupancy at the stadium;
- (b) the actions taken by the Council to remedy the track failures which arose on the 19th March 2016;
- (c) the circumstances which contributed to Belle Vue (BV) Arena Ltd and Belle Vue Speedway Ltd going into administration;
- (d) the British Speedway Promoters Association decision to revoke the Promoters Licences of the owners of Belle Vue Speedway Limited; and
- (e) the arrangements, following detailed consultation with the Belle Vue Speedway Association (BSPA), which the Council has now entered into to support the occupancy of the new ownership of the Belle Vue Aces Franchise at the National Speedway Stadium to ensure the future of the historic Aces club.

Finally, the report sets out the financial and other implications for the City Council in terms of dealing with the chain of events set out in this report.

Recommendations

The Executive is recommended to:

- 1) Note the contents of this report;
- 2) Authorise the City Treasurer to write off the bad debts of £224,000 in the event they are not recoverable from the Liquidator;
- 3) Approve a grant of £30,000 from the Council to Eastlands Trust to be funded from the 2016/17 Strategic Development Budget.

- 4) Approve the virements of £356,000 from the Manchester Institute Health Performance (MIHP) budget and £82,000 from the Strategic Acquisitions budget to meet the identified capital costs outlined in recommendation 5) below.
- 5) To approve capital expenditure of £438,000 form the capital fund, £209,000 for the acquisition of plant, machinery and IT equipment previously acquired by the Belle Vue Group of Companies and held by the Liquidator and Finance Companies; and £229,000 to deliver investment into the South Stand of the Speedway Stadium. It should be noted that a proportion of the £209,000 asset acquisition costs will be recoverable from Belle Vue Speedway 2017 Ltd should the parties enter into a long term lease arrangement for the Stadium.
- 6) Delegate to the City Treasurer the accounting treatment of whether spend from the capital fund is capital or revenue.
- 7) Delegate to the Director – Strategic Development and City Treasurer in consultation with the Executive Member for Finance and Human Resources the arrangements for the repayment of the invest to save costs for the stadium build, to be reported back to Executive as part of the 2018/19 capital budget process.
- 8) In accordance with paragraph 14 of Part 4, Overview and Scrutiny Procedure Rules of the Council’s constitution, and having consulted with the relevant statutory officers, approve the matter as urgent, in that any delay caused by the call-in process, would seriously prejudice the legal or financial position of the Council or the interests of the residents of Manchester and exempt it from call in.

Wards Affected:

Gorton North

Community Strategy Spine	Summary of the contribution to the strategy
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	Securing the future of the National Speedway Stadium as a platform to host a range of national and international speedway events will deliver additional economic benefits to the city and the East Manchester area
A highly skilled city: world class and home grown talent sustaining the city’s economic success	In the longer term Belle Vue Speedway 2017 Ltd will give consideration to the development of a Speedway Academy that will focus on a range of skills development opportunities needed to sustain the sport.

A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	The National Speedway Stadium is a key asset within the Belle Vue Sports Village and the combined facilities within the complex offer the opportunities for residents to come together and to become healthier.
A liveable and low carbon city: a destination of choice to live, visit, work	Securing the future of the National Speedway Stadium will help contribute to strengthening Gorton as a destination to live, visit and work.
A connected city: world class infrastructure and connectivity to drive growth	The National Speedway Stadium is already recognised as one of the best speedway tracks in the UK. This asset along with the other facilities on the Belle Vue Sports Village help support the vibrancy and attractiveness of Gorton and East Manchester.

Full details are in the body of the report, along with any implications for:

- Equal Opportunities Policy
- Risk Management
- Legal Considerations

Financial Consequences - Revenue

The report outlines the issues experienced with the building and operation of the Belle Vue Speedway Stadium which forms part of the Belle Vue Sports Village underpinning the regeneration proposals for East Manchester. It also outlines the measures being put in place to ensure that the speedway stadium has a sustainable future. The Council paid for the construction of the stadium on an invest to save basis with £350,000 rent to be paid from the operator to cover the borrowing costs for £5.25m as part of the £13.1m total Belle Vue Sports Village capital construction and fit out cost.

In order to resolve the issues with the Stadium track defect and the previous operator going into voluntary liquidation an additional £126,000 has been incurred in legal and consultancy fees associated with the remediation of the track and subsequent legal claims. This cost has been met from within the Strategic Development budget in 2016/17. The Council will also have to cover the historic utility costs at the stadium from 11th March 2016 until 31st October 2016. These have been estimated at £30,000 plus an, as yet unknown, amount in respect of drainage costs.

The Council has a claim for £224,000 in respect of unpaid rent, insurance and business rates costs which is currently with the liquidator. It is uncertain whether all these costs are likely to be recovered. In the event that these costs are unable to be recovered through the insolvency process, these costs will need to be written off against the Council's bad debt provision.

In order to ensure the continued operation of the speedway facility the stadium is being managed by the Eastlands Trust as part of the wider Belle Vue Sports Village.

A new Franchisee has now taken over the ownership of the speedway club and they will lease on a short term basis the track and pits from the City Council. A short term business plan has been put in place to cover this interim period while a long term arrangement and business plan is further developed. The Council will grant £30,000 to the Eastlands Trust, to be met from the 2016/17 Strategic Development budget, to support business development activity for the facilities in order to maximise the potential from the new arrangements and at the same time help develop a long term sustainable business plan with the new Franchise owners. This Business Plan will be developed around the economics of the sport and the potential of the facility itself.

Moving forwards with Belle Vue Speedway 2017 Ltd the forthcoming speedway season must be regarded as a transitional phase whereby the City Council should, at this juncture, not anticipate any significant improvement in the financial position. Working with Belle Vue Speedway 2017 Ltd will enable a robust rent share and occupancy base for the Stadium to be determined. As such this forms the basis on which the arrangements for 2017/18 have been formulated. A key aspect of these arrangements in developing a realistic Business Plan will be to test the previously agreed base rent of £350,000 per annum and to determine the timing of the capital borrowing to be repaid that was used to partly fund the Stadium. The outcomes of this work will be report to a future meeting of the Executive.

Financial Consequences – Capital

In order to achieve the required capacity crowds to meet Business Plan targets and to be allowed to host major events temporary seating was erected for the South Stand in 2016/17. It is proposed that the Council seeks the most cost efficient way to rent or purchase outright, terraces and ancillary toilets and concessions to increase the capacity by 1,200. This is currently estimated to be £189,000. In addition, to ensure that the condition of the track is retained, the Council will also purchase track covers for circa £40,000, bringing the total investment required to £229,000. A further sum up to £209,000 is required to secure the track operating equipment from the liquidator of which a proportion will be recoverable from the new Franchise owner, should they take up the option to take a long term lease of the Stadium. In agreeing to any long term lease the Council will have to satisfy itself that the lease arrangement represents best value for the Council. It is estimated that circa £70,000 of the £209,000 will be recovered if the long term lease arrangement is entered into.

The capital investment requirements outlined above total £438,000 and can be partially funded using the £356,000 underspend from the Manchester Institute of Health and Performance (MIHP) capital scheme. The balance of £82,000 will be met from the Strategic Acquisitions budget, with any expenditure recovered going back into the budget.

Initial discussions have been held with Sport England to consider a limited set of proposals to further enhance the asset base that has been developed at Belle Vue Sports Village. Detailed proposals together with a business case have yet to be developed. Any requirement for further investment into the facilities at the Speedway Stadium will be bought back to the Executive for consideration.

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Background documents (available for public inspection):

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1.0 Introduction

- 1.1 This report sets out the issues associated with the National Speedway Stadium at the Belle Vue Sports Village and to detail the matters which have affected the Stadium and its occupancy since late 2015, as referred to in the summary above.

2.0 The National Speedway Stadium: Background

- 2.1 On 13th July 2011 the Executive approved the Eastlands Regeneration Framework following consultation with residents, businesses, landowners and other stakeholders. In approving the Eastlands Regeneration Framework the Executive also endorsed a Draft Eastlands Community Plan that set out in some detail the opportunities in respect of new community infrastructure. Following consultation the Eastlands Community Plan was subsequently approved at the March 2012 meeting of the Executive. This Plan identified eight key initiatives to be brought forward for development, one of which was the Belle Vue Sports Village.
- 2.2 The April 2013 meeting of the Executive approved the principle of the development of the Belle Vue Sports Village which would incorporate the National Speedway Stadium, a national centre for Basketball and new playing fields. An indicative funding profile was provided that would be the subject of further reports to the Executive following design development work.
- 2.3 The case to support investment into the National Speedway Stadium was influenced by a number of factors: The Stadium would:
- enable an historic sports club - the Belle Vue Aces - to have a more sustainable and viable business going forward, based on increasing regular attendances for Elite League meetings;
 - increase the potential for team and meetings sponsorship;
 - provide the potential for new revenue streams in areas such as merchandise and from hosting national and international Speedway events;
 - deliver positive economic impacts subject to the scale and number of events held at the Stadium; and
 - provide positive community impacts from the use of the Stadium itself and the wider facilities across Belle Vue Sports Village.
- 2.4 In April 2014 the Executive approved amendments to the funding strategy with the total proposed capital costs of the Belle Vue scheme estimated to be £11.954m.
- 2.5 Subsequent reports to the Executive in July 2015 and in September 2015 further increased the capital programme to accommodate additional costs associated with construction inflation and to provide resources to deliver the infrastructure associated with temporary stand facilities for international and

national events. When completed the cost of developing the National Speedway Stadium was circa £8m out of an overall scheme budget of £13.3m.

- 2.6 The City Council had worked with the owners of Belle Vue Aces over a number of years to both evaluate the opportunity for a new Stadium at Belle Vue along with their active engagement in delivering the scheme once agreed. In order to deliver the scheme a number of companies were established by the owners of Belle Vue Aces, the principal ones being B V Arena Ltd, who would manage and operate the Stadium, and Belle Vue Speedway Ltd, who had responsibility for the speedway team. These Companies, along with two other Belle Vue Speedway related Companies, constitute the “Belle Vue Group of Companies” referenced throughout this report.
- 2.7 Base case Business Plan forecasts were presented to the City Council in 2013 by the owners of the Belle Vue Group of Companies. These forecasts were based on the numbers of spectators for the Elite League meetings being circa 1,800 per fixture along with a significant contribution from World Championships and FIM meetings. The move to a new Stadium and the switching of home race nights from Monday to a Friday / Saturday night, the removal of the rental payments to their previous Stadium owner, and the ability to retain food and beverage income, satisfied the Council that this enabled Belle Vue Aces to be profitable and to enable B V Arena Ltd to service the annual rent to the Council.
- 2.8 The £8m investment by the Council into the National Speedway Stadium development was secured on the basis that BV Arena Ltd would enter into a full repairing and insuring lease of the whole facility from the Council at a commercial base rent of £350,000 per annum. Under this agreement, BV Arena Ltd would lease the use of the speedway elements of the stadium to Belle Vue Speedway Ltd at a market rent.
- 2.9 Part of the terms of the commercial arrangement between the Council and BV Arena Ltd was the requirement of an injection of £500,000 of private equity investment into a ring fenced investment account of BV Arena Ltd, to ensure the long-term financial viability of BV Arena Ltd in accordance with its business plan. The ring-fenced investment account was to remain until a stable trading pattern was demonstrated and financial commitments met for a minimum period of 5 years. From a City Council perspective the £500,000 of private equity investment was therefore, additional security and was always envisaged as a buffer to the future trading performance of BV Arena Ltd.
- 2.10 The owners of the Belle Vue Group of Companies secured the necessary £500,000 of private equity investment in 2013. The two principal investors were significant business leaders with both a national and international business profile. These investors were regarded by officers as greatly enhancing the overall commercial capacity across the Belle Vue Group of Companies which would generate significant additional benefit for all parties.

- 2.11 In early February 2016 the Council was notified that the £500,000 of private equity investment in Belle Vue Arena Ltd had been withdrawn in October 2015 alongside the loss of the commercial skills that the original investors would have contributed to the business. At the time, the owners of the Belle Vue Group of Companies were not prepared to disclose the reasons for the withdrawal of the private equity funding to the City Council nor did they offer a satisfactory explanation for the three months delay in informing the Council.
- 2.12 Following notification of the withdrawal of the investment, at a meeting with the Chief Executive in early February 2016 the owners of the Belle Vue Group of Companies confirmed that they had tried but failed to secure replacement private equity in the intervening three month period.
- 2.13 As Paragraph 4.11 in the report indicates it subsequently came to light in October 2016 that £600,000 investment had in fact been made into the Belle Vue Group of Companies in October 2015. Although not confirmed this may have been used for the purpose of repaying the original investors. Having secured replacement investment of £600,000, it now appears that the Belle Vue Group of Companies had utilised part or all of the original £500,000 from the ring fenced investment account of BV Arena Ltd prior to October 2015. It has also now been established that the original investors withdrew their £500,000 investment as they had concerns about the development of the business and the overall governance arrangements associated with the Belle Vue Group of Companies.
- 2.14 The consequence of not having the £500,000 equity base available at the beginning of the 2016 Speedway season was that:
- this left the Belle Vue Group of Companies in a vulnerable position given the trading risks;
 - BV Arena Ltd were in breach of it's legal agreement with the City Council; and
 - the decision was taken that the full 60 year lease for the Stadium facility could only be drawn down when a £500,000 equity base was in place along with an updated Business Plan was developed.
- 2.15 Until a longer term arrangement could be concluded, and to support both the Speedway Team, the City Council entered into a series of short term licence agreements from 11th March 2016 to 31st October 2016 that enabled BV Arena Ltd to legally occupy and operate the Stadium,.
- 2.16 Due to the issues with the track (as set out below) between March and end April 2016, the Council waived the licence fee during that 2 month period and agreed for future payments to be made in an arrears for the duration of the speedway season. However, no licence fees due by the BV Arena Ltd under the licences between May and October 2016 (together with such other ancillary costs between March and October 2016) have ever been paid to the City Council.

3.0 The development of the National Speedway Stadium: the Track Failure and the remedies put in place by the City Council

- 3.1 The building contract for the Belle Vue Sports Village was awarded to ISG in late 2013. The building works for the Speedway Stadium were completed in mid March 2016 at which point BV Arena Ltd took occupancy of the facility under a licence.
- 3.2 The Peter Craven Memorial Event on 19 March 2016 was the first speedway event to be held at the new Stadium for which the City Council were informed by BV Arena Limited that circa 5,500 tickets were sold. The Council understands that on the 18th March 2016 the speedway track was signed off as fit for racing by the Speedway Control Board following testing of the track by speedway riders. On the 19th March 2016 the Clerk of the Course declared the track fit for racing. Unfortunately immediately before the start of the event had to be abandoned. In a series of practice laps before the event the riders, including past and present world champions, determined that the track on Turns 3 and 4 was too soft and that it was unsafe to ride on. The Council is still unclear on what basis the track was declared fit for racing on the 18th and the 19th March and why the event was not cancelled earlier.
- 3.3 A range of remedial works were undertaken between 21st March and 7th April 2016 but these did not rectify the issues and it was identified that part of the track (Turns 3 and 4) would need to be rebuilt. Arup, as consulting engineers, were appointed to provide technical advice to the Council.
- 3.4 Following site investigations it was evident that the materials used for the sub base on Turns 3 and 4 were different to those specified in the Building Contract and should not have been used as a replacement without an assessment on the impact of the Speedway track. It has come to light that the owners of Belle Vue Group Companies were aware of the proposal to use alternative material. However, the Council were not made aware of this change of material and the express consent of the Council was not obtained.
- 3.5 The rebuilding of the track on Turns 3 and 4 was subsequently undertaken by the contractor and Arup were engaged to oversee those works. The rebuilding works were completed and the track signed off as completed on 27th April 2016. There were no costs to the City Council in respect of remedying the defects.
- 3.6 In addition to the abandoned event of the 19th March, between the 20th March and the 27th April 2016 several Elite and National league matches for Belle Vue Aces were postponed due to the unsafe nature of the track and the need to undertake the subsequent remedial works to correct the track. It is claimed that the loss of income from these postponed events put significant financial pressures on the Belle Vue Group of Companies which was compounded by the requirements of BV Arena Ltd to purchase services associated with the hosting of the 2016 Speedway World Cup at the end of July 2016.

- 3.7 In April 2016 the Belle Vue Group of Companies commenced discussions with the City Council in order to seek a loan facility in the sum of £171,000 that would support the cash flow pressures that the company was facing.
- 3.8 In considering this request for the loan the Council indicated that there would need to be a range of security measures put in place along with necessary diligence undertaken. At the point of the loan request was made the Belle Vue businesses were assessed by the City Council as being in the category of "High financial risk with low collateralisation". The Council did offer to make a loan subject to diligence in the sum of £171,000 which included provision for loss of income while the track was being reinstated. The Belle Vue Group of Companies did not take up this offer
- 3.9 In July 2016 BV Arena Ltd submitted a claim against the City Council under the commercial agreements for their alleged losses purported to be due to the failure of the track. They did not pursue a claim against the contractor under the collateral warranty. Discussions were instigated by the City Council with ISG to resolve all issues in relation to the works and a confidential settlement is still being negotiated with ISG and the liquidators of the Belle Vue Group of Companies which is subject of an offer to the liquidator.

4.0 The circumstances leading to the collapse of the Belle Vue Group of Companies

- 4.1 Following the offer of the loan of £171,000 on the 1st June 2016, the owners of the Belle Vue Group of Companies wrote to the Chief Executive on 16th June 2016 seeking a grant of £133,000 to deliver the 2016 Speedway World Cup in Manchester.
- 4.2 On receiving this request for £133,000 of grant support the overall capacity of the owners of the Belle Vue Group of Companies to both manage the commercial aspects of the business and deliver the 2016 Speedway World Cup was called into question by the Council. Any confidence that the Council had in the competence and operational capacity of the owners of the Belle Vue Group of Companies had been seriously eroded away at that point in time.
- 4.3 Given these circumstances the Council held discussions with IMG, the promoters of the 2016 Speedway World Cup (SWC), to establish what IMG could offer in order to safeguard the event in Manchester. They in turn held discussions with the owners of the Belle Vue Group of Companies. The result of those discussions was that, whilst the event would be loss making for IMG, IMG took responsibility for the management and organisation of the event with all contracts which the Belle Vue Group of Companies had entered into for SWC 2016 being novated across to IMG.

- 4.4 In parallel with the work to engage IMG, the financial position of the Belle Vue Group of Companies was further reviewed by the Council. This review revealed significant weaknesses in the financial controls and processes associated with the Belle Vue Group of Companies. As such the Council confirmed that it would be unable to provide public monies to support the Belle Vue Group of Companies as it could not be assured that the Belle Vue Group of Companies was financially resilient so as to ensure that public money would be protected and the public interest would be served.
- 4.5 Further discussions were also held separately with the owners of the BV Arena Ltd about the future arrangements for occupying and operating the Stadium. In order to protect the public sector investment, the Council's position was that a commercial operator should be appointed to manage the Stadium with the owner's energies being focussed on the management and operation of the BVA speedway team.
- 4.6 The Council understood that the owners of the BV Arena Ltd recognised that there were several weaknesses in the commercial capacity of the business to manage and operate the Stadium and that they were keen to explore an approach with a commercial operator with an established track record in running stadia. Officers positively encouraged the owners to explore such opportunities without delay and that given the history of events, the officers considered that this would be the only basis on which the Council would be able to consider reviewing the relationship with the Belle Vue Group of Companies beyond the end of the 2016 speedway season.
- 4.7 During August and early September 2016 it was evident that little progress had been made by BV Arena Ltd in exploring an approach with a commercial operator to run the Stadium with the owners being focussed on BVA's qualification for the Elite League Play Offs and getting to the Play Off Final.
- 4.8 In late September 2016 the owners of the Belle Vue Group of Companies indicated a wish to pursue the loan facility that was offered on the 1st June 2016 due to their view of a rapidly deteriorating financial position. Officers could not recommend a loan with out a further review of the businesses.
- 4.9 In October 2016 following the end of the Elite League Speedway season a further review was undertaken of the Belle Vue Group of Companies finances by the City Council and this indicated that the weaknesses which were identified in July 2016 had not been rectified. As such officers could not recommend the signing of any loan agreement
- 4.10 Since taking occupation of the National Speedway Stadium in March 2016, BV Arena Ltd failed to meet important requirements of their agreements, including paying any rent on the property to the City Council. As a result the Council were therefore also unable to renew BV Arena Ltd's licence to occupy the stadium nor the entering inform of any further commercial arrangements with the Belle Vue Group of Companies

- 4.11 In October 2016, it had come to light that the Belle Vue Group of Companies had significant debt not only with the Council but with other parties. The Council was contacted by the Chairman of the British Speedway Promoters Association (BSPA) in respect of the financial position of both BV Arena Ltd and Belle Vue Speedway Ltd. They had been made aware that several BVA speedway riders had not been paid salaries and had heard rumours that contractors had not been paid by the Belle Vue Group of Companies. They had also been aware of rumours suggesting that the City Council was going to terminate the agreement with the Belle Vue Group of Companies, which was a major concern to the BSPA as the National Speedway Stadium.
- 4.12 On the 18th October 2016 Council officers were contacted by another investor who informed the City Council that they and a consortium of investors had invested £600,000 via an Enterprise Investment Scheme (EIS) into a new group company in October 2015 - BVA Holdings Ltd. This investment had not been shared with the Council by the owners of the Belle Vue Group of Companies when they met with the Chief Executive in February 2016. The new investors indicated that such monies were used to redeem the monies owed to the exiting consortium and the remainder of the investment being additional capital into the business. From the discussions held with this new investment consortium the City Council now understands that the EIS qualification was never confirmed.

The Events post October 2016

- 4.13 The licence for B V Arena Ltd to be in occupation of the National Speedway Stadium expired on the 31st October 2016. From Council and a BSPA perspective, the speedway franchise, Belle Vue Aces had collapsed as a business. Both the BSPA and the Council have remained absolutely committed to speedway in Manchester and agreed to work together to develop a long-term and sustainable solution to ensure that Belle Vue Aces could continue as the city's speedway team.
- 4.14 In the short term the Eastlands Trust were requested to take over the operations of the National Speedway Stadium from 1st November 2016. The Eastlands Trust is responsible for operating the Council's elite leisure facilities across East Manchester and since the completion of the Belle Vue Sports Village, has been responsible for operating all other aspects of the site, excluding the stadium. Given its experience, both in respect of operating City Council facilities and its knowledge of the Sports Village, the Eastlands Trust agreed to act as Stadium Operator until such time as the City Council was able to identify a more viable option.
- 4.15 At the same time, the City Council was notified that the Belle Vue Group of Companies were no longer trading as going concerns and had entered into discussions with a turnaround and recovery firm in respect of their business affairs.

- 4.16 In January 2017, it was confirmed that both BV Arena Ltd and Belle Vue Speedway Limited had formally entered voluntary liquidation following concerns over financial management. With the Financial Consequences section of this report the debts owed to the City Council are set out along with a number of costs and liabilities associated with the Stadium. After contact from the liquidator the Council appears to be the largest creditor. The Council has reason to believe that there may be other creditors such as the HMRC and other trade creditors and suppliers.

5.0 Belle Vue Speedway 2017 Ltd

- 5.1 Following a fuller understanding of the position of Belle Vue Speedway Ltd, the BSPA revoked the promoter's licences of the BVA promoters. The BSPA were approached by a number of parties who expressed an interest in running the speedway franchise and following conversations with these parties, considered three of the proposals to be suitable speedway promoters. Throughout the process, the City Council was kept informed by the BSPA of the interested parties.
- 5.2 The Council and the BSPA then undertook a joint exercise to identify the preferred partner to take over the speedway franchise granted by the BSPA and to enter into a lease with the Council to occupy the stadium with the control of operations at the stadium being provided by the Eastlands Trust.
- 5.3 An appraisal of the bids was undertaken by the Council which concluded that a consortia had offered the most commercial bid having shown an interest in developing a business plan that would, in the short term, occupy and operate the stadium whilst seeking to develop a business plan to operate both the speedway franchise as well as the stadium. This decision was supported by the BSPA who have agreed to provide the required speedway promoter's licence to the new company.
- 5.4 The two investors behind the new franchise were the original equity investors for BV Arena Ltd. Their commitment to be involved in the ongoing delivery of speedway in Manchester, as well as their commercial expertise, was considered to provide the strongest bid to successfully deliver in the short term the speedway franchise as well as in the long term to develop a sustainable business model that will facilitate growth and development of both the stadium and wider Sports Village.
- 5.5 Belle Vue Speedway 2017 Ltd was established in February 2017. The new business is led by Tony Rice and Robin Southwell. As referenced above they were the original investors into BV Arena Ltd and who withdrew their investment in October 2015. Tony was the Chief Executive of Cable & Wireless Communications (CWC) until 2013 whilst Robin was the Chief Executive of the aerospace company EADS (now Airbus) until 2014. He has recently had his role as a global UK Business Ambassador extended by the Government.

6.0 The Implications and Consequences for the City Council

- 6.1 Notwithstanding the work which was done at the outset to satisfy the Council about the robustness of the original Business Plan (which provided the essential justification for the City Council's investment to complete the funding plan for the Stadium) it is clear now that the absence of any commercial management competencies in the Belle Vue Group of Companies aligned with the absence of robust financial and operating systems within the company structure, has led the Belle Vue Group of Companies into voluntary liquidation. Their performance in managing the speedway business means that any reliable analysis of business performance has been rendered impossible. Such an analysis will now only be possible through working with the new owners of Belle Vue Speedway 2017 Ltd.
- 6.2 Looking back over the last 18 months it is now very clear that the owners of the Belle Vue Group of Companies have not been open and transparent with the Council particularly in respect of not informing the City Council of the withdrawal of the £500,000 of private equity funding along with not declaring that replacement investment of £600,000 had been made at the same time as the original investment was withdrawn.
- 6.3 In addition to not informing the City Council about the loss of the original investment the failure of the owners of the Belle Vue Group of Companies to replace the loss of the commercial expertise which the original investors added at the outset magnified the challenges which the owners faced to deliver the original Business Plan outcomes in their first season in the new Stadium.
- 6.4 While the defects to the track which became apparent at the Peter Craven Memorial Event on the 19th March contributed to the operational and financial difficulties faced by owners of the Belle Vue Group of Companies these were a result of a change of materials which were not specified in the original contract were not approved as a change by the Council and nor did the Council have any prior knowledge of the proposal. The Council's offer of a loan included an assessment of the lost income as a result of the track not being available while it was being reinstated.
- 6.5 The decision to go ahead with the loss making 2016 Speedway World Cup after the end of April 2016 was one made by the owners of the Belle Vue Group of Companies. This prestigious World Championship event only took place as a result of IMG assuming responsibility for the event otherwise it would have been cancelled.
- 6.6 The British Speedway Promoters Association's decision to revoke the licence of the Belle Vue Aces promoters was a reflection of their lack of confidence in the owners of the Belle Vue Aces as well as their financial management capability.

6.7 As a result of the BSPA's commitment to work closely with the Council a new franchise has now been granted to new owners which offers a realistic prospect of a successful future for Belle Vue Aces Speedway Team in addition to the delivery of the objectives as originally envisaged by the Council. Over the next 12 months the intention will be to work with the new franchise owners and produce a Business Plan which, subject to satisfying the Council, will determine the most productive operational management arrangements for the franchise and the Stadium going forwards. The outcome of this work will be presented to the Executive for final determination.

6.8 The work that will be undertaken with Belle Vue Speedway 2017 Ltd will be determine a reliable financial and operating base not only for the Stadium but Belle Vue Aces Speedway team too. This work is required to create a stable financial base from which future plans can be determined with confidence. As part of this review the previous agreed £350k pa rent will be tested.

7.0 Waiver from Call-In

7.1 Approval is sought pursuant to Rule 14 of the Overview and Scrutiny Rules that the decisions set out in the recommendations above are urgent as the delay caused by the call in process would seriously prejudice the legal or financial position of the Council or the interests of the residents of Manchester.

7.2 The Council must be in a position to finalise the commercial arrangements to ensure that all the necessary facilities and equipment are in place to meet the requirements for the speedway season the first race of which is to be held at the beginning of April 2017. If the current decision was called in it would result in a delay to providing the required facilities at the national speedway stadium and a legal and financial risk to the Council. Therefore in order to avoid such risks due to delay it is considered prudent to exempt the decisions from call in.

8.0 Recommendations

8.1 Detailed recommendations appear at the front of this Report.

9.0 Contributing to the Manchester Strategy Outcomes

(a) A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities

9.1 Securing the future of the National Speedway Stadium as a platform to host a range of national and international speedway events will deliver additional economic benefits to the city and the East Manchester area

(b) A highly skilled city: world class and home grown talent sustaining the city's economic success

9.2 In the longer term Belle Vue Speedway 2017 Ltd will give consideration to the development of a Speedway Academy that will focus on a range of skills development opportunities needed to sustain the sport.

(c) A progressive and equitable city: making a positive contribution by unlocking the potential of our communities

9.3 The National Speedway Stadium is a key asset within the Belle Vue Sports Village and the combined facilities within the complex offer the opportunities for residents to come together and to become healthier.

(d) A liveable and low carbon city: a destination of choice to live, visit, work

9.4 Securing the future of the National Speedway Stadium will help contribute to strengthening Gorton as a destination to live, visit and work.

(e) A connected city: world class infrastructure and connectivity to drive growth

9.5 The National Speedway Stadium is already recognised as one of the best speedway tracks in the UK. This asset along with the other facilities on the Belle Vue Sports Village help support the vibrancy and attractiveness of Gorton and East Manchester.

10.0 Key Polices and Considerations

(a) Equal Opportunities

10.1 An outcome will be to capture local employment opportunities and ensure that local residents have the opportunity to compete for such job opportunities.

(b) Risk Management

10.2 The delivery of the capital works required in the immediate short term will be overseen and monitored by the Belle Vue Project Board. This Board will also work with Belle Vue Speedway 2017 Ltd to oversee the development of a robust Business Plan that determines a reliable financial and operating base not only for the Stadium but Belle Vue Aces Speedway team.

(c) Legal Considerations

10.3 Legal consideration are contained in the body of the report. The legal team will continue to provide advice and support to officers in relation to all aspects of this project.

Manchester City Council
Belle Vue Speedway Arena
Remedial Works to Speedway Track

601820-REP-001

Issue 3 | 8 June 2016

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 601820

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ARUP

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ARUP

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Appendices

Appendix A

Report of test results of 6F2 sample

Executive Summary

Arup have been instructed by Manchester City Council (MCC) to provide them with advice regarding the track which had been constructed by ISG, the design and build contractor for the new Speedway Stadium at Belle Vue. The report summarises that advice.

The track was originally constructed in two parts, with Turns 3 and 4, constructed later in the programme. ISG also changed the design of track for Turns 3 and 4, most notably in that the MOT Type 1 sub-base, used in the remainder of the track, was substituted by an imported, second generation fill, referred to as "6F2".

On 19th March 2016, the Grand Opening Meeting was due to take place but was abandoned due to riders refusing to race due to safety concerns on Turns 3 and 4. Following that event ISG carried out some works to Turns 3 and 4, but were not able to satisfy MCC, the Employer in the contract, or Belle Vue Aces (BVA), the operator of the facility, that the track was satisfactory.

Arup were asked to advise MCC from 8th April 2016. Arup's view of the original design and construction is as follows

1. Whilst we were not present at the event of 19th March, the elastic settlement we observed in the sub-base on the 8th April and later, was resulting in softness in the surface material. We would expect that this would cause rutting in the surface material, even under a light load such as a speedway motorcycle.
2. The unsatisfactory nature of the track arose from areas of elastic settlement. The failure was not in the top Shale layer, but principally in the "6F2" sub-base. Some areas of softness in the sub-formation below the "6F2" may also have contributed.
3. There is insufficient information available from ISG regarding the design approach of the track, and the construction materials and methodology employed.
- 4.
5. Even if properly specified and installed, "6F2" material is not the equivalent of Type 1 and, on that basis, should not have been used as a replacement in the design without an assessment of the impact on the Speedway track of a reduced formation strength.
6. In a number of places the "6F2" did not even achieve the 15% CBR at its surface that it should do if supplied and installed in accordance with the Specification for Highway Works. This could be the result of poor material, poor compaction, the local saturation of this layer, or a combination of these. These areas of low CBR, in many places, coincided with the areas of elastic settlement at the surface.

7. We note in particular that we have not seen any testing which demonstrates that the “6F2” material brought onto site is compliant with the specification of such material (from the Design Manual for Roads and Bridges). What we have observed of the material is that it is a re-cycled aggregate from a demolition source, and has various characteristics of concern to us. The only testing available, which was carried out on a small sample collected by BVA, shows that the material does not comply with a 6F2 grading. Without testing to confirm acceptability, on the evidence available we would doubt that the placed material would comply with the 6F2 specification.
8. The “6F2” material should not be saturated, and it is likely that this is a contributory cause of the elastic settlement. The saturation could be caused by the absence of earthworks drainage, the localised areas of impervious sub-formation, or an excess of fines within the fill. However it is likely that use of Type 1 fill, on a subformation with a degree of permeability, would not have given rise to the elastic settlement which was observed

MCC on 14th April 2016 issued PMI 113 instructing ISG to reconstruct Turns 3 and 4 to the original design, i.e. with MOT Type 1 sub base. Arup has observed that the corrective works were carried out generally in accordance with TRP drawing; Re-use of Recycled Material Track Sections - Drawing No SK10 Revision S1, ‘Tender’ other than, as noted within our report, sub base thicknesses were typically 200mm on site as opposed to 150mm on that drawing.

On 26th April 2016, MCC issued PMI 115 requiring ISG to undertake and provide evidence of testing of the “6F2” material. This information has not been provided.

1 Introduction

1.1 Arup's Appointment

The new Belle Vue Speedway Arena has been constructed for Manchester City Council (MCC) at the site of the former hockey pitches on Kirkmanshulme Lane in Gorton. The Arena was due to be operational ahead of the Peter Craven Memorial Trophy, to be held on 19 March 2016. However problems were reported with the track immediately before this event, and it was abandoned. Following this, Manchester City Council were faced with two challenges;

- To establish the cause of the problems with the track
- To agree and complete all remedial works to the track as soon as possible to minimise the impact on the speedway events program

Manchester City Council have asked Arup to provide independent technical advice to facilitate the achievement of these goals. Arup were to;

- Attend meetings as required by MCC to provide technical advice
- Advise MCC as required as to the appropriate course of action to achieve the above aims
- Attend the Arena site as required by MCC to view the remedial works and advise on the quality of work being carried out.

Arup's appointment is with MCC only. We are not part of the construction team. However to achieve the aims we have been asked to liaise with all on site to ensure we are providing accurate advice to MCC.

At this stage we have been appointed to advise on technical aspects only, not to advise on contractual aspects of the track construction works.

The purpose of this report is to provide our advice on why the problem of 19 March 2016 occurred, and to describe the corrective works which took place from 8 April to 27 April 2016.

1.2 Organisations Involved in the Project

The following are the parties who have been directly involved in the speedway track construction works;

Client and Arena Owner	Manchester City Council (MCC)
Arena Operator	Belle Vue Aces (BVA)
Design and Build Contractor	ISG
Contractor's Architect	AFL Architects (AFL)

Contractor's Engineer TRP Consulting (TRP)

Contractor's Geotechnical Consultant Sub Surface North West Limited (SSNW)

1.3 Area of the Works

The problems reported on the 19 March 2016 were confined to turns 3 and 4 of the new speedway track. Arup's appointment is to advise on the construction of this part of the speedway track only. No other areas of the project are considered in this report. However it is recognised that the issues with the track may be influenced by factors beyond the immediate turns 3 and 4 track area. Therefore these have also been considered.

1.4 Information Provided.

The following information has been provided to Arup as background to the project and to assist with the advice Arup provided to MCC;

Drawing/Document	Revision	Status	Author
Geo-environmental Desktop Report Vol 1	S2	'Final'	TRP
Specification for Excavating and Filling	May 2015	-	TRP
Speedway Stadium Track – Drawing No AL-01-79-002	C2	Construction	AFL
Speedway Stadium – Speedway Track Grid Setting Out – Drawing No AL-01-14-001	C6	Construction	AFL
Re-use of Recycled Material Track Sections - Drawing No SK10	S1	Tender	TRP
Technical Report, Ground Investigation at Belle Vue Sports Village, Report No 5771A	Dec 2013	-	SSNW
Technical Report, Ground Investigation at Belle Vue Sports Village, Report No 5771B	Apr 2014	-	SSNW
Geo-environmental Desktop Report Volume 1	S2	'Final'	TRP
Email from [REDACTED] providing his opinion following a site visit	21 March 2016	Email	MCC

During the remediation works, the following instructions to change the works were issued by MCC which included additional technical content;

- PMI 113 (14/04/16)– Initial instruction to re-construct works on turns 3 and 4 and place orders for materials
- PMI 114 (18/04/16) – instruction for additional works due to the presence of buried tarmac in a location on turn 3.
- PMI 115 (26/04/16) – instruction to ensure that the “6F2” material is tested and evidence of this testing is provided.

As part of this appointment we have asked MCC to request from ISG all relevant documentation which they hold regarding the design and construction of Turns 3 and 4. At time of writing no such information has been received.

1.5 Terminology used in this report

The following terminology has been used throughout this report, see also the sketch in Figure 1;

Sub-Formation – We use this term to describe the layer of material on which the sub base layer is placed.

Sub-base – We use this term to describe the material, variously described in the contract as Type 1 or MOT, which has been laid on site between the Sub-formation and the Shale.

Formation – We use this term to describe the upper surface of the Sub-base

Shale – We do not use this term in its generally accepted Geological meaning. In this report we refer to the material described as Shale, produced by Breedon Aggregates Limited at their quarry in Derbyshire. We understand that this material is used widely in Speedway circles as a finished surface on Speedway tracks.

Surface Drainage – Drainage systems designed to collect rainwater which has fallen onto a surface and then runs across that surface.

Earthworks Drainage – Drainage system designed to collect water that has infiltrated into the ground.

CBR – California Bearing Ratio. This is a test commonly used in highway design and construction to assess the strength of a formation prior to the laying of the upper pavement construction layers. It is a simple test to carry out, but generally would be supported by more detailed geotechnical testing.

“6F2” – “6F2” is a grade of material defined in the Design Manual for Roads and Bridges, (DMRB), produced by Highways England. It is generally used in highway construction as a fill material layer to improve poor ground, and is normally overlain by Sub-base (Type 1 material) prior to the laying of the bituminous layers. On this site, we have not seen any test results for the material which was brought onto site as “6F2”. Therefore when we describe this material

in this report it is termed "6F2", although evidence has not been provided to show that it is compliant with DMRB.

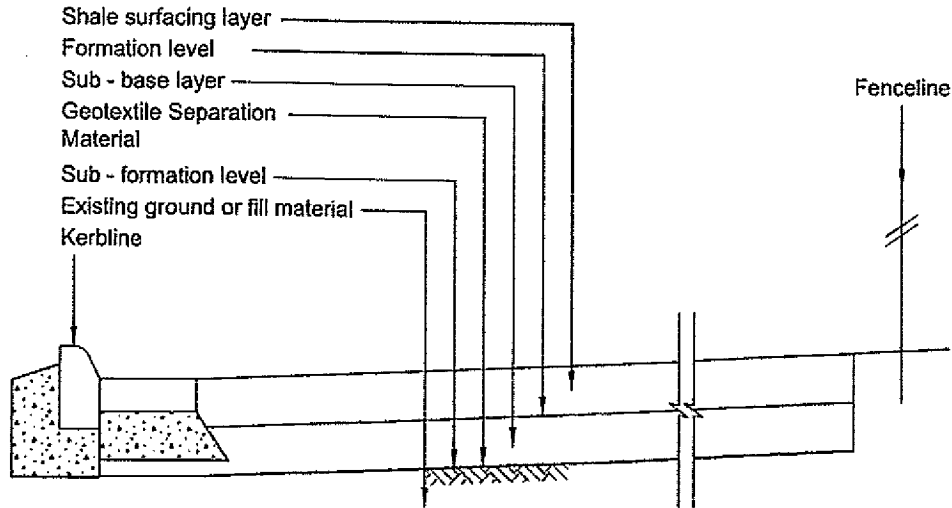


Figure 1 Typical cross-section of track construction

2 Original Track Design and Construction

2.1 Site Investigation

We have received and reviewed Sub Surface NW Ltd Geotechnical Report 5771A, rev A. It provides useful general information about the overall site conditions, although is written mainly to inform the design of building foundations.

2.2 Contract Requirements

From our review of the information above we have identified two elements of the Contract Document which relate to the track design

- a) The Employers Requirement section includes the following requirements for the track.
 - *“Provision of a suitable track sub-base build up that can accommodate the loading of a tractor pulling a fully loaded water bowser*
 - *The Track should be designed to create a unique, fast track that is exciting for spectators and riders.*
 - *Levels to take account of a top 150mm build up layer of shale which is to be provided by the Contractor”*
- b) Included in the Contractor’s Proposals is TRP Consulting drawing ‘Reuse of recycled material, Track Sections’, emailed to us on 08/04/2016 by MCC. A note on this drawing states ‘Track construction assumed to be 75mm shale on 150mm MOT’. It was stated at the meeting at MCC on 14th April 2016, by ISG, that this drawing was provided to inform the earthworks quantities for the project, for which the above track construction is provided as an assumption only.

2.3 Other relevant contract information

The phrase ‘MOT’ on the TRP drawing above is assumed to refer to a granular sub-base material Types 1 or 2 from the Specification for Highways Works clauses 803 or 804 and as referred to in the TRP Consulting specification document ‘Specification for Excavation and Filling’, clause 205 or 210.

From discussions with MCC and BVA we understand that term shale in the documents above related to a specific material produced by Breedon Aggregates Limited at their quarry near Breedon on the Hill, Derbyshire. We understand these are the sole provider of such material and is therefore BVA’s preferred supplier.

The design shows the track falling to the inner kerb. A flat kerb is provided with gullies at intervals

We note that we have not seen any specific reference to

- a) The specification of the Sub-Formation (the material below the sub-base layer). We note that The TRP drawing 'Reuse of recycled material, Track Sections' indicates that the majority of the track was to be on fill material.
- b) We have not seen any quantitative criteria for either the track formation or the MOT layer, such as CBR values within the original design.
- c) We have not seen any reference to consideration of earthworks drainage in the track design.

2.4 Other available design guidance

As part of this commission we have carried out some research into the availability of design information for permanent Speedway tracks. The only document we have been able to identify is the FIM Standards for Track Racing Circuits (STRC) 2013, published by the Federation Internationale de Motorcyclisme.

However we have not been able to identify any information in this guide to support the earthworks design of a new Speedway track. Thus, we would expect the earthworks design to be carried out following industry practice from other relevant project sectors.

2.5 Modifications to design

2.5.1 Prior to initial track construction phase

Changes were made to the design of the track, post contract but prior to the construction of turns 1, 2 and the straights. We have not been provided with all of the background to these changes and therefore cannot comment on why they were made. Our understanding of the changes are as follows;

- The assumed 75mm thickness of shale was considered too thin, this was increased to 150mm. We understand this was requested by BVA.
- We understand a geotextile separation material was provided below the MOT layer. This is not shown on the drawings or information provided. Its purpose cannot therefore not be confirmed

From discussions therefore, not supported by any information we have seen, turns 1 and 2, plus the two straights were built to the following construction;

- 150mm shale, over
- 150mm min granular sub-base (MOT), over
- Geotextile separation layer, over
- A fill material comprising the re-cycled hockey pitch pavement construction.

2.5.2 Prior to construction of turns 3 and 4

Prior to the construction of turns 3 and 4, we understand ISG sourced an alternative construction material to the sub-base. We understand that the revised design intent was for a 200mm thick layer of "6F2" capping material, meeting the Specification for Highways Works clause 613.

We have not seen any design information provided for this alternative design, and to our knowledge, no quantitative criteria (CBR values etc.) have been provided.

We understand from conversations that no geotextile separation material was provided at the sub-formation level under the sub-base on Turns 3 and 4.

2.6 Relevant construction issues

We were not appointed during the construction works and have not been provided with any documentation regarding the construction of Turns 3 and 4, prior to the abandoned event on 19 March 2016. This report therefore cannot comment on events in this period in any detail.

However in discussions with the Project Team the following issues have been raised. Their potential implications on subsequent events are discussed in Section 4.

2.6.1 Project Sequencing

We understand turns 3 and 4 were the last parts of the project to be constructed. Immediately prior to their construction, the area was used as a site access and storage area. Turns 3 and 4 were constructed in the weeks prior to the inaugural speedway event and Arena opening.

2.6.2 Rainfall

It has been reported to us that during the construction of Turns 3 and 4 there was a higher than average amount of rainfall in the region, mainly comprising prolonged periods of low intensity rainfall.

3 Arup observations on the original design and construction of Turns 3 and 4

3.1 Initial description of problem

In discussion with MCC, it was reported to us that the event on 19th March had been abandoned due to the condition of the Track on Turns 3 and 4. It was reported to us that the track was soft and this was causing rutting which made it unsafe for the track to be used as intended.

3.2 Inspection of the works by MCC Consultant Structural Engineer

██████████, a Consultant Structural Engineer working for Manchester City Council visited the site on 21st March 2016. His observations were

- a) The material beneath the shale was variable but in places was “spongy” underfoot.
- b) The 6F2 material had a “clay like” matrix and there was wire, timber and plastic in evidence. His view, based on visual inspection was that it would not comply with a 6F2 grading.
- c) The 6F2 material in places was wet and soft.

3.3 Visit of 8th April 2016

We first viewed the site on Friday 8th April. We were accompanied by MCC and BVA.

The following observations were made;

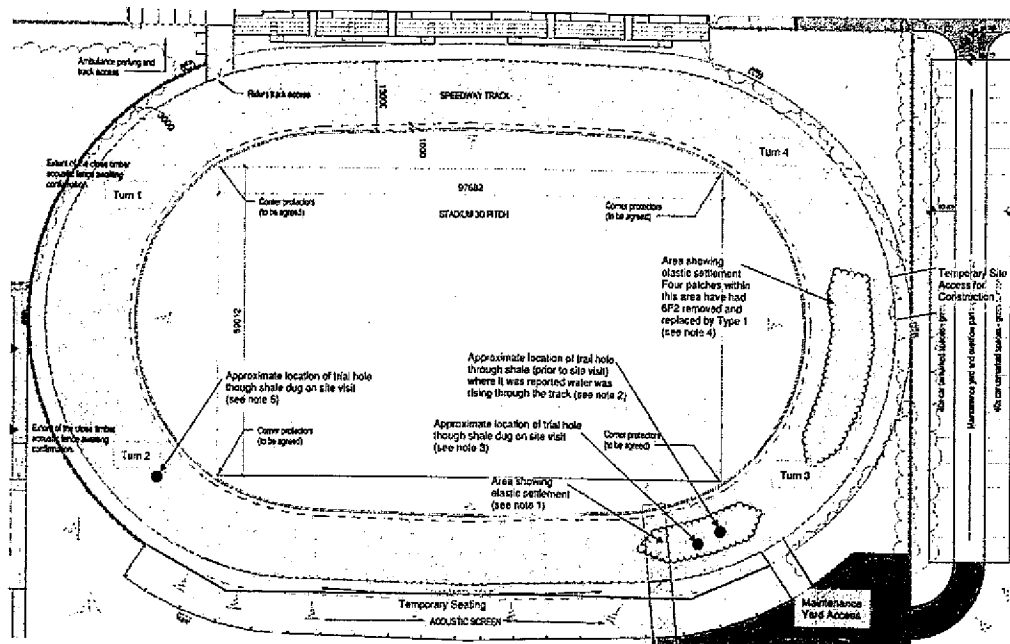


Figure 2 – Initial observation on site (refer to notes below)

1. An area roughly along the centre of the track, close to the temporary seating and the maintenance access, displayed a varying amount of elastic settlement under foot.
2. Within this area, a trial hole had previously been dug by ISG. We were informed by BVA that water had been seen seeping out of this hole from the track construction layers below the shale. Gravel had been placed in the hole to try to stiffen the ground. On our visit we viewed the hole to be full of water (see figure 3) to finished track level but there was insufficient evidence of flows moving through the pavement construction below. The flow of water leaving the hole could have been rainwater flowing on the surface. Refer to the photograph in Figure 3.
3. We viewed a trial hole being dug close-by through the shale, so that we could view the material below. Beneath the shale we viewed the material described by the contractor as “6F2” material. This was generally a stony mixture of material, most pieces being between 5mm and 30mm in size. Within the mixture there was dark brown fine material. Also, from the hole we recovered a piece of stone which was approximately 150mm long.
4. A second larger area of elastic settlement was located along the centre of the track further around turn 3 up to turn 4. We were told that ISG had previously carried out some remedial works here which involved removing the shale and capping material layers from four areas and replacing it with an imported sub-base type 1 or 2 material. We were told this had significantly improved the stiffness of the track construction in

these areas. Although this was impossible to prove without testing, we did note that these areas did not seem to noticeably settle when walked on.

5. There was ponding of rain water along the track inside kerb. We were informed this was due to the track surface not having its final layers of shale and was not a concern to BVA.

During the visit we were shown a sample of the “6F2” material used, which had been collected by BVA from the area described in 2 above and stored in a bucket in the BVA maintenance building (see photo in figure 4 below). The material comprised a variety of particles ranging from coarse sand through to large objects of stone, brick, concrete and other recycled materials. There appeared to be a large proportion of brownish fine material. Some large objects of metal and fabric were also recovered with the sample. This sample was sent for laboratory testing, and the results of this are discussed in Section 3.5.

As part of our initial site visit, a small area of shale was cleared on turn 2 to reveal the construction layer beneath. The shale was approximately 150mm thick. The material beneath appeared to be visually consistent with a type 1 or 2 sub-base material (an MOT). From the small area cleared, this surface appeared to have a high stiffness, also consistent with a type 1 or 2 material.



Figure 3 Excavation on turn 3 from which water was reported to have been issuing.



Figure 4 Sample of "6F2" material collected by BVA from Turn 3

3.4 Visit of 15th April

Following a meeting with ISG and MCC on the 14th April, we attended site again on the 15th April.

The previous night, MCC had issued Instruction PMI 113. On the 15th ISG were carrying out some enabling works for that instruction, but also carried out several insitu CBR tests on the sub-base layer, then formed of the material described as "6F2".

On that day we noted that a number of CBR tests recorded results less than 5%, including one test which was carried out in a location we identified as featuring elastic settlement, prior to removal of the shale in that location.

3.5 Outcome of test results of the 6F2 sample

As described earlier in this report, BVA dug a trial hole in Turn 3. They reported that water had been seen seeping out of this hole from the track construction layers below the shale (see picture in Figure 3). A sample of the 6F2 material from this area was collected in a bucket by BVA. MCC sent this bucket sample to a laboratory for testing. The letter report from this testing is enclosed as Appendix A.

It is important to note that this sample was collected by BVA, not the testing house, and thus they are unable to confirm that it is a representative sample of all the material imported. Additionally, the recovered mass of sample was insufficient for a full suite of testing and, thus, a reduced suite of classification tests were carried out to ascertain the suitability of the material.

These results are however valuable to augment the visual evidence of the imported fill.

The key conclusions are:

- a) The sample recovered is too small for a full suite of testing
- b) It contains a significant proportion of deleterious material
- c) The grading of the recovered sample failed to meet the 6F2 specification, owing to an excessive fines content at 10mm, 5mm and 0.6mm grading intervals.

4 Review of potential causes

4.1 Evidence related to the failure mode

Our observations and discussions between the 8th April and 15th April, led to the following conclusions regarding the failure mode.

- a) We define the failure as being the decision not to race on 19th March.
- b) We did not see the condition of the track on that day. However it was reported to us by MCC and BVA that the track was soft and this gave rise to rutting as the Speedway bikes drove over the surface.
- c) Our observations from our visits on 8th and 15th April, identified areas of elastic settlement. Whilst visible at the surface, our interpretation of the movement we were seeing was that the movement was not in the surface Shale but was in the lower layers.
- d) Whilst we were not present at the event of 19th March, the elastic settlement we observed in the sub-base on the 8th and 15th April, was resulting in softness in the surface material. We would expect that this softness would cause rutting in the surface material, even under a light load such as a speedway motorcycle.
- e) We note that the CBR tests carried out by ISG showed variable results at the Formation level (top of sub-base). Some tests showed insitu CBR's in excess of 20%, whilst others were less than 5%. As noted above, we identified one location which was demonstrating elastic settlement, and the CBR test in this location subsequently was less than 5%.
- f) As noted above we observed that, in places, the excavations opened up in the track filled with water seeping in from the surrounding layers. It is not fully clear which layers this water was being held in, but it was clear that parts of the track construction were saturated.

4.2 Review of possible failure modes

4.2.1 Limitations

This report provides our view of the possible failure modes, based on the information set out in this report.

We have observed that we would expect more documentation to be available to review from the Design and Build Contractor, and in particular

- Documentation of the design rationale, including the changes made for Turns 3 and 4,
- Test information of the materials incorporated into the works,

- Information about the ground conditions exposed at the sub-formation, including materials and groundwater regime.

We would however make the following comments based on our observations and the knowledge we have gained from those involved in the original construction works and the remediation works.

4.2.2 Design

As noted in Section 2.1 above, the only design information included in the contract was a TPR drawing which provides a layer of shale over a layer of "MOT". We note that this provides no guidance on the strength of the layers below the sub-base.

We interpret the Employers Requirements clauses as requiring the sub-base to be suitable for the intended use.

We have searched for more guidance on Speedway track design but have not been able to find any.

It is recognised that a speedway track is not a road. However we would note that in traditional highway design, the specification of the sub-base and the fill materials below this is not a function of the highway loading, but is a function of the ground conditions. It is only the bound layers above the sub-base that vary with the highway loading.

Therefore, despite it being for a Speedway track, we would interpret that the sub-base layer specified in the TPR drawing should perform as a road sub-base, and achieve a CBR of 30%.

Depending on the formation layer beneath the sub-base it is possible to achieve a CBR of 30% without any additional layers. However should the formation be too weak, we would expect the designer to either thicken the sub-base or specify suitable 'capping' to underlay the sub-base layer.

Finally we note that on a highway design, measures would be taken to keep moisture out of the sub-base, capping and subgrade both during the construction and during the life of the pavement. Without this, the material will be difficult to compact and will deteriorate under loading.

The surfacing will protect these layers from rainwater, but measures would normally be taken to understand the ground water regime and protect these layers against being sat in a layer of ground water. These would normally be in the form of drainage blankets beneath the capping layers or installed groundwater drains.

4.2.3 Layer where failure occurred

Our view is that the failure has arisen in either the "Sub-base" or the sub-formation. We note

- the nature of the elastic settlement observed with "bellying" of the upper layers, is characteristic of a failure below the surface layer

- the variability of the CBR testing of the formation layer, that was carried out between 8 and 15 April
- the link observed between area of elastic failure and poor formation CBRs

4.2.4 Sub Formation

We have not seen any records of the sub-formation, prior to the original placement of the “6F2” sub-base.

From observations during the remedial works, the sub-formation appears to have two characteristics which would influence the stability of the layers above

- a) As noted in section 3.2 above, there were areas of soft sub-formation which were removed during the remedial work
- b) As noted in section 4.2.6 below, there were areas where the sub-formation was impervious (tarmac and clay). This is discussed later as part of the groundwater management section (4.2.6).

4.2.5 “6F2” Material

This section considers whether “6F2” was an appropriate specification of material for this use, and the nature of the material brought to site.

Selection

“6F2” material is typically used as a structural foundation to a road pavement where the sub formation CBR is less than 15%. The thickness of “6F2” used for this purpose will vary with the weakness of the sub-formation, and “6F2” capping layers can be laid in thickness up to 600mm. A designer would typically expect that the correct thickness of “6F2” would achieve a CBR in excess of 15% at the surface.

The original design showed a layer of MOT, understood to mean Type 1 sub-base as defined by the Highways Agency. Type 1 is a more onerous specification of granular fill than “6F2”, and in a highway design is typically used above the capping and immediately below the bituminous layers. Traditionally one would expect a CBR in excess of 30% at the surface of a Type 1 sub-base layer.

Another key difference between the performances of the two materials is the issue of frost susceptibility, which is how the material resists the freeze and thaw action of water in the material. Current UK guidance is that a pavement should be able to remain stable under freezing and thawing if it is laid within 450mm of the surface. As Type 1 is often laid at such shallow depths it is designed to be frost resistant. A “6F2” is not often laid at such a shallow depth, and depending on its composition may be frost susceptible. This is tested by an additional test. The “6F2” was laid within 200mm of the surface, but we have seen no evidence that the “6F2” used on the site was tested for frost susceptibility.

We therefore note that “6F2” is an intrinsically weaker material than Type 1, and is potentially frost susceptible. Our view is therefore that “6F2” material would not be an acceptable replacement for Type 1 material in this design.

Material used on site

We have not seen full test results from the Contractor for the material brought to site and laid as “6F2”. We understand from a meeting with ISG that they have a test certificate from the material source, but did not carry out any testing of the material once delivered to site.

We understand from MCC that ISG have been instructed to commission independent tests of the material being taken from site. These should include the normal acceptability testing for “6F2”, plus frost susceptibility testing as discussed below. At the time of Issue (7th June 2016) these results have not yet become available to us, or we understand MCC.

MCC has also formally instructed the Contractor as part of PMI 114 to provide evidence of any certification or sign off sheets of the subject “6F2” material. At the time of Issue (7th June 2016) these results have not yet become available to us, or we understand MCC.

As noted in Section 3.5 above, a small sample of this material was removed and tested independently by MCC. This sample was too small for a full range of testing, but the laboratory noted that there was a significant presence of significant deleterious materials, and the proportion of fines was greater than the specification for 6F2.

Our observations, therefore are based on observation of materials excavated during the works. Figures 5 and 6 show photographs of such material as observed on site.

It is important to note that the specification for “6F2” material is not onerous, and a wide range of granular material can achieve the “6F2” standard. From our observations of the material we do have the following concerns

- a) The material used is a re-cycled aggregate from a demolition source. We would note that such materials are inherently more variable and we would recommend that the testing frequency is increased for such sources. We would normally expect that a samples would be collected and tests carried out on the material as it arrives on site.
- b) The material performance has been very variable and a number of CBR tests have recorded values of around 5% when it should be consistently in excess of 15%.
- c) The material has been observed to have a high proportion of fines. We note that the grading specifies that up to 12% allowed to pass a 63micron sieve. We suspect that the material may have a higher fines content than this. This is supported by the testing undertaken by MCC.
- d) All of a “6F2” material should be able to pass a 125mm sieve. We have identified some material which is larger than this.

- e) We note that the specification for “6F2” reduces the maximum particle size to no more than $\frac{2}{3}$ rd of the thickness of each compacted layer. If compacted in 100mm layers, the maximum particle size should be reduced to 65mm. We have seen no evidence that this requirement has been considered in the material selection.
- f) A “6F2” is allowed to have a proportion (1% by weight) of Class X material, which includes timber and plastics. There is certainly a proportion of Class X material that can be seen, but it is not possible to confirm if this is greater than 1%.
- g) We have not seen any evidence that the material is not frost susceptible. This would require additional testing.
- h) Our observation is that much of this material was saturated when placed. This will exacerbate any issues with an overly high fines content.

Without testing to confirm acceptability, on the evidence described above we would doubt that some areas of the placed material would comply with the 6F2 specification.



Figure 5 “6F2” material stockpile during removal



Figure 6 “6F2” material being removed

4.2.6 Ground water management

It is known that the weather conditions were continually wet when the original track construction was carried out. It is likely the materials laid for the track, principally the “6F2” material and the shale layers had a high water content when they were installed.

Adding to this there were possibly groundwater flows from the adjacent areas on the outside of turn 3. This probably resulted in a large volume of water trapped in the “6F2” material layer, confined by areas of potentially impervious sub-formation layer and the kerbing on the inside of the track, and held in the material due to the high fines content.

Some infiltration into the formation and seepage under the kerb would have been expected, but as the track was constructed rapidly, this may not have been sufficient to remove the water quickly enough.

It appears that the apparent stiffness problem was worst where there were areas of unbroken tarmac. At these locations the following would have contributed;

- These areas would effectively be impermeable, therefore water trapped in the “6F2” material layer could not escape.
- There was groundwater seepage from outside the track, possibly adding to the waterlogged track construction.

- Material with a “6F2” capping classification is not expected to achieve a high degree of stiffness under waterlogged conditions, possibly resulting in the settlement observed on site.
- The waterlogging of the construction would also impact on the shale layer above, retarding the setting process.
- The performance of the existing ground under the track construction could not be established from our involvement in the project, particularly under waterlogged conditions.

4.2.7 Construction issues

As noted in Section 2.6, the construction of Turns 3 and 4 were carried out in a period of reported higher than average rainfall, and were constructed late in the construction period.

We have noted above the impact of moisture content on the strength of the selected “6F2” material, but note that these issues can be managed by a Contractor and “6F2” can be successfully laid in wet periods.

Whilst we understand that the period of construction for these turns was short, again we can see no reason why the period of construction should of itself affect the quality of the final product. We note that the remedial works, discussed later in this report, were carried out successfully in a short period.

4.2.8 Conclusions on Original Design and Construction

1. There were areas of elastic settlement on the track when inspected on 8 and 15 April. We believe that these were the cause of the abandonment of the event on 19 March.
2. We have limited knowledge of the work on the project prior to our involvement, and have not had access to any paperwork related to the track.
3. Our conclusion from our observations is that the failure was not in the Shale layer, but either in the “6F2” sub-base or the underlying sub-formation.
4. Our observations of the remedial works suggest that there were areas of soft sub-formation, but that these were less extensive than the areas of elastic settlement.
5. We believe that the principle cause of the elastic settlement is the “6F2” sub base.
6. We believe that this material is not the equivalent of Type 1 and, on that basis, should not have been used as a replacement in the design without an assessment of the impact on the Speedway track of a reduced formation strength.

7. We note that in places the “6F2” did not even achieve the 15% CBR that we would have expected it to. This could be the result of poor material, poor compaction, the local saturation of this layer, or a combination of these.
8. The “6F2” material should not be saturated. The saturation could be caused by the absence of earthworks drainage, the localised areas of impervious sub-formation, or an excess of fines within the fill.

5 Track Remediation Strategy

5.1 Timeline of track remedial works

The timeline below is based upon information provided by MCC for the period prior to Arup's appointment (8th April 2016) and Arup's observations after that date.

- 17/03/16 BVA advised MCC of potential defect with Turns 3 & 4 and that they felt soft underfoot
- 18/03/16 Investigation on site with ISG, MCC and BVA on Turns 3 & 4, bikes taken around the track and issues confirmed with Turns 3 & 4
- 19/03/16 Grand Opening Meeting takes place and is abandoned due to riders refusing to race due to safety concerns on Turns 3 & 4
- 21/03/16 Investigations on site with ISG, MCC, ISG, TRP and [REDACTED] (Consulting Engineer for MCC).
- 22 - 24/03/16 Localised remedial works undertaken by ISG.
- 30/03/16 Bike test on site to enable BVA to get back their racing licence from the Speedway Control Board which was removed from them following the Grand Opening Meeting
- 07/04/16 Planned Speedway event on 08/07/16 cancelled by BVA due to water coming up through the track on Turns 3 & 4 following a period of prolonged rainfall
- 08/04/16 Arup first attend site on the request of MCC to observe and investigate issues with Turns 3 & 4 of the track
- 11/04/16 Arup issue initial findings and observations report
- 14/04/16 Meeting at Town Hall with ISG, Arup and MCC to discuss next steps to fully remediate Turns 3 & 4 of the track
- 14/04/16 Instruction 113 issued to ISG to remediate Turns 3 & 4 of the track
- 15/04/16 Meeting on site between MCC, BVA, ISG and ARUP to discuss and agree proposed methodology of remedial works to return Turns 3 & 4 in line with the original Contract specification
- 16/04/16 ISG works commence in stripping shale back
- 18/04/16 Instruction 114 issued to ISG to deal with tarmac layer encountered below track construction
- 26/04/16 Instruction 115 issued to ISG to ensure suitable testing regime is implemented for "6F2" material
- 26/04/16 ISG works to remediate Turns 3 & 4 are complete

27/04/16 BVA complete work to top dressing layer of shale and race bikes on the track on the same afternoon, following which confirm that the track is now performing correctly

5.2 Initial remedial works (from 22nd March 2016)

Following the cancellation of the speedway event on 19th March, ISG initiated some works to correct the faults. We understand these to have been as follows:

- The remedial works were to be carried out to the area of turns 3 and 4. The purpose was to improve the standard of the track in these location to that of turns 1, 2 and the straights, which had been deemed by BVA as acceptable.
- ISG stripped back shale in 5m grid intervals around Turns 3 & 4. The sub-base was tested for stiffness with a roller, where it was found to be noticeably moving. The sub-base here was removed until firmer sub-base was reached at edges and replaced with Type 1 MOT, rolled and compacted. This was carried out in what was considered to be four problem 'soft spot' areas, following which the shale was replaced.

The Client, supported by Arup's visit of 8th April 2016, and the views of BVA as track operator, concluded that these works had not sufficiently addressed the full extent of the concerns.

5.3 Further remedial works

Following the meeting between MCC and ISG (with Arup in attendance) at Manchester Town Hall on 14th April 2016, an initial instruction, PMI 113 was issued by MCC to ISG.

This states

"Further to issue of EWN 23 and meetings and subsequent conversations that have taken place on 14/04/16.

We hereby instruct you to carry out the following works in order to ensure the specification of Turns 3 & 4 of the speedway track is rectified in accordance with rest of the track.

Phase 1

- 1 - Instruct BVA to remove shale layer to turns 3 and 4 – they are mobilising people to be ready to do this on the morning of 15/04/16*
- 2 - ISG to move and stockpile the shale which can be re-used at the ends of the two straights – BVA to advise on shale that can be re-used*
- 3 - ISG to remove installed sub-base material to turns 3 and 4 up to where Type 1 MOT is encountered at the straights of the track.*

4 – ISG to place an order for additional shale from Breedon Aggregates to ensure a 150mm layer of shale can be re-instated. Liaison with BVA will be required on quantity required.

5 – MCC requires that these works commence tomorrow morning and continue on a 7 day a week basis until works have been completed.

ARUP will be present on site during the excavation works to observe and document the works on behalf of MCC.

Phase 2

The specification to reinstate the track in accordance with the rest of the track will be reviewed and agreed on site tomorrow with ARUP and BVA present.

We request that ISG are present at the already planned 2pm meeting to finalise these requirements.

A further instruction will be issued following this meeting to allow completion of the remedial works.

As per previous correspondence on the issue, we do not consider that this instruction represents a compensation event.”

The instruction stated that the reinstatement of the track on turns 3 and 4 should be ‘in accordance with the rest of the track’, referring to the turns 1 and 2 and the straights. These areas used a layer of type 1 sub-base material to support the shale, the requirement was that this construction should be replicated on turns 3 and 4. This was to be discussed further at a subsequent meeting on site the following day.

5.4 ISG proposed approach to the remedial works

The following approach from ISG was agreed at the meeting on the 15th April 2016.

- Inspection and compaction by rolling of the formation layer following removal of the capping material layer. Indicative CBR testing to be taken. In general visual observations of the roller to be used to judge the acceptable stiffness of the formation
- Areas where the formation is considered not to have acceptable stiffness should be excavated to a lower level such that an acceptable stiffness can be achieved. The excess dig should be filled with 100mm layers of type 1 material, each compacted with twelve passes of a vibrating roller.
- A geotextile separation membrane to be laid over the entire area of remediated track at formation level.
- A new sub-base layer 200mm thick to be constructed of type 1 material in 100mm layers, each compacted with twelve passes of a vibrating roller.

- Two layers of shale are to be laid, each 60mm thick. Each layer is to be compacted with twelve passes of a vibrating roller.
- BVA would lay and treat the final 30mm layer of shale to their requirements.

5.5 Works not included in the track remediation

The following potential remediation works were discussed at the meeting of 15th April, but were not included. This was mainly on the basis of program, including these would have substantially lengthened the construction period and more events would have to be rescheduled.

- Track drainage, in the form of filter drainage to remove the water from the sub-base layer, was not included. It was considered this would substantially increase the construction period, impacting on future speedway events. If considered necessary, this could potentially be carried out at a later date.
- A thin layer of original track construction was left in place adjacent to the kerb on the inside curve and the fenceline on the outside. Removal of these strips would have destabilised the kerb and fence foundations and required their reconstruction, significantly increasing the works necessary.

5.6 Remedial works subsequently instructed

As the works on site progressed it became apparent that some areas of turn 3 were constructed on top of a layer of tarmac. This was thought to be the former hockey pitch surface as the edge of the AstroTurf surface was visible in places. The tarmac layer was about 60mm thick and had a granular sub-base material underneath. The areas that were present were largely intact; they had not been punctured. The tarmac was flat and at such a level as to intersect the sloping formation level of the speedway track at approximately two-thirds of the way from the outside of the curve to the inside. For the outer two thirds of the track the tarmac was intact and levels made up to formation using site-won excavated material. This was essentially a stiff sandy clay material deposited and compacted on top of the tarmac. On the inside third of the track, the tarmac had been removed as part of the track construction and the formation was the former granular material.

Instruction PMI 114 was issued (dated 18 April 2016) to ISG, subsequent to the previous PMI 113. This specifically was written for the initial area of tarmac found close to the maintenance compound access. This required all material above the tarmac layer to be removed from site, the tarmac broken and levels to be made back up again with compacted type 1 sub-base material.

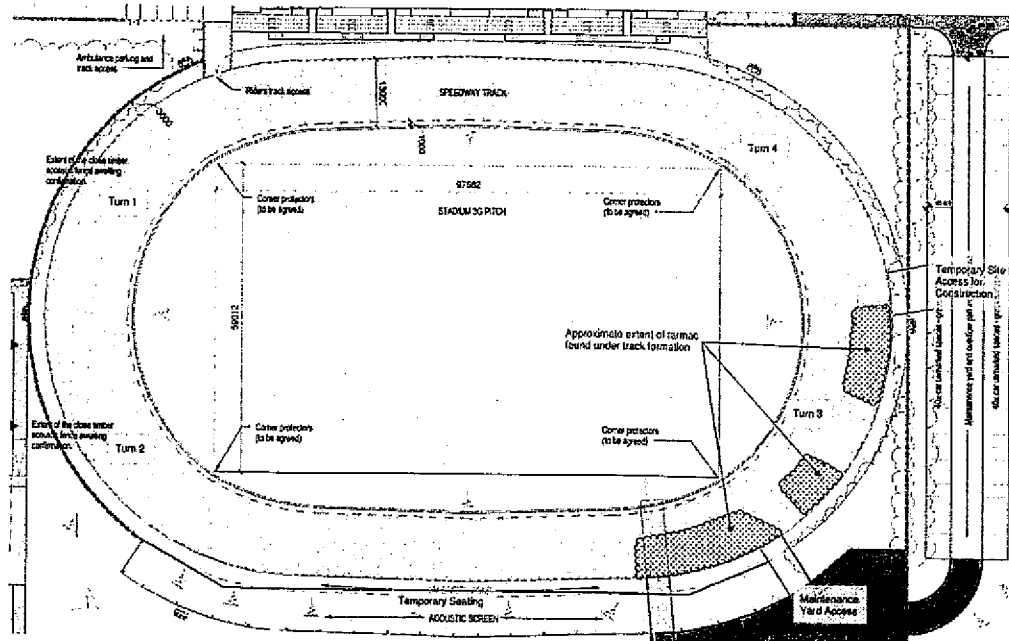


Figure 7 - Areas of intact tarmac found at turn 3

The tarmac was present in three areas of turn 3. There is a strong correlation between the positions of the tarmac and the areas showing the worst loss of stiffness on our first site visit. This would indicate that the presence of the tarmac was contributing to the apparent failures in track stiffness. It is assumed the intact tarmac layers were holding water within the capping material layer and the shale layers above, reducing their stiffness. It was Arup's view that the best way to minimise the risk of this occurring again was to puncture the tarmac layer to allow drainage to a deeper depth within the former hockey pitch granular foundation. To do this it would be necessary to remove the sandy-clay fill material on top of it, which should be replaced with a reasonably granular fill. The decision was made to fill the full depth above the tarmac with 100mm layers of type 1 sub-base material, rolling each layer twelve times.

6 Site Observations during Construction

The following are a list of observations noted during the site supervision, some of which had a direct impact on the construction works, others which are provided for record purposes;

6.1 Remediation works program

ISG commenced works on site on Monday 18th April. It was decided not to start earlier due to the risk of rain over the preceding weekend. The intention was to have completed the works to allow a trail run by motorbikes on the following Saturday 23rd April. This would have enabled the planned speedway event to take place on the Sunday. Due to various reasons, including the discovery of the tarmac layers, it became evident on the Thursday that this deadline was unachievable. The speedway event scheduled for Sunday 22nd April was re-scheduled. Works by ISG to the track were largely complete on the following Tuesday 26th April.

6.2 Weather conditions

During the weekend preceding the remediating works, there were showers on the Saturday but it was fine on the Sunday. Throughout the week commencing Monday 18th April there was no rainfall on the site. The weather was dry and fine.

It should be noted that this was in contrast to the period when turns 3 and 4 were originally constructed, when there was a large amount of rainfall.

6.3 Quality of shale material removed

The works involved the careful removal of the shale layer from turns 3 and 4. This was to be stockpiled on the track straights. This was necessary as the quarry could only produce a certain amount of shale within the required period and, thus, much of the shale would be re-used in the reconstructed track.

The shale was scraped back using excavators and transported by dumper. Areas of the shale had 'set' into a crust and came up in chunks, bringing some of the stones from the layer below with them. Two stockpiles were formed on each straight, one of 'clean' shale with no significant stones in it, the other 'contaminated' which had a varying amount of stones in it. The 'contaminated' shale was largely accepted by BVA for the lowest layer of the track construction as it was unlikely stones would migrate through the shale layers to the surface. This material had stones up to about 30mm in diameter throughout, although a hand stone-pick significantly reduced the number once laid.

6.4 Quality of the "6F2" material removed

As noted above, the capping material observed on site contained a wide range of particle sizes from very fine material up to the 125mm maximum size. For the

larger materials, a range of types of materials were noted, including stone, concrete, wood, fabric, plastic and metal. Figures 8 to 11 are photographs that were taken of this excavated "6F2" material.



Figure 8 Large items of material observed in "6F2" layer

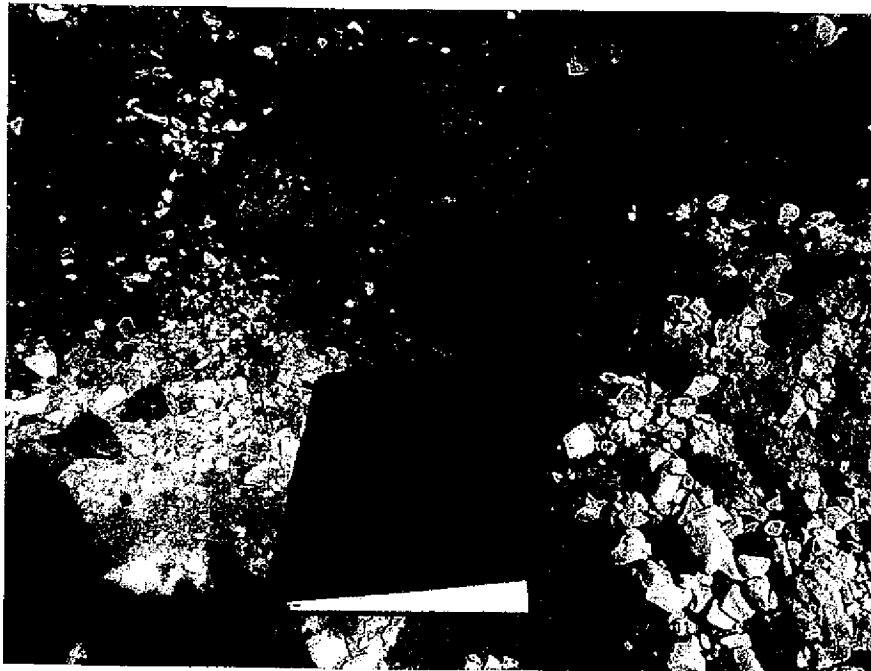


Figure 9 Large stone observed in "6F2" material adjacent to an A4 notebook

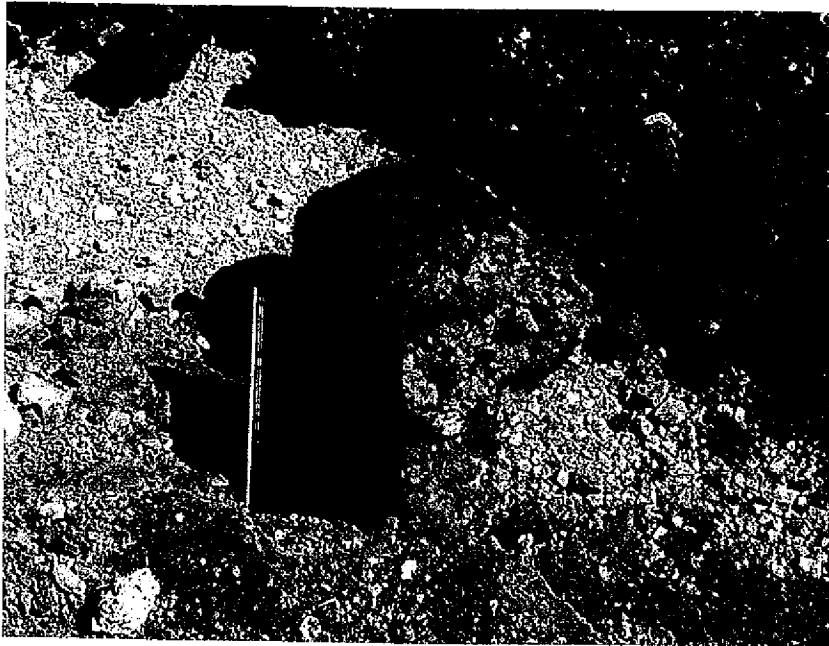


Figure 10 Section of 300mm diameter concrete pile found in "6F2" material



Figure 11 Timber observed in "6F2" material

6.5 Soft-spots at track formation level

Other than the areas where tarmac was found, the formation was observed to be one or other of the following;

- A generally stiff sandy clay material, assumed to be the natural ground for the site
- A granular material assumed to be the sub-base layer for the former hockey pitches.

During the rolling of the formation level, some soft-spots were observed, especially around the inside kerbline. These were generally small isolated areas which were treated by excavating an additional 200mm to 300mm depth and re-rolling to achieve the required stiffness. These were then filled with 100mm layers of type 1 material and rolled. In some locations the Contractor installed additional geotextile at sub-formation level. The results of this treatment provided a stiffer formation level when observed under the roller wheels.

6.6 Compaction of the sub-base layer

The requirement was for twelve passes of a vibrating roller over the 100mm thick layers of type 1 material. This was generally observed to achieve a reasonably stiff surface under the roller. In some areas, following the roller compaction, we observed a degree of settlement under the roller in excess of what we would judge as acceptable. These were generally small areas which appeared to settle under the roller to a greater extent than the surrounding surface. In all such cases identified in Arup's presence, an additional application of the vibrating roller was sufficient to visually achieve the stiffness we would expect as acceptable.

6.7 Treatment of the track edges

As previously described, a thin strip of original track construction, including the capping material layer, was left in place alongside the inner kerbline and the outer fenceline. This was necessary to minimise the risk of work required to these edges, which we understand would have significantly increased the works program.

When the capping material was initially excavated, the edge of the excavation was jagged and loose. As new material was laid, these edges were cleaned off and loose material removed such that compaction appeared to achieve a reasonably uniformly stiff layer throughout the track.

During the laying of the first shale layers we observed stones from the type 1 sub-base layer material lining the edge of the excavation. We requested that this material was removed such that the edges of the shale layers we observed were reasonably clean of stones.

Ideally, for a road pavement construction, we would recommend the layers of the construction to be stepped into the existing. Given the thin strip of original construction alongside the edges described above, the scope for this was limited.

The edges were cleaned off several times as the subsequent layers of material were laid. This would have provided a certain degree of interlock between the layers, our view is this would have been acceptable given the expected traffic loading.

6.8 Tie-ins to existing track construction

We requested the existing end of the track construction were stepped to allow continuity between the existing and new constructions. This was carried out to a reasonably acceptable extent.

6.9 Water seepage from outer edges of excavation

Following the excavation of the capping material layer, water was seen to be seeping from the outer edge of the excavation. This was seen in two locations;

- On Tuesday 19th April, water was seen to be seeping at turn 3 close to the tie-in to the existing track straight, near the temporary stand
- On Thursday 21st April, water was seen to be seeping at turn 3 near the car park.

On both occasions, the water appeared to be flowing mainly from the capping material layer although there was saturation within voids in the clay fill layer below this. It had not rained since the preceding Saturday. This raises the possibility that the track could receive groundwater flows from the surrounding embankments around turn 3, although this could not be confirmed by observation during the period of the works.

The remedial works were carried out during dry conditions. The materials were laid and compacted with very little water within them. The shale layer was laid before there was any significant rainfall, and was again laid in accordance with the agreed approach.

6.10 Conclusion of Observations

As noted above, there is a difficulty in designing a Speedway track to a clear specification. Our team's site observations were that the corrective works were carried out generally in accordance with TRP drawing; Re-use of Recycled Material Track Sections - Drawing No SK10 Revision S1, 'Tender' other than, as noted above, the layer thicknesses were typically 200mm on site as opposed to 150mm on that drawing.

6.11 Residual risk - earthworks drainage

We have noted through this process there is a risk that the sub-base may not in the long term be fully drained. The design did not appear to consider this important requirement.

We believe that the remedial works have reduced this risk as the Type 1 material is less susceptible to being saturated, and the works to the sub-formation will increase the ability of the sub-base to drainage down into the sub-formation. We would not expect to see elastic settlement with this design.

However we note that some of the subformation appears to have low permeability, groundwater is likely to continue to infiltrate into the subbase, and the kerb and channel detail is likely to reduce the lateral drainage.

We propose that at a suitable time in the winter, a probe hole is opened up in Turn 3, and degree of saturation assessed. If the fill continues to be saturated, consideration should be given to the installation of earthworks drainage around the edges of the affected sections.

Appendix A

Report of test results of 6F2 sample

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Our reference: B061229/RB/6849

1st June 2016

[REDACTED]
Manchester City Council – Corporate Services
Capital Programmes and Property
Growth & Neighbourhood Directorate
PO Box 532, Town Hall
Manchester
M60 2LA

Dear [REDACTED]

Re: Capping Material Appraisal, Belle Vue Speedway.

Further to your instruction of 18th May 2016, we have pleasure in submitting our appraisal of the capping material at the Belle Vue site.

Background

A sample of recovered material was supplied by yourselves and collected from site by our engineer on 6th May 2016. The origin of the material is unconfirmed, i.e. site-won (6F2) or imported (6F5), however it is understood to have been placed as capping beneath the speedway race track. If the material is sourced off-site (6F2), the material should have come with a WRAP Protocol certificate to confirm its origin and suitability.

The scope of the works comprised independent geotechnical testing of the material in line with Arup's 'Requirements for Acceptability and Testing of 6F2/6F5 Capping Materials', contained within Appendix A1. Environmental chemistry testing was also recommended to confirm suitability in light of the visual presence of both deleterious material and suspected Asbestos Containing Material (ACM) (present as a double-bagged, sub-sample within the main sample).

Material Description

The recovered sample was Made Ground, comprising brown to orange sandy fine to coarse angular gravel and cobbles, with occasional wood, brick, glass, metal, fabric (suspected nappy) and ceramics. A piece of plywood was also included within the recovered sample, with dimensions of 25cm x 25cm x 2cm. Photographs are contained within Appendix A2.

Geotechnical Testing

Owing to the recovered mass of sample being insufficient for a full suite of testing, the following classification tests were scheduled to ascertain, as best as possible, the suitability of the material as a 6F2/6F5 capping layer:

Continued 1/...

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- Moisture Content
- Particle Size Distribution
- Constituent Materials

The geotechnical testing results have been compared against the Arup's 'Requirement Acceptability and Testing of 6F2/6F5 Capping Materials' with the grading of the recovered sample failing to meet the 6F2/6F5 specification, owing to an excessive fines content at 10mm, 5mm and 0.6mm grading intervals.

It is important to note that, as well as the mass of the sample tested being insufficient for detailed geotechnical classification, this single sample may not be representative over the anticipated volumes placed and could be subject to challenge.

The Testconsult Ltd. Certificate number SA24719 are contained within Appendix A3.

Environmental Chemistry Testing

The environmental chemistry analysis results recorded slightly elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) that are suggestive of ash deposits (or combustion by-products) being present within the sample matrix and commonly encountered within 6F2/6F5 materials.

Asbestos testing recorded no detection within the double-bagged sub-sample, the content of which was found to comprise cement and man-made fibres.

The Scientific Analysis Laboratories Ltd Certificate number 568379-1 can be referred to within Appendix A4 of this report.

Conclusion

The suitability of the recovered sample for use as 6F2/6F5 capping was tested through; visual inspection, geotechnical testing, in general accordance with the specification provided, and environmental chemistry testing, with the following conclusions:

- A visual inspection indicates that the recovered sample falls outside the specification for 6F2/6F5 owing to the presence of significant deleterious material within the sample matrix.
- Geotechnical testing indicates that the recovered sample falls outside the specification for 6F2/6F5 owing to the presence of excessive fines content.
- Environmental chemistry testing indicates that the recovered sample would be broadly considered suitable for use as a capping material for this end use (speedway track).

Whilst the mass of the sample tested was insufficient for detailed geotechnical classification and the single sample may not be representative over the anticipated volumes placed, the significant presence of significant deleterious materials are strong indicators of the fill material being unsuitable as 6F2/6F5.

Continued 2/...

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It would have been anticipated that basic checks were in place during the development works such as visual inspections during the sourcing and placement of the material and/or screening of material, if site-won, to prevent unsuitable elements from being present within the fill.

We hope the foregoing and associated enclosures satisfy your current requirements, if you require any further advice please do not hesitate to contact us.

Yours sincerely,

Environmental Engineer
For and on behalf of
Curtins Consulting Ltd

Senior Environmental Engineer
For and on behalf of
Curtins Consulting Ltd

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Appendix A1 – Requirements for Acceptability and Testing of 6F2/6F5 Capping Materials

Subject Belle Vue National Speedway Stadium

Date 15 April 2016

Job No/Ref

Requirements for Acceptability and Testing of 6F2/6F5 Capping Materials

These testing requirements are derived from Volume 1 Specification for Highways Works, Series 600 Earthworks (Manual of Contract Documents for Highways Works

<http://www.standardsforhighways.co.uk/ha/standards/mchw/> (accessed 15 April 2016)

Acceptable limits for Type 6F2 are given in Table 1 below.

A grading curve for Type 6F2 is provided in Table 2 below. Requirements for Class 6F5 are also provided. This is also coarse capping material interchangeable with 6F2, but represents imported materials to site rather than site won materials and is therefore defined in accordance with BS EN standards for aggregates.

Recommendations for verification testing on excavation of materials on site:

4No representative samples of “6F2” capping from the affected area.

Sampling regime to include 2No samples from the most poorly performing area and 2No samples from elsewhere on Bends 3 & 4

Each sample to be tested for:

- Material description (against permitted constituents listed in Table 1). Further guidance on recycled aggregates for the purpose of identifying and quantifying constituent materials is as follows:

The constituents of a sample of recycled aggregate shall be classified by hand-sorting the coarse aggregate particles in accordance with BS EN 933-11. The test shall be carried out by a suitably trained laboratory technician who has demonstrated competence in classifying the constituent classes in accordance with the test method.

Recycled aggregate shall not contain more than 1% other materials (Class X – including wood, plastic and metal), not more than 50% in Class Ra (bituminous materials) and not more than 25% in Class Rg (crushed glass).

- Grading
- Optimum Moisture Content / Moisture Content
- LA Coefficient

In addition, **evidence of testing** is required to demonstrate that any material used within 450mm of the designed final surface level is not frost susceptible. Material shall be classified as non-frost-susceptible if the mean heave is 15mm or less, when tested in accordance with BS 812-124.



Subject Belle Vue National Speedway Stadium

Date 15 April 2016

Job No/Ref

General Material Description	Permitted Constituents (All Subject to Requirements of Clause 601 and contact specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements for Use on Fill Materials in Clause 601 and Testing in Clause 631)			Compaction Requirements in Clause 612	
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower Upper		
6F2 Selected granular material (coarse grading)	Any material, or combination of materials – including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock Property (i) in the next column shall not apply to chalk. Property (vi) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less. Where material in this Class is imported onto site it shall be classified as Class 6F5 and comply with the requirements for that material.	(i)Grading	BS 1377: Part 2 (On site materials only)	Table 6/2 Table 6/2	Table 6/4 Method 6	
		(ii)optimum mc	BS 1377: Part 4 (vibrating hammer method)	-		
		(iii)mc	BS 1377: Part 2 See Note 4	Optimum mc - 2%		Optimum mc
		(iv)Los Angeles Coefficient	Clause 635	-		50
		(v)Class Ra (asphalt) content	Clause 710	-		50%
		(vi)bitumen content	BS EN 12697-1 or BS EN 12697-39	-		2.0%

Subject Belle Vue National Speedway Stadium

Date 15 April 2016

Job No/Ref

Table 6/2: Grading Requirements for Acceptable Earthworks Materials

Percentage by Mass Passing the Size Shown																				
Class	Size (mm)		Size (mm) BS Series										Size (microns) BS Series				Class			
	500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18	600		300	150	63
6F2			100	80-100	65-100	45-100				15-60		10-45				0-25			<15	6F2
Class	Size (mm)		Size (mm) BS EN 933-2 Series										Size (microns) BS EN 933-2 Series				Class			
	500	300	125	80	63	40	31.5	20	16	10	8	6.3	4	2	1	500		250	125	63
6F5			100	75-99		50-90		30-75		15-60					0-35				0-12	6F5

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Appendix A2 – Photographs

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Geo-Environmental Appraisal, Belle Vue Speedway – Photographs

Photo 1: Sample recovered, containing suspected used nappy

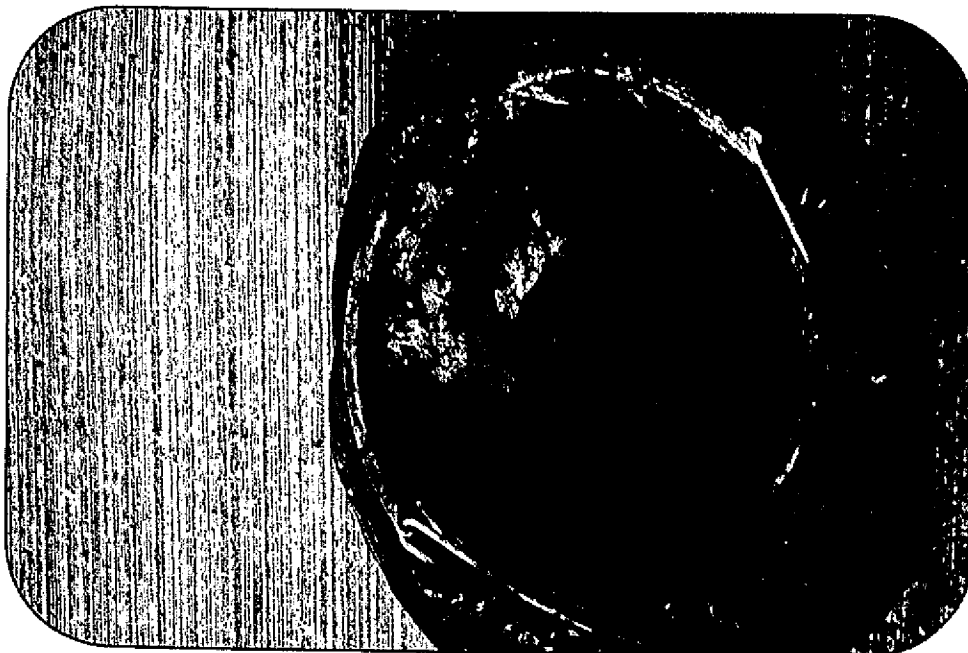


Photo 2: Suspected Asbestos Containing Material





Photo 3: Sample recovered

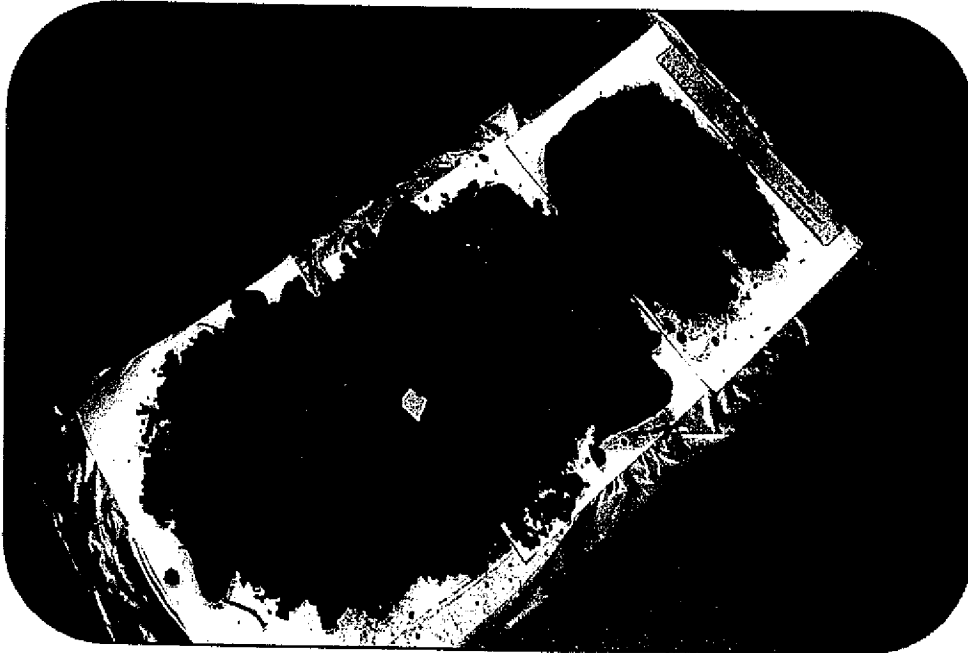


Photo 4: Sample recovered

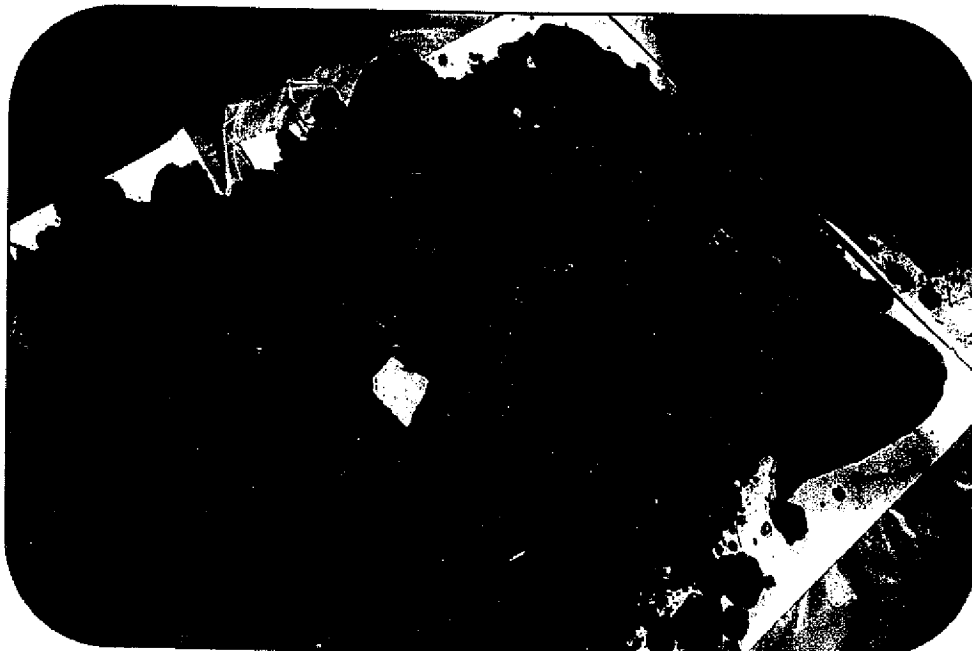
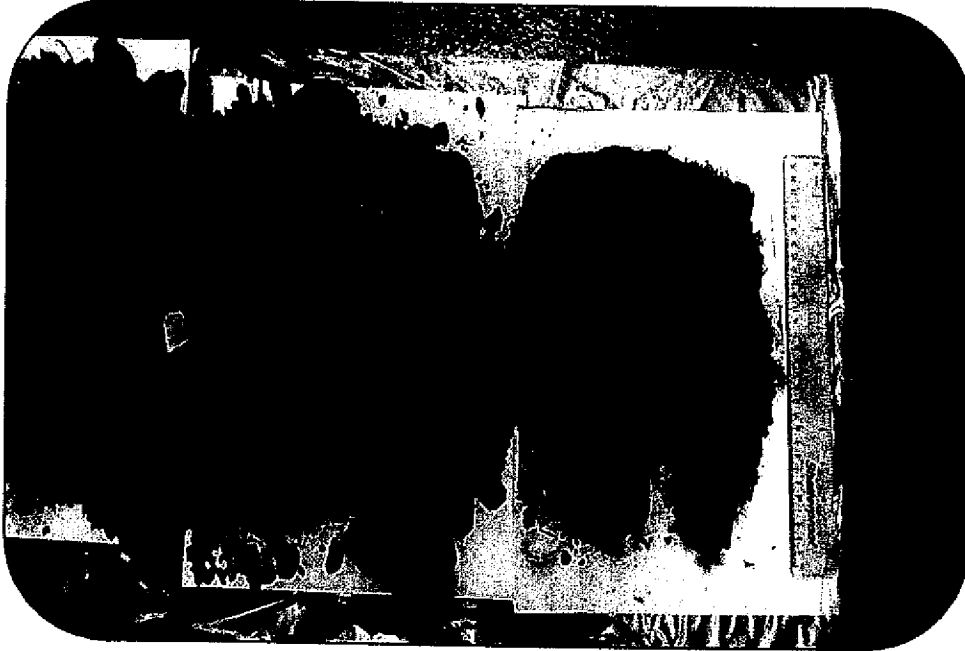




Photo 5: Sample recovered, containing large piece of plywood (25cm x 25cm x 2cm)



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Appendix A3 – Testconsult Ltd Laboratory Certificate no. SA24719



TESTCONSULT LIMITED

Ruby House, 40A Hardwick Grange, Warrington WA1 4RF
Tel (01925 286880) Fax (01925 286881)



LABORATORY TEST REPORT
CONSTITUENT MATERIALS IN RECYCLED MATERIAL - BS EN 933-11:2009

Project:	17-19 Whitworth St, Manchester	Lab Ref No.:	SA24719
Client:	Curtins Consulting	Date Received:	11/05/2016
		Date Tested:	16/05/2016
		Date Reported:	18/05/2016
		Material:	Recycled Material
Originator:	[REDACTED]	Specification:	-

<i>Client Ref No.</i>	-	<i>Sampling Certificate:</i>	Yes
<i>Supplier:</i>	-	<i>Sample Type:</i>	Bulk
<i>Source:</i>	-	<i>Description:</i>	Recycled Material
<i>Date Sampled:</i>	11/05/2016	<i>Location:</i>	-

MATERIAL TYPE	%
Concrete, Concrete products, Mortar, Concrete masonry units	35.6
Unbound aggregate, Natural stone, Hydraulically bound aggregates	21.2
Clay masonry units (bricks and tiles), Calcium silicate masonry units, Aerated non-floating concrete	35.1
Bituminous Materials	6.9
Glass	0.5
Other:- Cohesive, Metals, non-floating wood, plastic and rubber, Gypsum plaster	0.7

Tested in Accordance with BS EN 933-11:2009

[REDACTED]
Approved Signature

TESTCONSULT LIMITED

[REDACTED] Senior Technician



TESTCONSULT LIMITED
Ruby House, 40A Hardwick Grange, Warrington WA1 4RF
Tel (01925) 286880 Fax (01925) 286881



LABORATORY TEST REPORT
PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING

Project:	17-19 Whitworth St,	Lab Ref No.:	SA24719
Client:	Curtins Consulting	Date Received:	11/05/2016
		Date Tested:	16/05/2016
		Date Reported:	18/05/2016
Originator:	[REDACTED]	Material:	Recycled Material
		Specification:	Series 600 Table 6/2

Client Sample Ref :

Supplier: -
Location: -
Ticket No.: Not Stated
Date Sampled : -
Sample Type: Bulk
Sampled By: Testconsult
Sampling Cert.: Yes
Sample Preparation Method: Oven dried
Moisture Content : 13%

SIEVE ANALYSIS		
Sieve size	% Passing	Specification
125mm	100	100
90mm	100	80-100
75mm	100	65-100
37.5mm	93	45-100
28mm	89	
20mm	83	
14mm	75	
10mm	70	15-60
6.3mm	60	
5.0mm	57	10-45
3.35mm	51	
2.0mm	45	
1.18mm	41	
600micron	36	0-25
425micron	32	
300micron	27	
150micron	18	
63micron	10.6	0-12

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990
The sample was found NOT to comply with the specification for the test carried out

[REDACTED]
Approved Signature
TESTCONSULT LIMITED
[REDACTED], Senior Technician

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Appendix A4 – Scientific Analysis Laboratories Ltd Laboratory Certificate no. 568010-1



CONCEPT LIFE SCIENCES company

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 568379-1

Date of Report: 16-May-2016

Customer: Curtins Consulting Ltd.
17-19 Whitworth Street West
Manchester
M1 5WG

Customer Contact: [REDACTED]

Customer Job Reference: B061229/RB/6790
Customer Purchase Order: EB1899
Customer Site Reference: Bell Vue, Speedway
Date Job Received at SAL: 09-May-2016
Date Analysis Started: 10-May-2016
Date Analysis Completed: 16-May-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual



Report checked
and authorised by :
[REDACTED]
Customer Service Manager

Issued by :
[REDACTED]
Customer Service Manager [REDACTED]

SAL Reference: 568379 Project Site: Bell Vue, Speedway Customer Reference: B061229/RB/6790					
Soil Analysed as Soil Heavy Metals(9)					
SAL Reference					568379 001
Customer Sample Reference					S1
Date Sampled					06-MAY-2016
Type					Sandy Soil
Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	11
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	16
Copper	T6	M40	1	mg/kg	41
Lead	T6	M40	1	mg/kg	83
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	16
Selenium	T6	M40	3	mg/kg	<3
Zinc	T6	M40	1	mg/kg	120

SAL Reference: 568379 Project Site: Bell Vue, Speedway Customer Reference: B061229/RB/6790					
Soil Analysed as Soil Curtins Sulte A					
SAL Reference					568379 001
Customer Sample Reference					S1
Date Sampled					06-MAY-2016
Type					Sandy Soil
Determinand	Method	Test Sample	LOD	Units	
Asbestos ID	T27	AR			N.D.
Boron (water-soluble)	T6	AR	1	mg/kg	<1
Chromium VI	T6	AR	1	mg/kg	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1
pH	T7	AR			8.6
Phenols(Mono)	T546	AR	1	mg/kg	<1
Retained on 10mm sieve	T2	M40	0.1	%	<0.1
Soil Organic Matter	T287	M40	0.1	%	3.7
SO4(Total)	T6	M40	0.01	%	0.78
Sulphide	T4	AR	10	mg/kg	<10
Sulphur (total)	T6	M40	0.01	%	0.31

SAL Reference: 568379					
Project Site: Bell Vue, Speedway					
Customer Reference: B061229/RB/6790					
Soil TPH (CWG)					
Analysed as Soil					
SAL Reference					568379 001
Customer Sample Reference					S1
Date Sampled					06-MAY-2016
Type					Sandy Soil
Determinand	Method	Test Sample	LOD	Units	
Benzene	T54	AR	1	µg/kg	(13) <1
Toluene	T54	AR	1	µg/kg	<1
EthylBenzene	T54	AR	1	µg/kg	<1
M/P Xylene	T54	AR	1	µg/kg	<1
O Xylene	T54	AR	1	µg/kg	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	(13) <1
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	(13) 3
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	(13) 4
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	(13) 28
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	(13) 2
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	(13) 11
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	(13) 41
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	(13) 69

SAL Reference: 568379					
Project Site: Bell Vue, Speedway					
Customer Reference: B061229/RB/6790					
Soil Miscellaneous					
Analysed as Soil					
SAL Reference					568379 001
Customer Sample Reference					S1
Date Sampled					06-MAY-2016
Type					Sandy Soil
Determinand	Method	Test Sample	LOD	Units	
Retained on 10mm sieve	T2	M40	0.1	%	<0.1
Moisture @105C	T162	AR	0.1	%	9.4

SAL Reference: 568379					
Project Site: Bell Vue, Speedway					
Customer Reference: B061229/RB/6790					
Soil Analysed as Soil					
Total and Speciated USEPA16 PAH					
SAL Reference					568379 001
Customer Sample Reference					S1
Date Sampled					06-MAY-2016
Type					Sandy Soil
Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	0.7
Acenaphthylene	T207	M105	0.1	mg/kg	0.1
Acenaphthene	T207	M105	0.1	mg/kg	0.7
Fluorene	T207	M105	0.1	mg/kg	0.8
Phenanthrene	T207	M105	0.1	mg/kg	6.0
Anthracene	T207	M105	0.1	mg/kg	1.5
Fluoranthene	T207	M105	0.1	mg/kg	6.7
Pyrene	T207	M105	0.1	mg/kg	6.3
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	3.4
Chrysene	T207	M105	0.1	mg/kg	3.0
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	4.4
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	2.3
Indeno(1,2,3-cd)Pyrene	T207	M105	0.1	mg/kg	1.3
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	0.5
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	1.7
PAH(total)	T207	M105	0.1	mg/kg	39

SAL Reference: 568379					
Project Site: Bell Vue, Speedway					
Customer Reference: B061229/RB/6790					
Bulk Product Miscellaneous Analysed as Bulk Product					
SAL Reference					568379 002
Customer Sample Reference					S1
Date Sampled					06-MAY-2016
Determinand	Method	Test Sample	LOD	Units	
Asbestos	T27	AR			N.D.

Index to symbols used in 568379-1

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos

Method Index

Value	Description
T8	GC/FID
T7	Probe
T207	GC/MS (MCERTS)
T287	Calc TOC/0.58
T4	Colorimetry
T6	ICP/OES
T27	PLM
T54	GC/MS (Headspace)
T2	Grav
T162	Grav (1 Dec) (105 C)
T546	Colorimetry (CF)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Arsenic	T6	M40	2	mg/kg	M	001
Cadmium	T6	M40	1	mg/kg	M	001
Chromium	T6	M40	1	mg/kg	M	001
Copper	T6	M40	1	mg/kg	M	001
Lead	T6	M40	1	mg/kg	M	001
Mercury	T6	M40	1	mg/kg	M	001
Nickel	T6	M40	1	mg/kg	M	001
Selenium	T6	M40	3	mg/kg	M	001
Zinc	T6	M40	1	mg/kg	M	001
Asbestos ID	T27	AR			SU	001
Boron (water-soluble)	T6	AR	1	mg/kg	N	001
Chromium VI	T6	AR	1	mg/kg	N	001
Cyanide(Total)	T546	AR	1	mg/kg	M	001
pH	T7	AR			M	001
Phenois(Mono)	T546	AR	1	mg/kg	M	001
Retained on 10mm sieve	T2	M40	0.1	%	N	001
Soil Organic Matter	T287	M40	0.1	%	N	001
SO4(Total)	T6	M40	0.01	%	N	001
Sulphide	T4	AR	10	mg/kg	N	001
Sulphur (total)	T6	M40	0.01	%	N	001
Benzene	T54	AR	1	µg/kg	U	001
Toluene	T54	AR	1	µg/kg	U	001
EthylBenzene	T54	AR	1	µg/kg	U	001
M/P Xylene	T54	AR	1	µg/kg	U	001
O Xylene	T54	AR	1	µg/kg	U	001
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	U	001
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	N	001
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	N	001
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	N	001
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	N	001
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	N	001
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	N	001
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	N	001
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	N	001
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	N	001
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	N	001
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	N	001
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	N	001
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	N	001
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	N	001
Moisture @105C	T162	AR	0.1	%	N	001
Naphthalene	T207	M105	0.1	mg/kg	M	001
Acenaphthylene	T207	M105	0.1	mg/kg	U	001
Acenaphthene	T207	M105	0.1	mg/kg	M	001
Fluorene	T207	M105	0.1	mg/kg	M	001
Phenanthrene	T207	M105	0.1	mg/kg	M	001
Anthracene	T207	M105	0.1	mg/kg	U	001
Fluoranthene	T207	M105	0.1	mg/kg	M	001
Pyrene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001
Chrysene	T207	M105	0.1	mg/kg	M	001
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001
PAH(total)	T207	M105	0.1	mg/kg	U	001
Asbestos	T27	AR			SU	002