

**SCHEDULE 3
WORKS DELIVERY PLAN**

PART 2

RECYCLING

**CONFORMED COPY
OF THE PRINCIPAL CONTRACT DATED 31ST MARCH 2003
AND THE AMENDMENTS TO THE PRINCIPAL CONTRACT
PURSUANT TO THE DEED OF AMENDMENT DATED 28TH MAY 2003**

<p>RECYCLING WORKS DELIVERY PLAN</p>

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1. INTRODUCTION

This Works Delivery Plan identifies works to be carried out in the construction of the MRF, in accordance with the Contract.

The functioning of the MRF and hence its design is dependent upon the collection methods adopted by the WCAs and consequently assumptions have to be made in this Works Delivery Plan which serves as a benchmark rather than a specific description of the MRF to be built. A detailed outline of the assumptions and the functioning of the MRF is presented in the Service Delivery Plan relevant to Recycling contained in Part 2 of Schedule 4.

For the purposes of benchmarking the MRF within the Contract, it has been assumed that the works apply to the construction of a sorting plant for accepting and processing dry recyclables separately collected from kerbside, such materials being in accordance with the Contractor's input specification (contained in Appendix 4 of the Service Delivery Plan relevant to Recycling within Schedule 4). Such materials are then processed into three major component streams:

- newspapers, magazines, card, packaging
- plastic bottles
- metal containers (cans)

Adjacent bays will be provided for the storage of glass collected from bottle banks.

The development and construction works will be carried out by experienced Sub-Contractors. Control of the development of the works will be in accordance with the Contractor's management system procedure SP.16 Development Control (as set out in the Quality Manuals, as amended from time to time), with a contract being entered into with the construction Sub-Contractor. The construction contract will follow a model form structure such as the Institution of Mechanical Engineers MF1 (adapted), Institution of Civil Engineers Minor Works (adapted) or ICE Seventh Edition Conditions of Contract (adapted) or similar, as considered appropriate by the Contractor. An engineer will be appointed by the Contractor with powers to administer on the Contractor's behalf such construction contract. The engineer may be a suitably qualified employee of the Contractor or a consultant instructed for the purpose.

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2. PROJECT MANAGEMENT AND PROGRAMME

The construction programme for the MRF will be in accordance with the Works Programme.

A benchmark construction programme is contained in Appendix 2. Prior to the construction of the MRF the Contractor shall produce a construction programme showing the same level of detail as that shown on the benchmark programme.

Prior to commencement of the Works relevant to the MRF, the Contractor shall appoint a project manager with responsibility for the design and construction of MRF up to and including handover of the MRF to the Operations Manager. The project manager will report to the Contractor's Director of Engineering and Construction, providing the design and construction service to the Contractor's team. The project manager will be assisted by specialist functions such as Town Planning, Licensing & Environmental Control, Health & Safety and Project Managers as required.

The design and construction of the MRF will be procured using qualified and experienced contractors. Such Sub-Contractors may be appointed under a model form contract such as Institute of Mechanical Engineers MF1 (adapted), ICE Seventh Edition Conditions of Contract (adapted), ICE Minor Works (adapted) or similar, as considered appropriate by the Contractor. The Contractor may appoint two Sub-Contractors, one for the plant installation and the other in relation to the civil engineering and building works. The project manager may act as the engineer or appoint a professional consultant to act in the role. Either will adopt the powers invested in them by the contract to control the design and construction.

A Planning Supervisor will be appointed prior to issuing a tender for the Works relevant to the MRF with responsibility for producing the health and safety plan in compliance with CDM Regulations.

Technology for materials recovery facilities is developing rapidly and there are continual advances particularly in automated equipment. The MRF will be designed to utilise a mix of automatic sorting and human resources. The role of the operatives in the MRF will be essentially to improve the quality resulting from either source segregated collections or of that material sorted by mechanised equipment. The implication of this is that the design of the materials handling equipment is inextricably linked to the developing technology and each facility design is bespoke. Consequently contracts with Sub-Contractors will be placed following a limited tendering exercise for the design/development/construction of the materials handling equipment which may or may not be independent of the civil engineering and building works.

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The preferred Site for the MRF is Hollingdean Depot/Abattoir, Brighton, as shown in Appendix 1 of the Recycling SDP and indicated in the Waste Local Plan for Brighton & Hove City and East Sussex (Policy WLP8b inset plan 3) subject to Planning Permission and associated legal agreements, but the Contractor shall retain discretion over the selection of the Site in accordance with Schedule 14.

Construction management proposals will be developed for the construction phase of the Works relevant to the MRF based on the benchmark of the document entitled "Project Quality Plan – Construction Stage" for the Newhaven ERP contained in Appendix 3 of the Works Delivery Plan for Newhaven ERP tailored accordingly to suit the nature of the MRF.

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3. PURPOSE FUNCTION AND QUALITY

3.1 Materials Recovery Facility

Purpose

The MRF is required to allow the Recycling Targets to be achieved by producing segregated material streams from materials collected from kerbside or bring banks, such materials which conform to the Contractor's input specification, which is contained in Appendix 4 of the Service Delivery Plan relevant to Recycling within Schedule 4.

A materials recovery facility performs primarily two functions:

- (a) Sorting of mixed dry recyclable materials separated from the waste stream by source separated co-mingled collections into segregated material streams; and
- (b) Improving the quality of segregated materials to lower reject and contra levels.

The balance of functionality between these two depends on the type of collection deployed by the WCAs. Where recyclable material is collected kerbside with the various materials mixed (co-mingled) for ease of collection, (a) is the dominant function. If recyclable material is segregated kerbside, then function (a) reduces and the facility is primarily concerned with quality improvement. The complexity of material handling and the requirement for automated sorting diminishes as functionality moves from (a) to (b).

At the Execution Date, the collection methods to be adopted by the WCAs are not certain and consequently it is not possible to specify the precise nature of the MRF to be developed and therefore the Contractor shall adapt its proposals for the Works relevant to the MRF as the Contractor considers appropriate in the circumstances.

MRF Design

The MRF will likely have two processing streams, one for the paper and card materials and the other for the containers (plastics and metals). The MRF will therefore be able to process an input of:

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- newspapers, magazines, card, packaging
- plastic bottles
- metal containers (cans),

provided that each conform to the Contractor's input specification, which is contained in Appendix 4 of the Service Delivery Plan relevant to Recycling within Schedule 4.

Adjacent bays will be provided for the storage of glass collected from bottle banks which conform to the Contractor's input specification. It should be noted, however, that glass shall be delivered to the MRF as an independent stream. At no time shall glass be delivered mixed with other materials.

Quality of Construction

The Contractor intends to construct a materials recovery facility which shall have as a quality benchmark the existing materials recovery facility at Quartermaine Road, Portsmouth. The materials recovery facility at Portsmouth shall however only apply as a benchmark facility in relation to the quality of civil engineering works, building works and materials, but not to any plant and/or equipment. The benchmark shall be used as a minimum standard of quality. The Contractor shall make such information as is necessary to establish this quality benchmark available to the Councils on request. The nature of the chosen Site and the design features may differ from those of the materials recovery facility at Portsmouth.

3.2 Organic Waste Composting Facility

In the event that the Councils give notice that they will deliver organic kitchen waste the Contractor shall provide within one year but not prior to the operation of the Compost Plant a facility for the receipt and processing of such organic compostable kitchen waste delivered by WCAs to that facility. The facility shall be located at the Compost Plant.

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4. DESIGN PARAMETERS

MRF Capacity

The MRF will have a site capacity of at least 80,000 tpa to achieve the Recycling Targets, when considered alongside all other elements of the waste recycling infrastructure and the waste growth forecasts.

The MRF to be constructed by the Contractor in accordance with the Contract will have a capacity to sort up to 18 tonnes per hour of mixed Recyclable Materials from source separation collections, thereby providing (on a two shift operation) an annual capacity of 70,000 tonnes per annum (with a maximum of 20,000 tonnes being glass).

Transfer Stations

In addition to the MRF, the Transfer Stations shall be designed to accept 20,000 tonnes per annum of Recyclable Material as follows:

North Transfer Station	8,000 tonnes per annum
Eastern Transfer Station	12,000 tonnes per annum

Organic Compostable Kitchen Waste Capacity

The facility shall be designed to process up to 1,000 tonnes per annum of organic compostable kitchen waste.

In the event that the Councils give notice that they will deliver greater than 1,000 tonnes per annum of organic compostable kitchen waste the Contractor shall provide a facility located at the compost plant capable of processing such waste within a period of 30 months of the notice being given, subject to clause 24.

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5. DESIGN AND PROCUREMENT

Overall Processes

The Contractor will take overall responsibility for the management of the procurement of the MRF employing methods appropriate to the MRF. This process will encompass:

- Project definition, site investigation and selection;
- Design development to a state appropriate for Planning Application preparation, submission and determination;
- Detailed design and specification for construction purposes;
- Selection and appointment of a construction and process plant contractor(s);
- Supervision and administration of the Sub-Contractor with respect to adherence to the Contract
- Completion, testing and commissioning of the MRF

The exact arrangements for these overall activities, will be subject to the nature of the MRF to be constructed and will, therefore, be determined at the time of placing the design/development contract, commensurate with needs of the overall Project Plan and the obligations of the Contract.

Prior to and in parallel with this process, the Contractor will seek the required permits to enable construction and operation of the MRF to proceed.

Within the Planning Application process, and indeed as an integral part of the design process, environmental appraisal and environmental risk assessment of the Site and proposals will be conducted. This will provide guidance on mitigation of potential negative environmental impacts occasioned by the MRF.

Process Plant Procurement

The process design and the equipment supply for the MRF will be procured by a direct contract between the Contractor and a suitable Sub-Contractor, who will be responsible for process design and equipment design, development, supply and installation all to achieve the contractual requirements. This Sub-Contractor will be selected by a competitive tendering process. By way of reference, current preferred suppliers of materials recovery facility technology are Adcon and O Kay Engineering, although the Contractor shall be permitted to use alternative suppliers chosen by it. A description of the benchmark for the purposes of the equipment supply for the MRF is detailed in Appendix 1. Such benchmark shall apply as a benchmark for the purposes of the quality of the equipment but not to any building fabric or civil engineering works. The benchmark shall be used as a minimum standard of quality, when the MRF technology is selected.

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Mobile plant supply will be by leading suppliers of such equipment as appropriate at the time. Currently, preferred suppliers are Volvo, Manitou, Fiat-Hitachi and Boss, although the Contractor shall be permitted to use alternative suppliers chosen by it.

Design and Tendering

The Contractor shall appoint a project manager with responsibility for the design and construction of the MRF up to and including handover to the Operations Manager. A project team will be formed using the Contractor's personnel with an engineering consultant being appointed to join the team. The project team will control the design process for both the process equipment and the civil engineering works, building structure, architecture and site layout. Liaison with the Planning Authority and the Environment Agency will be undertaken as the planning drawings progress. During the liaison process the Contractor would expect to keep the Councils informed and involve the Councils in assisting it to inform the Planning Authority and other relevant bodies whilst maintaining the Councils' statutory role as the Planning Authority.

The project team will make the relevant applications for the relevant Planning Permission as soon as site investigation has progressed sufficiently, followed by application for the Waste Management Licence as soon as Planning Permission is granted.

The planning drawings and evaluation criteria will be developed by the project team which will then be used for the selection of one or more sub-contractor(s) by tendering. Other required documentation, which will include any other schedules, drawings or other information documents that may be required, will be prepared and enquiries issued for tenders for the award of a civil/building contract.

Initial site investigation to cover geo-technical and ground contamination investigations will be conducted under the control of the design/construction contract. Other physical development constraints for the Site will also be investigated. The outline design will be developed by the Sub-Contractor into a detailed design suitable for construction.

Organic Waste Composting

The general principles of design and procurement used in providing the Compost Plant shall also apply to the organic compostable kitchen waste facility using technology available at the time suitable for the capacity instructed by the Councils.

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6. SITE REQUIREMENTS

Location

The preferred Site for the MRF is Hollingdean Depot/Abattoir, Brighton but the Contractor shall retain discretion over the selection of the Site in accordance with Schedule 14. The selection process will take account of, but will not be bound by, the Waste Local Plan for Brighton & Hove City and the County of East Sussex and of the availability of a site on the commercial market. It is the responsibility of the Contractor to obtain all necessary planning, and other, consents for the implementation of the MRF.

Size

The site will be of an appropriate size and configuration to allow the effective and efficient siting of the MRF and its associated operational requirements.

Access

Suitable access to the highway network will be required and it is the responsibility of the Contractor, where necessary, to obtain permits for this and to carry out any necessary works.

Development Practicalities

Development practicalities will be taken into account in the selection of the Site including:

- Existing configuration and occupation; and
- engineering and/or environmental requirements.

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7. BUILDINGS AND ACCOMMODATION

Objectives

The buildings will be designed to satisfy a number of important objectives:

- Effective utilisation of the space available in order to provide an integrated service delivery facility
- Separation of input, and output functions in the MRF
- Provision of a separate covered area for the bulk storage of glass bottles and jars
- An amenity block will also house a conference room to host site visits and educational trips. There will also be offices for the site manager and supervisor and mess-room and locker-room facilities (showers and toilets) for the facility operatives
- Additionally there will be a general amenity area for vehicle and materials logistics plus a parking area for visitors, facility staff and operatives vehicles
- Should facilities be co-located, opportunity will be taken to combine and optimise provision of accommodation for support activity and personnel as well as for any common operational needs

Operational Accommodation

The building for the MRF will likely consist of three elements:

- A reception area, where incoming materials will be unloaded from the vehicles. This will be enclosed while allowing vehicular access as required. This will be large enough for vehicle manoeuvring, for buffer storage and for the initial handling of the materials by mobile plant
- A processing hall, an enclosed area which will contain the processing plant and the associated conveyors, sorting and quality monitoring stations, balers and any initial output storage receptacles
- An output area, where the materials will be buffer stored and loaded onto outgoing vehicles. This will be similar in concept and attributes to the reception area

All three elements will be arranged to provide logical flow of materials and processing from input to output. This is likely to be within one building envelope, depending upon the topography and traffic management constraints of the site.

In accordance with duty of care to contain waste, and for operational and impact mitigation purposes, the building will be enclosed as far as possible during operating hours. All accesses for vehicles, personnel and plant maintenance purposes will have roller shutter or other suitable doors to provide complete containment for security purposes during non-operational periods.

Additional operational space would be provided for external bays for the unloading, storage and loading of bulk segregated glass.

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Operational Support Accommodation

In addition, there will be accommodation provided on site for operational support activities. This will include:

- Vehicle weighbridge and weighbridge office
- Gatehouse for security and input/output monitoring
- Space for utility plant – e.g. electricity transformers and switching, drainage works, telecoms terminations, surveillance equipment management
- Storage areas for process and mobile plant consumables, including fuel, and spares
- Storage areas for internal cleaning and building maintenance purposes
- External areas for operational vehicle parking and spare container storage
- Parking area for staff and visitors' transport including space for bicycles and motorcycles

Personnel Accommodation and Welfare Facilities

In addition to accommodation for the operational activities, there will be associated accommodation for amenity and administrative purposes. These are expected to consist of:

- A reception area
- Administrative offices for the management and supervision of site operations
- Staff mess room/canteen/kitchen
- Staff shower rooms and toilets
- Staff changing rooms
- First Aid room

Additionally, there would be accommodation for hosting site visits and educational trips. This would consist of:

- Meeting and education room
- Visitors' washroom and toilet facilities

Given the health and safety issues for visitors to the site, these facilities would be sized to accommodate a maximum of 20 people on any one visit.

These facilities would also be available for staff training purposes.

All these are likely to be housed in a building separate from the operational building(s).

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Site Buildings

The main MRF building will be of steel frame construction with an exterior finish of clad steel profiles to give a simple, functional design to produce a clean, modern industrial appearance, which is also sympathetic with the surroundings of the Site.

Buildings will be designed and constructed for the functional needs and to an architectural brief encompassing the Contractor's design ethos. The visual appearance of the building will be discussed and agreed with the appropriate Planning Authority prior to submission of the Planning Application.

Fire points and fire fighting equipment

The MRF building and operation will be issued with a Fire Certificate by the Local Fire Officer and Building Control Authority. This will ensure that the MRF meets minimum fire and safety standards.

Life Expectancy of any plant, equipment and buildings

All plant and equipment incorporated in the MRF operation will be new and shall be designed to operate for a period of 27 years other than those components which have a shorter lifetime and are replaced under planned maintenance.

The Contractor will establish a Detailed Maintenance Plan for the MRF that shall be developed in accordance with Clause 22 of the Contract.

Staffing level

Anticipated staffing levels for this facility are included in the Service Delivery Plan for the MRF included in Schedule 4.

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8. EXTERNAL WORKS

In developing the Site for the MRF, site infrastructure will be required to support the operation of the MRF. This will consist of:

- Boundary barrier for the Site for security and Waste Management Licence purposes. This would be constructed to augment or replace any existing fencing. The barrier would consist of fencing or walling to achieve the primary security purpose but also to incorporate as appropriate design requirements for visual amenity, environmental impact mitigation and landscape purposes
- Surfacing of the Site will be needed principally for traffic management and circulation, including parking, but also for some waste storage areas and for other operational needs. Suitable all-weather hard surfacing bordered by kerbstones to direct surface water run-off will be provided for the requirements of the various purposes, which would also serve as relevant pollution control barriers
- Soft landscaping of appropriate areas of the Site will be carried out in accordance with the requirements of the Planning Permission
- Positive surface water drainage of the Site will be needed due to its effectively impermeable state. This will incorporate pollution control features and system divisions to isolate specific areas. Discharge will be to the municipal drainage network in accordance with relevant consents and conditions as issued by the Environment Agency and/or the drainage utility undertaker
- Foul drainage of the Site for the amenity purposes, for any particular process wastewater and for some potentially contaminated surface waters will be effected using a watertight pipe system in accordance with Building Regulations. Discharge will be to the municipal foul sewerage system by arrangement with the sewerage utility undertaker
- Lighting for the external areas of the Site will be provided for operational, traffic management and security purposes. Lighting will be designed in accordance with Planning Permission requirements and will be adequate to satisfy health and safety requirements.
- Signage will be designed for the Site to advise and inform all users of and visitors to the Site and to achieve traffic management objectives. Proposed signage will be provided to the Councils for comment prior to being installed. It will consist of elevated signs and on-road markings. A further objective of the signage will be a coherence of design and appearance as a contribution to the visual quality of the Site and as a unifying corporate and project branding
- CCTV surveillance system will be designed and installed, partly as an aid to MRF operation, monitoring and management and partly for safety and security purposes both during operation and during closed hours

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9. ACCESS AND TRAFFIC MANAGEMENT

Access

Access to the Site will be via existing, improved or augmented access points from the adjacent public highways.

Improvements to a nearby existing junction (such as Upper Hollingdean Road/Hollingdean Lane) are also envisaged to improve traffic flows and safety, to the standards and requirements of the Planning Authority.

These access and junction works will be undertaken by the Contractor as part of the development of the MRF.

Construction Phase Traffic Management

Management of traffic generated during the construction phase will be addressed in the contractual arrangements within the construction contract with the Sub-Contractor and in accordance with all Legislation relevant to the Works for the MRF.

This will address both on and off site vehicle movement issues.

It is expected that this issue will be addressed during the Planning Application consultation, in which the views on this aspect of the relevant authorities, public bodies, regulatory agencies and the general public will be addressed. All this will be taken into account in defining the various construction contractors' responsibilities while bearing in mind the need to accommodate the practical requirements of the construction processes.

Operational traffic

For the management of the operational traffic, refer to Schedule 4, Service Delivery Plan relevant to the MRF.

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10. PERMITTING

The Planning Application and the application for the Waste Management Licence will be developed using the output from the design and environmental risk assessment processes. These will be agreed with the relevant authorities to co-ordinate requirements of the regulatory processes.

Statutory permitting process for the MRF will be required. This is expected to include:

- Planning Permission from the Waste Planning Authority
- Waste Management Licence from the Environment Agency
- Consents to discharge surface water from the Environment Agency
- Agreements to discharge foul sewage to local sewers from Southern Water Services Ltd
- Approval for any highway improvements or adjustments from the Highway Authority
- Approval for structures under the Building Regulations
- Fire safety certification

All these will be initiated by the Contractor at appropriate stages throughout the procurement phase

Non-statutory consultations will be conducted with other parties that will have an effect upon or be affected by the proposals. The relevant WCAs will be consulted on their operational requirements following agreement with the relevant WDA on the proposals to be put forward.

In consultation with the WDA a liaison forum for the neighbouring occupiers and public will be set up as a means of communication with the local community.

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11. ENVIRONMENTAL IMPACT MITIGATION

Prevention or mitigation of potential negative environmental impacts occasioned by the operation of MRF on its surroundings will be a key consideration of an environmental impact assessment.

Control of operational impacts will be mitigated by the enclosure of operations within the proposed facility building and controlling movements on the site. Waste Management Licence requirements will address the pollution control aspect of the MRF. Environmental health requirements will address air quality issues including dust, noise, odour and other potential health or nuisance issues. Any other matter that is a planning consideration will be addressed in the design process.

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12. CONSTRUCTION HEALTH AND SAFETY

Construction & Design Management

A Planning Supervisor will be appointed by the Contractor's project manager and report to the project team to fulfil the requirements of the CDM Regulations. The Planning Supervisor will be an adequately qualified person and will be independent of the Sub-Contractor and the project team.

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13. TESTING AND COMMISSIONING METHODS

Acceptance Testing and Commissioning

The MRF will be commissioned by the Sub-Contractor(s) using the Contractor's operations team.

Acceptance Tests relevant to the MRF will be carried out prior to the operation of the MRF in accordance with Part 2 of Schedule 7 of the Contract.

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APPENDIX 1

**BENCHMARK MRF
SPECIFICATION**

APPENDIX 1

**BENCHMARK SPECIFICATION
FOR
A 60,000 tpa
CO-MINGLED
MATERIAL RECYCLING FACILITY**

MARCH 2003

1.1 SCOPE OF THE WORKS

1.1.1 Introduction

This document describes a benchmark for the construction of a 60,000 tonnes per annum Materials Recovery Facility (MRF). Following construction, the Plant shall be able to operate in such a way as to meet the Performance Test requirements stated in the Principal Contract.

The MRF equipment design and construct Contract will be generally administrated in accordance with the General Terms and Conditions of a modified MF1 type of Contract to be agreed between the Purchaser and Design/Construct Contractor.

1.1.2 Operating Philosophy

The equipment will allow the facility to sort a total of 60,000 tonnes per annum of mixed dry recyclable materials, as per input material specifications agreed between the Council and the Contractor.

The plant will be designed to sort effectively and with minimum manual intervention co-mingled recyclables consisting in the main of papers, magazines, card, packaging, plastic containers, metal containers, fines and residues as per maximum contaminant level in each sorted stream as agreed between the Purchaser and Contractor.

This will be achieved in the following ways :

Pre-Sort & Initial Screen

1. The incoming materials will be delivered, tipped and stored in the MRF reception/tipping hall where there will be sufficient space for at least one day average inputs.
2. The incoming materials will be fed onto in-floor loading conveyors by mechanical shovel / 360 machine or similar. This will be carried out at a rate sufficient to match the system throughput. The objective of these conveyors is to provide a steady and constant flow of material to the system in a controlled manner. The two feed lines will be of equal capacity and both will have ultrasonic feed flow measurement and control.
3. The material will be transferred onto elevating conveyors, which in turn will elevate and feed the material to the pre-sort conveyors into one single pre-sort cabin. The elevating conveyor running at a faster speed will thin out the material stream for delivery to the pre-sort area.
4. The principal task of the pre-sort area is to remove large residual (non-recyclable) material. This material will be manually picked and delivered through chutes to the residual storage bay / area sited below.
5. The mixed material flowing from the twin pre-sort area is fed into two trommel screens which will exact a three way split of the mixed materials as follows:
 - <180mm, mainly containers and fines material.
 - 180 - 350mm, mainly newspapers and magazines.
 - Oversize, mainly card with some papers.

Materials <180mm

6. Material, <180mm in size screened from the twin trommels will be collected and fed onto two conveyors which transfer the material onto two Disc Screens. These screens will remove fines via a chute to the residual storage bay / area (purpose built bunker). Any dust generated by the screens will be contained appropriately.
7. If the Disc Screens jam or fail, the conveyors can reverse onto two separate conveyors which will take all material to the containers line conveyors.
8. Under normal conditions material (containers) will pass over the Disc Screens onto the containers line collector conveyors.
9. At the head of collector conveyors there will be two air knives positioned to further clean up the containers by removing in the main, paper, card, packaging and residues. The air knives will air-convey this material to sorting conveyors. Here the material is cleaned up by hand (if required) and residual material is fed through chutes onto collector conveyor and then onto residual line conveyors which takes the residual material to the residual storage bay / area.
10. Mixed papers from the clean up sorting conveyors will be transferred onto conveyors and conveyed to the mixed papers storage area (purpose built bunker).
11. The material that has been cleaned by the air knives, which is the heavier material, will be transferred onto another conveyor which in turn is conveyed to the autosort area.
12. All material then passes under a magnetic separator where ferrous material is removed automatically and transferred via conveyor and chute to a walking floor storage bunker.
13. The through flow from the magnetic separator passes onto the Eddy Current Separator unit which separates non-ferrous materials from the stream of materials. These will be discharged onto transfer conveyor then onto sorting conveyor for a manual clean up (if required). Residual material is fed through chutes onto collector conveyor and then onto residual line conveyors which take the residual material to the residual storage bay / area. Clean non-ferrous product passes through the cabin onto a returns conveyor, which feeds material directly via a chute to a walking floor storage bunker.
14. The material that passes over the Eddy Current Separator unit will be fed to a plastic Autosort unit via an input conveyor. The aim of the Autosort unit is to remove mixed plastic containers (PET/PE product) from the stream, these are ejected by air jets onto a conveyor.
15. The relatively clean plastic container material is transferred from a conveyor onto sorting conveyor for a manual clean up (if required). Residual material is fed through chutes onto collector conveyor and then onto residual line conveyors which takes the residual material to the residual storage bay / area. The clean mixed plastic container material then passes through a perforator and into a walking floor storage bunker.
16. Materials that are not removed by the Autosort unit are passed onto a transfer conveyor. This stream contains saleable mixed papers. These are then passed through an Autosort unit to remove packaging and paper. The material that is not ejected by air is passed onto transfer conveyor which in turn transfers material onto residual line conveyor.

17. The relatively clean mixed papers, which have been positively sorted by the Autosort unit are transferred onto a sorting conveyor for a manual clean up (if required). Residual material is fed through chutes onto collector conveyor and then onto residual line conveyors which takes the residual material to the residual storage bay / area. The cleaned mixed papers pass on from the conveyor onto a transfer conveyor and into a mixed papers storage bay.

Materials >180mm /<350mm

18. This material, in the main, newspapers and magazines is removed via a second sized screen in the twin trommels and is collected on two conveyors.
19. At the end of these conveyors two air knives will be positioned for the removal of small / light papers, card & residuals (plastic film). This material will be transferred via air to two sorting conveyors. Here the material is cleaned up by hand, if required. Residual material is fed through chutes onto collector conveyor and then onto residual line conveyors takes the residual material to the residual storage bay / area. Mixed papers are also picked manually (if required) and placed through separate chutes into a mixed papers walking floor storage bunker for further processing.
20. The cleaned up paper material passes from the conveyors onto a transfer conveyor which transports the news and magazines material via conveyors to the news & magazines storage area (purpose built bunker).
21. The material which has been cleaned by the air knives being in the main newspapers and magazines will be transferred onto two conveyors via transfer conveyors and passed under two Autosort units which are designed to remove packaging and cards. This material is ejected by air, equally, onto 2 conveyors which in turn pass the material onto a conveyor where card material is removed by hand, and fed into a chute to a cardboard walking floor storage bunker. Residual material will also be removed by hand and passed via a chute onto a collector conveyor and then onto residual line conveyors, which takes the residual material to the residual storage bay / area. The remaining negatively sorted material being classed as a mixed paper grade runs off the end of the conveyor into the mixed papers, walking floor storage bunker.
22. The material that has been cleaned by the Autosort units (which is the bulk of the news and magazines) will be transferred onto two conveyors for a further manual clean up (if required). There will be positions on these conveyors for removal of residuals and mixed papers. The residuals are picked, fed through sorting chutes onto a conveyor and then onto residual line conveyors. The mixed papers are picked, and fed through sorting chutes into the mixed papers walking floor storage bunker. The cleaned news and magazines run off the end of the twin conveyors and onto a conveyor for transfer onto conveyors, which in turn feed into the news and magazines storage bay.

Oversize Material

23. Oversize material (mostly cardboard) is the run off from the twin trommels and is collected on two conveyors.
24. These two conveyors transfer all this material onto a central transfer conveyor which in turn transfers it to a sorting conveyor where card material is removed by hand, and fed via a chute to

a cardboard walking floor storage bunker. Residual material is also removed by hand and passed via a chute onto collector conveyor and then onto residual line conveyors which takes the residual material to the residual storage bay / area. The remaining negatively sorted material being classed as a mixed paper grade runs off the end of the conveyor into the mixed papers, walking floor storage bunker.

Material Grades

The system will sort and store the incoming comingled recyclables into the following grades for onward processing:

Item	Material	Storage Bunker
A	News & Magazines	Walled Storage Bay (purpose built)
B	Mixed Papers	Walled Storage Bays (purpose built)
C	Mixed Papers	Walking Floor Storage Bunker
D	Ferrous Containers	Walking Floor Storage Bunker
E	Non-Ferrous Containers	Walking Floor Storage Bunker
F	Mixed Plastics (PET/PE)	Walking Floor Storage Bunker
G	Card	Walking Floor Storage Bunker
H	Residuals	Walled Storage Bay (purpose built)

The requirements for the bunkers storage capacity is as follows :

- Purpose built bunker : minimum 1.5 day worth of sorted material at guaranteed throughput
- Walking floor bunkers : minimum of one shift worth of sorted material at guaranteed throughput production.

The baling machine will be operated during limited hours from 7.30 am to 17.00 pm and the design capacity of the bunkers must allow for this operational constraint.

Onward Processing

The news and magazines material (A) and mixed papers (B) will be bulked up into road transport by use of a grab for onward shipment to paper mills or depending on mill requirement or selling market, will be baled via an optional channel type baling press fed with optional conveyors. The later being in option.

Materials that have been stored in walking floor bunkers, namely mixed papers (C), ferrous containers (D), non-ferrous containers (E), mixed plastics (F) and cardboard (G) will be transferred onto an infloor conveyor and then onto a baler feed conveyor. The material will then be baled and processed through a twin ram baling press for onward shipment and sale to the market.

The residual / fines material (H) will be classed as waste and taken from its storage bay to an articulated vehicle by mean of a shovel for transport to disposal.

Sorting

The system will be designed to keep manual sorting to a minimum by utilising screening and Autosort technologies. Any manual sorting that will take place will be done as a negative sort / clean up of the

products. All this sorting will be carried out in operator friendly enclosures where fresh filtered air is either heated or cooled to create a positive pressure which in turn minimises operator exposure to Inhalable dust.

The conveyors and cabins are ergonomically designed to maximise comfort reducing fatigue amongst the workers. Walls and floors are also insulated against cold and noise and lighting is to a high level.

Control

Control of the plant will be carried out from a high level centrally located control room. This control room will contain a computer controlled operating system which will monitor the plant and its performance.

1.1.3 Environmental and ergonomics Conditions

- (a) Systems will be installed to supply heat and/or cooled outside air to all the cabins, control room and toilet room to the benefit of the sorting operatives and supervisor.
- (b) Equipment will be enclosed to minimise the distribution and generation of airborne dust.
- (c) Equipment will be insulated to reduce noise emissions to meet planning requirements.
- (d) The design of the plant, equipment and cabins will comply with recommendations for workstation ergonomics of operators in recyclables sorting plants, unless otherwise agreed with the Engineer.

1.1.4 Nature of the Works

The work covered by the Specification shall include the design, manufacture, supply, delivery to site, installation, construction, connection, commissioning and testing of the mechanical and electrical elements of the MRF to form as a whole, a complete working installation in accordance with good engineering practice and to the satisfaction of the Engineer.

The Plant and the MRF as a whole shall be designed to process at hourly and annual throughputs as described in section 1.1.1 (Introduction) of the Specification, taking into account operational information and constraints.

The whole facility will be designed for either unattended fully automatic operation or manual operation and maintenance of individual Plant.

The Plant will be monitored and controlled by a programmable logic control unit accessible through standard keyboard and computer, with dial in connection and remote monitoring.

The Design/Supply Contractor shall train the Purchaser's staff in the operation and maintenance of the Plant.

The Design/Development Contractor will be required to submit for approval by the Purchaser, a Project Quality Plan (PQP) prior to commencement, which shall be maintained for the duration of the Works.

1.2 GENERAL REQUIREMENTS

1.2.1 Site Operations

The Works shall be undertaken with due care and attention paid to the existing Site operations and Civil Works Construction.

1.2.2 Design and Standardisation

All materials and equipment supplied under this Contract shall be of a make, type, design, material and construction approved by the Engineer and, unless specified to the contrary, shall comply with the most recent applicable British Standard or other equivalent National or International Standards as approved by the Engineer.

1.2.4 Materials

All works will comply with planning conditions and Onyx's insurers requirements.

Materials used in the construction of the Works shall be fit for purpose and designed with good engineering practice.

1.2.5 Paintwork

All steel work will be treated with one coat of rapid drying alkyd primer / topcoat in a semi-gloss finish, the colour to be agreed in advance. The Engineer may request conveyor and main equipment to be painted in different colours.

1.2.6 Waste Disposal

The Design/Construction Contractor will be required to leave the Site in a clean and tidy condition. Any wastes generated as a result of the Works, shall be disposed of by the Design/Construction Contractor in a licensed landfill and proper records shall be submitted to the Purchaser.

1.2.7 Documentation

Drawing submissions by the Design/Construction Contractor will be made to Onyx in accordance with the 'Times and stages of Completion' stated in the Design/Construction Contract. These shall be reviewed by the Engineer prior to the installation of any Works.

The Design/Construction Contractor shall supply to the Engineer, the following documentation:

- (a) Draft Plant Operating and Maintenance Manuals and a use of equipment training programme,
- (b) List of spares with manufacturer's identification and reference number.

Following the successful completion of Performance Tests, and prior to the issue of the Take Over Certificate, the Contractor shall issue to the Engineer the complete Operating and Maintenance Manuals, the 'Quality Assurance' files and the 'Health & Safety' file (if applicable).

On completion of all snags and qualifications and prior to the issue of a Qualification Removal Certificate, the Design/Construction Contractor shall issue to the Engineer any as-built drawings and update documentation including Operating & Maintenance Manuals as necessary. As-built drawings will be required where the as-built version differs significantly from the detailed engineering drawings. Such documentation shall be submitted in both hard copy form and also on a CD ROM with hypertext link and searchability ability.

At the end of the Defects Liability Period and prior to the issue of a Final Acceptance Certificate, the Contractor shall update the documentation and CD ROM as necessary and submit the final documentation.

1.2.8 Software

The Design/Construction will be required to ensure that all software installed and supplied with the Works is designed to function until at least 1st January 2020. The Contractor shall provide the Purchaser with a certificate guaranteeing that all software installed and supplied with the Works complies with requirements. New developments are out of the control of the Contractor and no guarantee can be given with regard to its compatibility with future software that may be developed.

1.2.9 Commissioning

The Contractor will provide a management team to monitor the design, construction and commissioning and Take-over of the Plant.

1.2.11 Training

The Design/Construction Contractor shall provide theoretical and practical instruction to Onyx on Plant Operating and Maintenance procedures and equipment specification.

The training programme shall include but shall not be limited to:

- (a) Fire detection/prevention system.
- (b) Plant control mechanism.

- (c) Plant operation.
- (d) Plant maintenance.

1.2.12 Civil works

The development of the Buildings and Infrastructure will be administrated under the General Terms and Conditions of the New Engineering type of Contracts, namely The Engineering and Construction Contract (ECC), edition November 1995 published by Institutions of Civil Engineers or equivalent. The National Building Specifications (NBS) shall be used for the design, construction and management of the works.

The Civil Contractor shall be required to liase and co-operate with other contractors employed on the Site by the Contractor to ensure interfaces are made without difficulty.

The Design/Construction Contractor will be responsible for obtaining the design information on the interface items, checking the design, advise the Civil Contractor of any comments and inspect the works once completed.

1.2.13 Health and Safety

The entire construction shall comply with the Construction (Design and Management) Regulations. The Contractor will be the Principal Contractor for these Works and as such will be required to prepare and develop a Health and Safety Plan prior to starting work on site.

The Design/Construction Contractor will be responsible for ensuring that other contractors or visitors to the generating facility are aware of site specific and general safety issues and that they follow the above specific safety requirements. This applies whether the visitors or contractors are at the invitation of the Contractor or not and up to the issue of a Take-Over Certificate.

The contractors shall also comply with the Onyx Environmental Group plc document entitled 'Safety Rules and Conditions for Contractors and Sub Contractors'.

It is possible that the Design/Construction Contractor may be asked to act as a nominated Sub-Contractor to the Civil Contractor, acting as Principal Contractor, in terms of H&S and CDM Regulations. If this is the case he will be required to comply with any of the requirements and obligations of the Principal Contractor and provide him with any H&S information to enable him to comply with the CDM Regulations.

1.2.14 Storage on Site

All plant delivered to Site shall be protected from weather and stored securely to the satisfaction of the Engineer.

1.2.15 Alterations to Planning Permission

The Design/Construction Contractor shall submit to the Onyx details of any work, which will require approval from the Planning Authority in good time to allow the Onyx to seek approval from the relevant authority.

1.3 PLANT REQUIREMENTS

- (a) The main MRF system shall be able to allow the sorting of 60,000 tonnes per annum of co-mingled materials into its main component parts.

1.3.1 Material Flow

- (a) The system shall be designed so that the material flow is kept uniform regardless of way the system is fed, provided that the system is fed in a reasonable manner.
- (b) The system shall be designed so that there will be minimal spillage or accumulation of debris in or around the process equipment.
- (c) The system shall be designed so that the uniform burden depth on any individual sorting conveyor is such that the material is contained within the conveyor.

1.3.2 Modular Construction

- (a) The system shall comprise of modular structures and shall, wherever possible, be bolted together and not welded. Fixings shall be of a type to prevent the nuts from coming loose through operation of the facility.
- (b) It will not be acceptable to drill and tap the structure to secure bolts, as the thickness of the steel plate structure may not be equal to the depth of a full nut. In these cases a captive nut is to be used. Where fixings may be subjected to corrosive forces they shall be constructed of corrosion resistant materials. Structure is defined as supporting steel work for the plant. It is acceptable to drill and tap some fixings where deemed appropriate such as floorplates and sideguards.

1.3.3 Belts And Conveyors General Requirements

- (a) Access shall be provided wherever possible to facilitate maintenance and cleaning without the need of safety harnesses.
- (b) Gearbox/motor assemblies mounted in difficult locations shall be of low maintenance. Where lubrication is necessary this shall be achieved without the removal of the safety guards.
- (c) Stub shafts protruding from support bearings shall be capped to prevent entanglement. Stub shafts being defined as shaft ends protruding through a bearing or geared motor.
- (d) Access facilities shall be made available to be able to track and tension all of the conveyor belts. Safe access shall be provided and adjustment achieved without the removal of guards wherever possible.
- (e) All individual components of the conveyor belts shall be specified in the warranty documentation, including fixing arrangement security.
- (f) The design of guards shall reasonably enable spillage to be cleared without the removal of the guards.
- (g) Bearings which are sealed for life shall be marked as such and a life expectancy for the lubricant documented. Head and tail shaft bearing mounts shall be designed for ease of bearing replacement, without the need to cut away steelwork.
- (h) The number of types/styles of conveyor shall be kept to a minimum.
- (i) Machinery side steelwork is to be numbered with the identification of the conveyor at a point visible from the local start/stop station.
- (j) Wherever possible belt widths shall be standardised. (This does not absolve the contractor of his responsibility to design the system to achieve the required throughput)
- (k) Wherever possible, the number of gearbox sizes/styles shall be minimised
- (l) Where the system is designed to split the waste stream into two resultant outflows, the mechanism to split the waste stream shall be adjustable to allow the waste stream to be split over a full range of balances.
- (m) All conveyor belts are to be vulcanised
- (n) Debris drop out points shall be designed such that material cannot fall on to staff .The drop out point shall be positioned such that the debris can be removed conveniently and safely to a final place of

disposal.

A. Flat Belt conveyors

- (a) Where conveyors run parallel to the floor or at a shallow angle, they shall be left open on the underside to prevent any build up of material within the conveyor.
- (b) All inclined flat bed conveyors shall be able to convey material without material falling back, even at minimum speeds.

B. Chain conveyors

- (a) The belt should be flat with no rubber side-walls.
- (b) Sufficient side clearance for the chain is required to prevent rubbing of the chain.
- (c) Wear strips shall be designed for the life of the plant. If this is not the case, especially at high load turning points, then provision shall be made to change sections of the wear strip without dismantling the chain.
- (d) Sacrificial pads shall be fitted to the chain at intervals, as an indicator only of chain alignment.

C. Cross Band Electro-Magnetic Separator

- (a) Shall be designed to be self-cleaning.
- (b) All areas within the effective range of the magnet shall be manufactured of non-magnetic material. This shall include guards and chutes and all fixings.
- (c) Provision shall be made for the free flow of all of the separated ferrous material into the collection chute. Spillage onto platforms or working areas will not be acceptable.
- (d) Provision shall be made to clear the chutes, without the need to remove guards wherever possible.
- (e) Warning signs to be posted to warn of magnetic fields.

D. Eddy Current Separator

- (a) Shall be designed to be self-cleaning.
- (b) All areas within the effective range of the magnet shall be manufactured of non-magnetic material. This shall include guards and chutes and all fixings.
- (c) Provision shall be made for the free flow of all of the separated material into the collection chute. Spillage onto platforms or working areas will not be acceptable. Provision shall be made to clear the chutes, without the need to remove guards wherever possible.

3.4 Trommels

- (a) General construction, installation and maintenance requirements will apply as for conveyors.
- (b) The angle of inclination of the trommels shall not be adjustable but set permanently at the optimum angle, by the contractor. This shall be documented.
- (c) Material discharged from the trommels shall be distributed evenly and centrally across the next conveyors.
- (d) For the purposes of maintenance and cleaning of the internal parts of the trommel it will be necessary to provide safe access. This will include electrical interlocks on safety access gates, such as a 'Castell Key System'.
- (e) Harness securing points shall be provided at the safe access position.
- (f) A drive locking device or mechanical brake shall be provided for maintenance purposes.

1.3.5 Transfer Points

- (a) Brushes and rubber skirting should be provided to minimise carry back on all conveyors and trommels.

- (b) Transfer points shall be well illuminated and visible from walkways. This is defined as the area surrounding the transfer being well lit and not the inside of the transfer point being lit. Transfer points may be fully enclosed to meet with H&S requirements and to contain dust or other material.
- (c) All equipment shall be designed to prevent build up of material at the equipment and to prevent material falling off the equipment onto the floor of other platform/walkway.

1.3.6 Chutes

- (a) Chutes will be manufactured from mild steels.
- (b) Hinged covers shall be provided for the chutes for use at maintenance periods.
- (c) Divert flaps shall seal against the flow of material.
- (d) Chutes which may be vulnerable to occasional blockages shall be fitted with a device to clear the blockage without the need to remove covers or guards.

1.3.7 Safety And Alarm Equipment

- (a) A pull cord type stop will be provided at every sorting post.
- (b) All conveyor belts which are accessible by the work force shall have a pull cord type stop.
- (c) The pull cords on transfer conveyors shall have drop cords every 1m to allow a person to stop the belt if lying on the belt.
- (d) The above requires to be referenced to applicable standards e.g. BS EN292 (safety of machinery), EN418(emergency stop equipment and En60204-1. This list is not exhaustive.
- (e) All emergency stops shall be easily accessible by the work force and not obstructed.
- (f) All emergency stops shall be of the type that can only be reset by means of a key.
- (g) If an emergency stop is pressed then in accordance with H&S guidelines the entire system will be stopped.
- (h) The emergency stops and pull wires will operate the same with machinery either in or out of sequence.

1.3.8 Balers And Hydraulically Powered Equipment

- (a) The baler in feed conveyor shall be able to be operated independent from that of the baler, such that it can be operated if the baler supply fails. However, the safety systems shall be common.
- (b) All hydraulic pipes shall be secured where possible so as to prevent movement in the event of rupture.
- (c) The hydraulic oil tank will be provided with a tray of a size to contain oil lost up to the point where the low pressure switch switches off the pump.
- (d) Emergency stops shall be provided to satisfy the purchaser's Health and Safety requirements. A light shall be provided to allow the operator to view inside the baler chamber.
- (e) The bale tying mechanism shall be automatic.
- (f) General construction, installation and maintenance requirements apply as for conveyors.
- (g) Remote indicator lights shall be provided at a suitable position, to indicate to the baler operator the status of the baler and how much material is required to complete the bale.

1.3.9 Control System

The Works shall include a system to control and monitor the Materials Recovery Facility.

This shall include the following:

- A. Main Control Panel, PC accessed and operated.
- B. Local Control Panels
- C. Remote monitoring

- (a) The control system must be linked to all machinery to one central point.
- (b) The control system must be designed in a such a way that remote monitoring of the operation of the plant for flow and system parameters is available for engineering and operational needs.

1.3.10 Electrical Classification

All equipment shall be at least IP55.

1.3.12 Working Platforms

All working platforms will be designed with hinged sprung gates at the top of access ladders only..

1.3.13 Maintenance Platforms And Walkways

- (a) All equipment shall be accessible from a maintenance platform wherever possible.
- (b) All walkways should be of an angle of incline where there is no possibility of slipping.
- (c) All walkways at height should be contained within suitable and sufficient barriers.

1.3.14 Floors

- (a) All floors shall be made of checker plate or similar material to the approval of the Engineer.
- (b) These shall be made of galvanised steel.

1.3.15 Handrailing

All hand railing shall be made of galvanised steel

1.3.16 Enclosures Heating and Ventilation

- (a) Enclosure air changes will be adjustable between 10 and 14 per hour.
- (b) Temperature of the sorting enclosures shall not fall below 16 deg.C. This temperature refers to readings taken using an ordinary dry bulb thermometer, close to the sorting line operatives work station, at working height.
- (c) Fresh clean air is required which has been drawn from a source outside the building and is not polluted by discharge from flues, exhaust ventilation systems and process outlets.
- (d) Fresh clean air is required to be supplied downward to the breathing zone of the sorting line operative working between each of the material chutes. Full control of air supply and direction is required on each outlet duct.
- (e) Humidity control is not required.
- (f) Reference is to be made to 'Workplace Health, Safety & Welfare Regs. 1992, EH40/2000 and any other relevant standards.

1.3.18 Dust level in Plant

- (a) The plant must be designed as to minimise dust generation to achieve Dust Levels to be specified
- (b) The measurement of Total Inhalable Dust is to be carried out as specified in MDHS 14/3: General methods for sampling and gravimetric analysis of respirable and total inhalable dust.
- (c) The Contractor shall consult with and comply with the requirements of the local Environmental Health Officer
- (d) Where these dust levels are exceeded, the Contractor shall enclose (as far as is practicable) any piece of equipment with an enclosure. Dust extraction equipment will only be supplied to the agreed testing points at the cost of the Purchaser.

13.3.19 Material Storage Area

- (a) All areas that are designated to store materials shall be kept free of obstructions to allow access for vehicles. This will include columns in the building, bracing, electrical cable trays and support steelwork under working enclosures.
- (b) The material bunkers shall be designed by the Contractor to maximise even filling of the area from the

discharge chutes, or conveyors. Movement of material by loading shovel or similar to level the material will also be required.

- (c) Exposed ends of the concrete bunker walls shall be protected by steel plating. The edges of the bunkers shall be clearly marked, both by the Civil Contractor.
- (d) Material bunker walls shall be designed and constructed by Civil Contractor to withstand the force of the material being stored at full capacity and to take into account the force due to collecting/pushing up material with a vehicle/ machine.
- (e) All hydraulic pipes shall be secured so as to prevent wherever possible movement in the event of rupture.
- (f) The walking floors bunkers must be fitted with hydraulic operated doors to the satisfaction of the Engineer.

1.3.21 Pits

- (a) All pits shall be designed such that they are not classified as an enclosed space as defined in legislation. The Civil Contractor is solely responsible for the design and construction of the concrete pits to the Contractor specification.
- (b) All pits shall have adequate permanent lighting in order to carry out inspection and maintenance.
- (c) All pits shall be designed to prevent material from falling into or being blown into the area. Provision and installation of any spill plate, steel plating etc is the responsibility of the Contractor.
- (d) All exposed edges of new pits (other than those required for the effective operation of the plant) shall be protected by means of a handrail
- (e) All new pits shall be accessible by means of at least one ladder at each end of the pit.
- (f) All access gates to new pit areas shall be linked into the emergency stopping system of the plant.

1.3.22 Ladders

- (a) All ladders shall be made of galvanised steel.

1.3.23 Worker Access To The Facility

- (a) Worker access routes will be painted on the floor of the plant. These will be agreed by the Engineer.
- (b) Access routes will run from the main access doors to the access stairways.
- (c) Where possible, regular access to working enclosures shall be via a common point.

1.3.24 Certification

- (a) All equipment shall be CE Certified
- (b) The system shall comply with all relevant current BS EN and H&S standards

1.3.25 Fire Control Measures

- (a) Any fire detection/prevention system shall not interfere with the working plant and shall be suitably protected against damage from the operation of the facility (including vehicles).
- (b) All fire alarms will be clearly audible to all staff, contractors and visitors at any location in the plant, especially when the plant is fully operational.
- (c) A visual indication of the alarm shall be installed for those hard of hearing inside of the cabins only.
- (d) The alarm system shall be able to be easily identified from any other alarm or start up system on the plant.
- (e) Any cabin must be provided to the Fire officer Approval with minimum Fire alarm, detection and protection equipment such as, but not limited to :
 - Fire alarm
 - Escape route with emergency lighting
 - Break glass to each cabin door
 - Pushbutton detection
 - Smoke detection
- (f) Any walking floor bunker must be fitted with fire alarm and detection system.
- (g) Fire extinguishers during the plant installation and commissioning will be the responsibility of the Contractor. The Contractor shall gain Fire Certification for the MRF equipment.

1.3.26 Supporting Steelwork

- (a) The system shall be designed to minimise the number of steel columns and concrete walls require to support the machinery.

1.3.29 Warning Signs

- (a) Warning signs shall be provided where there is low clearance under a walkway.
- (b) All warning signs shall be provided for the safe operation of the plant, this shall include: hard hat areas, no smoking areas, PPE areas, no unauthorised access,

1.3.30 Spare Parts.

The MRF Contractor shall provide an itemised list of recommended spare parts for stock holding by the Purchaser.

1.3.31 Cleaning

The Contractor will take care when cleaning production equipment as follows:

- (a) Ensure that all plant and machinery is isolated where possible.
- (b) Obtain Permit to Work
- (c) Supply additional dust covers for protection as necessary
- (d) Achieve access using a combination of self-propelled Arial Platforms and Boon type giving outreach where possible, Aluminium Towers, ladders and steps.
- (e) All self-propelled plant to be powered via battery power.
- (f) Where necessary, staging boards will be used for access, particularly when working on the roofs of the operators sorting areas.
- (g) The process of cleaning will work progressively downwards from the highest point to avoid any potential resoiling problems.

**SCHEDULE 3
WORKS DELIVERY PLAN**

PART 2

RECYCLING

APPENDIX 2

**BENCHMARK MRF
PROGRAMME**

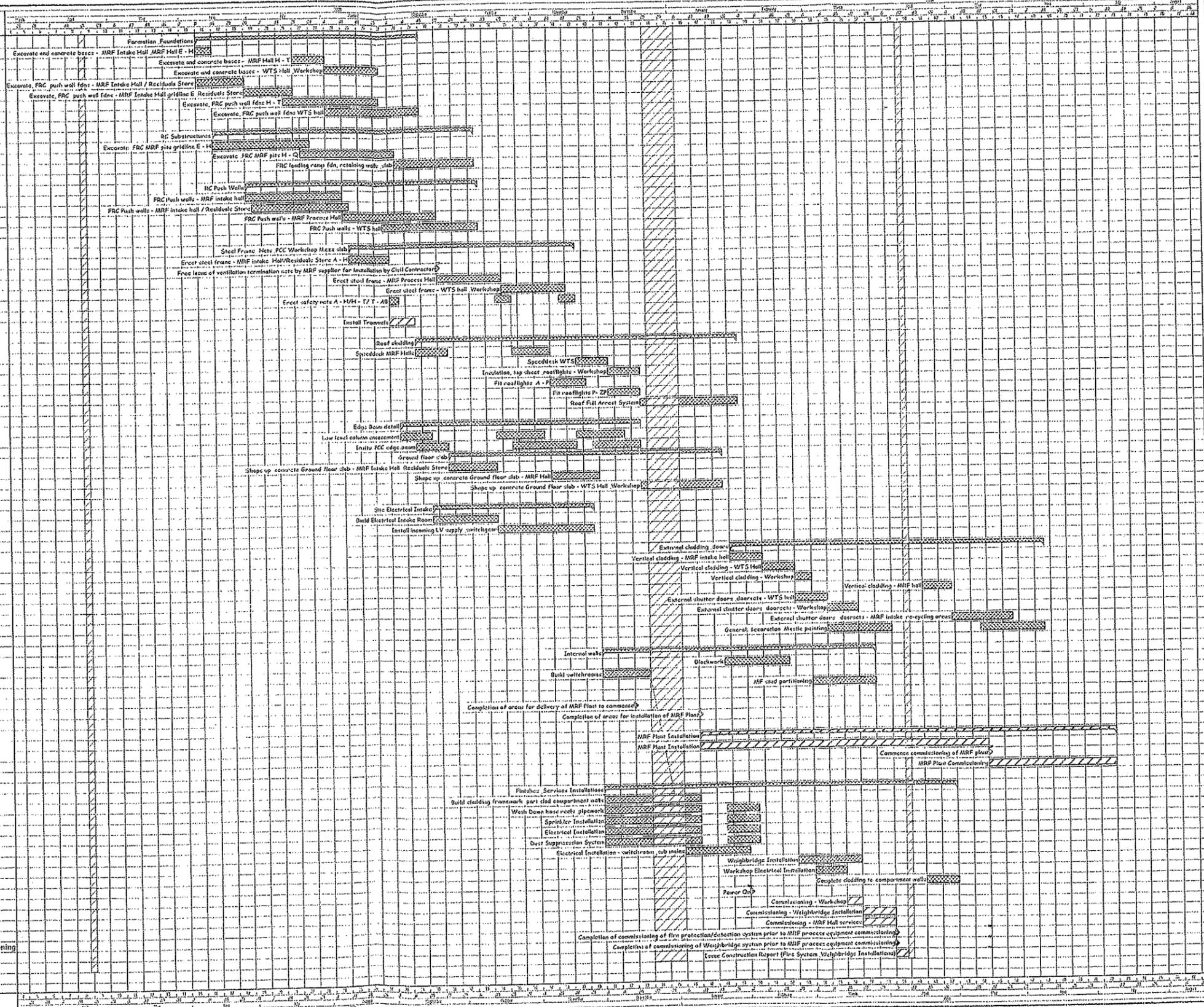


Onyx Hampshire Ltd

Alton Re-cycling Plant & Waste Transfer Station

Tender Programme

- Formation & Foundations
 - Excavate and concrete bases - MRF Intake Hall & MRF Hall E - H
 - Excavate and concrete bases - MRF Hall H - Y
 - Excavate and concrete bases - WTS Hall & Workshop
 - Excavate and concrete bases - MRF Intake Hall / Residuals Store
 - Excavate FRC push wall fdn - MRF Intake Hall / Residuals Store
 - Excavate FRC push wall fdn - MRF Intake Hall gridline E & Residuals Store
 - Excavate FRC push wall fdn H - T
 - Excavate FRC push wall fdn WTS Hall
- RC Substructures
 - Excavate & FRC MRF pitu gridline E - H
 - Excavate & FRC MRF pitu H - Q
 - FRC loading ramp fdn, retaining walls & slab
- RC Push Walls
 - FRC Push walls - MRF intake hall
 - FRC Push walls - MRF intake hall / Residuals Store
 - FRC Push walls - MRF Process Hall
 - FRC Push walls - WTS Hall
- Steel Frame & Nets & PCC Workshop Mezz slab
 - Erect steel frame - MRF intake Hall/Residuals Store A - H
 - Free issue of ventilation termination sets by MRF supplier for installation by Civil Contractor
 - Erect steel frame - MRF Process Hall
 - Erect steel frame - WTS Hall & Workshop
 - Erect safety nets A - H/H - T / T - AB
- Install Trombels
- Roof cladding
 - Speeddeck MRF Halls
 - Speeddeck WTS
 - Insulation, top sheet & rooflights - Workshop
 - Fit rooflights A - P
 - Fit rooflights P - ZP
 - Roof Fall Arrest System
- Edge Beam detail
 - Low level column encasement
 - Install PCC edge beam
 - Ground floor slab
 - Shape up & concrete Ground floor slab - MRF Intake Hall & Residuals Store
 - Shape up & concrete Ground floor slab - MRF Hall
 - Shape up & concrete Ground floor slab - WTS Hall & Workshop
- Site Electrical Intake
 - Build Electrical Intake Room
 - Install incoming LV supply & switchgear
- External cladding & doors
 - Vertical cladding - MRF intake hall
 - Vertical cladding - WTS Hall
 - Vertical cladding - Workshop
 - Vertical cladding - MRF hall
 - External shutter doors & doorsets - WTS hall
 - External shutter doors & doorsets - Workshop
 - External shutter doors & doorsets - MRF intake & re-cycling areas
 - General decoration & Mastic painting
- Internal walls
 - Blockwork
 - Build switchrooms
 - MF stud partitioning
- Completion of areas for delivery of MRF Plant to commence
- Completion of areas for installation of MRF Plant
- MRF Plant Installation
 - MRF Plant Installation
 - Commence commissioning of MRF plant
 - MRF Plant Commissioning
- Finishes & Services Installations
 - Build cladding framework part clad compartment walls
 - Wash Down hose reels & pipework
 - Sprinkler Installation
 - Electrical Installation
 - Dust Suppression System
 - Electrical Installation - switchroom & sub mains
 - Weighbridge Installation
 - Workshop Electrical Installation
 - Complete cladding to compartment walls
 - Power On
 - Commissioning - Workshop
 - Commissioning - Weighbridge Installation
 - Commissioning - MRF Hall services
 - Completion of commissioning of fire protection/detection system prior to MRF process equipment commissioning
 - Completion of commissioning of Weighbridge system prior to MRF process equipment commissioning
 - Issue Construction Report (Fire System & Weighbridge Installations)



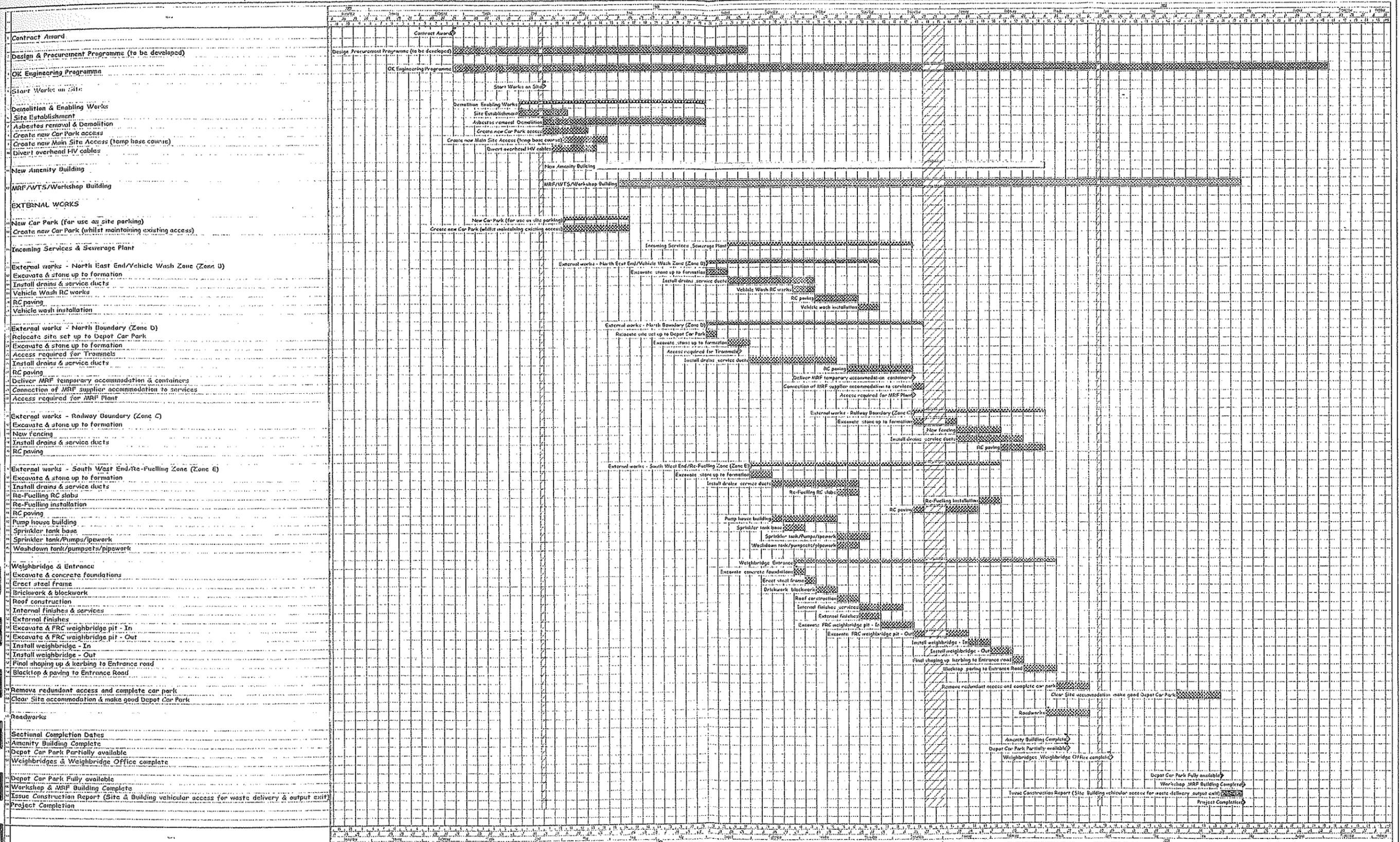
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Onyx Hampshire Ltd

Alton Re-cycling Plant & Waste Transfer Station

Tender Programme



Ballast Construction
(South West Region) Winnall Close, Winchester, Hampshire SO23 0LB

Comments: Summary Programme

Programme No: 077 TP2

Revision: D

Date: 10/02/03

Drawn By: JSP