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Donal Grant
Inspector
Office of Licensing and Guidance
Environmental Protection Agency Headquarters
PO Box 3000
Johnstown Castle Estate
County Wexford

Monday January 22nd 2007

RE: Article 14 Response for Carbury Compost Ltd W0124-02

Dear Donal,

Please find enclosed 3 hard copies and 16 CD copies of the *Article 14 Response* for submission to the Environmental Protection Agency, on behalf of our client Carbury Compost Limited (Waste Licence W0124-02) located at Drummin, Carbury, Co. Kildare.

If you have any queries relating to the above matter, please do not hesitate to contact myself.

Sincerely

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thinking beyond construction

Carbury Compost Ltd.
W0124-01
Article 14 Response

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Carbury Compost Ltd.
W0124-01
Article 14 Response

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Article 14(2) (b) (ii) Response

Article 12 & 13 Compliance Requirements

1. On Page i of the Environmental Impact Statement, reference is made to the dipping/dunking in water and storage of straw bales for up to three days. Will the dunked straw bales be stored on aerated pads? Please clarify. Also, in the composting facility overview on Page 1.2, please clarify whether the wetted bales are stored indoors or outdoors.

Dry and wetted straw bails will be stored outdoors in designated areas located in the northeastern corner of the site. The location of the designated straw bale areas are shown on engineer drawing 3154cPL-06-1.03 attached. The wet straw bales will be placed on concrete pads that do not have any active aeration systems included. The straw bales will receive passive aeration by being stored outdoors. It is considered that the storage of wetted bales for a maximum of three days will not be long enough for anaerobic conditions to develop in the bales to any significant extent and that little or no odours will be generated by the straw. After a maximum of three days the bales are placed on a conveyor systems and broken apart prior to entering the reception hall and blending with the other raw materials and this process aerates the straw (and other raw materials).

2. On Page ii of the Environmental Impact Statement, insufficient information is provided on the method for the proposed recirculation/removal of air in the Phase I bunkers and waste handling area. The removal of odorous air in the Phase I bunkers and in the raw material handling area using an air pressure system is also referenced on page 3.10 of the EIS. No explanation of this air pressure system is provided. Please provide detailed information on this aspect.

Fresh air enters the system via the fresh air inlet into the tunnels (please see Appendix A for diagram). Air is then re-circulated through the tunnels by the forced aeration system. If and when fresh air is needed it is added to the system via the inlet. Once fresh air is added, any excess air within the system is diverted and expelled through the stack. Air within the filling area (reception hall) is sucked through a fan system and expelled through the stack.

3. Page viii, reference is made to the storage of sewage effluent in the same tank (Tank B) as the floor drainage water (See also Q.7). Has any consideration been given to the possibility of human pathogens surviving after the composting process? Do you intend to test the final mushroom substrate/compost for the presence of such pathogens? Please advise.

It is highly unlikely that human pathogens will survive the pasteurisation phase within the composting process. It is planned to confirm that this is the case by carrying out a monitoring programme on the final compost as soon as the new systems and processes are operational. This will initially comprise a comprehensive testing programme and the testing methodology (No. of samples, frequency etc.) will be reviewed during the first months/year of operation. At present Monaghan Mushrooms Ltd currently test both compost and mushrooms at all their facilities for e-coli, salmonella and chemical residue on a yearly basis. One of these facilities currently is using the testing system proposed for Carbury Compost Ltd. To date, human pathogens have been encountered. In the unlikely event that human pathogens are found in the final compost then either the pasteurisation process can be amended or the sewage effluent removed from the waste stream completely.

4. Additional of urea to substitute the poultry manure

Prof R. Noble recommended the above (as well as other measures) as a measure to reduce odours in his Index of Measures for the Reduction of Odours from Mushroom Composting sites in Ireland. It is the understanding of the Agency that your company agreed to implement all of the Noble measures. However, no mention is made of the above measure or indeed any of Noble's measures in the application. Please clarify.

As part of its ongoing and pro-active approach to minimise its impact on the receiving environment, Carbury Compost Ltd. has historically undertaken research to substitute poultry manure with urea. Analytical results showed that there were problems with removing ammonia from the compost and therefore its quality was compromised. Following this unfavourable outcome, research into alternative nitrogen substitutes for poultry manure was undertaken.

Current research indicates ammonium sulphate to be an acceptable nitrogen substitute in poultry manure at the Carbury site. Ammonium sulphate is added to the bales as they are broken up prior to mixing with the chicken litter and gypsum. Present trials show that approximately 15% of the nitrogen source in poultry litter can be substituted with ammonium sulphate. Research at the plant is continually on-going to further reduce the nitrogen contribution from poultry manure by substituting with ammonium sulphate. An on-going quality assurance programme is undertaken to ensure the quality of the compost is maintained.

Carbury Compost Ltd. is currently or will be as part of the proposed development, implementing most of the measures detailed in Professor R. Noble's report entitled 'Measures for the Reduction of Odours from Mushroom Composting Sites in Ireland'. These include the following:

- The poultry manure will be stored and handled indoors in the new reception hall
- The poultry litter and gypsum will be pre-mixed in one of the bays in the reception hall
- Surface water discharges generated by precipitation falling on the roofs of the buildings and the hard standing areas of the site will be collected and stored in the existing water tank (tank A). Rainfall run-off from hard standing areas will be directed through a silt trap prior to storage in Tank A. As this will comprise of clean rainfall, the levels of solid matter will be extremely low and therefore will not require screening.
- All wastewater from phases I, II and III and the wheel washes will be directed to a new storage tank (tank B) via a silt trap and oil interceptor
- It is expected that all the water generated at the site (rainwater, run-off, leachate etc) will be re-used in the composting process and where possible reduce the volume to the minimum required for maintaining a consistent throughput of compost
- As stated in the EIS, prior to preparing a batch for composting, the straw bales will be 'dunked' in a large vat containing water from the new water storage tank (tank B). The bales will be dunked for approximately 1 minute to allow full wetting. The wet bales will then be stored in a designated area adjacent to the vat and outside the reception hall for up to 3 days after which time the bales are loaded onto the blender and broken up. No aeration takes place at this stage. While this starts a slow heating process, it is not considered to be a significant odour source as the water used to wet the bales will have been aerated and any odour generated will be minimal
- The new system allows for split application of poultry manure and gypsum
- Phase I composting will be aerated whereby electric fans will force re-circulated air through nodes (nozzles) located in the bunker floor and up through the composting material
- The compost in Phase I is monitored regularly for temperature and oxygen by remote telemetry and controlled by modern computerised systems
- All areas where compost is prepared will be regularly cleaned to avoid the accumulation of odorous residues or organic material which may become anaerobic
- In accordance with waste licensing requirements, results of all monitoring undertaken shall be recorded and made available for inspection

All of the measures presented above are detailed in Professor Ralph Noble's document entitled 'Index of Measures for the Reduction of Odours from Mushroom Composting Sites in Ireland.'

5. On Page 1.2, reference is made to the nodes built into the floor of the Phase I bunkers. Please clarify the exact function of these nodes and furnish the Agency with a description of their operation.

The nodes (or nozzles) installed into the floor throughout the Phase 1 Bunkers will act as the delivery point for the forced aeration system which will force air up through the compost to assist the composting process. The nodes are part of an intricate piping system which will be laid beneath the bunker floor that will carry the air to the nodes. These comprise cone like pivots that have the effect of concentrating and increasing the delivery pressure of the air (Please see photo's in Appendix A). Maintenance and cleaning of the bunker floors and the nodes will be carried out on a regular basis to ensure that the nodes do not become blocked. The cleaning and testing of the air flow system will generally be carried out when compost has been removed from a bunker and prior to the bunker being filled with the next batch of compost.

6. On Page 2.6 the results of the flue gas monitoring of Boiler A1-1 area presented in Table 2.2.4. Where is this monitoring point located? It is not marked on the Figure 2.2.1. Please clarify.

The location of Boiler A1-1 is shown on the revised Figure 2.2.1 – Monitoring Locations Map attached as Appendix B.

7. On Section 2.6.3.1 on Page 2.22 stated that all effluent generated on site will be re-used in the composting facility and no discharge to the local network are expected. If this is the case, why is the Puraflo system still needed?

It is planned that all effluent including sewage effluent generated at the site will be pumped to the Tank B storage tank and then reused in the composting process. In this case the Puraflo wastewater treatment plant will not be used and will be decommissioned. All inlet and outlet pipes to the Puraflo plant will be closed off and the plant emptied of any effluent/sludge which will be disposed of appropriately.

8. The following drawings need to be amended and furnished to the Agency as the text of the drawings is illegible

3154 CPL-'06-1.02

3154 CPL-'06-1.03

3154 CPL-'06-2.01

3154 CPL-'06-2.02

3154 CPL-'06-2.03

3154 CPL-'06-2.04

3154 CPL-'06-2.05

3154 CPL-'06-3.01

3154 CPL-'06-3.02

Please find attached amended Engineer Drawings as requested in Appendix C

9. Please provide information on the proposed mitigation measures to be used to reduce the possibility of bio aerosol production at the proposed facility

As detailed in the EIS, bio-aerosols may primarily arise from the following sources:

- Aeration of the goody water tank (Tank B)
- The mixing, handling, blending and delivery of raw materials to the Phase I bunkers
- During delivery of mixed/blended raw materials to Phase I bunkers

Carbury Compost Ltd. are committed to ensuring that the production of bio-aerosols are minimised through the implementation of measures detailed in the cré (Composting Association of Ireland) report entitled 'Bio aerosols and Composting – A Literature Evaluation, 2004'. These include:

- Implementation of a Bio-aerosol Control Plan
- Consideration in siting of the facility and its design
- On-site operational management

Bio-aerosol Control Plan

Carbury Compost Ltd. will compile and implement a control plan as part of its site procedures and protocols to minimise the generation of bio-aerosols to atmosphere and its risk to the health and safety of on-site workers and the general public. This plan considers the following elements:

Siting of the facility and its design

The proposed development will be located in the north-east corner of the existing site. The nearest sensitive receptor is situated approximately 270m to the north-west of the reception hall/Phase I building where the majority of bio-aerosols at the plant will be generated. This distance complies with the guideline set-back distance or buffer zone of 200m from composting facilities to a sensitive receptor as recommended in the cré report. It is well established that in most cases background concentrations of bio-aerosols are reached at a distance of less than 200-300m from composting facilities. Therefore, any

emission of bio-aerosols from the site is not expected to pose a health and safety risk to sensitive receptors.

The design of the proposed site is such that all mixing/blending of the raw materials and Phase I composting will occur indoors in a fully contained building and bunkers. Bio-aerosols may either escape when doors to the Reception Hall are opened or through the Phase I emission point where adequate dispersion to atmosphere will take place. Therefore the design of the plant is expected to minimise the impact of bio-aerosols on health and safety of on-site workers and off-site receptors.

Site Operations

The implementation of on-site operations will be undertaken to reduce bio-aerosols. These may include operational controls such as the maintenance of a proper composting environment, engineering controls, the use of personal protective equipment (PPE), worker hygiene, medical considerations and site sampling if requested.

Furthermore, mitigation measures as detailed in the EIS will be implemented to ensure that the production bio-aerosols are minimised. These include:

- A low energy diffuse aeration system to be installed in Tank B and will entail minimal agitation of the water with the result that there will be minor potential for aerosol emissions from these sources
- The handling of the raw manures, the mixing and blending process, delivery of mixed materials to the phase I bunker complex will be carried out in enclosed conditions
- Trucks delivering materials to the site will be enclosed or covered with a net with the exception of straw and horse manure
- Delivered materials will be housed in the enclosed reception hall or specified storage area
- The doors to the reception hall will be closed between deliveries
- The distribution system including conveyors will be enclosed in Perspex casing

The implementation and strict adherence to these mitigation measures will ensure that the production of bio-aerosols is kept to a minimum.

Furthermore, it should be noted that bio-aerosols formed in Phase I are likely to be emitted primarily via the 17.5m high emission point where it is anticipated that adequate dispersion will occur.

10. What provisions are made for the collection and disposal/treatment of any spills from tanks into their associated bunds?

In the unlikely event of spills into their associated bunds, the following actions will be taken:

1. The source of the spill will be closed off immediately if possible and the foreman or assistant manager will be notified.
2. The liquid will be contained in the bund.
3. A waste oil tanker will be contracted immediately to pump liquid from the area and the oil will be transported off site to a licensed facility for treatment (e.g. Enva Ireland Ltd.).
4. The bund surfaces will be cleaned with detergent once the oil has been removed and this liquid will also be removed from the bund to an appropriate treatment facility.

11. No contingency has been provided in case the movement of poultry litter is restricted due to circumstances such as a disease epidemic. What substitute is proposed if the scenario were to arise?

Please see below the 'Contingency Plan' that will be implemented should the movement of poultry litter be restricted due to circumstances such as a disease.

CONTINGENCY PLAN – RESTRICTED MOVEMENT OF POULTRY MANURE

In the event of AVIAN FLU imposing restrictions on the movement of poultry manure, the following procedures would be adopted by Carbury Compost Ltd.

- The Department of Agriculture in Ireland have indicated that any poultry movement restrictions will be by area / regional. If Avian Flu is confined to an area we should be able to source enough poultry manure from other areas to be used at a reduced level.
- If Avian Flu arrives in Ireland or Northern Ireland we will introduce a hygiene regime based on Guidelines issued by the Department of Agriculture.
- A modified composting recipe would be implemented.
- The levels of inorganic nitrogen sources [urea, ammonium sulphate and ammonium nitrate] would be increased to the maximum.

- The use of other organic nitrogen sources would be incorporated, for example:- pollard, citrus pulp, sunflower, peas, corn gluten, palm kernel, corn distillers, brewers grain, linseed, soy meal, sugar beet pulp.
- The quantities of any of the above products used will depend on their availability; their nitrogen, fat mineral and energy contribution, and cost.

POTENTIAL KNOCK ON EFFECTS

- Significant increase in raw material costs
- Difficulties achieving the density of compost to give normal fill weights in growing houses.
- A failure to produce the current volumes of compost being sold per week, as lack of density impacts on our ability to achieve current tonnage levels per tunnel filled.
- As a result of the above factors, compost productivity could be down 15 – 20% on normal volumes.

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Non Technical Summary

As required by Article 12 (1) (u) of the Waste Management (licensing) Regulations, 2004 a non technical summary is provided below which contains information on the matters listed in articles 12(1)(a) to (t) of the regulations.

This section relates to Article 12(1)(a to e)

Nature of the Facility

Carbury Composting Ltd. (CCL) presently operate a Composting Facility under waste licence 124-1 on a 9.4 ha site at Drummin, Carbury Co. Kildare (Tel: 047 38200, Fax:). The site is located in a rural setting in the townland of Drummin, 2.5km south of Derrinturn, Co. Kildare (2305E, 2717N). The site is generally flat at a height of approximately 80 m above sea level and is bounded by the R403 regional road to the west and hedgerows to the north south and east. Neighbouring lands are given almost entirely too agricultural usage with cereal growing, grasslands and horse rearing predominating. Timahoe bog is located to the east of the site and the Bog of Allen to the southwest.

Carbury Compost Ltd was granted planning permission (Reg. Ref. No. 06/912) from Kildare County Council to develop the proposed facility in October 2006.

Composting has been carried out at the site since the 1960's. The existing site infrastructure comprises of composting and mushroom growing buildings, open windrow composting, materials storage in the open yard and ancillary structures such as offices, bunds, gates, fencing etc.

The company intends to modernise and expand the facility within the existing site area to increase the capacity of the facility to process 160,000 tonnes/annum of raw materials and produce some 109,000 t/a of mushroom compost. The existing facility utilises horse manure, poultry litter, gypsum, water and straw to produce compost exclusively for the mushroom growing industry.

The proposed facility will see composting operations carried out within new infrastructure at the site comprising a raw materials reception hall, new purpose built Phase I bunkers and Phase II / Phase III composting tunnel complexes which will replace the existing windrow composting processes which have been in operation since the 1960's. The proposed expansion will involve the demolition of some existing buildings to make way for the construction of a modern purpose built composting operation and necessary ancillary infrastructure.

The installation of wheel washes near the site entrances, oil storage bunds, a new 250,000 gallon water tank (tank B) for the storage of sewage effluent and floor drainage from the composting buildings and the commissioning of a new site entrance along the western (road) boundary are also proposed.

The existing site is composed of two main operations, the composting operation (on 5.03 ha) and a separate mushroom growing facility. The demolition of some of the mushroom growing buildings will reduce the capacity of the mushroom growing operation by some 45%. A portion of the compost produced on site will continue to be used by the on site mushroom growing operation.

The development site is relatively flat located in a lowlying area at a height of approximately 80m above sea level. The site is drained by a small tributary of the Cushaling River which flows in a southwesterly direction approximately 600m from the site. The Grand Canal is located about 1.2 km to the south of the site.

The average annual rainfall for the area is estimated at 711mm. The main wind direction is from the west and the south west. Average annual temperatures are approximately 10.0°C with mean daily temperatures in January and July of 6.8°C and 15.9°C.

The bedrock underlying the site at Drummin is interpreted as the Waulsortian Formation, characterised by reef or clean shelf type limestone which are commonly dolomitised. Dolomitisation in north Kildare is known to be of a lower intensity and this leads to these rocks having lower permeability and porosity than their equivalents in south Kildare such as at Athy or Newbridge.

The bedrock is overlain by soils of the Allenwood complex and Kilpatrick series generally associated with the margins of bogs or peat lands.

The aquifer status of the bedrock underlying the site has been classified by the Geological Survey of Ireland as a locally important aquifer (generally moderately productive only in local zones). It is reported that all houses/businesses within 500m of the site are connected to the public mains water supply. Groundwater flow beneath the site is likely in a northwesterly direction mirroring the surface water drainage pattern. Regional flow may tend more towards the south west mirroring the Cushaling River. The available information suggests that natural aquifer vulnerability should be assigned a rating of moderate to low given the highly variable overburden thickness and its inherent nature.

The site is drained by the Cushaling River which joins the Figile River which is a tributary of the River Barrow which enters the Irish Sea at Waterford Harbour.

Regular surface water samples were collected on the nearby stream at four locations including one upstream and one downstream of the site and indicated generally good quality water.

The site is not situated in any areas of Scenic Amenity, High Amenity or any areas of Specific Interest. It is not located in a pNHA, pSPA or pSAC and does not impinge on any designated views or aspects. The existence of the proposed facility and its proposed expansion will have a positive effect on the local environment in that it will provide an outlet for the horse manure and poultry litter that may otherwise have been landfilled as a waste or landspread. Both of these options have potential implications for the environment.

The facility design, operation and management is fully described in Section 3 of the Main Text of the EIS that accompanies this Waste Licence Application, and on Figures and Drawings that are enclosed. Any correspondence in relation to this application should be addressed to Carbury Compost Limited, Drummin, Carbury, County Kildare.

This section relates to Article 12(1)(f)

Classes of Activity

In accordance with the Third and Fourth Schedules of the Waste Management Act, 1996 (WMA, 1996) the following classes of activity will be carried out on the site:

The principal activity relates to class 2 of the Fourth Schedule of the Act: Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes) will be the principle activity to take place on site.

The following activities from the Fourth Schedule of the Act will also take place on site.

"4. Recycling or reclamation of other inorganic materials"

"11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule"

"13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this schedule, other than temporary storage, pending collection, on the premises where such waste is produced."

This section relates to Article 12(1)(g)

Quantity and Nature of the Waste to be Disposed

The expanded facility will have sufficient capacity to produce a significantly greater volume of compost. The increase in volumes of compost produced is necessary in order to provide the economies of scale required to compete in the marketplace and to provide the state of the art technologies and infrastructure that are necessary to comply with the high environmental standards required at the facility. The revamped facility will have the capacity to process the following amounts of materials (or a variation of tonnes of each material according to availability):-

- i Horse manure (EC 02 01 06) – 45,000 t/a
- ii Poultry manure (EC 02 01 06) – 36,000 t/a
- iii Straw (EC 02 01 06) – 36,000 t/a
- iv Gypsum – 5,000 t/a
- v. Water - Balance

It is planned that some 160,000 t/a of raw materials (including manure, litter, straw, gypsum and water) will be used and given an approximate reduction in weight/volume resulting from the composting process (circa 33%) this indicates that some 109,200 t/a of compost will be produced. It is estimated that approximately 6.5 % of this will be used in the adjoining mushroom growing farm and the remainder will be exported off site to the mushroom growing industry.

This section relates to Article 12(1)(h)

Raw and Ancillary Materials, Substances, Preparations used on the Site

The site is served by three phase electricity, telecommunications, public water mains, storm water drainage and foul water drainage. A Puroflo wastewater treatment system is located along the northern boundary along with a water storage tank (tank A – 400,000 gallon capacity). The Puroflo plant machinery is not intended to be used on site.

The main raw materials used on site are diesel, mains water and electricity. Minor amounts of engine oil and hydraulic oil are used in the day-to-day operation of the facility. The quantities are provided in Section 3.5 of the EIS.

This section relates to Article 12(1)(i)

Plant Operating Procedures

The proposed composting process will be as follows: raw materials are imported to the site for processing and are received, weighed and verified at the entrance. The materials are then directed to their designated storage area where they are stockpiled in dedicated bays prior to processing. The imported straw bales are dipped in a vat of water and stored for up to three days on concrete pads to allow biodegradation to commence. This wetted straw is then broken down, placed on the conveyor and blended with the poultry litter (which has already been premixed with gypsum). The material is then placed in one of a number of Phase I bunkers which undergo forced aeration for two days following which the material is taken out and horse manure is added via a hopper. Some additional poultry litter may be added at this stage. This cycle is repeated three times and takes approximately 6 to 7 days. The material is then left in the bunkers for a period of 4 -5 days. Water is added on a regular basis throughout the process. This concludes the Phase I treatment process and takes a total of some 13 days. Material from Phase I is removed and placed in the tunnels in the Phase II / Phase III tunnel complex. The material is left in these tunnels for 6 days during which time no water is added although forced aeration is used on a continuous basis. Pasteurisation of the material occurs and the material is heated to 58° to 59°C. When Phase II is complete, the material is removed, spawned with mushroom spawn and placed in Phase III tunnels for 14 to 17 days during which period forced aeration is continued and no water is added. The maximum temperature is no greater than 25°C.

All processing with the exception of the wetting of straw is carried out in doors inside the main reception hall and bunker and tunnel complexes. The air in the Phase I bunkers is re-circulated and a fraction is discharged to the atmosphere at an elevated position via the air emissions stack located along the southern wall of the Phase I building. This will reduce the potential for odour, noise and dust

from the operations. Handling of the raw materials inside a fully contained building with roof, concrete floor and concrete lower walls will eliminate the potential for leachate emission to ground or surface water bodies as rainfall will not gain access to the composting operation.

The process from reception of raw materials to Phase III sees a gradual reduction in volume, finally producing a relatively dry and odourless product. It is planned that some 2,100 tonnes of mushroom compost will be produced each week. 135 tonnes per week will be used on site in the mushroom growing operation. The remaining compost will be delivered as bulk product to satellite mushroom farms.

All raw materials apart from the straw delivered to and from the site will be transported in fully contained or covered in trucks (the horse manure trucks will be covered by a net).

The proposed hours of operation for the site are as follows:

Composting Operation

Raw materials will imported to the site

6am to 8pm Monday to Friday

6am to 1pm Saturday

None imported on Sunday

Finished compost exported from the site

5am to 10pm Monday to Friday

6am to 8pm Saturday

None exported on Sunday

Mushroom Growing Operation

Mushroom is exported from the site

6am to 8pm seven days a week (normally one load at 12am and one load at 4pm – this can vary on occasion depending on demand)

The Company will agree all processes and engineering works in advance with the EPA.

The site will be operated and monitored in accordance with conditions issued by the EPA and specified in any Waste Licence that may issue. Regular environmental monitoring will be carried out and an annual status report will be prepared and submitted to the EPA.

This section relates to Article 12(1) (j)

Information related to Section 40(4) (a) to (g) of the Act

Compliance with Emissions

Dust

There are no National or EU standards for dust deposition. By law the plant will be required to be in compliance with Air Pollution Act, 1987 and should meet the existing EPA recommendation of 350 mg/m²/day. The dust levels are recorded in Table 2.2.4 of the EIS and are well below the EPA recommendation. During the construction phase dust levels may potentially rise, however dust is not expected to pose a problem during the facilities day to day plant operations.

Odours

There are no National or EU standards for odour emissions. The site manager and staff operatives will perceive odours on an ongoing basis and a complaints register will be set up in the office. As recommended by the EPA, the majority of measures to reduce odours from the composting process as outlined in Prof. R. Nobles '*Index of measures for the Reduction of Odours from Mushroom Composting Sites in Ireland*' (2004) will be implemented. In the event of receiving complaints from neighbouring premises or residents with regard to odours, details will be taken on a complaint form and appropriate remedial action will be taken to reduce odour emissions and this action will have regard to the principles of BAT. The proposed facility includes an elevated stack to disperse odours from the reception hall and Phase1 Building. Forced aeration in the composting process and aeration of the water tank mitigate against odour impacts and comply with BAT.

Noise

There are no legal limits currently in place for noise emissions from industry. The EPA have set a day-time guideline for L_{Aeq} of 55 dB(A) and a night time level of 45 dB(A) at sensitive locations for other similar developments. Processing all composting indoors in the proposed new composting buildings will reduce noise emissions from the facility.

Water

The risk to groundwater posed by the activities at the site is considered to have low to no impact. Given the complete containment of the site with concrete and the proposed control measure and reuse of all liquids generated on site it is expected that there will be no impact on groundwater quality from the redeveloped site.

Sewage effluent from the site toilets, and effluent from the canteens and washrooms will be collected and sewerred to the septic tank located along the northern boundary of the facility. The effluent will be pumped from here to the new water storage tank (tank B) for use in the composting process.

The entire site is either concreted or roofed and therefore all rainfall and liquids generated on the site are contained and controlled by the impervious concrete slab and drained to the water storage tanks for use in the composting process

Environmental Pollution

The design and operating practices that ensures that environmental pollution is avoided are listed below.

Risk to Waters is avoided by:

- ▶ All oil fuel tanks on site will be located in contained concrete bunds with a capacity of 110% of the largest tank contained within.
- ▶ The oil bunds will be located indoors or covered with a canopy in order to prevent rainfall from gaining access to and filling the bunds.
- ▶ Oil spill kits consisting of oil absorbent mats and booms will be stored at the site to deal with small spills should they occur.
- ▶ Sewage effluent from the site toilets, and effluent from the canteens and washrooms will be collected and sewered to Tank B located along the northern boundary of the facility for re-use in the composting process. Tests will be carried out on the final compost to ensure that no human pathogens survive the process

Risk to the Atmosphere is avoided by:

Construction Phase

- ▶ Implementation of a dust minimisation plan to be agreed by all parties prior to commencement of site works
- ▶ A truck wheel wash will be installed at the entrance/exit to the construction site and all trucks exiting the site will have their wheels and undercarriage washed down to avoid leaving any soil etc. onto the public road system
- ▶ A mobile bowser/dust suppression spray will be used during dry periods to dampen vehicle route ways
- ▶ During dry periods, stockpiles of soil and hardcore will be kept moist using rotary sprinkler heads
- ▶ Public roads will be regularly inspected for cleanliness and cleaned as necessary
- ▶ Lorries/trucks will be properly covered or enclosed during transportation of friable construction materials and debris to prevent their escape along public roads
- ▶ Hoarding will be erected around the site to reduce dispersion of fugitive dust
- ▶ All plant machinery will be regularly maintained and comply with all relevant legislation relating to emissions

Operational Phase

- ▶ Odour generated from Phase I composting and the storage of chicken litter and horse manure will be vented through a 17.5m stack to aid dispersion and eliminate odour annoyance at the nearest sensitive receptors
- ▶ All Phase I odorous activities will be housed inside
- ▶ All conveyors transporting raw materials or blended raw materials will be enclosed in perspex covered conveyors to prevent the release of odour and aerosol emissions
- ▶ A diffuse aeration system will be installed in Tank B to prevent anaerobic conditions occurring
- ▶ Water from the Tank B will be used to wet the bales thus reducing potential odour production
- ▶ The new reception hall will be located at the north-east corner of the site where it is further away from sensitive receptors
- ▶ Forced aeration of the compost in the Phase I bunkers indoors will ensure anaerobic conditions do not occur and emissions are vented through one emission point
- ▶ There will be a rapid throughput of horse manure and chicken litter in the storage areas to prevent anaerobic conditions occurring
- ▶ To control aerosol emissions, the handling, mixing, blending and delivery of raw materials will be carried out either with in enclosed conditions or within their designated areas.
- ▶ Emissions from the existing boiler (A1-1) are governed by the existing Waste Licence emission limit values (ELVs). In accordance with this licence, periodic monitoring is undertaken to verify compliance with ELVs
- ▶ Implementation of a regular and documented maintenance and inspection programme for all plant equipment and storage tanks
- ▶ Implementation of regular patrols to detect fugitive dust and odour emissions and regular maintenance of plant machinery

Risk to Land, Soil, Plants or Animals is avoided by:

- ▶ It is submitted that while the proposed development entails almost doubling the volume of compost produced at the site, that the proposed upgrading of the facilities to include the handling of all materials indoors (inside the reception hall and new bunkers and tunnels etc.) will ensure a lower potential for impact on the local ecological environment than existed heretofore.

Nuisance through Noise or Litter is avoided by:

- ▶ All materials for compost will be handled in a contained building and all vehicles carrying these wastes are and will continue to be covered (with the expectation of straw and horse manure).
- ▶ Daily boundary patrols are, and will be, carried out at the site.

- ▶ Machinery and plant on site will be modern and serviced on a regular basis. Any plant not in use will be switched off or throttled back to idle speed.

Adverse effects on the country side or places of interest are avoided by:

The location of the site is located in an agricultural area and is surrounded by greenfields. Operating the site with adequate environmental controls will ensure no impact on the surrounding environment.

Best Available Technology Not Entailing Excessive Cost

The principle of employing BAT is being applied at the Carbury Compost Ltd. facility in respect to emissions as follows.

Carbury Compost Ltd. has, and will, employ modern management practices and continue to commit financial resources in order to control all nuisance emissions and ensure protection of the environment. The existing management practices include ensuring that all plant and equipment are fully serviced and operational, transporting compost within covered vehicles, regularly cleaning site surfaces and regularly patrolling the boundaries and the reuse of all effluent generated on site

The existing and proposed new equipment on site e.g. weighbridge, emissions stack and forced aeration system are examples of the best available technology for such facilities.

Specialist consultants have and will be retained as required to monitor potential nuisances and all relevant environmental media set out by the EPA. The consultants will inform the company on a regular basis of improvements in pollution abatement or other relevant technology. The costs of the facility and adhering to the modern management practices will be financed from Carbury Compost Ltd. annual revenues or short term bank loans.

Fit and Proper Person

The applicants are fit and proper persons to hold and operate a waste licence. As stated in Section L.2 of the Waste Licence Application Attachment no employee of CCL has been convicted of an offence under the Waste Management Act 1996 or other prescribed acts under this section.

The management team at CCL have been operating a compost facility for many years and have abundant experience in this area. The Compost and Environmental Manager will be responsible for environmental aspects of the operation and compliance with the waste licence.

Financial Provision

Financial commitments may be required to cover decommissioning, aftercare management and environmental pollution. The Company's sound financial position and its ability to cover the cost of

environmental issues at the site are outlined in Section L.2 of the Waste Licence Application Attachments.

Energy Usage

Energy will be used efficiently at the facility. Once the new facility is up and running, energy usage will be verified during the stages of development when detailed records become available.

Noise Emissions

Noise emissions from the facility will comply with all noise regulations under section 106 of the Act of 1992.

This section relates to Article 12(1)(k)

Emissions

The potential emissions from the facility are divided into emissions to air, groundwater, surface water and noise emissions.

Emissions to Air

See Section 3.6.1 and 3.6.2 of the EIS

Emissions to Groundwater

See Section 3.6.9 of the EIS

Emissions to Surface Water

See Section 3.6.10 of the EIS

Noise Emissions

See Section 3.6.11 of the EIS

This section relates to Article 12(1)(l)

Assessment of the Effects of Emissions on the Environment

The location and the design of the facility along with the specified processes, procedures and mitigation measures will preclude the generation or impact from any potential nuisances such as aerosols, birds, dust, litter, odours, vermin or traffic.

There will be some emissions associated with the operation of the facility as detailed in the main body of the EIS. These will include in the main odour, noise and dust. Recommendations which are made by Prof R. Noble in his 'Index of Measures for the Reduction of Odours from Mushroom Compositing

site in Ireland' (2004) have been taken into consideration to help reduce the amount of odours from the facility. The facility has been designed and the operation will be such that the volume and duration of these emissions along with the proposed mitigation measures will not allow for any significant impact on the local environment.

It is proposed to continue to carry out environmental monitoring at the facility in line with the requirements of the waste licence governed by the EPA and any additional requirements the Local Authority may have in relation to monitoring.

This section relates to Article 12(1)(m)

Monitoring and Sampling Points

It is anticipated that a new monitoring programme under a new Waste Licence will be similar to the present monitoring programme under the current Waste Licence 124-01.

This section relates to Article 12(1) (n)

Site Generated Wastes

Wastes generated by the activity itself will be minimal. The company will prevent the generation of wastes on site by ordering materials in bulk for the facility and offer a recycling programme within the canteen for waste generated by employees. The facility itself will reuse many of the materials on site within the composting process,

This section relates to Article 12(1) (o)

Off-site Treatment or Disposal of Wastes

There will be no off site disposal or treatment of waste, bar municipal canteen waste which is collected on a weekly basis by Advanced Environmental Solutions Ireland Ltd (Waste collection Permit Review Register Number WCP/KE/51C/05B) or O'Hagan Waste Disposal (Waste collection Permit Review Register Number WCP/KE/080C/05C) and disposed of at a licensed facility.

This section relates to Article 12(1)(p)

Emergency Procedures to prevent Unexpected Emissions

Measures outlining procedures to be taken in the event of emergencies are outlined in Section 3.9 *Contingency Planning* of the EIS.

This section relates to article 12(I)(q)

Closure, Restoration and Aftercare of the Site

As the lifespan of the facility is open ended a decommissioning plan has not been specified. It is considered that the site and basic infrastructure will be sold on when closed. All other plant, equipment, machinery and infrastructure will either be sold or dismantled and recycled. All raw materials and compost will be removed off site and the entire property will be swept and cleaned to an acceptable standard. A post closure monitoring programme will be put in place in order to monitor the decommissioning process and the environment after the facility has closed.

This section relates to article 12(I)(r)

In the case of an application for the Landfilling of waste

This application does not relate to the landfilling of waste

This section relates to article 12(I)(s)

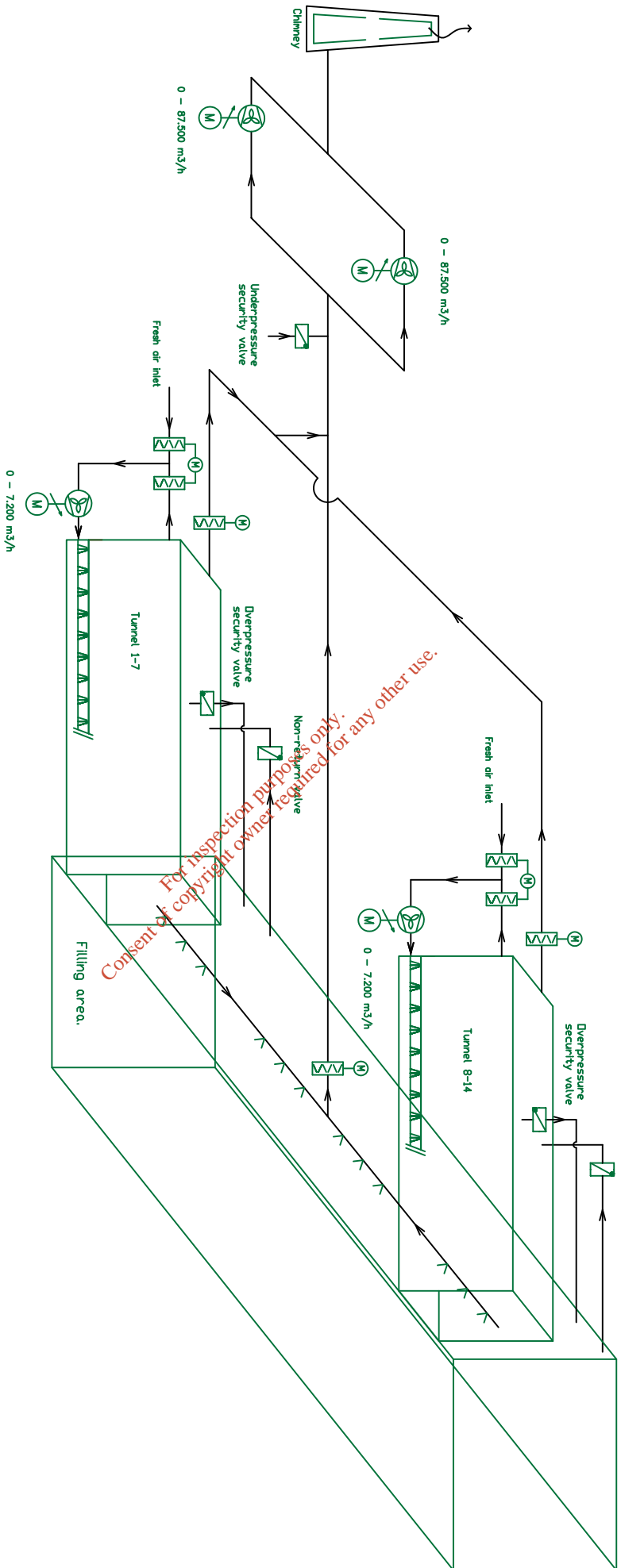
Control of Major Accident Hazards Involving Dangerous Substances Regulations

The European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2000 (S.I. No. 476 of 2000) do not apply to this activity.

This section relates to article 12(I)(t)

Activities giving rise to an emission to an aquifer of List I or List II substances

The activity will not give rise to the emission of any contaminants including List I and List II substances to an aquifer.



LEGEND

- Motor controlled air damper
- Radial fan controlled by frequency drivers
- Non return valve
- overpressure valve
- adjusted with air inlet

Client: Moneghen Mushroomrooms		Scale: -	
Project: 14 fase 1 bunkers		Size: A3	
Subject: P&I air treatment system		Drawing Nr.: 001	
Drawn by:	Date: 15-01-07	Name: R.V	Checked by: -

LEWEMEN
 CONSTRUCTIEBEDRIJF
 Van Haemsterdijkweg 18
 5828 LL Venlo
 The Netherlands
 Phone: 0031 (0)77 3987777
 Fax: 0031 (0)77 3987796
 E-mail: info@lewemen.nl

Appendix A – Photo's
Aeration Nodes



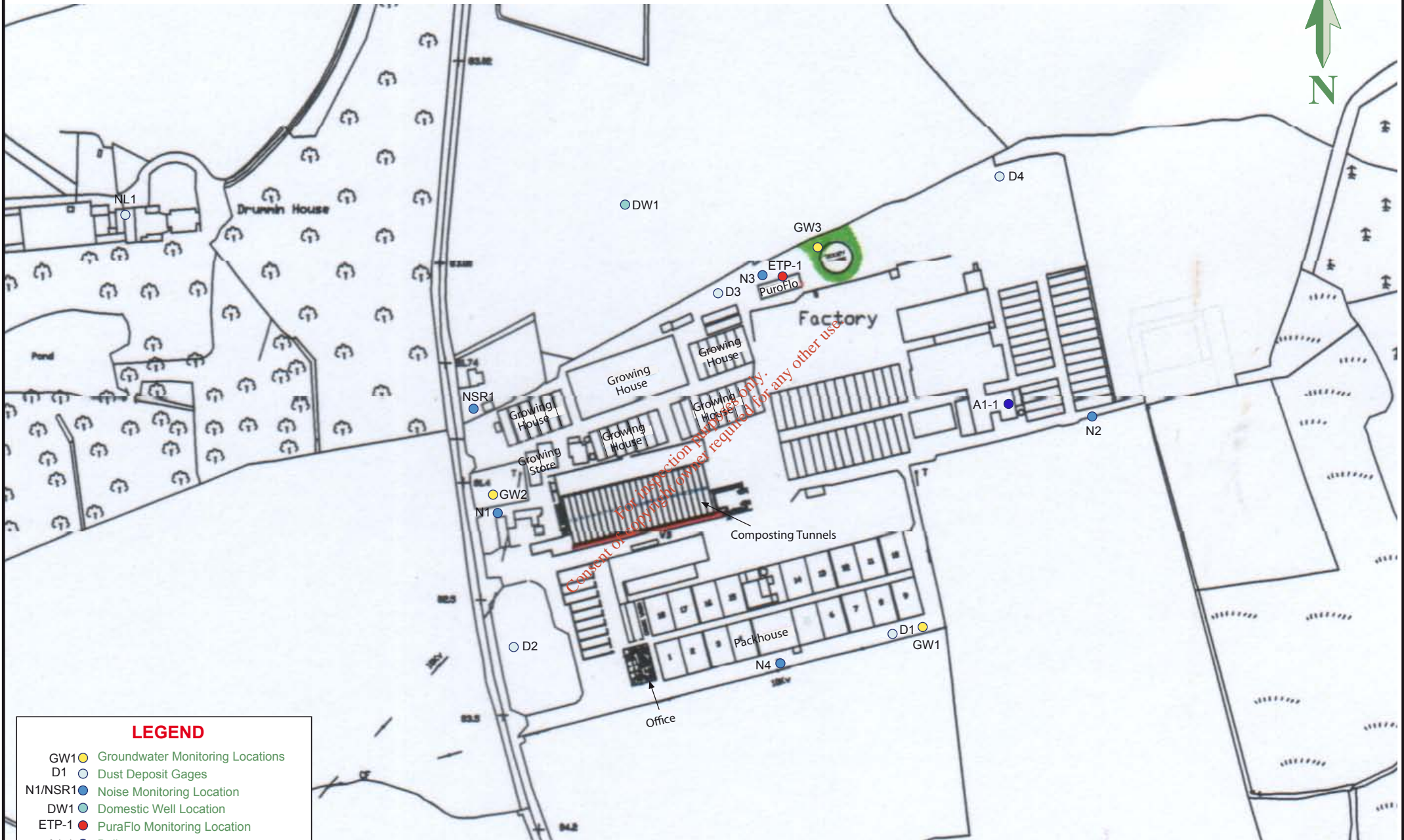
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Floor piping with aeration nodes



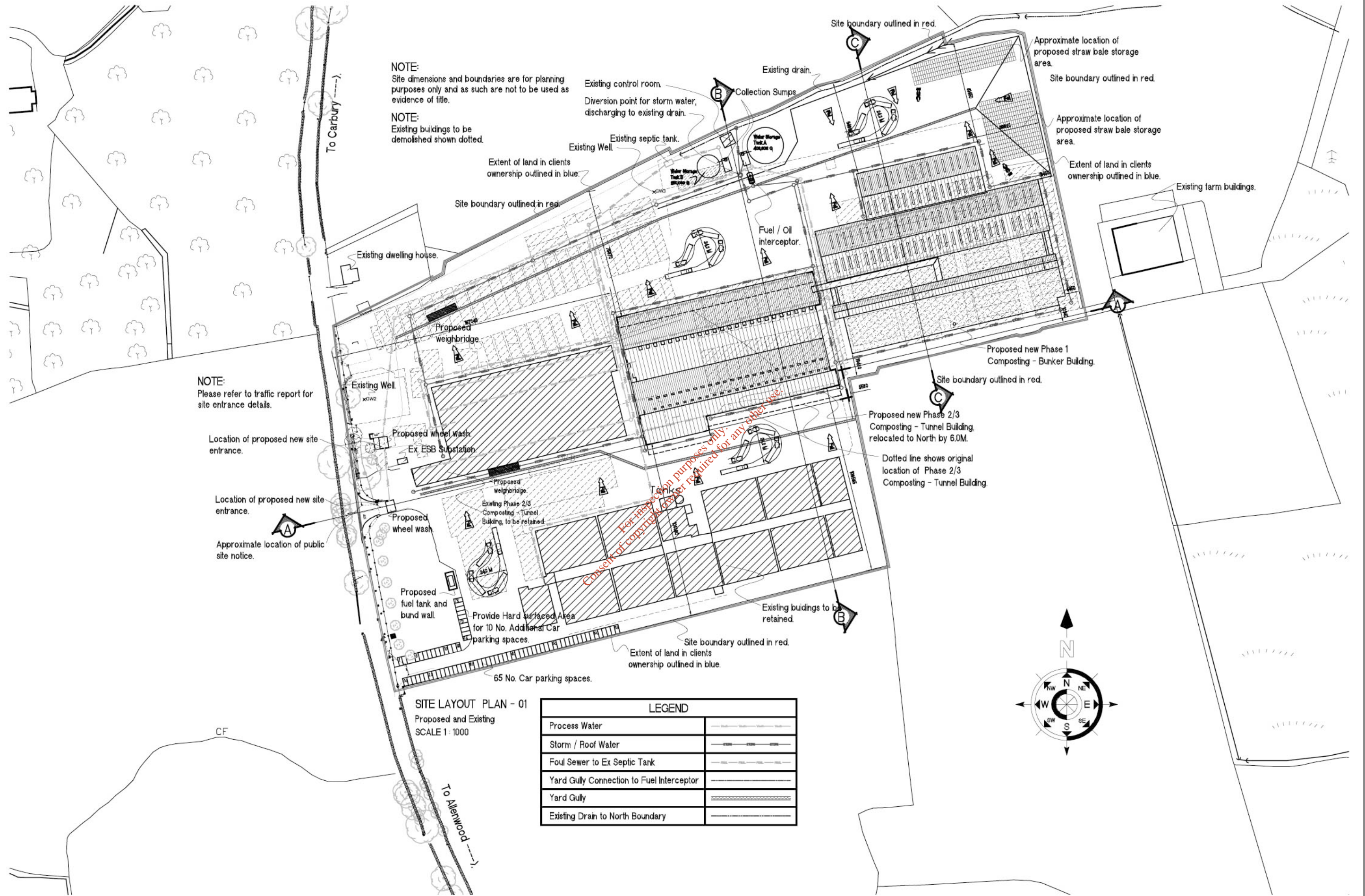
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LEGEND	
GW1	Groundwater Monitoring Locations
D1	Dust Deposit Gages
N1/NSR1	Noise Monitoring Location
DW1	Domestic Well Location
ETP-1	PuraFlo Monitoring Location
A1-1	Boiler

Carbury Composting Ltd. Monitoring Location			
Figure No. 2.2.1	Job No. C003393	Date. May 2006	
Finalised By - DMcD			

SCALE: 1:3400 approx.
 NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.



NOTE:
Site dimensions and boundaries are for planning purposes only and as such are not to be used as evidence of title.

NOTE:
Existing buildings to be demolished shown dotted.

NOTE:
Please refer to traffic report for site entrance details.

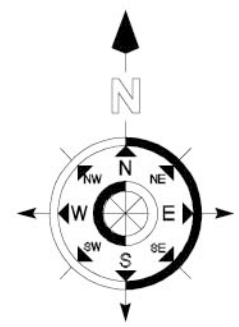
Location of proposed new site entrance.

Location of proposed new site entrance.

Approximate location of public site notice.

SITE LAYOUT PLAN - 01
Proposed and Existing
SCALE 1:1000

LEGEND	
Process Water	-----
Storm / Roof Water	-----
Foul Sewer to Ex Septic Tank	-----
Yard Gully Connection to Fuel Interceptor	-----
Yard Gully	-----
Existing Drain to North Boundary	-----



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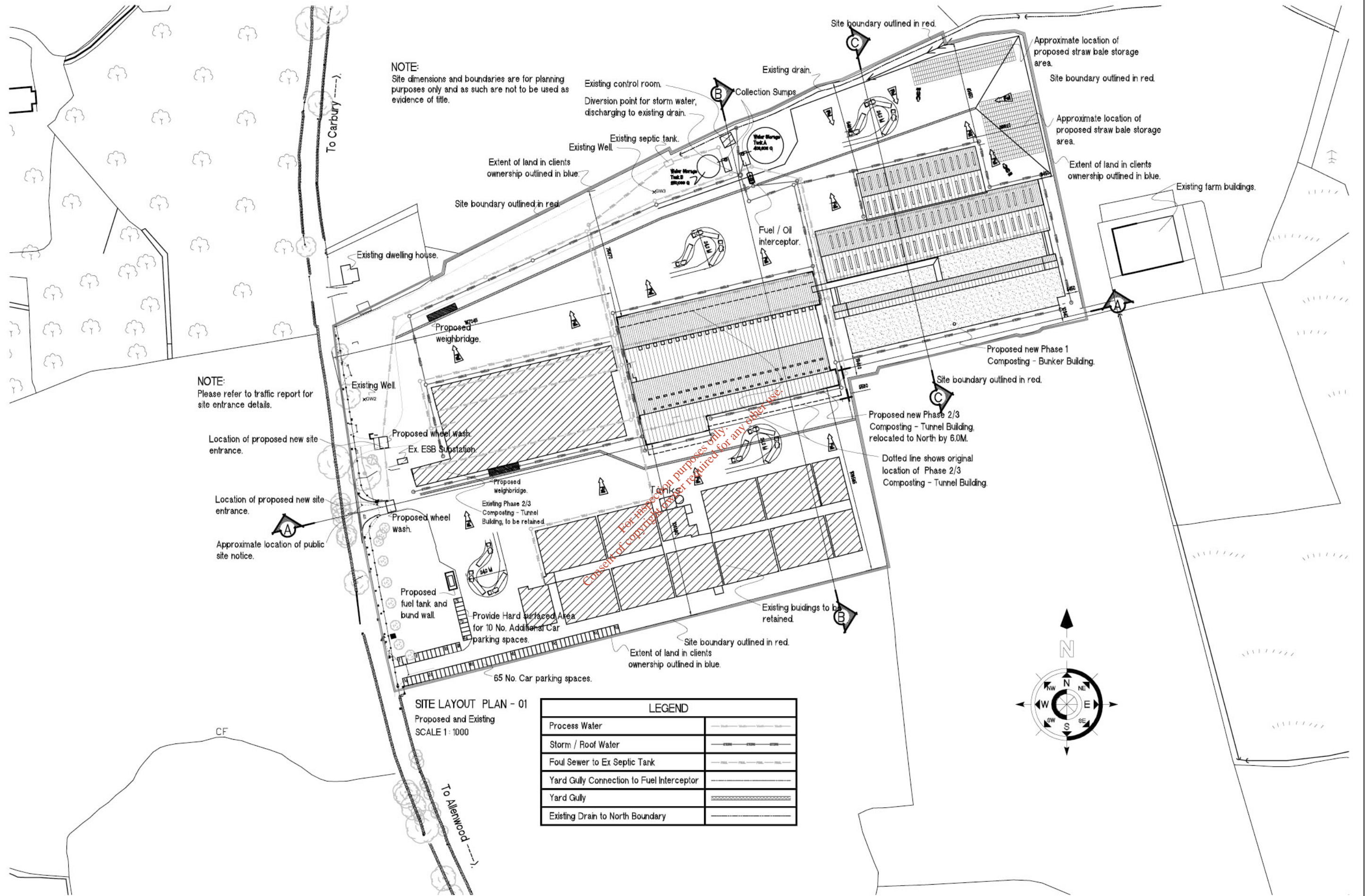
Revisions:
A - 18-01-08. Turning circles for articulated trucks shown, expanding increased to 65 No. spaces. Section line shown. BT
B - 08-02-08. Additional parking area. 10 No. spaces, added to paved area to South West of site. Unidentified information BT
C - 25-02-08. Proposed new Phase 2/3 Composting - Tunnel Building, moved 6M to north to the 6M existing tunnel location. Unidentified information BT

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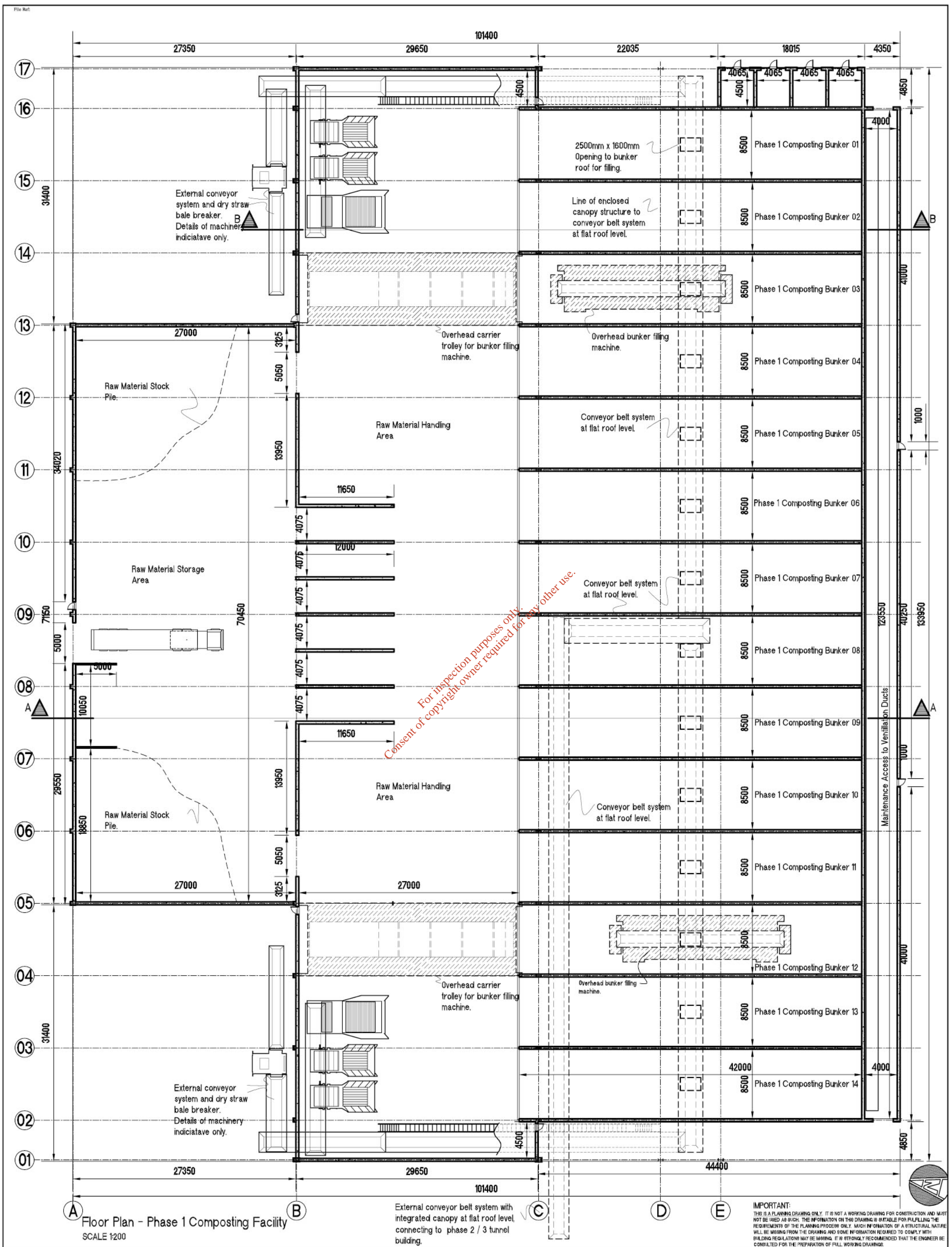
Scale: 1:1000
Date: 05-05-2006
Designed by: CARBURY COMPOST Ltd.
Drawn by: B. THORNTON

Job Title: PROPOSED NEW PHASE 1, 2 + 3 COMPOSTING FACILITY
CARBURY COMPOST Ltd.
DRUMMIN Td., KILDARE.
Dwg. No: 3154CPL-06-102
Site Layout Plan 01
Rev. No: C

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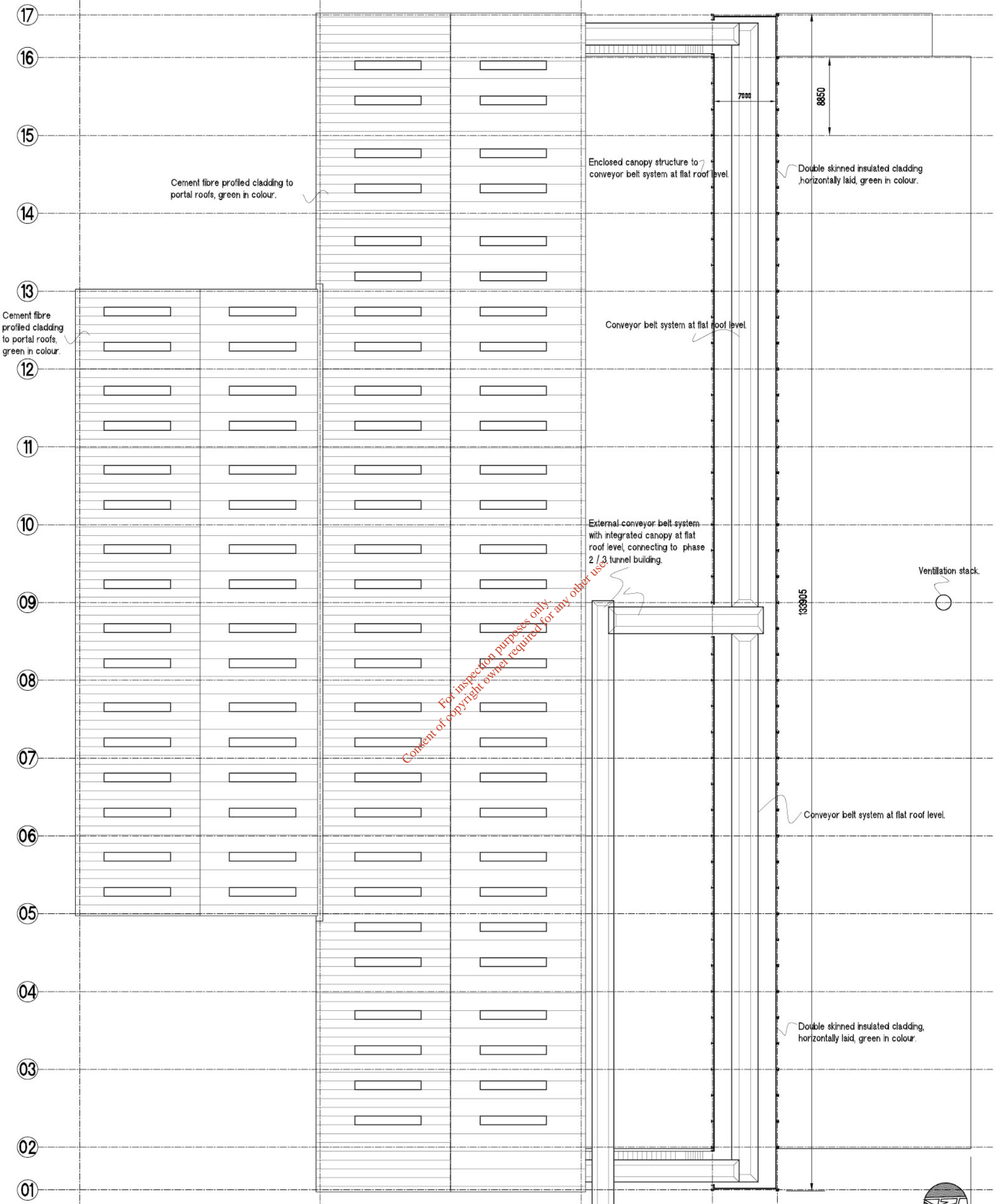
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Floor Plan - Phase 1 Composting Facility
SCALE 1:200

External conveyor belt system with integrated canopy at flat roof level, connecting to phase 2 / 3 tunnel building.

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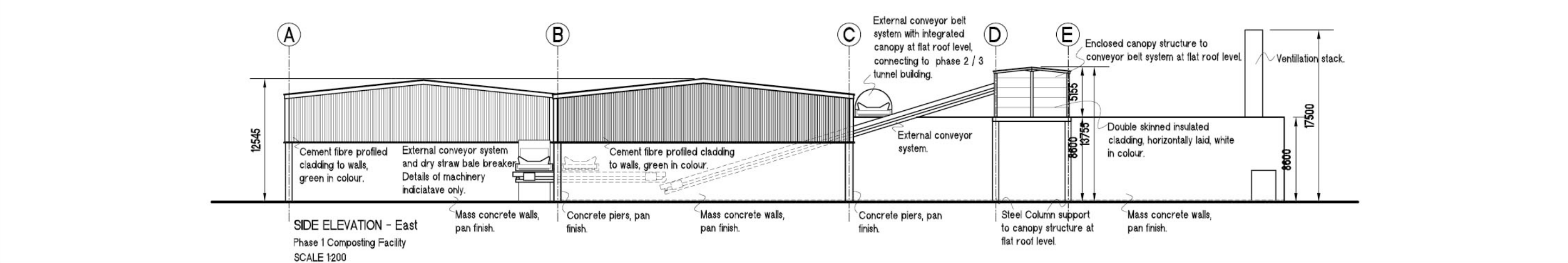
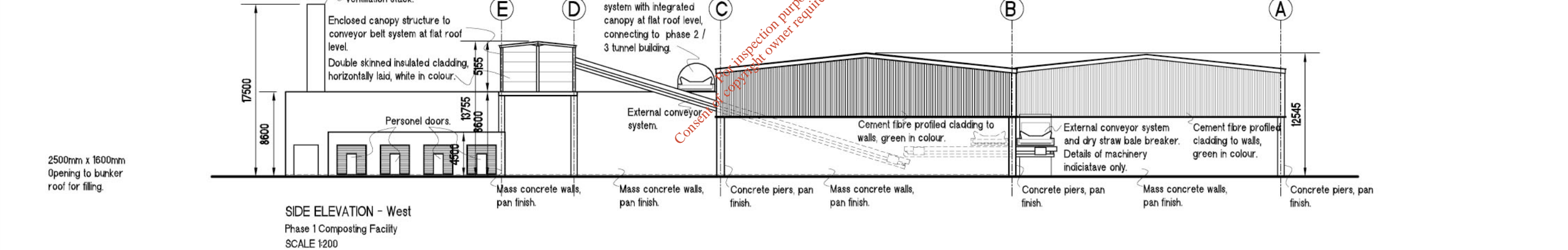
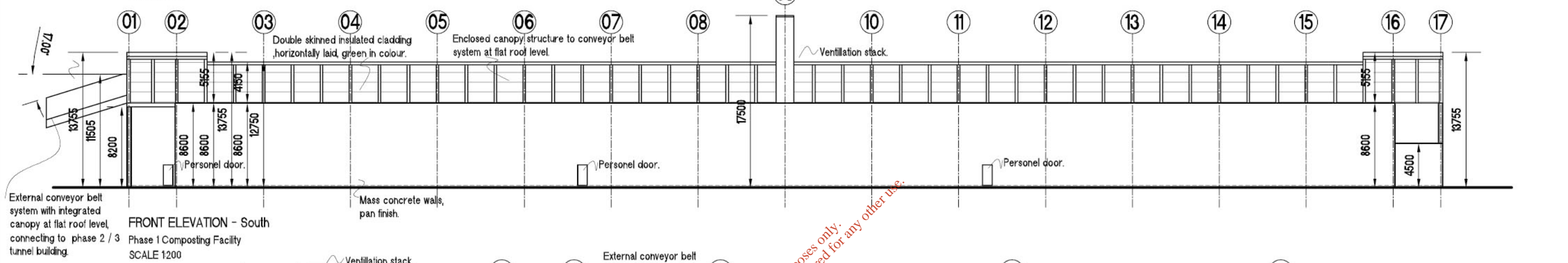
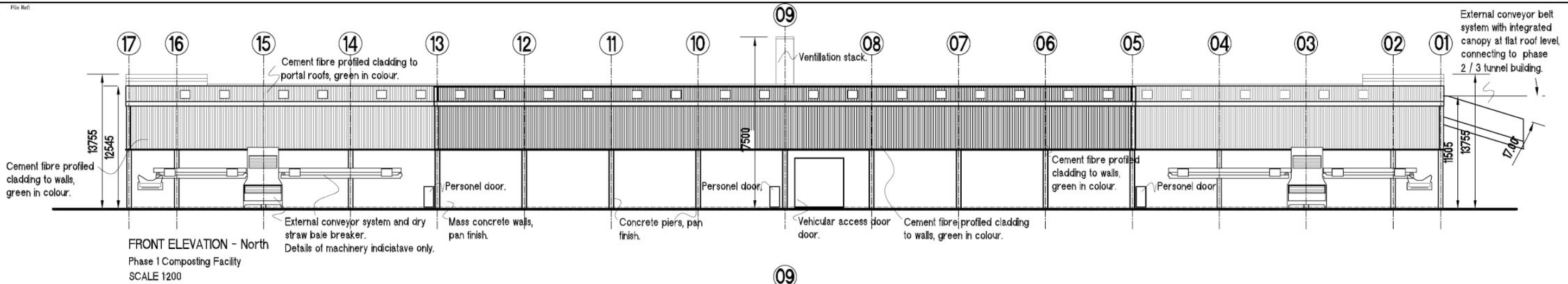


A Roof Plan - Phase 1 Composting Facility
SCALE 1:200

C External conveyor belt system with integrated canopy at flat roof level, connecting to phase 2 / 3 tunnel building.

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				<small>Rev. No.:</small> A	



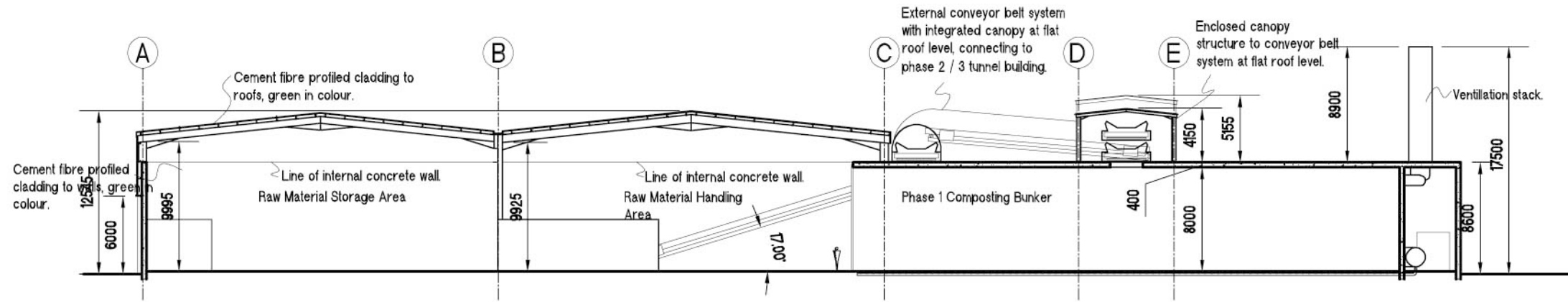
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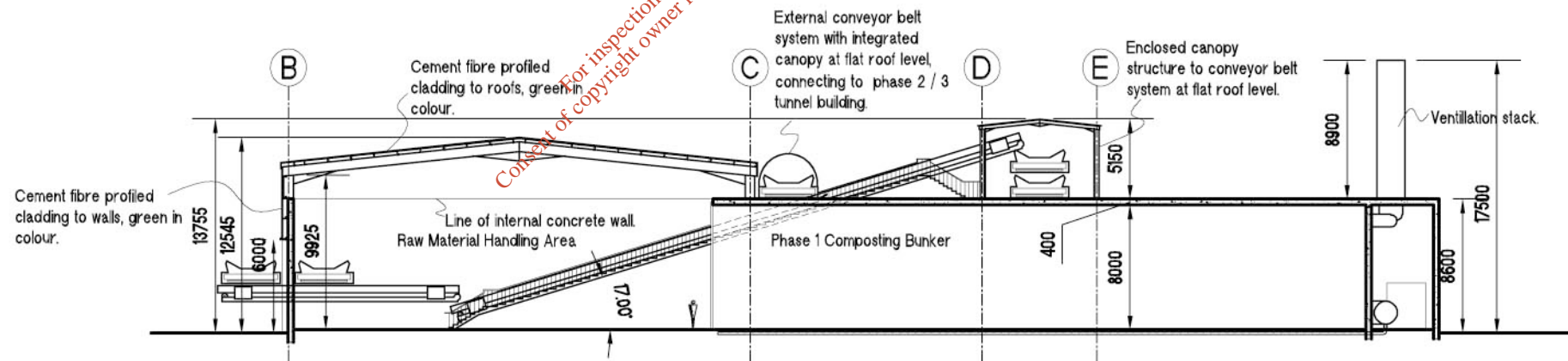
Revisions:
A - 25-09-08, High level eaving omitted, cladding colour revised to green as requested by Kildare Co. Council in clarification of further information. Section of conveyor canopy structure reduced in height. B1

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SECTION A-A
Phase 1 Composting Facility
SCALE 1:200



SECTION B-B
Phase 1 Composting Facility
SCALE 1:200

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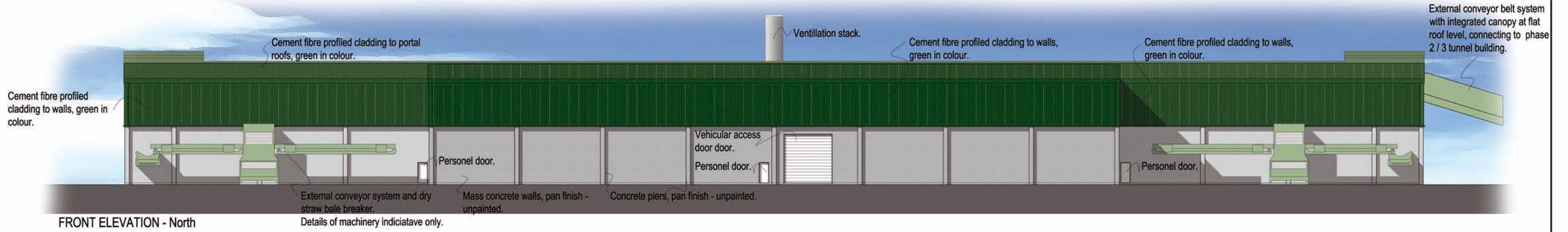
Revisions:
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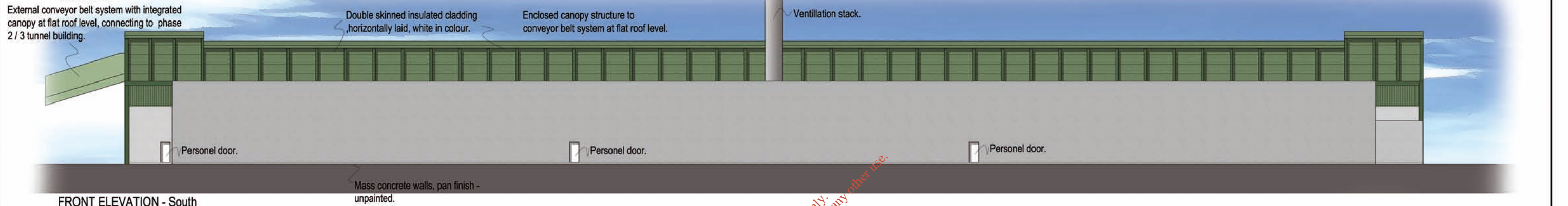
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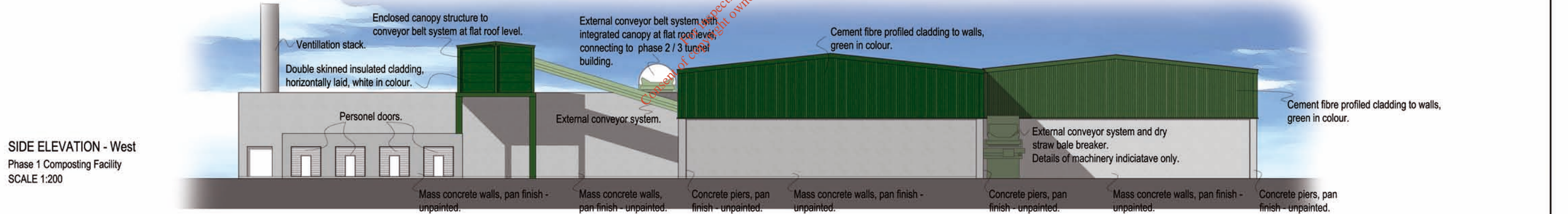
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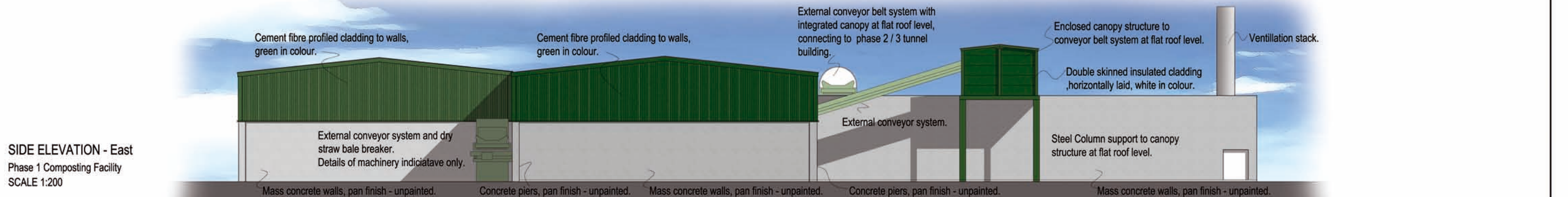
FRONT ELEVATION - North
Phase 1 Composting Facility
SCALE 1:200



FRONT ELEVATION - South
Phase 1 Composting Facility
SCALE 1:200



SIDE ELEVATION - West
Phase 1 Composting Facility
SCALE 1:200



SIDE ELEVATION - East
Phase 1 Composting Facility
SCALE 1:200

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Revisions:
A-25-09-18: High level glazing omitted, cladding colour revised to green as requested by Kildare Co. Council in clarification of further information. Section of conveyor canopy structure reduced in height. BT

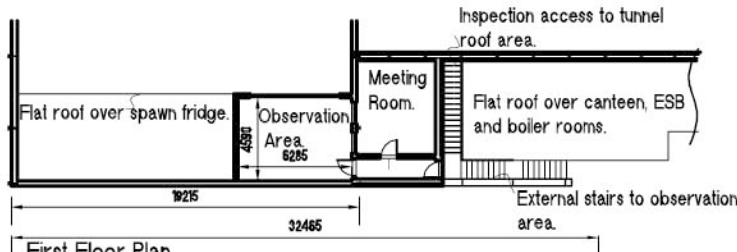
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Dwg. No.:	3154CPL-06-205
Rev. No.:	A

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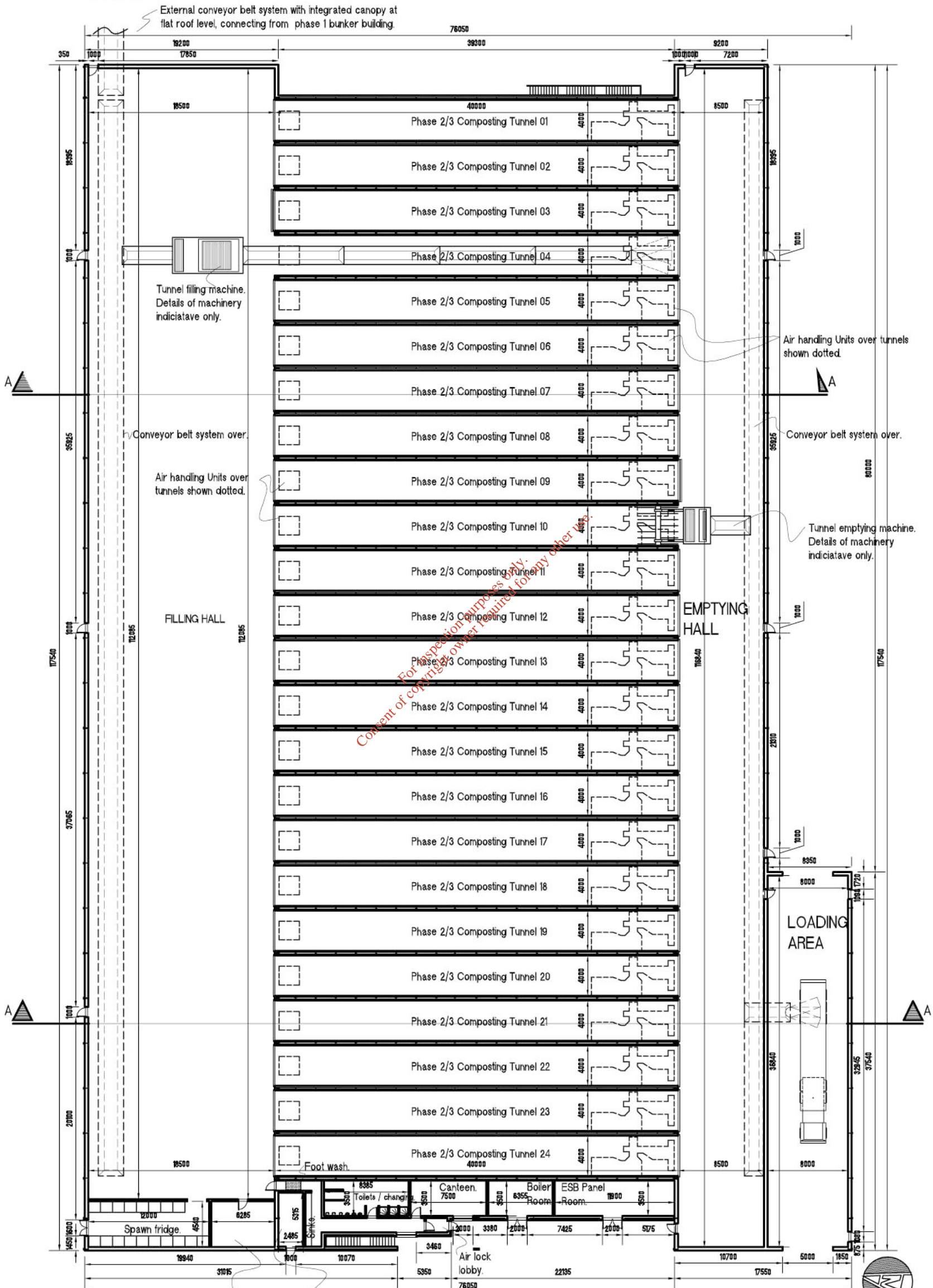
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First Floor Plan
Phase 2/3 Composting Facility
SCALE 1:200

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Ground Floor Plan
Phase 2/3 Composting Facility
SCALE 1:200

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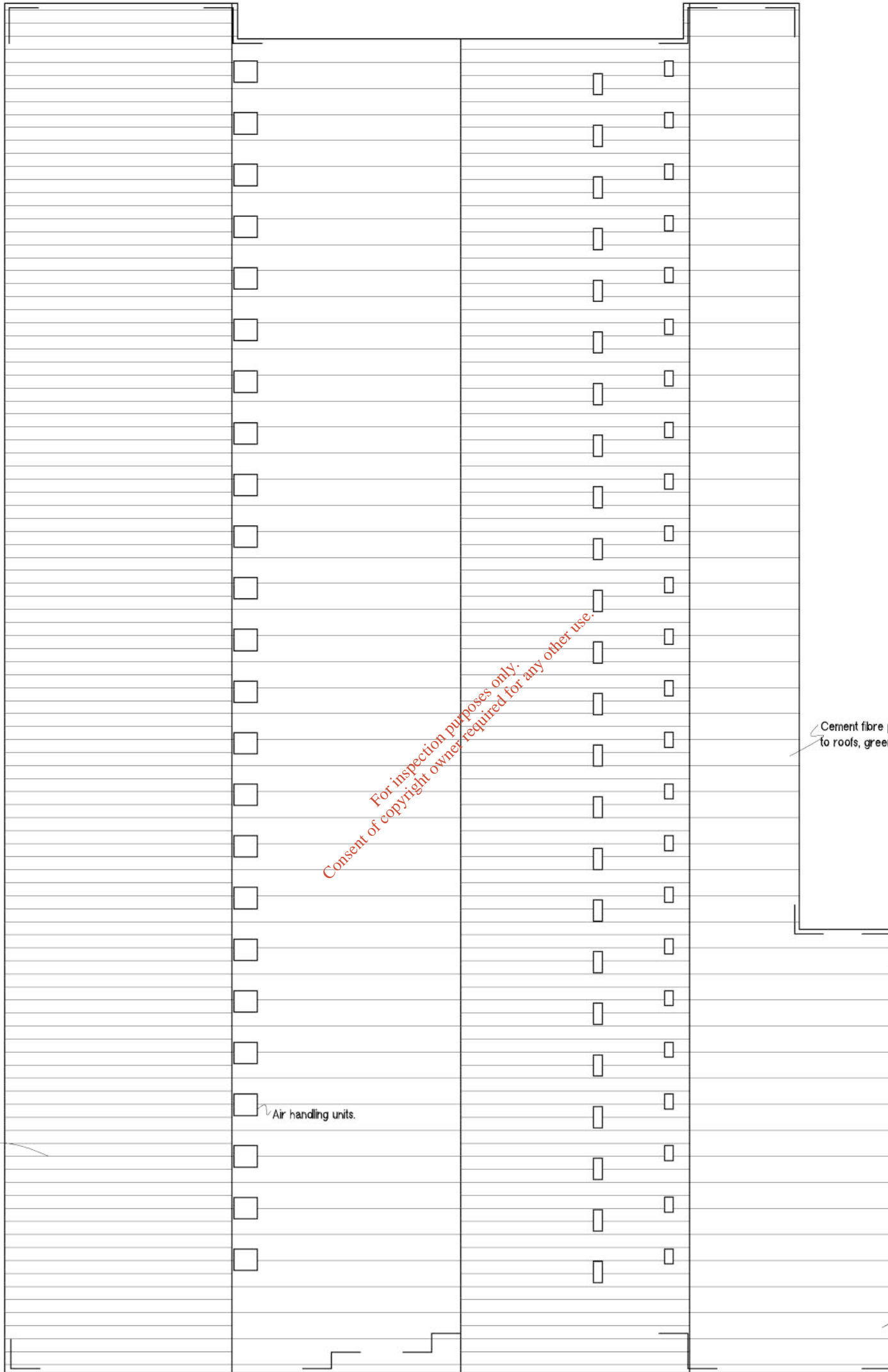
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Tunnel Building - Floor Plan

Rev. No. A

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Cement fibre profiled cladding to roofs, green in colour.

Air handling units.

Cement fibre profiled cladding to roofs, green in colour.

Cement fibre profiled cladding to roofs, green in colour.

Roof Plan
Phase 2/3 Composting Facility
SCALE 1:200



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DRUMMIN Td, KILDARE.	
Dwg. No. 3154CPL-06-002	Rev. No. A
Tunnel Building - Roof Plan	

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