Attachment D.1(a) – Site Security

The site has security fencing and gates that will be maintained in good order. The fence at the front of the site is chain-link, with palisade fencing around the rest of the site boundaries.

Heavy hard wearing metal gates are in place at entrance and exit to the site. These are securely locked and only limited access to keys afforded to key members of staff.

By end of year these will be upgraded to automatic opening gates with security code/fob input required for entry to the site.

The entrance gates and fencing can be seen on Photos D.1.1 and D.1.2 below.

Photo D.1.1 – Southernmost Entrance Gate

Photo D.1.2 – Northernmost Entrance Gate

There is a fully functioning CCTV system on site. Cameras are placed at all key areas of the site operations and main entrance/exit points of the site. These can be remote accessed. Activity is recorded and playback functions available.

Alarm System - In conjunction with the CCTV system there will also be a 24 hr remote alarm system installed on site prior to commencement of full operation of the site.

Attachment D.1(b) – Designs for Site Roads

The site roads are constructed of concrete and tarmacadam and are in good repair. The site roads were constructed during site development works in the 2004 to 2008 period. These roads served the site well during its previous use as a licensed MRF / Waste Transfer Station.

Attachment D.1(c) – Designs Hard Standing Areas

Hardstanding areas are comprised of concrete and tarmacadam. Drainage is generally to the surface water drainage system, but areas that have the potential to be soiled drain to the foul sewerage system. Full details of the drainage system are provided in Attachment D.1(k)

Drawing WL06 shows the current building layout, the extent of existing concrete and tarmacadam surfaces and traffic management at the site.

Drawing WL07 shows the planned layout of buildings, yards and traffic management at the site.

Attachment D.1(d) – Plant

The following plant and equipment will be used at the facility:

Plant & Equipment	Function	Throughput Capability
Liebherr Grab	Transfer MDR from stockpile into processing plant bunker	40 tonne per hour
Metering Bunker	Regulate feed rate of MDR into the sorting plant	40 tonne per hour
OCC Screen	To remove large flat fractions from the MDR mix	25 tonne per hour separation
OCC Optical Sort	To remove OCC from the large flat fraction separated	10 tonne per hour (5 tonne per hour per meter belt width)
2 deck Ballistic Separator	Separate incoming MDR into 2 dimensional, 3 dimensional and fines fractions	40 tonne per hour. Efficiency reduced at throughputs above separation capacity.
2 Dimension Oversize Optical Separator – Plastic Separation	Separate plastic film from mainly paper 2-D oversize fraction	10 tonne per hour (5 tonne per hour per meter belt width)
2 Dimension Midsize Optical Separator	Separate paper from mainly 2-D midsize fraction	10 tonne per hour (5 tonne per hour per meter belt width)
3 Dimension Line Optical Separator - Bottles	To separate PET and HDPE bottles from the 3-D stream	10 tonne per hour (5 tonne per hour per meter belt width)
3-Dimension Line Optical Separator – Paper Recovery	To recover paper from the 3-D stream	10 tonne per hour (5 tonne per hour per meter belt width)
Fine Fraction Line Optical Separator – Paper Recovery	To recover paper from the 3-D stream	10 tonne per hour (5 tonne per hour per meter belt width)
Plastic Film Optical Separator	To remove clear plastic film from the plastics stream removed from the 2-D stream	10 tonne per hour (5 tonne per hour per meter belt width)

INDUSTRIAL UNIT ON ADJACENT SITE

EXISTING POWER WASH HOUSING

FFL: :42.72

EXISTING WEIGH-OUT BRIDGE

EXISTING GATES

EXIT

CONCRETE SURFACE

BUILDING 1

BUILDING 2

EXISTING MATERIALS RECYCLING FACILITY

RIDGE 54.43

EAVES 38.56

+42.42

+42.38

+42.34

CONCRETE YARD

AREA TO BE DEMOLISHED

FFL: :42.27

EXISTING WEIGH-IN BRIDGE

FFL: :42.40

EXISTING ESB SUB-STATION

GRASS AREA

FORGE HILL (PUBLIC ROAD)

TARMAC SURFACE

EXISTING GATES

ENTRANCE

FFL: :42.19

EXISTING ADMINISTRATION BUILDING

+42.05

GRASS AREA

CONCRETE YARD

BUSINESS PARK ON ADJACENT SITE

N

TRAFFIC FLOW LEGEND

SITE ENTRANCE

SITE EXIT

DIRECTION OF TRAFFIC FLOW

SITE BOUNDARY IN RED

PROPOSED EXTENSION IN GREEN

EXISTING SITE LAYOUT PLAN - TRAFFIC MANAGEMENT

SCALE 1:500

Notes:

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Project:
PROPOSED EXTENSIONS TO MATERIALS RECYCLING FACILTY AT FORGE HILL, CO. CORK

Client:
FORGE HILL RECYCLING LTD

Drawing Title:
EXISTING SITE LAYOUT PLAN TRAFFIC MANAGEMENT

Scale:	Date:	Revision
1:500 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL06	

INDUSTRIAL UNIT ON ADJACENT SITE

EXISTING POWER WASH HOUSING

FFL: :42.72

+42.42

RWE 5413

+42.38

EMO 6125

CONCRETE YARD

+42.34

EXISTING MATERIALS RECYCLING FACILITY

BUILDING 2

BUILDING 1

LOADING BAY RAMP

EXISTING WEIGH-OUT BRIDGE

EXISTING GATES

EXIT

1:20 RAMP

CONCRETE SURFACE

PROPOSED BUILDING 3

AREA TO BE DEMOLISHED

FFL: :42.27

FALL

EXISTING ESB SUB-STATION

FFL: :42.46

GRASS AREA

FORGE HILL (PUBLIC ROAD)

EXISTING WEIGH-IN BRIDGE

CONCRETE YARD

TARMAC SURFACE

EXISTING ADMINISTRATION BUILDING

FFL: :42.19

+42.05

EXISTING GATES

ENTRANCE

GRASS AREA

BUSINESS PARK ON ADJACENT SITE

N

TRAFFIC FLOW LEGEND

SITE ENTRANCE

SITE EXIT

DIRECTION OF TRAFFIC FLOW

SITE BOUNDARY IN RED

PROPOSED EXTENSION IN GREEN

PROPOSED SITE LAYOUT PLAN - TRAFFIC MANAGEMENT

SCALE 1:500

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Drawing Title:
PROPOSED SITE LAYOUT PLAN TRAFFIC MANAGEMENT

Scale:	Date:	Revision
1:500 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL07	

Eddy Current Separator	Positive separation of non-ferrous metal material from 3-D stream	Not applicable. Efficiency reduced at target material throughputs above separation capacity
Over-band Magnet	Positive separation of ferrous metals from 3-D stream	Not applicable. Magnet does not restrict or limit line throughput.
2 no. Twin Ram Automatic Balers	Baling of segregated fractions	2 by 30 tonne per hour
2 no. Forklift Units	Removal of baled product from baling stations	Not applicable
1 Teleporter	Moving of material to baler	Not applicable

Attachment D.1(e) – Wheelwash

There is an existing wheelwash provided close to the northern boundary of the site as shown on Drawing WL06 and in Photo D.1.3 below. The previous operation of the site included handling C&D waste in the yard areas, so the wheelwash was necessary for wheel cleaning prior to vehicles exiting the site.

Photo D.1.3 – Existing Wheelwash

As the only waste materials handled at the site will be dry recyclables, the yard areas and the floors of the buildings are expected to be relatively clean. The wheelwash is not considered necessary in consideration of the materials that will be handled, so it will be decommissioned when the new extension building is constructed. The applicant requests that the Agency does not include a condition in the waste licence that requires a wheelwash at the site.

There is also a washing area at the back of the site for trucks and bins. This has an associated pump-house and concrete apron that drains to foul sewer. This wash area is available for use, but is not expected to be used regularly as the site will be handling dry recyclables, which by their nature are clean materials.

Attachment D.1(f) – Laboratory Facilities

There are no plans to provide laboratory facilities at the site as analysis of water and dust samples will be carried out off-site. However, the sewer line contains automatic monitoring equipment for measuring pH and flow of the trade effluent. The data produced by this equipment will be recorded and stored in the site office.

Photo D.1.4 – Monitoring Equipment on the Sewer Line

Attachment D.1(g) – Design and Location of Fuel Storage Areas

Road vehicles will not be refuelled or serviced on site so there will be no diesel tank.

Mobile plant on site will be fuelled by fuel delivery vehicles and will be serviced, as necessary. Fuel deliveries and servicing will take place in areas of the site where any spillage can be easily cleaned and contained. Emergency procedures will be put in place to address any spillages during re-fuelling or servicing and these procedures will ensure that any fuel spills do not result in surface water or groundwater contamination. The foul sewer and stormwater drainage systems are both designed in a way that can prevent contaminated water leaving the site.

Attachment D.1(h) – Waste Quarantine Area

A dedicated waste quarantine area will be established within the main site building close to the waste acceptance area. The area will be clearly labelled and will contain bunded pallets

for quarantined potentially polluting materials such as cans of paint, car batteries, gas bottles, etc.

Other rejected material is likely to include non-recyclable non-hazardous wastes and these materials will be temporarily stored in the waste quarantine area, but not on bunded pallets, as they will have little potential to cause pollution to the water environment.

Quarantined materials will be removed off site for recovery or disposal at an appropriately licensed or permitted facility as soon as practically feasible.

Attachment D.1(i) – Waste Inspection Area

A dedicated waste inspection area will be established within the main site building close to the waste acceptance area and close to the waste quarantine area. The area will be clearly labelled and will be used to inspect suspect loads or suspect items spotted within incoming loads.

Attachment D.1(j) – Traffic Control

There is a one way anti-clockwise system designed for truck movements around the site. Trucks will enter the site through the southernmost gate on Forge Hill road and stop on the incoming weighbridge, located close to the site office, prior to entering into the waste delivery or collection areas. The trucks will then proceed to delivery or collection areas and will pass through the wheelwash and the outgoing weighbridge prior to exiting the site at the northernmost gate on Forge Hill road.

Drawing WL06 shows the truck management route at the existing site and Drawing WL07 shows the truck management route after the buildings are extended.

Cars will enter the site at the southernmost gate and exit at the northernmost gate. At the existing site there are 36 (No.) parking spaces in the tarmacadam area at the front of the site. The building extension will encroach upon these spaces, so additional spaces for staff parking will be provided close to the office building at the southern boundary of the site. These cars will use the one-way anti-clockwise system to exit at the northernmost gate. The wheelwash is shallow enough for cars to drive through slowly.

Attachment D.1(k) – Sewerage and Surface Water Drainage Infrastructure

Foul Sewer Drainage

Drawing WL08 shows the foul sewer drainage system at the site and Drawing WL09 shows the proposed layout after the extension is constructed. The existing connection from inside the waste processing building will be blocked to facilitate the retention of fire-fighting water in conjunction with the construction of higher ramps at the doors of the building.

Trade effluent from the following areas is directed to foul sewer as Trade Effluent:

- The apron around the eastern door of the waste processing building at the back of the site
- The truck washing area at the back of the site
- The area around the wheelwash

- The area around the exit weighbridge

The trade effluent passes through a Class 1 Full Retention Hydrocarbon Interceptor and a monitoring station prior to discharge from the site to the Carrigrennan Waste Water Treatment Plant in Little Island. The interceptor was emptied by Munster Drain and serviced by Kingspan Klargester in August 2015, including the fitting of a new coalescing filter (see Photo D.1.5 below). Kingspan's technical expert has declared that the interceptor is fit for purpose as detailed in the report presented in Attachment D.1(k).1.

Photo D.1.5 – New Filter on Foul Line Interceptor

The AERs submitted to the EPA between 2008 and 2011 for the Forge Hill site (W0173-01), record that the wastewater discharge was below 1 mg/l mineral oil on each of the 10 sampling occasions reported. These reported analyses also suggest that this hydrocarbon interceptor is effective and fit for purpose.

Discharge to foul sewer was limited to 60m^3/day under Waste Licence W0173-01. This was exceeded on several occasions[1], presumably during storm events, so it was considered to be too low, when applying to Irish water for a discharge licence in 2015.

The Discharge to Sewer licence issued by Irish Water in December 2015 is included in Attachment B4. The flow of trade effluent is limited to 100m^3/day, which was based on SLR's estimations of flow during a 5 year storm event. The hourly flow is limited to 30m^3/hour by the discharge licence.

The hydrocarbon interceptor on the foul sewer line is designed to manage a maximum flow of 15 litres per second. This equates to 1,296m3/day (54m3/hour), well in excess of the 5 year storm event discharge of 100 m3/day, so the interceptor will continue to function effectively during a storm event.

[1] Seven times in 2010 according to the AER submitted to the EPA.

FOUL DRAINAGE LEGEND

DRAINAGE BEFORE INTERCEPTOR

DRAINAGE AFTER INTERCEPTOR

NOTE: REFER TO ENCLOSED DOCUMENT REF 501.00271.00002 FOR DETAILED INFORMATION ON INTERCEPTORS

MONITORING LOCATIONS LEGEND

FOUL WATER MONITORING LOCATIONS FW

INDUSTRIAL UNIT ON ADJACENT SITE

EXISTING POWER WASH HOUSING

FFL: :42.72

EXISTING TRUCK & SKIP WASH WITH CHANNEL DRAIN TO MANHOLES

MH CL:42.45 IL: 41.35

CONCRETE YARD

EXISTING CHANNEL DRAIN TO MANHOLES

MH CL:42.32 IL:41.14

MH CL:42.28 IL:40.86

MH CL:42.29 IL:40.76

MH CL:42.24 IL:40.67

EXISTING GATES

SHUT OFF VALVE

EXISTING WEIGH-OUT BRIDGE

MH CL:42.05 IL:40.44

MH CL:41.96 IL:40.26

MH CL:42.14 IL:38.95

CONCRETE SURFACE

TO PUBLIC SEWER

BUILDING 1

BUILDING 2

EXISTING MATERIALS RECYCLING FACILITY

AREA TO BE DEMOLISHED

FFL: :42.27

EAVES 53.56

RIDGE 58.93

+42.42

+42.38

+42.34

+42.05

MH CL:41.86 IL:39.15

FFL: :42.48

EXISTING ESB SUB-STATION

GRASS AREA

FORGE HILL (PUBLIC ROAD)

MH CL:42.01 IL:39.36

MH CL:42.08 IL:39.54

FW-1

MH CL:42.18 IL:39.51

EXISTING WATER

OIL INTERCEPTOR

TARMAC SURFACE

EXISTING ADMINISTRATION BUILDING

FFL: :42.19

GRASS AREA

MH CL:41.85 IL:39.85

EXISTING WEIGH-IN BRIDGE

MH CL:41.99 IL:40.25

CONCRETE YARD

MH CL:41.97 IL:41.01

MH CL:41.96 IL:40.82

BUSINESS PARK ON ADJACENT SITE

N

SITE BOUNDARY IN RED

SITE LAYOUT PLAN - EXISTING FOUL DRAINAGE LAYOUT

SCALE 1:500

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Client:
FORGE HILL RECYCLING LTD

Drawing Title:
SITE LAYOUT PLAN
EXISTING FOUL DRAINAGE LAYOUT

Scale:	Date:	Revision
1:500 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL08	

FOUL DRAINAGE LEGEND

DRAINAGE BEFORE INTERCEPTOR

DRAINAGE AFTER INTERCEPTOR

NOTE: REFER TO ENCLOSED DOCUMENT REF 501.00271.00002 FOR DETAILED INFORMATION ON INTERCEPTORS

MONITORING LOCATIONS LEGEND

FOUL WATER MONITORING LOCATIONS FW

INDUSTRIAL UNIT ON ADJACENT SITE

EXISTING POWER WASH HOUSING

FFL: :42.72

EXISTING TRUCK & SKIP WASH WITH CHANNEL DRAIN TO MANHOLES

CONCRETE YARD

EXISTING CHANNEL DRAIN TO MANHOLES

BUILDING 1

BUILDING 2

EXISTING MATERIALS RECYCLING FACILITY

PROPOSED BUILDING 3

AREA TO BE DEMOLISHED

FFL: :42.27

ROCKING BAY RAMP

EXISTING WEIGH-OUT BRIDGE

EXISTING GATES

SHUT OFF VALVE

CONCRETE SURFACE

1:20 RAMP

TO PUBLIC SEWER

EXISTING ESB SUB-STATION

FFL: :42.48

GRASS AREA

FORGE HILL (PUBLIC ROAD)

EXISTING WEIGH-IN BRIDGE

OIL INTERCEPTOR

TARMAC SURFACE

FW-1

EXISTING ADMINISTRATION BUILDING

FFL: :42.19

GRASS AREA

CONCRETE YARD

BUSINESS PARK ON ADJACENT SITE

N

SITE BOUNDARY IN RED

PROPOSED EXTENSION IN GREEN

SITE LAYOUT PLAN - PROPOSED FOUL DRAINAGE LAYOUT

SCALE 1:500

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Client:
FORGE HILL RECYCLING LTD

Drawing Title:
SITE LAYOUT PLAN
PROPOSED FOUL DRAINAGE LAYOUT

Scale:	Date:	Revision
1:500 @A3	APRIL 2015	-
Drawn By: JB	Drawing Number: 4348-WL09	

Schedule A of the discharge licence from Irish Water contains details of required emission limit values, monitoring parameters, frequency and methods, as follows:

LICENCE NO.: IW-DTS-728357-01 CONDITIONS

Schedule A

The Licensee shall discharge trade effluent in compliance with the emission limit values (ELVs) and sample at the prescribed monitoring frequency below.

Parameter	ELV*	ELV*	Monitoring Frequency **	Method
Flow	100 m3 /day		Continuous	On-line continuous flow monitor & recorder
Flow	30 m3 /hour		Continuous	" "
pH	6.0– 9.0		Continuous	On-line pH probe &recorder
Temperature	25 Celsius		Continuous	On-line Temp probe & recorder
BOD	2000 mg/l	200 kg/day	Monthly	Standard Method
COD	4000 mg/l	400 kg/day	Weekly	Standard Method
Suspended Solids	500 mg/l	50 kg/day	Weekly	Standard Method
VOCs	1 mg/l		Quarterly	Standard Method
Total Nitrogen	100 mg/l		Bi-annually	Standard Method
Sulphates (as SO4)	750 mg/l		Quarterly	Standard Method
Detergents(as MBAS)	10 mg/l		Quarterly	Standard Method
FOG	100 mg/l		Monthly	Standard Method
Total Heavy Metals	1 mg/l		Annually	Standard Method
Mineral Oils	5 mg/l		Bi-annually	Standard Method
Total Hydrocarbons	5 mg/l		Bi-annually	Standard Method
Toxicity***	10 Toxicity Units		As requested	Standard Method

*

Note: All samples with the exception of Flow, pH and Temperature shall be taken on a 24 hour flow proportionate composite sampling basis. In this regard, a composite sample for testing purposes shall be defined as any sample extracted from the sampling apparatus between 8.00 am and 12.00 noon on any day for which normal operational activities have been ongoing for the previous 24 hours.

**

Note: Sampling shall take place on alternate week days on a rolling basis to ensure representative samples are obtained for site operations which may vary across the working week.

***

Note: Toxicity Units (TU) are defined as: TU= (100/x Hour EC50) where x is the relevant period of exposure and EC50 is expressed as % vol/vol

The sewage from the site offices is directed to the sewerage system without passing through the interceptor or monitoring point.

There is a manual shut-off valve on the foul sewer line just outside the northernmost site gate (exit gate). The risk of a spillage of significant quantities of hazardous or dangerous liquids is very low as there will be no diesel tank or other storage tanks containing hazardous liquids on site. Relatively small volumes of hydraulic oils, engine oils, or fuel from the tanks of plant could spill on site and in those circumstances the emergency response procedures would require the shut-off valve on the sewer line to be manually closed.

We suggest that manual shut off is sufficient in these circumstances as trained staff are expected to be on site during such an incident and can manually activate the relevant shut-off valve, which is accessible from outside the northern gate. Simultaneously, staff will be trained to use materials from strategically placed spill kits to contain a spill locally before it can enter the drainage system in the main processing building. There is also a hydrocarbon interceptor on the foul line as an additional containment measure.

Surface Water Drainage

Drawing WL10 shows the existing surface water drainage system at the site and Drawing WL11 shows the proposed layout after the extension is constructed.

Surface water from the following areas is directed to the surface water drainage system:

- The roofs of buildings
- The yard areas apart from the areas directed to foul sewer (apron around back door of building, truck wash, wheel wash and exit weighbridge)

The surface water from the yard areas passes through a Class 1 Full Retention Hydrocarbon Interceptor and a Balancing Tank prior to discharge from the site to a local stream.

The AERs submitted to the EPA between 2008 and 2011 for the Forge Hill site, record that the surface water discharge was compliant with an Emission Limit Value (ELV) of 5 mg/l mineral oil on each of the 11 sampling occasions reported. In fact, the highest level of mineral oil recorded during that period was 1.14 mg/l, well below the 5mg/l ELV and many recorded analyses were below detection limits for this parameter.

These reported analyses suggest that this hydrocarbon interceptor is effective and fit for purpose.

The interceptor was emptied by Munster Drain and serviced by Kingspan Klargester in September 2015. Kingspan's technical expert has confirmed that the interceptor is an NS100 Klargester interceptor and acts as the primary settlement tank as well as a hydrocarbon interceptor. The unit has been declared fit for purpose as detailed in the Kingspan report presented in Attachment D.1(k).2. An oil alarm was fitted by Kingspan in September 2015 and the commissioning certificate is included as Attachment D.1(k).3.

The run-off from the roof of the waste processing building by-passes the hydrocarbon interceptor and drains directly to the Balancing Tank, which is designed to serve a number of purposes, as follows:

- To attenuate run-off from the site to balance peak flows
- To contain firewater run-off
- To allow recirculation of water during fire fighting
- To allow sedimentation of silt prior to discharge.

The tank is located in the northwest of the site as shown on Drawing WL10 and covers a surface area of 6m long x 4.7m wide. The two compartments have reported capacities of 90m^3 (eastern compartment) and 82m^3 (western compartment), suggesting that the tank is c.6m deep.

SURFACE DRAINAGE LEGEND
DRAINAGE FROM ROOF
DRAINAGE FROM GROUND
HIGH LEVEL OVERFLOW PIPE

NOTE: REFER TO ENCLOSED DOCUMENT REF 501.00271.00002 FOR DETAILED INFORMATION ON INTERCEPTORS

MONITORING LOCATIONS LEGEND

SURFACE WATER MONITORING LOCATIONS SW

INDUSTRIAL UNIT ON ADJACENT SITE

EXISTING POWER WASH HOUSING
FFL: :42.72

EXISTING GATES

EXISTING WEIGH-OUT BRIDGE

CONCRETE SURFACE

50 CUBIC METER SURFACE WATER ATTENUATION TYPE

25 CUBIC METER FIRE EXTINGUISHING WATER STORAGE TANK

EXISTING CHANNEL DRAIN TO MANHOLES

AREA TO BE DEMOLISHED

FFL: :42.27

BUILDING 1

BUILDING 2

EXISTING MATERIALS RECYCLING FACILITY

RIDGE 53.53

EAVES 53.26

+42.42

+42.38

+42.34

+42.05

CONCRETE YARD

GW-1
GROUNDWATER SAMPLING LOCATION

EXISTING ESB SUB-STATION
FFL: :42.48

GRASS AREA

FORGE HILL (PUBLIC ROAD)

EXISTING CHANNEL DRAIN TO MANHOLES

EXISTING WEIGH-IN BRIDGE

EXISTING CHANNEL DRAIN TO MANHOLES

CONCRETE YARD

TARMAC SURFACE

SHUT OFF VALVE

EXISTING GATES

TO STREAM

SW-1

EXISTING ADMINISTRATION BUILDING
FFL: :42.19

GRASS AREA

BUSINESS PARK ON ADJACENT SITE

N

SITE BOUNDARY IN RED

SITE LAYOUT PLAN - EXISTING SURFACE DRAINAGE LAYOUT
SCALE 1:500

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Client:
KWD RECYCLING

Drawing Title:
SITE LAYOUT PLAN
EXISTING SURFACE DRAINAGE LAYOUT

Scale:	Date:	Revision
1:500 @A3	APRIL 2016	1
Drawn By: JB	Drawing Number: 4348-WL10	

SURFACE DRAINAGE LEGEND
DRAINAGE FROM ROOF
DRAINAGE FROM GROUND
HIGH LEVEL OVERFLOW PIPE

NOTE: REFER TO ENCLOSED DOCUMENT REF 501.00271.00002 FOR DETAILED INFORMATION ON INTERCEPTORS

MONITORING LOCATIONS LEGEND

SURFACE WATER MONITORING LOCATIONS SW

INDUSTRIAL UNIT ON ADJACENT SITE

EXISTING POWER WASH HOUSING
FFL: :42.72

EXISTING GATES

EXISTING WEIGH-OUT BRIDGE

CONCRETE SURFACE

90 CUBIC METER SURFACE WATER ATTENUATION TYPE

RE-CIRCULATING FIRE EXTINGUISHING WATER STORAGE TANK

1:20 RAMP

PROPOSED BUILDING 3

PROPOSED CHANNEL DRAIN TO MANHOLES

AREA TO BE DEMOLISHED

FFL: :42.27

BUILDING 1

EXISTING MATERIALS RECYCLING FACILITY

BUILDING 2

LOADING BAY RAMP

ROOF SLOPE

EAVES 53.56

CONCRETE YARD

GW-1
GROUNDWATER SAMPLING LOCATION

EXISTING ESB SUB-STATION

GRASS AREA

FORGE HILL (PUBLIC ROAD)

EXISTING WEIGH-IN BRIDGE

EXISTING CHANNEL DRAIN TO MANHOLES

CONCRETE YARD

SHUT OFF VALVE

TO STREAM

SW-1

EXISTING CATCH PIT

10L INTERCEPTOR (900x900x750)

TARMAC SURFACE

EXISTING ADMINISTRATION BUILDING
FFL: :42.19

GRASS AREA

BUSINESS PARK ON ADJACENT SITE

N

SITE BOUNDARY IN RED

PROPOSED EXTENSION IN GREEN

SITE LAYOUT PLAN - PROPOSED SURFACE DRAINAGE LAYOUT
SCALE 1:500

Notes:
1. This drawing is for licensing purposes only. - If in doubt ask.
2. Do not scale, figured dimensions only to be taken.
3. Engineer to be informed of any discrepancies before work proceeds.
4. Contractor to check all dimensions and conditions on site before commencing works.
5. Drawing to be read in conjunction with current Building Regulations.
6. All components and materials to be installed fully in accordance with manufacturers instructions.

Revision	Comments	Date

BRIAN O KENNEDY & ASSOCIATES LTD
ConsultingEngineers
Shannon House, Church Road, Douglas, Co.Cork
Tel: 021-4899854
Fax: 021-4899464
Email: info@bok.ie
Web: www.bok.ie

Project:
PROPOSED EXTENSIONS TO MATERIALS RECYCLING FACILTY AT FORGE HILL, CO. CORK

Client:
KWD RECYCLING

Drawing Title:
SITE LAYOUT PLAN
PROPOSED SURFACE DRAINAGE LAYOUT

Scale:	Date:	Revision
1:500 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL11	

The eastern compartment is designed for attenuation of the run-off from the yard areas of the site. The western compartment is designed for fire-fighting. Both compartments have pumped outflows.

Surface water is pumped from the Balancing Tank to a manhole located just outside the southernmost gate (entrance gate) on Forge Hill Road, where it is monitored at SW1. From here, it drains by gravity to a stream located 800m west of the site.

Operation of the site normally requires pumping of surface water from the Balancing Tank. However, an overflow pipe is built into the system at the manhole after the interceptor and this allows by-pass of the Balancing Tank if the pumps are not operating and the system backs up towards the hydrocarbon interceptor. This prevents flooding of the site and the potential overflow of contaminated water from the top of the hydrocarbon interceptor.

The overflow pipe is directed to the stormwater manhole outside the southern entrance gate (SW1), which is the discharge point for stormwater from the site. This connection is 2m above the base of the manhole as shown on Photo D.1.6 below and by-passes the Balancing Tank.

Photo D.1.6 – High Level overflow to Stormwater Discharge Point (SW1)

A manual shut-off valve is located on the storm-water drainage system at SW1 as shown on Photo D.1.7 below.

Photo D.1.7 – Manual Shut-Off Valve at Stormwater Discharge Point (SW1)

The large interceptor on the stormwater drainage system acts as a silt trap as well as intercepting hydrocarbons. The Balancing Tank can also trap sediment, but experience has shown that solids settle in the interceptor and the water in the balancing tank is clear. The main functions of the balancing tank are flow attenuation in the event of high rainfall events, fire-fighting water and firewater retention.

The balancing tank consists of two compartments. The compartment closest to Forge Hill road (western side) is kept at a high level and can be used for fire-fighting. Roof-water from the site is used to top-up this tank and any overflow is directed to the other compartment. The compartment furthest from Forge Hill Road (eastern side) is kept at a low level and used for flow attenuation and for fire-water retention. This compartment contains a submersible pump and the water is pumped from here via a rising main to the discharge point at SW1. The compartments are fitted with alarms that alert staff when the water level is too low in the fire-fighting compartment and too high in the flow attenuation compartment as detailed in the notice on the wall of the ESB Substation, captured in Photo D.1.8 below.

Photo D.1.8 – Notice on site Detailing Alarms in Balancing Tank

The system is designed to manage stormwater run-off in different scenarios as follows:

- **Normal working conditions** – roof-water flows directly to the balancing tank. Water from concrete yard areas (except those that drain to foul sewer) is directed to NS100 Klargester interceptor and from there to the balancing tank where it is pumped to SW1 discharge point.
- **Flood Event** – During a flood event, the eastern compartment of the balancing tank will fill with water as the pump will not be capable of keeping the water level low. This will attenuate flow during this event and as the rainfall decreases the system will return to normal. If the tank fills and the system backs up, flow may by-pass the balancing tank by way of the overflow pipe shown in Photo 6 above. This water is expected to be clean as it has passed through the interceptor and with such a high level of flow, any contaminants will be highly diluted.
- **Fire Event** – The emergency response procedures will require shut-down of the pump in the balancing tank and closure of the discharge at SW1 by way of the manual shut-off valve, which is accessible from outside the gate of the site. This

will capture water that by-passes the balancing tank via the overflow pipe. The balancing tank will fill and the system will back-up.

Contaminated fire-fighting water will be held in the building which has had ramps designed at all of the doors to contain adequate fire-fighting water. Water landing on the roof and the yards that does not enter the buildings will be clean and will drain to the balancing tank, where it can be used as additional fire-fighting water to supplement the fire hydrants. Note that no waste will be stored outside the waste processing buildings, so rainwater or fire-fighting water will not be contaminated if it falls on the roofs or the yards during a fire event.

A Technical Drawing of the Balancing Tank, prepared by Fehily Timoney & Co in 2003/2004 is included as Attachment D.1(k).4.

Surface Water Destination

Surface Water from the site discharges from the southernmost entrance gate to a local stream c.140m west of the site via a stormwater sewer that appears to also serve other premises in the area. Photo D.1.9 below shows the approximate path of the storm sewer to the local stream as a yellow line.

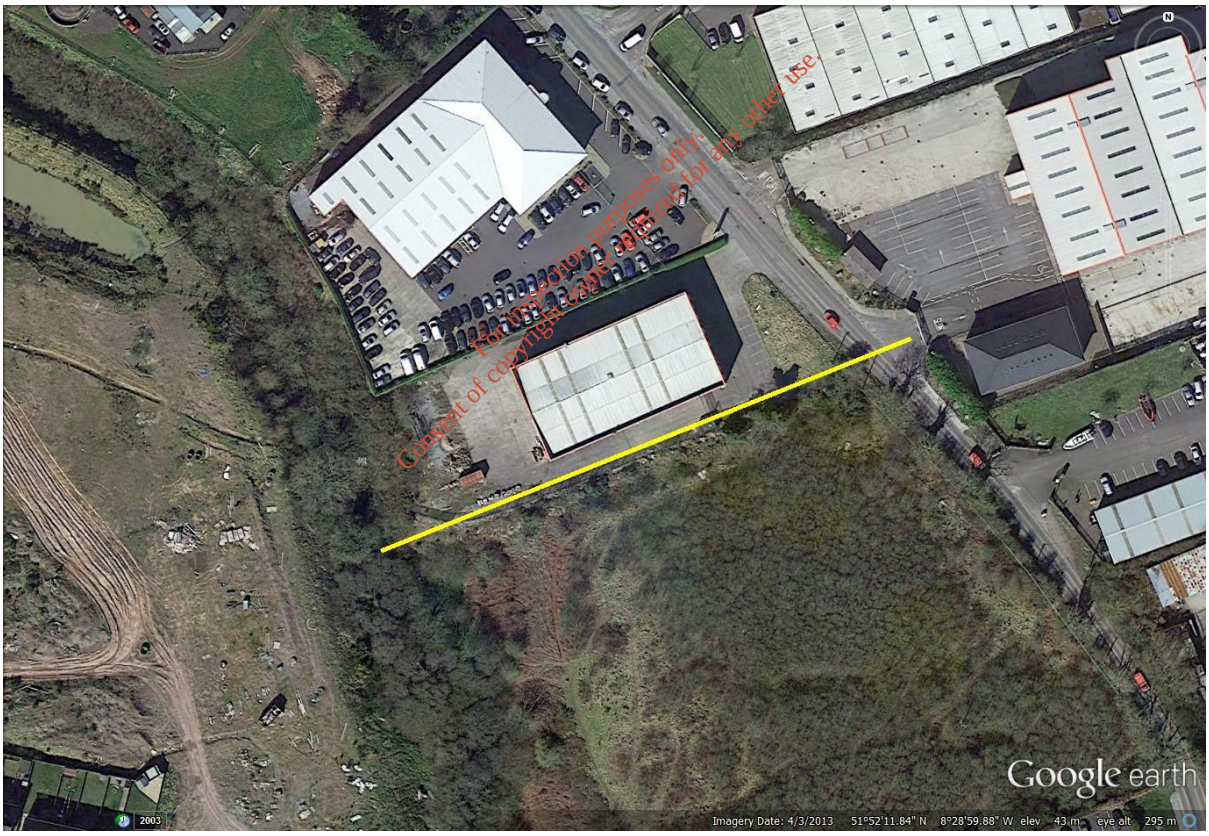


Photo D.1.9 – Approximate Route of Stormwater Sewer to Local Stream

The stream to the west of the site flows north and discharges to the Tramore River just before the river passes under the N40 South Ring Road. This location is approximately 370 metres north of the site boundary and is shown in Photo D.1.10 below.

Customer Service Report

Customer

Customer Name: Killarney Waste Disposal
Customer Address: C/O Sean Murphy
Aughacureen

Postcode: Kerry
Email Address: cwalsh@slrconsulting.com

Site Contact Name: Conor Walsh
Site Address: Forge Hill Road
(Between City and Airport)

Postcode: Cork
Phone: 0868337573
Alternative Phone:

Product: Full Retention Separator NSFP15/NSFA15

Call

Call: 285525 (O - One-Off Service)
Account Manager:

Date Attended: 07/08/2015
Attended by: Frank Brennan

Report

Unit full of water on arrival. Coaleser had been removed and filter no longer on it. Fitted new filter on coaleser and secured. Installed coaleser. Secured in place with fixing bolts. Checked closure device. Operating properly. No alarm fitted on unit. Refitted covers. Refitting rubber sealing ring to base of coalescer. Locked premises gate when leaving. Photos sent to office.

Questions:	Answers:
Are there any follow up works required? if 'yes' please detail in report	No
Have any parts been replaced?	Yes
Confirm plant/unit type:	as described
Was the unit turned back on after you finished?	No
Are there any additional assets on site i.e. STP, PC, OT, RWH, SOLAR	No
Is the unit/system fit for contract, if yes please indicate to which level i.e. Bronze, Silver or Gold	Yes
Are there any alarms that could be fitted to this unit/system, if so please indicate:	Yes
Have you posted/handed out a service leaflet?	No
Are there any special site requirements going forward, if yes please indicate	No
Calling Card Completed and left at premises	No

Customer Signature

07/08/2015

Customer Service Report

Customer

Customer Name: Killarney Waste Disposal
Customer Address: C/O Sean Murphy
Aughacureen

Postcode: ROI
Email Address: cwalsh@slrconsulting.com

Site Contact Name: Conor Walsh
Site Address: Forge Hill Road
(Between City and Airport)

Postcode: Cork
Phone: 0868337573
Alternative Phone:

Product: Full Retention Separator NSFP100/NSFA100

Call

Call: 289504 (B - Call Out)
Account Manager:

Date Attended: 29/09/2015
Attended by: Sean Bennis

Report

Commissioning of a klargester separator alarm. The control panel is located in the building and has been installed correctly. There is no probe tube in the separator but the probe has been set at the correct height by the customer, I was unable to set the height because the separator was empty. The alarm and probe are operating correctly. Unit left in working condition.

Parts Used

Part Number	Part Description	Quantity

Questions:	Answers:
Does the unit require emptying?	No
Are there any follow up works required? if 'yes' please detail in report	No
Have any parts been replaced?	No
Confirm plant/unit type:	Separator
Confirm panel type:	Klargester
Was the unit turned back on after you finished?	Yes
Are there any additional assets on site i.e. STP, PC, OT, RWH, SOLAR	Na
Would the unit benefit from any flood prevention product?	No
Is the unit/system fit for contract, if yes please indicate to which level i.e. Bronze, Silver or Gold	Yes
Are there any alarms that could be fitted to this unit/system, if so please indicate:	Na
Have you posted/handed out a service leaflet?	No
Are there any special site requirements going forward, if yes please indicate	Na
Calling Card Completed and left at premises	Yes

Customer Service Report

Customer Signature

Customer Not Present

29/09/2015

KINGSPAN ENVIRONMENTAL
KINGSPAN ENVIRONMENTAL SERVICES

THIS IS TO CERTIFY THAT

KINGSPAN ENVIRONMENTAL SERVICES

has successfully completed

Commissioning of a Full Retention Separator NSFP100 - Alarm

in accordance with company procedure at the following location:

Forge Hill Recycling, Forge Hill Road, Cork

Date 29th September 2015 Signed Joe Shields

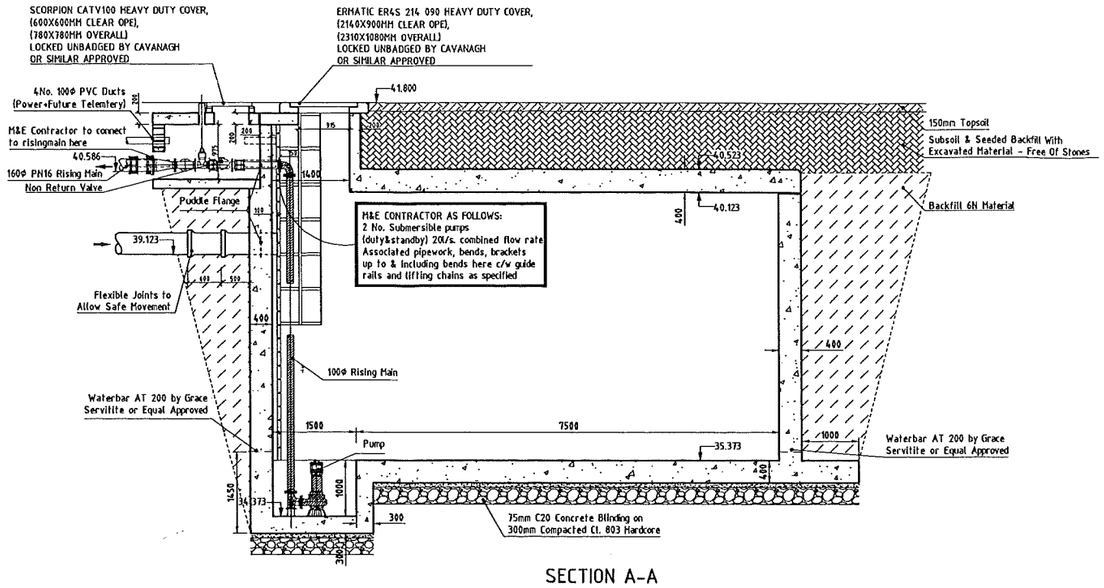
UK GREEN BUILDING COUNCIL Founding Member

BRITISH WATER

Kingspan Environmental Services
UK: 0844 846 0500 NI: 028 3025 4077 IRL: 048 3025 4077 email: helpingyou@kingspan.com
http://kingspanenviro.co.uk/category/service-and-maintenance

enVirowise Practical Environmental Advice for Business

UKRHA



SECTION A-A

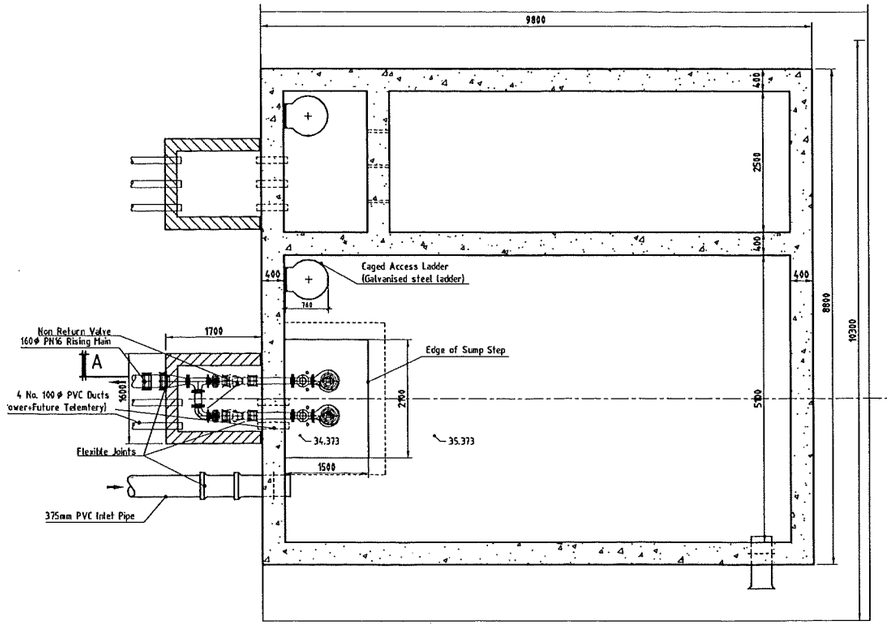
NOTE:
All Concrete Grade C35N20. All Concrete work in accordance with BS8007 code of practice for the design of the Concrete Structures Retaining aqueous liquids

NOTE
The Design of this Tank has Assumed 1No. Floor Pour 1No. Wall Pour and 1No. Roof Pour. Any Construction Joint would need to be Approved By Fehily Timoney & Company. Tank Design to BS 8007. Timber or Steel Shutters are Acceptable

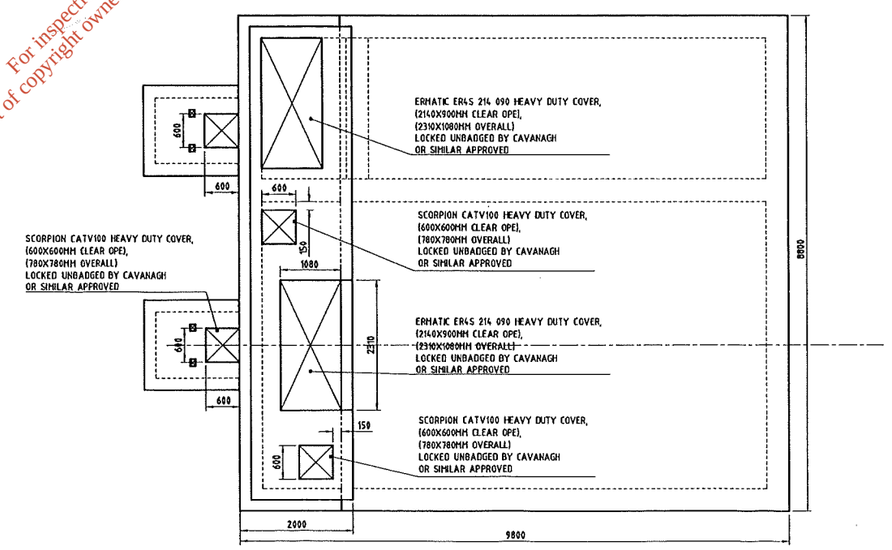
NOTE:
A Galvanised Steel Lifting eye is to be bolted to the wall of the Tank at a Suitable Location under the access Covers. The Purpose of the Lifting eye is to provide a safe point to attach Harnesses to before entering the Tank. Exact Location to be agreed on Site. Lifting eye to be Designed and supplied by Hilti or similar for a 500kg pull out load

NOTE:
The water table is high at the site (Generally 1m below Ground Level) All excavations are to be Dewatered until completely backfilled

Title of Drawing	Drawing No.	Rev
1:50,000 Site Location Plan (A4)	2003-115-06-001	A
1:2500 Site Location Plan	2003-115-06-002	A
1:1000 Site Location Plan	2003-115-06-003	A
Setting Out Points layout	2003-115-06-005	A
Existing Site Survey Phase 1	2003-115-06-007	A
Locating of Existing & Proposed Services & Foul Sewer	2003-115-06-008	A
Phase 1 & Phase 2 Site Services Layout Plan	2003-115-06-009	A
Phase 1 Site Services and Drainage Layout Plan	2003-115-06-010	A
Phase 1 Proposed Storm Drainage Layout Plan	2003-115-06-011	A
Phase 1 Proposed Foul Drainage Layout Plan	2003-115-06-012	A
Phase 1 Proposed Site Services Layout Plan	2003-115-06-013	A
Phase 1 Balancing Tank General Arrangement	2003-115-06-014	A
Phase 1 Balancing Tank Reinforcement details Sheet 1 of 2	2003-115-06-015	A
Phase 1 Balancing Tank Reinforcement details Sheet 2 of 2	2003-115-06-016	A
Phase 1 Proposed Storm & Foul sewer Longitudinal Sections	2003-115-06-017	A
Phase 1 Petrol Interceptors General Arrangement	2003-115-06-018	A
RC Sround Reinforcement details of Petrol Interceptor	2003-115-06-019	A
Typical Details Sheet 1 of 7	2003-115-06-030	A
Typical Details Sheet 2 of 7	2003-115-06-031	A
Typical Details Sheet 3 of 7	2003-115-06-032	A
Typical Details Sheet 4 of 7	2003-115-06-033	A
Typical Details Sheet 5 of 7	2003-115-06-034	A
Typical Details Sheet 6 of 7	2003-115-06-035	A
Typical Details Sheet 7 of 7	2003-115-06-036	A
Phase 1 Standard Details Sheet 1 of 3	2003-115-06-037	A
Phase 1 Standard Details Sheet 2 of 3	2003-115-06-038	A
Phase 1 Standard Details Sheet 3 of 3	2003-115-06-039	A



FLOOR PLAN OF BALANCING TANK



ROOF PLAN

NOTE:
REFER TO HEALTH & SAFETY REPORT & RISK ASSESSMENT RPT 003

Rev.	Drawn	Chkd	Apprvd	Date	Description
A	CH			27-04-04	ISSUE FOR INFORMATION

Name of Client
IPODEC IRELAND LTD. CORK

Name of Job
REFURBISHMENT OF WASTE TRANSFER STATION AT FORGE HILL.

Title of Drawing
PHASE 1
BALANCING TANK
GENERAL ARRANGEMENTS

Scales Used
A1-1:50, A3-1:100

Dwg. No.	Rev.
2003-115-06-014	A

FEHILY TIMONEY & COMPANY
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CORE HOUSE, POULADUFF Rd, CORK, IRELAND.
Phone: +353-21-4964133, Fax: +353-21-4964464, Email: info@ftco.ie
WEB SITE: www.fehilytimoney.com

ORIGINAL DRAWING SIZE A1 - 841 x 594

NATURAL SCALE

Photo D.1.10 – Discharge of Culverted Local Stream into Tramore River (370 north of site)

The Tramore River flows into Cork Harbour at Lough Mahon, via a tidal estuary known as the Douglas River.

Attachment D.1(l) – All Other Services

The site is served with the following services (in addition to drainage services):

- Water mains, including fire hydrants
- Electricity, including an ESB substation
- Telecommunications

The facility operated successfully as a licensed waste facility for many years, so the site services are tried and tested.

Attachment D.1(m) – Plant Sheds, Garages and Equipment Compound

The existing waste processing shed has a height of 9.375m to the eaves and 11.840m to the apex. The Waste Processing Shed is comprised of two adjacent buildings divided by a wall that has a large opening at the southern end and a smaller opening at the northern end. The floor of each building is constructed of mass concrete.

Building 1 (westernmost) is 1,250m^2 in area and consists of a steel portal frame, brick walls to 3.5m, double skinned cladding to the full height and across the roof. See Photo D.1.11 below.

Photo D.1.11 – Internal view of Building 1

Building 2 (easternmost) is 1,390m^2 in area and consists of a steel portal frame, mass concrete walls to 3.5m, double skinned cladding to the full height and across the roof. See Photo D.1.12 below.

Photo D.1.12 – Internal view of Building 2

Building 2 has some acoustic insulation panelling on the cladding on the eastern and southern walls, as visible in Photo D.1.13 below. Some minor defects in this insulation were repaired in Q3 2015.

Photo D.1.13 – Acoustic Insulation in Building 2.

The planned extension is 1,412m^2 in size with a height of 9.375m to the eaves and 11.840m to the apex (same height as existing buildings).

There is an ESB compound located on the site boundary at Forge Hill Road. This compound is 40m^2 in size and has a height of 3m with a flat roof. It is accessible from outside the site.

There is no equipment compound on site. The site office is large enough to accommodate storage of essential spare parts for plant or machinery.

The following drawings are included in Attachment D.1(m):

- Drawing WL12 – Existing Waste Processing Building Floor Plan
- Drawing WL13 – Existing Waste Processing Building Elevations
- Drawing WL14 – Planned Extension to Waste Processing Building - Ground Floor Plan
- Drawing WL15 – Planned Extension to Waste Processing Building - First Floor Plan
- Drawing WL16 – Planned Extension to Waste Processing Building - Elevations

Attachment D.1(n) – Site Accommodation

The Site Office is a two floor building that is 320m^2 in area with a height of 6m to the eaves and 10m to the apex. It is located close to the site entrance gate at the southwestern part of the site and includes a weighbridge operator station.

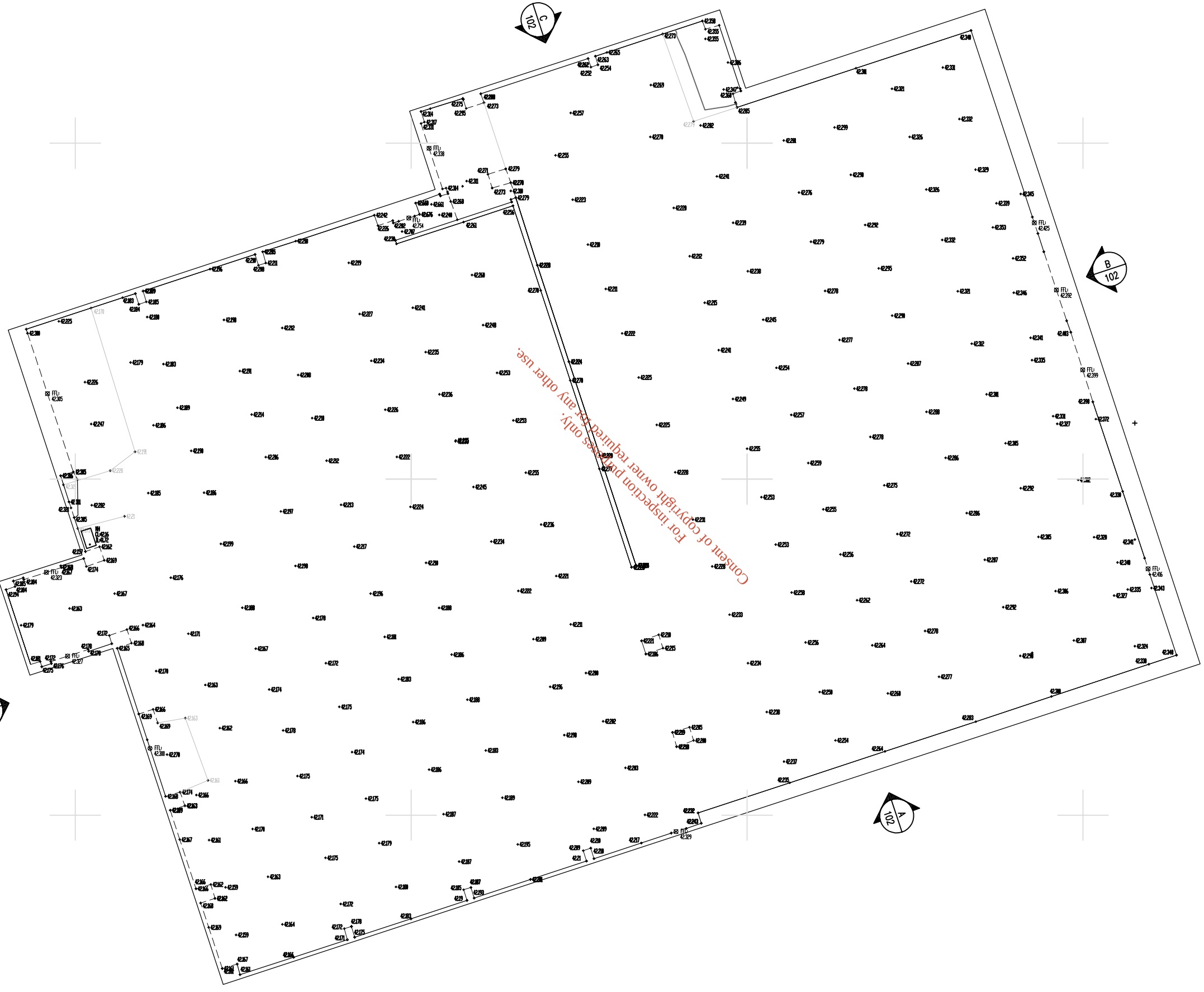
Photo D.1.14 below shows the site office.

Photo D.1.14– Site Office

Attachment D.1(o) – Fire Control System, including Water Supply

The following issues are relevant to Fire Control at the site:

- storage of combustible materials,
- compartmentalisation of these storage areas,
- fire-fighting water and
- fire-water retention.



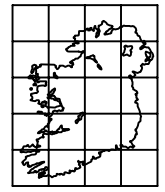
EXISTING WASTE PROCESSING BUILDING FLOOR PLAN
SCALE 1:500

ITM NORTH

THE IRISH INSTITUTION OF SURVEYORS

SURVEY NOTES
1. ALL LEVELS ARE RELATED TO MALIN HEAD DATUM
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED
3. ANY DESCREPENCIES IN THE SURVEY SHOULD BE REPORTED TO GEODATA SURVEYING LTD IMMEDIATELY.
4. DO NOT SCALE, THIS SHALL ONLY BE PERMITTED IN DIGITAL FORM.
5. GRID IS 20m X 20m

COORDINATE SYSTEM
ITM-Irish Transverse Mercator



0 10m 20m 30m
1:500

SYMBOLS

AJ	ARMSTRONG JUNCTION	+100	PEG REF No
SIGN	ROAD SIGN		CONTROL SURVEY STATION
	GATE	FFL100	FINISH FLOOR LEVEL
+203.31	SPOT HEIGHT	+RIDGE100	RIDGE ELEVATION
MP	MINI PILLAR	+SOFFIT100	SOFFIT ELEVATION
G	GULLY	LP	LAMP POST
EP	ESB POLE	TP	TELECOM POLE
SSL	STRUCTURAL SLAB LEVEL	AV	AIR VALVE
DIA = 0.8m	TREE ACTUAL SPREAD	BL	BOLLARD
TAG NO	TREE TAG NUMBER	UI	UTILITY INSPECTION CHAMBER
WM	WATER METER	FH	FIRE HYDRANT
SV	SLUICE VALVE	IL	INVERT LEVEL
SC	STOP COCK	BL	BED LEVEL
	UNDERGROWTH HATCH	+SWL	SURFACE WATER LEVEL
	HEDGE HATCH	WB	HEIGHT OF WINDOW BOARD FROM FFL
	DITCH HATCH	LB	HEAD HEIGHT OF BEAM
	DRIPLINE HATCH	UC	HEAD HEIGHT OF CEILING FROM FFL
	BUILDING HATCH	O/H TEL	OVERHEAD TELECOM LINE
	WALL HATCH	O/H ESB	OVERHEAD ESB LINE
	FLAT ROOF		FILL GROUND
MH CL	MANHOLE COVER	TEL IC	TEL INSP CHAMBER

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& ASSOCIATES LTD
ConsultingEngineers

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Church Road,
Douglas,
Co.Cork

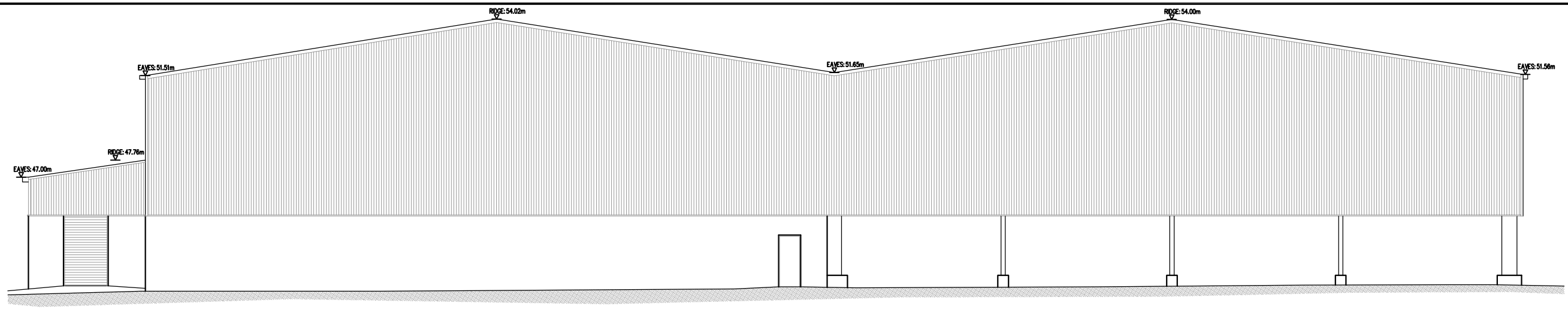
Tel: 021-4899854
Fax: 021-4899464
Email: info@bok.ie
Web: www.bok.ie

Project:
PROPOSED EXTENSIONS TO MATERIALS RECYCLING FACILTY AT FORGE HILL, CO. CORK

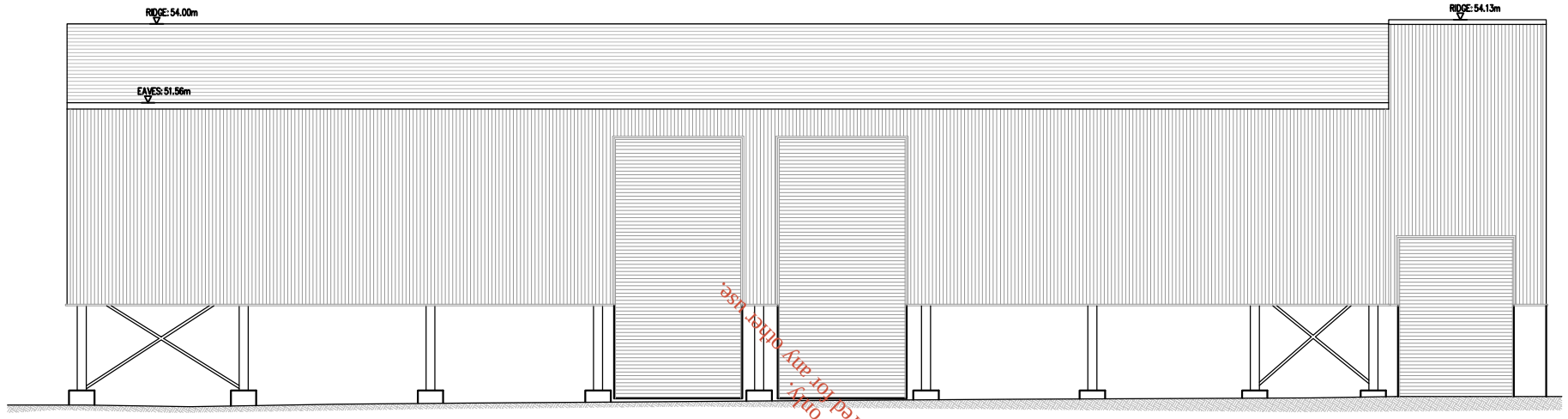
Client:
FORGE HILL RECYCLING LTD

Drawing Title:
EXISTING WASTE PROCESSING BUILDING FLOOR PLAN

Scale:	Date:	Revision
1:500 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL12	



1 ELEVATION A–A
Scale: 1:100



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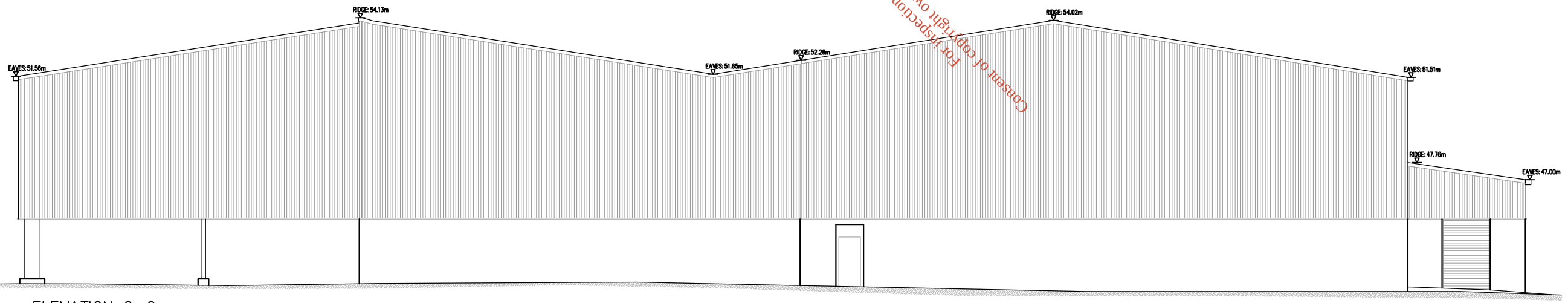
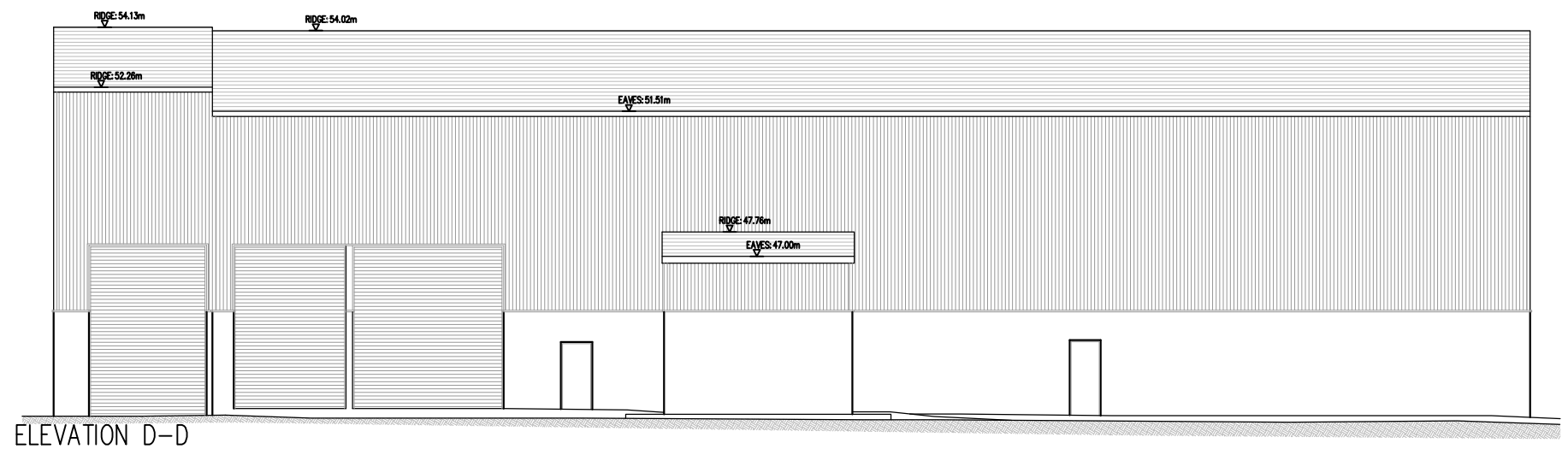
Scale: 1:100



1 ELEVATION C–C
Scale: 1:100



1 ELEVATION D–D
Scale: 1:100

ITM NORTH

THE IRISH INSTITUTION OF SURVEYORS

SURVEY NOTES
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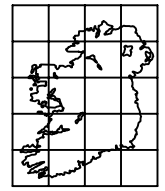
COORDINATE SYSTEM
ITM–Irish Transverse Mercator



0 10m 20m 30m
1:500

SYMBOLS

AJ	ARMSTRONG JUNCTION	+100	PEG REF No
SIGN	ROAD SIGN		CONTROL SURVEY STATION
	GATE	FFL:000	FINISH FLOOR LEVEL
+213.31	SPOT HEIGHT	+RIDGE:000	RIDGE ELEVATION
MP	MINI PILLAR	+SOFFIT:000	SOFFIT ELEVATION
G	GULLY	LP	LAMP POST
EP	ESB POLE	TP	TELECOM POLE
SSL	STRUCTURAL SLAB LEVEL	AV	AIR VALVE
DIA = 0.8m	TREE ACTUAL SPREAD	BL	BOLLARD
TAG NO	TREE TAG NUMBER	UI	UTILITY INSPECTION CHAMBER
WM	WATER METER	FH	FIRE HYDRANT
SV	SLUICE VALVE	IL	INVERT LEVEL
SC	STOP COCK	BL	BED LEVEL
	UNDERGROWTH HATCH	+SWL	SURFACE WATER LEVEL
	HEDGE HATCH	WB	HEIGHT OF WINDOW BOARD FROM FFL
	DITCH HATCH	UB	HEAD HEIGHT OF BEAM
	DRIPLINE HATCH	UC	HEAD HEIGHT OF CEILING FROM FFL
	BUILDING HATCH	O/H TEL	OVERHEAD TELECOM LINE
	WALL HATCH	O/H ESB	OVERHEAD ESB LINE
	FLAT ROOF		FILL GROUND
MH CL	MANHOLE COVER	TEL IC	TEL INSP CHAMBER

BRIAN O KENNEDY & ASSOCIATES LTD
ConsultingEngineers

Shannon House,
Church Road,
Douglas,
Co.Cork

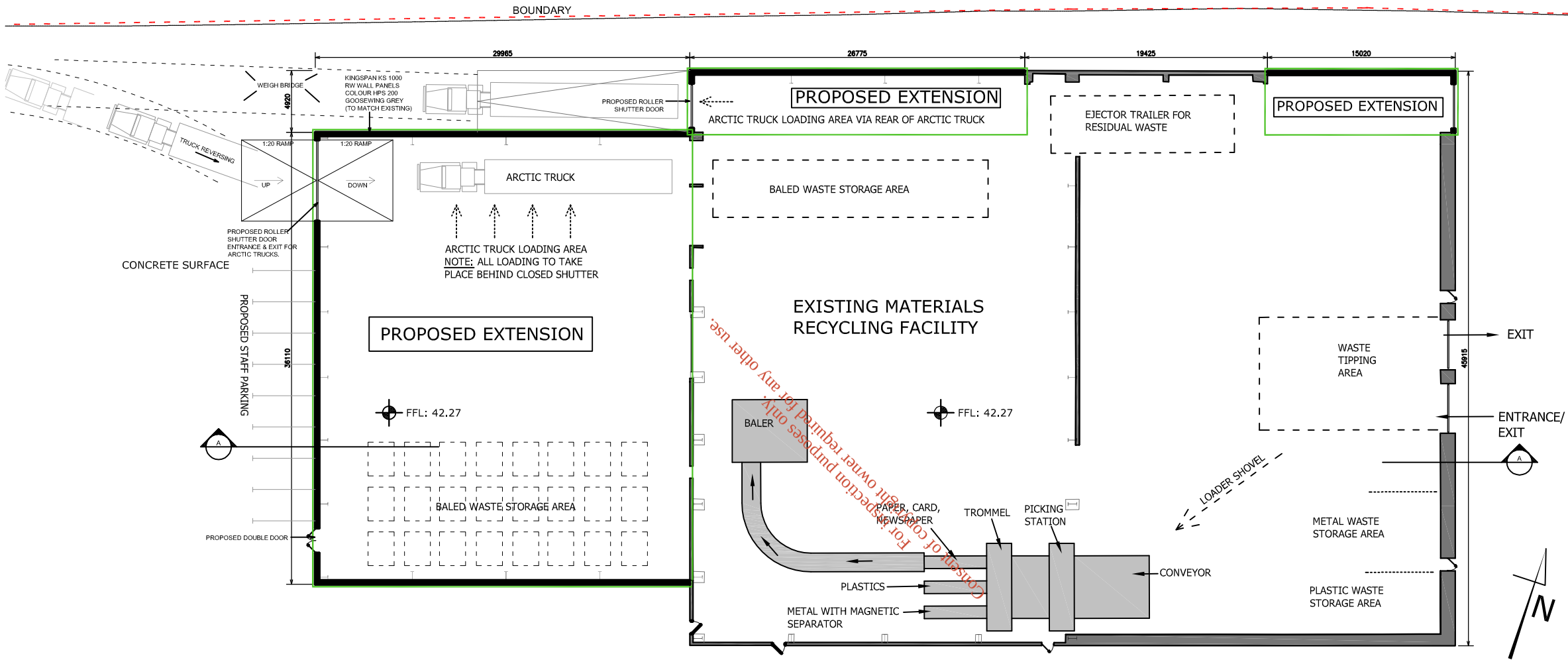
Tel: 021-4899854
Fax: 021-4899464
Email: info@bok.ie
Web: www.bok.ie

Project:
PROPOSED EXTENSIONS TO MATERIALS RECYCLING FACILTY AT FORGE HILL, CO. CORK

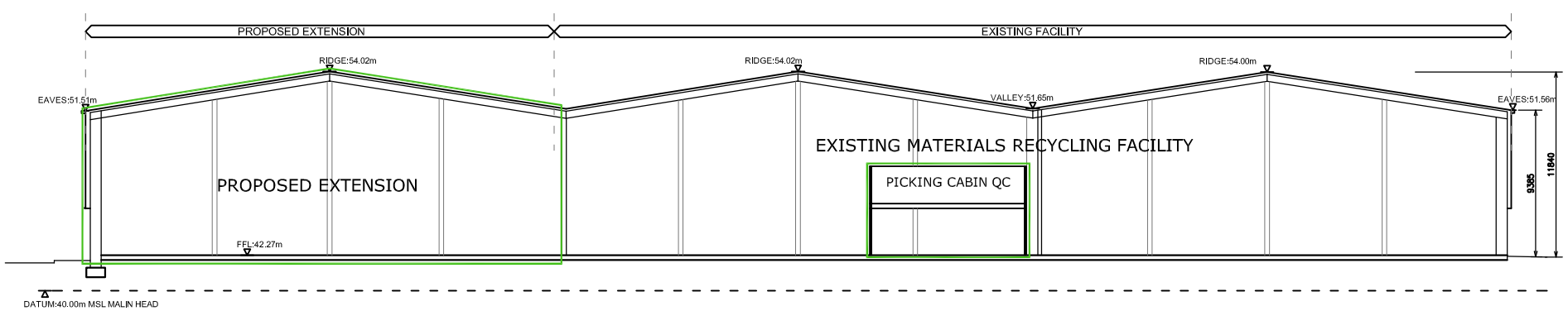
Client:
FORGE HILL RECYCLING LTD

Drawing Title:
EXISTING WASTE PROCESSING BUILDING ELEVATIONS

Scale:	Date:	RevIsIon
1:500 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL13	



GROUND FLOOR PLAN
SCALE 1:200



SECTION A-A
SCALE 1:200

PROPOSED EXTENSION IN GREEN

Notes:
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4. Contractor to check all dimensions and conditions on site before commencing works.
5. Drawing to be read in conjunction with current Building Regulations.
6. All components and materials to be installed fully in accordance with manufacturers instructions.

Revision		
Revision	Comments	Date

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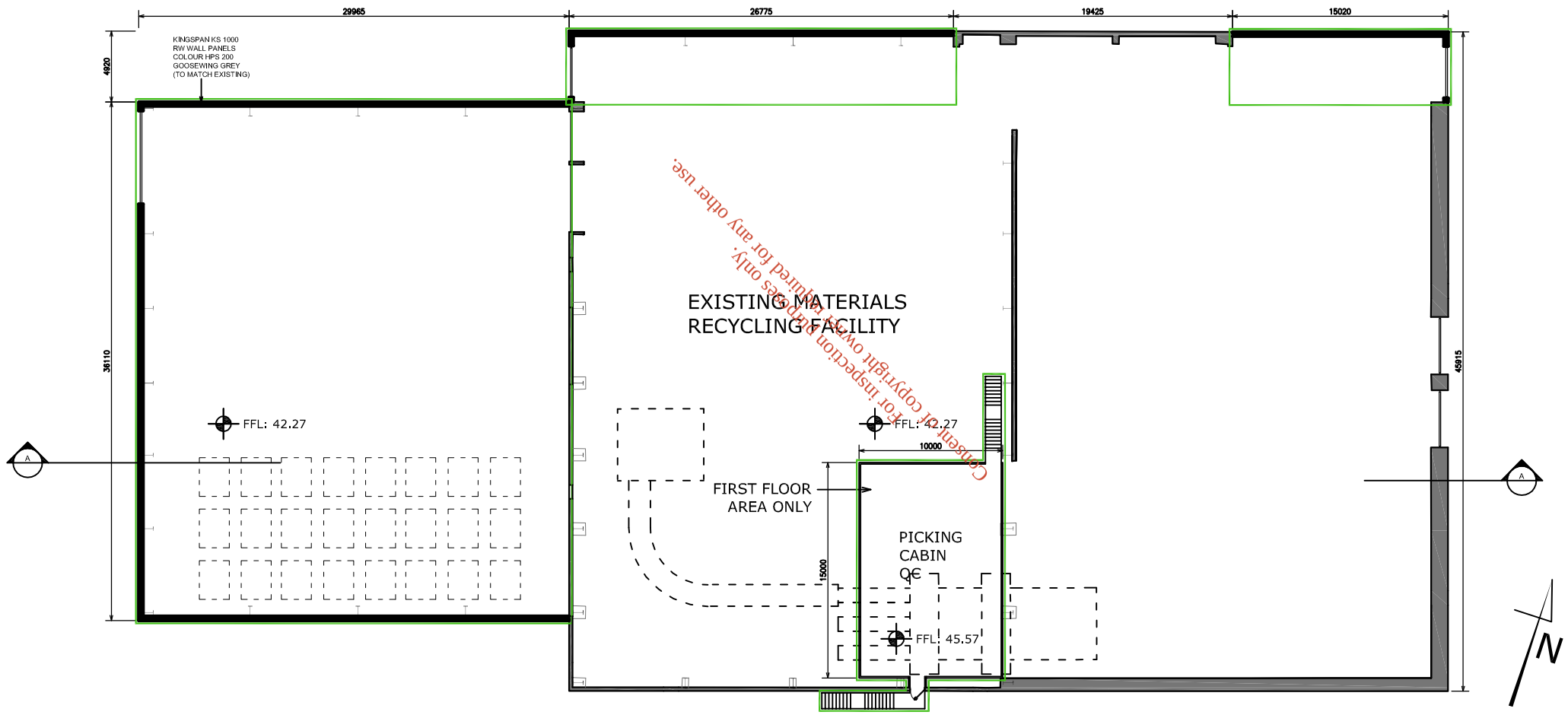
Project:
PROPOSED EXTENSIONS TO MATERIALS RECYCLING FACILTY AT FORGE HILL, CO. CORK

Client:
FORGE HILL RECYCLING LTD

Drawing Title:
GENERAL ARRANGEMENT PROPOSED PLAN & SECTION

Scale:	Date:	Revision
1:200 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL14	



FIRST FLOOR PLAN
SCALE 1:200

PROPOSED EXTENSION IN GREEN

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Revision		
Revision	DESIGN AMENDMENTS	11-03-2015
Revision	Comments	Date

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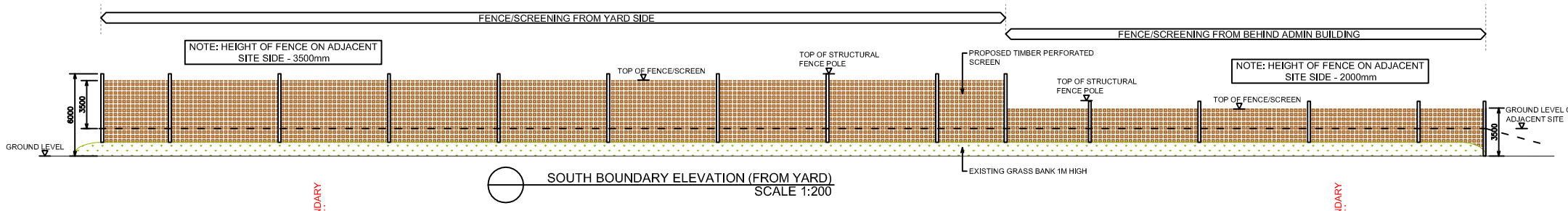
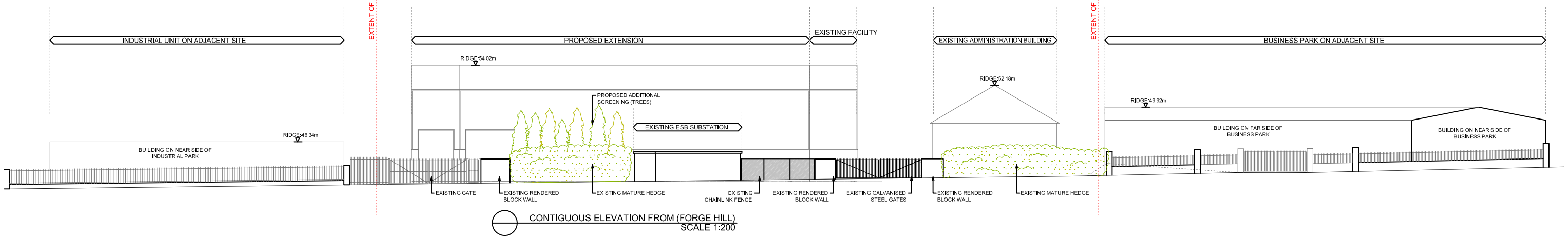
FORGE HILL RECYCLING LTD

Drawing Title:
GENERAL ARRANGEMENT
PROPOSED FIRST FLOOR PLAN

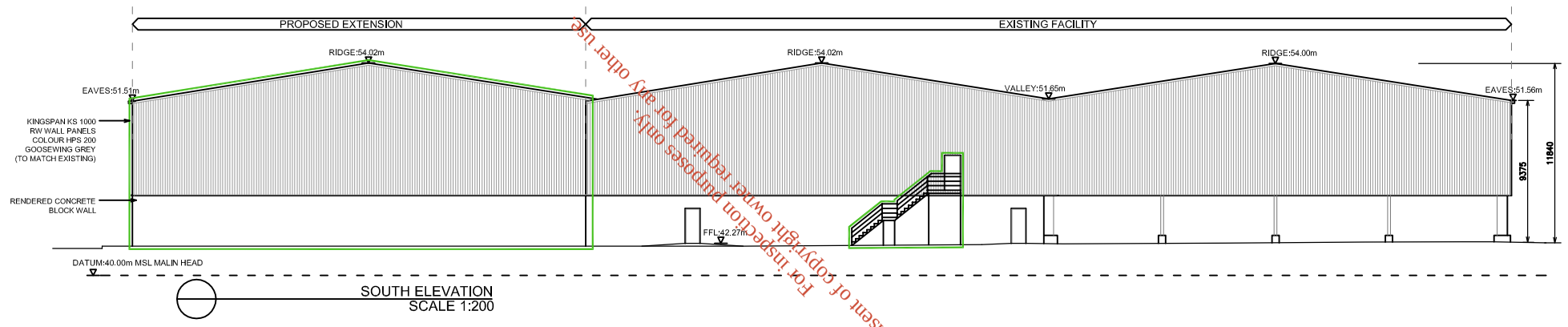
Scale:	Date:	Revision
1:200 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL15	



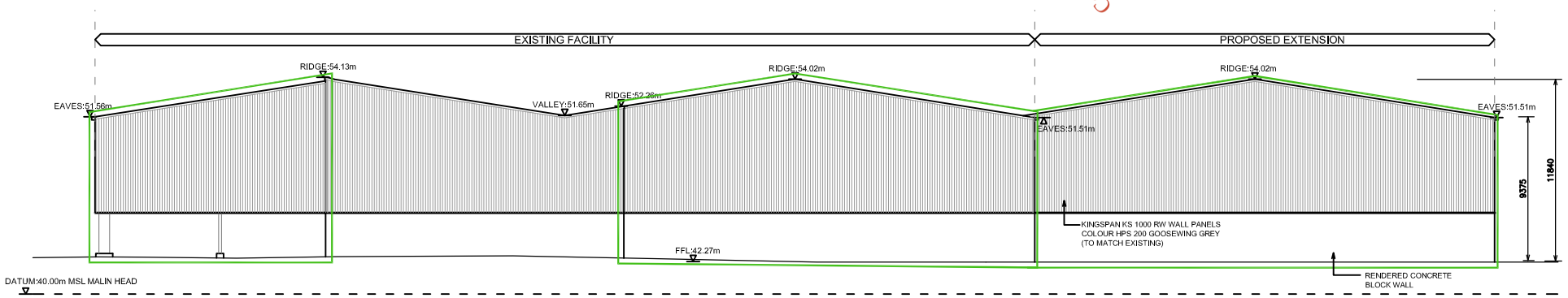
SOUTH BOUNDARY ELEVATION (FROM YARD)
SCALE 1:200



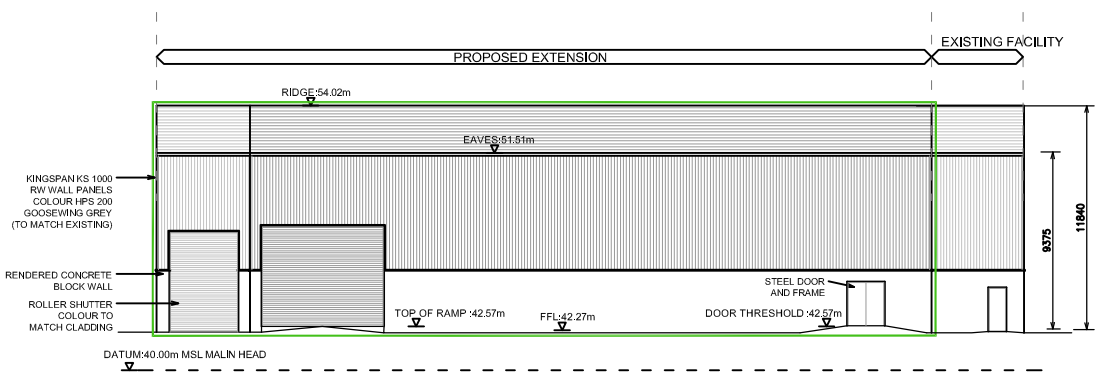
CONTIGUOUS ELEVATION FROM (FORGE HILL)
SCALE 1:200



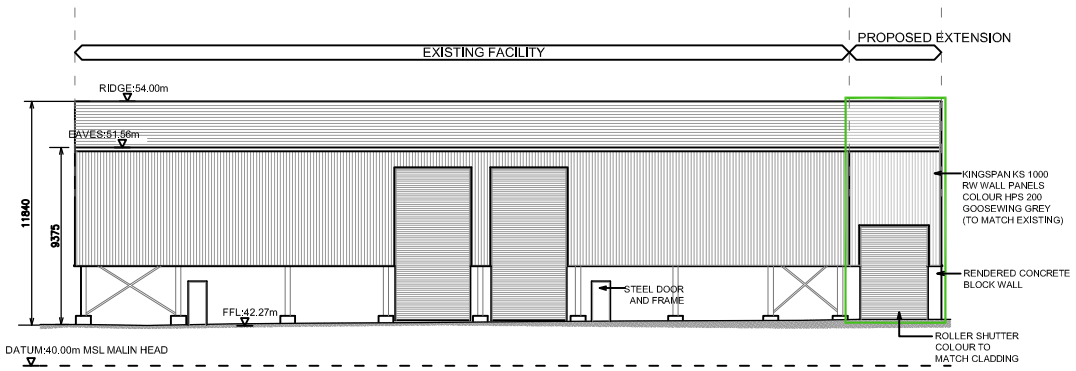
SOUTH ELEVATION
SCALE 1:200



NORTH ELEVATION
SCALE 1:200



WEST ELEVATION
SCALE 1:200



EAST ELEVATION
SCALE 1:200

PROPOSED EXTENSION IN GREEN

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Project:
PROPOSED EXTENSIONS TO MATERIALS RECYCLING FACILTY AT FORGE HILL, CO. CORK

Client:
FORGE HILL RECYCLING LTD

Drawing Title:
GENERAL ARRANGEMENT PROPOSED ELEVATIONS

Scale:	Date:	Revision
1:200 @A3	APRIL 2016	-
Drawn By: JB	Drawing Number: 4348-WL16	

These issues are addressed below in both the existing scenario (without the extension) and the proposed scenario (including the extension):

Storage of Combustible Materials

Chapter 2 of The EPA Guidance Note : *'Fire Safety At Non-Hazardous Waste Transfer Stations'*, outlines Fire Prevention measures for such facilities and Forge Hill recycling Ltd intends to comply with all the measures recommended by the EPA.

In relation to stockpiling of waste, the EPA Guidance Note recommends the following actions:

- *manage size and spacing of stockpiles/stacks;*
- *consider enclosing stockpiles/stacks;*
- *consider whether to turn or not turn stockpiles/stacks.*

Forge Hill Recycling Ltd, intends to operate the existing site in a manner that would limit the extent of a major fire by limiting the size of stockpiles, as detailed here.

The incoming waste stockpile would be limited to **100 tonnes**. We estimate that the density of incoming waste is 0.24 tonnes per m^3, based on the size and payload of the large trailers that transport this material (20 tonnes in 84m^3). This stockpile would therefore have a volume of **417 m^3**.

Enclosure of this stockpile is not practical as it will be subject to continual deposition and loading on to the process line.

The incoming waste stockpile will be moved around as it is loaded on to the process line, so turning will not be required. It will not be stationary for long periods of time.

Product storage will be kept at least 30m away from the incoming waste stockpile. This will be restricted by the operator to **200 tonnes** of combustible materials in the **existing** scenario. It is expected that 50% of this material would be paper and cardboard and 50% would be plastics (PET, HDPE, plastic film). In addition, there will be storage of aluminium and steel cans, but these will not be combustible, so are not included in our calculations of fire-fighting water and fire-water containment.

The paper and cardboard bales have an estimated density of 0.52 tonnes per m^3, based on weights and measurement of current bales produced at KWD Recycling, whereas the plastic bales have an estimated density of 0.40 tonnes per m^3, using the same calculation method. The paper/card stockpile would therefore be 192 m^3 and the plastic stockpile would be 250 m^3 at their maximum extent. The combustible bales would therefore have a maximum extent of **442 m^3** (192 m^3 + 250 m^3).

Bales of product are not expected to act as a source of spontaneous combustion due to their compacted nature and the fact that these materials have been through a process that has separated them from any potentially flammable or hot materials (e.g. aerosol cans or hot ashes).

Compartmentalisation

In the existing buildings, compartmentalisation is not a practical option as the process lines will link the incoming wastes to the product. However, it is proposed to compartmentalise the

new building from the existing buildings by way of a fire break wall. Therefore a fire in the existing building should not spread to the new building and vice-verse.

Bales of product will be carried by forklift from one building to the other, through an open door, but this door will close automatically in the event of a fire and will be kept closed during the night and at other times when the process lines are not operating.

Fire-Fighting Water

Total stockpiled combustible material in the existing buildings would have a maximum volume of **859 m^3** (417 m^3 + 442 m^3) split into two areas, front and back of the facility.

According to UK Environment Agency Guidance[2], a 300 m^3 pile of combustible material will normally require a water supply of at least 2,000 litres per minute for a minimum of 3 hours [360 m^3 in total].

Based on this rule of thumb, we calculate that 1,031m^3 of water would be required to extinguish a fire that extends to all stockpiles in the existing buildings.

Forge Hill Recycling Ltd intends to install a sprinkler system that will be zoned to target particular areas of the process and the stockpiles will be targeted in this way. Early operation of the sprinkler system is expected to prevent a fire spreading from the stockpile at one end of the process to the stockpile at the other end, which will be in an adjacent building. However, our calculations are based on full spread of the fire to all stockpiles in the existing building **or** to all combustible bales in the new building and this is considered to represent the worst case scenario.

The source of water for firefighting will be from the water mains servicing the site and an underground fire water storage tank, located close to the northernmost site entrance/exit (See Drawings WL10 and WL11 for tank location). There is a ring main around the site that feeds 5 no. fire hydrants located in the site yards. Water is supplied to the ring main from a Cork County Council mains water supply and is reported to be designed to discharge 1,591 litres per minute through the hydrants. At this rate, it would take 667 minutes (11hrs 7 mins) to extinguish the worst case fire [1,061m^3 ÷ 1.591m^3/min = 667 minutes].

However, an additional 82m^3 of fire-fighting water is stored permanently on site in an underground tank located in the north-western part of the yard, close to the northern-most entrance/exit gate. The Fire Service would have access to this water supply during a fire as it is easily accessible from the public road. The availability of this water should reduce the time of a fire to 10 hours and 15 minutes [(1,061m^3 – 82 m^3) ÷ 1.591m^3/min = 615 minutes].

Re-filling this storage tank using mobile tankers, if requested by the fire service, would reduce the time of a fire further. The availability of the underground storage tank allows for flexibility in the management of a fire at the site and the site operator can assist the fire service, by arranging the re-filling of this tank, as required.

For example, if the tank was re-filled once per hour during the course of a fire, the time of the fire could theoretically be reduced to **under 6 hours** [1,061m^3 – (6 × 82m^3) = 569m^3] [569 m^3 ÷ 1.591m^3/min = 358 mins].

[2] Fire Prevention Plans, Version 2, UK Environment Agency, March 2015. (Page 12)

Fire-Water Retention – Existing Buildings

The dry recyclable materials will absorb water and evaporation rates will be high in an intense fire. It is difficult to source data on the likely absorption rates and evaporation rates during such an event. For the purpose of this exercise and in the absence of data, we take a conservative view that 30% of the water used on the fire will be lost through evaporation and/or absorption, given the intensity of the heat generated in such a serious fire. We therefore assume that **722m^3** of fire-water would be generated in a fire in the existing building (70% of input water – 0.7 × 1,031m^3).

We assume that 50mm of rain falls on the site as the fire is extinguished and we assume that the roof is off, so a total of 132m^3 would land on the building (2,640m^2) and be contaminated in this worst case scenario [2,640 m^2 × 0.05m = 132 m^3]. However, approximately 10% of this rainfall would land on the burning stockpiles and can be considered already included in the volume of fire-fighting water discussed above. The other 90% rainwater (118m^3) would be subjected to evaporation, but not absorption, so we reduce this by a further 15% (conservative estimate rather than 30% used above) to leave 100m^3 of contaminated rainfall.

Total contaminated fire-water is therefore estimated at **822m^3** in the **existing** buildings (722 m^3 + 100 m^3) in a worst case scenario.

Forge Hill Recycling Ltd has agreed to provide further containment within the waste processing building to contain this volume of fire-water. The building is currently designed with small ramps on the doors to contain 162m^3 of fire-water. Increasing the ramps at all doors by **25cm** would provide an additional 660m^3 of containment, giving containment of 822m^3. In addition, three new trenches have been constructed in the existing building to facilitate new plant. This provides additional containment, as follows:

	L	W	D	Volume	Availability	Available Volume
	m	m	m	m3		m3
Trench 1	35	3.3	1.5	173	75%	130
Trench 2	35	3.3	1.5	173	75%	130
Trench 3	10	3.3	3.0	99	75%	74
						334

Total containment will therefore be 1,156 m3 (822 + 334) which is clearly more than adequate to address the worst case scenario in the existing building.

There is an existing discharge pipe in the building that discharges to sewer. It is proposed to block this pipe with a non-combustible device/material to ensure full containment within the building. Floor cleaning will be managed with a system that does not require a direct discharge from the building floor, e.g. sweeping system. This is common practice at Material recovery Facilities (MRFs) and given that the only material to be handled at the site is mixed dry recyclables, so the floor will not require regular wash-down.

Managing the stockpiles in the way described above reduces the risk of a serious fire at the facility, so we consider that this arrangement represents best practice for a MRF.

Keeping the contaminated water inside the building is also considered best practice as it reduces the amount of contaminated fire-water by preventing the mixing of clean water from yard run-off with contaminated water.

In the event of a fire, the shut-off valve on the storm-water line will be activated and storm water will be contained on site. The surface water in the balancing tank is clean and will remain clean as contaminated water is kept within the building.

In this scenario, the fire service can use the water in the balancing tank for fire-fighting, should they require it (in addition to the water in the adjacent fire-fighting water storage tank). If flooding occurs in the yard due to heavy rainfall, the fire service can alleviate the build-up of floodwater in the yard areas by using the clean water in the balancing tank for fire-fighting, leaving further capacity for surface water containment in the tanks rather than the yard areas.

Fire-Water Retention – New Building

The facility has received planning permission for a new building that will attach to the existing buildings. This will provide additional storage of materials on site. The planned maximum storage volumes are detailed below.

	Weight t	density t/m3	Volume m3	Average Height m	Area m2
Incoming Waste	100	0.24	417	5	83
Paper Storage Existing Building	200	0.52	385	6	64
Plastic Storage Existing Building	150	0.4	375	6	63
Subtotal Existing Building	**450**		**1176**		**210**
				% of building	8%
Paper Storage New Building	450	0.52	865	6	144
Plastic Storage New Building	300	0.4	750	6	125
Subtotal New Building	**750**		**1615**		**269**
				% of Building	19.1%
Total	**1200**		**2792**		**479**
				% of Building	12.3%

It is planned to install 38cm ramps at the doors of the new building to provide additional containment of firewater. Additional containment will be provided by linking the floor of the new building with the floor of the existing building via an underground pipe. There is an existing 225mm sewer pipe in this area that is due to be blocked and this can be easily converted to be an underground link between the new and old buildings.

Using the same assumptions discussed above, it is estimated that **1,411m^3** of fire-water would be generated in a fire in the new building. Details are presented as follows:

New Building

Firewater Needed	1938	m3
Hydrant Discharge	1.591	m3 per minute
Water in Tank	82	m3
Time of Fire	1167	minutes
Time of Fire	19.4	hours
Estimated Evaporation & Absorption	30%	
Rainfall	50	mm
Rainfall on building	70.6	m3
Rainfall on fire (included already)	10%	
Rainfall not already included	64	m3
Estimated Evaporation Rate for Rainfall	15%	
Firewater generated from rainfall after evaporation	54	m3
Total Firewater	**1411**	**m3**

As mentioned earlier, the time of the fire can be reduced by using the on-site balancing tanks for additional storage and use of fire-fighting water.

Containment of firewater when the new building is constructed will be managed as follows:

Containment in New and Existing Buildings

Ramps at Doors	380	mm
Building containment with ramps	536.56	m3
Floor area not available due to stockpiles	19%	
Effective containment	434	m3
Additional containment from Existing Building	1055	m3
Available Containment	**1489**	**m3**

Total containment would therefore be **1,489m^3** which is more than adequate to contain the worst-case fire-water from the new building. The firebreak wall will be designed to ensure that the fire is compartmentalised and does not spread to both new and existing buildings.

Fire Certificates for the Site

Cork County Council Fire Services and Operations section has issued a number of fire certificates for the site. These are:

- Fire Certificate 06/BC/S/1500 granted in August 2006 for the Administration Building
- Fire Certificate 07/BC/S/1014 granted in January 2007 for Building 3
- Fire Certificate 08/BC/S/1129 granted in March 2008 for the new extension to the building.

Attachment D.2 – Facility Operation

A report from Forge Hill Recycling detailing the proposed Facility Operation is included as Attachment D.2.1.

A Drawing that shows the proposed plant & equipment layout is included as Attachment D.2.2.

Alternatives Considered:

The facility has a waste permit that was issued by Cork County Council in December 2015 and has planning permission to operate as a Materials Recovery Facility (MRF). (See Section B for details).

The do-nothing alternative would therefore result in the facility operating with a permitted capacity of 49,999 tonnes per annum. This would leave a shortfall in processing capacity for dry recyclables in the Southern Region as KWD is currently processing more than 50,000 t/a and the company must relocate that operation due to licensed capacity restrictions at that site.

Development of an alternative facility to compliment the Forge Hill Site is not a good option environmentally or economically. Scale is important for efficient use of fuel and other resources, so two small facilities would have a much greater environmental impact than a single facility of the scale proposed in this application. The cost of recycling would also increase and would therefore be less incentivised compared with alterative waste treatment options that are placed lower in the waste hierarchy.

Diversion of materials to other MRFs in the Region was also eliminated as a viable alternative as there are no such facilities with spare capacity to make up the shortfall and to allow increased recycling in future years, as will be required by the future development of EU Directives under the Circular Economy package.

Facility Operation

As per Condition 5.15.1 of our Waste Facility Permit, items of plant deemed critical to the efficient and adequate processing of waste at the facility (including inter alia waste loading vehicles and ejector trailers) shall be provided on the following basis: - (i) 100% duty capacity; (ii) 50% standby capacity available on a routine basis; and (iii) Provision of contingency arrangements and/or back up and spares in the case of breakdown of critical equipment'.

Following is a detailed report on the duty and standby capacity of all the waste handling and processing equipment to be used at the facility as well as contingency arrangements.

Raw Material Quantity and Components:

The following table presents the processing line input tonnage, and the approximate percentage of each target material in the input mixed recyclables, and the output tonnage each target material represents.

Raw Material Component	Percentage (range)	Processing Input / Output (tonne per hour)
Mixed Dry Recyclables	100%	20
Of which		
Cardboard	15% (10 - 20%)	3
Paper	50% (30 – 35%)	10
PET Bottles	5% (3 – 6%)	1
HDPE Bottles	5% (3 – 6%)	1
Ferrous Metals	3% (2 – 4%)	0.6
Aluminium Metals	1% (0.5 – 1%)	0.2
Clear Film 90/10	3% (2 – 4%)	0.6
Mixed Film	8% (5 – 10%)	1.6
Dross (incl Fines)	10% (8 – 18%)	2

In the following table the throughput and separation capacity of the individual processing line components will be compared against the input tonnage constituents and target material tonnage presented to each item of separation plant.

Plant and Equipment Capacity Review:

Plant & Equipment	Function	Throughput Capability	Separation Capacity	Capacity Demand	Comments	Quality Control
Liebherr Grab	Transfer MDR from stockpile into processing plant bunker	40 tonne per hour	Not applicable	20 tonne per hour infeed	Teleporter capable of feeding bunker.	Not applicable
Metering Bunker	Regulate feed rate of MDR into the sorting plant	40 tonne per hour	Not applicable	20 tonne per hour infeed	Variable speed drum function permitting infeed control	Not applicable
OCC Screen	To remove large flat fractions from the MDR mix	25 tonne per hour separation	10 tonne per hour	15 tonne per hour.	Remaining fraction from OCC screen continues into process	Not applicable
OCC Optical Sort	To remove OCC from the large flat fraction separated	10 tonne per hour (5 tonne per hour per meter belt width)	5 tonne per hour of target material	3 tonne per hour target material	2 meter belt width NIR Titech Optical	QC sortation station to quality check separated OCC
2 deck Ballistic Separator	Separate incoming MDR into 2 dimensional, 3 dimensional and fines fractions	40 tonne per hour. Efficiency reduced at throughputs above separation capacity.	28 tonne per hour (2 deck with 14 tonne capacity per deck)	13.5 tonne per hour infeed. Largest target fraction 5 tonne per hour	Four way material split. Oversize 2-D, Midsize 2-D, Roll-back 3-D and Fines	Variable deck angle and orientation options
2 Dimension Oversize Optical	Separate plastic film from mainly	10 tonne per hour (5 tonne per hour	5 tonne per hour of target material	1.5 tonne per hour of target	2 meter belt width NIR Titech Opticals	QC sortation station to remove

Separator – Plastic Separation	paper 2-D oversize fraction	per meter belt width)		Plastics		contaminants prior to baler.
2 Dimension Midsize Optical Separator	Separate paper from mainly 2-D midsize fraction	10 tonne per hour (5 tonne per hour per meter belt width)	5 tonne per hour of target material	2.5 tonne per hour target material	2 meter belt width NIR Titech Opticals	QC Sortation Station to remove contaminants prior to baler
3 Dimension Line Optical Separator - Bottles	To separate PET and HDPE bottles from the 3-D stream	10 tonne per hour (5 tonne per hour per meter belt width)	2 tonne per hour of target material	Average 0.5 tonne per hour of each target bottle stream	2 meter belt width NIR Titech Opticals	QC stations separated PET and HDPE lines to remove contaminants
3-Dimension Line Optical Separator – Paper Recovery	To recover paper from the 3-D stream	10 tonne per hour (5 tonne per hour per meter belt width)	5 tonne per hour of target material	Maximum 0.5 tonne per hour of target material	2 meter belt width NIR Titech optical	Positively sorted paper fraction.
Fine Fraction Line Optical Separator – Paper Recovery	To recover paper from the 3-D stream	10 tonne per hour (5 tonne per hour per meter belt width)	5 tonne per hour of target material	Estimated 1.0 tonne per hour of target material	2 meter belt width NIR Titech optical	Positively sorted paper fraction.
Plastic Film Optical Separator	To remove clear plastic film from the plastics stream removed from the 2-D stream	10 tonne per hour (5 tonne per hour per meter belt width)	2 tonne per hour of target material	0.5 tonne per hour clear films	2 meter belt width NIR Titech optical	Positively sorted plastic film fraction
Eddy Current Separator	Positive separation of non-ferrous metal	Not applicable. Efficiency reduced at target material	Up to 2 tonne per hour separation	Average 0.075 tonne per hour of Aluminium	Positively sorted non-ferrous separation.	QC station on separated Alu Cans line to

	material from 3-D stream	throughputs above separation capacity		target material		remove contaminants.
Over-band Magnet	Positive separation of ferrous metals from 3-D stream	Not applicable. Magnet does not restrict or limit line throughput.	Up to 2 tonne per hour.	Average 0.45 tonne per hour of target ferrous stream	Rare earth magnet 0.5 m belt width	
2 no. Twin Ram Automatic Balers	Baling of segregated fractions	2 by 30 tonne per hour	Not applicable	Maximum 30 tonne per hour.	One baler operating on-line with second off-line batch baling from material bunkers	Baler and Bunker Operative controls batch baling from segregated material bunkers.
2 no. Forklift Units	Removal of baled product from baling stations	Not applicable	Not applicable	20 tonne per hour.	Clamp attachment. Waste spec machines.	Quality Control Check undertaken prior to transfer of bales to storage hall
1 Teleporter	Moving of material to baler	Not applicable	Not applicable	20 tonne per hour		

Separation Dynamics:

The following table presents the separation dynamic currently employed on the FHR processing plant for the recovery of the listed target material streams.

The Positive sortation involves the target material being identified and actively removed from the mixed material stream, as opposed to a negative selection and sortation which involves the removal of non-target materials and leaving the target material.

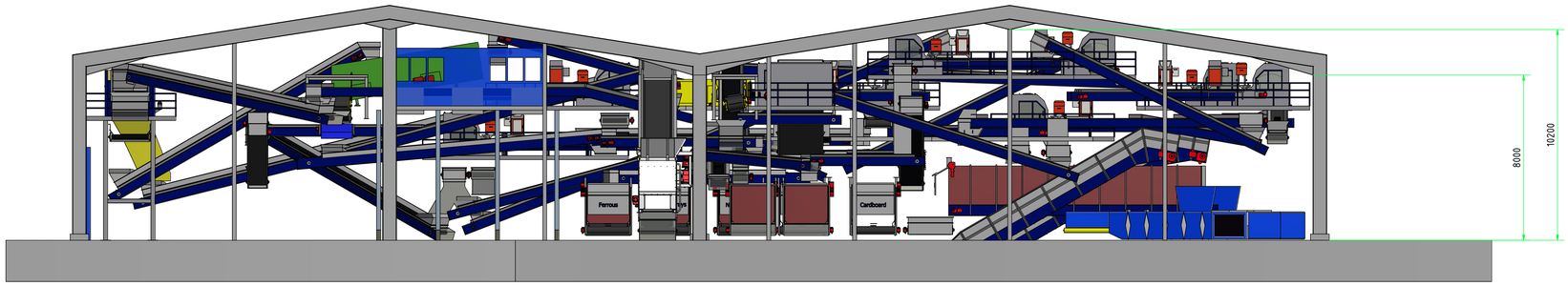
Material Stream	Positive Material Sortation (Yes/No)	Manual Quality Control (Yes/No)
Cardboard	✓	✓
Paper –Oversize	✓	✓
Paper – Midsize	✓	✓
Paper – Fine Fraction	✓	✗
PET Bottles	✓	✓
HDPE Bottles	✓	✓
Ferrous Metal	✓	✗
Aluminium Cans	✓	✓
Clear Plastic Film	✓	✗
Mixed Plastic Film	✓	✓

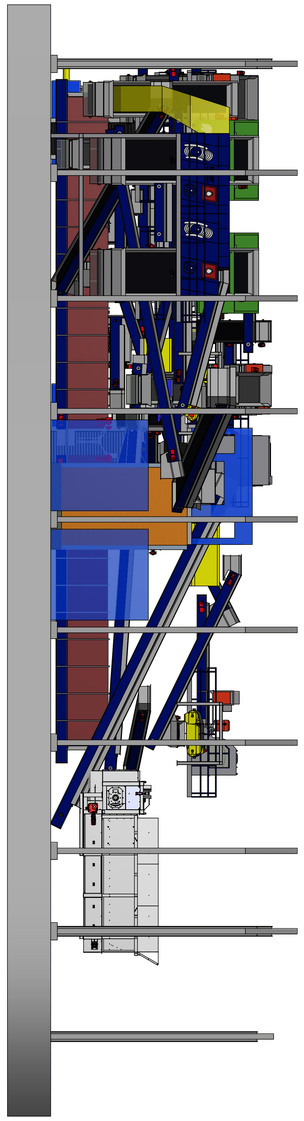
Yard/Line Staffing Levels & Duties:

I.D. No.	Title	Location	Primary Duties
1	Grab Operative	Intake Hall. Liebherr Grad Unit.	Inspect Incoming raw material and completing inspection documentation. Feed suitable material into the infeed bunker.
2	Line Supervisor	Processing Floor	Supervision of processing line function including equipment and staff. Responsible for operation efficiency and quality.
3	Sortation Operative X 10	Various stations on line	Manual sortation of any non-target and/or target materials
4	Bale Quality Operative	Bale Output Hall	Inspection and quality check of segregated material bales.
5	Baler & Bunker Operative	Batch Baler	Operation of the segregated material bunkers with batch baling of bunkered material as required. Inspection and control of quality of segregated bunkered material prior to baling.
6	Teleporter, Shovel & Forklift Operative	Main Floor	Control of incoming material offloading. Movement of raw material and/or segregated streams as required.
7	Forklift Operative	Bale Storage Hall	Inspection and stacking of bales following QC Operative checking. Loading of conforming bales into outgoing vehicles. Conducting export inspection and documentation.
8	Cleaning Operative	Yard/Line	Upkeep of yard and Lines
9	Maintenance Operative	Yard/Line	Maintenance of plant/equipment on site

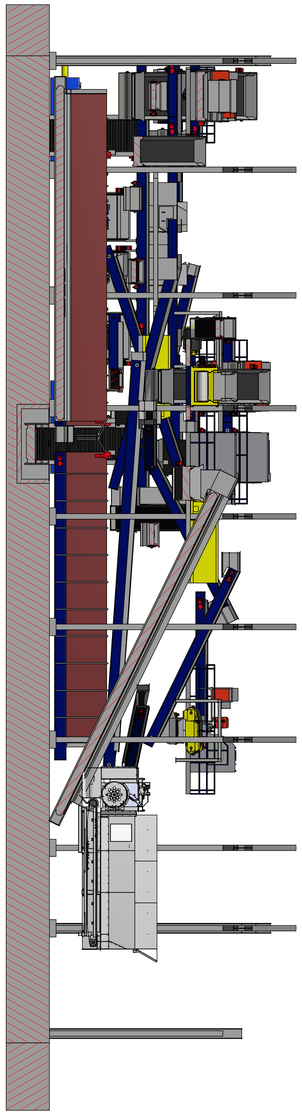
Contingency Plans

1) Processing line can be loaded using Grab machine and/or Teleporter so always a backup option if needed.
2) 2 Balers on site. Both have capacity to handle the full hourly tonnage of the processing line solely if required due to breakdown on 1.
3) 2 Forklifts on site. Both have capacity to handle the full hourly tonnage of the processing line solely if required due to breakdown on 1.
4) Maintenance person on site. They will carry out quick and efficient repairs on plant/machinery breakdowns on site.
5) Fully stocked supply of replacement parts/spares on site.
6) On call electrician for any quick resolution of any electrical faults.
7) Material flow on the line adjustable to bypass problem areas (e.g. specific optical separators/conveyors) if required.
8) Capability to restrict delivery of material onto site.
9) Material can be diverted to KWD Recycling in Killarney if required





A-A (1 : 100)



Allgemeintoleranzen nach DIN ISO 2768 mittel

Oberfläche DIN 3141 Fz = Reihe 2

	Datum	Name
Gezeichnet	09.10.2015	Kopzik
Kontrolliert		
Norm		

Maßstab 1 : 100 | Position | Ident.-Nr.

MRF Sorting Plant

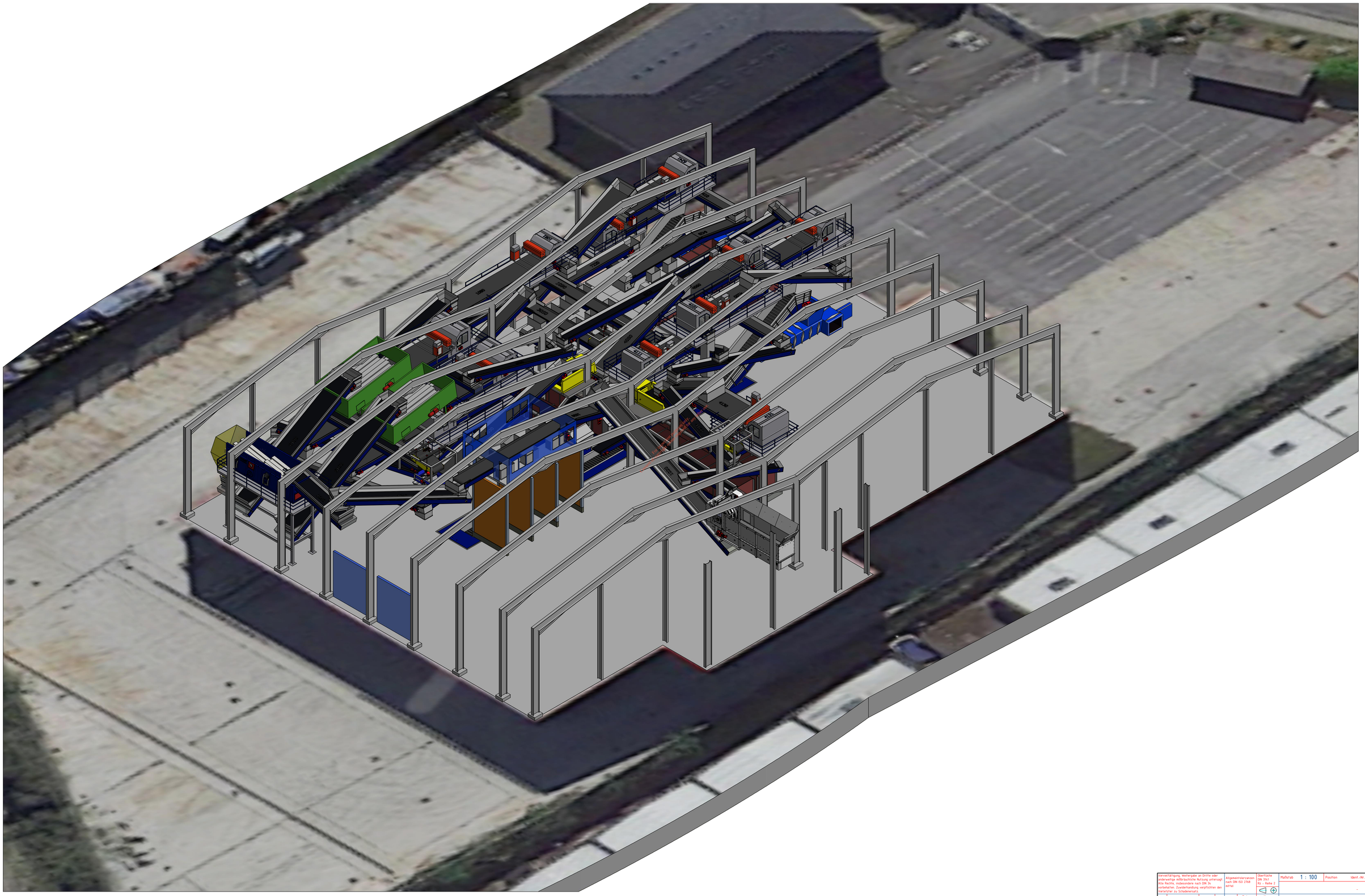
P012850_KWD_Neubau MRF

STADLER®
Technik von Ihrer besten Seite

P012850_DWG04_A

1
A0

Status	Änderungen	Datum	Name



Allgemeintoleranzen nach DIN ISO 2768 mittel

Oberfläche DIN 3141 Rz – Reihe 2

	Datum	Name
Gezeichnet	09.10.2015	Kozinc
Kontrolliert		
Norm		

Maßstab 1 : 100

Position

Ident.-Nr.

MRF Sorting Plant

P012850_KWD_Neubau MRF

STADLER
Technik von Ihrer besten Seite

P012850_DWG04_A

2

A0

Kopfnr.	Änderungen	Datum	Name