

Customer Name: <b>Kiely Bros</b>	Customer Registered Company No.:
Customer Registered Office: <b>135 Cherrywood Road Birmingham B9 4XE</b>	Customer Contact:
Invoice Address: <b>135 Cherrywood Road Birmingham B9 4XE</b>	Customer Tel:
	Customer Reference (if applicable):
Site Address: <b>135 Cherrywood Road Birmingham B9 4XE</b>	OA Reference: <b>6024-REV1-T06-PB1-OA2-19SEPT19</b>
	OA Issue Date: <b>8<sup>th</sup> October 2019</b>
	Contract Currency: <b>Pound Sterling</b>

## Your Order

### Item 1: CDEnviro Hopper

Model: M14

- Tension and impact resistant Multi-ply fabric conveyor belt
- Adjustable feeding capacity
- CDE designed polyurethane spring tensioned primary belt scraper - using continuous scraper wear profile to maintain scraping performance as the scraper wears.
- Vari-Angle PU Troughing rollers as standard
- Motorised head drum
- Tungsten tipped belt scraper
- Crowned tail and head drums to assist belt tracking
- Tipping Grid to allow for more material to be fed into hopper bin
- Tivar lining to protect against abrasive material
- Homogenises material on belt to be fed into the system

### Item 2: CDEnviro Conveyor

Conveyor Type	Model	Quantity
G:MAX feed conveyor c/w belt weigher	M2010	1

*\*Conveyor lengths pending layout sign off*

- Tension and impact resistant Multi-ply fabric conveyor belt
- CDE designed polyurethane spring tensioned primary belt scraper - using continuous scraper wear profile to maintain scraping performance as the scraper wears.
- Adjustable skirting rubbers
- Vari-Angle PU Troughing rollers as standard
- Motorised head drum
- Guarded to British specification
- Lagged head drum

Initials

CDE:	
Customer:	

ORDER ACKNOWLEDGEMENT

CDEnviro General Terms and Conditions of Sale (Capital Equipment)



- Crowned tail and head drums to assist belt tracking
- Anti-spillage metal dust cover

### Item 3: CDEnviro HYDRO:GRADE

Model: 82SR

**i) CDEnviro Pre-screen**

Model: DW/B

- Patented trilogy side wall construction
- Galvanised finish
- Huck non bolted structural connections
- CDE VibroSync technology:
  - o Designed to transfer energy direct to side walls
  - o Linear motion drive
  - o Access to eccentric weights through end guards
  - o Quiet & cool in operation
- Patented U-Span cross members
- Excellent access for changing modules
- Isenmann polyurethane modules
- Isenmann polyurethane side wall liners

**Sump**

- Mild steel rubber lined sump
- Integrated into HYDRO:GRADE chassis

**ii) CDEnviro Rotomax**

Model: RX80

- Heavy attrition induced in the material for scrubbing and cleaning using high wear and abrasion resistant attrition paddles
- Hydraulic clutch for soft start under load
- Guarded over top of HYDRO:GRADE for safe access using GRP
- Reinforced steel structure
- Primary heavy-duty bearings mounted on outside of machine for safe and rapid maintenance access.
- Side and rear discharge points for efficient removal of water, organics and fines.
- Twin shaft design
- Single gearbox and motor driving both shafts to ensure synchronous motion of twin scrubbing shafts
- Temperature sensors on rear bearings for early warning failure notification
- Single remote grease point for ease of maintenance
- Retention time adjustable via rotation speed
- Rolling inlet chute for maintenance access.

Initials

CDE:	
Customer:	

ORDER ACKNOWLEDGEMENT

CDEnviro General Terms and Conditions of Sale (Capital Equipment)



- Upward flow classification system integrated into base of RotoMax to allow for removal of difficult organic/contaminant material of a lower density.
- Motorised hinged access door on floor of RotoMax to aid maintenance/cleaning.

**iii) ProGrade Sizing Screen**

**Model: Aggregate washing and dewatering Screen**

*2 Deck Horizontal Screen (0.8m x 1.6m)*

- Dedicated mild steel sump with integrated wash system
- Vibrating Double Deck Rinsing Screen
- Tensioned wire mesh screening media
- High pressure spray nozzles directing washing water onto the aggregate to ensure maximum capture of sand and/or removal of contaminants therefore producing an optimally clean oversize product
- Return of sand to fines washing section via internal pipework for optimum sand output

*Sump*

- Mild steel shallow sump
- Manual valve level controls
- Feed / overflow points each side
- Rubber lined front product chute
- All necessary internal pipe-work and fittings

**iv) Trash/Organic Screen**

- Dewatering screen for organics products with modular polyurethane panels – non bolted, and adjustable offset vibrating motors
- Replaceable polyurethane liners along screen sides
- Splash protection cover over rear of dewatering screens
- Replaceable modular back splash panels
- 4 no. High-efficiency 'Marsh Mallow' rubber screen mounts
- Mild steel shallow sump
- Feed / overflow points each side



*Additional specifications*

- Rubber lined front product chute
- All necessary internal pipe-work and fittings

*Sump / Pump / Chute*

- Mild steel shallow sump
- Overflow points each side
- Heavy Duty Warman pump
- Complete with motor and drive
- Rubber lined front product chute
- All necessary internal pipe-work and fittings

Initials

CDE:	
Customer:	

**Buffer tank Sump and Pump**

- Manual drain valve
- Inspection hatch
- 6/4 Warman pump
- Complete with motor and drive
- All necessary internal pipe-work and fittings

**Item 4: CDEnviro: G:Max, CFCU, Sieve bend arrangement**

**Dewatering screen**

- Dewatering split screen for sand products
  - o 1 no. B-Series screen
- Modular polyurethane panels – non bolted
- 2 no. adjustable offset vibrating motors
- Replaceable polyurethane liners along screen sides
- Splash protection cover over rear of dewatering screens
- Replaceable modular back splash panels
- 4 no. High-efficiency 'Marsh Mallow' rubber screen mounts
- 3 rows of spray bars fitted to dewatering screen

**Cyclone**

- Natural rubber lined modular cyclone c/w overflow discharge chamber

**Sump**

- Mild steel sand slurry sump
- Overflow points
- Skid mounted with integrated base for pump and motor

**Pump**

- Heavy-duty rubber lined Warman slurry pump
- Sigma Flexible Heavy Duty slurry pipe-work between pump and cyclone
- Complete with motor and drive

**CFCU**

**Model:** CFCU70

- CFCU tank
- Main water manifold
- Water inlet valve control
- Manifold assemblies
  - o Auto Feed valves
  - o Regulating valves
- Auto Flush valves
- Water upward flow polyurethane water nozzles
- PLC Controlled pressure transducer to control bed depth
- PID Pneumatic, Solenoid valve & Automatic level controls
- Rubber lined feed box to feed sand from cyclone to CFCU
- Heavy duty rubber lined pneumatic valves for discharge of product

ORDER ACKNOWLEDGEMENT

CDEnviro General Terms and Conditions of Sale (Capital Equipment)



- All sand outlet pipes are Rubber-lined

**Vibrating Sieve bend**

**Quantity:** x2

- Sieve bends to remove lignite / light waste, stainless steel
- Inlet chamber to distribute evenly over width of screen
- Gravity Solids discharge
- Includes pipe-work
- Steel support structure complete with walkway
- Horizontally slotted apertures

**Item 5: CDEnviro CO:FLO**

**Model:** 350

- Complete waste water treatment unit including:
  - o Chemical storage
  - o Integrated chemical make-up, aging and dosing plant
    - Liquid Poly proven within the recycling industry
    - Faster mixing and reaction times c/w powder
    - Shorter maturity retention time required
    - Better settlement characteristics
    - Quality Instrumentation used to provide accurate metered dosing
    - Fully automated control
  - o Control Panel
  - o Precise chemical metering
- Optimised chemical application to ensure most efficient chemical usage
  - o Designed to treat various types of waste water
  - o Cyclone overflow
  - o Centrate
  - o Filtrate
    - Roller shutter doors both sides for ease of access
    - Multiple maintenance access points for ease of access to all areas requiring inspection/maintenance
    - Flanged Drain point at the lowest point of the system for periodic clean out
    - Modular designs means rapid site set-up
    - Minimal contact points on the ground to avoid harbouring dirt/liquid
    - Chemical storage section designed to catch any liquid and feed this to a drain point
    - GRP flooring in the base section to avoid slips in the case of potential chemical spillage
    - Minimal moving parts
    - Multiple flow sampling points for more efficient chemical treatment refinement
    - Polymer sampling/draining points
- Dedicated routing for all chemical dosing lines/wiring

**Item 6: CDEnviro HYDRO:FLO**

**Model:** A400

Initials

CDE:	
Customer:	

## ORDER ACKNOWLEDGEMENT

*CDEnviro General Terms and Conditions of Sale (Capital Equipment)*



- Peripheral weir for collection and discharge of recycled water
- Central diffusion drum for receiving pre-dosed effluent
- Centrifugal sludge pump to discharge to decanter
- Pneumatic for control of sludge discharge
- Multiple dosing points for polyelectrolyte
- Thickener requires constant uninterrupted power supply of 400 V
- Mild steel Thickener Tank
- Galvanized steel support structure
- Scraper mechanism for conditioning of sludge
- Motor, gearbox and heavy duty transmission shaft
- Conical bottom section complete with flushing valves and pipe-work
- Compressor for pneumatics
- Scraper support bridge and galvanized walkway
- Access stairs and handrails
- Automatic or manual operation
- Automatic flushing of sludge pipe-work after de-sludging cycle

### Item 7: CDENVIRO Water Buffer Tank

Containerised combined water and sludge buffer tank is an integrated unit that provides excellent control and visibility of the water treatment process. This is described in two stages below:



#### *Water Section*

- Walkway
- Water recycle pump and motor
- Ultra-sonic probe

#### *Sludge Section*

- Sludge recirculation pump & associated pipework
- Walkway and access stair
- Ultra-sonic probe

Initials

CDE:	
Customer:	

## Item 8: CDEnviro Decanter

**Model:** CF6000

- Material of Construction Duplex Stainless Bowl & Scroll
- Variable Speed Bowl by VSD
- Differential Speed Generated by Cyclogear with Variable speed motor by VSD
- Liquid Discharge Chute
- Solid Discharge Chute (typical solids pictured below)
- Electrically controlled Solid end slide valve for diversion of shut down breakwater
- Set Of Essential Maintenance Tools
- Flushing water connection
- Noise Measurement Test Bay Certificate
- Vibration Measurement Test Bay Certificate
- Factory Acceptance Test Bay

### *Automatic Main Control Panel*

- The unit comes complete with a fully automatic dewatering process control panel.
- Panel supplied in Form 2 design
- This panel control and starts the decanter. It allows for the control of all the ancillary equipment through volt free contacts.
- There are 3 main sequences to the dewatering process.

### *Materials of Construction*

- Rotating product-contacting parts: 1.4470. Duplex Stainless Steel
- Stationary product-contacting parts: 1.4301
- All other parts: painted steel

### *Abrasion protection*

- Scroll wear protection: hard-facing tips and face, replaceable welded tungsten carbide on Nickel basis.
- Wear protection in bowl discharge outlets
- Wear protection in solids collection chamber
- Wear protection in scroll distributor

### *Automatic Sequencing*

- Stage 1: starts the centrifuge and brings it up to operational speed in an orderly sequence while supervising all safety components on the centrifuge.
- Stage 2: Once the centrifuge start sequence has started successfully then the feed start sequence is initiated. This sequence starts on the operator request the sludge feed pump, primary motor and polymer dosing pump. During operation of the feed sequence it monitors all elements of the sequence and shuts off the sequence if any alarm is activated on any of the sequence components. It then shuts down the sequence on operator request once the processing has been completed.
- Stage 3: Finally it controls the shutdown sequence of the decanter including the wash water sequence.
- This automatic panel reduces the operator input into the operation. The operator initiates the dewatering operation in the morning. He can then with minimal input monitor the

ORDER ACKNOWLEDGEMENT

CDEnviro General Terms and Conditions of Sale (Capital Equipment)



operation throughout the day. If any alarm condition is activated on the Plug & Play unit then the operator is alerted via a beacon on the container and an audible alarm.

- Power supply from local Site plant room. Power connection required 3 phase and earth. A single phase supply is also required to the heaters in the unit which are always on regardless of the status of the panel on the rig.

*Solids Discharge Pneumatically Actuated Solids Slide Valve*

- Pneumatically actuated solids discharge valve
- Unit complete with discharge flange 1500mm flange for connection of the breakwater pipe work to the centrate pipe work (See enclosed drawings)
- Unit complete with proximity switches to confirm open and closed positions
- Unit bolts directly onto the solids discharge flange from the decanter.
- Odour control connection flange
- Flushing water connection
- The unit is then designed to mate directly with the local screw conveyor or belt conveyor

*Decanter Centrifuge Liquid Discharge Chutes*

- Liquid/Centrates discharge chute. The unit is a rectangular tank profiled to the liquid discharge flange of the decanter
- The chute tapers into 300mm flange for connection to the centrate discharge pipe work
- Unit complete with sample point and antifoam injection points



*Decanter Solids screw*

- Screw conveyor to transfer solids from decanter solids discharge into stockpile bay
- Includes drain point which aids in reducing the amount of excess water reaching solids bay
- Drain point feeds directly back into sludge buffer tank
- Includes automated flushing point

*Additional Items*

- Flowmeter
- Centrate sump & pump
- Cabin for decanter and control panel

initials

<b>GDE:</b>	
<b>Customer:</b>	



## PERFORMANCE LIMITS

**TABLE 1: RAW MATERIAL INPUT LIMITS**

Raw Material Type	Trommel Fines and Rubble
Feeding method	Excavator/loader fed
Maximum particle size	80mm
Maximum total throughput	*30tph
Maximum 5-80 mm throughput (SG>2.5)	30tph
Maximum 0.063-5 mm throughput (SG>2.5)	30tph
Maximum 0-0.063 mm throughput	8.0tph
Maximum trash/organics throughput (SG <2.5)	3tph
Maximum moisture content in feed	20%

**TABLE 2: FINAL PRODUCT OUTPUTS**

Final Product Specifications Supplied By Customer:	
- Product 1 (mm)	20-40 mm
- Product 2 (mm)	5-20 mm
- Product 3 (mm)	0.063-5 mm
- Product 4 (mm)	0-0.063 mm

**TABLE 3: CAKE SPECIFICATION**

Final Product Specifications Supplied By Customer:	
- Product 4 moisture content	The decanter will produce a stackable product at >=45% dry solids by weight

**TABLE 4: CUSTOMER REQUIREMENTS**

Minimum Top-up Water Requirement (m <sup>3</sup> /hr)	8m <sup>3</sup> /hr – <ul style="list-style-type: none"> <li>• Max 250micron particle size</li> <li>• Max 250ppm solids concentration</li> </ul>
Potable water supply	5m <sup>3</sup> /hr

**TABLE 5: PERFORMANCE TEST**

Test period	Single consecutive 8-hour period during the commissioning phase – Proof of Performance
-------------	--

\*note – the fines content of the 'Trommel Fines' limits the total throughput to 25tph.