



# Equinox BATCHtech

## User Manual (metric version)



*Weigh ahead batching*

Version 15.01 1-Aug-2015

Equinox BATCHtech automated batching.

Units.

Aggregates and cements are measured in **kilograms**

Water is measured in **litres (or Kg)**

Admixtures are measured in **milli litres or milli litres / 100kg**

**Cementitious**

Unless explicitly stated otherwise times are measured in **milli seconds** e.g. jog a jog time of 200 would pulse the corresponding air solenoid for 1/5<sup>th</sup> of a second.

**Plant Configuration**

The Equinox batching software is the same for all batch plants whether it be a simple single aggregate hopper end loader configuration with one cement or a very large overhead bin design with several cementitious products. One single program is very beneficial for operators owning several plants and for the rapid distribution of software improvements and updates. In order for this to happen the actual plant is configured by parameters at initial setup.

After initial plant setup most parameters never need changing

The standard Equinox Batching system supports up to 16 counters divided into 8 weigh type devices and 8 volumetric pulse devices

ID	Name	Order	Class	SettleTime	Zero	Type	Ext Display	Multiplier	Enabled
0	AGG1 SCALE	1	AGG	3000	20	Up to Hopper	TX1	0	<input checked="" type="checkbox"/>
1	AGG2 SCALE	2	AGG	3000	20	Up to Hopper	TX2	0	<input checked="" type="checkbox"/>
2	CEM SCALE	3	CEM	2000	5	Up to Hopper	NONE	0	<input checked="" type="checkbox"/>
3		4	AGG	0	0	Up to Hopper	NONE	0	<input type="checkbox"/>
4	WATER SCALE	5	WTR	3000	2	Up to Hopper	NONE	0	<input checked="" type="checkbox"/>
5		6	WTR	0	0	Up to Hopper	NONE	0	<input type="checkbox"/>
6	ADMIX1	7	ADMX	600	0	Up Direct	NONE	0	<input checked="" type="checkbox"/>
7	ADMIX2	8	ADMX	600	0	Up Direct	NONE	0	<input checked="" type="checkbox"/>
8	ADMIX3	9	ADMX	600	0	Up Direct	NONE	0	<input checked="" type="checkbox"/>
9	ADMIX4	10	ADMX	600	0	Up Direct	NONE	0	<input checked="" type="checkbox"/>
10	ADMIX5	11	ADMX	600	0	Up Direct	NONE	0	<input checked="" type="checkbox"/>
11		12	AGG	0	0	Up Direct	NONE	0	<input type="checkbox"/>

The **Class** for each counter is selected from a drop down when the field is clicked. The Class is one of AGG, CEM,WTR,ADMX,ADDV standing for Aggregate, Cement, Water, Admix and Additive. Chemical admixtures such as plasticizer may be either Admix or Additive. The only reason for having 2 admixture classes is to give added flexibility to the loading sequence. E.g. it is possible to specify that some admixtures are loaded up front and some with the tail water.

The **Order** is the position that the counter is to be displayed on the computer screen and is generally chosen so that the computer screen has a similar layout to the position of the actual scale indicators in the batch room.

**Settle Time** is to eliminate the effects of dynamic loading when recording batch weights. When falling material lands in the weigh hopper the scale reading will be greater than the steady weight. The final batch weight reading is not taken until after the settle time has elapsed. Choose the value by using the manual controls to drop some material and observe how long after closing the actuator the scale takes to assume a steady reading.

**Zero** is the scale reading that below which a hopper is considered to be empty. It is common for some product to adhere to the sides of a weigh hopper. A scale reading may be zero before the weigh hopper was filled, but after the hopper is emptied a true return to zero reading may not be achievable. The batch computer will attempt to empty a hopper to the original start reading, but if after a finite time zero can not be achieved the batch computer will consider the job done as long as the reading is less than the **Zero** value.

The **Type** allows for different measuring configurations. If a weigh hopper is on load cells then the weight increases as material is batched (Up to hopper), but if for instance a cement silo is on load cells then the weight decreases as cement is batched (Down no hopper). The value (Up Direct) is for when there is no hopper and material is direct into the truck bowl – typical of admixtures and water measured by flowmeter.

End loader plants generally have a remote display visible to the loader driver. The **Ext Display** value is the port to which the external display is connected. Except for an end loader weigh hopper, the value is generally **None**

**Multiplier** converts a physical measurement to a true measurement. For scales the value can be left as zero (which is treated as a multiplier of 1) i.e. there is no difference between the weight displayed on the scale and the actual scale weight. If however an admixture flowmeter gives one pulse for every 10 ml then the multiplier needs to be set to 10 to convert pulses to milli litres of admixture. If water is measured by a flow meter that gives 50 pulses per litre then the multiplier would be 0.02

**Enabled** is a yes/no value (tick box) to indicate the counter is available for use. If for example at a dual aggregate weigh bin plant one hopper was damaged it can be taken off line simply by unticking the check box then re-ticking after repair. This is a lot more convenient than deleting then re-entering the whole line.

## Raw Materials

Code	Name	Short Name	Class	Units	SG	Tol %	Tol Max	Cost/1000	Modifiable	Enabled
MP10	Moy Pocket 10mm	MP10	AGG	Kg	1	5	50	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
MP20	Moy Pocket 20mm	MP20	AGG	Kg	1	5	50	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
MP7	Moy pocket 7mm	MP7	AGG	Kg	1	5	50	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SAND	Ningi Fine Sand	SAND	AGG	Kg	1	5	50	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WHITE	EXP WHITE	EXPW	AGG	Kg	1	5	50	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CFA	Calide Flyash	FA	CEM	Kg	1	3	20	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FA	Sunstate - Tarong Flyash	FA	CEM	Kg	1	3	20	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GP	Sunstate GP	GP	CEM	Kg	1	3	20	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WATER	WATER	WATER	WTR	Litre	1	2	10	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AEA	Sika Air	AEA	ADMX	ml	1	5	50	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
HRWRRE	Sika Visocrete PC HRF2	HRWRRE	ADMX	ml/100Kg Cem	1	5	50	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RAPID	Sika Rapid AF	RAPID	ADMX	ml/100Kg Cem	1	5	50	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RF	Sika Retarder N	RF	ADMX	ml/100Kg Cem	1	5	50	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Code** is used to identify a material in a mix whereas the **Name** appears on most printed reports. The **Short Name** is shown on the outdoor weight display used by the loader driver at loader style plants. The Short Name must be chosen to satisfy the constraints of the outdoor display – it must consist only of characters the outdoor display is capable of showing and have no more characters than the display accommodates. Some displays can only show numeric and upper case and are limited to as few as 5 characters.

**Class** is chosen from a drop down and is one of AGG, CEM, WTR, ADMX, ADDV.

**Units** are chosen from a drop down and are **Kg** for Aggregate and Cement classes, **Litre** or **Kg** for Water and **ml** or **ml/100kg** Cem for admixtures.

The specific gravity **SG** is used to calculate the volume of weighed materials.

**Tolerances Tol %** and **Tol Max** are used during batching. The tolerance used in batching is the minimum value of the two and depends on the batch size.

E.g. if Tol % is 5 and TolMax is 50 for a material in a mix that uses 400kg / cubic metre of that material then when batching a 3 metre load the tolerance will be the lesser of 50 and 5% of 1200 ( = 60 ) ie a tolerance of 50 kg. In a 1 metre load the tolerance is the lesser of 50 and 5% of 400 giving a tolerance of 20kg.

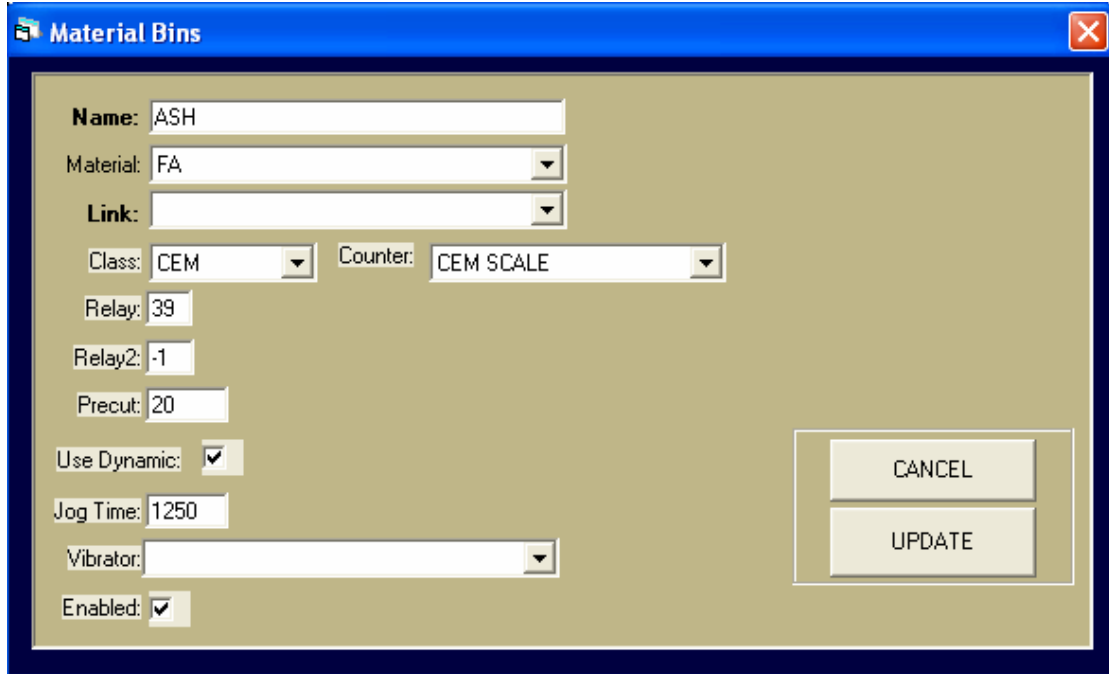
**Cost/1000** is used to calculate the actual raw material cost of a mix design.

May be left as zero if this ability not required or entered as the cost per tonne for aggregates and cements or the cost / litre of admixtures.

**Modifiable** means that the quantity of this material in a mix design may be altered at batch time. This usually only applies to admixtures such as retarders or accelerators. Only materials that are **Enabled** may be batched. If a material is temporarily unavailable then unticking Enabled will prevent the batching of a mix containing this material from starting.

## Bins

Raw materials are stored in a bin for batching. The bin parameters describe the operation of that bin



The screenshot shows a software window titled "Material Bins" with a blue border and a close button in the top right corner. The window contains the following fields and controls:

- Name:** Text input field containing "ASH".
- Material:** Dropdown menu showing "FA".
- Link:** Empty dropdown menu.
- Class:** Dropdown menu showing "CEM".
- Counter:** Dropdown menu showing "CEM SCALE".
- Relay:** Text input field containing "39".
- Relay2:** Text input field containing "-1".
- Precut:** Text input field containing "20".
- Use Dynamic:** Checkmark icon.
- Jog Time:** Text input field containing "1250".
- Vibrator:** Empty dropdown menu.
- Enabled:** Checkmark icon.
- Buttons:** "CANCEL" and "UPDATE" buttons on the right side.

Choose any descriptive **Name** and select the **Material** that the bin holds from the dropdown. In an overhead bin plant it is common for two or more bins to contain the same material because a lot of that material is used in the mixes. If you **Link** a bin with another then during batching the material will be drawn from both bins simultaneously. If bin A is linked to bin B then you must also link B to A.. Although uncommon in practice, 3 bins A, B and C could be linked by A links to B, B links to C, C links to A..

Bins can only be linked if they contain the same material. The **Class** of a bin must match the class of the material. The **Counter** is the scale or pulse meter that is used for measurement when this bin is used. **Relay** is the electrical relay number that operates the bin and would never be changed after initial set up. If a bin has a fast and slow feed ability then **Relay2** is the slowfeed relay. Whenever a relay is not present then it must be given the value of -1 ( At an end loader plant an Aggregate bin would typically have both relays set to -1 as there is no automatic operation to start the feeding of material to be weighed.)

**Precut** is to make allowance for inflight material and is the amount to be subtracted from the required target weight to determine when the relay switches off so that the final weight will be the target weight. The value to be given is determined by observing the scale during manual operation. **Use Dynamic** indicates that the precut value will change automatically between batches based on what happened in previous uses. E.g. if a material went over by 30 kg then the precut would increase by 30kg for that bin on the next batch in order to get the correct target weight. Whenever the batch program is restarted, the original precut is used on the first batch.

The **Jog Time** is in milli seconds and is the incremental time that the feed will operate in order to feed some more material to achieve target. If the Precut is too large, then the batch time will be excessive as lots of jogs will be required to reach target. The jog time needs to be chosen by experiment. A small value will give accuracy in reaching the target but may require an excessive number of jogs, Too large a value will feed material in larger increments with the possibility that the increment is so big that the last jog takes the material over tolerance. A properly tuned plant will have good values for precut and jog time. If the jog time is zero then no jogging will take place. It is usually not advisable to jog bins that are pump operated. In this case spend time getting the precut right.

If the bin has a connected **Vibrator** to help with slow or stopped feed then select the correct vibrator from the drop down.

## Weigh Hoppers

**Hoppers**

Name: AGG1

Counter: AGG1 SCALE

Class: AGG

Gates: 2

	Open	Close	Is Open	Is Closed	Pulse length Milli Seconds
First Gate	13	14	132	131	200
Second Gate	15	16	134	133	200

Vibrator: AGG1 VIB    Conveyor: AGGREGATE

Enabled:     Save    Cancel

The **Class** of the hopper must be the same class as its counter.

**Gates** specify how many discharge gates the hopper has. Most aggregate hoppers have a front and rear gate. Water weigh tanks have just one outlet. If a hopper has inching gates (the gate can move to and stay in any position between closed and open) then there will be a relay for **open** and a relay for **close**. Non inching gates just use the **open** relay and the gate fully opens when the relay is on and closes fully when the relay is off. Any not used relay must be given a value of -1. (Close is always -1 for non inching gates)

**Pulse length** applies to inching gates only (set zero for non inching) and is the incremental time that either open or close is applied in order to increase or decrease the gate aperture. If an inching gate takes one second to fully open or close then a pulse length of 200 would allow for 5 different apertures. This enables the computer to control the exit rate from the hopper so that conveyor belts do not overflow etc.

**IsOpen** and **IsClosed** are the relay numbers for limit switches that indicate the fully open or fully closed position of a gate. Most plants are designed so that the second gate does not start opening until the first gate is fully open. Also most plants have interlocks that prevent a hopper being loaded unless the Isclosed relay is ON

If the hopper has a **Vibrator** then choose from the dropdown, if the hopper requires a **Conveyor** motor to be started before discharge then select from the dropdown.

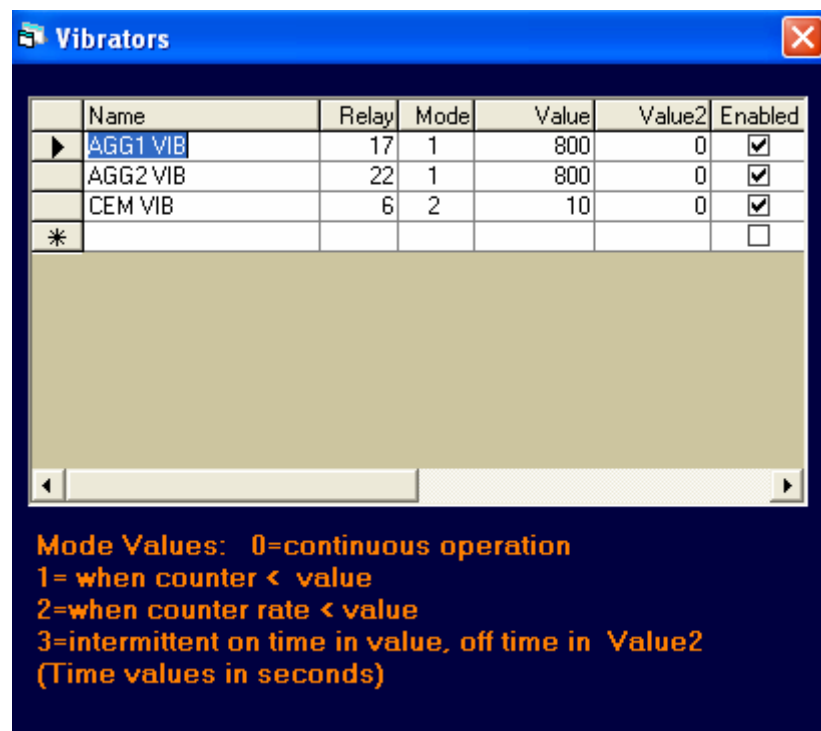
### Conveyors

The screenshot shows a software window titled "Incline Conveyors and Augers" with a close button in the top right corner. Below the title bar, the text "( Seconds )" is centered. A table with the following columns is displayed: Name, IsRunning Relay, Run Relay, Pre Run Time, and Post Run Time. The table contains three rows: an empty row, a row with "AGGREGATE" highlighted in blue, and a row with an asterisk "\*" in the Name column. The "AGGREGATE" row has values: IsRunning Relay: -1, Run Relay: 40, Pre Run Time: 0, and Post Run Time: 10.

	Name	IsRunning Relay	Run Relay	Pre Run Time	Post Run Time
		-1	-1	0	0
▶	AGGREGATE	-1	40	0	10
*					

The **Run Relay** is the relay number for turning the conveyor on and off. Some motors have an output that comes on when the motor is up to speed. This is the input to the **Is Running** relay. If there is no Is Running then set to -1 and the computer assumes the conveyor is running if the run relay is on. The **Pre Run Time** is the number of seconds from the activation of Run before any feeding hopper will open. May be necessary if a conveyor takes a while to get up to speed. **Post Run Time** is the number of seconds the conveyor will continue running after a discharging hopper is empty. On an aggregate incline conveyor this is the time that material takes to get from the bottom of the belt to the top.

## Vibrators



The screenshot shows a window titled 'Vibrators' with a table of settings. The table has columns for Name, Relay, Mode, Value, Value2, and Enabled. Below the table is a legend for the modes.

	Name	Relay	Mode	Value	Value2	Enabled
▶	AGG1 VIB	17	1	800	0	<input checked="" type="checkbox"/>
	AGG2 VIB	22	1	800	0	<input checked="" type="checkbox"/>
	CEM VIB	6	2	10	0	<input checked="" type="checkbox"/>
*						<input type="checkbox"/>

**Mode Values:** 0=continuous operation  
1= when counter < value  
2=when counter rate < value  
3=intermittent on time in value, off time in Value2  
(Time values in seconds)

Vibrators can be set to operate in one of 3 **Modes** as appropriate.

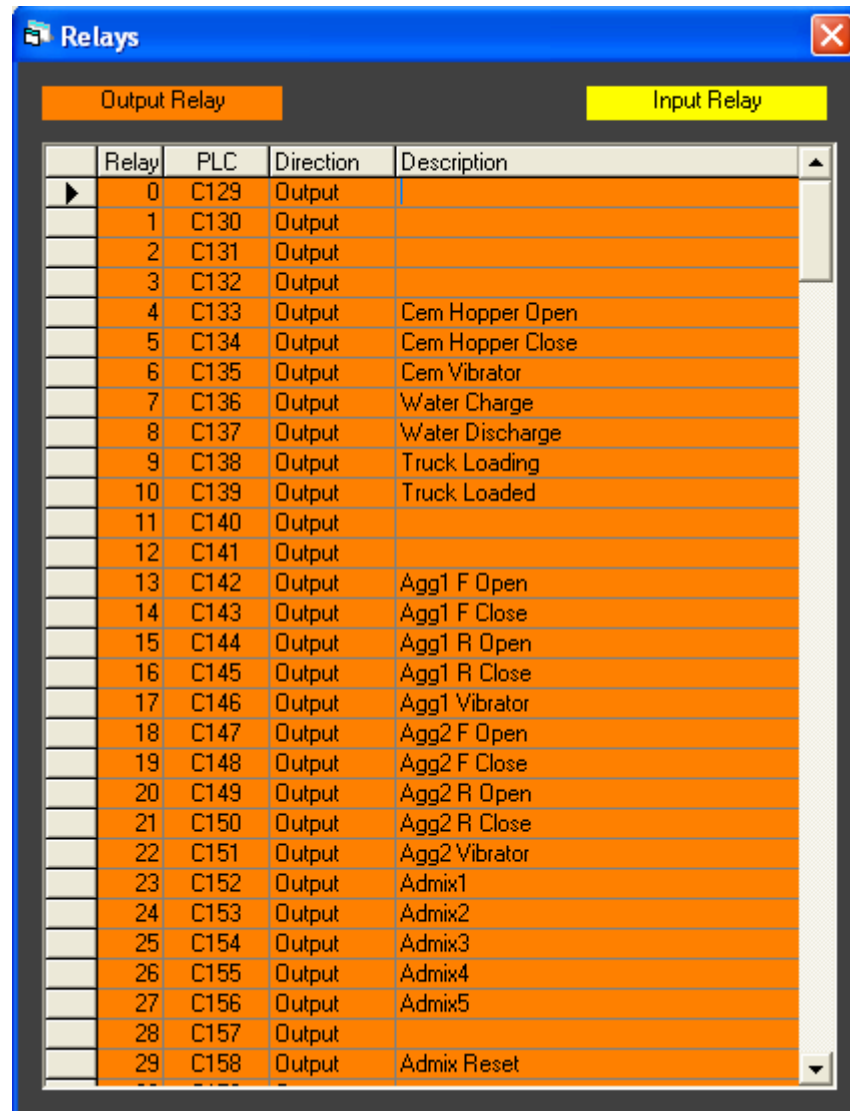
- Mode 1. The vibrator comes on when the counter is less than the set **value**. E.g. when the scale of an aggregate hopper gets below the value. A good mode for hoppers that have difficulty discharging when nearing empty.
- Mode 2. The vibrator comes on when the rate of flow is lower than the **value**. The value is measured in units per second. For cement this would be in Kg/second
- Mode 3. The vibrator cycles on and off . On for Value seconds then off for **Value2** seconds.

**Relay** is the relay number for activating the vibrator.



## Relays

There is a table for documenting relay usage.



Relay	PLC	Direction	Description
0	C129	Output	
1	C130	Output	
2	C131	Output	
3	C132	Output	
4	C133	Output	Cem Hopper Open
5	C134	Output	Cem Hopper Close
6	C135	Output	Cem Vibrator
7	C136	Output	Water Charge
8	C137	Output	Water Discharge
9	C138	Output	Truck Loading
10	C139	Output	Truck Loaded
11	C140	Output	
12	C141	Output	
13	C142	Output	Agg1 F Open
14	C143	Output	Agg1 F Close
15	C144	Output	Agg1 R Open
16	C145	Output	Agg1 R Close
17	C146	Output	Agg1 Vibrator
18	C147	Output	Agg2 F Open
19	C148	Output	Agg2 F Close
20	C149	Output	Agg2 R Open
21	C150	Output	Agg2 R Close
22	C151	Output	Agg2 Vibrator
23	C152	Output	Admix1
24	C153	Output	Admix2
25	C154	Output	Admix3
26	C155	Output	Admix4
27	C156	Output	Admix5
28	C157	Output	
29	C158	Output	Admix Reset

Relays 0 to 127 are used as outputs i.e. for turning something on

Relay	PLC	Direction	Description
122	C251	Output	
123	C252	Output	
124	C253	Output	
125	C254	Output	
126	C255	Output	
127	C256	Output	
128	C257	Input	Cem Closed
129	C258	Input	
130	C259	Input	Water Closed
131	C260	Input	Agg1 F Closed
132	C261	Input	Agg1 F Opened
133	C262	Input	Agg1 R Closed
134	C263	Input	Agg1 R Opened
135	C264	Input	Agg2 F Closed
136	C265	Input	Agg2 F Opened
137	C266	Input	Agg2 R Closed
138	C267	Input	Agg2 R Opened
139	C268	Input	
140	C269	Input	
141	C270	Input	
142	C271	Input	
143	C272	Input	
144	C273	Input	Fresh
145	C274	Input	Chilled
146	C275	Input	Recycle 1
147	C276	Input	Recycle 2
148	C277	Input	
149	C278	Input	
150	C279	Input	
151	C280	Input	E Stop

Relays 128 to 255 are used as inputs e.g. a limit switch is closed

## Discharge Profiles

Profile Name: BB [Update] [Delete]

Desired Agg flow rate kg/min: 6000

Max Cementitious flow rate kg/min: 2000 (Seconds)

	AGG	CEM	WTR	ADMX	ADDV	Post Delay
1	0	0	85	100	0	0
2	10	0	0	0	0	0
3	90	100	0	0	0	0
4	0	0	15	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0

[Create new profile based on this profile]

Discharge profiles control how a batched mix is loaded into the truck. The profile controls both the speed and sequence of loading. Different sized trucks may have different discharge profiles, special mixes may require a special profile.

In the above example the computer will control the aggregate discharge hopper so that 6000kg / minute is discharged onto the incline conveyor, the cement will be discharged at 2000kg/minute maximum.

The loading sequence may be up to 15 distinct intervals, the last indicated by a row of all zeros.

The computer does not move on to the next sequence until everything in the current sequence has completed.

Each cell in the loading sequence table represents a % of the total activity. Every column in the sequence table will add up to 100% (or zero if unused)

In the above example, firstly 85% of the total water and all the admixtures will be discharged together into the truck.

When that has fully completed 10% of the aggregate will be discharged.

When that has happened the cement and remaining aggregate are discharged together.

Finally the remaining 15% of water is added on its own.

The easiest way of creating a new profile is to first select a profile close to that required and click the *Create new profile based on this profile* button. Then modify as required and save.

The **Post Delay** column allows for entering a value in seconds. When a sequence completes if there is a non zero post delay on that row the next sequence will not be started until after post delay seconds. One could for instance create a profile that pauses for 60 seconds halfway through the loading to allow for the manual loading of colored oxide or fibres into the bowl.

## Mix Designs

Mix designs are the recipes for concrete products. The mix designs must be based on the dry weights of constituent materials. (Wet materials are compensated for at batch time by an assigned moisture %)

**Mix Code** 17 **Cash Sale Price** 0 **Update** **Delete**

**Description** N32MPa/20mm/80mm slump GP

**MPA** 32 **SLUMP** 80 **Max Agg** 20 **Trapped Air %** 0 **Calculate** **Enabled**

	Material	Amount	Enablec
1	GP	337	<input checked="" type="checkbox"/>
2	MP10	428	<input checked="" type="checkbox"/>
3	MP20	625	<input checked="" type="checkbox"/>
4	DUST	455	<input checked="" type="checkbox"/>
5	SAND	316	<input checked="" type="checkbox"/>
6	WR	1516	<input checked="" type="checkbox"/>
7	RE	1348	<input checked="" type="checkbox"/>
8	WATER	196	<input checked="" type="checkbox"/>
9		0	<input checked="" type="checkbox"/>
10		0	<input checked="" type="checkbox"/>
11		0	<input checked="" type="checkbox"/>
12		0	<input checked="" type="checkbox"/>
13		0	<input checked="" type="checkbox"/>
14		0	<input checked="" type="checkbox"/>
15		0	<input checked="" type="checkbox"/>

**Create new Mix based on this Mix**

Each row of the mix design has the material and quantity required for one cubic metre of product. If a product is not **enabled** it will not be batched.

The batching sequence of materials using the same counter is the order in which they occur in the mix design. Materials using different counters can batch simultaneously e.g. cement and water weigh up at the same time. In the above example MP10, MP20, DUST and SAND which are all aggregates will batch up in that order into the aggregate weigh hopper of any plant that has one weigh hopper for all aggregates.

If correct specific gravity's have been entered against materials (in the material setup) then the **calculate** button will show the yield that would be achieved if these exact quantities were batched.

After entering a new mix design it is a good check to verify the yield as a number not close to 1 is an indication of a material omitted or a wrong quantity.

**Mix Design**

Mix Code: 17  
 Cash Sale Price: 0  
 Description: N32MPa/20mm/80mm slump GP  
 MPA: 32, SLUMP: 80, Max Agg: 20, Trapped Air %: 0  
 Calculate button: Enabled

	Material		
1	GP		
2	MP10		
3	MP20		
4	DUST		
5	SAND		
6	WR	1516	<input checked="" type="checkbox"/>
7	RE	1348	<input checked="" type="checkbox"/>
8	WATER	196	<input checked="" type="checkbox"/>
9		0	<input checked="" type="checkbox"/>
10		0	<input checked="" type="checkbox"/>
11		0	<input checked="" type="checkbox"/>
12		0	<input checked="" type="checkbox"/>
13		0	<input checked="" type="checkbox"/>
14		0	<input checked="" type="checkbox"/>
15		0	<input checked="" type="checkbox"/>

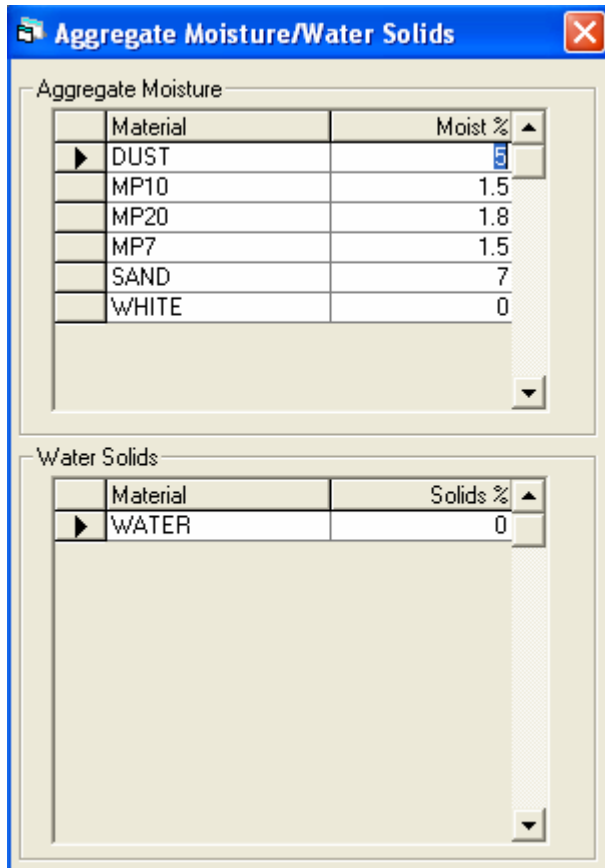
Calculations dialog box:  
 Yield = 1.076  
 Cost = 0.00  
 OK button

Create new Mix based on this Mix

If raw material costs have been entered then the calculation also gives the material cost of the mix.

As mentioned previously, all mix designs are based on dry weights.

To compensate for water included in actual materials that are not dry, the computer increases the batched weight of the non dry material so as to be equal the required weight of dry material. The extra weight is water that the computer then subtracts from the batched water in the mix design.



The screenshot shows a software dialog box titled "Aggregate Moisture/Water Solids". It is divided into two sections: "Aggregate Moisture" and "Water Solids".

**Aggregate Moisture Table:**

Material	Moist %
DUST	5
MP10	1.5
MP20	1.8
MP7	1.5
SAND	7
WHITE	0

**Water Solids Table:**

Material	Solids %
WATER	0

The moisture % may be adjusted in the table at any time. Direct measuring moisture probes may also be connected to the batching system.

If recycled water is being used the % weight due to suspended solids may also be set. The batch computer will increase the water content to compensate for the weight attributable to the suspended solids.

The plant screen is used for setting miscellaneous relays and other details. After initial setup there is nothing in the plant screen that requires changing or fine tuning.

The screenshot shows a software window titled "Plant" with a blue header and a close button in the top right. The window contains several sections for configuration:

- Serial Number:** A text box containing the value "0".
- Site Prefix:** An empty text box.
- Phone/Fax:** Two empty text boxes.
- Site Details:** Three empty text boxes stacked vertically.
- Docket Printer:** A dropdown menu currently showing "OKI MICROLINE 320 TU".
- Email address(es) to send transaction data:** An empty text box.
- Determining Configuration:**
  - Maximum single batch size:** A text box containing "7.5".
  - Block Plant:** An unchecked checkbox.
  - Moisture Probe:** An unchecked checkbox.
  - Tandem agg bin:** A checked checkbox.
  - Wet Mix Plant:** An unchecked checkbox.
- Print Docket:** A checked checkbox.
- At Start of Batch:** An unchecked radio button.
- At Start of Loading:** An unchecked radio button.
- At End of Loading:** An unchecked radio button.
- At End of Slumping:** A checked radio button.
- Docket Style:** A dropdown menu currently showing "Laser1".
- Days history kept:** A text box containing "90".
- ABN:** An empty text box.
- GST %:** A text box containing "0".
- Miscellaneous Relays (Stationary Mixer):** A section with two tabs, "Miscellaneous Relays" (selected) and "Stationary Mixer". It contains several text boxes with values:
  - Truck in Position: 153
  - Auto Manual: 152
  - Hold Batching: -1
  - Out of Tolerance: 42
  - Truck Loaded: 10
  - Pulse Reset: 29
  - Accept Tolerance: 154
  - On Time: 5000
  - Batch Ready: 41

At the bottom center of the window is a "Save Settings" button.

The **Maximum single batch size** is generally governed by the physical sizes of the weigh hoppers, and may well be less than the capacity of the largest truck bowl. If a requested batch is larger than this value then the load will be batched in two or more drops. E.g. a request for 8 cubic metres would result in two drops each of 4 cubic metres. These drops would have the same batch number and a single docket is generated.

Docket printing can happen at one of 4 different places in the batch cycle as shown above. The batch time printed on the docket will be the time that the docket was first generated.

Reports are always printed to the Windows default printer. The printer for dockets may be selected from the **Docket Printer** drop down which lists all printers installed to the batch computer.



The **Docket Style** allows for different printer types and stationery.

Laser1 setting produces a single page output and is suitable for both laser printers and impact printers that have multi part continuous forms.

Laser2 and Laser3 settings are for laser style printers only and will produce 2 or 3 copies of the same docket allowing plain single sheets to be used rather than multipart forms.

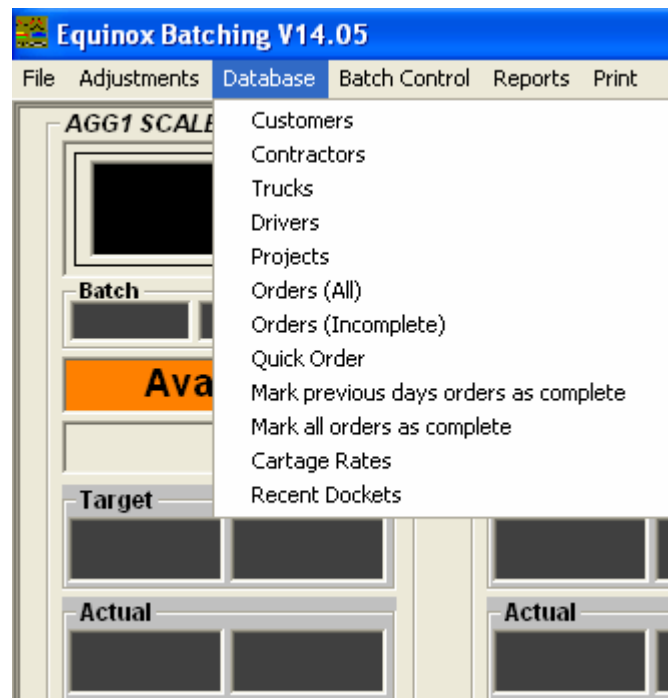
The screenshot shows a software window titled "Plant" with a blue title bar and a close button. The window contains several sections for configuration:

- Serial Number:** Input field with "0".
- Site Prefix:** Input field.
- Phone/Fax:** Input fields.
- Site Details:** Three empty text input fields.
- Docket Printer:** Dropdown menu set to "OKI MICROLINE 320 TU".
- Email address(es) to send transaction data:** Input field.
- Determining Configuration:**
  - Maximum single batch size: Input field with "7.5".
  - Block Plant:
  - Moisture Probe:
  - Tandem agg bin:
  - Wet Mix Plant:
- Miscellaneous Relays:** A section with a tab labeled "Stationary Mixer".
  - Counter: Dropdown menu set to "NONE".
  - Mixer Auto Manual: Input field with "-1".
  - Mixer Busy: Input field with "-1".
  - Mixer All Done: Input field with "-1".
  - Mixer Precut: Input field with "0".
  - Mixer Charge Select: Input field with "-1".
  - All Done Timer: Input field with "0".
  - Mixer Discharge: Input field with "-1".
  - Discharge Ready: Input field with "-1".
- Docket Style:** Dropdown menu set to "Laser1".
- Days history kept:** Input field with "90".
- ABN:** Input field.
- GST %:** Input field with "0".

At the bottom of the window is a "Save Settings" button.

Some plants run a stationary mixer onsite (typically for loading mini trucks) The settings for controlling the stationary mixer are also set up from this screen.

## Database



Database menu option is for creating tables that are not to do with the plant setup. The tables are about the administration and generation of loads.

The tables are

- Customers - Person or company buying concrete
- Contractors - Anyone who owns one or more trucks operating.
- Trucks - All of the trucks
- Drivers - Details about truck drivers
- Projects - Delivery location and mix pricing at location.
- Order - Detail about a single mix for project delivery.
- Recent Dockets - Individual docket loads resulting from an order.

Code: BETTER BRICKLAYING      Type: Credit Account

Account: Better Bricklaying

Name: Justin Gotard

Address1: 60 OUTLOOK DR

Address2:

Address3:

Phone: 0412800765

Fax:

Email:

CreditLimit: 0      CurrentCredit: 0

Notes:

	ContactName	ContactPosition	ContactPhone	ContactFax	ContactEmail
*					

Update      Next      Cancel

The customer record is self explanatory. The address is an invoicing address which may be different from a customers order delivery address.

Most plants set up a single cash sale customer for one off cash jobs.

Code: NMC

Name: Neil Mansell Concrete

Address1:

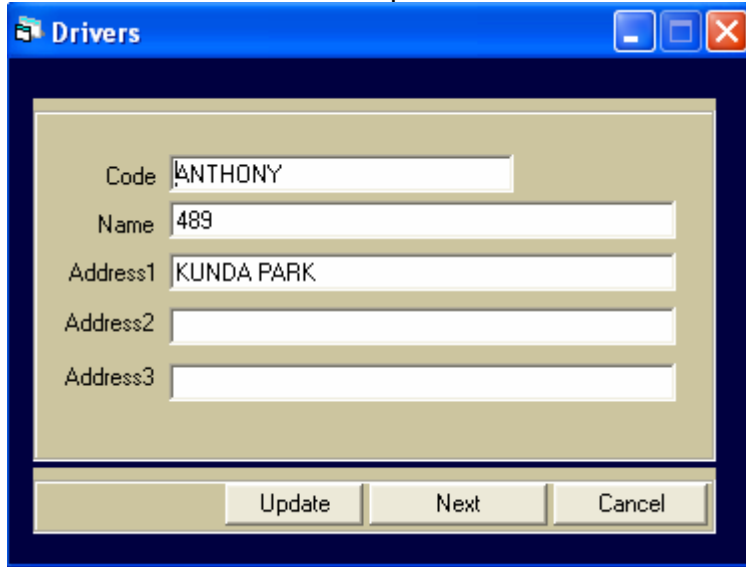
Address2:

Address3:

Update      Next      Cancel

The contractor (truck owner) record is very simple.

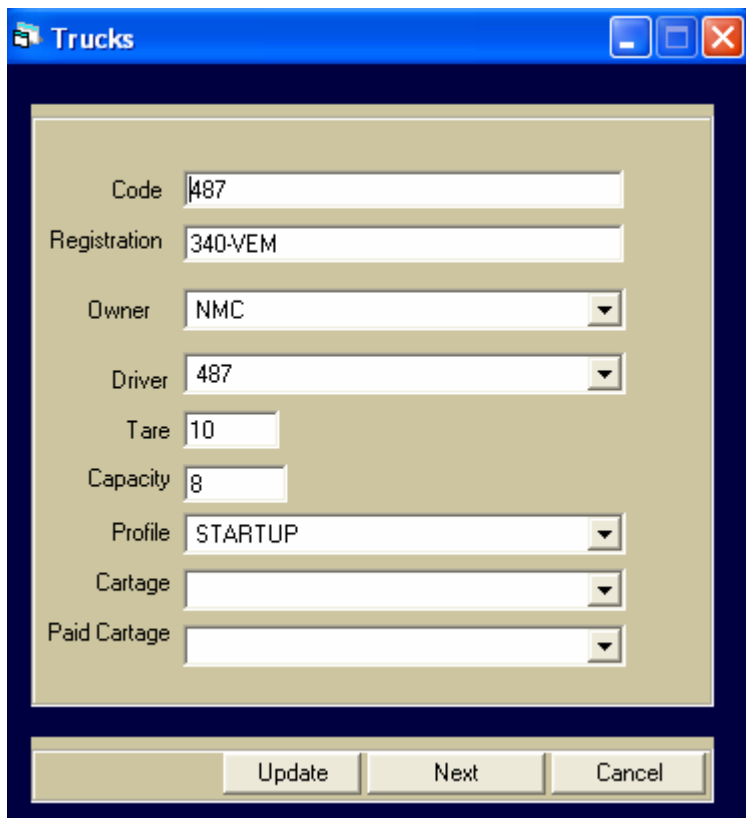
Driver records are also simple to understand



The screenshot shows a window titled "Drivers" with a blue title bar. The form contains the following fields:

Code	ANTHONY
Name	489
Address1	KUNDA PARK
Address2	
Address3	

At the bottom of the form are three buttons: "Update", "Next", and "Cancel".



The screenshot shows a window titled "Trucks" with a blue title bar. The form contains the following fields:

Code	487
Registration	340-VEM
Owner	NMC
Driver	487
Tare	10
Capacity	8
Profile	STARTUP
Cartage	
Paid Cartage	

At the bottom of the form are three buttons: "Update", "Next", and "Cancel".

Contractors (Owner) and Drivers must already be in their corresponding tables before a truck record can be completed. The **Capacity** is the largest load this truck may take. A warning is produced at batch time if you attempt to batch a load that exceeds the truck capacity.

## Projects

The screenshot shows a software window titled "Projects" with a blue title bar. The window contains a form with the following fields and sections:

- Code:** BETTER BRICKLAYING
- Customer:** BETTER BRICKLAYING (dropdown menu), Distance: 25
- Name:** Justin Gotard
- Description:** (empty text area)
- Address1:** 60 Outlook Dr Nindery
- Address2:** (empty text area)
- Address3:** (empty text area)
- Remarks:** Caution inside school zone 7:30 until 09:00
- Contact:** (empty text area)
- Table:** A table with 3 columns: Mix Code, Mix Description, and Price. The second row is highlighted in cyan.

	Mix Code	Mix Description	Price
▶	200	S20MPa/7mm230mm Blockfill.GP	187
*			

At the bottom of the window, there are three buttons: "Update", "Next", and "Cancel".

A project is created for each customer delivery address. Pricing for different mixes to the project location goes here. A project may run for a very long time or may just be for one load. A single Cash project could be created for one off jobs and all the detail recorded on an **Order**. Anything written in **Remarks** is printed on delivery docketts.

## Orders

Every Job, no matter how small will require an order.

The screenshot shows a software window titled "Orders" with a blue title bar. The main area is divided into several sections:

- Order Code:** BETTER BRICKLAYIN
- Project:** BETTER BRICKLAYIN (dropdown)
- Customer:** BETTER BRICKLAYIN (dropdown)
- Cust Ref:** (empty text field)
- Date of Order:** 27/11/14 (dropdown)
- MixDetails:**
  - MixCode: 200 (dropdown)
  - Quantity Ordered: 15 (text field) with a checked "Plus" checkbox
  - Slump: 230, MPA: 20, Delivered \$/M3: 0 (text fields)
  - Calc button
  - Table:

Material	Quantity
▶ RE	120
- Job Delivery Details:**
  - Name: Justin Gotard
  - Address: 60 Outlook Dr Nindery
  - Remark: (empty text area)
  - Distance to Job: 25, Time to Job: 15
  - Time Between Loads: 45
  - Time First Load: 27/11/14 13:45 (dropdown)
- Delivered Details:**
  - Supplied: 11.4, Loads: 2
  - First Load Docket Number: 38
- Order Notes:** (empty text area)
- Completed:**

At the bottom, there are three buttons: "Update", "Next", and "Cancel".

The order is for one mix design only and largely controls everything other than the load size and truck when a load is batched.

Materials that have been set up as modifiable will show on this screen (Retarder RE in this case, the mix design value of 120mls/100 kg cementitious may be changed). The changed value will replace the mix design value whenever this order is used – modifiable materials can also be changed at batch time without changing the order.

**Plus** means that more than the ordered quantity can be batched against this order.

**Completed** should be ticked when the order is finished to limit the number of orders to choose from on the **new batch** screen.

**Recent docket** firstly gives a list of docket with the most recent docket listed first

	Batch	Mix	Qty	Order	Truck	Cancelled
	45	TEST	4	TEST	TEST	No
▶	44	TEST	6	TEST	TEST	No
	43	TEST	6	TEST	485	No
	42	TEST	4	TEST	TEST	No
	41	4	6.4	SHEDMEN	489	No
	40	200	5.4	BETTER BRICK	486	No
	39	10	3.6	COD	487	No
	38	200	6	BETTER BRICK	489	No
	37	180	3.6	AZFIRM	486	No
	36	180	7	AZFIRM	487	No
	35	95	4.2	WAG	487	No
	34	95	5	WAG	489	No
	33	95	5	WAG	485	No
	32	95	4.4	WAG	486	No
	31	95	4.6	WAG	485	No
	30	5	2.2	ALKIRA 20	487	No
	29	5	7.4	ALKIRA 20	486	No
	28	5	7.4	ALKIRA 20	485	No
	27	5	7.4	ALKIRA 20	489	No
	26	4	7.4	ALKIRA 20	487	No
	25	4	7.4	ALKIRA 20	486	No
	24	4	7.4	ALKIRA 20	485	No
	23	5	1	NMC	TEST	No
	22	TEST	1	TEST	TEST	No
	21	TEST	1	TEST	TEST	No
	20	5	3	NMC	TEST	No
	19	12	2	NMCO1	TEST	No
	18	TEST	3	TEST	TEST	No

Reprint Docket      Show Detail      Edit Detail      Change Cancelled

Highlight a docket by clicking the left blank column of the row. Once a docket is chosen in this way, options to reprint or make changes become available.

Limited changes only are allowed to a docket. It is possible to correct for using the wrong order, truck or driver. Other batch details remain unchanged for quality assurance purposes.

Change Order, Truck or Driver on docket

Docket 37

Old Values	New values
Order AZFIRM	AZFIRM
Truck 486	486
Driver LINC	LINC

Update

### Ready to batch.

With a plant that has been set up, a database of mix designs, orders and trucks we are ready to let the batching computer do the rest of the work.

Batching a load of concrete requires just an order, a quantity and a truck. The computer knows the project from the order and the project knows the customer.



New Job - Batch No 46

Order: AZFIRM

Mix	Quantity	Trim	Returned
152	4.2	-20	0

Truck: 487 Driver: LINC

Profile: STARTUP

Agg Hopper:  Front  Rear

Notes / Reference: RE 100

	Mat	/Metre	Load
▶	MP10	300	1258
	MP20	418	1754
	MP7	149	626
	DUST	490	2060
	SAND	342	1437
	GP	320	1344
	FA	150	630
	WATER	148	623
	w/R	2115	8883

**CANCEL** **Queue For Batching**

Select the **order** from the drop down.

Enter the **quantity** to be batched and select a **truck**

The **Trim** varies the water from the mix design values and is expressed as litres / cubic metre. (In the above a total of  $4.2 \times -20 = 84$  litres will be held back.

**Returned** allows for a non empty truck to use a returned load. All documentation is for the load quantity, but the amount actually batched will be (Quantity – Returned)

The **Driver** and **Profile** that was originally assigned to the truck in the database may be altered and the alteration is for this load only.

New Job - Batch No 46

Order: AZFIRM

Mix	Quantity	Trim	Returned
152	4.2	-20	0

Truck: 487 Driver: LINC

Profile: STARTUP

Agg Hopper:  Front  Rear

Notes / Reference: RE 100

Mat	/Metre	Load
DUST	490	2060
SAND	342	1437
GP	320	1344
FA	150	630
WATER	128	539
WR	2115	8883
RE	220	4343
HRWRRE	221	4363

**CANCEL** **Queue For Batching**

Materials that are modifiable are highlighted in the batching materials list.

Note that materials with units of mls/100kg cementitious use that figure in the /metre column but the total load column is the actual quantity that will be batched ( in this case total cementitious (FA and GP) is  $630 + 1344 = 1974$  So total of RE at 220mls / 100kg cementitious will be  $220 \times 1974 / 100 = 4343$

To change a modifiable material prior to batching, click that materials /metre value.

Notes / Reference  
RE 100

Mat	/Metre	Load
DUST	490	2060
SAN		437
GP		344
FA		630
WA		539
WR		883
RE		343
HR		363

RE Adjust / M3

mls/100kg Cem

Cancel
Update Mix

CANCEL
Queue For Batching

Change the value and click **Update Mix**.

Once batch details are as required, click the **Queue for Batching** button

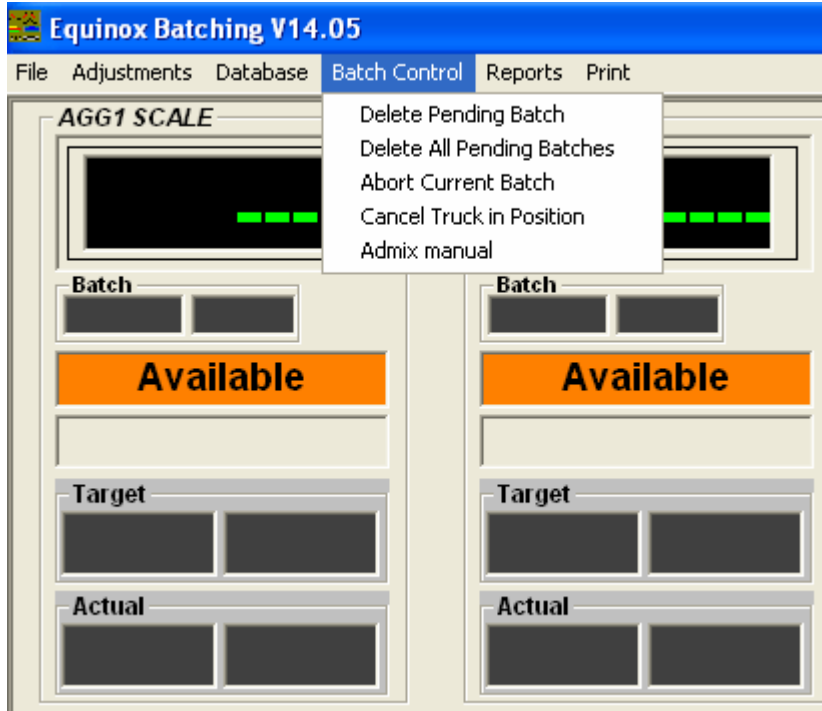
The batch will be entered into the batch queue

Batch	Qty	Mix	Order	Truck	Driver	Description
46	4.2	152	AZFIRM	487	LINC	4.2 MRTS70 S50MPa/20mm/160mmSlump (DRY) Tremie Tarwin Place Mountain Creek RE 100

If the plant is in automatic and ready the batch will be removed from the queue immediately and the load will be batched.

The batcher must press the **Truck Ready** button on the control panel before the batched load will move from the weigh hoppers to the truck.

## Batch Control



The batch control menu option affects the current or queued batches.

Cem Hopper Open	Cem Hopper Close	Cem Vibrator	Water Charge	Water Disch
Agg1 F Close	Agg1 R Open	Agg1 R Close	Agg1 Vibrator	Agg2 F Op
Agg2 F Close	Agg2 R Open	Admix2	Admix3	Admix4
Batch Ready	Out of Tolerance	Cem Clos		
Agg2 F Closed	Agg2 F Opened	Agg2 R Clc		
E Stop	Auto	Truck Rea		

Batch	Qty	Mix	Order	Truck	Driver	Description
46	4.2	152	AZFIRM	487	LINC	4.2 MRTS70 S50MPa/20mm/160mmSlump (DRY) Tremie Tarwin Place Mountain Creek RE 100

Delete Pending Batch allows for a single batch number to be selected. Delete all pending batches removes everything from the queue. Neither affects the current batch once it has commenced.

**Abort current batch** clears the process control computer and PLC. Everything will stop and relays will all switch off. The batch can not be restarted. For a temporary halt, switch the plant to Manual then back to Auto when ready.

**If the batcher should switch the plant to manual and complete a batch manually for any reason then it is essential to click the Abort current batch menu option before another batch is queued.**

**Cancel Truck in Position** allows the truck ready signal to be removed. It only has effect before the truck has started loading. The batching of materials into weigh hoppers will complete but the load will not go into the truck until the Truck Ready button is pressed again.