AGGREGATE BATCHER CALIBRATION PROCEDURES:

Due to the accuracy required and the specialized training necessary to perform the required adjustments and calibration, it is recommended that a qualified technician perform the work on the batchers. If a qualified technician is not available, then use the following procedure to calibrate the batchers to a reasonable degree of accuracy.

Aggregate Weigh Batcher or Weigh Belt Calibration @ Load Cell Summing Junction Box:

1. Using the Volt meter and verify the following:
   a. Incoming voltage (120 VAC) to relay base (pin 3 & 1) and DC power supply (terminal 1 & 3).
   b. Good ground connection by measuring between Neutral terminal block and Ground terminal block or Ground Bus (should be constant - No fluctuation).
2. DO NOT CONNECT LOAD CELL WIRES TO LOAD CELL JUNCTION BOX TERMINALS.
3. Using the Volt meter and verify output voltage of 10 VDC power supply (check at each RED & BLACK terminal blocks - Excitation Voltage).

   V_{exc_agg} = _____ VDC
4. Using the Volt meter and verify output voltage from the Aggregate Batcher Load Cell junction box is approximately - 5 VDC without any load (pin 7 & 8 on relay base).

   V_{out_agg} = _____ VDC
5. Insure that the Aggregate Batcher is empty and all unfastened material has been removed.
6. NOW CONNECT EACH LOAD CELL WIRES TO LOAD CELL JUNCTION BOX TERMINAL.
7. Using the Volt meter and verify output voltage of 10 VDC power supply (check at each RED & BLACK terminal blocks - Excitation Voltage).

   V_{exc_agg1} = _____ VDC
8. Verify that **$V_{exc\_agg} = V_{exc\_agg1}$**. If not, continue to observe and check for any loose wiring connection. Call factory if Voltage Fluctuation occur (possibly power supply failure).
9. Using the Volt meter and RECORD output voltage from each Load Cell for reference. Pin 7 & 8 on relay base.

   V_{agg_lc1} = _____ VDC
10. Remove Load Cell 1 and repeat step 7 thru 9 for all Load Cells on Aggregate Batcher.

V_{exc_agg2} = _____ VDC	**V_{agg_lc2} = _____ VDC**
V_{exc_agg3} = _____ VDC	**V_{agg_lc3} = _____ VDC**
V_{exc_agg4} = _____ VDC	**V_{agg_lc4} = _____ VDC**

11. NOW CONNECT ALL LOAD CELL WIRES TO LOAD CELL JUNCTION BOX TERMINALS.

12. Using the Volt meter and verify output voltage of 10 VDC power supply (check at each RED & BLACK terminal blocks - Excitation Voltage).

    V_{exc_agg1} = _____ VDC

13. Verify that **$V_{exc\_agg} = V_{exc\_agg1}$**. If not, continue to observe and check for any loose wiring connection. Call factory if Voltage Fluctuation occur (possibly power supply failure).

14. Using the Volt meter and RECORD output voltage from the Load Cell Junction Box. Pin 7 & 8 on relay base. This is the Aggregate Batcher Empty Voltage.

    V_{agg_empty} = _____ VDC

15. ADD a predetermine weight (**WT1**) to the Aggregate Batcher and RECORD the output voltage from the Aggregate Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT1 = _____ lbs. or kgs. **V_{agg_WT1} = _____ VDC**

16. ADD a predetermine weight (**WT2**) to the Aggregate Batcher and RECORD the output voltage from the Aggregate Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT2 = _____ lbs. or kgs. **V_{agg_WT2} = _____ VDC**

17. ADD a predetermine weight (**WT3**) to the Aggregate Batcher and RECORD the output voltage from the Aggregate Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT3 = _____ lbs. or kgs. **V_{agg_WT3} = _____ VDC**

18. ADD a predetermine weight (**WT4**) to the Aggregate Batcher and RECORD the output voltage from the Aggregate Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT4 = _____ lbs. or kgs. **V_{agg_WT4} = _____ VDC**

19. If all predetermine weight are the same (example = 50 lb. each), then the differential Voltage between each weight step should be the same.

    Example:

w/o any weight added		**V_{agg_empty} = - 3.94 VDC**
w/ 50 lb.	**WT1 = 50 lbs.**	**V_{agg_WT1} = - 3.725 VDC**
w/ additional 50 lb.	**WT2 = 100 lbs.**	**V_{agg_WT2} = - 3.570 VDC**
w/ additional 50 lb.	**WT3 = 150 lbs.**	**V_{agg_WT3} = - 3.415 VDC**
w/ additional 50 lb.	**WT4 = 200 lbs.**	**V_{agg_WT3} = - 3.260 VDC**

20. Remove all the weights on the batcher or belt.

Aggregate Weigh Batcher or Weigh Belt Calibration @ Main Control Panel:

1. Verify shielded cable connection from Aggregate Batcher Load Cell junction box directly to terminal on Analog module and shield is connected to ground.

2. Calculation to determine Aggregate Weigh Batcher or Weigh Belt Load Cell High Limit:

   Agg. High Limit = [(WT3 - WT1) * 10] / (V_{agg_WT3} - V_{agg_WT1})

   or **Agg. High Limit = [(WT4 - WT2) * 10] / (V_{agg_WT4} - V_{agg_WT2})**

   This is the Maximum weight that the Aggregate Weigh Batcher or Belt can handle.

   Example: **Agg. High Limit = [(WT3 - WT1) * 10] / (V_{agg_WT3} - V_{agg_WT1})**

   = [(150 - 50) * 10] / (- 3.415 + 3.725)

   = 3225.8 (Maximum weight)

   or **Agg. High Limit = [(WT4 - WT2) * 10] / (V_{agg_WT4} - V_{agg_WT2})**

   = [(200 - 100) * 10] / (- 3.26 + 3.570)

   = 3225.8 (Maximum weight)

3. ENTER the **Agg. High Limit** value in the SCALE instruction box using the TI Software. (Refer to the TI Programming Reference Manual for SFPGM & SCALE instruction)

   - ON-LINE with the PLC using TISOFT
   - Press "space bar" for next commands
   - Press F8 "SFPGM"
   - Select the appropriate SFPGM instruction
   - Press F2 "SHOW"
   - Using the arrow "Down" key to select edit instruction
   - Press F2 "EDIT"
   - Using the "ENTER" key to scroll to the "High Limit" field and enter the **Agg. High Limit** value.
   - Press F8 "ENTER" to accept all the changes.
   - Press F2 "YES" if question Loop Card in Run Mode.
   - Press F1 "EXIT"
   - Press F1 "EXIT". This should get you back to the Relay Ladder Logic screen.

Aggregate Weigh Batcher or Weigh Belt Calibration @ Main Control Panel: **(continued)**

4. Select the System Calibration & Setup Screen on the Panelmate (Page 8)
5. RECORD the value in 'AGG BATCHER SCALE VALUE' template. **THIS IS YOUR AGG. BATCHER STRUCTURE WEIGHT.**
6. Enter the Aggregate Batcher structure weight into 'AGG. BATCHER STRUCTURE WT' template.
7. Double check by adding predetermine weight to the batcher and verify that weight with the Panelmate. Repeat several times to verify weight accuracy

   Predetermine weight = Agg Batcher Scale Value - Agg Batcher Structure Weight
   (Call factory if there is any question or problems)
8. The Aggregate Weigh Batcher or Weigh Belt is now calibrated.

YOU CAN GO TO THE NEXT PROCEDURE NOW. THANK YOU

CEMENT BATCHER CALIBRATION PROCEDURES:

Due to the accuracy required and the specialized training necessary to perform the required adjustments and calibration, it is recommended that a qualified technician perform the work on the batchers. If a qualified technician is not available, then use the following procedure to calibrate the batchers to a reasonable degree of accuracy.

Cement Weigh Batcher Calibration @ Load Cell Summing Junction Box:

1. Using the Volt meter and verify the following:
   a. Incoming voltage (120 VAC) to relay base (pin 3 & 1) and DC power supply (terminal 1 & 3).
   b. Good ground connection by measuring between Neutral terminal block and Ground terminal block or Ground Bus (should be constant - No fluctuation).
2. DO NOT CONNECT LOAD CELL WIRES TO LOAD CELL JUNCTION BOX TERMINALS.
3. Using the Volt meter and verify output voltage of 10 VDC power supply (check at each RED & BLACK terminal blocks - Excitation Voltage).

   V_{exc_cem} = _____ VDC
4. Using the Volt meter and verify output voltage from the Cement Batcher Load Cell junction box is approximately - 5 VDC without any load (pin 7 & 8 on relay base).

   V_{out_cem} = _____ VDC
5. Insure that the Cement Batcher is empty and all unfastened material has been removed.
6. NOW CONNECT EACH LOAD CELL WIRES TO LOAD CELL JUNCTION BOX TERMINAL.
7. Using the Volt meter and verify output voltage of 10 VDC power supply (check at each RED & BLACK terminal blocks - Excitation Voltage).

   V_{exc_cem1} = _____ VDC
8. Verify that $V_{exc\_cem} = V_{exc\_cem1}$. If not, continue to observe and check for any loose wiring connection. Call factory if Voltage Fluctuation occur (possibly power supply failure).
9. Using the Volt meter and RECORD output voltage from each Load Cell for reference. Pin 7 & 8 on relay base.

   V_{cem_lc1} = _____ VDC
10. Remove Load Cell 1 and repeat step 7 thru 9 for all Load Cells on Cement Batcher.

V_{exc_cem2} = _____ VDC	V_{cem_lc2} = _____ VDC
V_{exc_cem3} = _____ VDC	V_{cem_lc3} = _____ VDC
V_{exc_cem4} = _____ VDC	V_{cem_lc4} = _____ VDC

11. NOW CONNECT ALL LOAD CELL WIRES TO LOAD CELL JUNCTION BOX TERMINALS.

12. Using the Volt meter and verify output voltage of 10 VDC power supply (check at each RED & BLACK terminal blocks - Excitation Voltage).

    V_{exc_cem1} = _____ VDC

13. Verify that **$V_{exc\_cem} = V_{exc\_cem1}$**. If not, continue to observe and check for any loose wiring connection. Call factory if Voltage Fluctuation occur (possibly power supply failure).

14. Using the Volt meter and RECORD output voltage from the Load Cell Junction Box. Pin 7 & 8 on relay base. This is the Cement Batcher Empty Voltage.

    V_{cem_empty} = _____ VDC

15. ADD a predetermine weight (**WT1**) to the Cement Batcher and RECORD the output voltage from the Cement Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT1 = _____ lbs. or kgs. **V_{cem_WT1} = _____ VDC**

16. ADD a predetermine weight (**WT2**) to the Cement Batcher and RECORD the output voltage from the Cement Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT2 = _____ lbs. or kgs. **V_{cem_WT2} = _____ VDC**

17. ADD a predetermine weight (**WT3**) to the Cement Batcher and RECORD the output voltage from the Cement Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT3 = _____ lbs. or kgs. **V_{cem_WT3} = _____ VDC**

18. ADD a predetermine weight (**WT4**) to the Cement Batcher and RECORD the output voltage from the Cement Batcher Load Cell junction box (pin 7 & 8 on relay base).

    WT4 = _____ lbs. or kgs. **V_{cem_WT4} = _____ VDC**

19. If all predetermine weight are the same (example = 50 lb. each), then the differential Voltage between each weight step should be the same.

    Example:

w/o any weight added		**V_{cem_empty} = - 3.94 VDC**
w/ 50 lb.	**WT1 = 50 lbs.**	**V_{cem_WT1} = - 3.725 VDC**
w/ additional 50 lb.	**WT2 = 100 lbs.**	**V_{cem_WT2} = - 3.570 VDC**
w/ additional 50 lb.	**WT3 = 150 lbs.**	**V_{cem_WT3} = - 3.415 VDC**
w/ additional 50 lb.	**WT4 = 200 lbs.**	**V_{cem_WT3} = - 3.260 VDC**

20. Remove all the weights on the batcher or belt.

Cement Weigh Batcher Calibration @ Main Control Panel:

1. Verify shielded cable connection from Cement Batcher Load Cell junction box directly to terminal on Analog module and shield is connected to ground.

2. Calculation to determine Cement Weigh Batcher or Weigh Belt Load Cell High Limit:

   Cem. High Limit = [(WT3 - WT1) * 10] / (V_{cem_WT3} - V_{cem_WT1})

   or **Cem. High Limit = [(WT4 - WT2) * 10] / (V_{cem_WT4} - V_{cem_WT2})**

   This is the Maximum weight that the Cement Weigh Batcher can handle.

   Example: **Cem. High Limit = [(WT3 - WT1) * 10] / (V_{cem_WT3} - V_{cem_WT1})**

   = [(150 - 50) * 10] / (- 3.415 + 3.725)

   = 3225.8 (Maximum weight)

   or **Cem. High Limit = [(WT4 - WT2) * 10] / (V_{cem_WT4} - V_{cem_WT2})**

   = [(200 - 100) * 10] / (- 3.26 + 3.570)

   = 3225.8 (Maximum weight)

3. ENTER the **Cem. High Limit** value in the SCALE instruction box using the TI Software. (Refer to the TI Programming Reference Manual for SFPGM & SCALE instruction)

   - ON-LINE with the PLC using TISOFT
   - Press "space bar" for next commands
   - Press F8 "SFPGM"
   - Select the appropriate SFPGM instruction
   - Press F2 "SHOW"
   - Using the arrow "Down" key to select edit instruction
   - Press F2 "EDIT"
   - Using the "ENTER" key to scroll to the "High Limit" field and enter the **Cem. High Limit** value.
   - Press F8 "ENTER" to accept all the changes.
   - Press F2 "YES" if question Loop Card in Run Mode.
   - Press F1 "EXIT"
   - Press F1 "EXIT". This should get you back to the Relay Ladder Logic screen.

Cement Weigh Batcher or Weigh Belt Calibration @ Main Control Panel: (continued)

4. Select the System Calibration & Setup Screen on the Panelmate (Page 8)

5. RECORD the value in 'CEM BATCHER SCALE VALUE' template. **THIS IS YOUR CEM. BATCHER STRUCTURE WEIGHT.**

6. Enter the Cement Batcher structure weight into 'CEM. BATCHER STRUCTURE WT' template.

7. Double check by adding predetermine weight to the batcher and verify that weight with the Panelmate. Repeat several times to verify weight accuracy

   Predetermine weight = Cem. Batcher Scale Value - Cem. Batcher Structure Weight
   (Call factory if there is any question or problems)

8. The Cement Weigh Batcher is now calibrated.

YOU CAN GO TO THE NEXT PROCEDURE NOW. THANK YOU