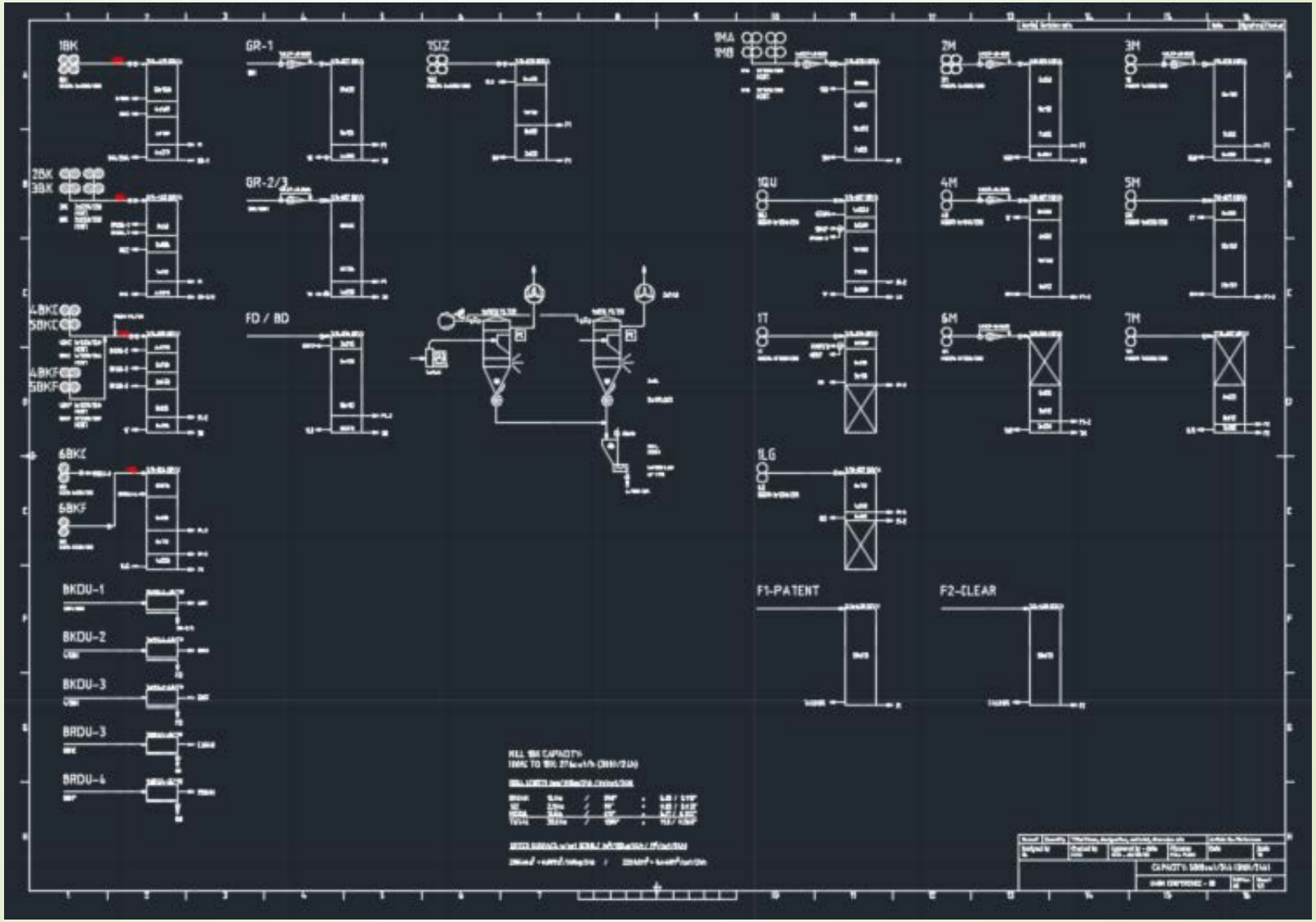
Modernizing the Mill Flow

John Steinfort – Star of the West Milling

A Review of the Use of Impact Detachers to Aid Milling

Modernizing the Flow – Using Impact Technology



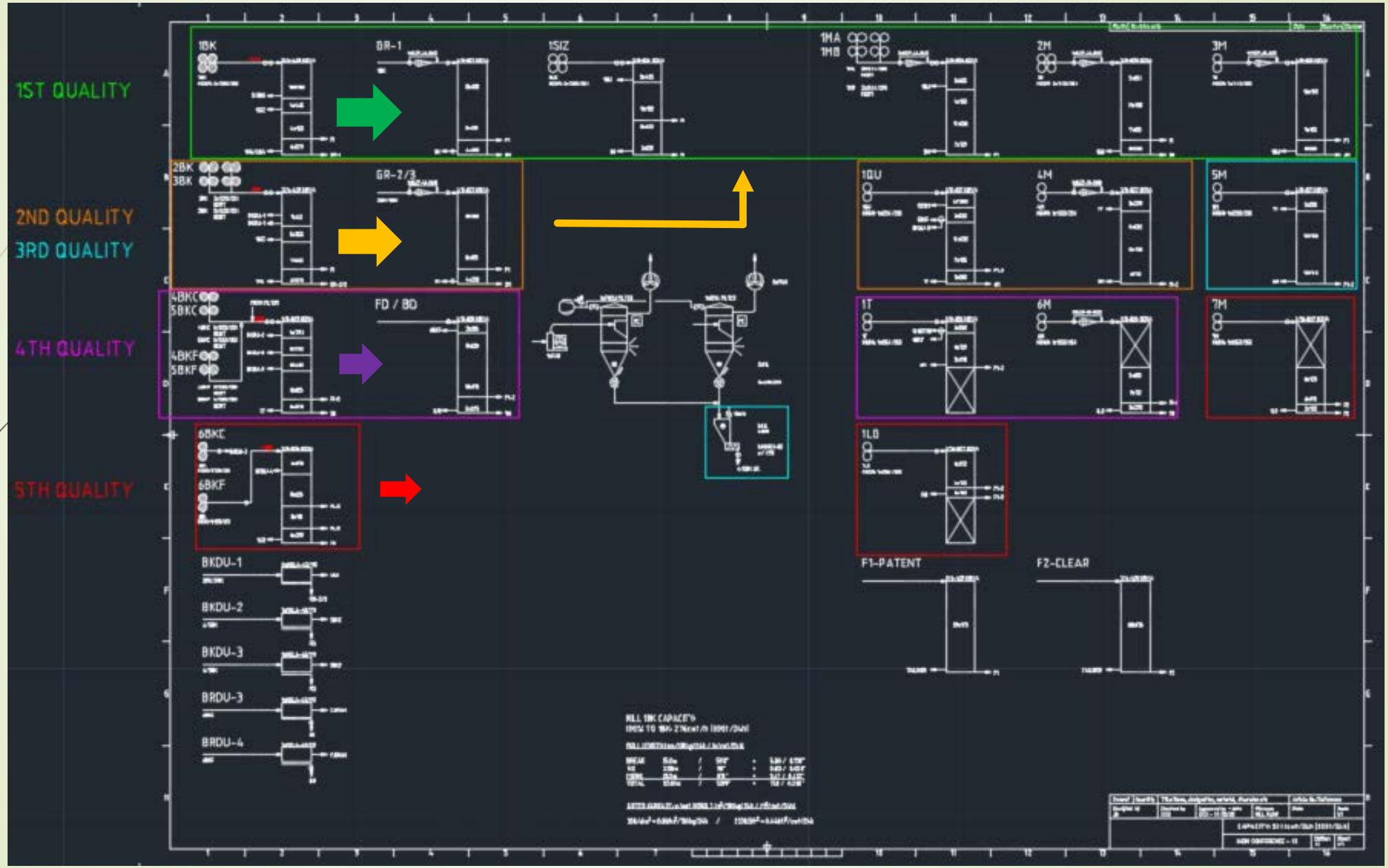
1st QUALITY

2ND QUALITY

3RD QUALITY

4TH QUALITY

5TH QUALITY



Modernizing the Flow – Using Impact Technology

- Maximize mill performance by:
  - Increasing flour release at Grader (BKRD) sifter sections
  - Increasing flour release of reduction passages
  - Releasing the maximum amount of 1st & 2nd quality flours, thereby, reducing the load at subsequent downstream passages
  - Release maximum amount of flour at each passage in the flow
  - Reduce the amount of endosperm in the stock at each of the collection passages

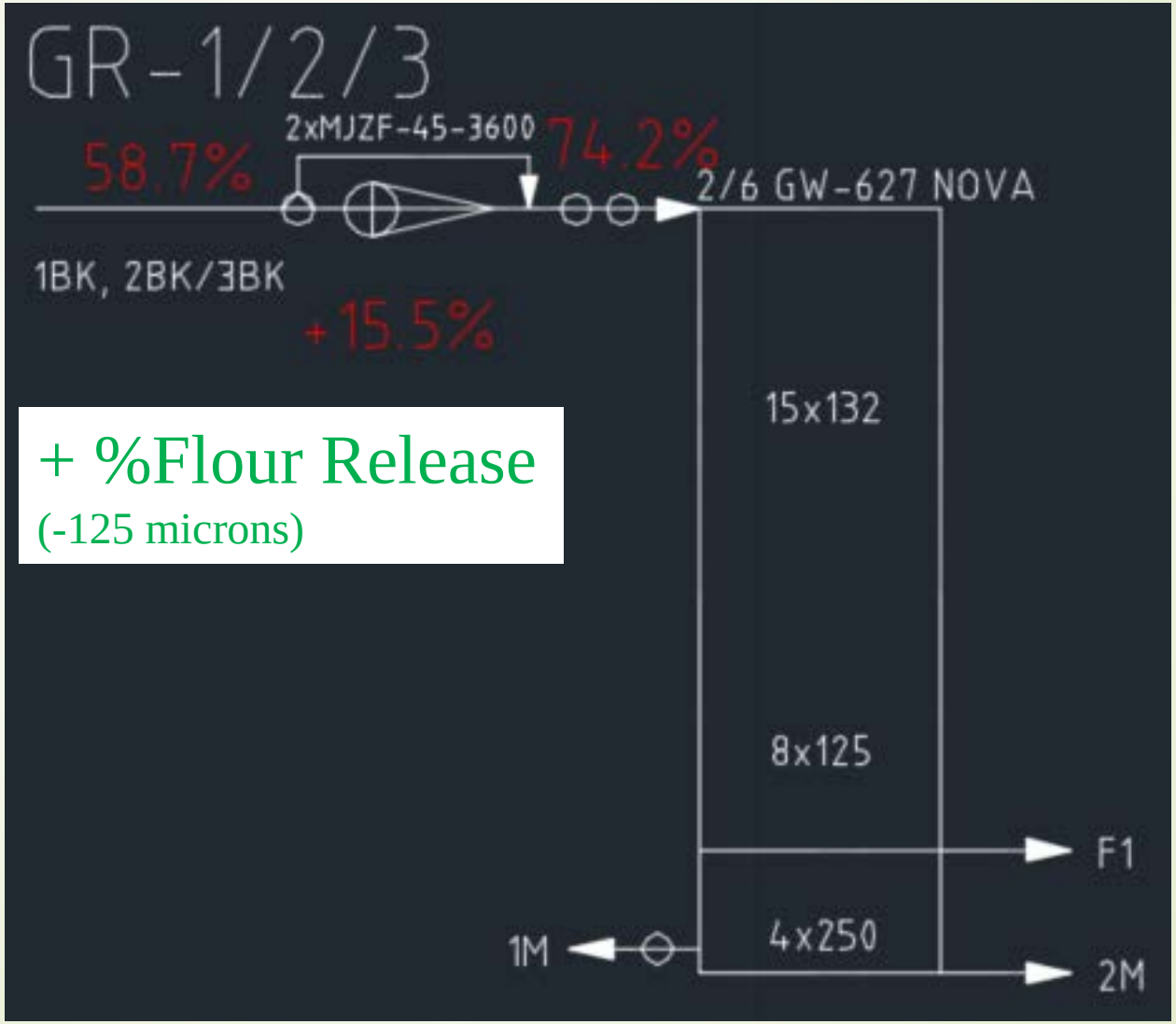
Modernizing the Flow – Using Impact Technology

- Maximize rollstand performance
  - Increase flour release by being able to flake
- Maximize flour release
  - Over the wear life of a pair of rolls
  - Reduce variability in rollstand performance due to adjust error
- Add “flexibility” to the milling process
  - Compensate for a lack of new rollstand technology
  - Compensate for adjustment error

Modernizing the Flow – Using Impact Technology

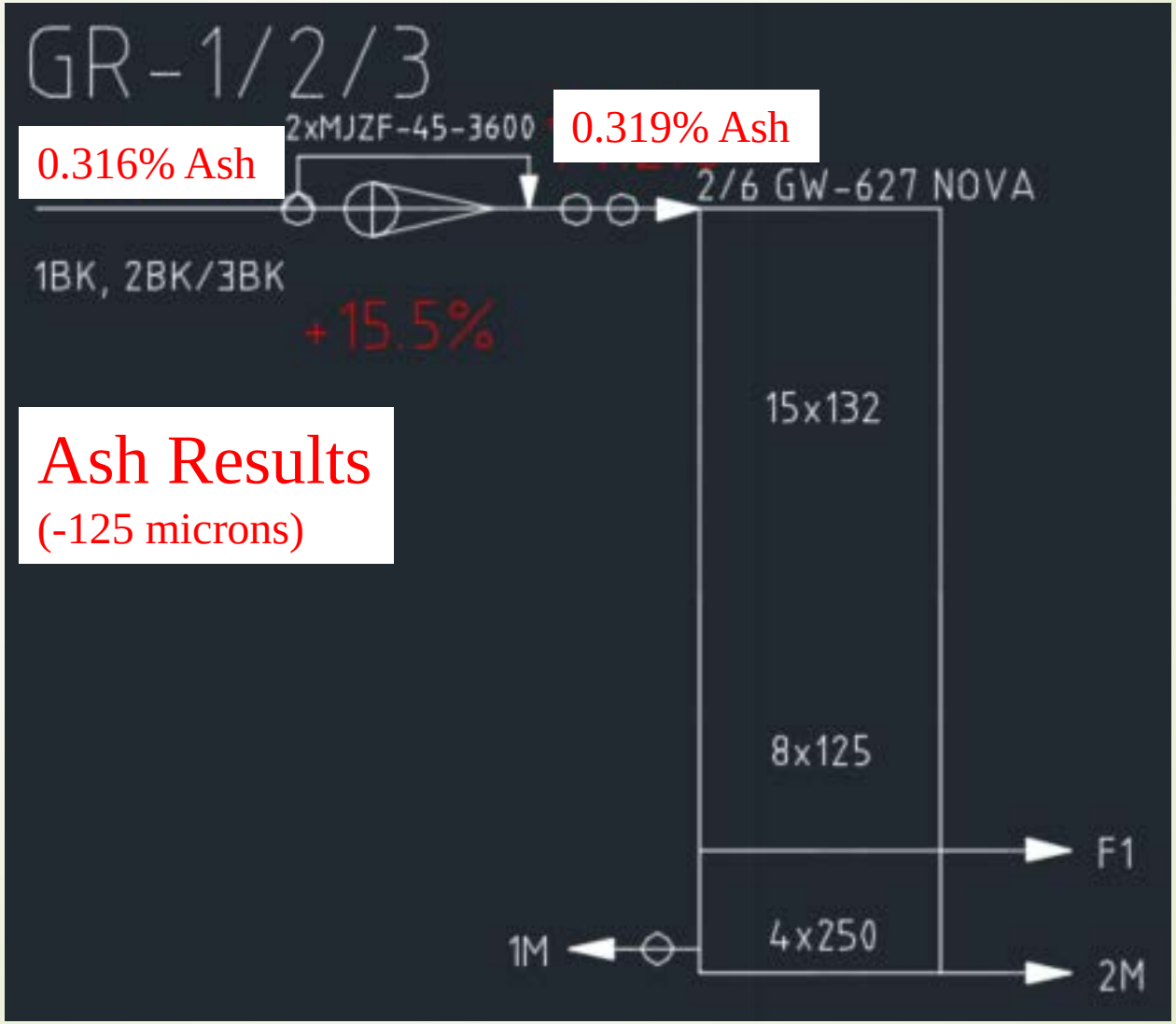
- "Compensates" for old rollstand technology
  - Improper stock delivery – inconsistent stock delivery into the nip of the rolls → leading to lack of grinding efficiency
  - Inconsistent grinding → "moving rolls"
  - Insufficient scraper assemblies → not being able to grind without wrapping
- "Compensates" for rollstand adjustment mistakes
  - "Over-flaking" & uneven grinding

GR-1/2/3 Flour Release w/ MJZF Impact Mch.

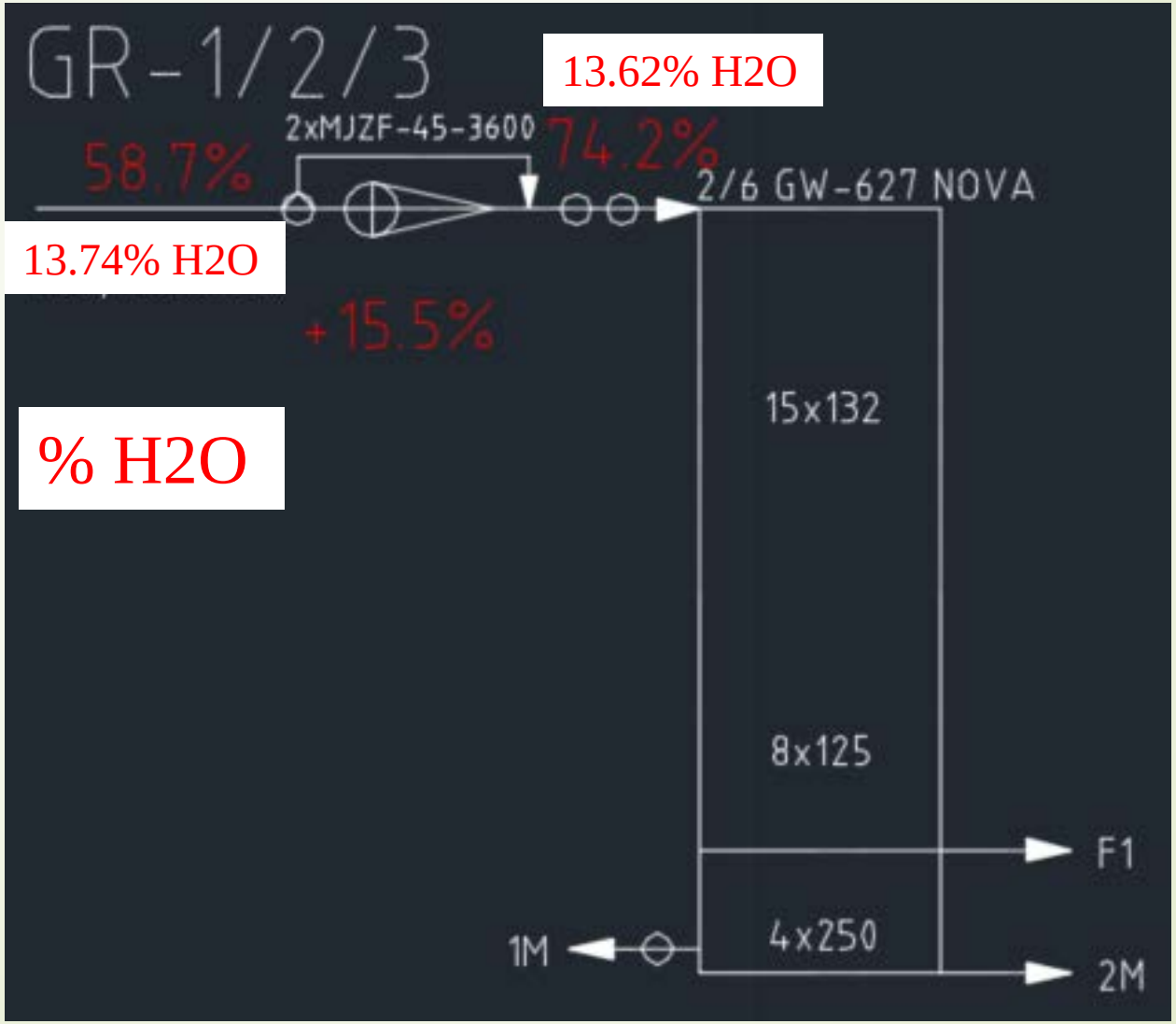


+ %Flour Release
(-125 microns)

GR-1/2/3 Flour Release w/ MJZF Impact Mch.



GR-1/2/3 Flour Release w/ MJZF Impact Mch.



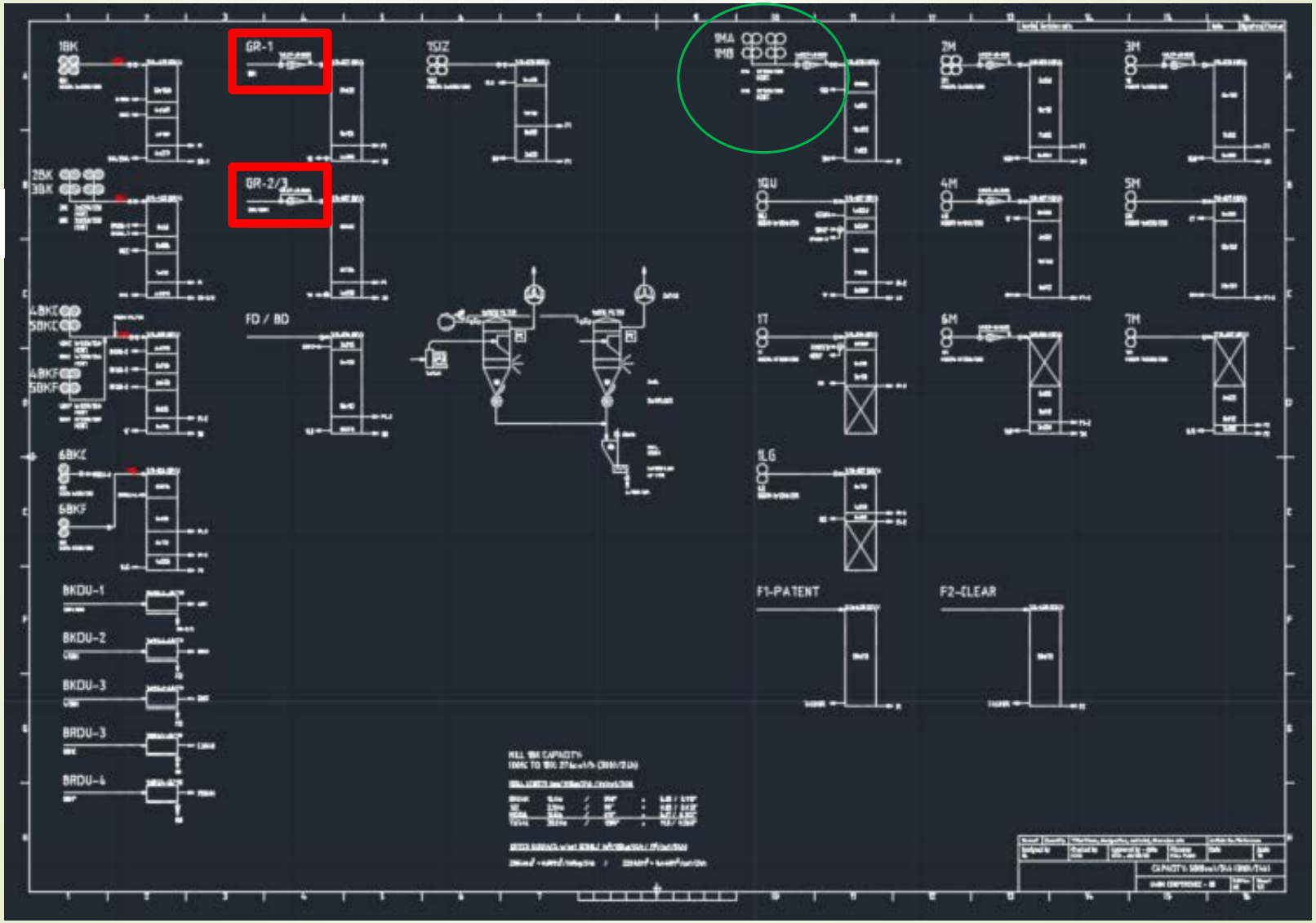
Decrease in Middlings & Fine Semolina

Test 4a - GR-1/2/3 Flour Release - before MJZF w/ 250micron collection sieve											
Microns	**GR-1/2/3**	**GR-1/2/3**	**GR-1/2/3**	**Avg.**	**%**	**% Flour Release**	**% Fl. Release Increase**	**% H2O**	**% Ash (as is m.b.)**	**% Ash (14% m.b.)**	**Comment**
60 US (+250)	4.3	4.9	5.2	4.8	1.92						no flakes - clean fine bran particles
9XX (+125)	96.8	96.8	97.7	97.1	38.84						
Pan	147.1	148.4	144.6	146.7	58.68	**58.68**		**13.74**	**0.317**	**0.316**	
total =	248.2	250.1	247.5	248.6	99.4						
Test 4b - GR-1/2/3 Flour Release - after MJZF w/ 250micron collection sieve											
	Note: samples taken above sifter section										
Microns	**GR-1/2/3**	**GR-1/2/3**	**GR-1/2/3**	**Avg.**	**%**	**% Flour Release**	**% Fl. Release Increase**	**% H2O**	**% Ash (as is m.b.)**	**% Ash (14% m.b.)**	**Comment**
60 US (+250)	2.5	2.9	3.4	2.9	1.17						no flakes - clean fine bran particles
9XX (+125)	59.5	59.2	60.6	59.8	23.91						
Pan	186.0	186.7	183.5	185.4	74.16	**74.16**	**15.48**	**13.62**	**0.320**	**0.319**	
total =	248	248.8	247.5	248.1	99.2						

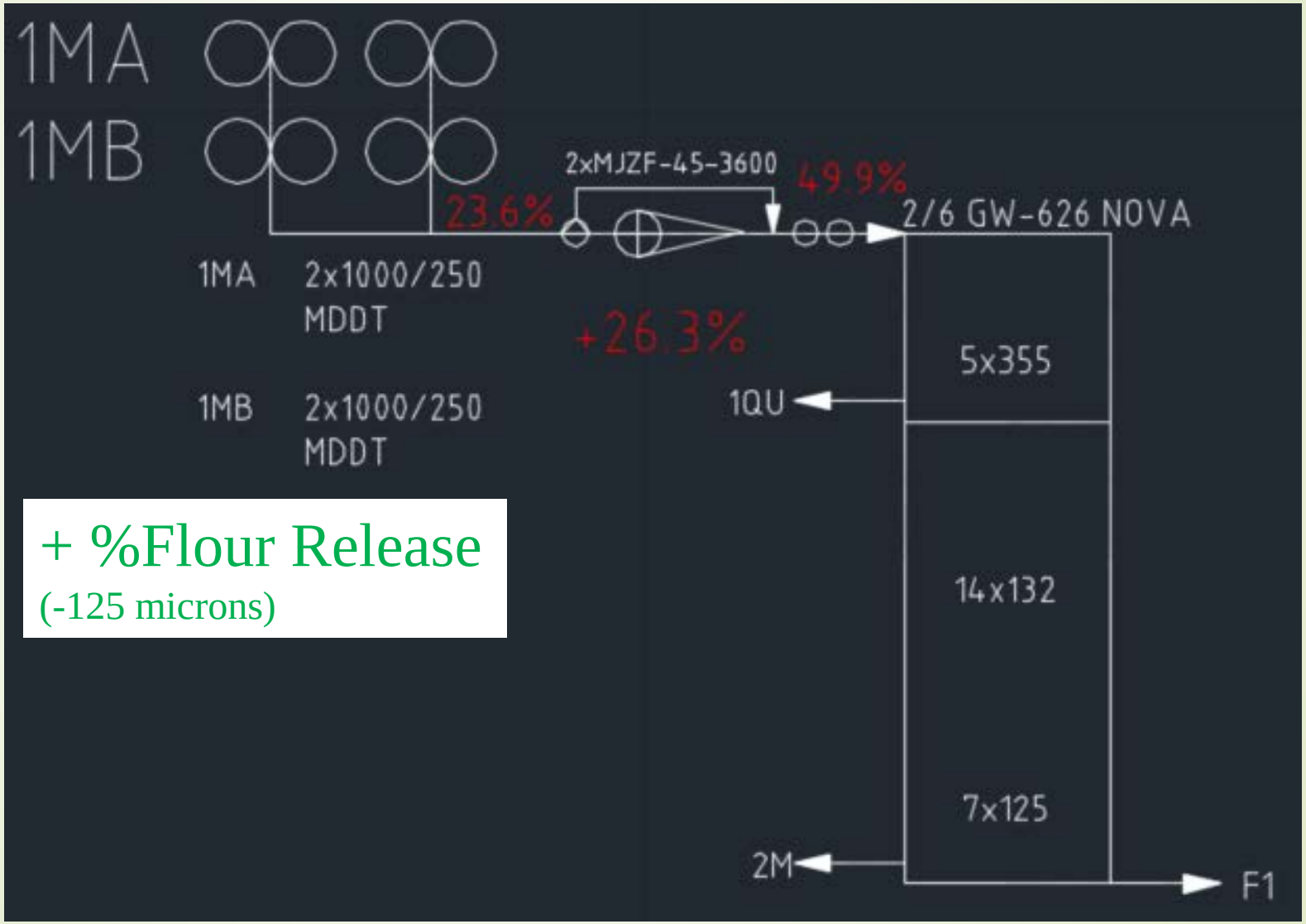
Modernizing the Flow – Using Impact Technology

1st QUALITY

2ND QUALITY

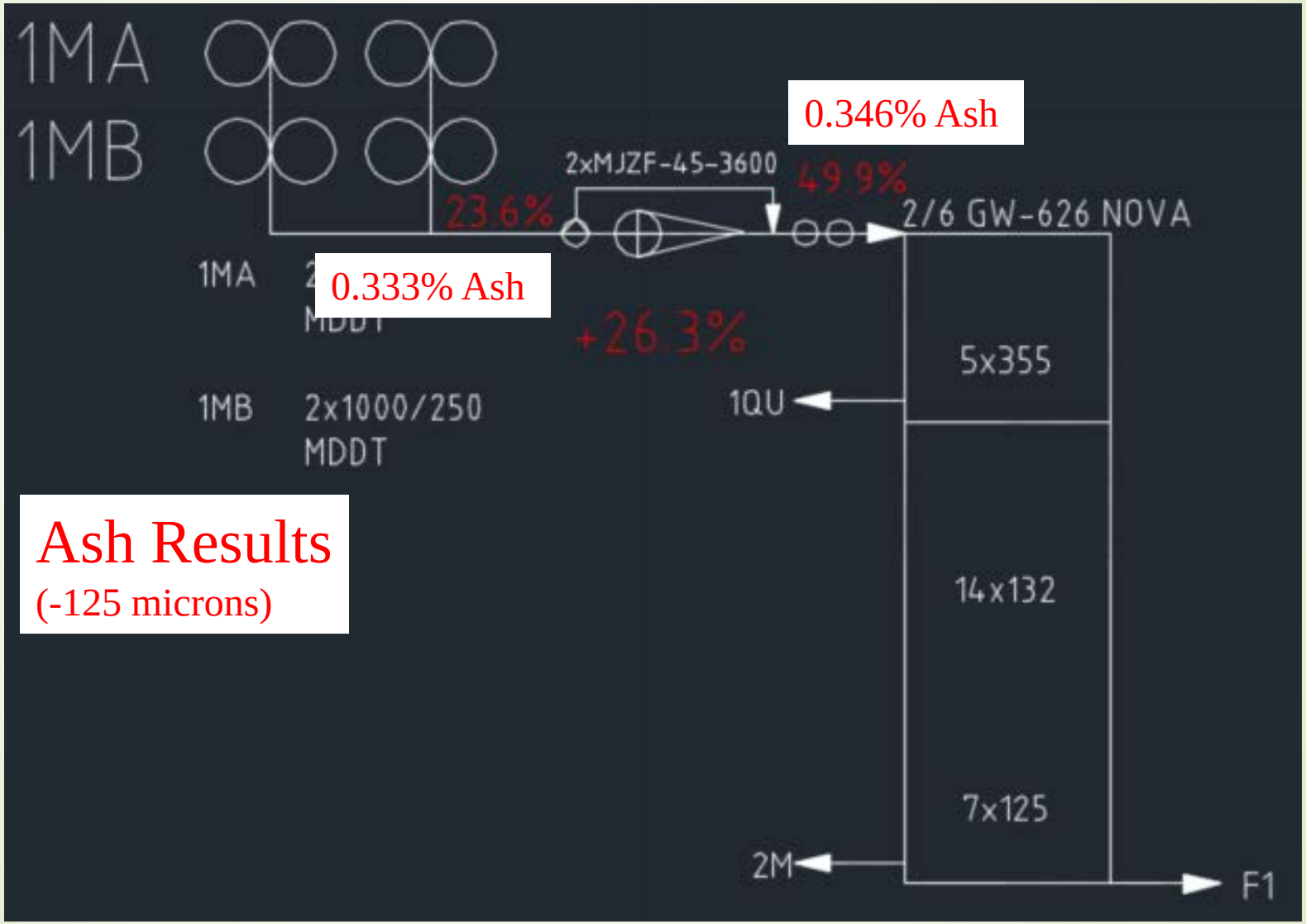


1Ma/1Mb Flour Release w/ MJZF Impact Mch.

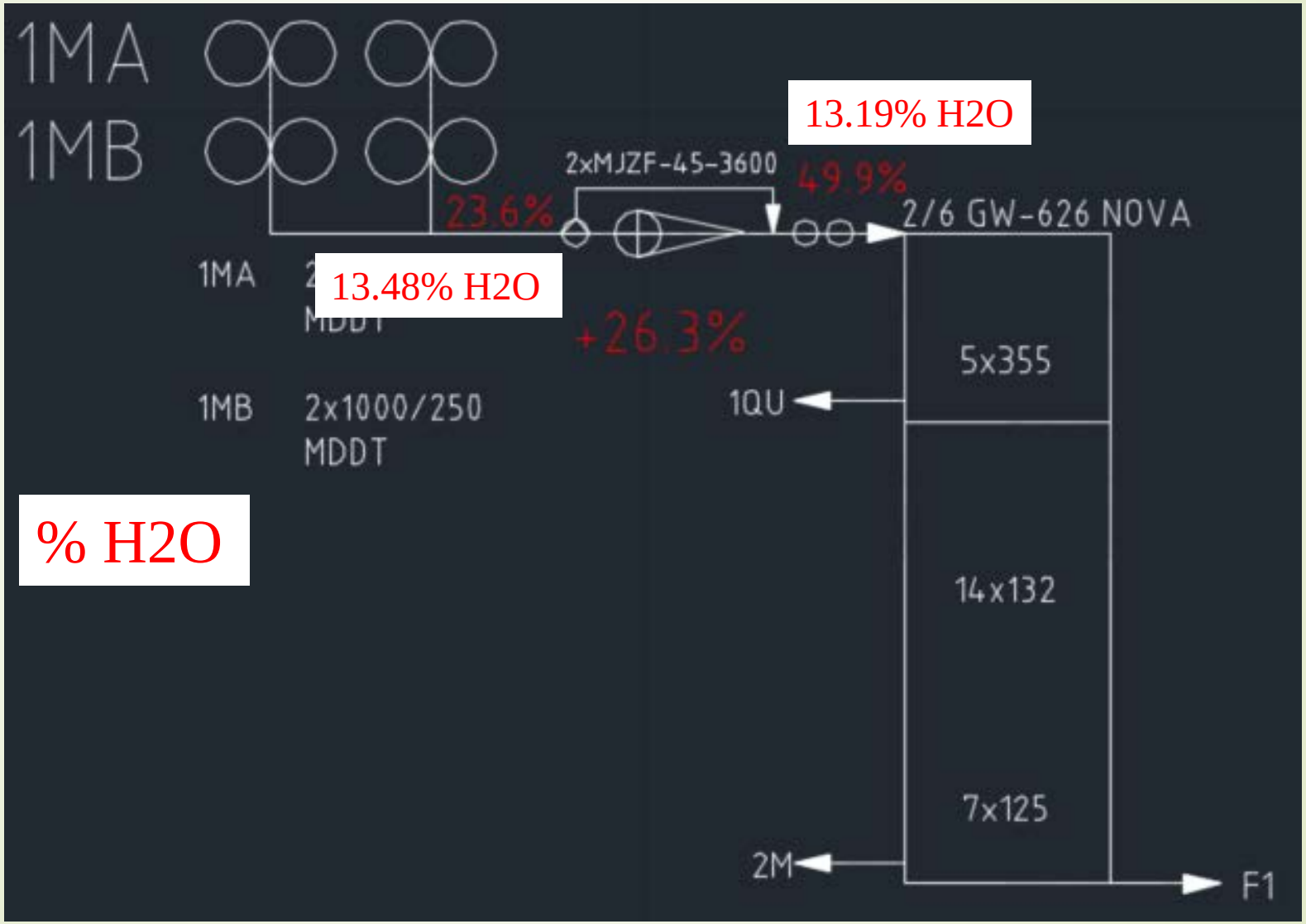


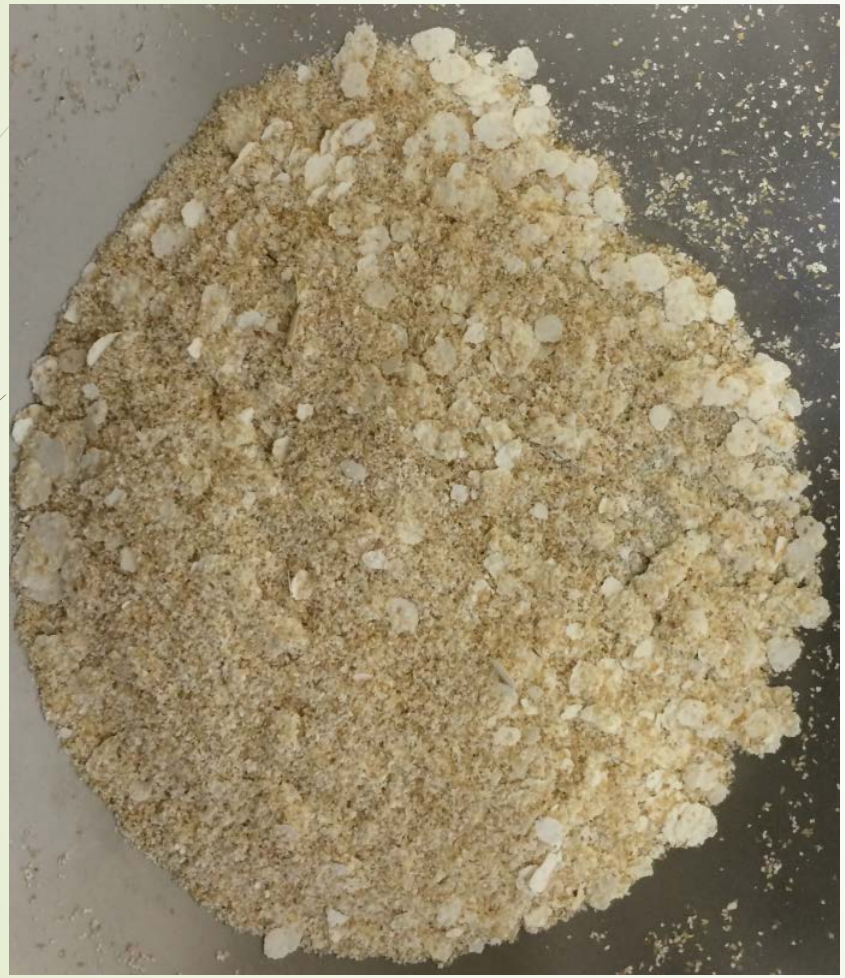
+ %Flour Release
(-125 microns)

1Ma/1Mb Flour Release w/ MJZF Impact Mch.



1Ma/1Mb Flour Release w/ MJZF Impact Mch.





Test 3a - 1Ma/1Mb MDDT Rollstand Release - before grinding											
	Note: samples taken at inlet of rollstand										
Microns	**1Ma/1Mb-1**	**1Ma/1Mb-2**	**1Ma/1Mb-3**	**Avg.**	**%**	**% Flour Release**	**% Fl. Release Increase**	**% H2O**	**% Ash (as is m.b.)**	**% Ash (14% m.b.)**	**Comment**
60 US (+250)	86.2	96	102.9	95.0	38.01						no flakes - clean bran particles
9XX (+125)	129.7	114.4	108.3	117.5	46.99						
Pan	33.8	39	37.8	36.9	14.75	**14.75**					
total =	249.7	249.4	249	249.4	99.7						

Test 3c -1Ma/1Mb MDDT Rollstand Release - after rollstand w/ 355micron collection sieve											
	Note: samples taken below nip of rollstand										
Microns	**1Ma/1Mb-1**	**1Ma/1Mb-2**	**1Ma/1Mb-3**	**Avg.**	**%**	**% Flour Release**	**% Fl. Release Increase**	**% H2O**	**% Ash (as is m.b.)**	**% Ash (14% m.b.)**	**Comment**
45 US (+355)	12.1	10.4	9.4	10.6	4.25						large flakes and bran particles
9XX (+125)	144.2	143.1	139.4	142.2	56.89						
Pan	93.3	95.5	99.2	96.0	38.40	**38.40**	**23.65**	**13.48**	**0.335**	**0.333**	
total =	249.6	249	248	248.9	99.5						

Test 3e -1Ma/1Mb MDDT Rollstand Release - before sifter w/ 355micron collection sieve											
	Note: samples taken above sifter section										
Microns	**1Ma/1Mb-1**	**1Ma/1Mb-2**	**1Ma/1Mb-3**	**Avg.**	**%**	**% Flour Release**	**% Fl. Release Increase**	**% H2O**	**% Ash (as is m.b.)**	**% Ash (14% m.b.)**	**Comment**
45 US (+355)	4.3	4.6		4.5	1.78						no flakes - clean fine bran particles
9XX (+125)	82.1	82.3		82.2	32.88						
Pan	161.6	161.6		161.6	64.64	**64.64**	**49.89**	**13.19**	**0.349**	**0.346**	
total =	248	248.5	0	248.3	99.3						

Test 3a - 1Ma/1Mb MDDT Rollstand Release - before grinding												
	Note: samples taken at inlet of rollstand											
Microns	1Ma/1Mb-1	1Ma/1Mb-2	1Ma/1Mb-3	Avg.	%	% Flour Release	% Fl. Release Increase	% H2O	% Ash (as is m.b.)	% Ash (14% m.b.)	Comment	
60 US (+250)	86.2	96	102.9	95.0	38.01						no flakes - clean bran particles	
9XX (+125)	129.7	114.4	108.3	117.5	46.99							
Pan	33.8	39	37.8	36.9	14.75	14.75						
total =	249.7	249.4	249	249.4	99.7							

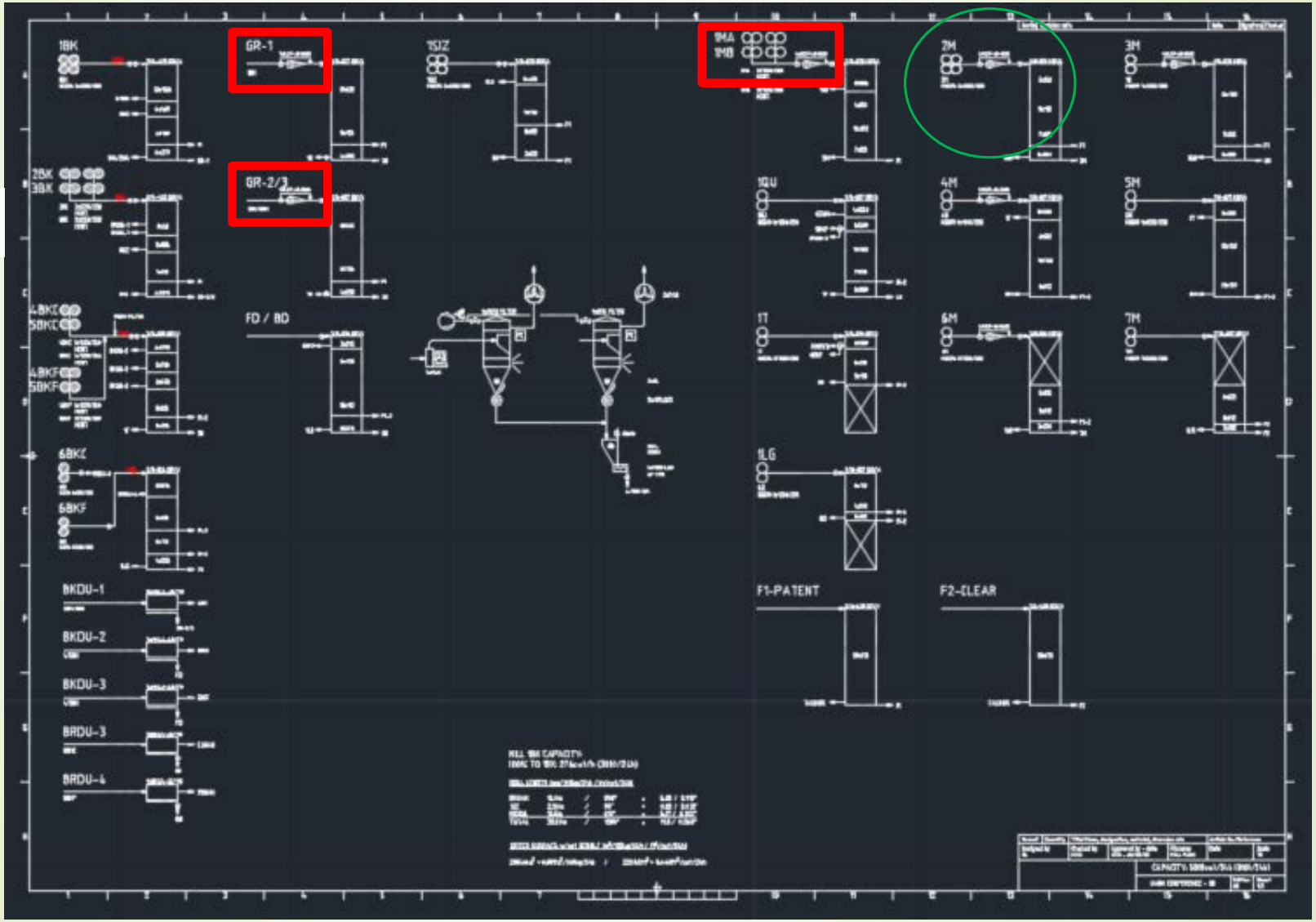
Test 3b -1Ma/1Mb MDDT Rollstand Release - after rollstand w/ 250micron collection sieve												
	Note: samples taken below nip of rollstand											
	1Ma/1Mb-1	1Ma/1Mb-2	1Ma/1Mb-3	Avg.	%	% Flour Release	% Fl. Release Increase	% H2O	% Ash (as is m.b.)	% Ash (14% m.b.)	Comment	
60 US (+250)	21.7	22.2		22.0	8.78						large flakes, small bran particles and coarse midd	
9XX (+125)	128.7	126.6		127.7	51.06							
Pan	97.9	99.2		98.6	39.42	39.42	24.67	13.48	0.335	0.333		
total =	248.3	248	0	248.2	99.3							

Test 3d -1Ma/1Mb MDDT Rollstand Release - before sifter w/ 250micron collection sieve												
	Note: samples taken above sifter section											
Microns	1Ma/1Mb-1	1Ma/1Mb-2	1Ma/1Mb-3	Avg.	%	% Flour Release	% Fl. Release Increase	% H2O	% Ash (as is m.b.)	% Ash (14% m.b.)	Comment	
60 US (+250)	9.7	9.6		9.7	3.86						no flakes - clean fine bran particles	
9XX (+125)	73.8	71.7		72.8	29.10							
Pan	165.1	166.7		165.9	66.36	66.36	51.61	13.19	0.349	0.346		
total =	248.6	248	0	248.3	99.3							

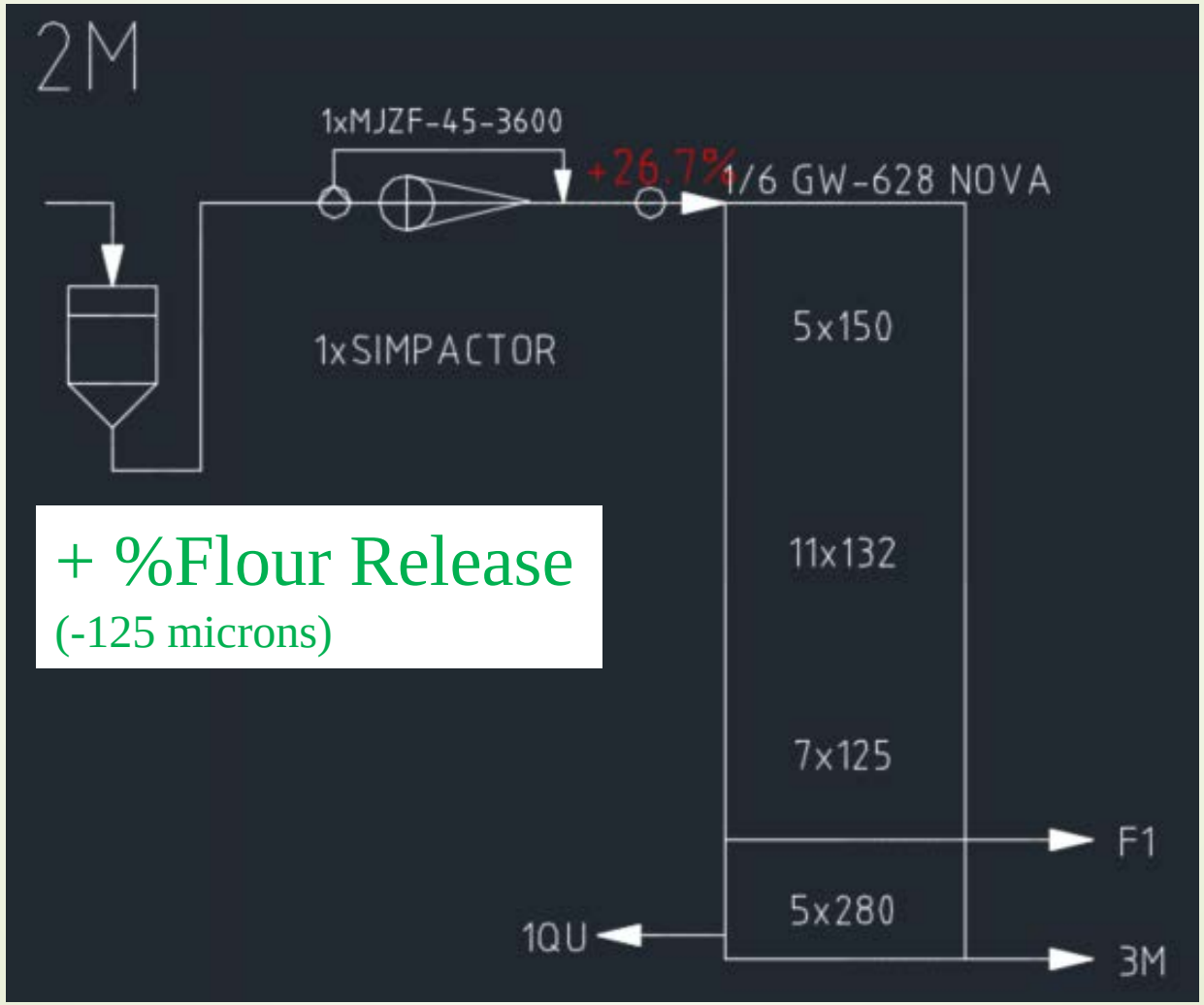
Modernizing the Flow – Using Impact Technology

1st QUALITY

2ND QUALITY



2M Flour Release; Pin Mill & MJZF Impact Mch.



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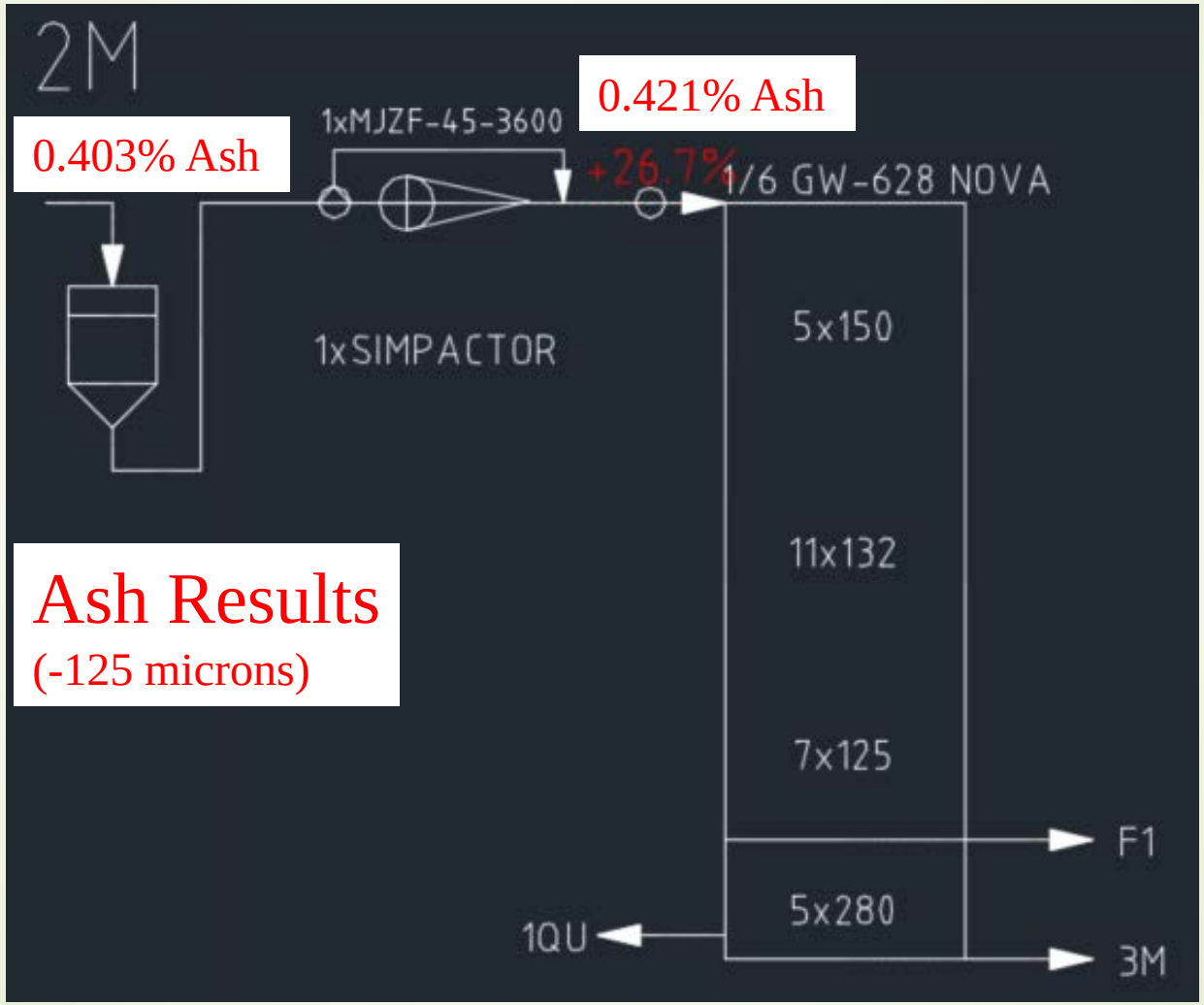
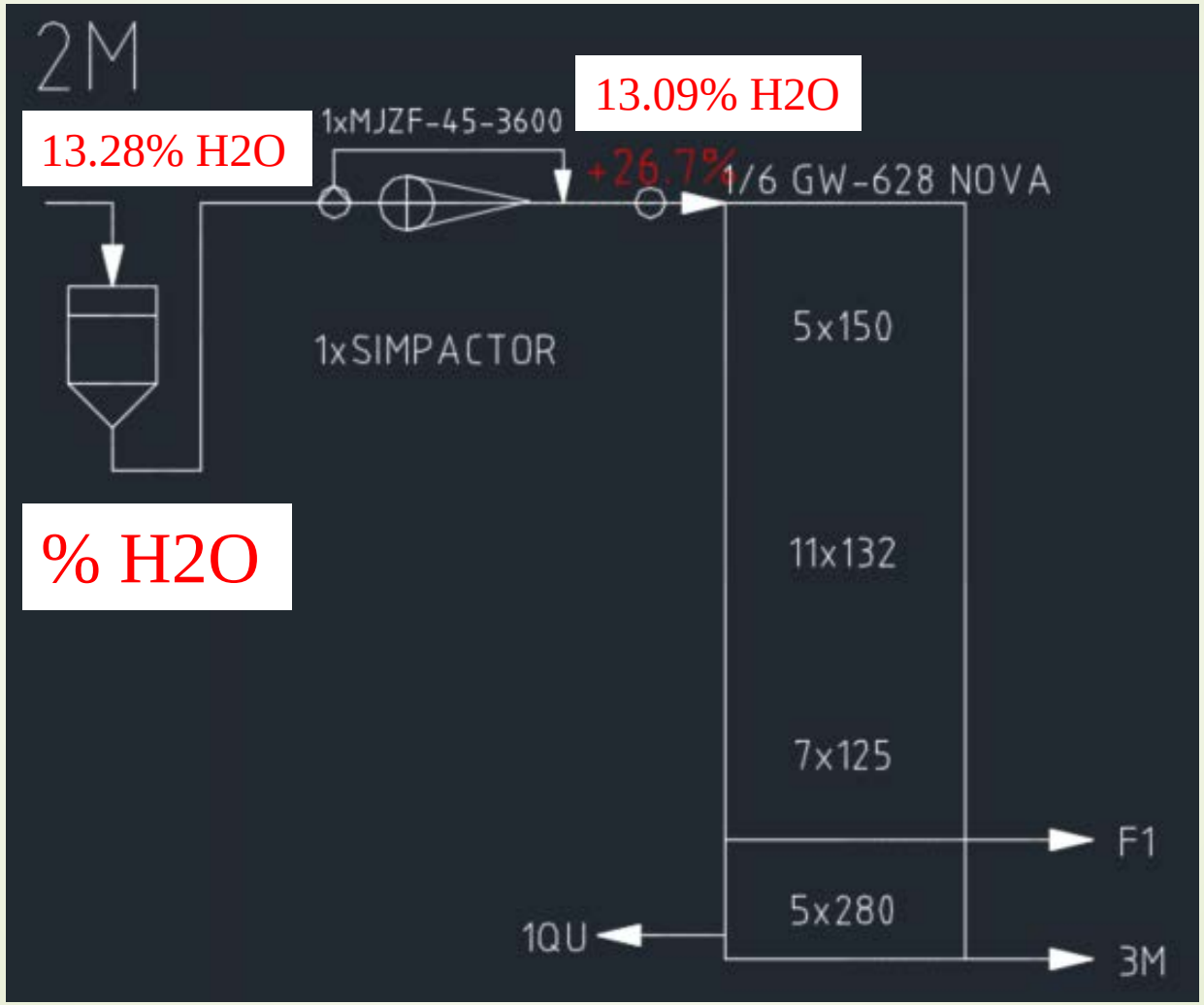


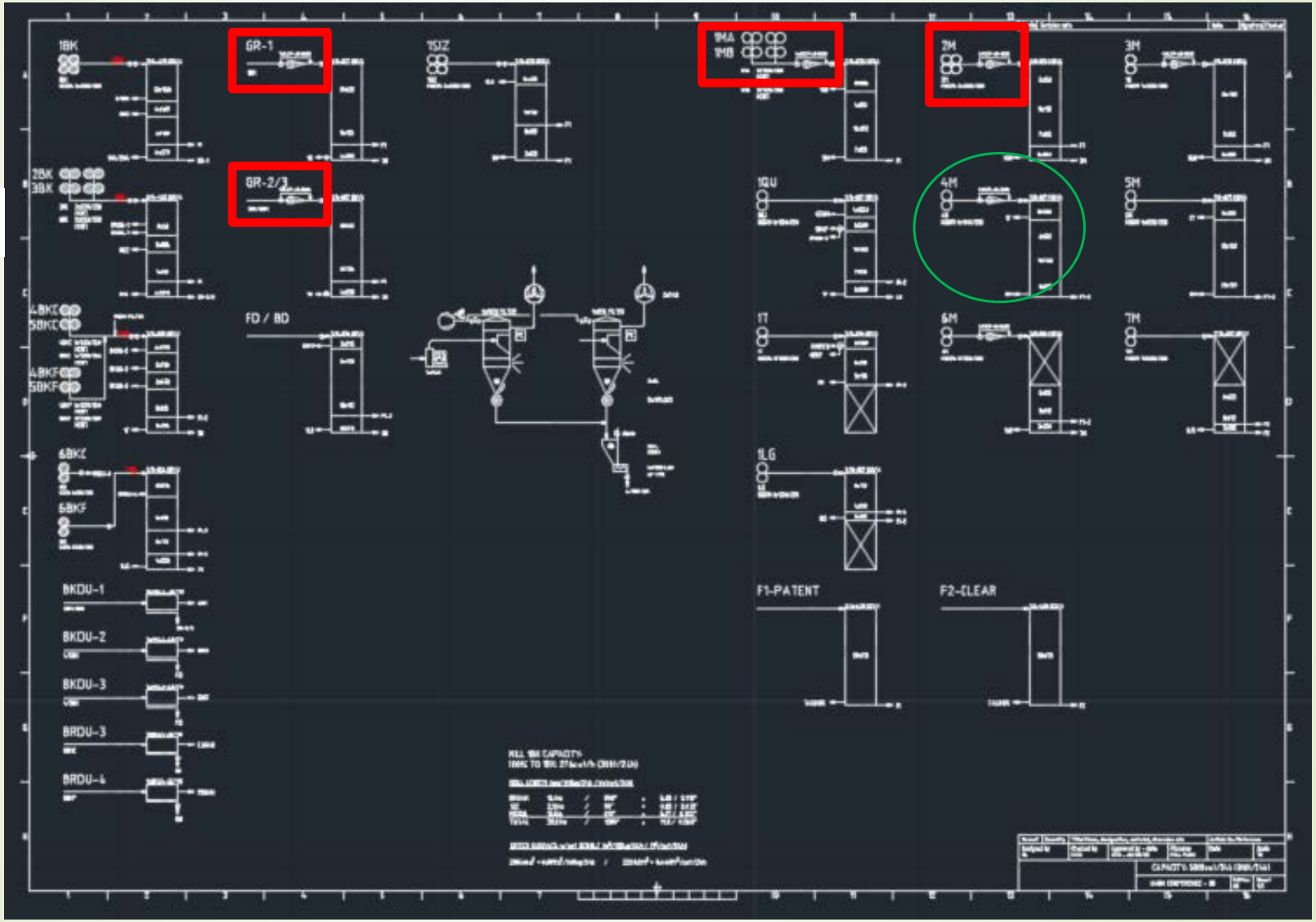
2M Flour Release; Pin Mill & MJZF Impact Mch.



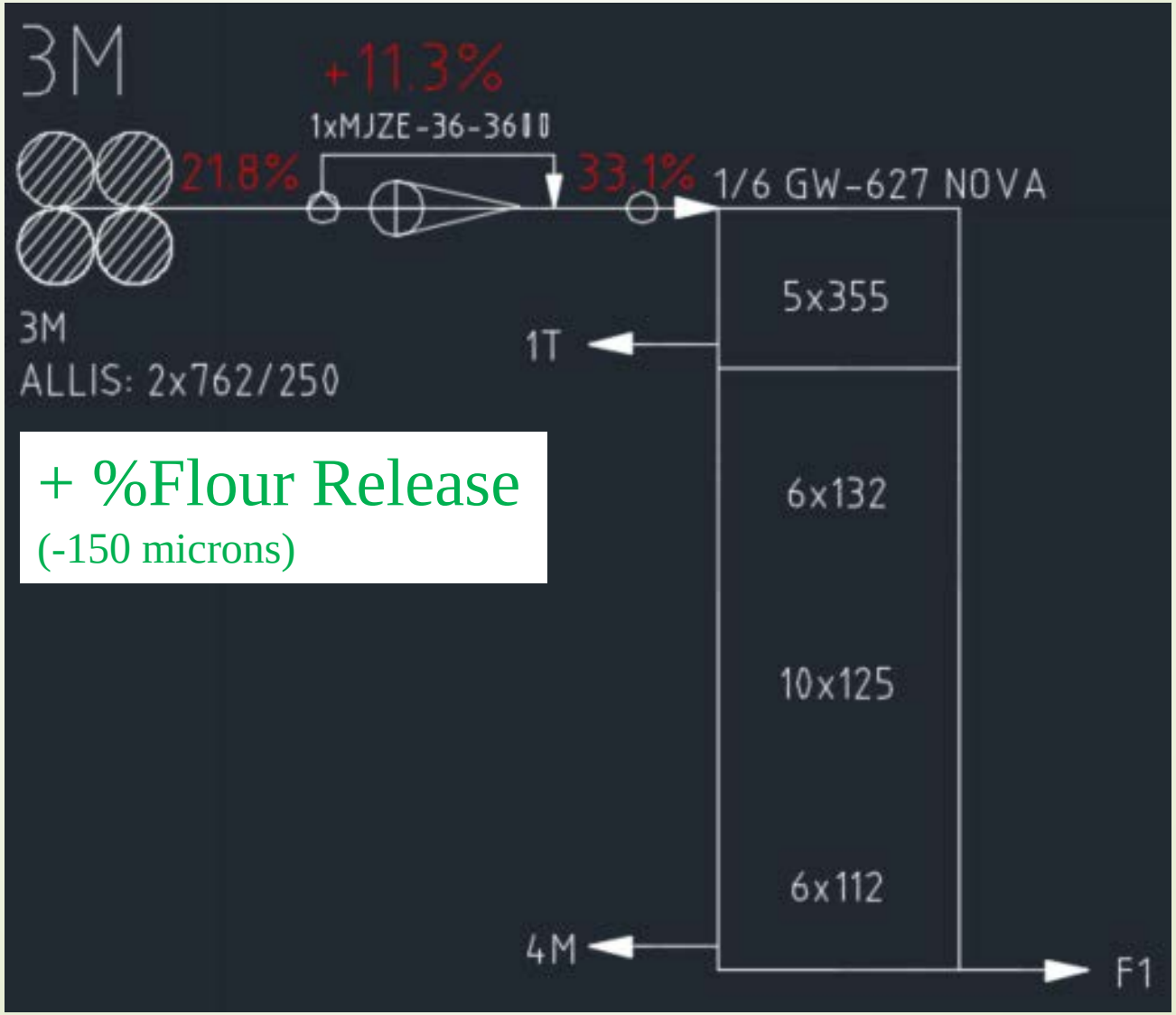
Modernizing the Flow – Using Impact Technology

1st QUALITY

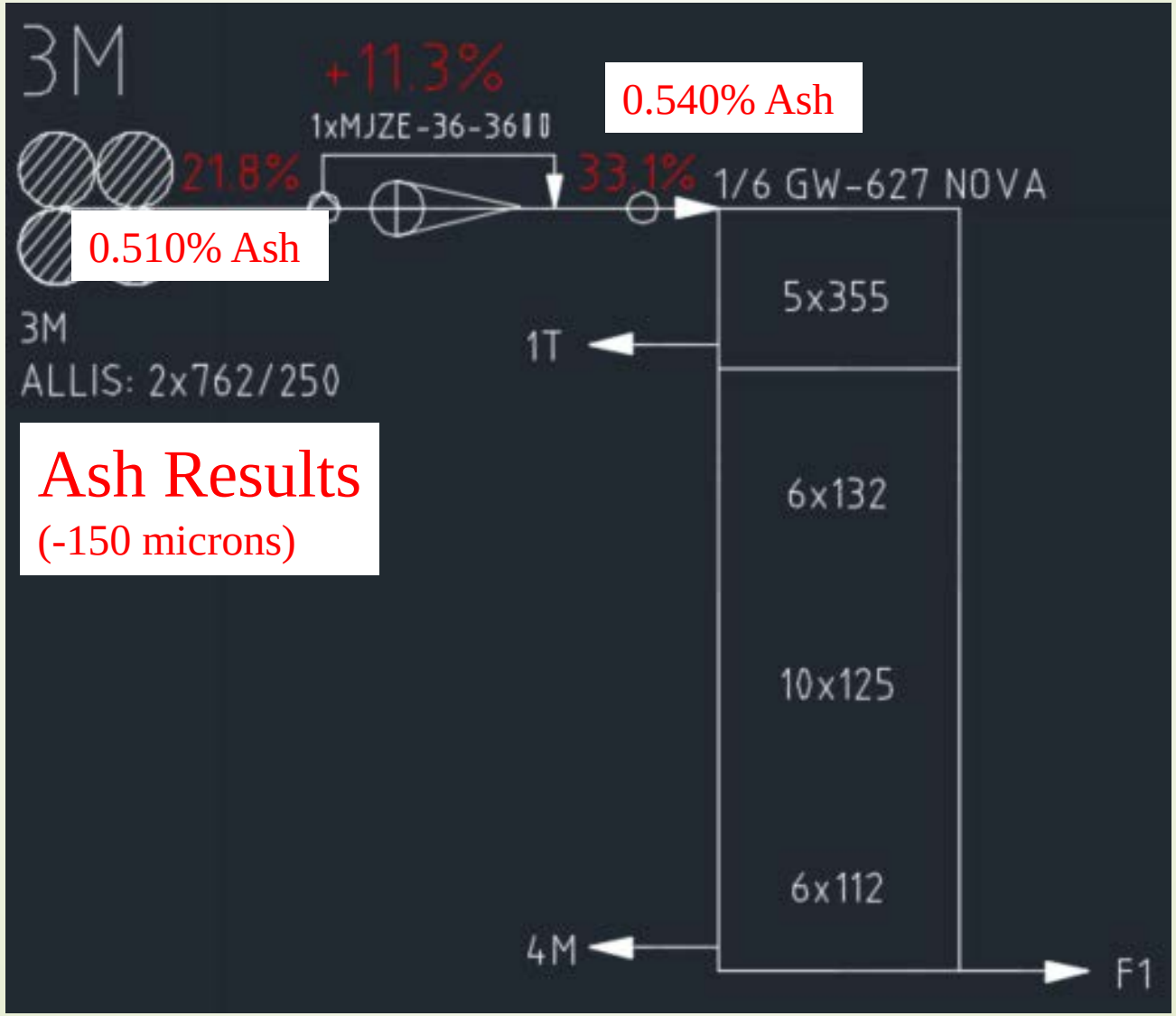
2ND QUALITY

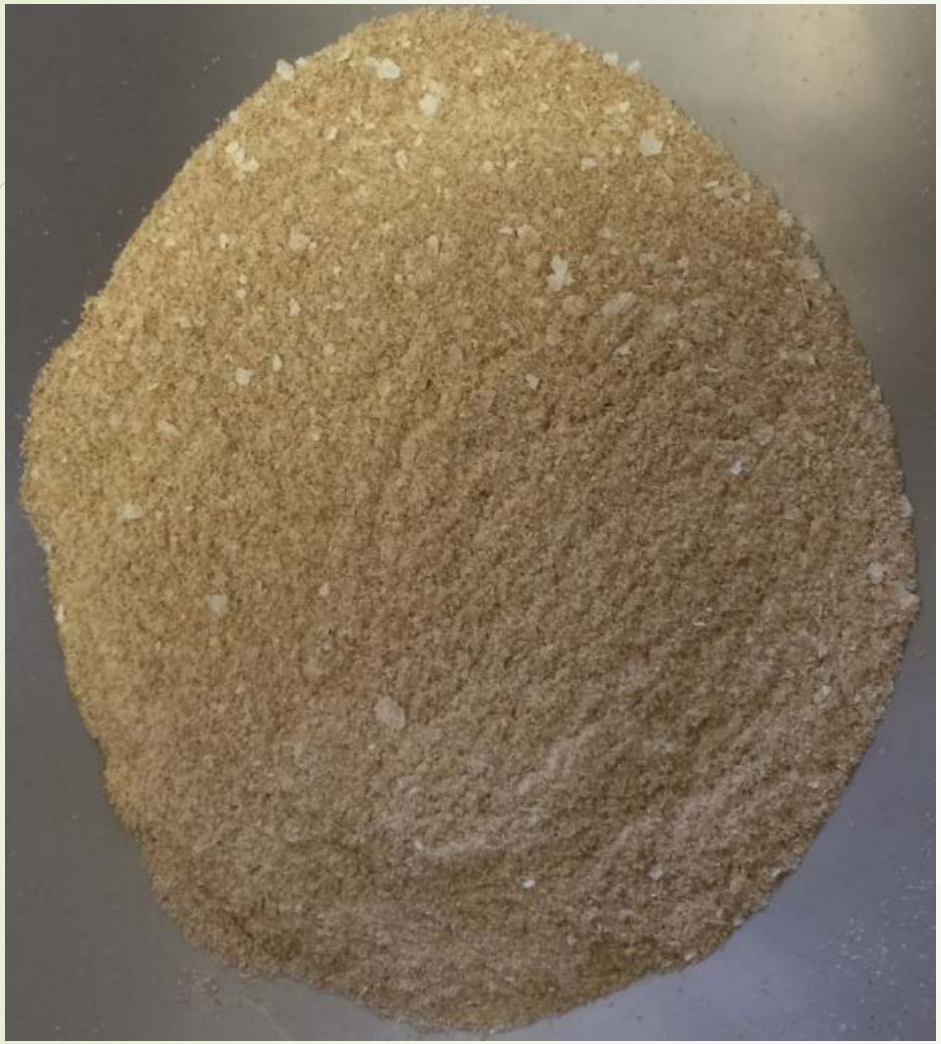


3M (4M) Flour Release w/ MJZE Impact Mch.



3M (4M) Flour Release w/ MJZE Impact Mch.



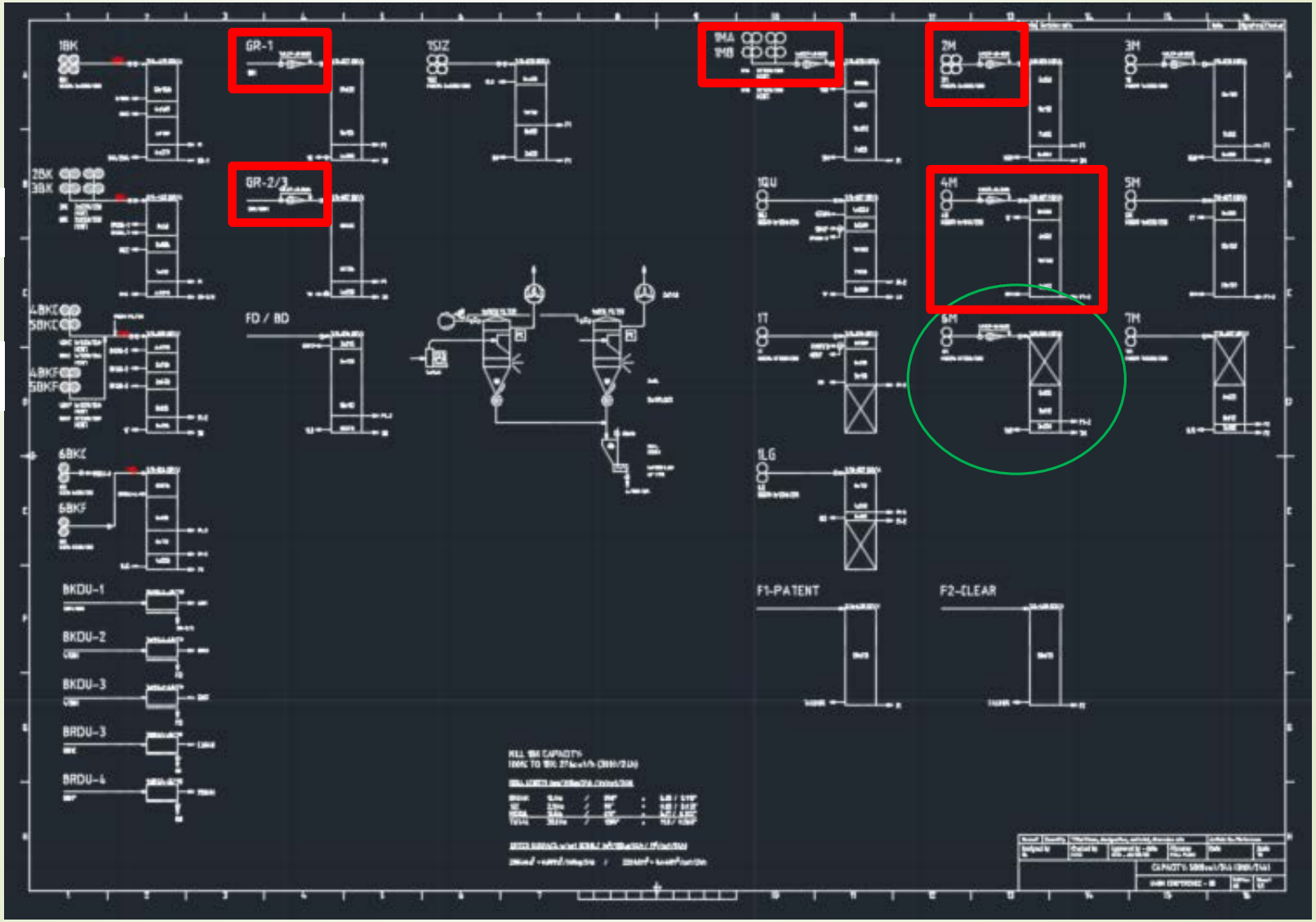


Modernizing the Flow – Using Impact Technology

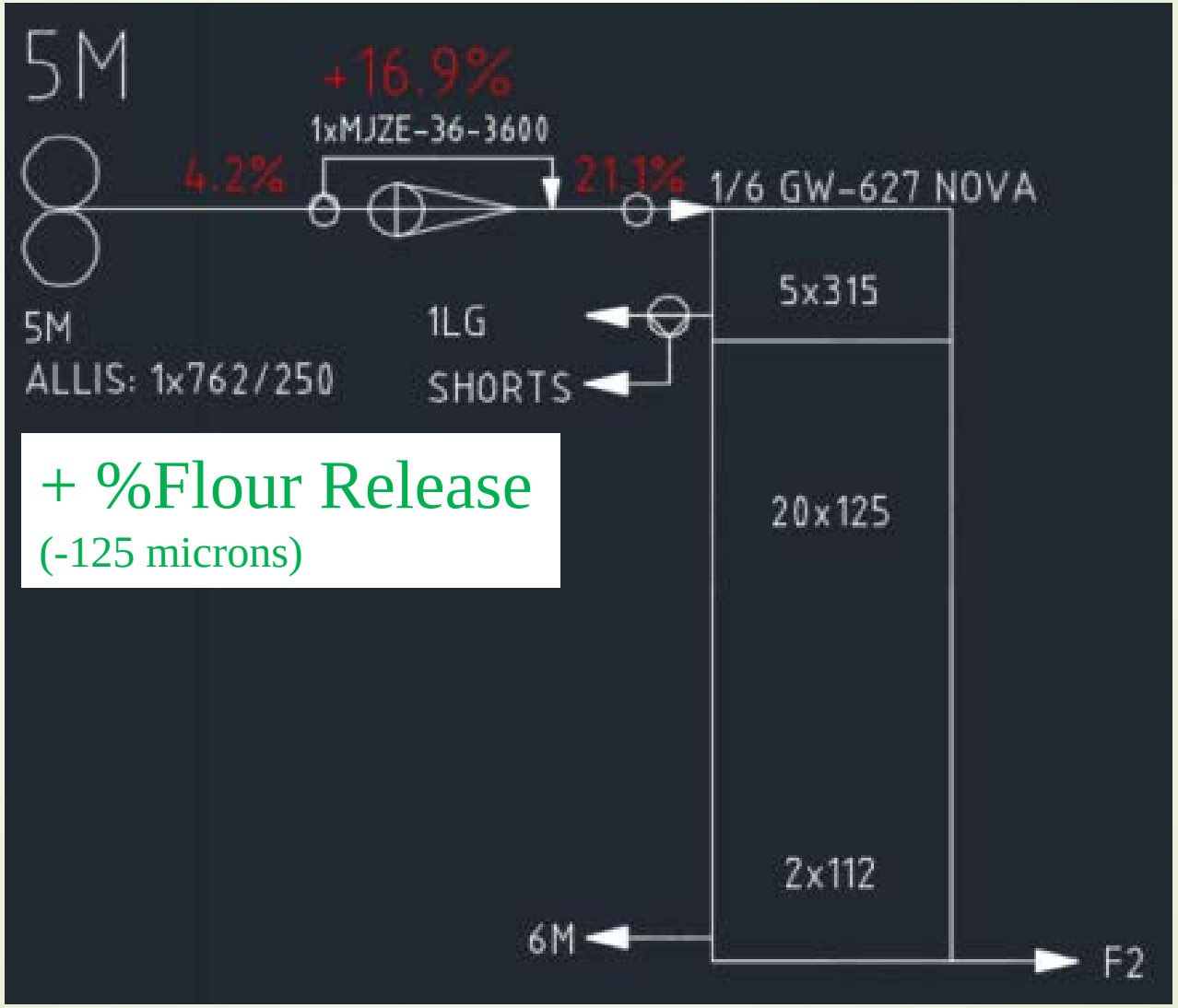
1st QUALITY

2ND QUALITY

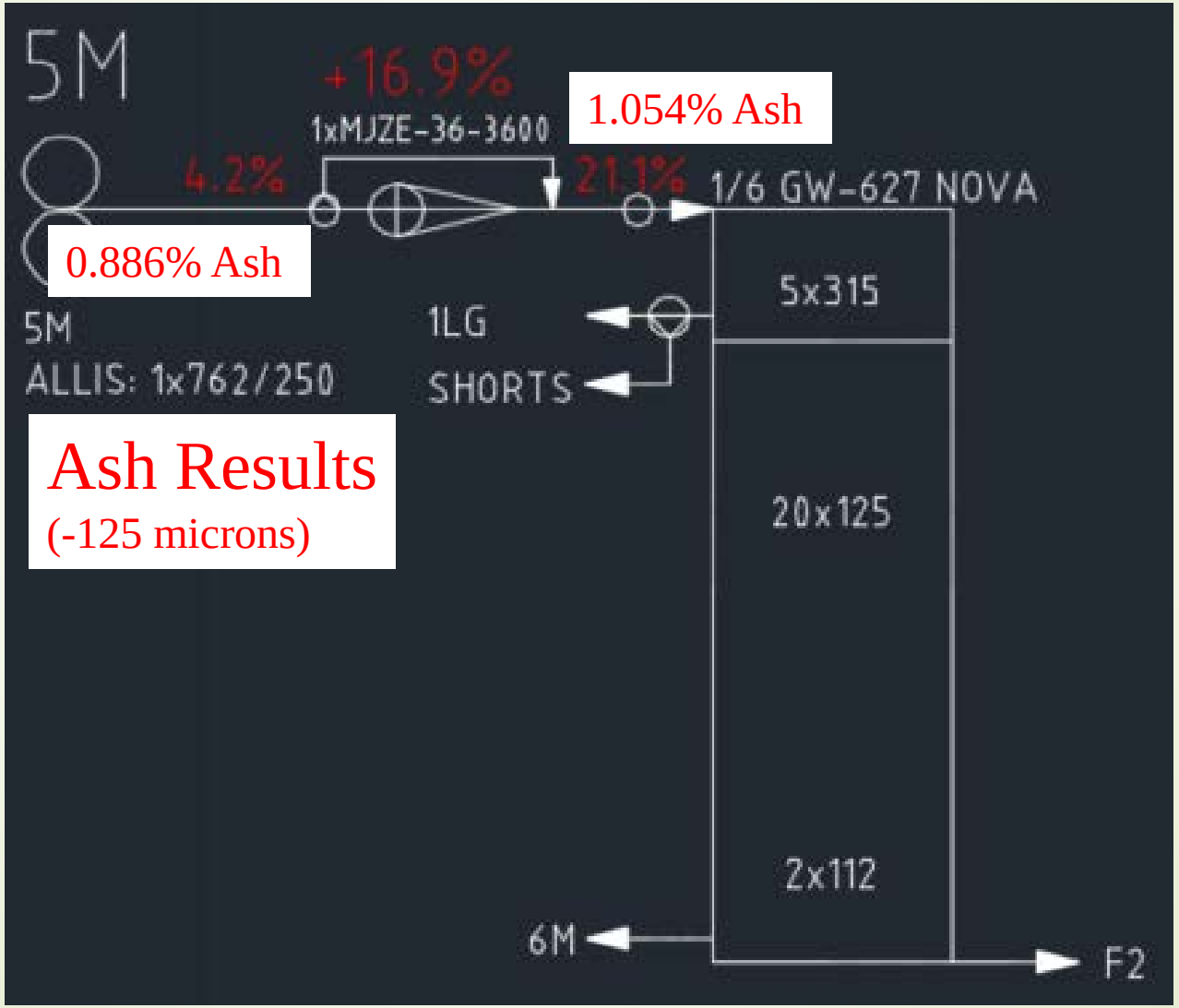
4TH QUALITY



5M (6M) Flour Release w/ MJZE Impact Mch.



5M (6M) Flour Release w/ MJZE Impact Mch.



Test 2a - 5M Allis Rollstand Release - before grinding											
	Note: samples taken at inlet of rollstand										
Microns	5M-1	5M-2	5M-3	Avg.	%	% Flour Release	% Fl. Release Increase	% H2O	% Ash (as is m.b.)	% Ash (14% m.b.)	Comment
60 US (+250)	83.2	83	80.1	82.1	32.84						no flakes - clean bran particles
100 US (+150)	134.5	138.6	141.1	138.1	55.23						
Pan	31.6	28.8	28.1	29.5	11.80	**11.80**					
total =	249.3	250.4	249.3	249.7	99.9						

Test 2b - 5M Allis Rollstand Release - after rollstand											
	Note: samples taken below nip of rollstand										
Microns	5M-1	5M-2	5M-3	Avg.	%	% Flour Release	% Fl. Release Increase	% H2O	% Ash (as is m.b.)	% Ash (14% m.b.)	Comment
60 US (+250)	77.1	85	83.2	81.8	32.71						no flakes - clean bran particles
100 US (+150)	131.5	127.1	124.8	127.8	51.12						
Pan	41.0	37.2	41.4	39.9	15.95	**15.95**	**4.15**	**12.97**	**0.897**	**0.886**	
total =	249.6	249.3	249.4	249.4	99.8						

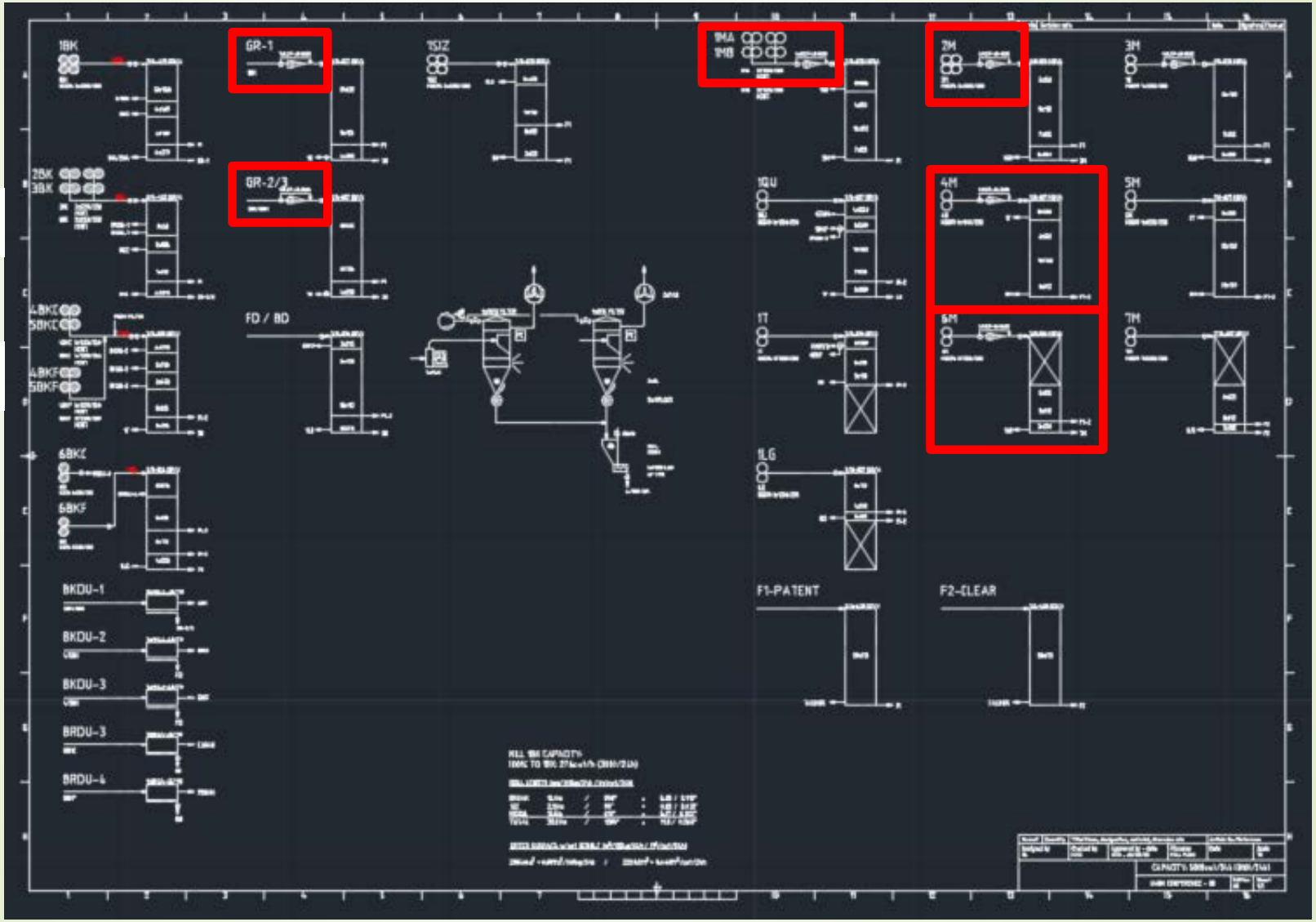
Test 2c - 5M Allis Rollstand Release with MJZE Flake Detacher											
	Note: samples taken above sifter section										
Microns	5M-1	5M-2	5M-3	Avg.	%	% Flour Release	% Fl. Release Increase	% H2O	% Ash (as is m.b.)	% Ash (14% m.b.)	Comment
60 US (+250)	55.0	52	51.3	52.8	21.11						no flakes - clean bran particles
100 US (+150)	115.3	113.9	112.8	114.0	45.60						
Pan	79.0	82.8	85.0	82.3	32.91	**32.91**	**21.11**	**12.97**	**1.067**	**1.054**	
total =	249.3	248.7	249.1	249.0	99.6						

Modernizing the Flow – Using Impact Technology

1st QUALITY

2ND QUALITY

4TH QUALITY

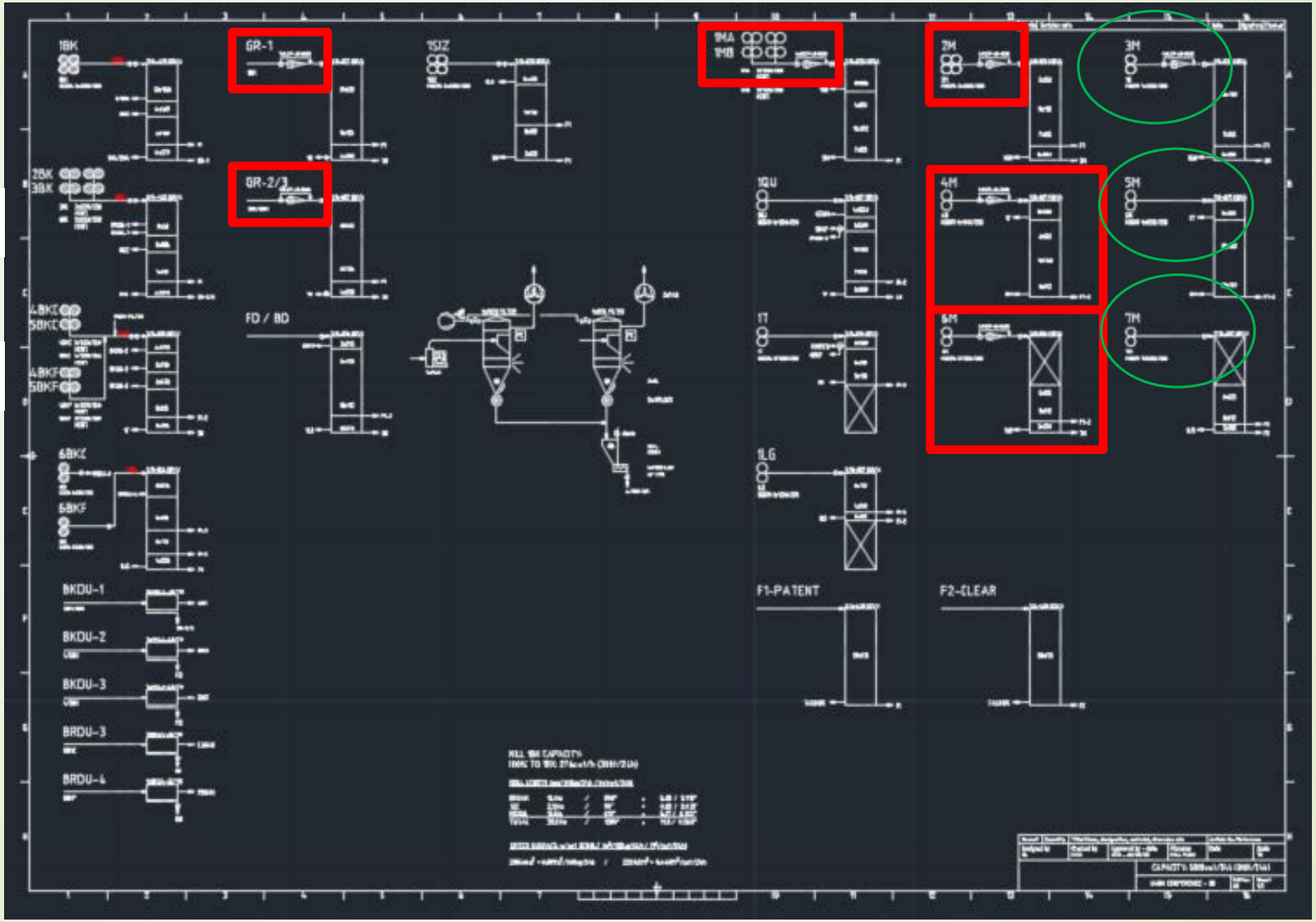


Where could we add additional impact passages?

1st QUALITY

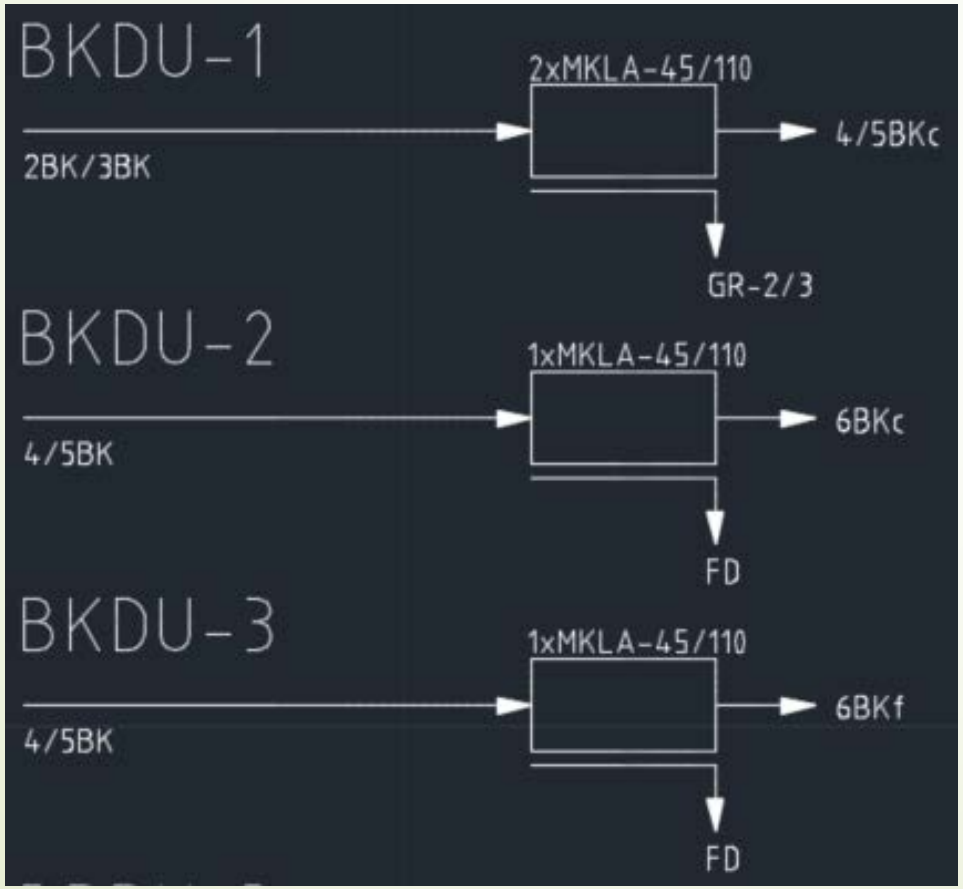
2ND QUALITY

4TH QUALITY



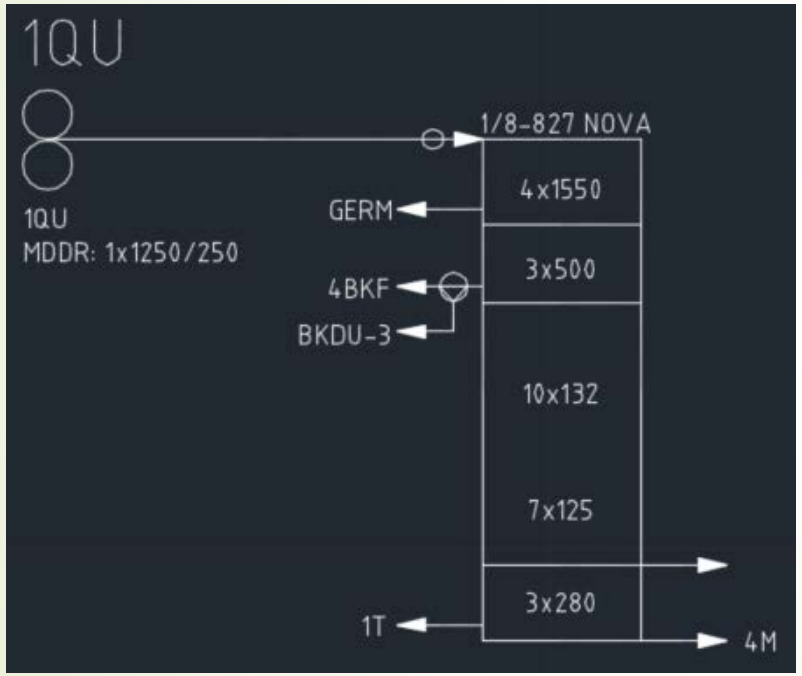
Modernizing the Flow – Using Impact Technology

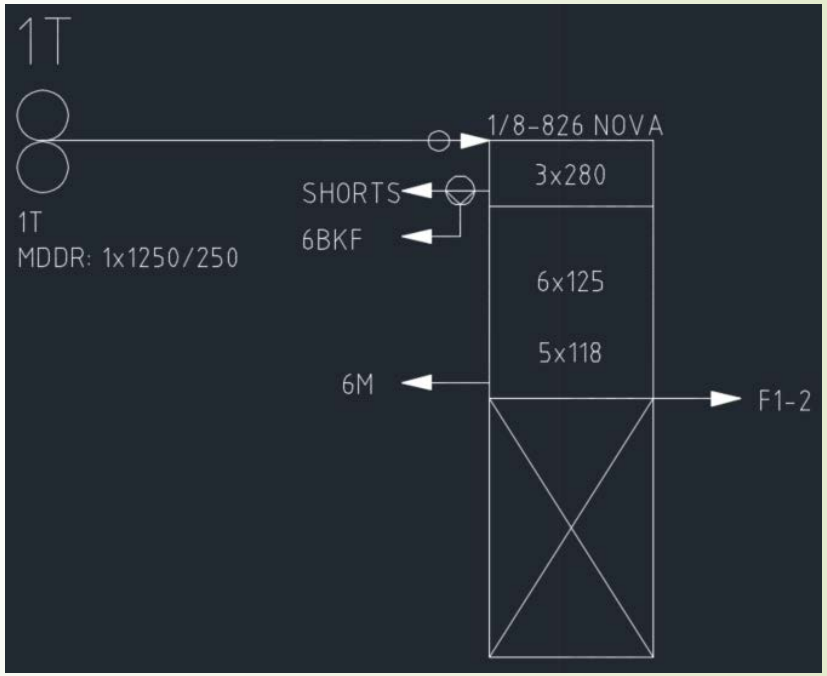
- Applying Impact to Compound Bran Particles



Modernizing the Flow – Using Impact Technology

- Are we routinely applying it to all collection passages?



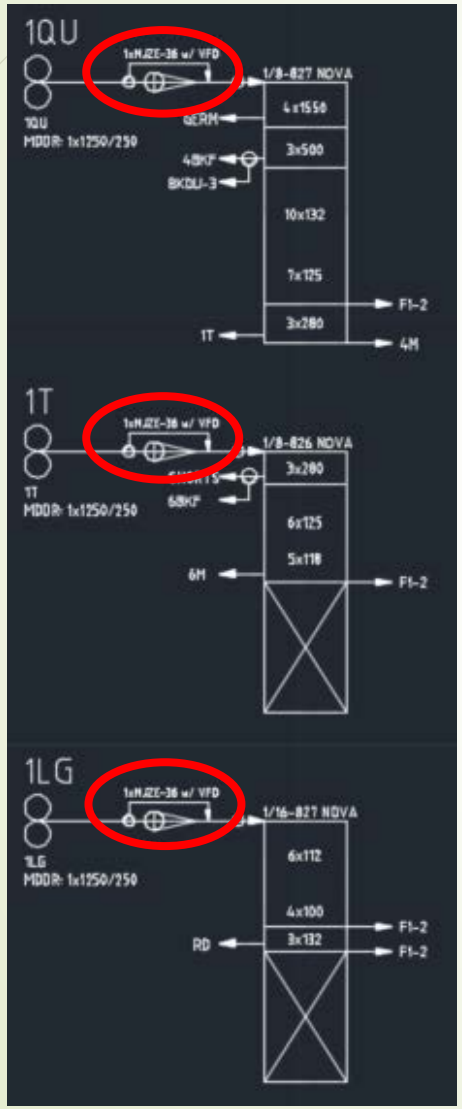


Are we routinely applying impact to all collection passages?

2ND QUALITY

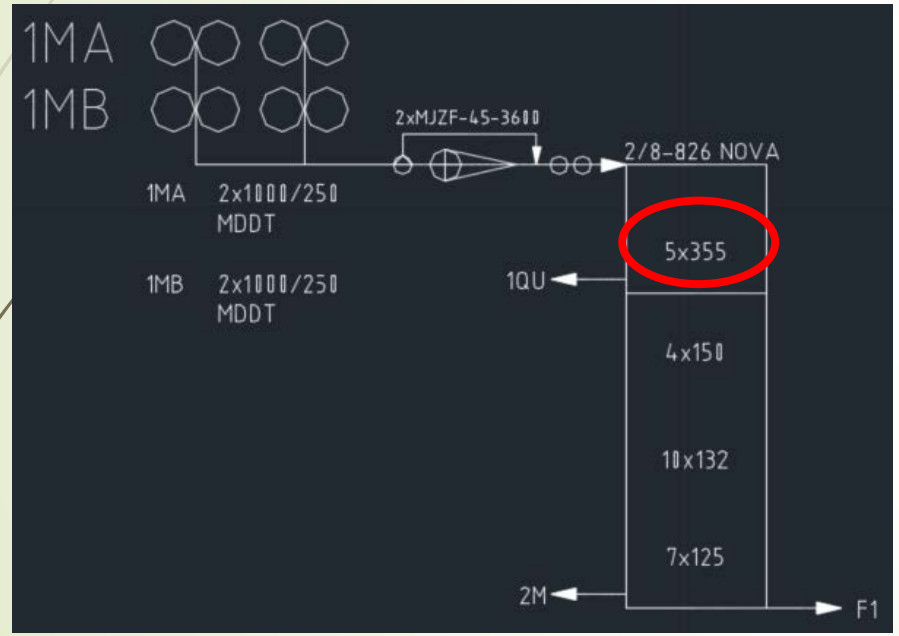
4TH QUALITY

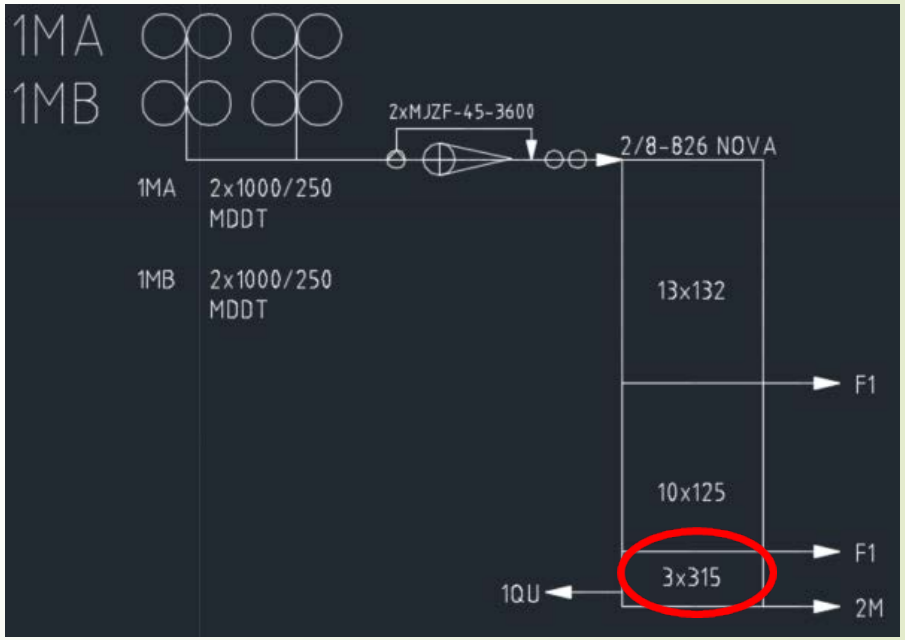
5TH QUALITY



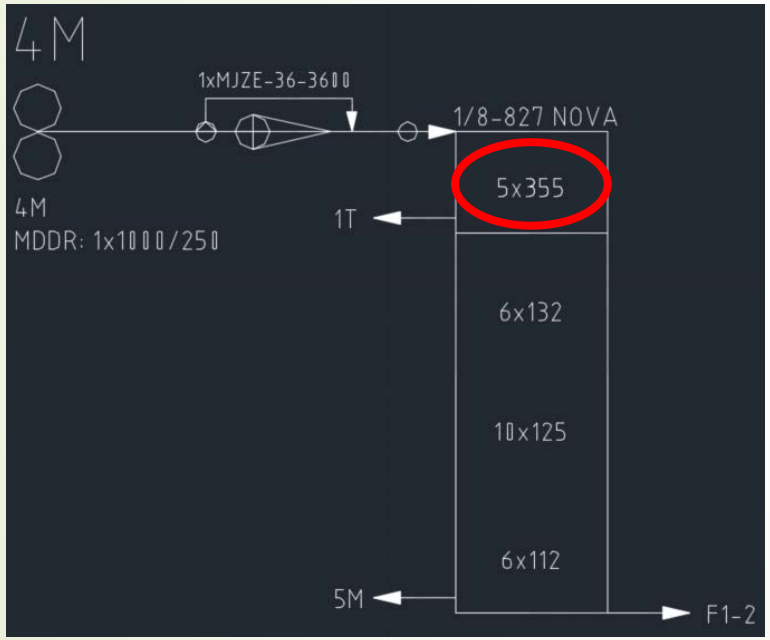
1. How much impact force should we apply?
2. How aggressive can we be at each passage quality?
3. How important is germ yield?
4. As the germ quality increases can we fine-up on the germ scalping sieve to recover broken germ to compensate for yield loss?

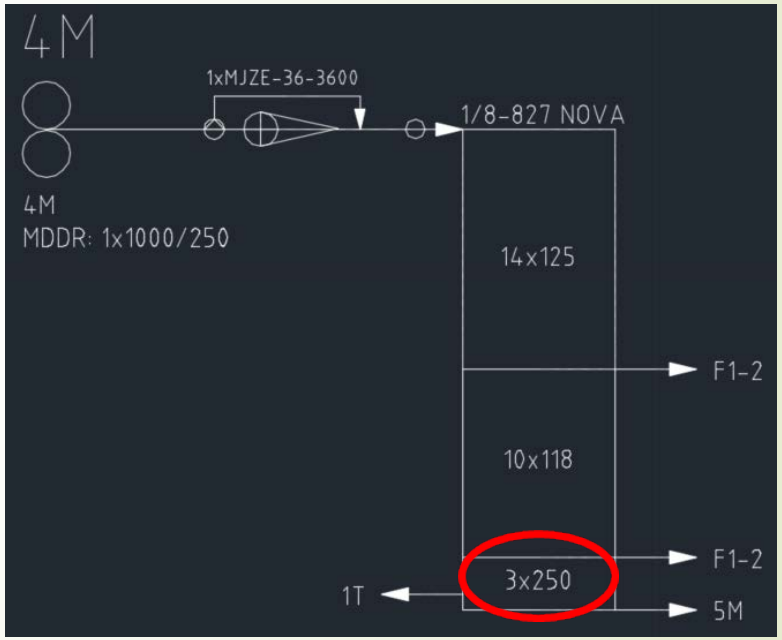
Impact: Improved Sifter Schemes





Impact: Improved Sifter Schemes





Thank You