# Crushing Plant Performance


## Bill Malone & Alex Scott



Improving Processes. Instilling Expertise.

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Dyno Nobel


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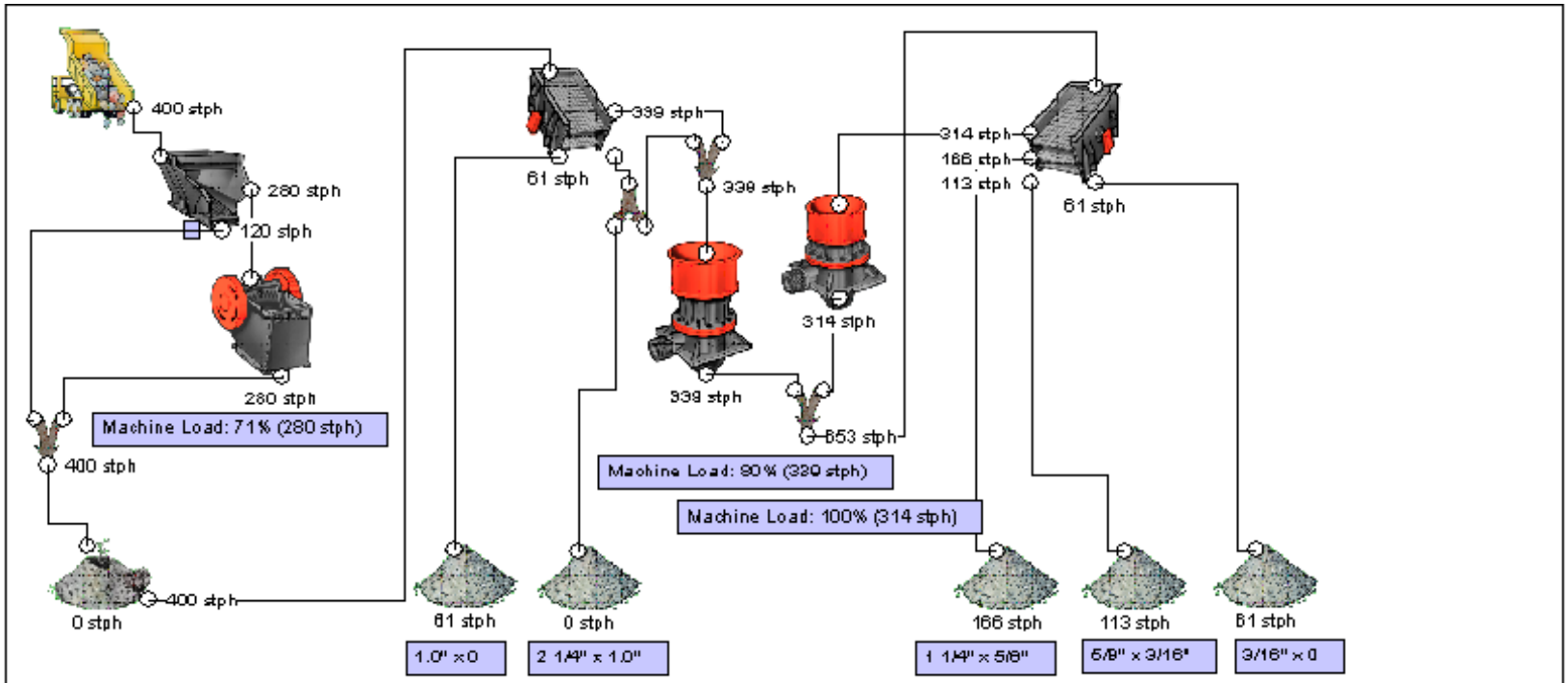
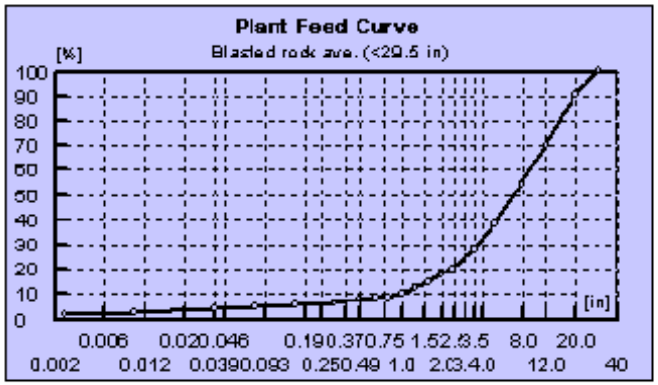
# Audience Survey

- **How many people think that saving dollars at the drill & blast will save dollars in the over all cost of operation ?**



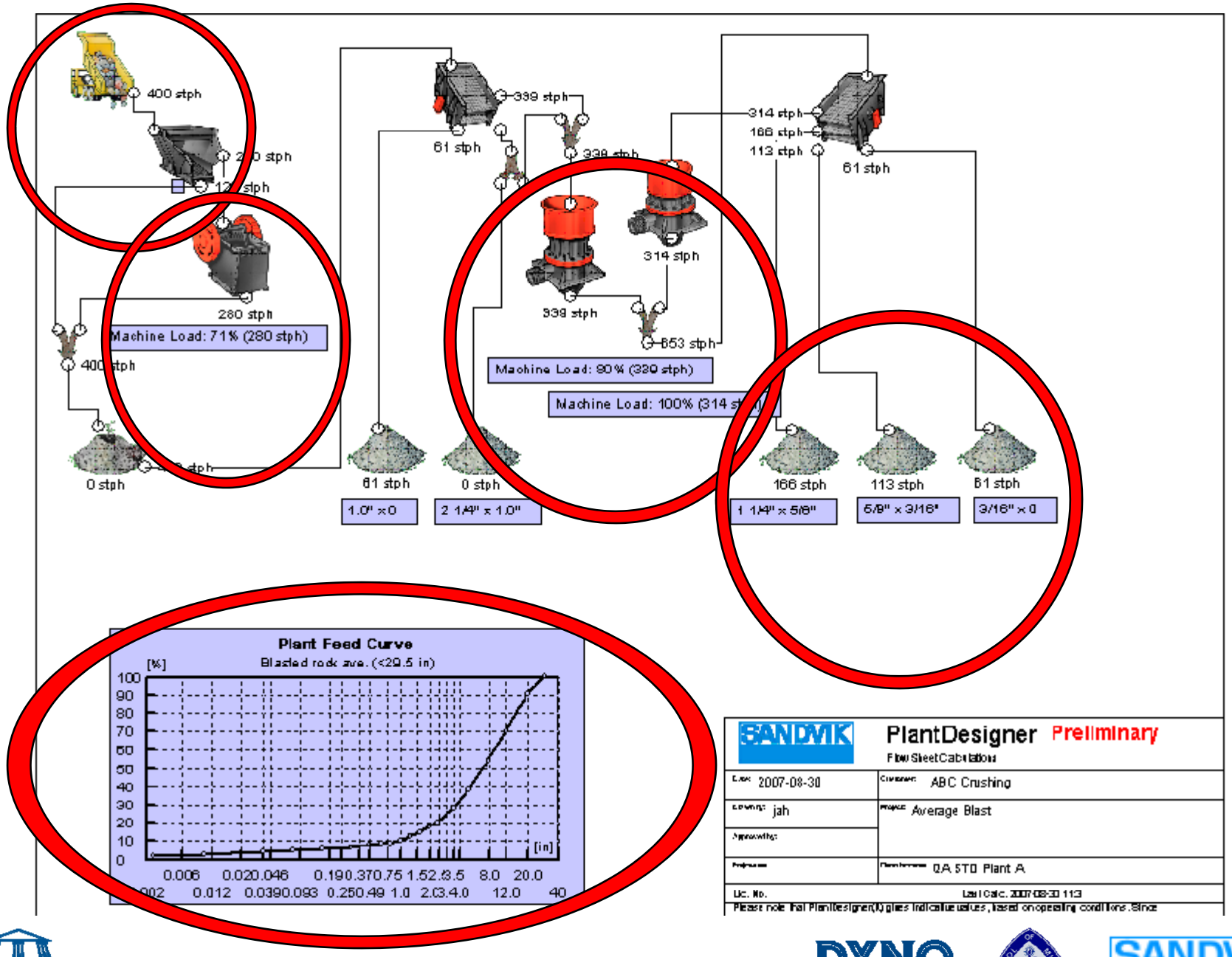




SANDVIK **PlantDesigner** **Preliminary**

Flow Sheet Calculations

| | |
|---|---|
| Date: 2007-08-30 | Customer: ABC Crushing |
| Drawing: jah | Project: Average Blast |
| Approved by: | |
| Profession: | Performance: QA STD Plant A |
| Loc. No. | Last Calc. 2007-08-30 11:3 |

Please note that PlantDesigner(R) gives indicative values, based on operating conditions. Since

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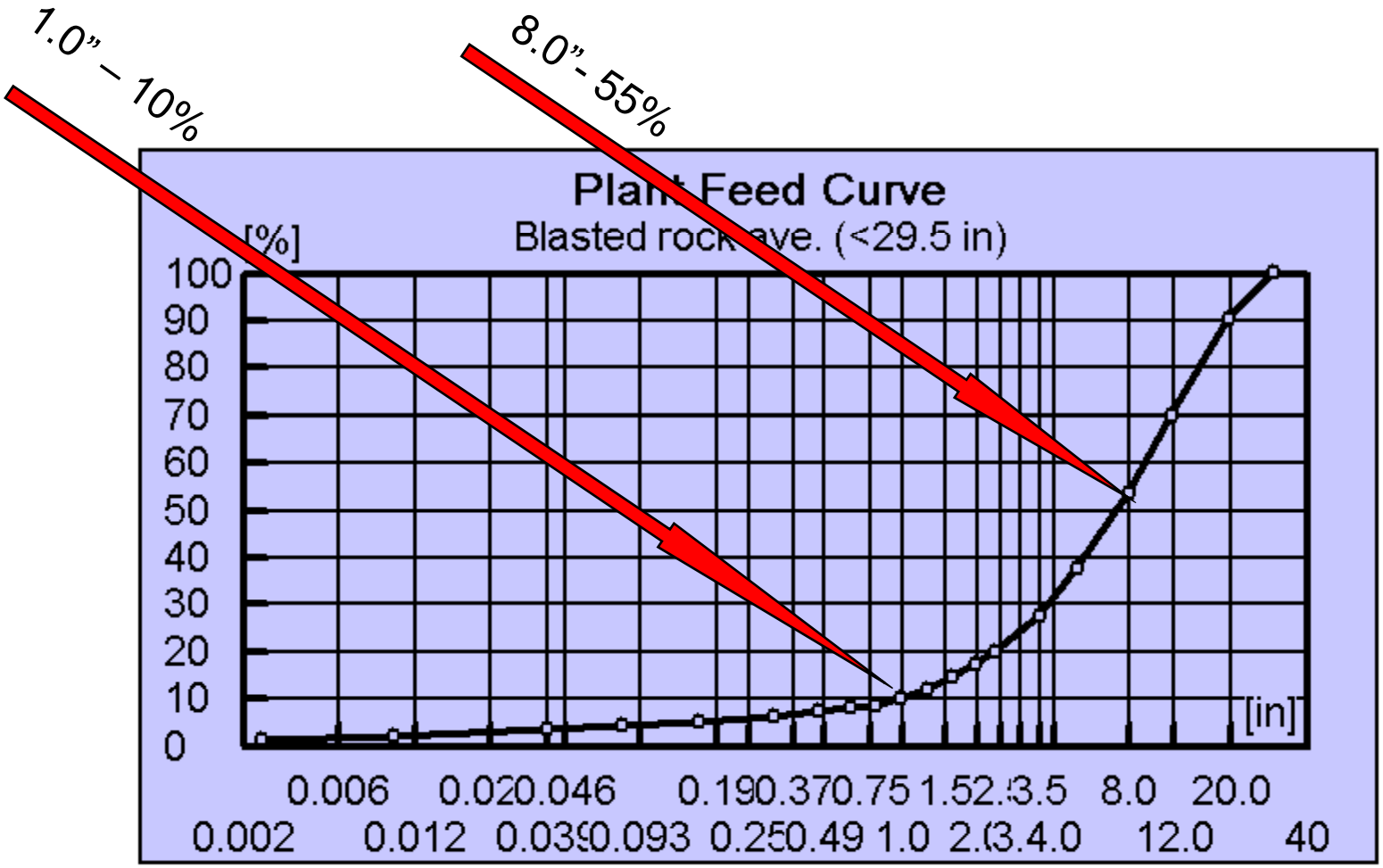
1.0" – 10%
8.0" - 55%
Plant Feed Curve
Blasted rock ave. (<29.5 in)
[%]
100
90
80
70
60
50
40
30
20
10
0
[in]
0.002
0.006
0.012
0.02
0.039
0.046
0.093
0.19
0.25
0.37
0.49
0.75
1.0
1.5
2.0
3.5
4.0
8.0
12.0
20.0
40

# Estimated Production Tonnages

- **Crush, Size, and Convey Product values**
  - **1 x 0 = 61 tph**
  - **1 ¼ x 5/8 = 166 tph**
  - **5/8 x 3/16 = 113 tph**
  - **3/16 x 0 = 61 tph**

  - **Sub Total = 400 tph**
  - **8 hours = 3200 tons per day**
  - **16,000 tons per week**
  - **800,000 tons per year**

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# Estimated Production Revenue

- **Crush, Size, and Convey Product values**
  - **1 x 0 = $4.00**
  - **1 ¼" x 5/8" = $5.00**
  - **5/8" x 3/16" = $6.00**
  - **3/16" x 0 = $2.00**

- 1 x 0 @ $4.00 X 61 tph = $ 244.00
- 1 ¼ x 5/8 @ $5.00 X 166 tph = $ 830.00
- 5/8 x 3/16 @ $6.00 X 113 tph = $ 678.00
- 3/16 x 0 @ $2.00 X 61 tph = $ 122.00

- Sub Total = $ 1874.00 dollars per hour
- 8 hours per day = $15,000 per day
- 40 hours per week = $75,000 per week
- 50 weeks per year = $3,750,000 possible revenue per year

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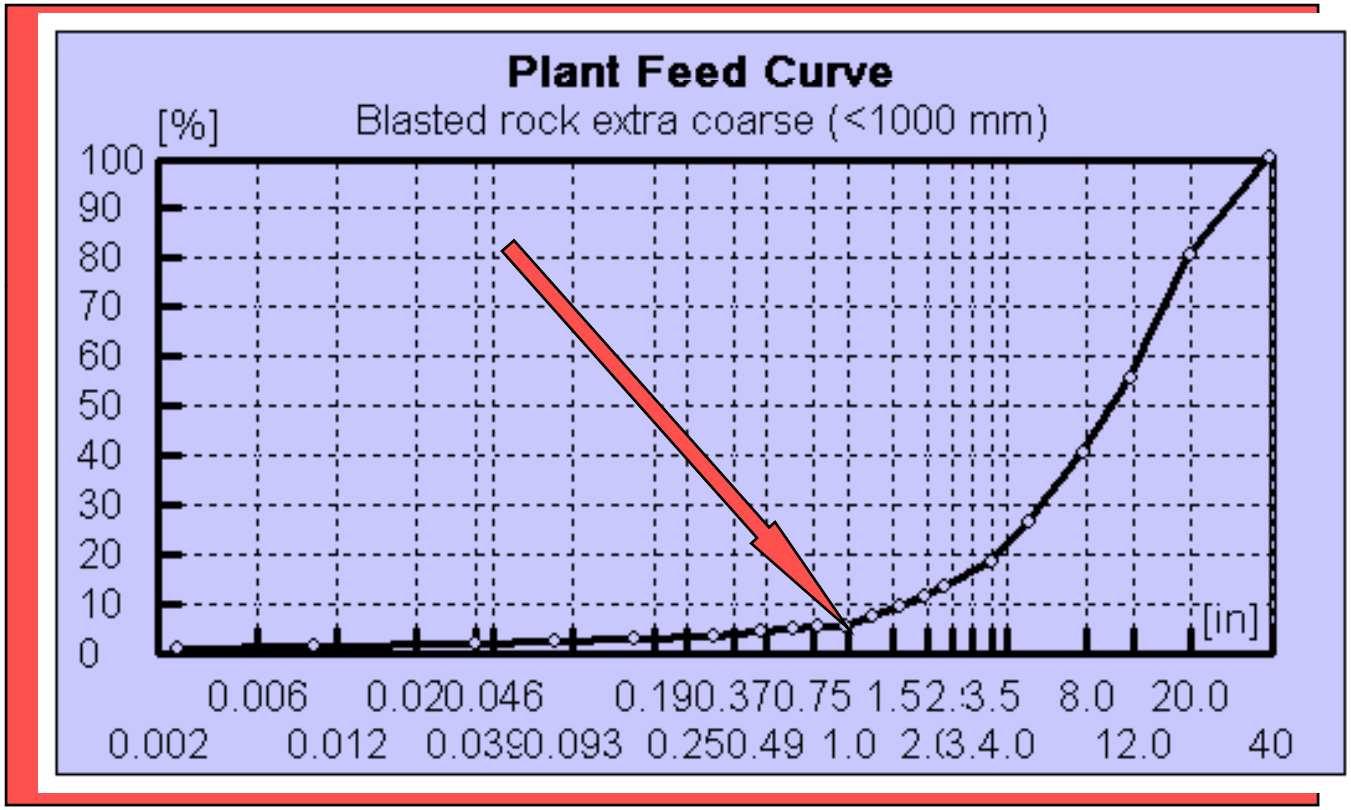


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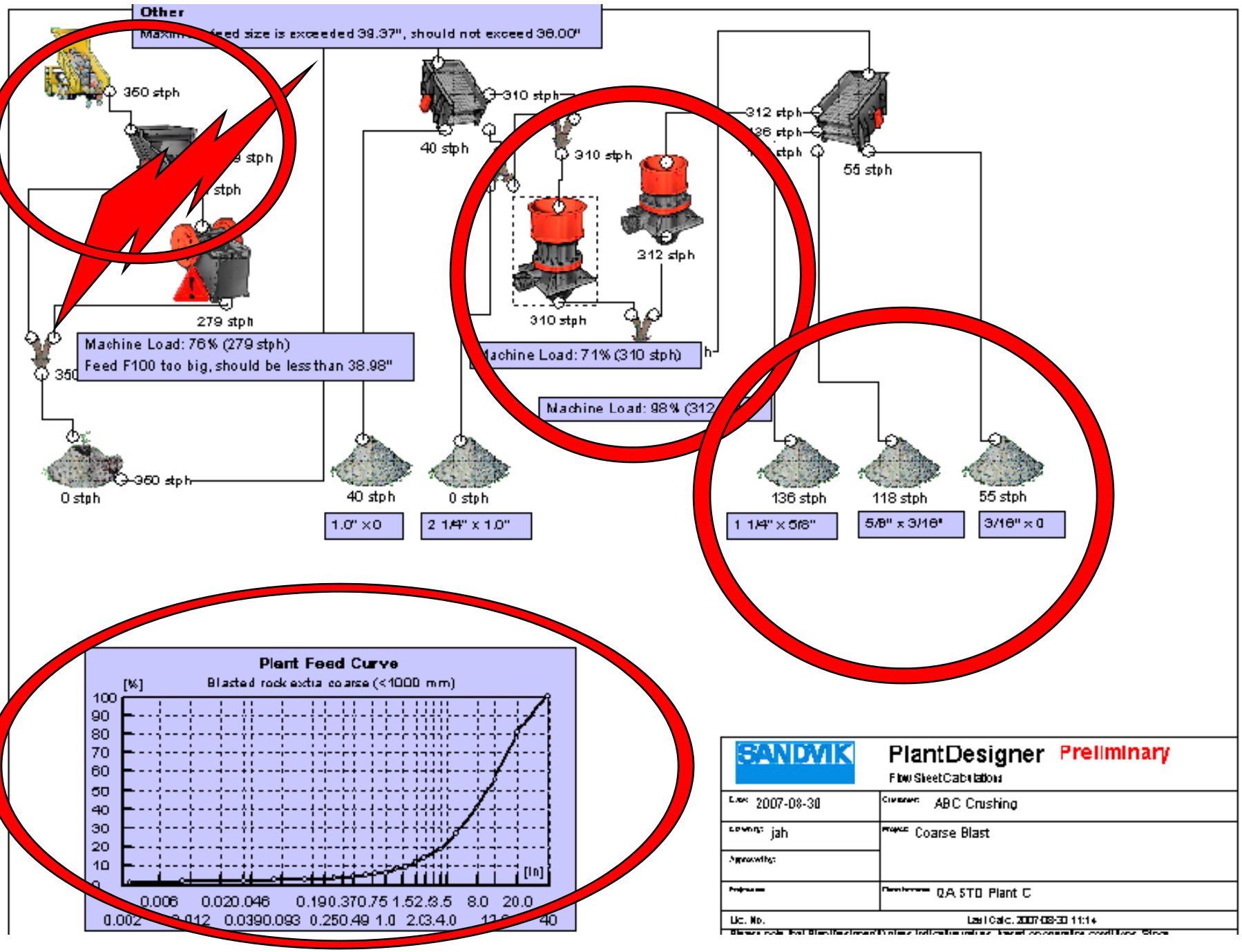
# Audience Survey

- **How many people see the use of a pick used in secondary breakage in their operations today?**

?


Other
Maxim feed size is exceeded 39.37", should not exceed 36.00"
350 stph
279 stph
Machine Load: 76% (279 stph)
Feed F100 too big, should be less than 38.98"
0 stph
360 stph
310 stph
40 stph
310 stph
312 stph
310 stph
Machine Load: 71% (310 stph)
Machine Load: 98% (312
312 stph
55 stph
40 stph
0 stph
1.0" x 0
2 1/4" x 1.0"
136 stph
118 stph
55 stph
1 1/4" x 5/8"
5/8" x 3/16"
3/16" x 0
Plant Feed Curve
Blasted rock extra coarse (<1000 mm)
[%]
[in]
100
90
80
70
60
50
40
30
20
10
0.006
0.020.046
0.190.370.75
1.52.3.5
8.0
20.0
0.002
0.012
0.0390.093
0.250.49
1.0
2.03.4.0
40
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PlantDesigner
Preliminary
Flow Sheet Calculation
Date: 2007-08-30
Customer: ABC Crushing
Drawing: jah
Project: Coarse Blast
Approving:
Preference:
Plant name: QA STD Plant C
Lic. No.
Last Calc. 2007-08-30 11:14

# Estimated Production Tonnages

- **Crush, Size, and Convey Product values**
  - **1 x 0 = 40 tph**
  - **1 ¼ x 5/8 = 136 tph**
  - **5/8 x 3/16 = 118 tph**
  - **3/16 x 0 = 55 tph**

  - **Sub Total = 350 tph**
  - **8 hours = 2800 tons per day**
  - **14,000 tons per week**
  - **700,000 tons per year ( 13% drop)**

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# Estimated Production Revenue

- **Crush, Size, and Convey Product values**
  - **1 x 0 = $4.00**
  - **1 ¼ x 5/8 = $5.00**
  - **5/8 x 3/16 = $6.00**
  - **3/16 x 0 = $2.00**

- 1 x 0 @ 4.00 X 40 tph = $ 160.00
- 1 ¼ x 5/8 @ 5.00 X 136 tph = $ 680.00
- 5/8 x 3/16 @ 6.00 X 118 tph = $ 708.00
- 3/16 x 0 @ 2.00 X 55 tph = $ 110.00

- Sub Total = $ 1658.00 dollars per hour
- 8 hours per day = $13264 per day
- 40 hours per week = $66,320 per week
- 50 weeks per year = $3,316,000 per year
- ($434,000 12% reduction)

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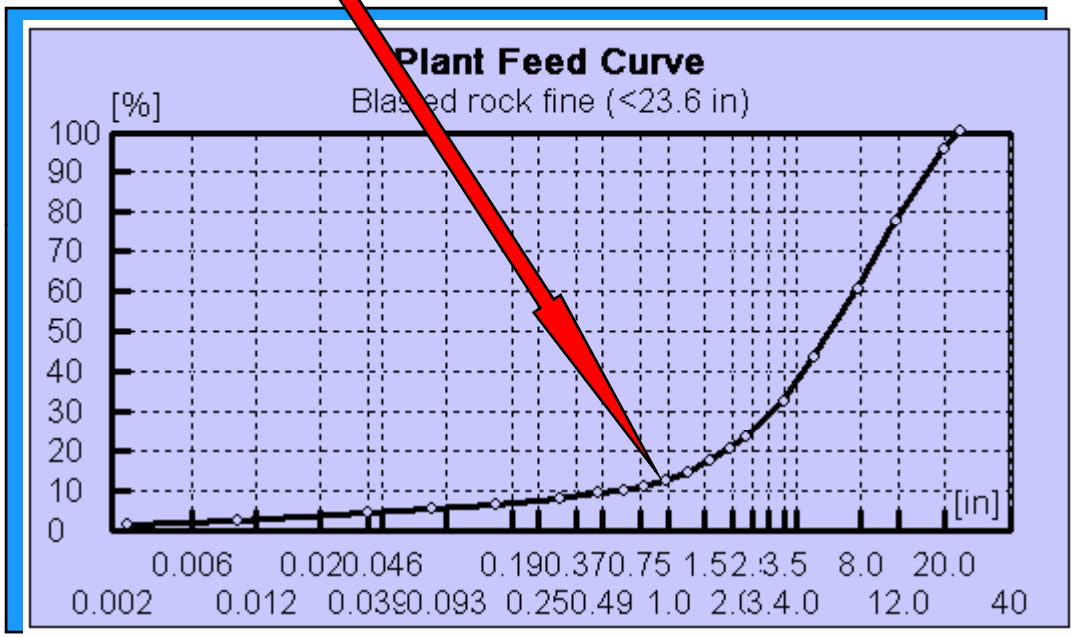
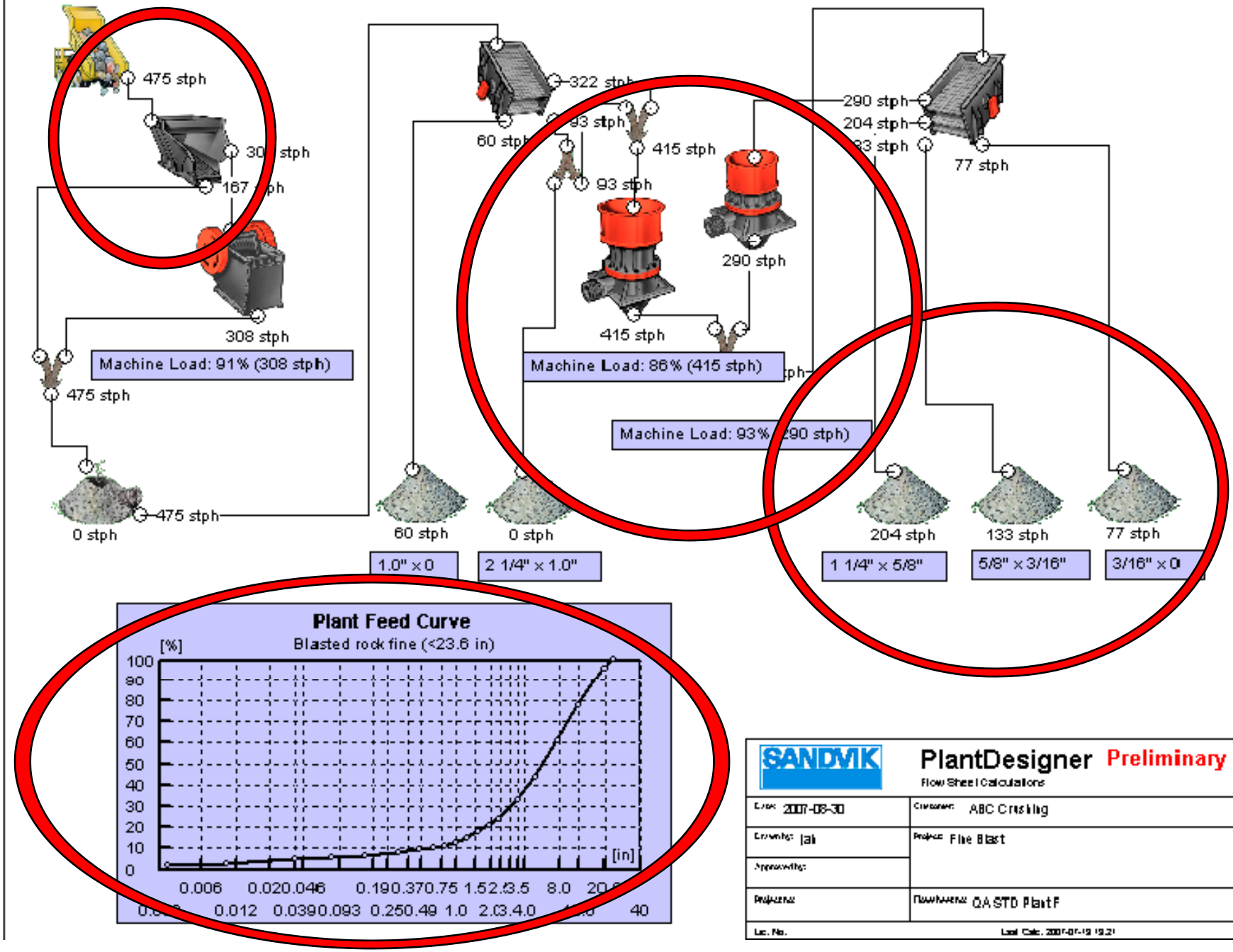
1.0” - 15%


Plant Feed Curve
Blasted rock fine (<23.6 in)
[%]
100
90
80
70
60
50
40
30
20
10
0
[in]
0.002
0.006
0.012
0.020
0.039
0.046
0.093
0.190
0.250
0.370
0.49
0.75
1.0
1.52
2.0
3.5
4.0
8.0
12.0
20.0
40


475 stph
30 stph
167 stph
308 stph
Machine Load: 91% (308 stph)
475 stph
0 stph
475 stph
322 stph
60 stph
93 stph
415 stph
93 stph
290 stph
415 stph
Machine Load: 86% (415 stph)
Machine Load: 93% (290 stph)
290 stph
204 stph
83 stph
77 stph
60 stph
0 stph
204 stph
133 stph
77 stph
1.0" x 0
2 1/4" x 1.0"
1 1/4" x 5/8"
5/8" x 3/16"
3/16" x 0
Plant Feed Curve
Blasted rock fine (<23.6 in)
[%]
[in]
100
90
80
70
60
50
40
30
20
10
0
0.006
0.020.046
0.190.370.75
1.52.53.5
8.0
0.012
0.0390.093
0.250.49
1.0
2.03.4.0
40
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PlantDesigner
Preliminary
Flow Sheet Calculations
2007-08-30
ABC Crushing
jak
Fine Blast
QA STD Plant F

# Estimated Production Tonnages

- **Crush, Size, and Convey Product values**
  - **1 x 0 = 60 tph**
  - **1 ¼ x 5/8 = 204 tph**
  - **5/8 x 3/16 = 133 tph**
  - **3/16 x 0 = 77 tph**

  - **Sub Total = 475 tph**
  - **8 hours = 3800 tons per day**
  - **19,000 tons per week**
  - **950,000 tons per year ( 19% increase)**

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# Estimated Production Revenue

- **Crush, Size, and Convey Product values**
  - **1 x 0 = $4.00**
  - **1 ¼ x 5/8 = $5.00**
  - **5/8 x 3/16 = $6.00**
  - **3/16 x 0 = $2.00**

- 1 x 0 @ $4.00 X 60 tph = $ 240.00
- 1 ¼ x 5/8 @ $5.00 X 204 tph = $ 1020.00
- 5/8 x 3/16 @ $6.00 X 133 tph = $ 798.00
- 3/16 x 0 @ $2.00 X 77 tph = $ 154.00

- Sub Total = $ 2212.00 dollars per hour
- 8 hours per day = $17,696 per day
- 40 hours per week = $88,480 per week
- 50 weeks per year = $4,424,000 per year
- ($674,000 18% increase)

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# Audience Survey

- **How many people think that saving dollars at the drill & blast will save dollars in the over all cost of operation ?**

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**There are big dollars at stake**

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# Now for a Demonstration of Plantdesigner® 10.0


*Using a finer blast curve*

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# Summary

Average Blast
400 Stph Plant tonnage
$ 3,750,000 revenue

**Coarse Blast**
**350 Stph Plant tonnage**
**$ 3,316,000 revenue**
**- 12% ( $ 434,000)**

**Fine Blast**
**475 Stph Plant tonnage**
**$ 4,424,000 revenue**
**+ 18% ( $674,000)**

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