

CORESTA RECOMMENDED METHOD N° 16

LAMINA STRIP PARTICLE SIZE DETERMINATION

(January 1991)

A. INTRODUCTION

This Coresta method is concerned with the measurement of the particle size of lamina strips. The lamina strips arise from leaf threshing or hand stripping operations and can be from any tobacco type including flue-cured, Burley and cigar.

The particle size determination method consists in taking a sample of lamina strips and passing them over a Cardwell Quality Control shaker. This apparatus separates the lamina strips into five particle sizes by passing them over four screens.

B. CARDWELL TYPE QUALITY CONTROL SHAKER

The Quality Control Test Shaker consists of a feed band conveyor, four sieving trays and a fines collection pan all of which is mounted in a robust frame. Separation is carried out by vibrating the four trays each fitted with a different mesh screen. These are arranged above each other in such a way that particles falling through one screen are exposed to at least 660 mm of the next screen. Any strips passing over a screen are automatically collected in separate bins at the end of each shaker screen.

A diagram of the general design of the shaker is shown in Appendix A.

C. STANDARD SPECIFICATION FOR SIEVING SCREENS

The four screens fitted to the Cardwell Test Shaker should be wire mesh constructed from stainless steel to ASTM E11 specification.

Diagrams of the screen set up are shown in Appendix B-D. The screens have the following dimensions :

Size	Sieve Opening	Wire Diameter	Open Area
1" x 1"	1.0"	0.1496"	75.9 %
1/2" x 1/2"	0.5"	0.1051"	68.3 %
1/4" x 1/4"	0.25"	0.0716"	60.3 %
US 8 mesh	0.0937"	0.0394"	49.0 %

All screens consist of stainless steel wire with a single crimp except the US 8 mesh screen which is plain weave.

D. SETTING UP PROCEDURE

1. Vibrational frequency of screens

The frequency of vibration of all screens is to be set at 525 vibrations per minute ± 5 vibrations per minute.

This is accomplished by changing the pulleys on the motor and/or the eccentric drive shaft to give a drive shaft speed of 525 rpm ± 5 rpm. The speed of this shaft should be checked with a tachometer.

2. Stroke of Screens

The stroke of each screen is to be $33/64" \pm 3/64"$.

The stroke of each shaker screen is measured by the use of a stroke diagram. The method is described in Appendix E. The measurements must be taken whilst the drive shaft is running at 525 rpm ± 5 rpm.

On any one machine the stroke should remain constant. If the measured strokes are found to be outside the tolerance then check that there is no slackness in the drive mechanism. (Very small amounts of slack in a key can cause considerable loss of motion).

Errors in stroke might also be due to incorrect tray weight or spring stiffness.

3. Feedband

Adjust the feedband so that the sample of tobacco covering the band will be discharged in $7 \frac{1}{2}$ minutes ± 5 seconds.

4. Collecting Bins

Ensure that the collecting bins are of the same weight.

5. Breaker Bars

The shaker sieve should be fitted with breaker bars to break up any lumps of lamina as it falls from the feedband. A diagram showing the design of the bars is shown in Appendix F and G.

E. SIEVE TESTS - STANDARD ROUTINE TESTING PROCEDURE

1. Sampling Procedure

The sample weight for flue-cured cigarette lamina is 3,000 gms ± 300 gms.

The sample weight for burley lamina is 3,000 gms ± 300 gms.

The sample weight for cigar lamina is 1,000 gms ± 100 gms.

If the weight of the sample is outside the appropriate limits reject the sample and draw a fresh one.

If the sample is within limits record the weight and pass it on for testing.

2. Testing Procedure

- a) Ensure that the sieve screens are free of tobacco particles and that the tared collection bins are in their correct place at the discharge outlets.
- b) Spread the sample evenly over the entire surface of the feed conveyor.
- c) Start the sieve and then the feedband.

When the total sample has passed over the top screen pass a soft brush gently over the breaker bars and then over the top screen thus freeing all trapped particles of tobacco and allowing them to pass over the remaining screens. Repeat for the remaining screens. Stop the sieve and feedband when all the tobacco has been collected in the tared bins.

- d) Weigh collected samples to the nearest gramme. Record each weight under the headings :

On	1" screen
On	1/2" screen
On	1/4" screen
On	1/8" screen
Below	1/8" screen

- e) Check that the sum of the individual weights is within ± 50 g of the initial sample weight. If it is not, discard the test and repeat with a new sample.
- f) Express the individual weights as a percentage of the sum of the individual weights.

Note : **do not** calculate the percentages using the initial weight of the sample.

- g) The general formula for determining the percentage weights of each individual weight is :

percentage = (individual weight x 100) / (sum of the individual weights)

F. ROUTINE CHECK PROCEDURE

1. Check once a day the stroke of each screen by observing the stroke diagrams.
2. Check once a day that the speed of the eccentric drive shaft is 525 ± 5 rpm.
3. Check once a day that the screens are not distorted in any way. The screen must be replaced by the standard ASTM E11 as soon as there is a visible sign of wear.

New screens and complete kits can be obtained from :

W.C. Tyler Inc., 3200, Bessemer City Road, PO Box 8900, Gastonia, N.C.
28053-9065, USA. Fax N° 704-868-3374 - Telex 510-8244 -

Ask for : Standard Tobacco QC Sieves Conversion Kit.

4. Check once a day that the tobacco discharge time is 7 1/2 minutes.

G. A NOTE ON SAMPLING POSITIONS

The majority of strips sampled for lamina particle size testing are taken at the end of the threshing line as a quality control measure. These samples generally range from 16 to 20 % moisture.

Tobacco strips are also sampled and tested from the exit of the redrier and from the packed case or hogshead. Samples are also taken and tested before and after strips blending during cigarette manufacture.

The sampling and handling of dry lamina must be carried out carefully to avoid degradation. Moisture content of some samples may vary from 10 to 13 % and they should be reconditioned to at least 15-16 % before checking.

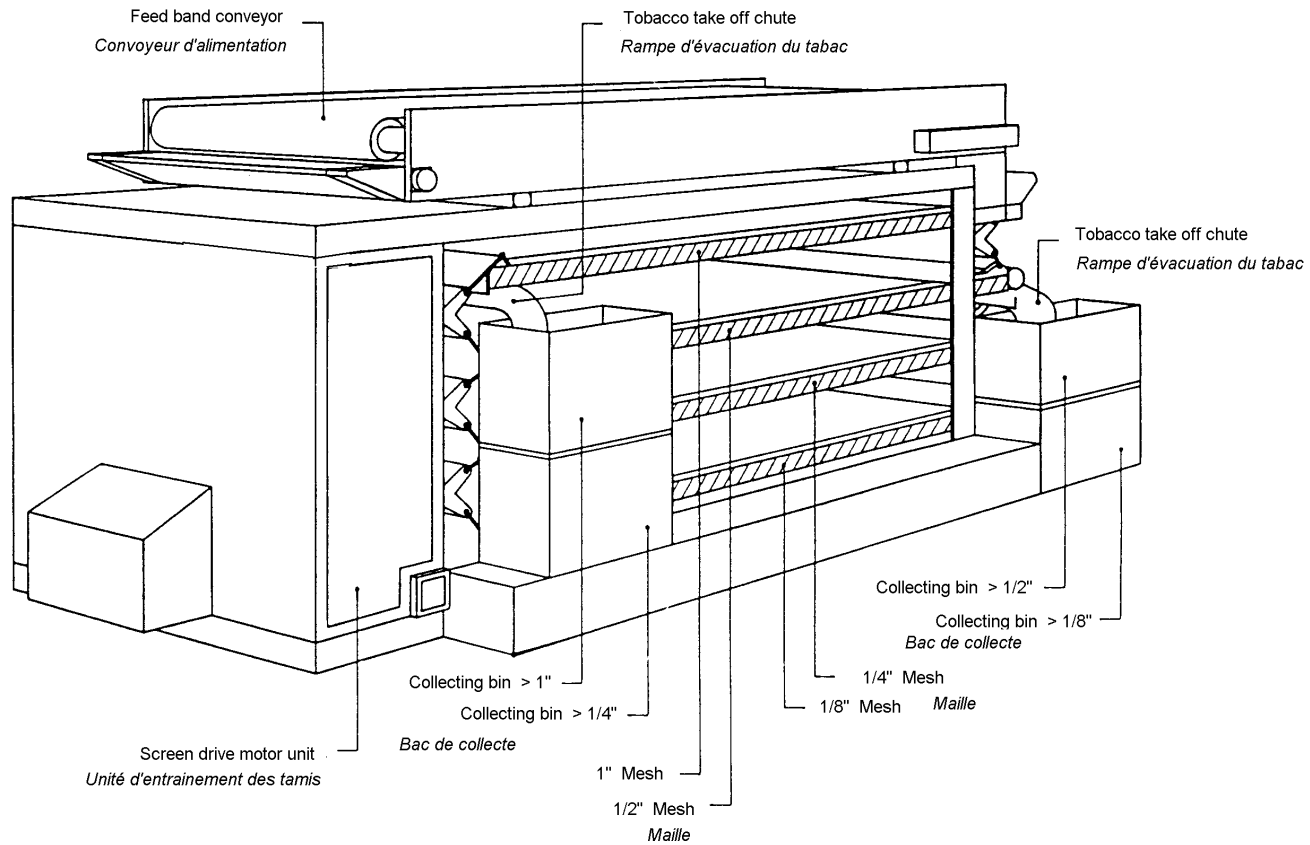
RECOMMENDED METHOD N° 16 - FIGURES

RM 16 - APPENDIX A

GENERAL DESIGN OF
CARDWELL QUALITY
CONTROL SHAKER

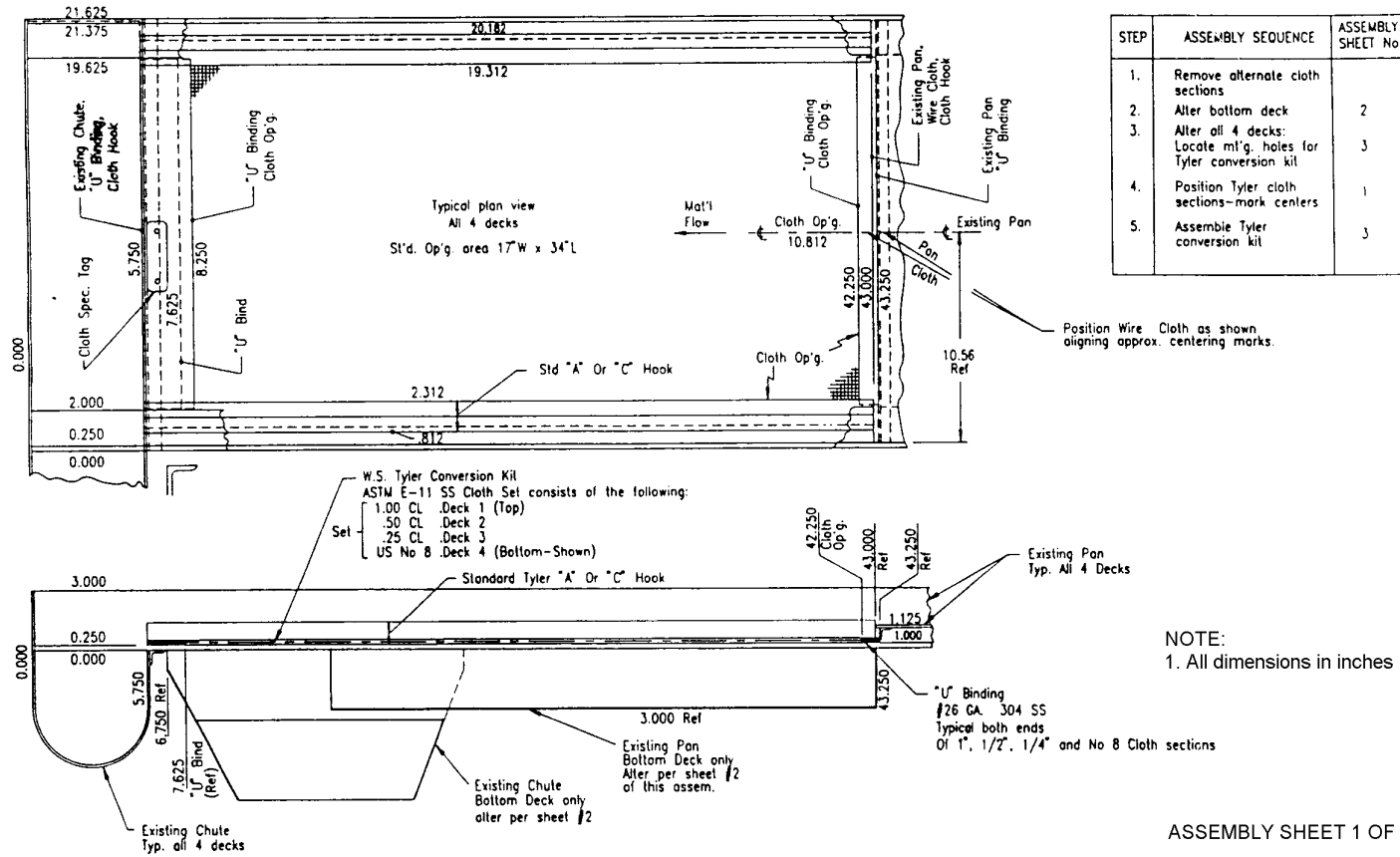
Annexe A

REPRESENTATION
D'ENSEMBLE
DE L'APPAREIL DE
CONTROLE DE
QUALITE CARDWELL



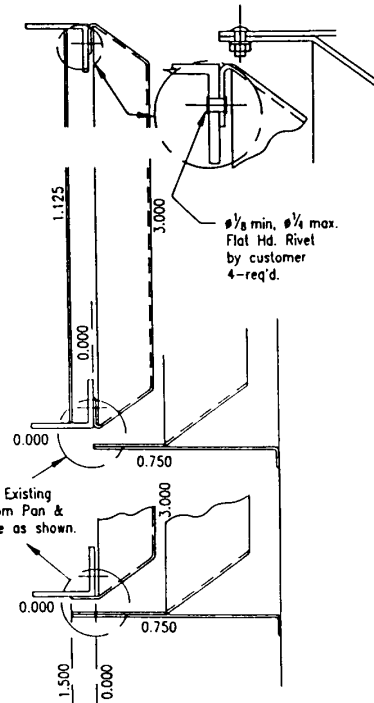
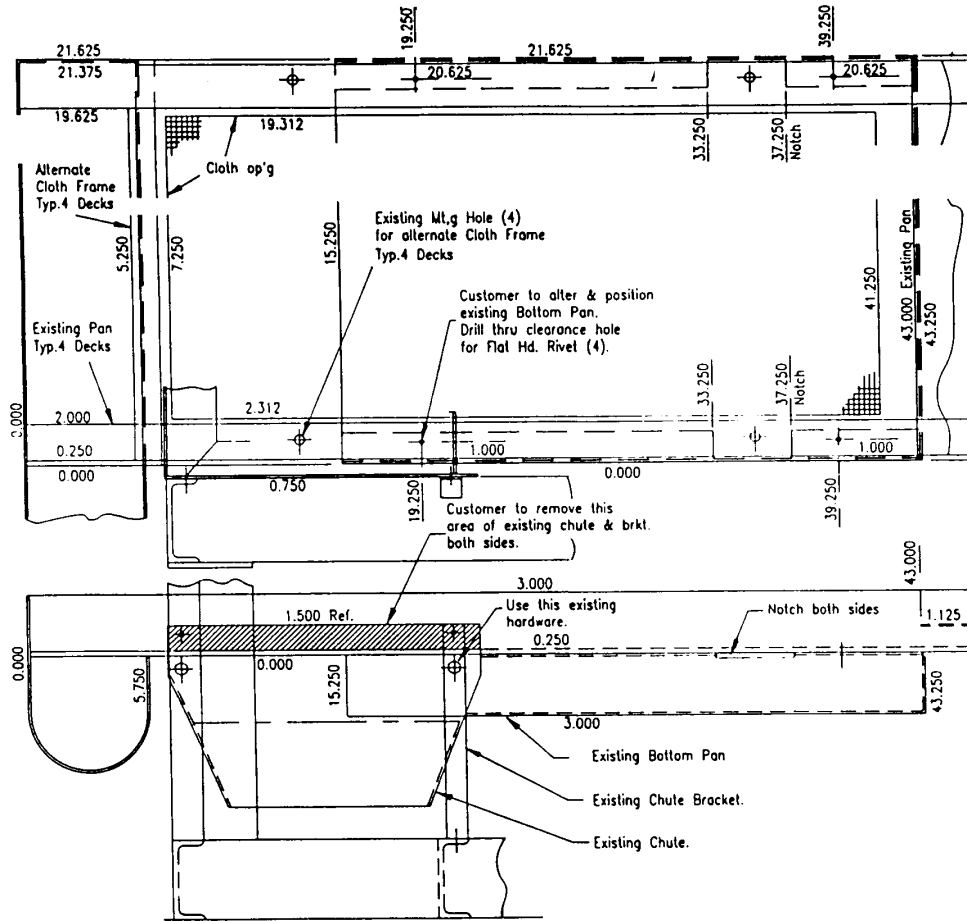
RM 16 - APPENDIX B

CLOTH LOCATION - QCT/WS TYLER SCREEN CONVERSION KIT



STEP	ASSEMBLY SEQUENCE	ASSEMBLY SHEET No.
1.	Remove alternate cloth sections	
2.	Alter bottom deck	2
3.	Alter all 4 decks: Locate mt'g. holes for Tyler conversion kit	3
4.	Position Tyler cloth sections-mark centers	1
5.	Assemble Tyler conversion kit	3

RM 16 - APPENDIX C
 BOTTOM DECK ALTERATION - QCT/WS TYLER SCREEN CONVERSION KIT

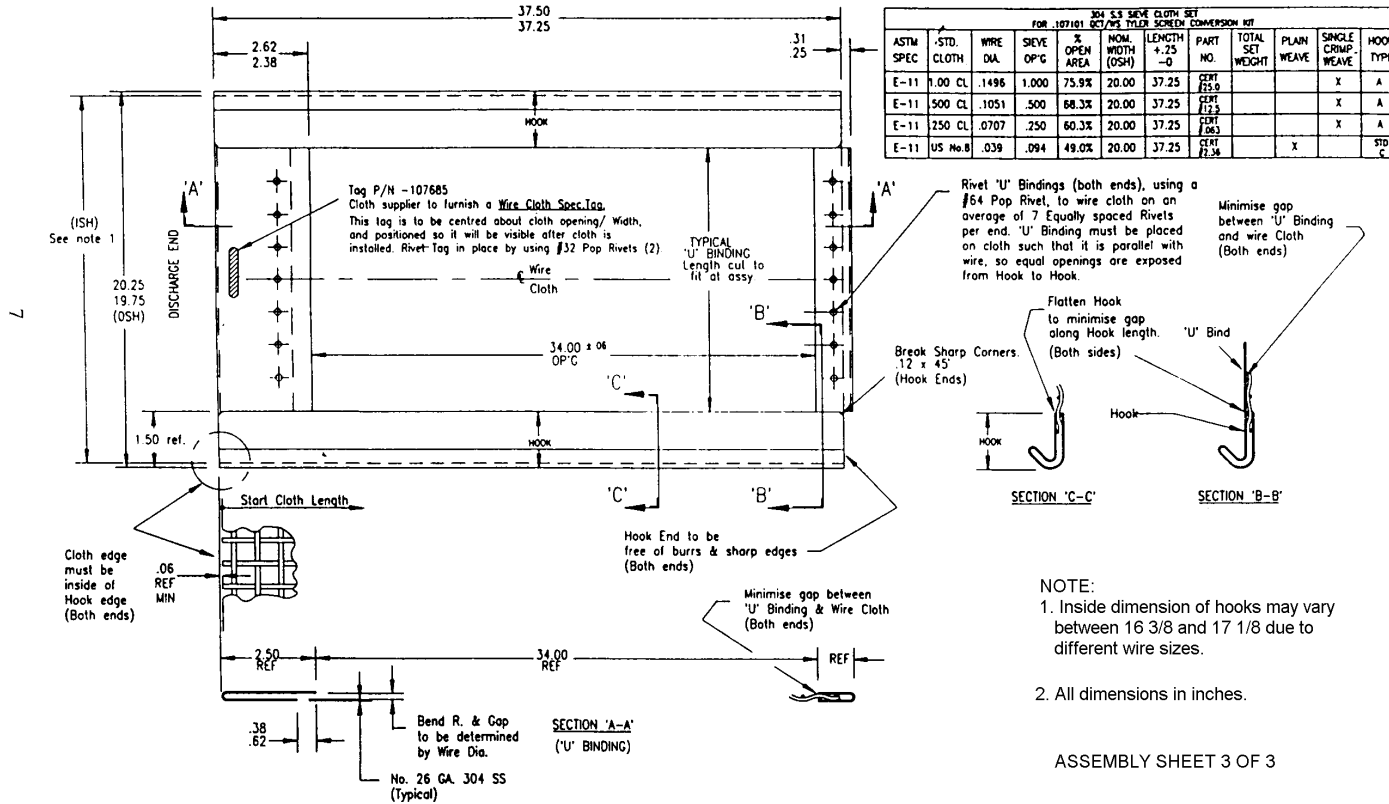


NOTE:
 1. All dimensions in inches

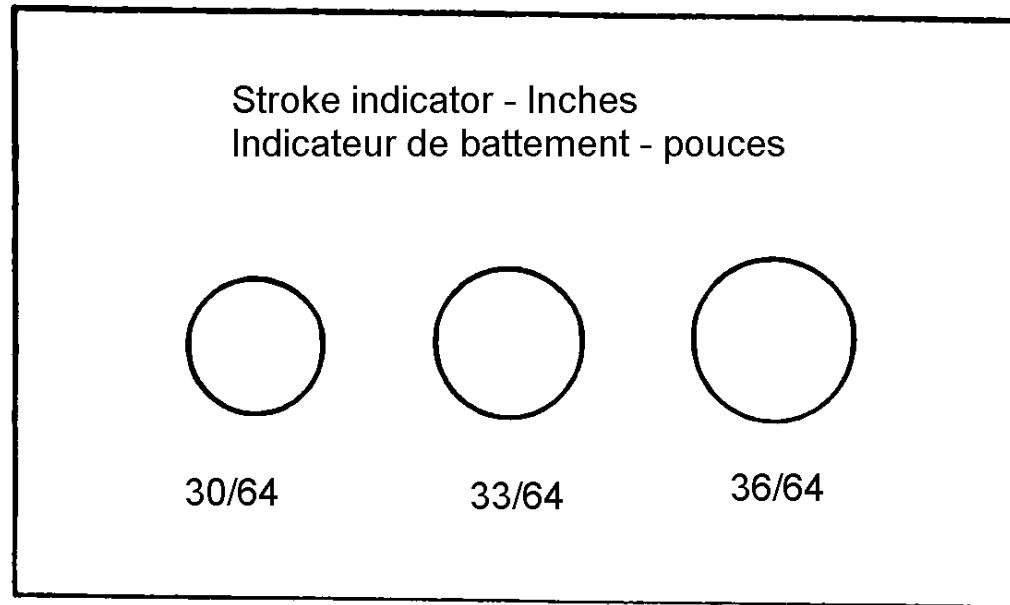
ASSEMBLY SHEET 2 OF 3

RM 16 - APPENDIX D

SIEVE CLOTH SET - TYLER SCREEN CONVERSION KIT

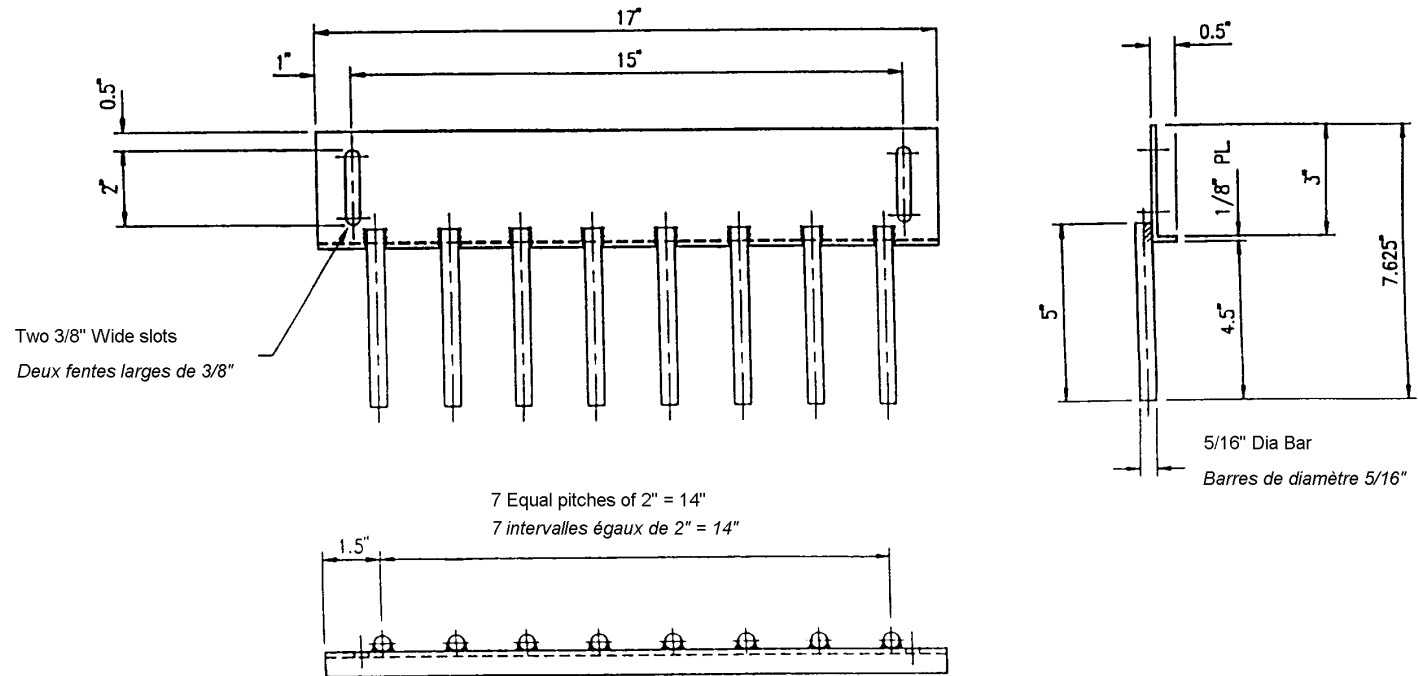


RM 16 - Appendix E
MR 16 - Annexe E



RM16 - Appendix F *Annexe F*

BREAKER BARS *BARRES SEPARATRICES*



Note : Vertical fingers of this unit should be installed exactly two inches above horizontal fingers of spreader assembly

Note : Les doigts verticaux de cette unité doivent être montés exactement deux pouces au-dessus des doigts horizontaux du répartisseur.

STAINLESS STEEL WELDED CONSTRUCTION

FABRICATION EN ACIER INOXYDABLE SOUDE

RM16 - Appendix G

Annexe G

BREAKER BARS

BARRES SEPARATRICES

