Kirton Ranch Summary Report

Tuesday 18 of December

Travelors: John Capece, Grant Griffith and Nicolas Louvet

Objective: Meeting with Dudley Kirton to plan for ditch construction.

1. Arrive at Kirton Ranch 1:35pm.
2. Discuss sod cutting and ditch construction issues with Ranch owner/operator Dudley Kirton (figure 1-4)
3. Sod cutting 'best method' is for driver to line up flags and cut a guideline, then proceed to cut area designated between flags/markers.
4. Sod cutters may have limited sod transportation/sale opportunity between Christmas and New Years, therefore slow rate of sod cutting.
5. An arrangement was made with Mr. Kirton to dig test ditches with the grader. Mr Kirton indicated that he may be limited in his ability to produce perfect 'v' shaped ditches, using his equipment.
6. Mr Kirton is confident, based upon his experience with local soils, that ditches he can produce will be of sufficient stability and capacity for our purpose (figure 5) *(note: hydraulics calculations also support this conclusion figure 6)*
7. Graders to cut ditches along vertical and horizontal lines(figure 7-9).
8. Measurements were taken of the two main pieces of equipment (figure 10,11)
    - Sod cutter
    - Grader
9. Samplers were inspected for missing components (core samplers, control units etc) to evaluate parts to be transported.
10. Short tour of local government and research centers of relevance
11. Return to Labelle office at 5:00pm

Figure 1

Kirton Ranch's Layout

Lay out for the sod

Figure 2

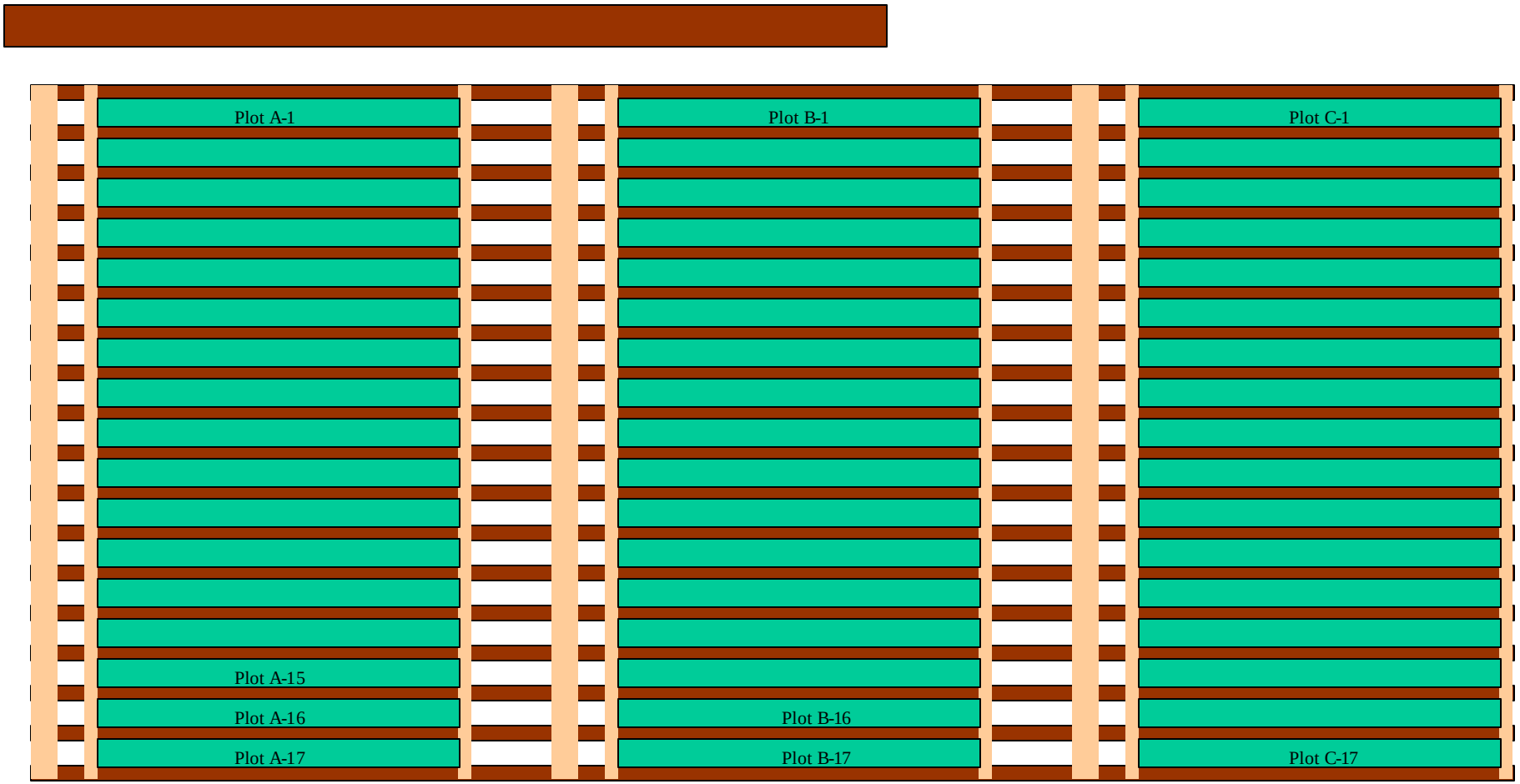
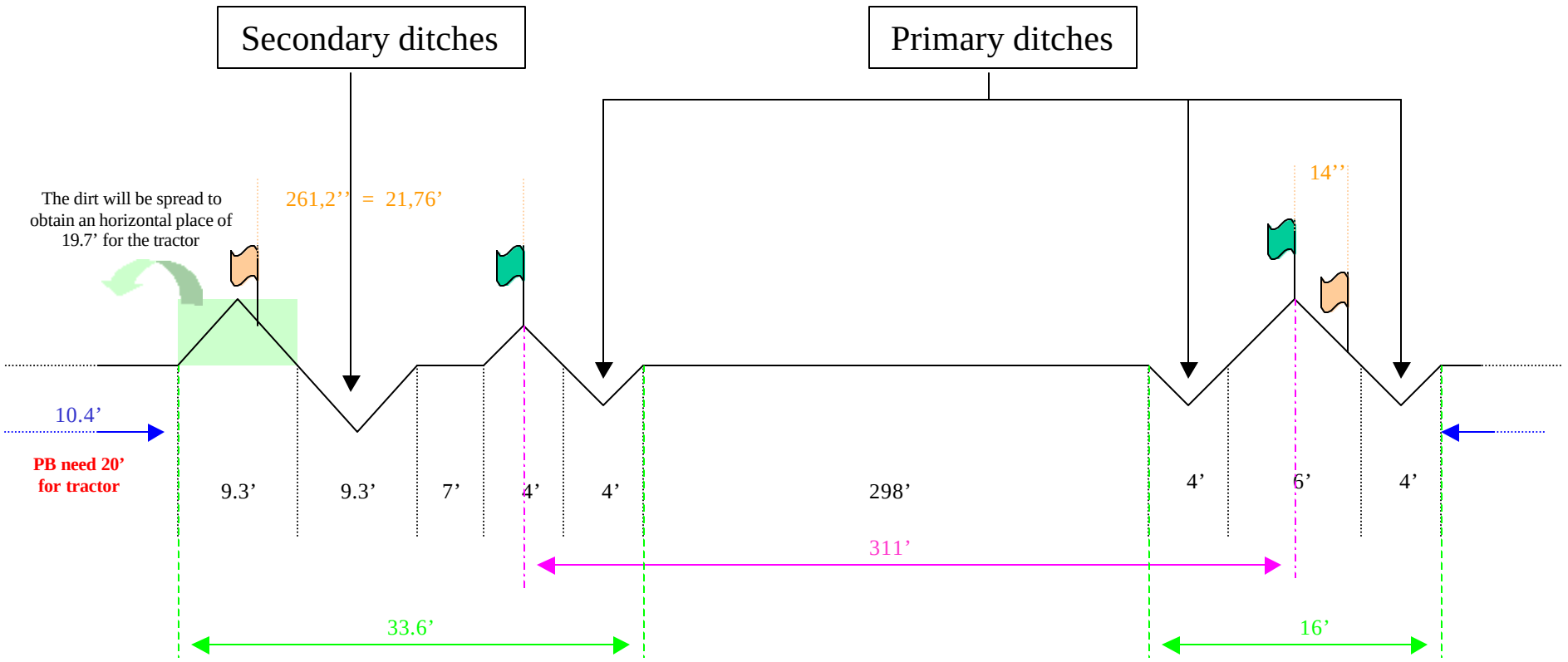


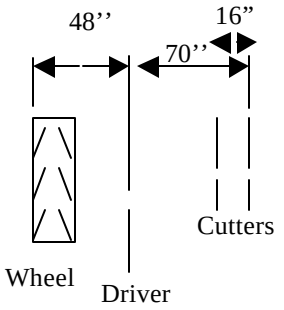
Figure 3

North-South cut of one plot for the location of the sod cut flags



Not final dimensions

Þ Wait for tractor experimentations



Old white flag

Sod cutter driver's flag

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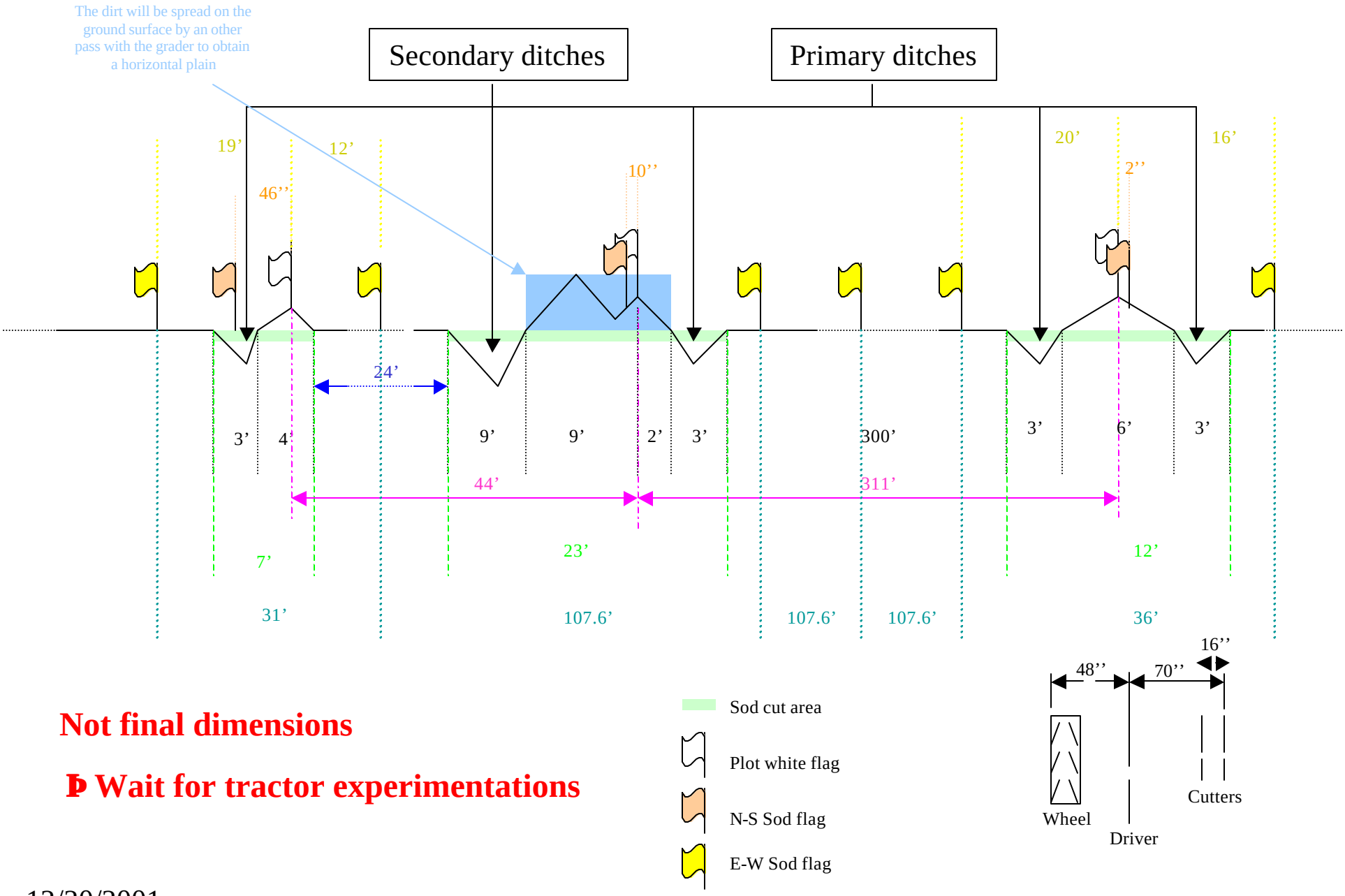
Figure 4

East-West cut of one plot for the location of the sod cut flags



Not final dimensions

Wait for tractor experimentations

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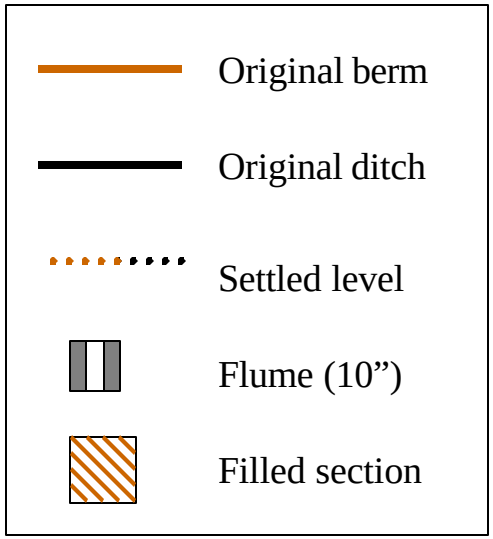
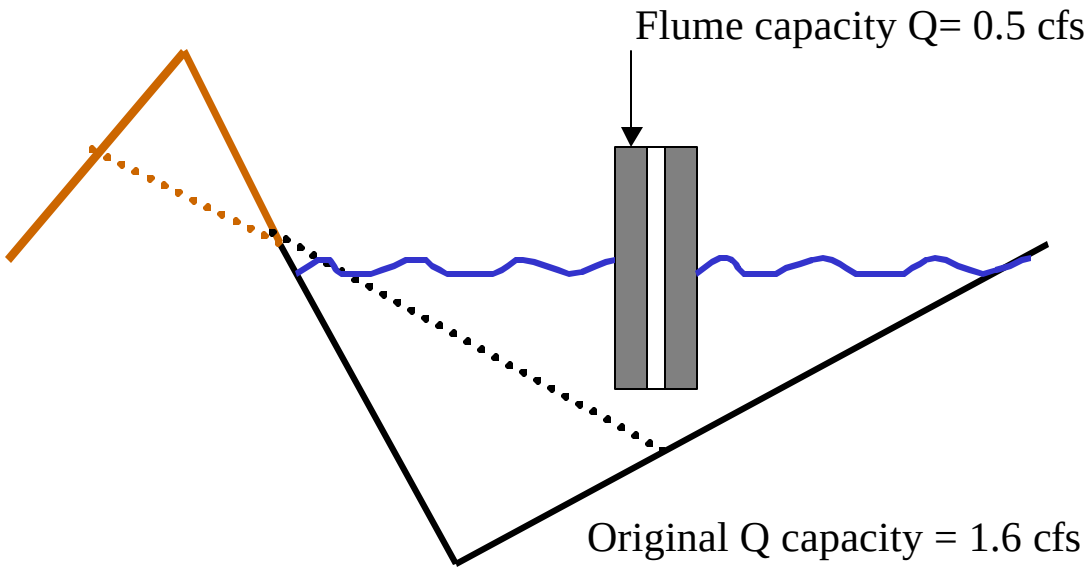
Figure 5

Flume Position and Ditch Dimensions after Settling





An offset positioning of the flume will allow for some infill and settling of the steeper wall too a 2:1 ratio. Infilling is not seen as a flow-limiting problem at this stage, as the present flow capacity is in excess of 3 times the required volume for prolonged heavy rainfall (Q= 0.5cfs). Furthermore the flume will provide the constraint to waterflow not the ditches.

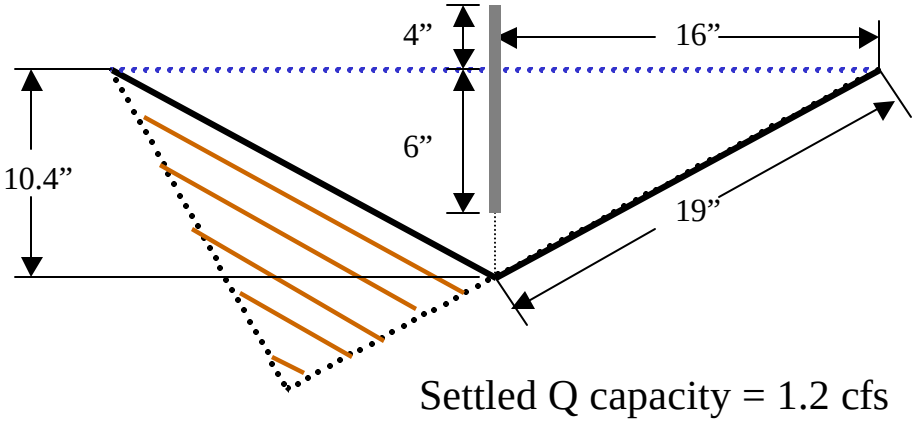
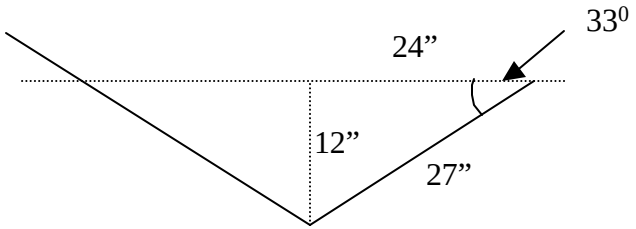


Figure 6

Ditch Volume

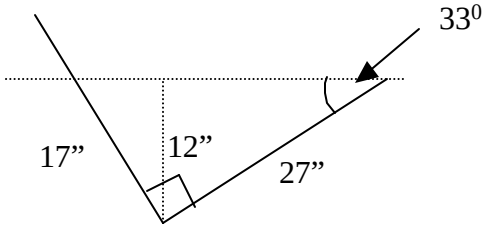
1. Original ditch design



Cross sectional area (A)= 2ft²

Hydraulic radius (R)= 288”/54”

2. Revised design



Cross sectional area (A)= 1.6ft²

Hydraulic radius (R)= 239”/44”

The required value for these ditches was calculated as Q= 0.5cf/s. Therefore the value for the revised ditch (2) is 3 times greater than the required 0.5cf/s

Using the flow equation

$Q = 1/n \cdot S^{1/2} \cdot R^{2/3} \cdot A$

Q= flow

N= friction factor-0.025

A= area ft³

R= Hydraulic radius = A/P

S= slope-0.0026

Ditch	Q	A	R
1	2.2cf/s	2ft²	2/5
2	1.6cf/s	1.6ft²	1.6/4

Figure 7

First method

1. Tractor Path for Row Ditches

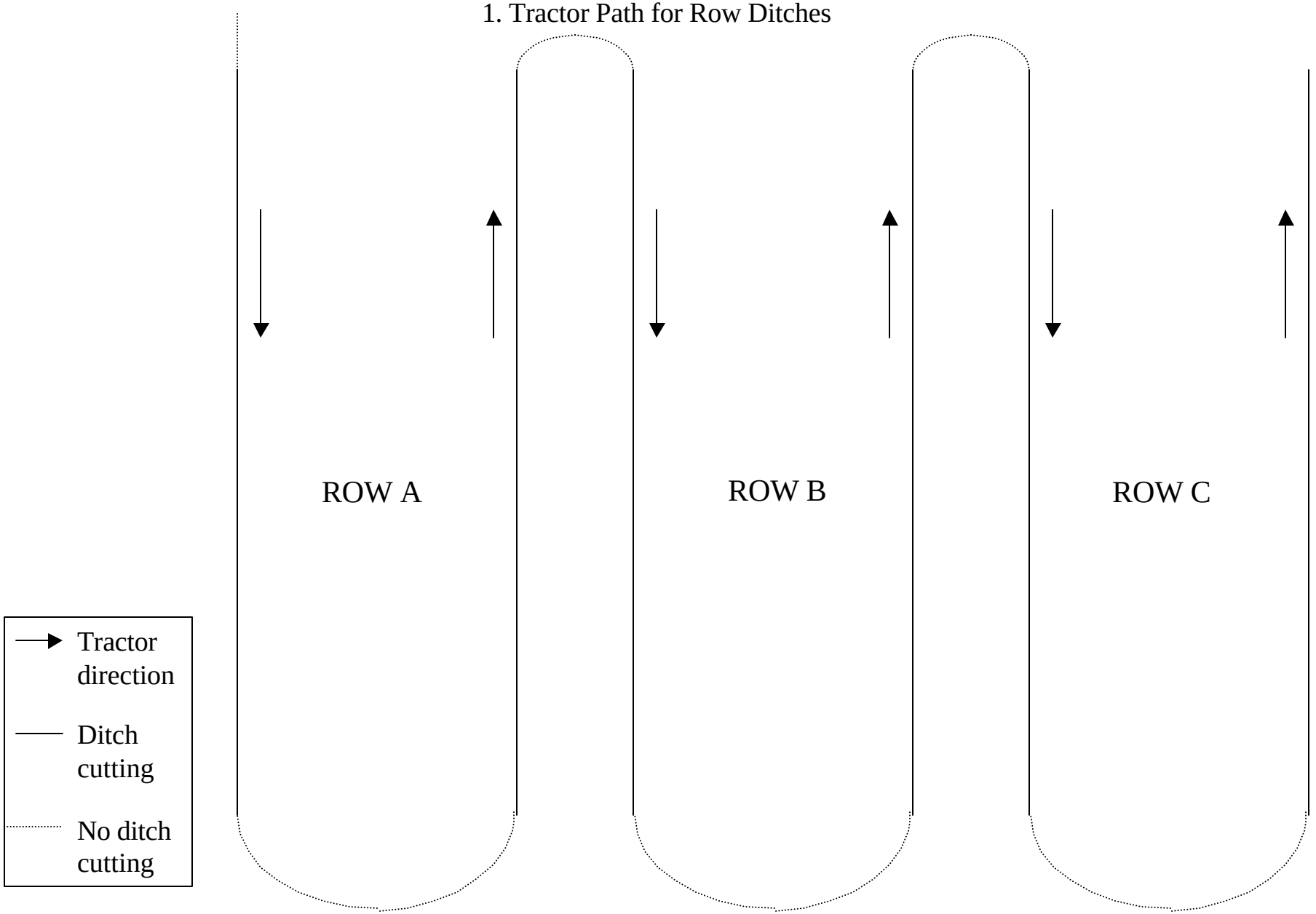
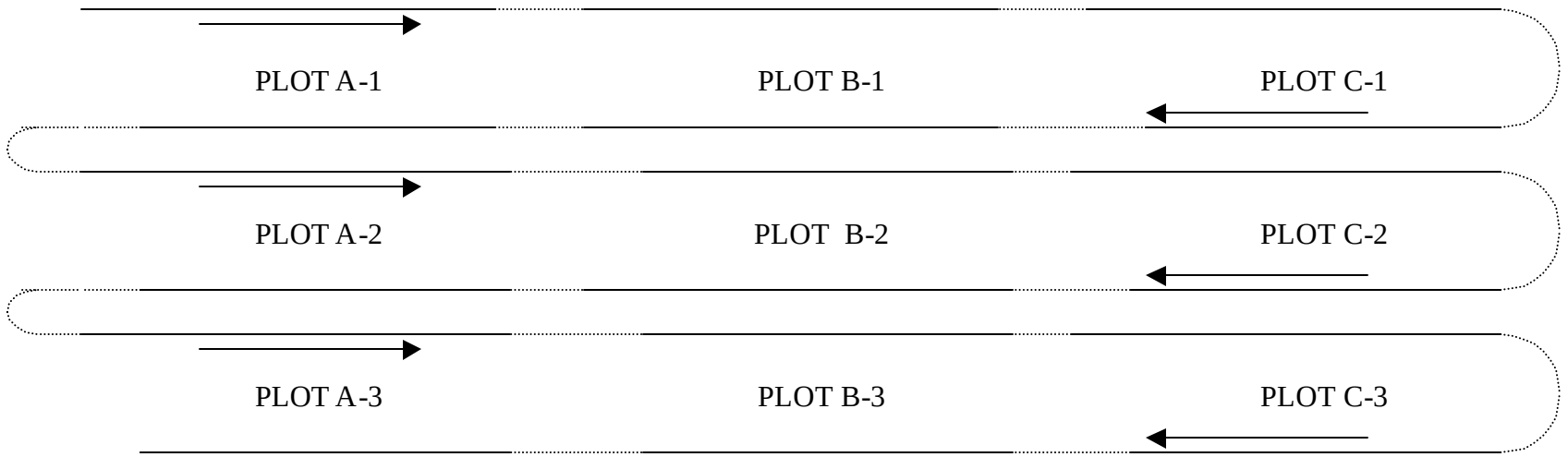


Figure 8

First Method

2. Tractor Path for Plot Ditches



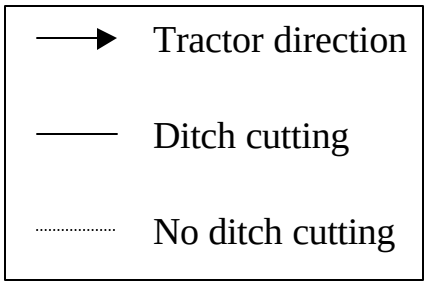


Figure 9

First method

3. Combined layout of Row and Plot Paths

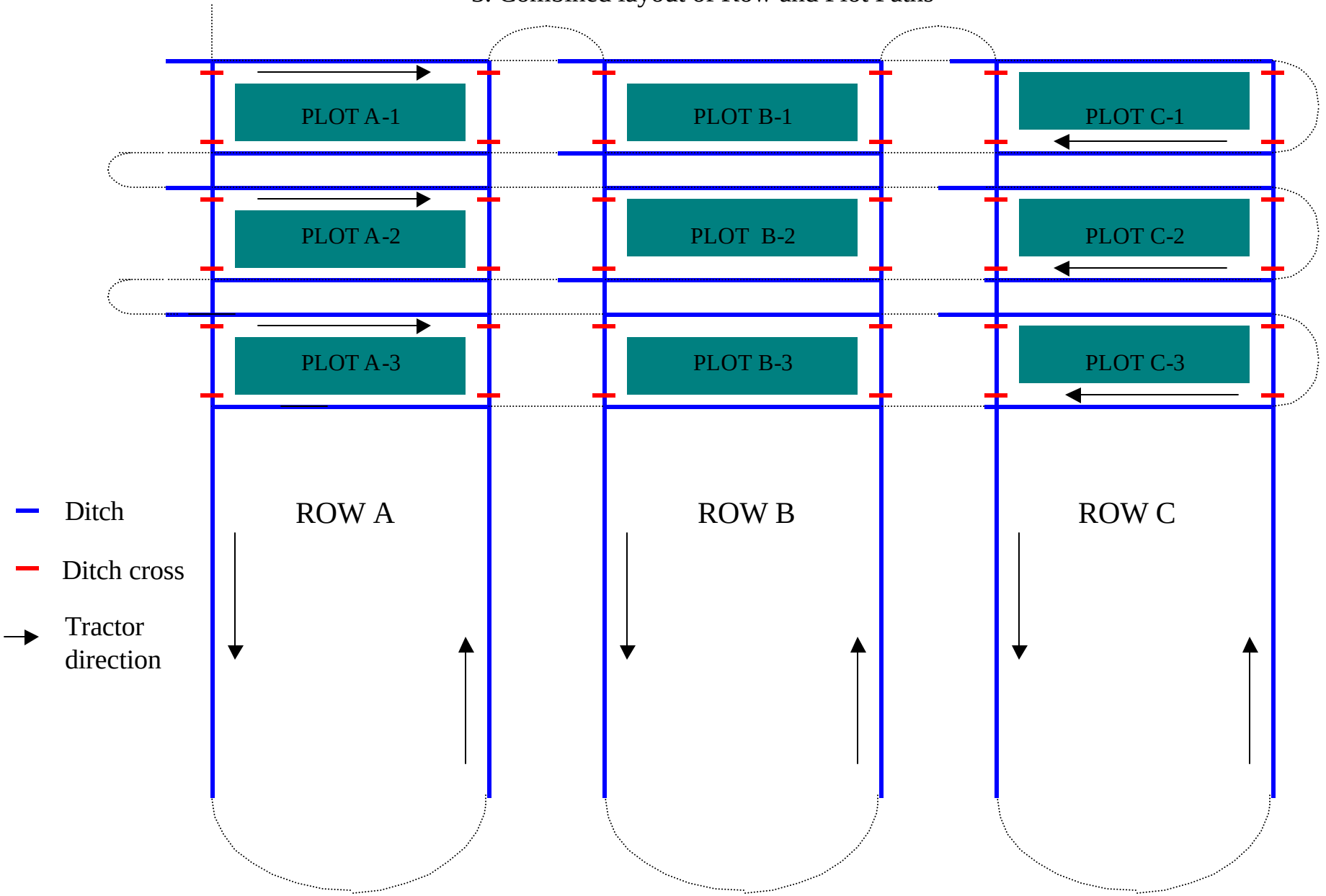


Figure 10

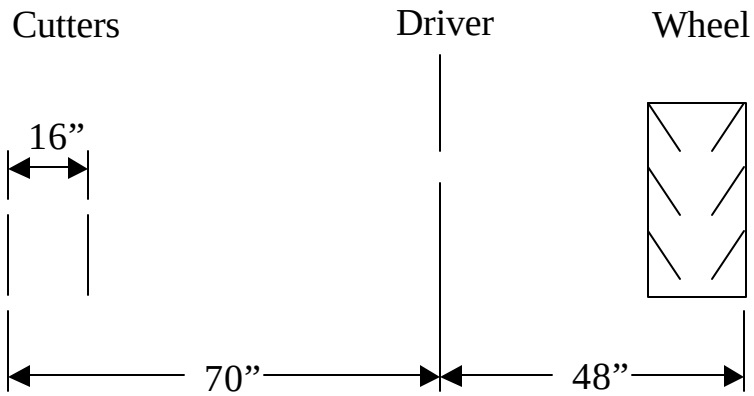


Plate 1: sod cutter dimensions

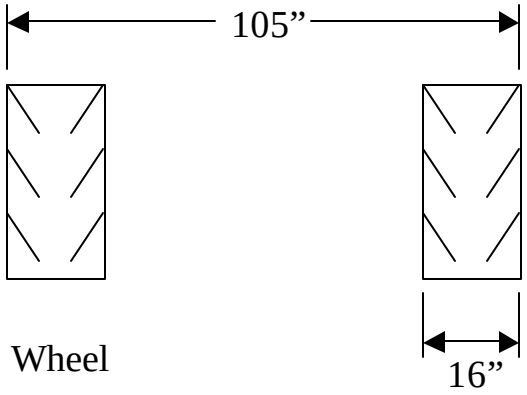


Plate 2: grader wheel base dimensions

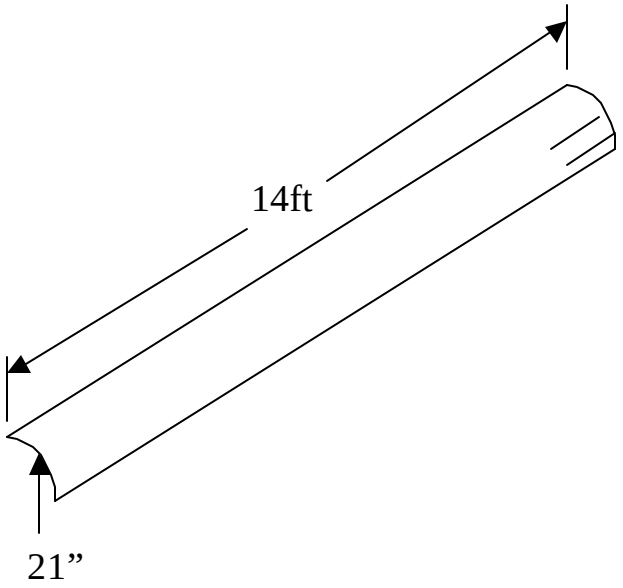
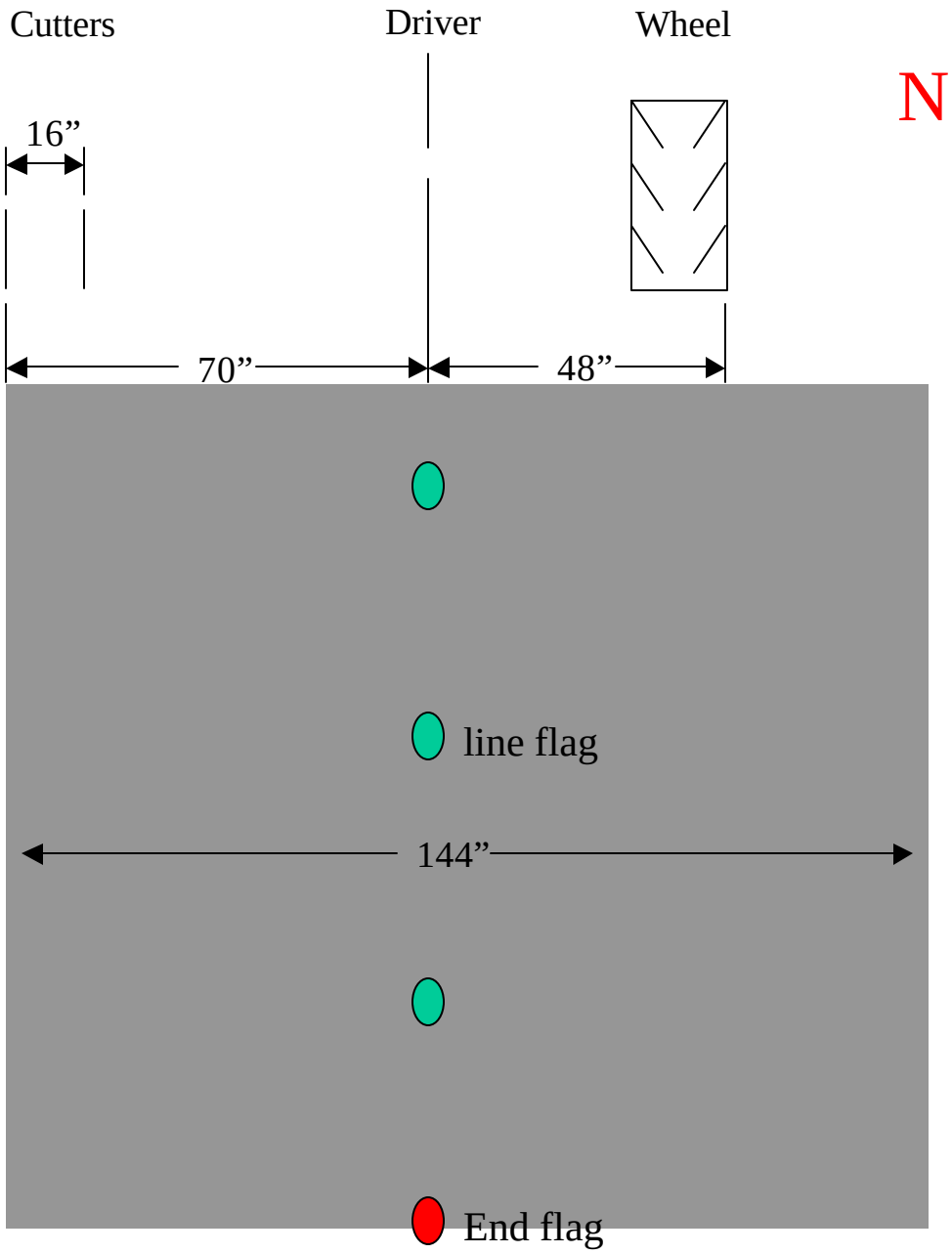


Plate 3: grader blade dimensions

Figure 11

12/19/2001



Not Final Dimensions

Need 9 pass of 16’’

to cut the sod.