

its, give the train mileage. This multiplied by the direct cost per
per degree train mile, will give the yearly cost of operating. The saving
on curves resulting from the adopting of flatter grades and reducing train
mileage may thus be determined.

Trains will be figured lighter than the rating over ruling
grade according to its rate, and total length as compared with
section, the reduction will generally be as follows,—

is usually	Grades 0.3, 25%
r summits	0.4, 20%
conditions,	0.5, 18%
ake grade	0.6, 16%
uired, the	0.7, 14%
l, and de-	0.8, 12%
	1.0, 10%

ng Grade The values for assistant engines, doubling, etc., is as per
2.0 "volume of traffic."

el Grade. The value and cost of grade reductions will be shown on
2.0 standard forms X. 11, 35-36-37-38.

1.9 VELOCITY GRADES.

1.75 In all work, when it is possible to save a considerable
1.55 amount in cost of construction, velocity grades will be used
1.25 as per standard sheets. These sheets are figured so that the
egree. energy stored up in a moving train may be utilized in surmount-
r degree. ing grades steeper than the ruling grade for which train is loaded.
egree.

The velocity heads and speed grades are shown for speeds
5-40 M.P.H.

l, the new The velocity head does not represent the height in excess
should be of ruling grade which train could overcome, owing to the fact
be neces- that the tractive power of the locomotive is much less at high
minimum. speed than at low speed; this decreases length of steeper grade
ag heavier which train can surmount.

To use sheets, select the one corresponding to the grade
which has been adopted as ruling grade and for which the train
in traffic. has been loaded at 10 M.P.H. The speed acquired or lost will
as long a be found by following along the curved line corresponding to
y number the grade on which the train will run, the starting point being
ction will at the intersection of the horizontal line corresponding to speed,