

GRADES AND CURVES.

They shall be in accordance with the proposed project. The grades shall never exceed 2-1/2%, and the curves cannot have a radius less than 87.75 M. (288') which corresponds to a central angle of 13°- 5' per cord, of 20 M. (65'-7"); or 288 feet radius, corresponding to a central angle of 20° for each cord of 100 feet. However, these curves of minimum radius, cannot be put on grades higher than 2%, and when the maximum grade of 2-1/2% is used, the curves shall be of the greatest possible radius, and never less than 109.69 M. or 360 feet. This shall be done only in very necessary instances, with the previous examination and approbation of the Government. Between the curves in opposite directions there shall be a minimum tangent of 30.47 M. or 100 feet. The same minimum tangent shall be required on both sides of the bridges.

Should the excessive cost make the fulfillment of this condition impossible, the tangent may be reduced to one half, with the previous approval of the Government.

RAILS.

They shall be of Bessemer steel, with a weight of 50.4 lbs. per M., or 50 lbs. per yard. The joints of the rails shall be between the ties and in couples, for which purpose there shall be a number of rails shorter than the others. The joints shall be fastened by means of screws and nuts equal to those actually used in the Atlantic Railway.

Agreement made the Second day of July
the Thousand Eight Hundred and Seventy
between J S Casement of the first Part
and E Cooper and J C Trisbee of the
Second part - In consideration of a ^{contract} deed
to J S Casement made and this day delivered
for the Union & Titusville Rail Road from
the said E Cooper and J C Trisbee the
said J S Casement hereby agrees to pay to the
said Second parties at least Eighty Cents
on the dollar for fifteen thousand Dollars
of the Capitol Stock of said Company this day
agreed to be issued to ^{the} said Second parties
and the said Second parties hereby agree to
give the said J S Casement the refusal of said
fifteen thousand Dollars of Capitol Stock for the
period of one year at Eighty Cents on the dollar
Provided however that if the market price
of said Stock exceeds Eighty Cents on the dollar
then the said J S Casement agrees if he elect to
take the same to pay the market price therefor

In testimony whereof we have
hereunto set our hands and seals Dated the
Day and Year first above written

The word "Contract"
in 5th line inserted before
signing
Mump

R H Trisbee

J S Casement
J C Trisbee
E Cooper

Agreement made the 2nd day of July 1840
between the Union Rail Roads

C O N T R A C T

Celebrated between the Secretary of Foment,
DOCTOR DON JUAN J. ULLOA G. and
MR. JOHN S. CASEMENT, for the Construction
of the Pacific Rail-Road.

Juan J. Ulloa, G., Secretary of State in the
Department of Foment:-

I certify:- that from page two hundred and
eighteen to two hundred and thirty of the "Book of Con-
tracts," which this Secretaryship keeps, is registered
the one that literally follows:-

" Juan J. Ulloa, G., Secretary of State in the
Department of Foment, duly authorized by the President of
the Republic, of one part, and John S. Casement, Contractor
of Railways,- and resident of Painesville, Ohio, of the
United States of North America, of the other part, have
agreed to celebrate the following contract.

I.

Mr. John S. Casement, who will hereafter be called the
Contractor, compromises himself to construct, for the sum
of two millions, eight hundred and ninety-eight thousand,
nine hundred and seventy-one dollars, and forty-three cents,
American gold, and deliver in a perfect state of service,
a Railway, that departing from this Capital, ends in the

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Port of Tivivis on the Pacific Coast, including also the tracks, turntables, switches, water-tanks and stations, with their buildings and dependencies,-- shops provided with motor power, and the necessary machinery, rolling stock of the latest and most approved types, with engines and cars, provided with patent couplers and air brakes. In the execution of the work of construction of the Railway, only first class materials will be used, and the Contractor will be obliged to follow the details and specifications stipulated in the technical bases, formulated by the General Direction of Public Works, as stated in the following clauses.

II.

The technical bases referred to in the former clause are as follows:-

The railroad shall start from the City of San Jose, at a point selected by the Government for Central Station;- it shall continue along the right banks of the Rivers Virilla and Grande, terminate at the Port of Tivivis in Nicoya Gulf, in accordance with the study made by the General Direction of Public Works, except such modifications as may be required by the final location of the line.

Road-bed shall be:-

4.57 M. (14'-11-9/10") wide in cuts.

(2) 3.35 " (15'-11-4/5") " " fills.

TALUS IN CUTS.

Solid rock, perpendicular, or very slightly inclined.

Loose or soft rock,- 1 base x 3 altitude.

Thick sand,- 1/2 base x 1 altitude.

Common earth,- 1 base x 1 altitude.

Clay,- 1/2 base by 1 altitude.

TALUS IN FILLS.

3 base x 2 altitude;- The places where they shall be made, must be cleared of stumps of trees, branches, etc., etc. Fills shall be protected by retention wall wherever it may be required by the nature of the ground, whether this may be due to the heavy inclination of the transverse sections, or to any other circumstance.

CLEARING OF THE WOOD.

This shall be done in such a manner as to avoid all damage that may occur through the roots of trees in the upper part of the Slopes of cuts, or through the accident, or partial destruction that may be occasioned to the road by the falling of the nearest trees. In no case shall the clearing be less than 20 M. (65'-7") on either side of the middle of the road.

DRAINAGE.

The gutters shall be up to 0.75 M. (29-1/2") wide at the mouth, and shall have the necessary depth for the easy passage of the water. They shall be 1.20 M. (3'-11") from outside rail.