

(i.) When the earth is at the proper state of moisture, give it the rolling. Continue until there is practically no more compression indicated under the wheels. If the subgrade at this stage shows spongy or wavy places it indicates too much water and not enough harrowing. In such cases it is useless to proceed until this condition has been corrected.

(j.) The grade should roll down within 1 in. of finished grade. Immediately after the rolling the cutting of subgrade should be done. On the final cut the wheels should rest on the headers at all points, as indicated when they are turning. Follow the cutter with sufficient men to throw out the excess earth, so that the return cut can be made quickly.

(k.) After final cut, by means of ropes at each end, drag the scratch templet the full length of the subgrade to check for depth. The nails in this templet shall not be more than 3 in. apart, and shall project at least $\frac{3}{4}$ in. from the wood in such a manner as to be on line for the true depth and surface of the subgrade when the templet is supported on each side by the side forms. If the depth is O.K., immediately give it an application of water, letting it bake the balance of the day. Examine it frequently, and when indications show that it is drying out too much, water again.

The detail of the operations of making subgrade shall be under the direction of the engineer, and he shall at all times have authority to stop the operation if in his opinion these specifications are not being complied with in a manner which will result in the character of subgrade specified.

Continued use of sections of prepared subgrade for hauling, so as to cut up or deform it from the true cross-section, will not be permitted. The contractor shall protect the prepared subgrade from both his own and public traffic.

(This elaborate specification is to some extent the result of experiments on a test road at Pittsburgh during 1921-22.)

ENCLOSURE B.—SPECIFICATION FOR ASPHALT-CONCRETE PAVEMENT.

(a.) *Description.*—Upon the subgrade prepared as hereinbefore specified shall be laid the asphalt-concrete pavement composed of broken stone, sand, stone-dust, and asphaltic cement. No pavement shall be laid when the subgrade is wet or shows indications of being spongy, soft, or unstable; loose dirt and other foreign matter shall be removed before any asphaltic mixture is placed on the subgrade.

The thickness of the pavement shall be controlled by the typical cross-section shown on the plans; when final compression is attained the top surface of the finished pavement shall conform to the grade and cross-section indicated on the plans. The pavement shall be laid in two courses, or compressions; the lower or base course shall be $3\frac{1}{2}$ in. in thickness after compression, and the top or wearing course shall be $1\frac{1}{2}$ in. in thickness after compression.

SIDE FORMS.—PAVEMENT.

Timber side forms shall be No. 1 common Oregon pine, and straight. They shall be not less than 16 ft. long, not less than $2\frac{1}{2}$ in. thick, and their depth shall be at least $\frac{1}{2}$ in. more than the specified depth of the edge of the base course. They shall have square top edges, square butt joints, and shall not contain enough knots or other imperfections to impair their strength. They shall have no wane on the edge to be placed uppermost.

Timber side forms shall rest upon 2 in. by 3 in. stakes, spaced not greater than 4 ft. apart, driven with their tops to the line and grade for the bottom of the side form. Stakes for nailing on the outside shall be placed 4 ft. apart at the intermediate points.

Timber side forms shall be secured by side stakes not less than 3 in. in width, $1\frac{1}{2}$ in. in thickness, and not less than 18 in. in length. The length of stakes shall be increased when the character of the soil will not give sufficient bearing to an 18 in. stake. Side forms shall be staked at intervals not greater than 4 ft., and the tops of the stakes shall be 1 in. below the top edge of the side form. Side forms shall be spliced with a section of timber 2 ft. in length, 1 in. thick, and 4 in. wide, which shall be nailed lengthwise, lapping the joints.

The stakes shall be sufficient in size and number to support the asphalt-concrete pavement. The headers shall remain in place as a part of the completed pavement.

On completion of the rolling of the base course additional strips $1\frac{1}{2}$ in. deep and not less than $2\frac{1}{2}$ in. wide shall be nailed in place on the base headers with their upper edges conforming to the lines and grades of the edge of the finished pavement.

BASE COURSE.

The different mineral ingredients composing the base course shall be mixed in such proportions that the percentage by weight shall be within the following limits when tested on laboratory sieves:—

Broken stone and sand as follows:—

Passing 200-mesh screen—between 2 and 4 per cent.

Passing 80-mesh screen—between 6 and 12 per cent.

Passing 40-mesh screen—between 12 and 20 per cent.

Passing 10-mesh screen—between 20 and 30 per cent.

Passing screen having $\frac{1}{4}$ in. square openings—between 30 and 40 per cent.

Passing screen having $\frac{3}{8}$ in. round openings—between 40 and 50 per cent.

Passing screen having $1\frac{1}{4}$ in. round openings—between 65 and 75 per cent.

Passing screen having $2\frac{1}{2}$ in. round openings—100 per cent.

To the above shall be added asphaltic cement, 4 to 8 per cent.