

PAVEMENTS ESPECIALLY SUITABLE FOR COOS BAY

Clear and Concise Treatise on the Cost and Kind of Materials.

BITULITHIC, CEDAR BLOCKS AND BRICK

Any of Them Can Be Put Down on Coos Bay at Comparatively Low Cost.

Because of the deep interest which is now being manifested in the paving question in Marshfield and North Bend, the Times has secured from C. A. Sandberg, city engineer, a treatise on pavements. Mr. Sandberg has had years of practical experience with pavements of all kinds, and a perusal of the appended article will give one a clear idea of what paving involves. Engineer Sandberg has treated only of those pavements—bitulithic, cedar blocks and brick—which are especially adapted to the needs of Coos Bay because of the comparatively low cost, due to the fact that practically all of the material that practically all of the material Coos Bay country. The article follows:

ASPHALT PAVEMENTS.

The original pavements were made in Paris in 1854 and were formed of pulverized natural asphalt rock. The European rock is a natural combination of limestone and bitumen. The American rock asphalt as found in Kentucky and California is a combination of sandrock and bitumen.

The artificial mixture of sand and asphalt was first used in Newark, N. J. in 1870. Since that time it has become the best known form of asphalt pavement and has been used in a great number of cities, until now there are more than 2600 miles of this pavement in the country. Some cities like Buffalo and Philadelphia have between 200 and 300 miles each.

The natural sandrock asphalt streets have been laid in several cities, and compare very well with the artificial mixture. Buffalo has about 10 miles of this pavement that has practically needed no repair. Front Street in San Francisco was paved with rock asphalt in 1890 and has had an exceptionally heavy traffic but had no repairs for 11 years.

Sheet-asphalt, as the artificial mixture is called, is commonly laid on a five to six inch concrete base, one inch binder course and a two inch wearing surface.

Bituminous Macadam, or Bitulithic Pavement.

During 1901, a practically new form of pavement with the above name attracted much attention and has come into use at widely separate places. It has received favorable discussion in both the Engineering News and the Engineering Record as well as in a number of other engineering journals.

The old style bituminous or tar pavements have usually been formed of sand and fine grains of which have no other stability or structural strength than is derived from the matrix of asphalt or coal-tar in which they are embedded; or they have consisted of tarred fragments of stone with 20 per cent or more of void spaces, generally placed without systematic heating and mixing.

The new pavement is formed of traprock, or other tough rock, crushed and screened to fragments, varying in size from two inches down to dust, and combined in such proportion of sizes that the final spaces between the fragments of rock do not exceed ten per cent. This means that the fragments must be in actual and firm contact with each other and that the addition of ten or twelve per cent by bulk, of bituminous compound will fill the remaining voids and make a solid and impervious mass.

The base for the bitulithic pavement is prepared as for a macadam road; the earth roadbed being graded, drained, formed and rolled, and then covered with a layer of the best stone available which is crushed and screened to two inches and larger and is rolled with a heavy steam roller into a compact layer of four inches thick. This stone base is then sprinkled with a thin hot bituminous mixture which binds the surface of the base and prepares it to receive the next layer which is spread on top of it.

The wearing surface is then spread while hot, and is rolled and compressed to a final thickness of two inches; this wearing surface is formed of the best available rock,

crushed and screened to retain all less than two inches. This is then dried and heated in rotary drums and then screened in rotary screens which separate it into the various sizes from two inches down to dust. These sizes are then proportioned in such ratio as shall give a minimum of voids not exceeding ten per cent. It is then run into a mechanical mixer and at a temperature not exceeding 300 deg. fh., mixed with bituminous cement, in sufficient quantities to fill all voids.

Upon this surface is then poured and rubbed a coating of quickdrying bituminous cement, heated at 250 deg. fh., and over this is poured a quarter inch layer of small stone chips which are rolled and forced into the sticky coating forming a final wearing surface.

This pavement is also laid on a concrete foundation. The cost of this pavement varies according to local conditions from \$2.00 to \$2.75 per square yard.

The opinion of skilled road-builders, who have examined it critically are favorable as to its durability and value. It is recommended by such unbiased experts as C. A. Brown, president of the Massachusetts Highway Association; R. A. Jones, vice-president of the Massachusetts Highway Association; Prof. A. W. Dow, of Washington, D. C., who is quoted by the Municipal Journal as expressing the opinion, based upon what he knew of it, that this pavement exceeded in good qualities any other pavement that he had seen laid.

ROUND CEDAR BLOCKS.

Wood used for road making or pavement has been in use for many years, and has undergone many changes from the time curdury roads were first built, until our present day wood block pavement, as built since 1900, surpass others in freedom from noise, and rank among the best in qualities.

The round cedar block came into general use in western cities about 1880, in demand of a quick and cheap pavement. The blocks are set on end in close contact, on a plank foundation. The irregular interstices are filled with gravel, and the surface is then flooded twice with coal-tar heated to 300 degrees Fh., using two gallons per square yard in all, followed while hot with a three-fourths-inch layer of clean gravel.

The cost of this pavement in Chicago in 1900 was about 70 cents per square yard, and that city had at that time about 880 miles of that class of pavement. Other cities using the same class were Detroit, Superior, Duluth, Minneapolis and Toronto. The life of the pavement was from three to six years.

Oregon red cedar blocks, creosoted with ten pounds per cubic foot, were laid in Indianapolis in 1899 at a cost of \$2.10 to \$2.50 per square yard, including base and five-year guarantee, the joints being filled with paving cement and the surface covered with half-inch screenings of crushed granite.

Hardwood pavements have been used to a great extent in Australia and in England. But the excessive cost (\$3.00 and upward, exclusive of foundation) has excluded them from use in this country. The cities have now for some years been using the treated native woods. All of those treatments contain creosote mixed with some tar preparation or resin. The up to date wood pavement is

constructed on a concrete base commonly five inches thick. The blocks are in size 4x4x6 to 10 inches. To provide for the expansion of the blocks, expansion joints are formed along each side of the pavement and also across the street surface every 25 to 50 feet. The best result is reached when these joints are filled with a plastic cement.

The blocks are commonly placed in courses running at right angles to the line of the street, except at street intersections, where the courses run diagonally.

The cost is of course different in different localities. In Indianapolis blocks were laid at a cost of \$2.50 to \$2.70 per square yard. The block pavement in front of the Auditorium hotel in Chicago was \$1.90 per square yard, exclusive of concrete base, but including five-year guarantee. Both of those pavements were laid in 1901. The cost of treated blocks laid on a six-inch concrete base in Boston was from \$3.10 to \$3.50 per square yard. A wood block pavement is noiseless, free from dust, is not slippery when wet and can be taken up and relaid readily.

Vitrified Brick Pavements.

During the last twenty years there has been a steady increase in the use of vitrified brick for pavements, and at the present time there are something like 1,400 miles of this class.

The pavement is constructed by placing a 4 to 6-inch concrete base, which when ready is covered with a sand cushion by spreading moist screened sand over the concrete base to a uniform depth of 1 1/2 to 2 1/2 inches, and smoothed and brought to the proper crown by wooden templates. Upon this the brick is set on edge, in regular lines across the street. The bricks are then rammed with a heavy rammer and rolled with a 2 1/2 to 5 ton steam roller and settled firmly in the sandbed.

As a filler sand is used, because it is cheap and allows the brick to be taken up and replaced, but it also allows the corners and edges of the brick to chip off and also allows the brick to settle in soft spots.

Portland cement grout, if properly made and applied, is better. It makes it harder to take up a brick and replace the same, but it protects the edges of the brick and in this way preserves the smooth surface, but for some reason those pavements are the most noisy.

Paving cement makes an elastic joint, but costs more than grout. It is poured into the joints hot.

Brick pavements have to be provided with expansion joints the same as wood block pavements.

The cost of the pavement varies greatly, depending upon the cost of materials.

For a good Hatch use the

PETALUMA INCUBATOR

JOHN W. FLANAGAN, Agt.

Poultry Supplies

Order Your Settings Now For

Brown Leghorns
Rhode Island Reds
Barred Plymouth Rocks

All Standard Bred.

Price \$1.50 Per Setting
Special Price on Incubator Lots.

See Us For Bargains

We do a general real estate business, invest money for outside parties, make collections, collect rents and write fire insurance.

M. A. Sweetman & Co.

Phone 763 Marshfield, Ore.



Get In Line. I'll Treat You Right Geo. Goodrum

Representing Style and Quality.

THE RINK - Now open 7 to 9:30 p. m. Saturday Afternoon 2 to 4:30 Special Rates to private parties 9:30 to 11:30 p. m. Wednesday Afternoon, Ladies Exclusively. C. B. Schiffer, Floor Mer. D. L. Avery, Prop.

The Steamer **STEAMER HOMER** BETWEEN COOS BAY AND SAN FRANCISCO No reser. tickets held after the arrival of the ship unless ticket is bought. F. S. DOW, Agent MARSHFIELD, OREGON

California and Oregon Coast Steamship Company **Steamer Alliance** B. W. OLSON, Master. **COOS BAY AND PORTLAND** SAILS FROM PORTLAND SATURDAYS, 8 P. M. SAILS FROM COOS BAY TUESDAYS, AT SERVICE OF TIDE. F. P. Baumgartner, Agt. Couch St. Dock, Portland, Ore. L. W. Shaw, Agt. Marshfield, Ore., Phone 441.

WHY DO PEOPLE BUY IN SENGSTACKEN ADDITION? BECAUSE It is choice inside residence property, lots 50x100 with alleys, is well sheltered with a good bay view and prices of lots are reasonable. For particulars see **TITLE GUARANTEE & ABSTRACT CO.** Henry Sengstacken, Manager.

WE MAKE GAS ENGINES AND BOATS Speed Launches and Engines a Specialty All Classes of Boat and Engine Repairing Promptly Attended to H. R. BEVIER, Mechanical Engineer North Bend, Oregon C. H. ALLGER, Boat Builder

The Latest Bound Books Three Weeks The Lions Share The Broken Road My Lady of Cleve The Yoke **NORTON & HANSEN** Front Street

Portland & Coos Bay S. S. Line BREAKWATER

Sails from Portland Wednesday at 8 p. m. Sails from Coos Bay Saturdays at Service of Tide.

[C. F. McCollum, Agt.]

Phone Main 34 - - - - A. St. Dock

BEAVER HILL COAL The Fuel that Made Coos Bay Famous Send your teams or telephone your orders to **Masters & McLain, -Sole agents-** \$5.00 Per Ton at the Yard, \$6.00 Per Ton Delivered. Special prices on sea load lots. Phone 2011. Prompt Delivery Guaranteed.

WHEN IN NEED of cigars, candy or pipes your order to **THE MODERN COMPANY** Odd Fellows' Building. Prompt attention given all orders.

Business Directory

Doctors.

DOCTOR B. W. BAUMBAUGH Physician and Surgeon. Diseases of Women and Children. Office over Lockhart drug store. Rooms E and F. Phone 1451.

R. GEORGE W. LESLIE Osteopathic Physician Graduate of American School of Osteopathy Kirkville, Mo. Office Hours: 9 a. m. to 4 p. m. Other Hours by Appointment. Office in Nasburg Block Phone 1611. Marshfield, Ore.

R. GEO. E. DIX Physician and Surgeon. Office-First Nat. Bank Bldg. Phone 1681

R. J. W. INGRAM Physician and Surgeon. Office over Sengstacken's Drug Store. Phones—Office 1621; Residence 783.

R. A. L. HOUSEWORTH Physician and Surgeon. Office over First National Bank. Residence, two blocks north of Crystal Theater. Office Phone 1431. Residence Phone 1656.

Lawyers.

Francis H. Clarke Jacob M. Blake Lawrence A. Liljequist **CLARKE, BLAKE & LILJEQUIST,** ATTORNEYS-AT-LAW Times Building, Marshfield, Ore. United States Commissioner's Office.

J. W. BENNETT, Office over Flanagan & Bennett Bank. Marshfield, Oregon

C. F. MCKNIGHT, Attorney at Law. Upstairs, Bennett & Walter Block Marshfield, Oregon

COKE & COKE, Attorneys at Law. Marshfield, Oregon

Miscellaneous

CARPENTER Call R. A. Corthell. For all kinds of carpentering, building and repair work. Show cases and office furniture a specialty. Phone 561. Corthell's Delicatessen.

M. R. ALBERT ABEL, Contractor for Teaming of all kinds. Phone 1884.

MRS. GERALDINE MORRIS, Voice Culture, Pure tone production a specialty. Studio in Nasburg Block.

PIANO TUNING, By J. F. O'Reilly, Resident Tuner. Address Box 240, Marshfield.

ELMER A. TODD, Director Coos Bay Academy of Music. Voice, Piano, Pipe Organ, Harmony etc., from beginning to graduation. Singers coached in style diction and interpretations, for opera, oratorio or concert work. New O'Connell Building, Marshfield.

EMPIRE Fish Market A Street Wharf Fresh, Salt, Smoked and canned fish; in fact all kinds of fish in season. Wharf back of - - - **PIONEER GROCERY.**

BONITA and NORTH BEND FASTEST BOATS ON THE BAY. Half Hour Schedule. Run Between Marshfield and North Bend Made in 12 Minutes. Private Landings. Fare: One way, 15c.; round trip, 25c. J. A. O'KELLY, Proprietor.