

C. G. WASHEON GIVES STRIKING PICTURE OF MAGNITUDE OF WORK

Tells of Difficult Problems Involved, In Interview

HAS HAD DIRECT CHARGE OF WORK

Success Due to Men and Equipment

When one thinks of the Tamiami Trail, one has in mind the State highway from Fort Myers to Miami, although State Road Number Five, from Fort Myers to Tampa is also considered a part of the Tamiami Trail. This article will not touch on any portion of the road outside of Collier or Dade counties, a distance of one hundred and nineteen miles. This road from Fort Myers to Miami was first started in 1910 and notice was brought before and aid asked of the state legislature at that time. The original location was made about 1911 or 1912 by Mr. Jenkins, who was formerly location engineer for the Atlantic Coast Line railroad.

At the time this location was made, very little was known about the country south of Naples to Everglades, and from there east to Miami. What is Collier county now, was then a portion of Lee county.

In March, 1912, an old walking Moneghan dredge started work throwing up a sand grade south of Naples. This work was under the direction of County Engineer Ransome, located in Fort Myers. A grade that averaged seven thousand cubic yards per mile was thrown up, the material being mostly sand, and some marl and muck. In May, 1921, or over nine years after work was commenced, the machine was about two and a half miles north of Carnestown, the point at which one turns south to reach the city of Everglades. This represented a distance of thirty miles or three and a third miles each year. At this time very little interest was taken in this great work, and very few people had any idea of its nature or the magnitude of the undertaking.

Collier Undertakes Work

In October, 1923, Barron G. Collier undertook the building of this road. Everglades and Fort DuPont were chosen as a base from which to carry on the work. The firm of Alexander, Ramsay, and Kerr was awarded the contract, and soon work was commenced.

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The first equipment to go on the job was a one yard Marion steam floating dredge. This dredge, under the supervision of Otto Neal, was started west from Carnestown, and by Christmas had thrown up the grade to where the old Moneghan had stopped.

At the time the Marion was working west, a one yard Bay City Crawler dredge was purchased and erected at Carnestown to start east. This machine was ready to operate January first, 1924. A great deal of the success of this great undertaking was due to the selection of the Bay City type dredge. The credit for picking this dredge must be given to Jack Taylor of Moore Haven, one of the first county commissioners. After seeing all kinds of dredges, draglines, and shovels, Mr. C. G. Washburn, in charge of the work, believes that there is not another machine that could have done this work.

In building the Trail through Collier County, two distinct classes of material were encountered, the one being sand, and the other a lime rock. The sand extends from the county line south and east to within two miles of Carnestown. Here the rock starts and extends throughout the county into Dade county and Miami.

The equipment necessary for this work was standardized to use gasoline, and this standard has never been changed. In standardizing the equipment, the question of fuel had to be considered. The fact that the base was located at tide-water, and that water transportation was the only means of receiving supplies, the minimum tonnage per horse power was in favor of gasoline.

The value of the equipment used in this project has grown year by year as follows: Before 1924, \$6,000; January, 1924 \$38,000; January 1925 \$91,000; January 1926 \$125,500, January, 1927, \$187,000; July, 1927, \$200,000. Working from Miami west, the contractor, R. C. Huffman, Incorporated, has over \$250,000 invested in equipment, or nearly one half million dollars has been invested in equipment to do this work.

The work in Collier county has been carried through by the firm of Alexander, Ramsey, and Kerr. Since September, 1925, the work has been under the direction of Chief Engineer D. Graham Copeland. The organization is

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as follows, divided into sections East, West and Carnestown base: Chief engineer, supervising engineer in charge in field, industrial engineer in charge at base; East section, general superintendent of dredging, general dredging foreman in charge of camp, foreman in charge of right of way of clearing, with a crew of twenty-five men, foreman in charge of drilling, double shifted with fifteen men, foreman in charge of blasting, with ten men, three Bay City dredges and one skimmer scoop double shifted,, and grading superintendent, with a crew of thirty-five men.

Ox Teams Are Used

Attached to the drilling and blasting crews were two ox teams of three yokes each, with drivers and helpers. These oxen hauled the gasoline and dynamite ahead of the grade to the "front." In the past year twenty-nine oxen were killed or injured and rendered unfit for work. The average time an ox was used was two weeks. At all times no less than forty oxen were available for use. Without the oxen this road could not have been built. It was only at the last mile where the water and muck were too deep that the oxen were taken off the job and boats pushed by men substituted.

Three messes were maintained on the East section with portable bunk houses and kitchen. A great deal of pains were taken to see that the best of foods were served and the camp kept clean. Fresh meats and vegetables were supplied and in this way the health of the men was insured by proper diet.

The West section, working in sand, was under a superintendent who had a dredging foreman, a grading foreman, and one mess, taking care of sixteen men. Colored labor was used on this grading crew of twelve men.

Warehouse at Carnestown

At Carnestown was a large warehouse and magazine under a store manager. Here was stored the dynamite and caps. A stock of approximately \$20,000 in spare parts for all machines was carried, and all trucks and drivers except those assigned to each camp, based at this point. A bridge crew with eight men was stationed here, and Carnestown was connected with the main office by telephone. All

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breakdowns were reported to Carnestown, and if it could not supply the necessary spare parts, this information was telephoned to the main office, and orders were issued to take the work to the shops at Port DuPont; or the purchasing agent was notified and new parts ordered. In the main office were two clerks--one that kept the time and costs, the other looked after requisitions and chased materials.

No great obstacles were encountered in building the sand on the West section of the Trail. It was purely a dredging proposition--a thirty foot sand base approximately four feet high was thrown up. On this was placed a twelve inch, compacted eight inch, lime rock wearing surface nineteen feet wide. This surfacing is being done by state contract under Captain Honsford, construction superintendent. The material for surfacing was obtained at Carnestown. The equipment required was one Bay City Floating Dredge, one Marion steam one yard floating dredge, one jetting and blasting outfit, mounted on a barge with necessary motor boats and barges to furnish fuel, water, dynamite and supplies. The crew of this unit was handled direct from the central office. It consisted of a foreman and twelve men on the Marion, four men on the Bay City a blasting foreman, and six men to handle the dynamite. Approximately one hundred and ten thousand cubic yards of rock were required for twenty miles of this work.

Dredge is Floated

One of the many obstacles to be overcome was the raising of the one yard floating Marion dredge. Due to mishandling by one of the operators, this huge dredge was sunk in fourteen feet of water in the canal. Dams were placed across the canal at each end of the dredge, and it was thought that the canal could be pumped out, the dredge pontoons emptied of water, and the dredge floated. This proved almost an impossibility. At the end, fourteen six inch and eight inch centrifugal pumps were used, requiring three weeks time to float the dredge, and at a total cost of nearly seven thousand dollars. "Rock dredge at sixty cents per cubic yard," Mr. Washburn added, "brought the contractor no profit after this little party."

The building of the trail east of Carnestown has

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required the greatest thought and indomitable spirit and engineering experience. The secret of the success of this work lay in the blasting of the rock. If the rock was blasted, the dredges could make a road. The grade required was thirty feet finished surface with a four inch crown. This was laid at zero grade, there being a difference of only six feet in ground level in twenty-three miles. The yardage in this fill is approximately four and one half cubic yards per foot of road.

The character of the country passed through from Carnestown is saw grass prairie, covered with muck that runs from eight inches to four feet in thickness, and underlaid with a sedimentary lime rock in two stratas. Under this is strata of sand, marl, and shell, that varies from twelve inches to three feet. Under this is a harder rock that averages three feet thick, underlaid with sand and marl. This section is crossed with cypress strands and water courses, and greater portions of the road ran through a scrub cypress growth that had to be cleared. The cost of clearing varied from seventy-five to three hundred dollars per acre.

Men Comply With Specifications

The state specifications for this section were that no rock larger than six inches in diameter could be within twelve inches of the finished surface, and no rock greater than two inches in diameter could be within six inches of the finished surface. No variation greater than one tenth in the finished grade from the established grade was permitted. Today, as one rides over the road, he can see that these requirements were rigidly followed. The equipment used on this section alone consisted of one drilling outfit mounted on standard gauge railway trucks on which were two Ingersoll-Rand compressors, one six by seven, and one six by nine type number twenty.

Three number seventy drifters were mounted in vertical leads that permitted the use of sixteen feet drilled bits. The rock was drilled to the average depth of twelve feet. The holes were spaced three across the canal six feet apart, a center hole spotted at the three foot mark. This drilling outfit ran double shifted continuously for sixteen months. From the hurricane last September until this May, the drilling crew worked in water about two feet deep, and at times waist deep. An average progress of two hundred and fifty feet per day was maintained under these difficulties.

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Blasting Machines Follow

Following the drilling machine came the blasting crews. It was their duty to clear out the holes, load, and shoot them. Their equipment consisted of two jetting pumps, and Fairbanks-Morse equipment was chosen as standard for this work. A three by three Typhon pump directly connected to a one and one-half horse power gas engine was used. The discharge from these pumps was reduced to a five-eighth inch double strength pipe, fourteen feet long, used to wash out the drill holes. These tubes, after many experiments, were chosen from a tube used as struts on aeroplanes. One and one eighth inch sixty per cent nitro-glycerine dynamite was used in the blasting, the load varying with the character of the drilling from ten to twelve sticks to the hole, to forty sticks to the hole. The last two miles were hardest, and twenty sticks were placed in the outside line of holes and forty sticks in the center holes. All the attention possible was given to the blasting and then, at times, the dredge could not dig the rocks on account of the boulders. When this condition arose there was only one thing to do--that was to reshoot in front of the dredges. This operation consisted of taking about forty sticks of dynamite, making them into a bundle with an electric blasting cap in the center, making two of these bundles, placing them in the canal in front of the machine, and exploding them. During the whole period of construction, only one accident occurred in the blasting section, and no life was lost on this job. There was only one death and that was due to typhoid fever contracted on leave.

The total progress from September, 1925, to August, 1927, has been as follows: thirty-one miles of sand section and twenty-five miles of rock section-- an average of two and three tenths miles per month. During this time we experienced the worst hurricane that has ever passed over Florida. Two miles of sand grade had to be rebuilt. The camp on the east end was destroyed by the storm, causing great delay. The water from Lake Okeechobee flowed south, and one week after the storm the water on the east end had raised thirty inches, and did not drain off until May of this year.

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Bay City Dredges Used

The battery of dredges consisted of three one yard Bay City type. These machines were double shifted, and made an average of eighty feet per shift, handling over five cubic yards per foot of canal excavated. It was a wonder how these machines could do the work required. The average life of a bucket was about two weeks. When one of these dredges would break down everything was done to make the repairs, and no railway wreck ever received more prompt attention than was given them to get them running again.

The burning question of the hour with the dredge men was: "Have I got enough material?" Grade stakes were set by the engineers, and a large surplus of material was not permitted. Enough must be dredged; but not too much. Payment for the job was canal measurement.

The next operation was done by a skimmer scoop, levelling the fill to be followed by the grading outfit. A mounted camp followed the skimmer scoop, and it was the duty of the grading crew to move the camp every two thousand feet.

The equipment of the grading crew consisted of two ten ton Holt tractors, and one five ton Holt tractor. The largest and heaviest scarifier and grader built by the Austin Western people was used, in addition to one Adam Road King number twelve, and one number eight Adam's grader. The dump trucks were attached to this outfit. A stationary camp was used to house the grading crew. It was located in the center of the last sixteen mile section.

Transportation is Via Water

The transportation required to supply the work was very extensive. A weekly boat service plied between Everglades, Fort Myers, and Tampa. In addition to this, a tug boat and sea going barge handled dynamite and other large shipments from Fort Myers, a distance of one hundred and twenty miles by water. A tanker with a capacity of ten thousand gallons of gasoline made weekly trips

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to Fort Myers. The daily consumption of gasoline on the whole job was approximately twelve hundred gallons.

Each camp had a utility truck attached to it to serve the mess and handle repair parts. Two one ton trucks handled dynamite, gasoline, and oil, making daily trips from Port DuPont. When the material reached the point it was loaded on a barge and floated to the dredges, or loaded on ox carts and hauled to the drilling and blasting crews. From thirty to forty boxes of dynamite were used daily.

The health of the men was given every consideration, a finely equipped hospital with doctor and trained nurse being maintained at Everglades. First aid kits were to be found in all messes. Frequent inspections were made by the doctor. Typhoid serum was given to all men. Anyone injured was allowed half pay during time off work. All accidents, including minor ones, were promptly reported to the office. A medical examination was required before a man could be employed. In this way no contagious disease ever entered one of the camps.

Bonuses are Paid

All men were employed at a monthly rate. Each month a task was set, and a bonus paid at the completion of the task. Approximately twelve thousand dollars was paid out as bonuses, in addition to the regular wages.

Recreation was furnished the men in the shape of a pool room and bowling alley at Fort DuPont, open evenings and Sunday. Motion pictures were shown twice a week in the club house at Everglades, usually followed by an impromptu dance.

Mr. Washburn concluded by saying: "Years to come, as one rides over this beautiful road, little thought will be given to the men who labored so boldly and earnestly to build it, but the road itself will be a lasting monument to the Tamiami Trail Builders."