Quarry Park Derrick Exhibit Audio Tour Transcript

Chapter One- Liberty Derrick

Welcome to Quarry Park & Nature Preserve, Stearns County's largest park. Quarry Park is the product of decades of quarrying granite for Dimensional stone used in building foundations and walls, pavers for street car routes, building facing, and monuments.

You are standing between two pedestals of polished Diamond Pink granite salvaged during a remodeling project at the historic Stearns County Courthouse in downtown St. Cloud. These pedestals and most of the granite in the Courthouse were part of the first big project of the Rockville Granite Company using Diamond Pink. They were manufactured around 1920 and came from a quarry 1 ½ miles northwest of Quarry Park.

As you look into the quarry exhibit you see the 85 foot tall Liberty Derrick. This derrick acts like a crane and allows extremely heavy objects to be lifted and loaded for hauling to processing plants.

The derrick got its name because it was imported into the park from an adjoining granite processing site known in the mid-1900's as LIBERTY GRANITE. You can view the history of this derrick on the county's website.

The derrick is about 100 years old and is fastened to a concrete slab that was poured in 1946 for a derrick. The derrick can lift 20,000 pounds of payload.

Just to give you an idea of the weight of granite, the block of St. Cloud Red Granite at the bottom of the boom arm, by the hook, is 8,000 pounds. Granite weighs about 180 pounds per cubic foot, an object about the size of a small microwave oven.

The timbers of the Liberty Derrick are made of single-piece Douglas Fir which were harvested from the Oregon Coastal Range in 2005. They cost $15,000 per timber. They were cut from 110 year old trees and planed into 15" square beams 85 feet long.

The derrick could rotate 360 degrees if it were set up for that range of motion. This demonstration derrick has a smaller turning range. The round wheel at the bottom of the mast is called the "bullwheel." This wheel is used to allow the derrick operator to turn the mast and boom arm. The mast has a steel pin on the top which is in the middle of the "spider." This lubricated spindle pivots within the "halo" ring while held erect by the 7 steel guy lines.

At the base of the mast is another pin which is lubricated within a socket to allow the mast to rotate freely when the bullwheel is engaged in pivoting.

The guy lines are anchored into the 1.8 billion year old BEDROCK by STAPLES. These steel U-shaped pins are drilled into the bedrock at an angle so that when there is a load on the boom arm the cable loop SLIDES down the shank and pinches against the bedrock. This is similar to how you put a tent stake in the ground so it is stronger against winds.

Chapter Two- The Derrick House

If you look to the south of the Derrick you will see a small wooden shack called the Derrick house. It is from the derrick house that the operator engages drum hoists and brakes. One drum controls the direction the mast pivots. Another drum controls the height and angle of the boom arm, and yet another controls the hook at the end of the boom arm.

You will notice at the back of the drum hoist there is a large hole on the frame. That was the location of a boiler that generated steam which drove a flywheel. This flywheel was then engaged into different drum hoist gears by the operator which then channeled the steam power into the selected activity; either turning the mast… lifting the boom arm….. or raising & lowering the hook. The drum hoists were modified many years ago to be powered by electricity. The Park Department uses a 125 kilowatt portable electric generator when operating the derrick

During stone lifting and moving there is always a second quarrier present. That person stands outside and uses hand signals to tell the operator how much to raise or lower the boom. The assistant also signals when to take up slack from the hook cable, and which direction to pivot the mast. He helps keep the load from snagging ledges or trees. The hoist operator needs the extra eyes to land the granite load on the transport wagon.

The drum hoist machinery was patented by American Hoist and Derrick of St. Paul, Minnesota about 1908. The company no longer exists.

The Stearns County Park Department operates the derrick once a year during the summer festival of the City of Waite Park. For a lifting schedule contact the park department.

Chapter Three- Quarrying Artifacts

As you look around the exhibit area you will see a number of artifacts from the granite quarrying days.

To the south of the derrick house is an 11 and one-half foot diameter saw from a processing plant that cut granite. The steel saw has 144 teeth. Each tooth had a short extension called a SEGMENT. The Segments were silver-soldered onto the teeth. Segments are made with synthetic diamonds imbedded in them. Diamonds are harder than granite so the blade would very slowly cut granite blocks into slabs. When the SEGMENTS were worn down the entire blade was sent in for a new set of teeth.

The two polished building columns lying on the ground are the former St. Cloud Red Granite pillars from the exterior of St. Cloud's Carnegie Library. The Library was built in 1902 and torn down in 1982. These columns were manufactured by Simmers and Campbell Granite Company and turned on a lathe. You can see some of the cutter marks on the polished surface if you look at the right angle. The product name for this granite was Northstar Red and came from a quarry about ¼ mile north of Quarry Park in what is now the Martin Marietta Aggregate pit.

Behind the columns you will see two metal scoops. These were old boilers that quarries converted to SKIPS. Skips were attached to the Derrick Hook and lowered into the quarry so stone cutters could remove the excess granite debris from the bottom of the quarry. This material was then hauled onto the waste rock piles called grout piles.

To the north of the quarry on which the derrick is located you will see one of the types of methods of disposing large stones that were considered unusable. Quarriers used steel tongs that grabbed these blocks and created retaining walls next to the quarry. Because land was expensive, this technique allowed the stone cutters to maximize the ground surface area for the actual quarry. As the waste rock wall stacked up more irregular sized chunks of stone were disposed of behind the wall.

Across the canyon from the derrick is the other way in which waste rock was disposed. It was just dumped in a heap in an area the owner felt would be out of the way.

When you look at some of the waste rock lying around the exhibit area you wonder WHY they weren't used. Because the stone products made from granite at this site were for dimensional stones – blocks of granite, if there were any blemishes the rock was discarded. If an architect ordering that type of granite said that "no crystal size should be larger than a dime," and the stone didn't meet that specification the stone was disposed onto the grout pile. Other reasons rocks became part of the grout pile were: irregular colors, varying crystal sizes or tiny fractures within the rock. About 80% of the rock removed from a quarry ended up on the GROUTE PILE.

As you go back toward the exhibit entrance, on your right, you will find a stone with a series of holes in it. Stuck in one of the holes are the wedges used to split the stone. These are called PLUGS AND FEATHERS. The plug is a steel peg in the center. The FEATHERS are the winged wedges on either side of the plug. These were placed in holes the stone cutter made with a drill bit. The more holes with plugs and feathers along the splitting line the more control the stone cutter had in cracking the stone where he wanted. A hand sledge was used to tap the PLUGS. After going along the entire row of PLUGS & FEATHERS the stone cutter would repeat the process. Eventually enough side pressure would be placed from the wedges to split the stone. A crow bar was then placed in the crack to finish separating the pieces of the stone.

That concludes our brief tour of the LIBERTY DERRICK exhibit. To learn more about the exhibit or park explore Stearns County's website at www.co.stearns.mn.us. We hope you enjoyed your tour. Comments regarding this tour can also be submitted to the Park Department at PARKINFO@CO.STEARNS.MN.US Thanks for visiting Granite Country, USA.

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