

THE UNIVERSITY



CUCARACHA SLIDE



The troublesome Cucaracha slide, south of Gold Hill. The original Cucaracha slide covered an area of 6 acres, but late surveys show that it has extended to cover 47 acres. Slides are caused by the oozy nature of the ground, the irregular rock formation and its consequent tendency to fill up immediately where there are any depressions. The ground lacks cohesive qualities and when acres get to slipping there is nothing to do to check it.

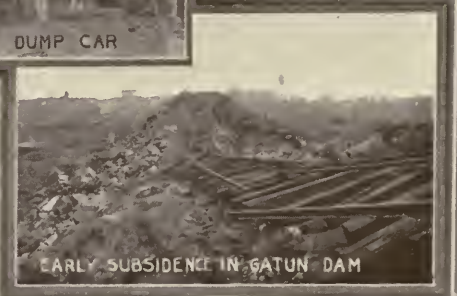
DIFFICULTIES



WRECKER RERAILING DUMP CAR



RIVER BREAKING INTO CHANNEL



EARLY SUBSIDENCE IN GATUN DAM



WRECK AT BALBOA, Y., 1902



FLOOD, BAS OBISPO



FLOOD, PEDRO MIGUEL LOCKS



A CHAGRAS WASHOUT



ACCIDENT IN FRENCH BAY

The greatest difficulty encountered in the excavation is due to slides and breaks, which closes the drainage, upsets the steam shovels and covers the tracks. Whatever water is not carried off by diversion streams enters the cut, necessitating pumping.



General view of Engine House and Yards, 1908. Not in use now.

The canal from Paraiso bridge looking South, 1908. Ancon Hill in the distance.

View from Paraiso bridge looking North towards Gold Hill, showing work progressing in the canal, August, 1908. Cars, 18 yards in length, twenty in a train, are used. The average loading of a car is three minutes, but the record is lower.

:-: P A R A I S O :-:



CHICKEN RANCH



CANAL BRIDGE ON FIRE, 1911



COMMISSION CARRYALL



IN THE FRENCH DAYS



LOOKING TOWARDS PANAMA



POLICE STATION

In the French times Paraiso was the site of one of the locks in the 10-lock canal scheme. The brake shown above is used for transporting passengers from station to residence; also for conveying children to and from school. This work is under the quartermaster's department.

PEDRO MIGUEL



Engine yards on the east side of the lock. Locomotive engineers are paid from \$150 to \$210 a month.



Section East of the Panama Railroad looking South.



Section East of the Panama Railroad looking North, showing the usual style of buildings. This is in the Pacific Division, where the Pedro Miguel lock overcame a 30-foot difference of level; in other words, connecting the summit or 85-foot level with the 55-foot level.

PEDRO MIGUEL



SCHOOL BUILDING



RESIDENCE STREET



RESIDENT TAFT INSPECTING THE LOCK



I.C.C. HOTEL AND CLUB



Gold employees are quartered in bachelor and married quarters. Each district has a small working force of artisans, utility men, janitors, etc., to attend to the wants of the District. The buildings are all generally uniform in construction plan and painted the same color.

PEDRO MIGUEL



FLOOR AND LATERAL CULVERT SYSTEM



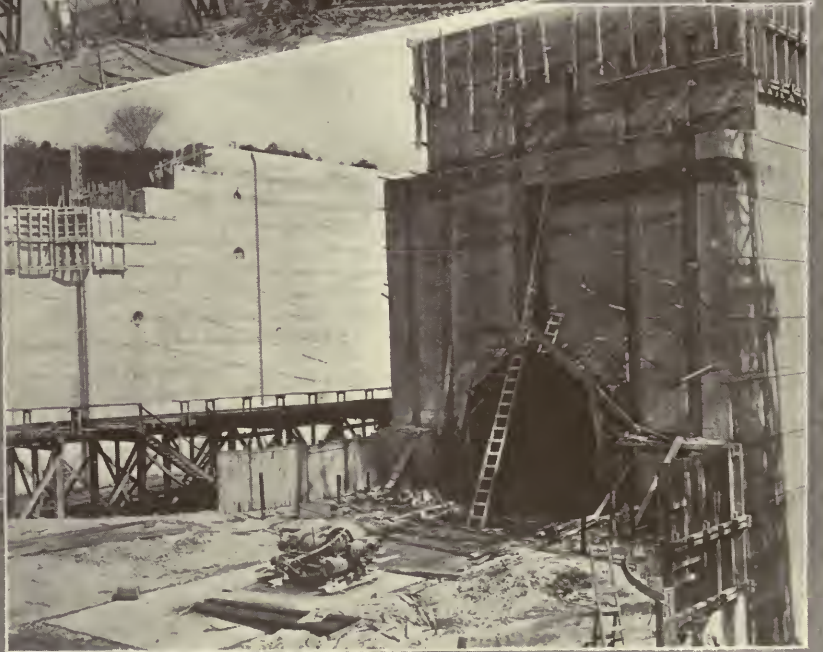
LOCK SITE 3906



BERM CRANE

To handle the millions of tons of stone, sand and cement required for building the locks, ingenious machinery has been installed which carries the stone, sand and cement and mixes the material. Grab-buckets bite into the piles, shoot back to the crane, and feed their loads into the mixer hoppers.

PEDRO MIGUEL



The center wall of Pedro Miguel lock. The size of the structure can be appreciated by noting the laborers at the intakes.
 Chamber cranes lift the large buckets of concrete from the cars, send them out on their long arms, and lower and dump them where required.
 Showing the center and east walls of the lock. Note the steel rails imbedded in the concrete to reinforce the wall. The great tube is one of the three culverts to fill or empty the lock.

PEDRO MIGUEL



General view of the lock looking North, showing the outer and middle walls almost completed. The steep banks on either side dispense with the arrangement of aerial cableways used at Gatun, hence chamber cranes, shown in distance, are used. Each crane is mounted on four heavy freight-car trucks, which carry it along as the work progresses. All the electrical operating machinery is in the house on top of the tower.

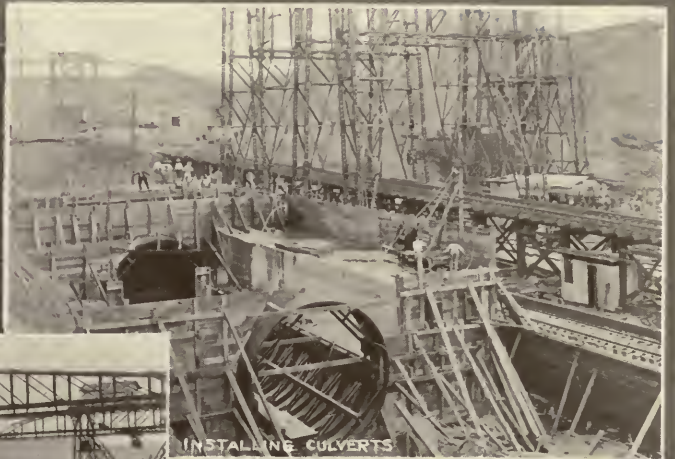


General view of the lock looking South. There are three main culverts extending the full length of the locks, one in each of the side walls and one in the middle wall. These culverts are to fill or empty the locks. The cars convey the heavy buckets of concrete from the mixers to the chamber cranes.

PEDRO MIGUEL



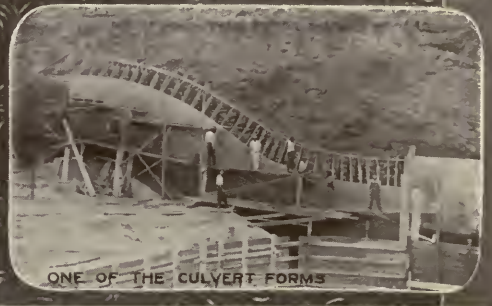
NORTH FOREBAY



INSTALLING CULVERTS



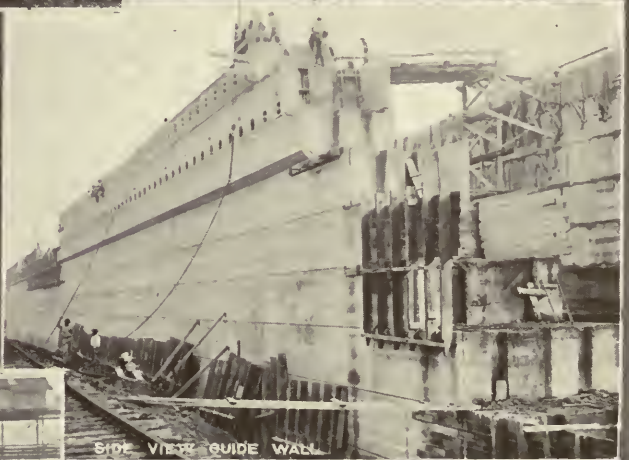
SHOWING ALL CHAMBER CRANES



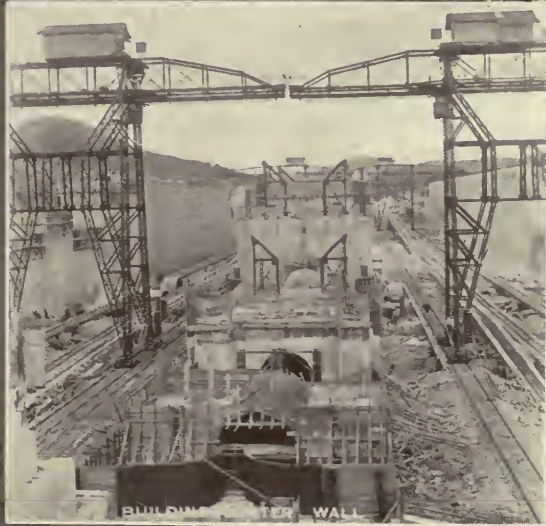
ONE OF THE CULVERT FORMS



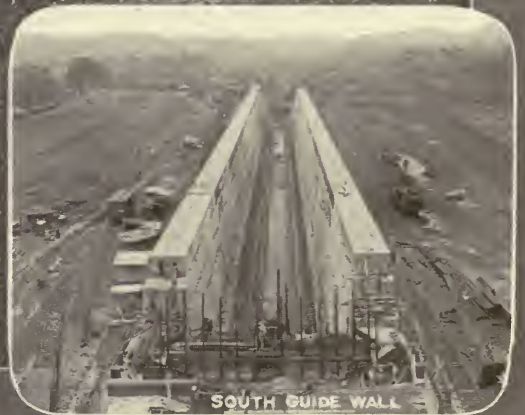
COAL SHED AND CINDER PITS



SIDE VIEW GUIDE WALL



BUILDING WATER WALL



SOUTH GUIDE WALL

Some construction views of the great lock at Pedro Miguel, including the excavated lock-site. One is bewildered by the tremendous machinery of the work—the enormous berm and chamber cranes, with their almost uncanny air of intelligence, towering over the scene with their interlaced-ironwork arms extended above the cement walls which they are constructing.

∴ DYNAMITE ∴



TRIPOD DRILLS



DYNAMITE GANG

BLASTING AT BALBOA



DYNAMITE



CHANNEL BLASTING BALBOA



SCENE OF PREMATURE EXPLOSION

Millions of pounds of dynamite and blasting powder are used annually. It is stored in twelve magazines located at points along the Zone. Churn and tripod drills are used. They operate in batteries of from 4 to 12 and are operated by compressed air. The scene of the premature explosion of 22 tons of dynamite was at Bas Obispo, and occurred December 12, 1908.

PHOTOGRAPHIC RECORD



View of the volcanic landscape from the summit of the volcano, showing the ash-covered slopes and the plume of smoke rising from the crater.



View of the volcanic landscape from the summit of the volcano, showing the ash-covered slopes and the plume of smoke rising from the crater.



View of the volcanic landscape from the summit of the volcano, showing the ash-covered slopes and the plume of smoke rising from the crater.

MIRAFLORES



View of locks looking North, showing center and east walls under construction.



Installing the cylindrical valves for the control of the inflow and outflow of water in the locks.



A berm crane in operation. The berm cranes at Pedro Miguel were operated from the head of the lock. The character of the banks at Miraflores made it possible to operate the cranes along the banks. Four berm cranes were used at Miraflores; two set up new and two modified from the ones at Pedro Miguel.

MIRAFLORES



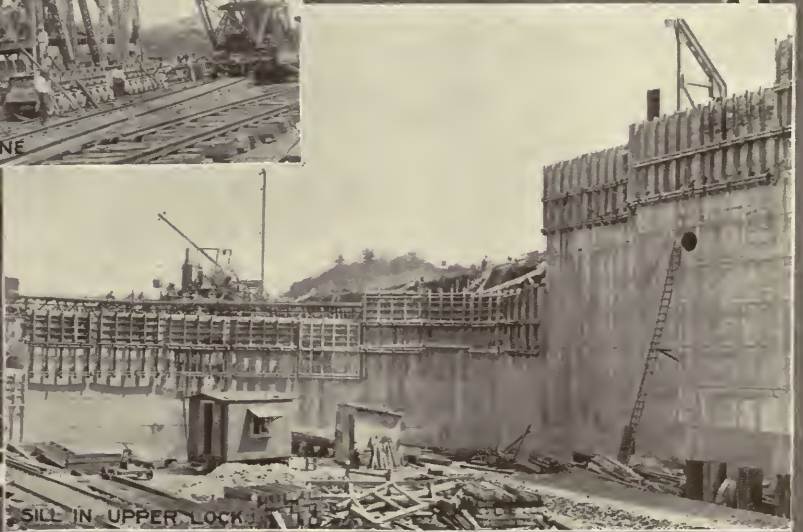
EAST AND CENTER WALLS



ERECTING A BERM CRANE



PORTABLE CONCRETE MIXER



SILL IN UPPER LOCK

These locks are two in flight, overcoming the difference in level between Miraflores Lake, the surface of which is 55 feet, and the sea-level section. As the fluctuations in the tide are about 20 feet, it will be noted that the maximum lift for these locks is about 65 feet.