

## **Punta Catalina (Dominican Republic) Power Plant Discharge Pipeline**

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### **ABSTRACT**

designed for feeding the seawater cooling circuit of the 2x360 MW Thermal Power Station at Punta Catalina and consists of three OD 2500 HDPE pipes installed in parallel, with 350m length each.

Each of the three pipelines of this marine outfall is be equipped with 15 holes designed to let the effluents flow directly into the ocean. These holes are spaced 20 meters apart. The diffuser of each pipe has 5 holes Ø1000 mm, 5 holes Ø800 mm and 5 holes Ø560 mm, totaling 15 holes per diffuser.

The pipelines were manufactured in Norway and towed to the site for installation. These pipes were stored in the northeast part of Bahia de Las Calderas, located at 25 NM from the construction site.

Each pipe stretch is assembled with 72 reinforced concrete ballasts of 6.40m<sup>3</sup> with 16 tons each. These were installed in parallel in a single trench opened by the backhoe dredger "Novadragamar" equipped with hydraulic ripper and conventional buckets. After the full pipeline installation, the trench was covered by rock backfill formerly dredged. At its bottom, from slope toe-to-toe, the trench had a theoretical width of 19.40m along its entire length of 350 meters. The average depth of the trench was around 5.0 m CD.

The dredged material removed from the trench consisted of mainly limestone rock.

The main works of The Punta Catalina submarine outfall were:

1. Design including Plans, Calculation notes, technical memories of the reinforced concrete blocks.
2. Reception inside Bahia de Las Calderas of 3 x 350 m of OD 2500mm pipes in HDPE and accessories.
3. Assembly of the outfall pipelines with 216 concrete ballast elements and with sinking accessories.
4. Electro welding of 45 diffuser chimneys.

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5. Trench dredging by a backhoe dredger, with side casting of dredged material for posterior backfilling.
6. Installation (Sinking) of 3 x 350 meters of HDPE pipes in parallel inside an opened trench.
7. HDPE chimney extension tube assembled by divers.
8. Backfill of the trench with dredged material and installation of a layer of 1,3 m thickness of 500 to 1000 Kg imported rock.
9. Connection with the pumping structure.

The main Project challenge was the Sinking of the 3 x 350 meters OD 2500mm pipes in three separate operations using the S curve method in this rather Large Diameter pipes, taking into account the required towing forces required to avoid pipeline buckling. In addition, the extra controlled backfill operation, due to the presence of vertical chimneys, which consisted of reuse and careful placement of backfill material. Finally, the installation of the rock layer on top of the granular material for added protection against waves that have their origin in hurricanes (highly hurricane area).