(PP8) PILOT ACTION REPORT

Version 1

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Contents

1. Pilot Action Title

Test of a more environmental friendly and cost effective way to provide the capping.

2. Place/area of PA implementation

The North Adriatic Sea Port Authority (NASPA) pilot action is located, as showed in Figure 1 with the red dot, in the so-called Montesyndial area, in Porto Marghera, in the Venice Lagoon (Northern Adriatic Sea).

Porto Marghera is an industrial area since 1917, and is, by law, since 1998 (Law n. 426/1998), a "Sito di Bonifica di Interesse Nazionale" (SIN), which means a remediation site of national interest, because of its potential impact on the environment, due to its surface extension and risk posed by contaminants. In 2013, Porto Marghera SIN border was redefined to a surface of around 1900 ha.

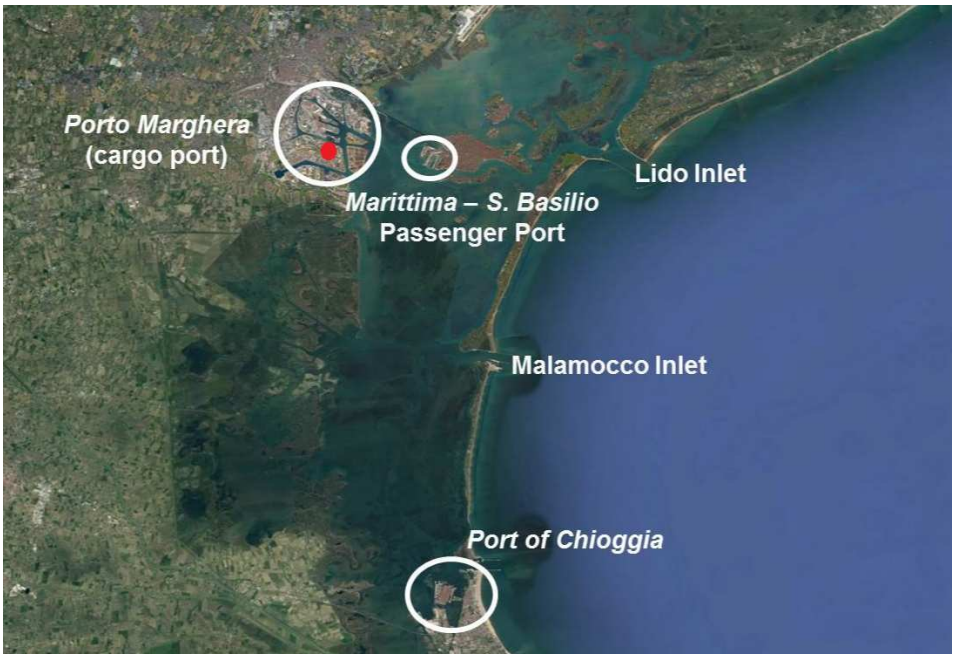

Figure 1 Pilot action location.

3. Duration of PA implementation

The pilot work was initially foreseen to last three months, however, being it a pilot, in the detailed design and in the tender documents, it was underlined that the effective duration should be subordinated to the monitoring outcomes collected during the development of the pilot itself. The duration of the pilot activity on the whole was: tender procedure started on 24/06/2018 , while the work started on 20/09/2018 and lasted until 12/07/2019.

4. Costs related to PA

The total cost sustained to develop the NASPA Pilot Action is of € 140.544.

5. Background and challenges faced

The pilot action consists in the re-use of excavated not-polluted soil to consolidate a former industrial flooring and in an environmental capping. As anticipated above, the site is located in Porto Marghera (PM), in the so called "Montesyndial" area, future location of a container terminal.

The developed and tested pilot action consists of two versions of the pilot itself:

- "Embankment A": layer made of not-polluted soil, with the bottom base of 35 x 35 m and an upper base of 25 x 25 m.
- "Embankment B": layer made of not-polluted soil with the bottom base of 35 x 35 m and upper base of 25 x 25 m. This version of the pilot is also equipped by a drainage system, and the capping layer: 25 x 25 m.

A preparatory study was developed in 2017 before starting the pilot action. In particular, this study focussed on the definition of an environmental survey plan as well as a geotechnical/geognostic survey plan. The two survey plans delivered a list of tests and analysis that were carried out in order to gain preliminary results useful to subsequently plan, develop and test the capping.

During the development of the pilot action, some challenges have been faced. They reflected the intrinsic unpredictable nature of the pilot action and have been posed by unpredictable events related to the pilot's development itself. The most significant example is represented by the trend of failures of both the embankments, and in particular of "Embankment B" (with drainage system, where the capping needed to be realised and tested). Indeed, while "Embankment B" was supposed to achieve an equilibrium of failures in one month and it finally took approximately almost six months to achieve the equilibrium in failures. This implied a subsequent delay in obtaining the information expected and thus concluding the pilot.

6. PA objectives

The aim of the "layer made of not-polluted soil" in Embankment A and Embankment B is to consolidate the soil under the container terminal pavement, using not polluted soil excavated from the quay, thus minimising transportation of material.

The main scope of the capping is to interrupt the pathways of contaminants from the underground water and also to provide statics quality to the flooring to be constructed for the future container terminal.

7. Activities carried out

The following is the list of the activities carried out:

- Development of an environmental survey plan as well as a geotechnical/geognostic survey plan, and collection and analysis of related results;
- Cleaning the area from grass and bushes;

- Excavation of not-polluted soil;
- Installation of the drainage system in the area “Embankment B”;
- Realisation of “Embankment A” and “Embankment B”;
- Installation of monitoring devices;
- Removal of “Embankment B” when failures asymptote was achieved;
- Realisation of the capping in “Embankment B” area;
- Statics tests on the capping.

8. Technical specifications and solutions tested

The site where the pilot project has been developed and tested comprehends two areas, as showed in Figure 2:

- “Embankment A” (so called “Rilevato A”): layer made of not-polluted soil*. Lower base: 35 x 35 m. Upper base: 25 x 25 m.
- “Embankment B” (so called “Rilevato B”): layer made of not-polluted soil*. Lower base: 35 x 35 m. Upper base: 25 x 25 m + drainage system. Therefore, capping layer: 25 x 25 m.

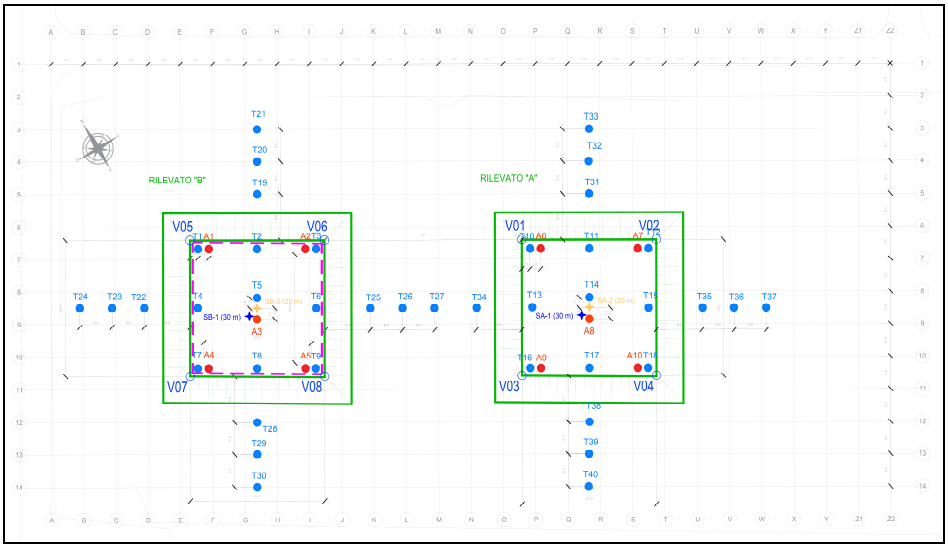

Figure 2 Pilot action: “Embankment A” and “Embankment B”.

The pilot project consisted in two phases, as showed in Figure 3 and Figure 4:

- Phase 1: realisation of a layer made of not-polluted soil and installation of monitoring devices (e.g. settlement gauge in steel). For “Embankment B”, installation of a drainage system.

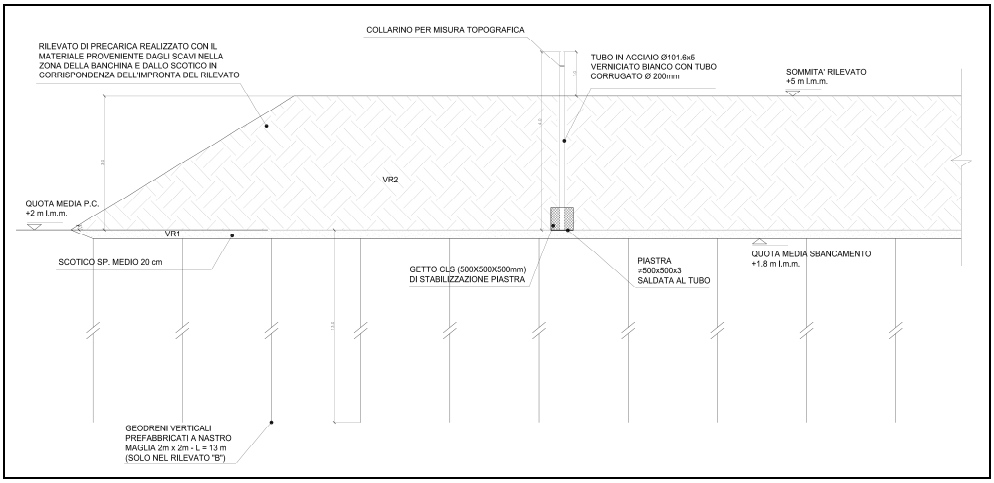

Figure 3 Pilot action phase 1.

- Phase 2: realization of environmental capping, necessary for the detailed design of the container terminal.

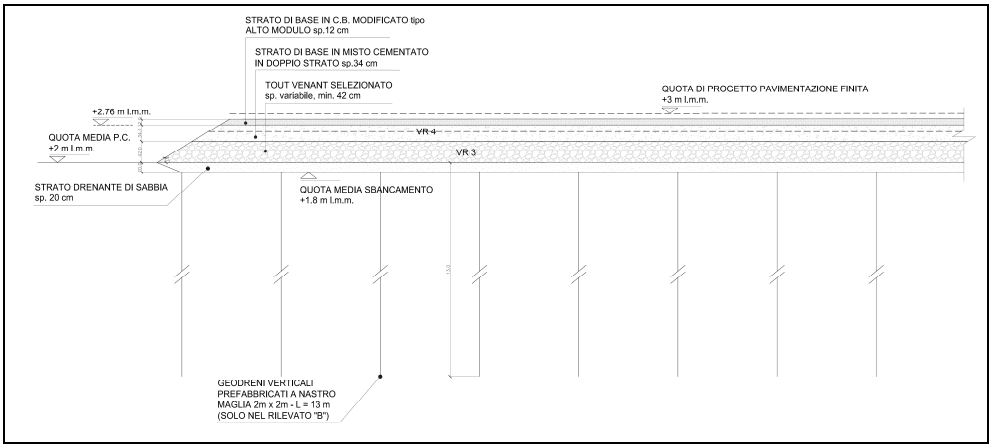

Figure 4 Pilot action phase 2.

9. Impact/ results/ experience (how many target groups/ stakeholders were reached, pilot events)

The target groups involved and informed about the pilot results are:

- At national level: Ministry for the Environment, Ministry for Economy and Finance, ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale – Istitute for the environment protection and research);
- At regional level: ARPAV (regional environment agency) and Veneto Region;
- At local level: municipalities, port community and port operators;
- National level - Urbanistic Experts: the pilot local event was organized inside the national event “UrbanPromo Green” participated by experts from the urbanistic world at national level. A further presentation of the GreenerSites NASPA Pilot was also held during the Triennale in Milan;

- International level - remediation techniques experts: the NASPA pilot was presented, by mean of a poster, during the REMTECH initiative, which is widely participated at international level by experts in the remediation field.

10. Contribution to project objectives

The pilot project contributes to achieve the GreenerSites objectives as it contributes to improve the environmental management of an underused industrial area and thus facilitating its future use as a new container and logistics terminal for the port of Venice. The reconversion of an unused and polluted area to an active economic activity will bring along other improvement for the territory creating job opportunities and contributing to the development of the region and the port.

11. Transnational added value - how PA contributed to other activities implemented by the project & added value for partners

The results obtained with the pilot's development represent a good example of a sustainable innovative way of providing the capping and testing the statics. They are immediately exploited at local level as functional for the drafting of the detailed design and the construction of the container terminal and will be taken into good consideration for future construction works in the ports of Venice and Chioggia.

The test can be replicated in any similar area, in the combined version (capping and statics test) or separated (only for the environmental capping or only to test the statics) in any brownfield remediation project. The procedures followed are widely spread among the project partners, local, regional and national level.

The pilot added valued could also be disseminated to a wide attendance of experts during the UrbanPromo and REMTECH initiatives.

12. Compliance with the sustainability principles

NASPA solution tested represents a sustainable pilot project according to the following considerations:

Capping is considered one of the available remediation technologies in the Matrix provided by the Italian Environmental Protection Agency (adapted and based on the Matrix developed by the Federal Remediation Technologies Roundtable).

In the NASPA specific case, this technology will be adopted in combination with other in situ remediation technologies in the Ex MonteSyndial site (90 hectars). It aims at interrupting the pathways of contaminants from the underground water.

The in-situ not polluted soil has been used for the pilot project, and it will be used in the future making the approach environmental friendly (less transports, therefore less CO_2 production) and cost effective.

13. Media coverage

The media coverage was guarantee through a constant use of the social media. Additionally an article specifically dedicated to the NASPA Pilot action was published by a web news-agency on 31/10/2018.

http://www.veneziatoday.it/attualita/area-ex-montesyndial-bonifica-porto.html