

Concerns for Environmental Impacts of Seabed Improvement Work in Land Reclamation in  
Henoko

## **1 Background**

Regarding the Futenma Replacement Facility Construction Project that the national government (Okinawa Defense Bureau) is proceeding (hereinafter referred to as “the project”), the existence of layers believed to have impacts on the stability of seawalls, etc. and ground subsidence (hereinafter referred to as “soft seabed”) were found in a wide area, as deep as 90 meters below sea level in Oura Bay, the planned site of reclamation work.

Although the existence of soft seabed revealed that the current planned site significantly impairs suitability as a reclamation site, the national government states that adding seabed improvement work makes it possible to conduct the construction, ensuring required stability. And, “the report of study results on design and construction of ground” (hereinafter referred to as “the report”) was shown as a summarized material of the examination.

In the report, after considering construction technique in seabed improvement work adopting sand compaction pile method and sand drain method, it plans to conduct a large-scale construction work, which is to install 77,000 sand piles in the seabed, using more than 90 vessels, including eleven ships for sand compaction at its peak. The volume of sand used for sand piles and so forth is 6.509 million cubic meters, which is 5.25 times as large as Tokyo Dome and as enormous as a several years of gravel collected in Okinawa. The report also makes an assessment of environmental impacts by anticipating environmental burdens associated with this construction and by considering and comparing those with the environmental burdens stated in an environmental conservation document.

## **2 Consideration of Environmental Impacts in the Report**

Although the planned seabed improvement work is a large-scale project, the report says that even if seabed improvement work is conducted, “coordinating construction process makes it feasible to construct without exceeding the scope stated in the environmental conservation document at its peak,” but the examination on environmental impacts is inadequate. There are many areas in the report where the examination is inadequate. The following show major matters.

- (1) The report compares the anticipated environmental burdens based on construction schedule only for seabed improvement work and the operation schedule of

construction equipment with the environmental burdens in the environmental conservation document, however, environmental impacts as a whole construction, including seabed improvement work, have not been considered.

- (2) Although soft seabed was confirmed approximately at 90 meters below sea level, the seabed improvement work is planned only for about 70 meters below sea level. The seabed improvement work plans to use more than a half of sand compaction vessels in Japan all together for a long period of time, and there are uncertainties over the plan itself, in which environmental impacts are examined.
- (3) The plan is to have a number of ships, more than 90 vessels, sailing in the narrow waters off Oura Bay. Taking into account that a certain distance should be kept between those ships because of collision prevention and anchor chains, there are concerns that it may have influence on the travel of dugongs, sea turtles, fish and so forth across an extensive area. Moreover, it is anticipated that a lot of noise will be generated by ships, and impact of their underwater noise on dugongs and so forth has not been fully estimated nor assessed.
- (4) The seabed improvement work plans to install sand piles at the maximum depth exceeding 30 meters below sea level, after depositing sand in the seabed. At such deep seabed, there are concerns that the turbidity caused by the soil rolled up from the seabed may be diffused, even with pollution prevention fences covering the work area. However, diffusion simulation has not been conducted and specific countermeasures are not shown. This work will be conducted at open water, therefore, if countermeasures are insufficient, the turbid water could run off into the entire Oura bay without being interrupted. This creates concerns over their impacts on marine life, such as corals, seagrass/algae, and marine ecosystem.
- (5) Regarding seabed vibration by installing sand piles and so on, environmental impacts have been considered based on the past measurement cases, however, it has not considered impacts on the entire seabed improvement work installing 77,000 sand piles, and the basis for claiming that there are no impacts on marine life has not been fully shown.
- (6) By depositing or dredging sand associated with seabed improvement work, the area where the bottom sediment conditions are altered is likely to be expanded compared to the environmental conservation document. If the altered area of seabed expands, it is necessary to consider impacts on marine life living on the seabed and conservation measures, however, no estimate or assessment on environmental impacts for expansion of the altered seabed area has been conducted.

### **3 Concerns for Environmental Impacts of Seabed Improvement Work**

The entire Oura Bay is a rich ocean with biodiversity of more than 5,300 species, including 262 kinds of endangered species. The bay is exceptionally rich in natural environment among the main islands of Okinawa, because large-scale blue coral (*Heliopora coerulea*) clusters and seagrass/algae beds are widespread, and many marine lives such as dugongs and sea turtles exist in the area.

In addition, Henoko coastal area is categorized as “Assessment Rank 1” under the “Guidelines on the Conservation of Natural Environment” stipulated by the prefecture, which means that its natural environment is subject for strict conservation as a coastal area maintaining healthy and diverse ecosystems.

In such waters, the landfill has been moving forward as we speak. After beginning the construction work, there is a concern about environmental impacts by already conducted construction work such as boring surveys and many vessels sailing, considering the dugongs having lived around the construction site have not been confirmed and so on.

Under such circumstances, examination on environmental impacts in the report is arbitrary, insufficient, and lacking in objectivity, because it takes out the impacts only by seabed improvement work based on the premise of highly uncertain seabed improvement work plan, without considering impacts on corals, seagrass/algae, etc., without fully demonstrating evidence for the basis of estimate in each section, and without conducting detailed simulation.

Therefore, the report does not dispel concerns on further environmental impacts resulted from adding the large-scale seabed improvement work using more than 90 vessels and installing 77,000 sand piles in the seabed in the project.

Furthermore, the report does not consider specific environmental conservation measures for adding seabed improvement work. Considering the time necessary for the said measures, it will greatly extend the time schedule for the entire construction.