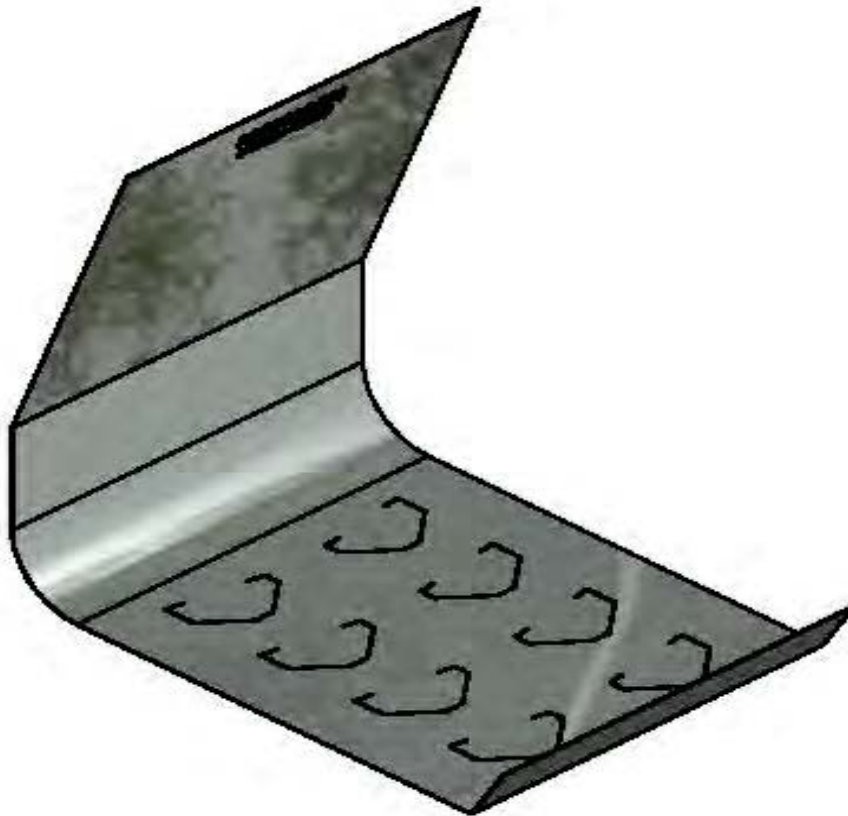


08/12/2016

DESERT SAND TRAP (DST)
KSA – JEDDAH
MOUCKUP REPORT (PROGRESS)
ENIGEERING ASSESSMENT



Prepared by:

ENGINEERING DEPARTEMENT

Patent P201630476

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Purpose and Scope

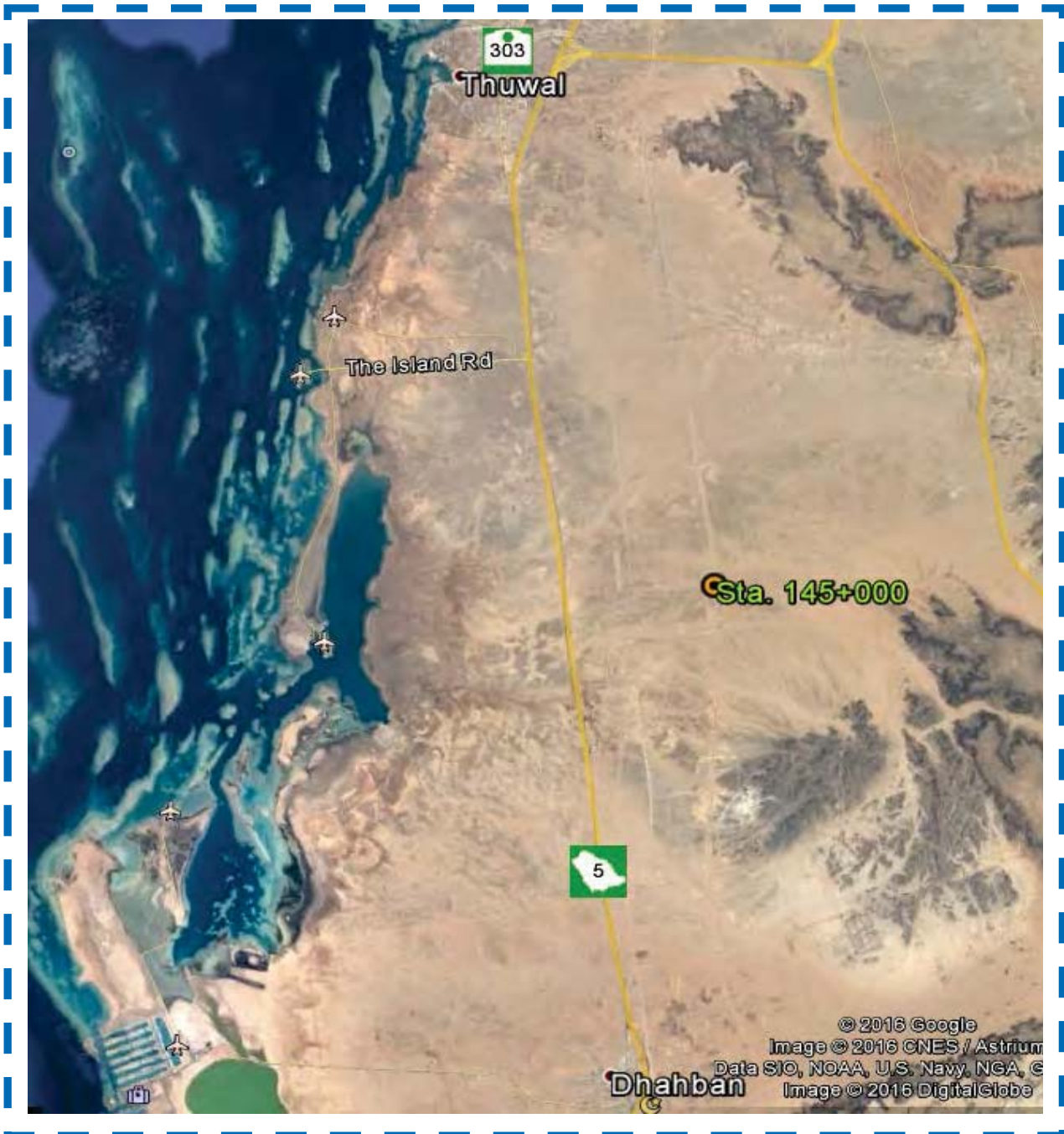
The purpose of this report is to address the current site result for Mockup of the Desert Sand Trap (DST) and to ascertain the physical and structural analysis of the site. This report is to assess the Desert Sand Trap (DST) as a general and to give statement for next step as the deep study and calculation/tests has done on site.

Overview

The Desert Sand Trap (DST) is a direct and easy solution to control the Desert sand and protect the construction works against wind-borne sands that is located in parallel throughout a work to protect such a road or a railway track, substantially perpendicular to the direction of the wind. The mockup of (DST) done at Station 145+000 which is located between Dahban and Thuwal, The Mockup of Desert Sand Trap (DST) implemented on site by COVEMA on 1st of August 2016 under fully coordination with COPASA ARABIA Ltd. team.

Location

The Mockup site was originally selected by COPASA ARABIA Ltd. Team, the site is located at Station 145+000 as shown in below photo.



Site condition and Physical analysis

The site is located inside the fence of train line, the site is having moderate sand accumulation, while the sand is hack the train line causing significant affect as shown on following photos.

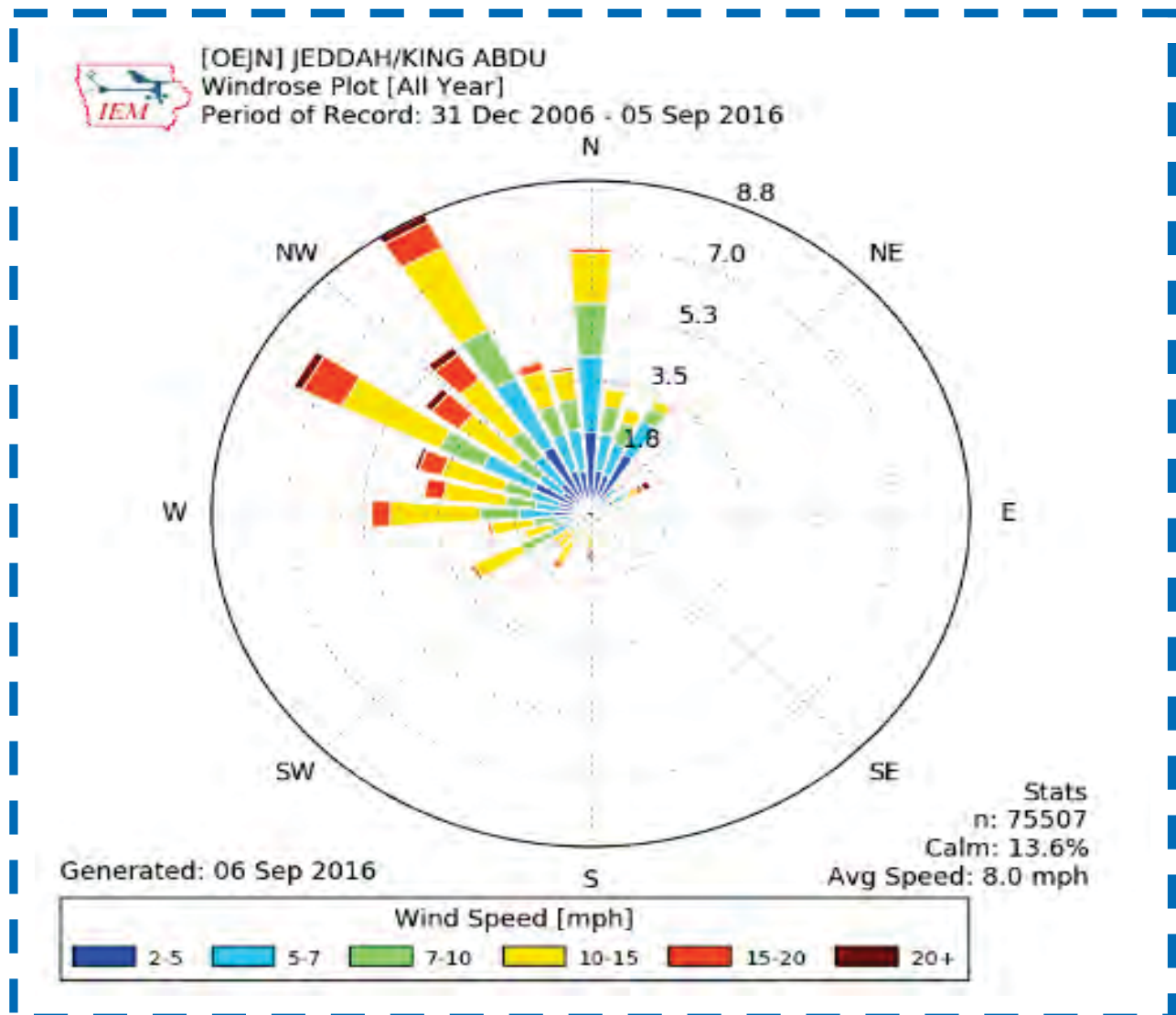




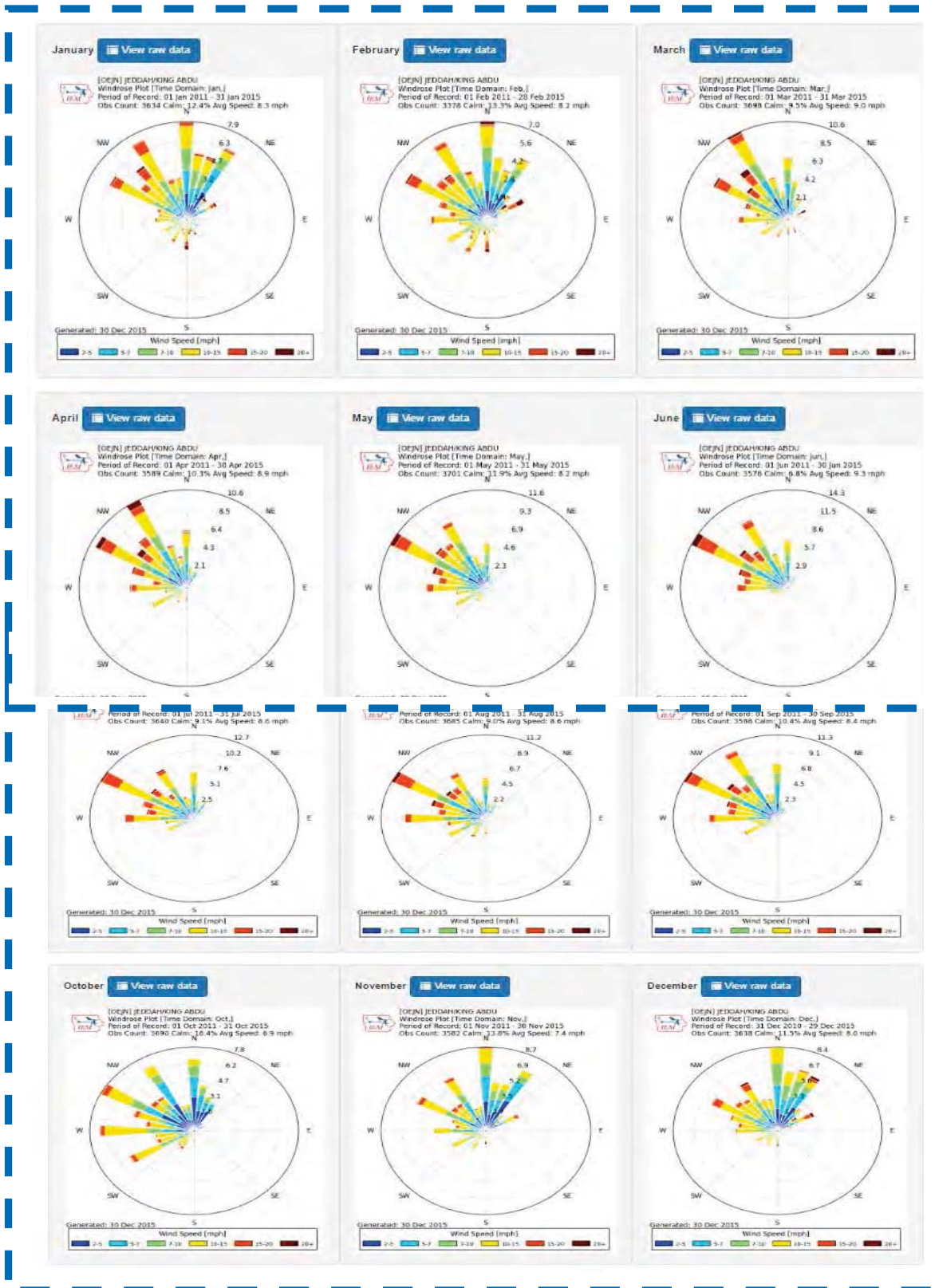
Wind Direction & Wind Rose

The wind direction at any point is based on historical record for the same, as our target is the main wind direction along the whole year. The nearest point to the Desert Sand Trap (DST) Mockup is Jeddah Airport, So the wind rose of Jeddah airport utilized as shown in photo, The wind rose is a graphic tool used by meteorologists to give a succinct view of how wind speed and direction are typically distributed at a particular location. Using a polar coordinate system of gridding, the frequency of winds over a time period is plotted by wind direction, with color bands showing wind speed ranges. The direction of the longest spoke shows the wind direction with the greatest frequency.

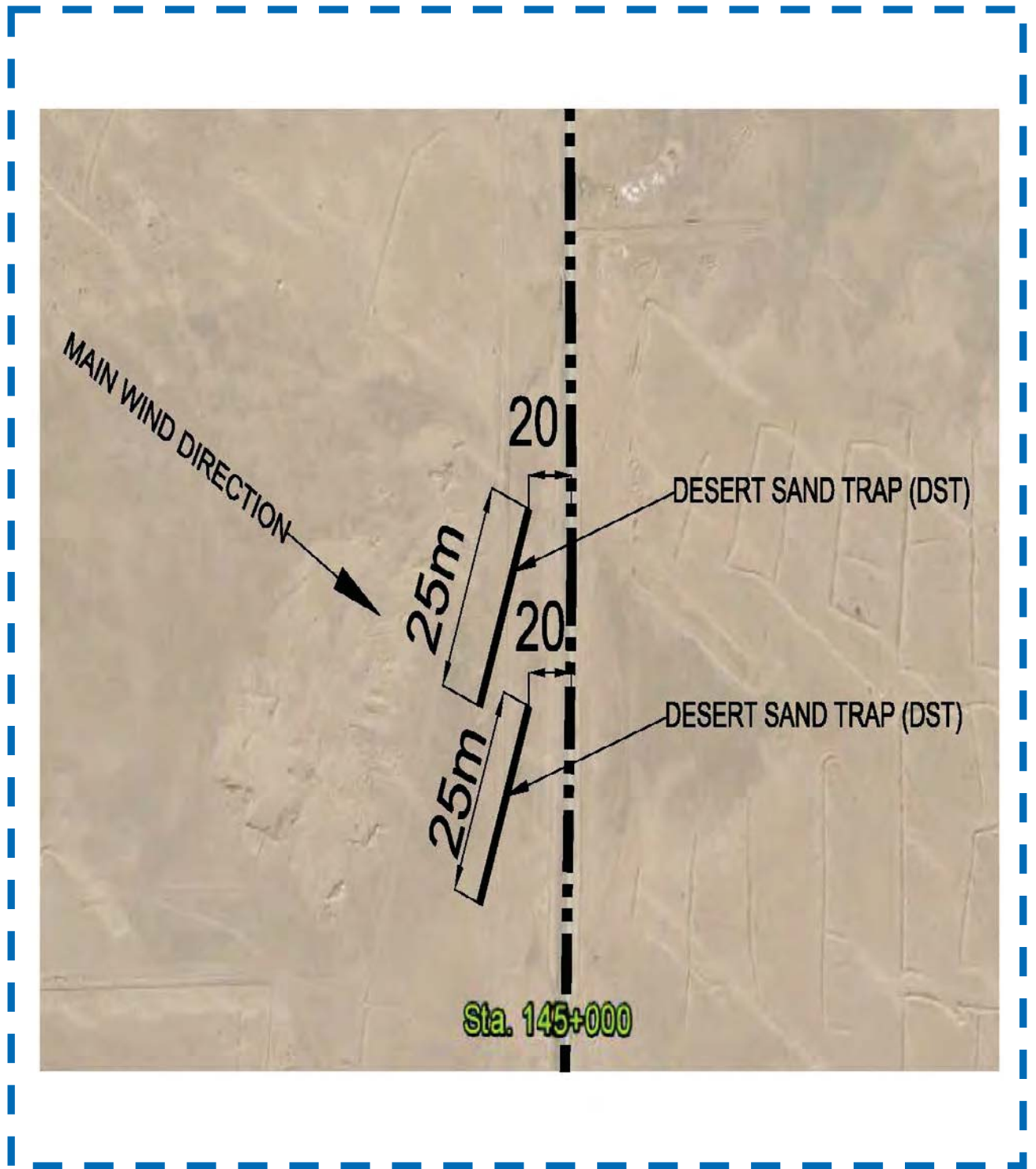
Wind direction history per year



Wind direction history per months



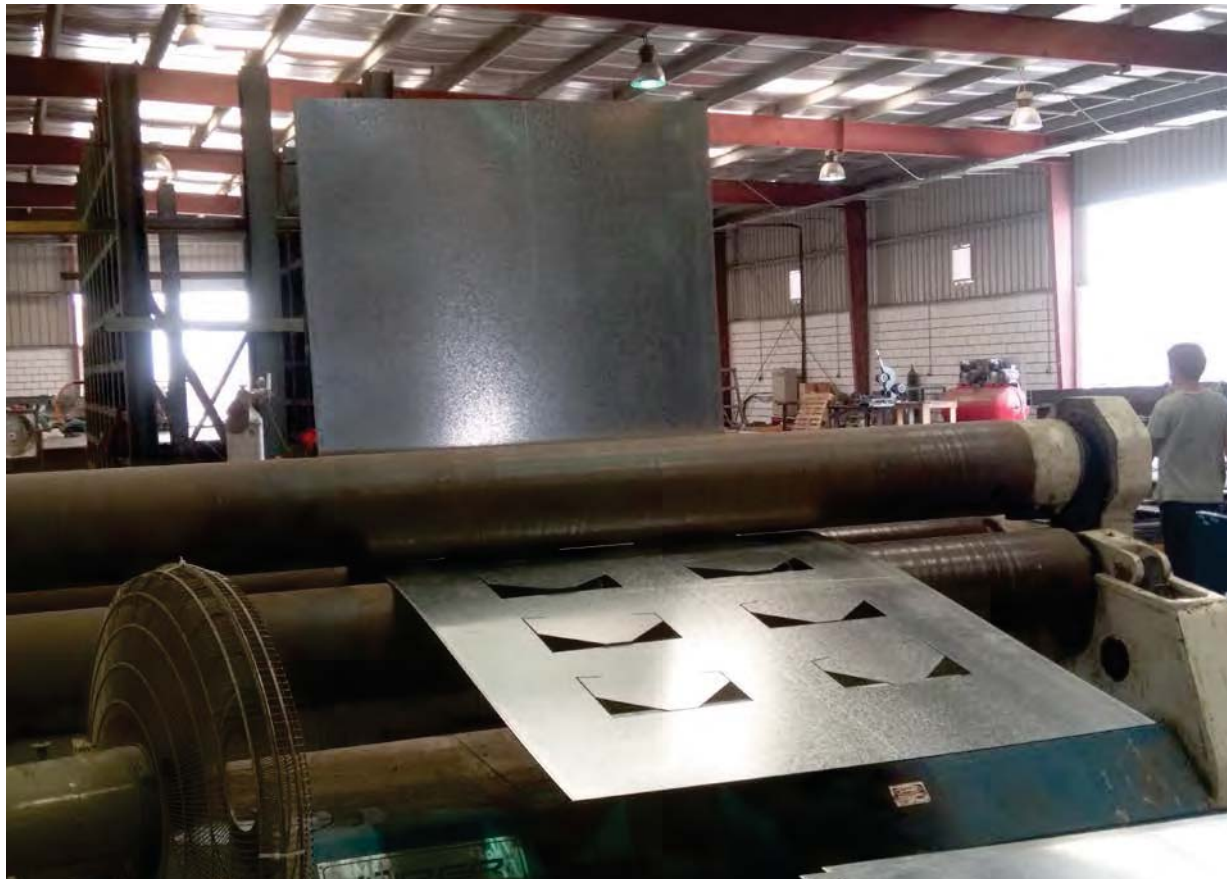
Due the above mentioned wind rose the wind direction for Desert Sand Trap (DSF) determined as shown in next figure.



Desert Sand Trap (DST) Fabrication

The Desert Sand Trap (DSF) is a Spanish product manufactured in (Attia Steel Factory) – jeddah – KSA, under direct supervision of Covema Team and in coordination with COPASA ARABIA Team, The fabrication had been started after design and shop drawing stage and determine the specification of the product. The following photos is giving a brief for the manufacturing stages.





SITE PREPARATION

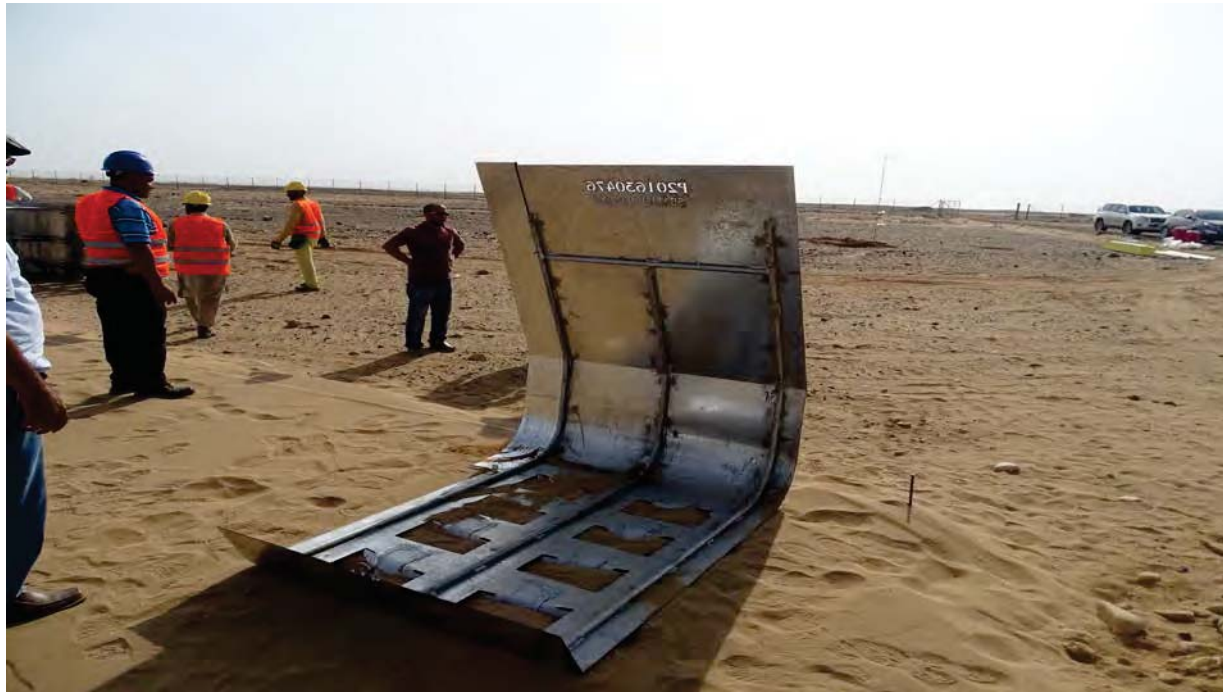
The site level adjusted by sand as shown in photos by utilizing a simple tools to have mate of sand which will receive The Desert Sand Trap (DSF).



DESERT SAND TRAP (DST) INSTALLATION

The Desert Sand Trap (DSF) is a single units with splice peace in between, the installation is simple and fast which is could be installed by labors or by using crane truck as shown in next photos.









SAND LEVEL INDICATOR

The sand level indicator is an analyses tool designed and build by our team to provide full indication analysis for the sand accumulative level at each stage and size of grain size at each level, to identify the behavior of the sand at the site.



Progress (After 4 months)

To identify the progress and analysis results, Time comparison photos were prepared for the area protected by The Desert Sand Trap (DSF) against the non-protected area in the same location, Noting that the protected area already cleaned by M/S COPASA ARABIA Team after around one month of installing The Desert Sand Trap (DSF).

Railway Before sand cleaning (Desert Sand Trap on installation time)



Railway After sand cleaning (Cleaning by COPASA ARABIA TEAM)



Railway Site Progress Photo (AFTER 3 MONTHS OF CLEANING)



Desert Sand Trap at installation time



Desert Sand Trap Progress Photo (AFTER 4 MONTHS OF INSTALLATION)



Progress analysis and conclusion:

- 1- The site is have moderate sand accumulative rate.
- 2- The Desert Sand Trap (DSF) protected 50m length of the rail way.
- 3- The rail way cleaned after installation of the Desert Sand Trap (DSF) by around one month.
- 4- The protected length by the Desert Sand Trap (DSF) after 3 months ago is still clean.
- 5- The non-protected length by the Desert Sand Trap (DSF) after 3 months ago is have obvious accumulative sand.
- 6- The direction of wind on site is have some different than the available record in Jeddah Airport.
- 7- Due to above point the Desert Sand Trap (DSF) system is working effectively, while some requirements has to be done to have fully effective system, Such as confine the protective length from north direction.