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1 Introduction

1.1 Purpose of this Document

1.1.1.1 This appendix provides explanation on the assumptions adopted as well as findings of the grid convergence test conducted for the EIA Study.

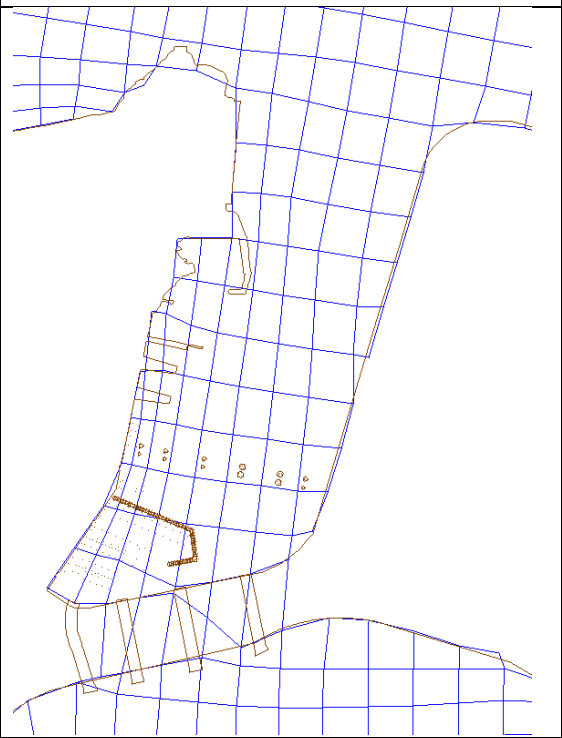
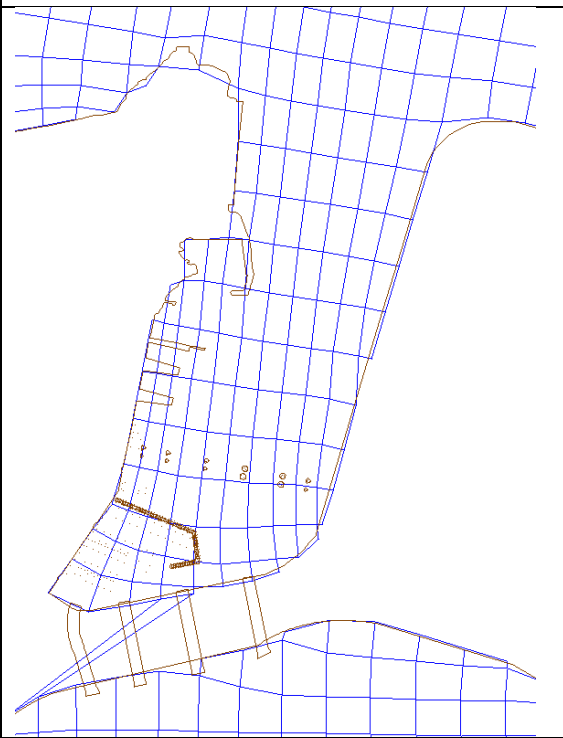
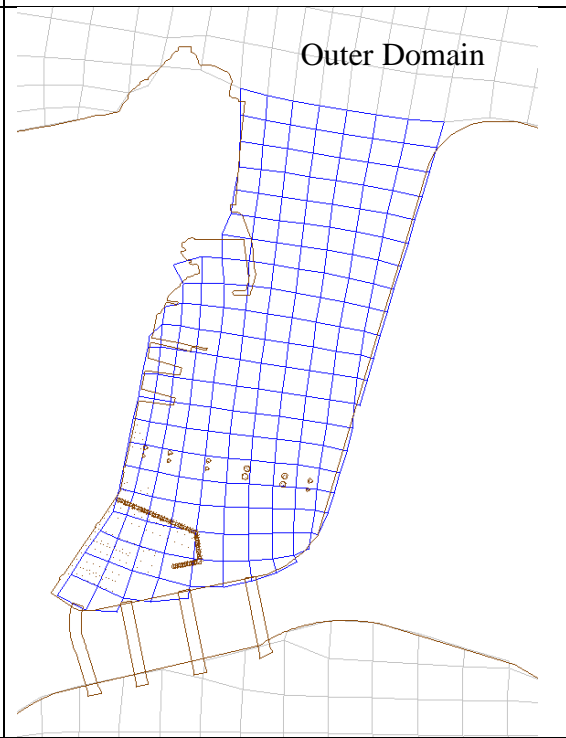
1.2 Need for Convergence Test

1.2.1.1 Delft3D tracer dispersion modelling was conducted to evaluate the potential change in flushing time within the embayment due to the presence of floating / fixed wave attenuator for the marine facilities. To ensure the currently selected model grid is sufficiently refined at the embayment for the tracer dispersion modelling exercise, a model convergence test was conducted for demonstration purpose.

1.3 Approach and Methodology

1.3.1.1 A model convergence test was conducted to demonstrate the resolution of a selected grid for this EIA (referred as "EIA grid" hereafter) is sufficient by comparing the performance of the select grid with that by other grids with different grid resolution and configuration. For this Study, two other grids were selected in addition to the adopted grid for the EIA Study. On the lower resolution side of the spectrum, the original model grid from the 3RS EIA (referred as "3RS grid" hereafter, which the EIA grid based on and further developed from) was selected. On the higher resolution side, a new grid with additional refinement within the embayment using domain decomposition technique (referred as "DD grid" hereafter) was prepared. A comparison of all three grids considered are shown in Table 1 below.

Table 1 Comparison of Model Grid at the Embayment

Grid	3RS	EIA	DD
Resolution	Around 70-90 m	Around 60-75 m	Around 40-60 m
Grid Configuration			

1.3.1.2 For this test, tracer dispersion modelling was conducted in the same way as those model runs for determination the material exchange rate for the embayment. Initial tracer concentration of 1 mg/L was set within the embayment with the same coverage shown in *Figure 5.3* of *Section 3* for 8 different tidal conditions ([spring / neap] × [flooding / ebbing / high water / low water]). The average tracer decay curve at Point D shown in *Figure 5.3* of all 8 conditions would be compared for each of the model grid.

1.4 Findings and Conclusion

1.4.1 Average tracer concentration at Point D under all 8 model runs for all 3 model grids are shown in *Figure 1* below. As shown, the rate of reduction of conservative tracer concentration for the EIA grid (i.e. grid adopted for this EIA) matches very well with the DD grid, while the rate of reduction under the 3RS grid is notably higher than the other two. The grid convergence test findings indicated the resolution of the EIA grid is sufficiently and additional refinement (considered under the DD grid) will not benefit the analysis of concern. Overall, it is concluded that the findings of the grid convergence test demonstrated the EIA grid is suitable and sufficiently refined for the purpose of tracer dispersion modelling under this EIA Study.

Figure 1 Average Tracer Concentration at Point D for Model Runs by Different Model Grid

