

The best relation between the other two datum planes, was established by Mr. E. H. Keating when City Engineer at Halifax, from comparisons between twenty-one Benchmarks, which define the City datum and the Royal Engineers' datum respectively. From his original notes, the difference between them, as indicated by these Benchmarks, ranges from 1.61 to 1.96 feet, when two exceptional values are discarded which he has marked. The actual average of the nineteen remaining differences is 1.81 feet; and the mean value which Mr. Keating has finally adopted, places the Halifax city datum at 1.85 feet below the Royal Engineers' datum. This value for the difference has since been generally adopted.

The height reached by the exceptional tide of October 5, 1869 known as the Saxby tide, was also determined by Mr. Keating in April 1876, from the best marks that could then be pointed out to him. From the mean level of these marks, he found the elevation which this tide reached at Halifax to have been 7.90 feet above the Halifax city datum.

A further endeavour was made this season, to connect the Halifax city levels with the Bench-mark in the Dockyard, to establish a relation with the Admiralty datum. But the city Bench-marks in that vicinity were found to have both "original" and "corrected" elevations; besides showing a want of agreement with each other; and no method of working out the comparisons could be devised to give a satisfactory result. Discrepancies ranging from four inches to a foot remained outstanding which could not be accounted for, as there was no means of knowing which of them had the greater balance of probability in their favour.

The elevation of the Bench-mark in the Dockyard is given as 11.05 feet above the Royal Engineers' datum on their own plans; and it is also so noted on the chart of Halifax harbour; but there was some doubt as to this, because the Royal Engineers' datum is presumably intended for Mean Sea Level. The true value of Mean Sea Level however, as now ascertained by this Survey from four complete years of continuous observation, is found to differ by 1.55 feet from this value for their datum; an error which is inadmissibly large where the range of the tide is only seven feet. From a comparison which has just been made by the Royal Engineers, the corrected elevation of this Bench-mark is 12.61 above their datum. This determination now serves to define the relations desired.

The tide levels given below, are defined by reference to the one Bench-mark. These levels have been repeatedly checked by myself; and there is no error outstanding in them which exceeds 0.01 of a foot.

HALIFAX, N.S.—TIDAL LEVELS AND DATUM PLANES.

		Above or below Admiralty Datum.
	Feet.	
Bench Mark in the Dockyard, as above described, which records the Admiralty datum.	16.08	
Coping of the Halifax Dry Dock.	10.97	
Highest High Water during the tidal observations from 1895 to 1902. Occurred during a gale on November 25, 1901. Elevation reached.	9.35	
Mean Sea Level. Deduced from the hourly ordinates of the tide during four complete years of observation, as follows:—		
During one year, October 1895, to October 1896	3.391	
" " January to December, 1897	3.515	
" " " " 1898	3.512	
" " " " 1899	3.492	
Mean value for the four years	3.478	3.48
Harmonic Tide Plane, or low water mark at a distance below Mean Sea Level given by the sum of the harmonic constants $M_2 + S_2 + K_1 + O$. Mean value of this sum for the four years 1851—1852 and 1860—1861 = 2.955. Value for the year 1895-6 = 3.093 feet below Mean Sea Level which in that year was 3.391. Average elevation resulting		0.41