The New Penguin Dictionary of

Civil Engineering

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normal **1** Conforming to the standard, typical, conventional, usual. **2** [math.] *Perpendicular*, right angled, such as to a line or a *plane* or to the *tangent* to a *curve* at a point of contact.

normal depth [hydr.] For a flow e.g. of water in open channels, the uniform depth of flow when the channel bed, water surface and the *energy line* are parallel and therefore at the same *slope*; cf. *critical depth*.

normal distribution [math.] A **Gaussian distribution** – the traditional bell-shape curve – a symmetrical and continuous *frequency distribution* in which the *mean*, *median* and *mode* are the same and the *probability density function* is:

$$f(x) = \frac{1}{\sigma\sqrt{2\Pi}} \exp\left(-\frac{(x-\mu)^2}{2\sigma}\right).$$

normal fault [geol.] A *dip-slip fault* on which there has been relative downward movement on the upper side of the fault plane; cf. *reverse fault*. See also *wrench fault*, *throw*.

normal pool The typical elevation of a lake or river, especially one controlled by a dam, which is between low-water level and high-water level.

normal stress [stru.] *Direct stress*.

normalizing **1** [mats] Heating a metal to an appropriate predetermined temperature and cooling in still air to alter properties. For example, to relieve *residual stresses* in steel to make it less brittle – see *heat treatment*. **2** [math.] Expressing some *data* proportionally such that the *maximum value* is one or 100%.

North American Datum (NAD) A coordinate reference system used for horizontal positioning. The North American Datum of 1927 (NAD27) is being replaced by NAD83. Both are indicated on some maps and often a conversion method is given for deriving NAD83 from NAD27. NAD27 is defined by the latitude and longitude of an initial point (Meade's Ranch in Kansas), the direction of a line between this point and a specified second point, and two dimensions that define the spheroid. The NAD83 is geocentric. A vertical datum is a level surface to which elevations are referred. In the US, vertical positioning is referenced to the National Geodetic Vertical Datum of 1929 (NGVD29), formerly called 'mean sea level 1929', and the North American Vertical Datum of 1988 (NAVD88).

northing [surv.] The difference in *latitude* between two positions as a result of a movement to the north. See also *southing*, *easting*, *westing*.

nosing [rwy] A horizontal lateral force applied by a *locomotive* normal to a curved track – cf. *lurching*.

notch **1** A sharp indentation or incision on an edge or surface. **Notch brittleness** causing *brittle fracture* of a metal occurs more readily in a notched specimen than one that is notch free. In a tensile test of a notched specimen, **notch ductility** is the percentage reduction in area after complete separation of the metal. A **notch effect** [stru.] is a local increase in stresses where the section of a member changes abruptly or over a relatively short distance. Must be avoided in highly stressed members or where there are repeated loads – see *fatigue*, *impact load*, *stress concentration*. **Notch sensitivity** is the extent to which the strength of a material to fracture is reduced by a stress concentration such as a notch, a sudden change in section, a crack or a scratch. Low notch sensitivity is usually associated with ductile materials and high notch sensitivity with brittle materials. It can be established by *Charpy V-notch test*, *impact test*, *Izod test*. **2** [hydr.] Small measuring weir with its upper edge above the water level.

notcher [mech.] A steel-fabrication workshop machine that takes the *flanges* from a length of the end of an *I-section* – see *fabricate*.

notional probability of failure [stru.] See *probability of failure*.

nourishment A process of replenishing, e.g., a beach – may occur naturally or, e.g., by depositing dredged material – see *beach nourishment*.