

### UTILITY SERVICES

**Colour coding:** Underground utility services and any protective ducting must be colour-coded, as shown, to comply with safety and building regulations.

**Location:** Minimum depths for services below ground that aim to reduce the incidence of damage to underground services and minimise risk to personnel are also shown.

Utility	Colour coding and minimum depths (mm)		
	Colour	Footpath	Road
Gas	Yellow	600 - 750	750 min
Water	Blue	750	750 min
Electricity (LV)	Black	450	600
Electricity (HV)	Red	450 - 1200	750 - 1200
Telecoms	Grey	250 - 350	450 - 600
Street Lighting	Orange	450	600
Drainage	-	Varies	Varies

### Trench construction

- Research records to establish likely location of existing services and classification of road or footpath. (This will affect the specification for reinstatement.)
- Erect warning signs, barriers and lighting.
- Cut through or take up and remove existing surfacing.
- Excavate through base layers and subsoil to required depth. Hand digging is required in the vicinity of existing services and tree roots to reduce possible damage.
- Support trench walls to safely retain adjacent ground.
- Level trench bottom. Lay new services on suitable bedding and backfill with compacted granular material to suit road or footpath classification.
- Re-construct surface to match existing construction and pattern.

### Connections to mains services

**Water:** The supply company will normally lay a service pipe from the site boundary to the closest water main and make a connection via an isolation valve. A supply pipe (possibly metered) is then required to connect the building to the provider's service pipe.

**Electricity:** The service provider will supply a new connection to the site boundary. It will then be necessary to connect this to a meter connected to a consumer unit.

**Gas:** The gas provider will install a supply, fit a suitable meter and connect the supply to the meter.

**Telephone and broadband:** Services will be installed by the selected provider who will normally carry out all work required to bring their service into the building, either underground, from a local cabinet on the fibre optic network or via satellite.

**Drains:** Connection from the site boundary to the main public sewer will usually be undertaken by a Local Authority approved contractor who must ensure that all work on roads and footpaths is completed to standard.

### FOOTPATHS AND ROADS

#### Kerbs and channels

**Kerbs:** Typically purpose-made precast concrete blocks located at the edge of a road to prevent vehicles from leaving the carriageway. The height of road kerb above the road surface varies from 100mm to 200mm. There are several different road kerb profiles, including bullnose, battered and splayed.

**Channels:** Usually formed in concrete slabs between the kerb and the road surface to collect surface runoff from the roadway and carry it to outlets. The channels must be designed to accommodate storm water and minimise roadway flooding.

**Footpath edgings:** Footpath edgings, bedded in concrete, are used wherever a rigid support or restraint is required at the perimeter of a footpath or pavement, typically at the junction between a footpath and any adjacent verge or landscaping.

**Gully drainage:** Road gullies collect surface water from the road channel and divert it into the drainage system where it is then taken to a watercourse or storm drain. The gullies are usually fitted with an open heavy duty metal grating which can be removed for cleaning.

**Falls and cross falls:** Paved surfaces, including roads, rely on a fall or gradient to carry storm water to the inlets of the drainage system. The fall, or longitudinal fall, describes the fall or gradient along the length of a pavement or surface and is probably determined by topography and safety considerations. Cross fall, or transverse fall, describes the fall or gradient.

#### ROAD CONSTRUCTION

**Wearing course:** The upper layer of the road on which vehicles move. It is made by the combination of asphalt/bitumen and aggregates. It needs to be durable and have good non-skid capabilities.

**Base course:** The layer immediately under the wearing surface (bituminous or concrete) which is subjected to high loadings and must therefore be constructed and compacted carefully, using high quality, usually granular or Macadam, materials. ON....

**Sub-base:** The bottom layer, usually consisting of crushed stone or dry lean mix concrete (not exceeding 150mm in thickness) compacted over the subgrade.