

# DRAINAGE & HYDROLOGICAL ASSESSMENT

The drainage/ hydrological assessment will gather information relating to watercourses, flooding and Northern Ireland Water Ltd infrastructure to identify the potential drainage constraints associated with road drainage, land drainage, fluvial flows and floodplains. The drainage assessment will include the following:

- **IDENTIFICATION OF WATERCOURSES:** Data from 'walkover' surveys, DARD - Rivers Agency, DoE - EHS and DCAL - Fisheries will initially be collated to identify watercourses, water bodies, sources of fluvial and overland flow, historical flooding, floodplains, flood defences, culverts, bridges, water quality and fish designations. This data will be used to identify drainage constraints within the study area and will facilitate the determination of route options.
- **IDENTIFICATION OF EXISTING INFRASTRUCTURE:** Data collated from NI Water, Roads Service and 'walkover' surveys will be used to identify existing infrastructure including water mains, sewers, culverts, transfer stations and treatment centres. This data will be used to identify constraints within the study area and facilitate determination of route options.
- **SURFACE WATER DISCHARGES:** Following identification of route options preliminary drainage design will identify potential surface and sub-surface drainage types and potential surface water discharge locations and discharge volumes. Throughout the drainage design consultations will be held with key stakeholders including Rivers Agency, EHS and Roads Service to seek agreements 'in principal' for drainage type, discharge locations and discharge volumes, where identified drainage design may incorporate upgrading works to watercourses to facilitate additional discharges from the proposed road. Preliminary drainage design of various route options will be used facilitate the determination of a preferred route. During detailed drainage design of the preferred route, further consultations will be held with River Agency and EHS to seek agreement for

discharge locations, discharge volumes, water quality and to confirm proposed pollution prevention measures, watercourse upgrades and flow attenuation measure, if required..

- **WATERCOURSE CROSSINGS:** Following identification of route options preliminary drainage design will identify watercourses crossings and seek agreements 'in principal' with Rivers Agency for culvert sizes and type. Consultations will also be held with Fisheries to determine impacts of culverts on migratory fish. Where identified drainage design may include proposals to divert or realign watercourses to avoid excessive culverting. Preliminary drainage design of culverts will be used to facilitate the determination of a preferred route. During detailed drainage design of preferred route further consultations will be held with Rivers Agency and Fisheries to seek agreements for culverts and watercourse engineering works.
- **FLOOD RISK ASSESSMENT:** Following identification of route options flood risk assessment will identify local floodplains and flood risk affected by road construction and operation. During flood risk assessment consultations will be held with Rivers Agency in relation to flood risk, scope of flood risk assessment and flood mitigation options. Matters arising from flood risk assessments will be incorporated into road level design, culvert sizing, road alignment, road make-up, drainage design and provision of compensatory storage, if required. Outputs from flood risk assessments will be used to facilitate the determination of a preferred route. During detailed design of preferred route further consultations will be held with Rivers Agency to identify flood risks and to agree flood mitigation options.
- **EXISTING DRAINAGE INFRASTRUCTURE:** Following identification of route options drainage design will identify existing infrastructure, NI Water and DRD Roads Service, which may require upgrading, replacement or diversion to facilitate construction and operation of the road. Outputs from these assessments will be used to facilitate selection of a preferred route. During detailed drainage design of a preferred route further consultations will be held with NI Water to confirm infrastructure replacements, upgrades and diversions.