Australian Government

Assessment Requirements for NWPHYD002 Apply principles of open channel hydraulics

Release: 1

Assessment Requirements for NWPHYD002 Apply principles of open channel hydraulics

Modification History

Release 1. This is the first release of this unit of competency in the NWP National Water Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and includes:

- checking data for inconsistency against measured flows
- identifying types of flows
- interpreting and applying technical documentation to the collection, analysis and reporting of hydrographic data
- presenting calculations and disseminating information
- selecting, performing and using relevant calculations associated with applying principles of open channel hydraulics including:
  - calculating hydraulic energy gradients
  - calculating minor energy losses associated with enlargements, contractions and bends
  - calculating the gradual varied flow profiles in uniform channels when the discharge is known
  - drawing velocity distribution curves for fluids in pipes or channels with both laminar flow and turbulent flow
  - using data to determine the value of roughness
  - using simple equations for determining channel friction with their appropriate application
- using recording and reporting systems
- using surveying techniques
- verifying results by applying hydraulic principles and other methodologies including:
  - estimating calculations based on observations
  - using continuity equations
  - using technology to perform high level calculations for channel hydraulics

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and includes knowledge of:

- applications and characteristics of notches and weirs, including type of the crest, shape of the notch, crest and conditions

- characteristics of open channels including:
  - critical
  - laminar
  - state of open channel flow
  - steadiness
  - subcritical and supercritical flow
  - transitional and turbulent flow
  - types of data including photographic, surveying, long-section and cross-section, topographic maps and historical
  - types of open channel
  - uniformity
- effect of velocity variation on velocity head
- flow conditions associated with open channel hydraulics including:
  - backwater
  - characteristics of open channel pipe flow
  - critical flow
  - distinction between laminar and turbulent flow
  - full pipe flow
  - laminar flow
  - rapidly changing flow
  - smooth, rough pipe and channel surfaces
  - subcritical and supercritical flow
  - submerged flow conditions
  - turbulent flow
  - uniform flow
  - weir and flumes behaviour under various flow conditions
- hydraulic calculations including:
  - estimating calculations
  - fluid dynamics
  - hydraulic mechanics
  - measuring and collecting data
  - principles of fluid statics
- mathematical formulae and calculation techniques for calculating channel hydraulics including:
  - application of matrix algebra to systems of linear equations
  - Bernoulli's equation
  - Darcy–Weisbach equation
  - equations for calculating the approximate value of the friction factor, the characteristics of flow through notches/weirs, including the use of these in channel flow measurement
  - graphical and algebraic methods for solving systems of linear, quadratic, exponential,

logarithmic and trigonometric equations
- Hagen–Poiseuille equation
- limitations of formulae
- Pascal's law and hydrostatic effect on submerged surfaces

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations. Where this is not appropriate, assessment must occur in suitable simulated workplace operational situations reflecting actual workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment currently used in industry
- applicable relevant documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume Implementation Guides are found in VETNet - https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037