Briefing Note 41: RAP3 Support for CPD for the Engineering Sector in Nepal, Collaboration with NEA and NEC

1. INTRODUCTION

Continuing Professional Development (CPD) is defined as the systematic maintenance, improvement, and broadening of knowledge and skills, and the development of personal qualities, necessary for the execution of professional and technical duties throughout a person's working life. CPD is normally based on structured professional work experience to achieve the required skills and qualities, with the addition, when required, of training programmes which complement such work experience and further develop the required skills and qualities.

CPD is an essential requirement for engineering professionals the world over, ensuring that their knowledge and experience remains up to date and relevant. In the context of Nepal where ten years of conflict, from 1996-2006, led to a significant gap in engineering works and expertise, CPD is critical to ensure that the engineering profession can provide the technical expertise required for the overall development of the nation. With over 4,000 engineers graduating annually in Nepal, there is a large number of young, motivated engineers coming into the work place each year, but in the absence of structured professional experience and mentoring, many struggle to develop professionally and often seek employment overseas. Many experienced professionals also seek employment overseas, further weakening the engineering capacity in Nepal and limiting the availability of experienced mentors for graduate engineers.

In the face of such challenges the Nepal Engineering Council (NEC) and the Nepal Engineers' Association (NEA) are working to try to develop and implement a national strategy for CPD. This briefing note outlines the collaboration between the NEC and NEA, and the Rural Access Programme 3 (RAP3), a UK Aid funded poverty alleviation programme focused on rural road maintenance, improvement, and construction, for the development of CPD in Nepal.

2. NEA AND NEC VISION FOR CPD

The Nepal Engineering Council (NEC) and the Nepal Engineers' Association (NEA) both consider the introduction of Continuing Professional Development (CPD) for the engineering sector in Nepal to be critical for the overall for the development of the profession. The NEC was formed in 1999 under the 'Nepal Engineering Council Act'. The 'Nepal Engineering Council Regulations' introduced in 2000, defines the application process for membership of the NEC and the three categories for membership; 'General Registered Engineer', 'Professional Engineer', and 'non-Nepali Registered Engineer'. The 'Nepal Engineering Council Regulations' also sets out the professional Code of Conduct to which all engineers must adhere. In order to work in the engineering sector in Nepal, all engineers must be registered with the NEC and as of March 2015 there were nearly 27,000 registered engineers, across 45 disciplines. The NEC is the regulatory body for the engineering profession in Nepal, and as a result has a critical role to play in developing and implementing a nationwide strategy for CPD. One key area of focus for the NEC is the introduction of a 'Professional Membership Qualification' which would require engineers to demonstrate that a certain level of structured professional experience has been gained, similar to the professional membership awarded by Engineering Councils and Institutes across the world, including the Institute of Civil Engineers in the UK.

The Nepal Engineers' Association (NEA), is an independent, non-profit organisation of Nepalese engineers which was established in 1962 and represents more than 15,000 engineers. The NEA is a democratically elected body which represents the engineering profession and contributes to major policy issues and the overall direction and development of the profession. The NEA's long term vision in terms of CPD is to establish an 'Engineering Staff

College'. The 'Engineering Staff College' would be an autonomous and independent training institution that would be responsible for delivering training courses. The NEA is hoping to become a member of the 'International Professional Engineers Agreement', formerly the 'Engineers Mobility Forum (EMF)', under the 'International Engineering Alliance', which is the international body for regulating CPD and accreditation (responsible for the Washington Accord which provides international recognition for engineering degrees awarded by accredited institutions in member countries). A key requirement for full membership is the development and implementation of a full CPD programme for the engineering profession. In the short term, a great deal of progress has been made towards the establishment of a 'Continuous Centre of Engineering Education' within the NEA, which will start to deliver training courses in the second quarter of 2015. The NEA has also conducted visits to a number of equivalent organisations in other South Asian Association for Regional Cooperation (SAARC) countries, including Sri Lanka, India, and Pakistan, in order to learn from the CPD approaches used by these engineering associations / institutes.

3. RAP3'S CAPACITY BUILDING PROGRAMME

The Rural Access Programme 3 (RAP3) is a UK Aid funded, poverty alleviation programme that uses the maintenance, improvement, and construction of rural roads as an entry point. The RAP3 Capacity Building (CB) component was developed to address capacity gaps affecting the delivery of the RAP3 programme, in particular a lower than expected performance from private sector actors working on the programme. The RAP3 CB component includes an engineering internship programme and a graduate training programme plus a Continuing Professional Development (CPD) programme, based on the ICE and Engineers Ireland models.

3.1. CONTINUING PROFESSIONAL DEVELOPMENT

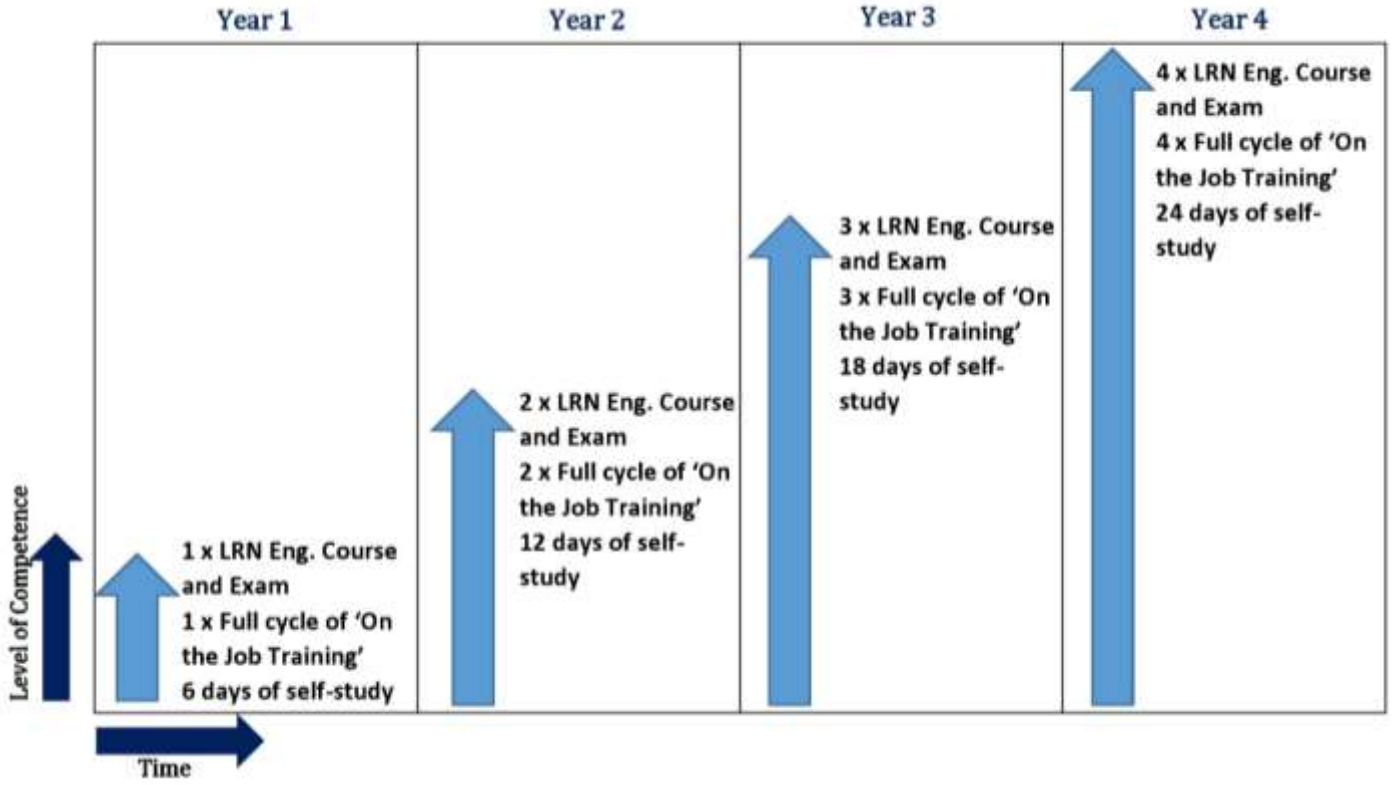
The Rural Access Programme, Phase 3 (RAP3) CPD Programme, which is currently being piloted, involves all engineers and technicians working on RAP3, including RAP3 interns (see Section 0 below), RAP3 graduates (see Section 3.3 below), RAP3 field engineers (including those working for private sector firms), DTO / DDC field engineers, and RAP3 District Team Leaders (DTLs) / Engineering Officers (EOs). The RAP3 CPD Programme has three main components:

1. Annual LRN Engineering Course and Examination: An annual 6 day 'LRN Engineering Course' with an associated examination which participants must pass to remain working on the RAP3 programme. The 'LRN Engineering Course' training materials can be found on the RAP website here http://www.rapnepal.com/lrn-engineering-course-materials.
2. On the Job Training: Prior to carrying out each work component, refresher training sessions on the relevant modules from the 'LRN Engineering Course' are delivered by the RAP3 District Team Leaders (DTLs), or Engineering Officers (EOs) and a short exam must also be completed by all the participants. Unlike, the LRN Engineering Course Examination there is no 'pass' or 'fail' mark associated with the 'On the Job Training' exams as these exams are simply intended to be used by the DTLs / EOs as an indicator of the level of the participants following each training session. Once the refresher trainings are complete, the District teams must then go and implement the relevant work components. Under the CPD programme there are considered to be three different levels at which the programme participants are involved in the practical implementation of the works:
    a. Observing the work being completed by others,
    b. Completing the work under the supervision of others, or
    c. Managing the work.

    The record of practical experience must be supported by a daily record of activities / tasks carried out that must be maintained by every engineer in their own 'Day Book' or 'Daily Diary'.
3. Self-Study: As part of the RAP3 CPD programme all participants are required to complete a minimum of 6 days self-study per year.

All members of the engineering team are required to record their completed CPD activities in the RAP3 CPD log book (the format for which can be found on the RAP website - http://www.rapnepal.com/cpd-log-book). Activities which are not documented in the log book, will not be considered to count towards the CPD programme.

CPD credits are awarded based on the CPD activities documented in the CPD log book. RAP3 has four levels which form the CPD certification system; level 1 requires 25+ CPD credits, level 2 requires 50+ CPD credits, level 3 requires 75+ CPD credits, and level 4 requires 100+ CPD credits. The participants in the CPD programme will be awarded a certificate for each level that they reach. As the participants in the CPD programme move through each annual cycle of the programme, their competency to deliver the RAP3 programme, and as engineers generally, should improve, as illustrated in the diagram below:



Full details of the RAP3 CPD Programme can be found in the CPD Briefing Note, available on the RAP website here - http://www.rapnepal.com/cpd-briefing-note.

3.2. INTERNSHIP PROGRAMMES

RAP3 currently offers two different internship programmes; one for CTEVT Technical School pass outs, and one for recently graduated civil engineers. Further details on both internship programmes are provided below.

3.2.1. CTEVT Technician Interns

The RAP3 internship programme for CTEVT Technical School pass outs provides a 12 month internship for one Inspector of Works (IoW) intern and one Senior Technical Supervisor (STS) intern in each RAP3's 14 Districts (i.e. 28 interns annually). RAP3 selects the interns based on the nominations of the local CTEVT Technical Schools, and this has yielded highly motivated young individuals who generally come from less privileged backgrounds (state funded schools). The aim of the internship is to provide technicians from local CTEVT Technical Schools with the opportunity to secure that all important initial work experience upon completing their technical courses. The CTEVT Technician Interns benefit from continuous assessment and mentoring throughout their internship and begin to establish a professional network within the construction industry in Nepal.

3.2.2. Engineer Interns

In early 2014, RAP3 hired 7 recently graduated engineers for a 6 month internship. This was the 'pilot phase' for the internship programme for civil engineers and it was extremely successful. Given RAP3's commitment to support the development of the engineering sector in Nepal, and the positive experience of the pilot phase, a

further 14 interns were hired by RAP3 in November 2014 and the Internship Programme for Civil Engineers became an established part of the RAP3 programme.

The aim of the internship is to offer young Nepali civil engineers the opportunity to gain their initial work experience on completion of their degree, an essential step in their professional development. The interns are given exposure to a variety of contexts (the interns spend three months in two RAP3 Districts) and get to travel and work in some of the most remote areas of Nepal. On completion of the internship the engineers should be in a strong position to secure employment and will also have had the opportunity to consider which sector, or area, they may wish to specialise in. The engineer interns also benefit from continuous assessment and mentoring throughout their internship and begin to establish a professional network within the engineering sector in Nepal.

3.3. GRADUATE PROGRAMME

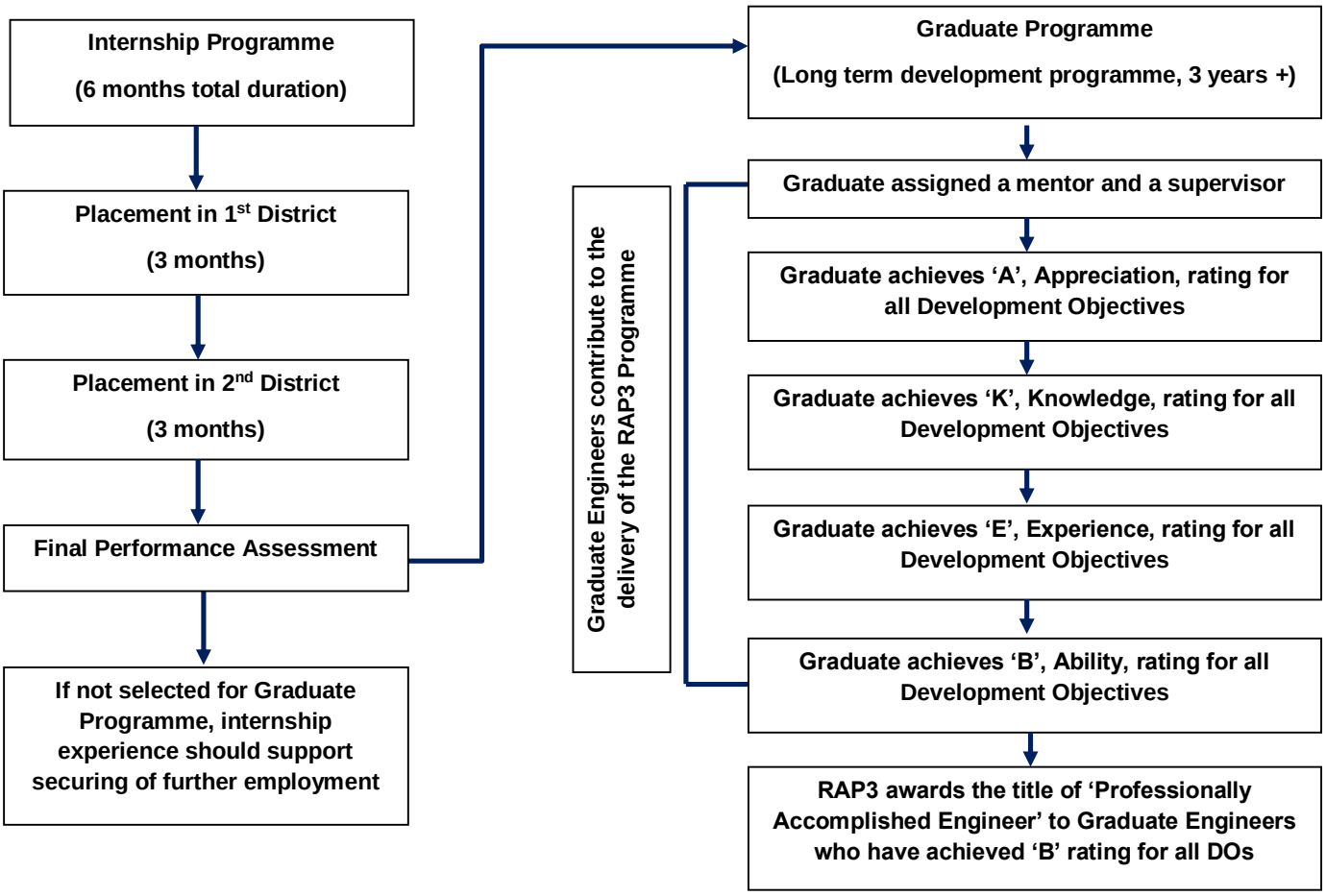
The RAP3 Graduate Programme was developed to provide long term professional development opportunities to exceptional engineers who come through the RAP3 internship programme. Places on the graduate programme are offered, at the end of each 6 month block of the internship programme, based on the ranking of the engineer interns ranking following their final performance assessment. The number of places available on the graduate programme is generally limited. As of March 2015, there are 6 graduate engineers in the RAP3 Graduate Programme. The graduate programme represents a significant step up from the internship programme and graduates are expected to contribute to the delivery of the RAP3 programme with RAP3 providing support for their development. The structure of the graduate programme has been developed based on the Institute of Civil Engineers' (UK) 'Development Objectives (DOs)' model, and the ten DOs prescribed for the RAP3 graduate programme are as follows:

- DO1: Identify engineering problems and define possible solutions
- DO2: Manage contractual issues
- DO3: Understand, and apply, the relevant procurement act and regulations
- DO4: Control budgets, tasks, people, and resources
- DO5: Bring about continuous improvement through quality management
- DO6: Demonstrate personal and social skills and ability to communicate with others at all levels
- DO7: Comply with relevant codes of conduct
- DO8: Manage and apply safe systems of work
- DO9: Contribute to sustainable development through engineering activities
- DO10: Manage your own continuing professional development

The graduate engineers must achieve certain 'Achievement Ratings' under each DO as per the table below:

Achievement Rating	Definition	Level of Demonstration	Time Frame (Months)
A	Appreciation	Graduate must appreciate why the DO is important and why it is done.	1-2
K	Knowledge	Graduate must have a basic understanding and knowledge of the DO and how it is achieved.	1-2
E	Experience	Graduate must have achieved the DO, or part of it, working under supervision.	3-9
B	Ability	Graduate must have achieved the DO several times in different situations, having the competence to assist others and to work without supervision.	12-36

The flow chart below outlines the relationship, and differences, between the internship and graduate programmes:



As there is currently no 'Professional Membership Qualification' under the NEC for which the graduate engineers can prepare as part of the RAP3 Graduate Programme, RAP3 award graduate engineers who have achieved a 'B', ability, rating for all DOs with the title of 'Professionally Accomplished Engineer'. The RAP3 Graduate Programme is however aligned with the expectation that eventually there will be a 'Professional Membership Qualification' under the NEC and at this point RAP3 will no longer award the title of 'Professionally Accomplished Engineer' but will expect graduate engineers to secure their 'Professional Membership Qualification' upon completion of the graduate programme.

4. COLLABORATION BETWEEN NEA, NEC, AND RAP3

Initially the RAP3 Capacity Building component was designed to specifically address the capacity gap which was affecting the delivery of the RAP3 programme, but the Capacity Building component was eventually expanded to include collaboration with the Nepal Engineering Council (NEC) and the Nepal Engineers' Association (NEA) in order to support the overall development of the engineering profession.

RAP3 is now supporting the NEA and the NEC to develop a nationwide strategy for professional development that accommodates the challenges faced by engineers working in remote and extremely poor areas with limited communication infrastructure and access to mentors. The strategy will include advocacy for the need for graduate and professional development among engineering sector clients, including international donors and government of Nepal. Some of the key aspects of the collaboration between the NEA, NEC, and RAP3 are outlined in further detail below.

4.1. CPD FIELD VISIT

As part of the collaboration between the NEC, NEA, and RAP3, a CPD field visit was held in Parbat District on the 10th and 11th of March 2015. The objective of the field visit was to give the NEC and the NEA an opportunity to consider the practical aspects of developing CPD across the engineering sector in Nepal, by providing the chance to observe a pilot CPD programme in practice. The field visit was attended by the NEC Chairman, Er. Satya Narayan Shah, the NEA General Secretary, Er. Kishore K. Jha, the ICE Representative for Nepal, Chandra Shrestha, DFID's Infrastructure Adviser, Dr. Suman Baidya, and Siobhan Kennedy, an independent researcher currently researching the impacts of the RAP3 Capacity Building component.

The field visit was very informative, and both the NEA and the NEC found it very useful to spend time with the RAP3 District Team Leader who is responsible for managing and delivering the CPD programme in the District, and the participants in the CPD programme. Further details of the field visit can be found in the field visit report, published on the RAP website here http://www.rapnepal.com/section-pages/176.

4.2. CPD WORKSHOP

Building on the field visit, a CPD workshop, jointly hosted by the NEA, NEC, and RAP3 was held on the 27th March 2015. The workshop was attended by a wide range of stakeholders from across the engineering sector, including several GoN Departments and Ministries, private sector representatives, and development sector representatives. The workshop included four sessions; session 1 was a presentation by the NEC on 'Quality Engineering Education and the Role of the NEC', session 2 was a presentation by the NEA on the 'NEA Vision for CPD', session 3 was a presentation by RAP3 on the 'RAP3 CPD Programme', and session 4 was a panel discussion.

Despite the short duration (half-day) the workshop was a successful first step in terms of a nationwide strategy for CPD, and general consensus was secured from all participants for the establishment of a CPD Coordination Forum (see Section 4.3 below). Further details of the workshop can be found in the workshop proceedings, published on the RAP website here http://www.rapnepal.com/section-pages/176.

4.3. CPD COORDINATION FORUM

The key outcome of the CPD Workshop held in March 2015 (see Section 4.2 above) was the consensus amongst all participants that a CPD Coordination Forum should be established in order to offer a continuous platform for the coordination of CPD activities across the engineering sector. The CPD Coordination Forum will be supported by a CPD Working Group, made up of the members of the panel for the panel discussion during the CPD workshop; Jeevan K. Shrestha, DG DoLIDAR, Kishore K. Jha, NEA General Secretary, Satya Narayan Shah, NEC Chairman, Suman Baidya, Infrastructure Advisor DFID, Bill Seal, Engineering Team Leader RAP3, and Siobhan Kennedy, Independent Researcher. The CPD Working Group will work together to review the issues, challenges, opportunities in terms of CPD, and the suggestions as put forward by participants in the CPD workshop, and will present findings and proposals at the CPD Coordination Forum for further review and discussion.

RAP3 will act as the secretariat for the CPD Coordination Forum and will provide key administrative, logistical, and financial support for the management of the CPD Coordination Forum.

4.4. DEVELOPMENT OF A NATIONAL CPD STRATEGY

Building on the platform provided by the CPD Coordination Forum the next step for the Nepal Engineering Council (NEC) and the Nepal Engineers' Association (NEA) is the development of a national strategy for CPD for the engineering profession. The NEC and NEA are clearly the lead organisations for the development and implementation of such a strategy, with the NEA primarily focused on the delivery of trainings, and the NEC acting as the regulatory body, and in the position to introduce mandatory CPD standards and parameters for employers to adhere to.

A key expectation of the CPD Coordination Forum is that it will support coordination across all employers in the engineering sector. This is essential as the NEA and NEC cannot provide all aspects of CPD. For example structured professional experience, graduate and internship programmes, mentors, supervisors, etc., all of which

will be part of the national strategy for CPD, can only be provided by employers, but should be implemented under approved NEC, and NEA, standard frameworks / parameters. The national strategy for CPD will also have to address the need for a 'Professional Membership Qualification' under the NEC. Such a qualification, based on professional experience in the work place, is reliant on employers providing engineers with opportunities to acquire structured professional experience under established parameters. It is therefore critically important to have employers across the engineering sector engaged in, and committed to, the national strategy for CPD in order for it to be sustainable and effective.

RAP3 will support the development, and implementation, of the national strategy for CPD through the on-going collaboration between RAP3 and the NEC and NEA. Initial areas where RAP3 could potentially support have been identified and are as follows:

- Technical assistance for the preparation of the national CPD strategy (documentation, dissemination, etc.)
- Assistance to identify and access resources for the implementation of the national CPD strategy
- Provide lessons learned from the RAP3 CPD, internship, and graduate programmes in order to support other employers to implement similar programmes, and to support the NEC and NEA to develop standards for such programmes
- Provide financial and logistical support for inputs from SAARC country engineering institutes, ICE UK, Engineers Ireland, etc. where required
- Channel DFID support for CPD, and capacity building generally, for the engineering sector in Nepal. This is a key priority area for DFID, and DFID will continue to support such initiatives through the RAP3 programme