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5 QUALITY ASSURANCE

5.1 GENERAL OBLIGATIONS OF THE CONTRACTOR

- i) Contractor shall establish, staff, equip and operate a comprehensive quality organisation at the site during the full period of the Works. The principal responsibility and duty of this organisation shall be to ensure that all work carried out and materials produced or supplied by the Contractor comply fully with the Specifications, as well as, with all relevant Indian or other standards.
- ii) With his tender, a Contractor shall submit an outline quality control manual, organisation plan and staffing programme. This manual shall list all internal quality control procedures to be undertaken by the Contractor, give details of laboratories (listing their equipment and testing procedures), reporting procedures and quality control training programmes for their field staff. Prior to finalisation of any contract, the Project Manager shall review and comment on these data, and request any modifications or additions, which are considered necessary.
- iii) Within 28 days of issue of the Notice to Proceed, the Contractor will submit to the Project Manager, for review and approval, a revised, more-detailed and updated quality control manual and programme, which will take into account all comments made previously by the Project Manager.
- iv) At all times, the Contractor's quality control and other site personnel will co-operate with and inform fully the Project Manager in all matters relating to the work in progress and testing of materials etc., and will reply promptly to any requests by the Project Manager and his site supervision personnel for additional information and data.
- v) OWNER may establish and operate their own site laboratories or use the laboratories of third parties for materials testing, and the contractor will be required to provide at no cost to OWNER samples for testing in these laboratories.

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<div>vi) Supervision and testing which may be carried out by the Project Manager in no way relieves the Contractor of his full and sole responsibility for the quality of the Works and for compliance with the requirements of these specifications.</div> <div>5.2 <u>CONTROL OF THE PROGRESS OF WORK</u></div> <div><div>i) Close progress control, and the preparation of corresponding progress reports, shall be an important part of a Contractor's quality control responsibilities. A contractor must at all times provide the Project Manager with up to date information on the progress of work and must without delay bring to the attention of the Project Manager all delays or occurrences which could lead to delay or additional costs.</div><div>ii) Contractor shall submit detailed monthly progress reports to the Project Manager, in which the contractual programme for the works is updated and information is given on the quantitative completion of civil works (in the form of tables indicating the quantities of completed work).</div><div>iii) The monthly progress reports shall give full details of any delays to work in progress or planned, delays in transport to/from the site, together with detailed proposals for overcoming or preventing delays, and for regaining any lost time.</div><div>iv) The Contractor shall at any time, at the request of the Project Manager, submit detailed reports on particular matters relating to the execution and progress of the works, if such reports are required in order to assess the quality or progress of specific activities or works.</div></div> <div>5.3 <u>CONTRACTOR'S QUALITY CONTROL STAFF</u></div> <div><div>i) Contractor shall assign one experienced engineer to the site as full-time quality control officer, responsible with complying with all requirements of this Section.</div></div>		
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- ii) The experience and qualifications of this engineer shall be given in the contractor's tender and shall be subject to the approval of the Project Manager.
- iii) The positions, and the qualifications and duties, of the contractor's quality control staff shall be indicated in the quality control organisation plan and manual respectively, and shall likewise be subject to approval by the Project Manager. As a minimum, the Contractor shall appoint one qualified and experienced engineer to be responsible for quality control of each of the construction activities.

5.4 CONTRACTOR'S LABORATORIES

- i) As required herein, Contractor shall establish, equip and operate on site laboratories for the testing of the following principal construction materials:
 - a) Concrete, including also the testing of sand, aggregates, cement, water and admixtures.
 - b) Shotcrete, including also the testing of sand, aggregates, cement, water and admixtures.
 - c) Any site testing and/or calibration of monitoring instruments.
- ii) The numbers of samples to be tested, and the timing of testing, shall be as may be given elsewhere in these specifications, or as may be instructed by the Project Manager.
- iii) The staff of a Contractor's laboratory shall have proven experience in similar previous work and their qualifications shall be subject to approval by the Project Manager.
- iv) Complete records shall be kept of all laboratory tests carried out and shall be available at any time to the Project Manager on request.
- v) The Project Manager shall be permitted at any time and without notice to observe tests being carried out in any of the Contractor's laboratories, to inspect equipment or to study results.

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5.5 MATERIALS DELIVERED TO SITE

- i) The Contractor's quality control staff shall keep full records of all materials delivered to site for use in the Works, and of all tests made on such materials either prior to or following delivery to site.
- ii) These records shall be available at all times to the Project Manager, together with any factory testing certification.


5.6 SUPERVISION OF TRANSPORT

- i) Contractor will be required to appoint a transport officer with responsibility for all haulage of materials and equipment to and from the site.
- ii) This transport officer will contribute a section of the monthly progress reports covering transport to, from and at the site and any problems related thereto. He will be responsible for notifying the Project Manager of any problems and/or delays related to transport and for making proposals for overcoming them.
- iii) This transport officer will have direct responsibility for ensuring that local public and private traffic is able to have unrestricted use of the road up to the work sites at times to be agreed with or specified by the Project Manager.

5.7 ENVIRONMENTAL CONTROL

- i) Contractor shall appoint an environmental control officer to be responsible for ensuring compliance with all specified obligations, laws and regulations with regard to environmental protection of the site of the project, access roads and all site installations.
- ii) The Environmental Control officer of the Contractor must maintain close liaison with the provincial environmental department and its officers and must provide all data needed by this department and/or the Project Manager needed at any time to confirm full compliance with environmental regulations and obligations.

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<div data-bbox="231 443 1361 533"> iii) Details of all environmental protection activities, and of any cases of environmental damage, shall be included in the monthly progress reports. </div> <div data-bbox="231 577 474 616"> 5.8 <u>SAFETY</u> </div> <div data-bbox="346 645 1358 734"> The Contractors' obligations with regard to site safety are detailed in Section 3 Part I of these specifications. </div> <div data-bbox="231 779 745 815"> 5.9 <u>TRAINING OF FIELD STAFF</u> </div> <div data-bbox="231 844 1358 1093"> <div data-bbox="231 844 1358 981"> i) As part of his quality control obligations during the construction of the Works, Contractor will be required to employ and train field staff in the supervisory, testing and recording activities. </div> <div data-bbox="231 1003 1358 1093"> ii) A contractor must allow for providing quality control training to field personnel during the construction period. </div> </div> <div data-bbox="231 1137 812 1173"> 5.10 <u>MEASUREMENT AND PAYMENT</u> </div> <div data-bbox="346 1202 1358 1339"> No measurement for payment will be made for the Contractor's quality control activities required in this Section. All costs of these activities will deemed to be included in the Unit Prices for work listed in the Schedule. </div> <div data-bbox="231 1361 442 1400"> End of Chapter </div> <div data-bbox="1390 2033 1493 2116"> <div>ISSUE</div> <div>P0</div> </div>		