Irrigation Department
Government of Sindh, Pakistan

World Bank

SINDH BARRAGES IMPROVEMENT PROJECT

IDA CREDIT 62420

RFB No: PK-AFOF SBIP-98666-CW-RFB

Contract: SBIP/S4

Rehabilitation and Modernisation of Sukkur Barrage

Package-4: De-Silting of Rice Canal in Head Reach (RD 0 to 82.4)

Bidding Documents

Volume 2 Specification

May 2023

Overall Content of Bidding Documents

PART 1 – BIDDING PROCEDURES

VOLUME 0 – BIDDING PROCEDURES

Section I - Instructions to Bidders (ITB)

This Section provides relevant information to help prequalified Bidders prepare their Bids. It is based on a one-envelope Bidding process. Information is also provided on the submission, opening, and evaluation of Bids and on the award of Contracts. **Section I contains provisions that are to be used without modification.**

Section II - Bid Data Sheet (BDS)

This Section includes provisions that are specific to each procurement and that supplement Section I, Instructions to Bidders.

Section III - Evaluation and Qualification Criteria

This Section specifies the criteria to determine the Most Advantageous Bid.

Section IV - Bidding Forms

This Section includes the forms for the Bid Submission, Bill of Quantities, Schedules of technical proposal, including technical and financial qualifications, personnel, financial resources, and equipment, Bid Security and others to be completed and submitted by the Bidder as part of its Bid.

Section V - Eligible Countries

This Section contains information regarding eligible countries.

Section VI - Fraud and Corruption

This Section includes the Fraud and Corruption provisions which apply to this Bidding process.

VOLUME 1 – BILL OF QUANTITIES

PART 2 – WORKS' REQUIREMENTS [INCLUDED WITHIN VOLUMES 2, 3 AND 4]

Section VII - Works' Requirements

This Section specifies the Scope of Works, Specification, the Drawings, and supplementary information that constitute the Works' Requirements for the Works to be procured. The Works' Requirements also include the environmental and social (ES) requirements (including requirements relating to Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) which are to be satisfied by the Contractor in executing the works.

VOLUME 2 – SPECIFICATION

VOLUME 3 – DRAWINGS

VOLUME 4 – SITE DATA

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

VOLUME 5 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VIII - General Conditions (GC)

This Section refers to the "General Conditions" which form part of the Conditions of Contract for Construction (Second Edition 2017) published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC).

Section IX - Particular Conditions (PC)

This Section includes particular conditions of the contract consisting of: Part A-Contract Data; Part B -Special Provisions, PART C – Fraud and Corruption; and PART D – Environmental and Social (ES) Reporting Metrics for Progress Reports. The contents of this Section supplement the General Conditions and shall be completed by the Employer.

Section X - Contract Forms

This Section contains the Letter of Acceptance, Contract Agreement and other relevant forms.

Contents

1 Introduction

1.1 Abbreviations

The following abbreviations are used in this Specification:

Length	in	inch
	Ft, ft	foot
	RD	reduced distance (thousands of feet); 1 RD = 1000 ft; 5 RD = 1 canal mile
	mm	millimetre
	m	metre
	km	kilometre
Area	sq.ft, ft^2	square foot
	sq.mm, mm^2	square millimetre
	sq.cm, cm^2	square centimetre
Volume	cu.ft, ft^3	cubic foot
	cu.mm, mm^3	cubic millimetre
	cu.m, m^3	cubic metre
Discharge	cusec	cubic feet per second (ft3/s)
Mass	lb	pound
	kg	kilogram
	T	tonne = 1000 kg
Force	kN	kilonewton
Time	d	day
	Hr, hr	hour
	Sec, s	second
Other	dia	diameter
	nr	number
	°C	degree Celsius
	°F	degree Fahrenheit
	%	per cent
	±	plus or minus
	CESMP	Contractor's Environmental and Social Management Plan
	EBRD	European Bank for Reconstruction and Development
	EMP	Environmental Management Plan
	SEMP	Site Environmental Management Plan
	GC	General Conditions of Contract
	PC	Particular Conditions of Contract
	IFC	International Finance Corporation
	ICB	International Competitive Bidding
	WHO	World Health Organisation
	WSIP	Sindh Water Sector Improvement Project

The terms 'canal' and 'channel' are interchangeable and refer to Rice Canal.

1.2 Brief Description of Works

The principal items of works to be executed under the Contract SBIP/S4 include but are not limited to the following:

The scope of works for the contract SBIP/S4 is as follows:

- Excavation for removal of silt from Rice canal bed in dry and wet conditions, during the canal closure period (Rabi season)
- Disposal of excavated material to designated disposal areas within or outside the canal RoW.

1.3 Canal Closure Period Dates and Identified Constraints

As a non-perennial canal, the flows in Rice Canal are released only during May to October, the de-silting works are required to be planned during closure of Rice Canal from 1st November to 30th April (inclusive). During the closure period a negligible flow from seepage / potable water requirements continues through small naturally formed channels in the canal bed or as sub-surface flow. This flow is not to be disrupted during de-silting works.

The exact dates for the closure period each year will be notified to the Contractor by the Engineer when they are announced by the Employer. Extended closure periods occur only by the direction of the Employer.

1.4 Mobilisation for Construction of the Works

The Contractor shall mobilise all resources as required for construction of Works according to the Contract Provisions. The major items of mobilisation are, but not limited to those listed and described in this Clause. The Contractor shall make his own assessment for provision and maintenance of mobilisation and demobilisation requirements and shall ensure their availability.

(a) Mobilisation of Contractor's Equipment to the Site

(b) Mobilisation of Contractor's personnel and labour at the Site

(c) Provision of camps

(d) Provision of such administrative and field offices, as the Contractor considers necessary for his organisation

(e) Provision of workshops, warehouses, shades, and storage yards required by the Contractor for the proper and sufficient execution of the Works

(f) Preparation of approved Contractor's Environmental and Social Management Plan (CESMP - see Clause 1.25)

(g) Preparation of approved Health and Safety Plan (see Appendix C)

(h) Arrangements for supply of water for use in construction, including installation of the necessary wells, pumps, pipes, storage tanks, and suitable arrangements for the delivery of water at the various points of requirement.

(i) Maintenance of temporary site facilities provided by the Contractor for performance in connection with the Works.

(j) Demobilisation at the end of the Defects Notification Period.

1.5 Shipment of Contractor's Equipment to Pakistan and to Site

The Contractor shall be responsible for shipment and clearance of plant, equipment and machinery required for the execution of the Work to the specified Site within the specified time. In this regard the Contractor shall also be responsible for the payment of all applicable dues, taxes and customs duties.

1.6 Provision of Contractor's Camps

The Contractor shall provide adequate camps and associated facilities such as required for the proper and efficient progress of the Works. These camps are required in order to house all the Contractor's Employees and facilities for use of the Engineer and Employer. The Contractor shall provide cold food storage, food preparation and associated waste, sewerage, toilet and other public health and environment management facilities as well as refectory for all employees. On the completion of the Works, the Contractor shall remove said camps and facilities with a follow up reinstatement of the camp area. The Contractor shall be responsible for any damage caused by his labour to the surrounding environment and other utilities.

The Contractor shall submit to the Engineer for approval, a layout plan for each camp, including construction and accommodation camps, before works begin to establish each camp. Layout plans for accommodation camps shall demonstrate compliance with the requirements of Clause 1.28 of this Specification.

The Contractor shall consult with local communities and make all reasonable efforts to mitigate their concerns before finalising the camp location.

1.7 Provision of Contractor's Workshops and Warehouses

The Contractor shall provide workshops, warehouses, shades, and storage yards required by the Contractor for the proper and sufficient execution of the Works.

The Contractor shall provide, maintain and operate temporary buildings such as his staff quarters, stores, workshops, labour camps and other temporary buildings necessary for the execution of the Works at the place the Employer will provide. If the contractor considers that the area provided by the Employer is not suitable or not large enough for establishing his site camp, site office or workshops and warehouses, then the contractor will arrange the land at his own risk and cost. The Contractor shall submit site plans and general particulars of the prescribed buildings to the Engineer for his approval. The construction of the buildings shall not be started until the proposals have been approved by the Engineer.

All workshops and storage areas including wastes shall be built on hard compacted ground/paved surface with sufficient barriers, secondary containment, signage, fence/guard and spill kits so as to prevent the loss or infiltration of leaked or spilt fluids into surrounding soils, ground water or water courses.

In locating storage areas, the Contractor shall avoid watercourses, drains and transport routes, ensure the area is not at risk of flooding, fire and other natural disasters, and where possible, locate storage areas close to the point of use. The Contractor shall prefer covered storage with proper ventilation, and where this is not practicable, shall regularly sprinkle with water, stockpiles which have the potential to increase particulate matter in the locality. Where requested, a water spraying schedule shall be prepared by the Contractor and submitted to the Engineer. The Contractor shall only use storage areas identified on his approved site layout plan. All excess materials, except earth stockpiles, shall be removed from the Site on completion of the Works.

1.8 Contractor's Power Supply

The Contractor shall make his own arrangements for electricity supply to the Contractor's office, his quarters, labour camp, workshop and stores and other temporary buildings.

1.9 Water Supply for Construction

The Contractor shall make his own arrangements for the supply of water for the purposes of the Works. The quality and quantity of the water shall be to the approval of the Engineer and suitable for the purpose for which it is intended.

The Contractor's arrangements for supply of water for construction must not reduce the quantity or quality of local water resources where these are relied upon by people in the vicinity of the project for any purpose. The Contractor shall be prohibited from using ground water for use in construction, unless otherwise approved by the Engineer.

Waste water shall be discharged from the Site after proper treatment as per Environmental and Social Management Plan so as to cause no pollution, damage or complaint.

1.10 Maintenance of Site Facilities of Contractor

The Contractor shall arrange service for all of his mobilisation works, fixtures and equipment including provision of all water, electricity and sewerage and refuse disposal services, until the end of the Defects Notification Period. The Contractor shall replenish consumable items as and when required. At the end of Defects Notification Period, the Contractor shall remove his camp and facilities and reinstate the camp area.

1.11 Drawings and Specification

The Drawings at the date of the Letter of Acceptance show the Works to be carried out in sufficient detail for the Contractor to fully plan his activities. However, the Drawings issued with the Contract shall not be used to construct the Works, as revised versions of these Drawings will be issued to be used for the construction of the Works.

The Contractor shall check the Drawings and Specification carefully and advise the Engineer, in writing, of any ambiguities, discrepancies, errors or omissions and a full instruction will be furnished to the Contractor should any ambiguities, discrepancies, errors or omissions be found. Although the Drawings are prepared to scale, work shall be based upon dimensions shown on the Drawings and not on dimensions scaled from the Drawings.

Drawings when read in conjunction with the Specification and instructions that may be issued from time to time by the Engineer, will show sufficient dimensions, specific details and typical details to define the various features of the work, but the details necessary for the construction of any part of the Works may have to the deduced from several Drawings. Any additional drawings, which the Contractor requires to interpret how to construct the Works, shall be prepared by the Contractor.

The Engineer may, from time to time, issue additional or revised Drawings to modify the Works.

1.12 Contractor's Working Drawings and Shop Drawings

The Contractor shall prepare and submit to the Engineer such working drawings and shop drawings as may be necessary to illustrate his proposed designs and method of working.

The Contractor shall note that during the course of the contract information will be given by the Engineer in respect of individual structures to be constructed in accordance with issued drawings which show typical structures of the same form. The Contractor shall prepare from this information such working drawing as are required for the proper setting out and construction of such structures. Work shall not commence on an individual structure until the relevant working drawing has been approved by the Engineer.

These working drawings and shop drawings shall:

a) be prepared to appropriate scales and include plans, l-section and cross-sections;

b) consist of an electronic copy of the drawing (if available) in AutoCAD and PDF format, one print and one copy of design calculations, specification and parts catalogues;

c) be signed by a qualified engineer responsible for the design, checked and approved by the Contractor prior to submission;

d) Prior approval of the Engineer shall be obtained for appointing the Contractor's design engineer as well as the checking and approving engineer.

e) bear the title of the contract package.

Within 30 days of receiving such working drawing and shop drawings the Engineer shall signify his approval or request modifications. The Contractor shall modify the designs and drawings within seven days, as may be required by the Engineer.

The Works shall be constructed in accordance with the approved working drawings and shop drawings, and a copy of such drawings shall be kept on the Site at all times until the completion of the Works. All drawings on which changes are made, shall have the revisions clearly marked and dated.

Construction of any portion of the Works shall not commence until the design and drawings have been approved in writing by the Engineer and thereafter no change shall be made to any drawings so approved without the permission of the Engineer. Permission to make such changes shall be treated as a new submission under this Clause 1.12, and the requirements (a) through (e) above shall be met.

The approval of the working drawings and shop drawings by the Engineer shall not in any way relieve the Contractor of his responsibilities under the Contract.

1.13 As Built Drawings

The Contractor shall prepare and submit one copy of as built drawings to the Engineer for review as the works proceed. The Contractor shall modify the drawings, as may be required by the Engineer. These drawing shall be for the permanent record of the Employer and shall be in the form of soft and hard copies (black line/monochrome). Total number of prints shall be 10 (A3 size) along with one soft copy in AutoCAD and PDF format. The drawings shall be readable on A3 size for each drawing produced. The quality and format of these drawings shall be subject to the approval of the Engineer. One set of the drawings shall be on archive quality drawing film.

1.14 Right to Change

When additional information regarding the geological formations, or other conditions becomes available as a result of excavation, testing, model studies, or exploratory work, the Engineer may revise the Works to accommodate the newly disclosed conditions. The Contractor's Equipment shall be laid out and his operations shall be conducted so as to accommodate any such reasonable changes in the Works with no increase in cost to the Employer other than that due to changes in the measured quantities of the Works.

1.15 Datum of Levels

The levels shown on the Drawings refer to a system of bench marks previously established by the Irrigation Department based on a fixed datum level at Sukkur Barrage. For the purpose of these Works the datum to be used shall be a bench mark for which the Engineer will ascribe a value prior to the commencement of the Works.

1.16 Survey

From the bench mark specified in Clause 1.15 hereof, the Contractor shall check the levels of any existing temporary bench marks he proposes to use in setting-out the Works and shall establish additional bench marks such that no level is transferred more than 3000 feet without being transferred to a bench mark. Bench marks shall be numbered and their construction shall be to the approval of the Engineer.

The Contractor shall supply to the Engineer, in duplicate, maps and records in an approved form, giving details of the location (including coordinates) and level of each bench mark used or established by the Contractor. Levels shall be transferred and ascribed to the bench mark within an accuracy of 0.25 $\sqrt{m}$ inches, where m is the length in miles of the levelling circuit. Bench mark coordinates shall be determined to within an accuracy of 1 in 4000 of the length of the levelling circuit.

Where required, the Contractor shall submit to the Engineer lists of original ground surface levels for the purpose of measurement of earthwork operations

The method of surveying shall be to the approval of the Engineer. Field books and tabulated data shall be well maintained and made available to the Engineer for inspection when ordered.

1.17 Programme

Before commencing the Works the Contractor shall submit to the Engineer for his approval a programme including a Gantt chart prepared in MS Project software, showing the order in which he proposes to carry out the Works. This submittal shall be in accordance with the relevant clause within the General Conditions of Contract. The Contractor shall revise this programme as necessary to ensure completion of the Works within the time periods stated in the Contract. The Contractor shall also revise the programme whenever the previous programme is

inconsistent with actual progress or with the Contractor's obligations. All revised and updated programmes shall be submitted to the Engineer for his approval. The Contractor shall submit three hard copies, an electronic copy and one copy as a pdf file. The programme shall include the following details:

(i) details of the Contractor's methods of working and planned sequencing of works for all operations;

(ii) narrative statement giving the numbers and categories of supervisory and technical staff and skilled and unskilled labour to be employed on the Works;

(iii) a list and type details of major Contractor's Equipment (including vehicles) which the Contractor proposes to employ on the Works;

(iv) a statement giving the proposals for location or locations and sizes of base camps, accommodation, offices, workshops, stores and working areas.

Each Gant chart shall:

- be prepared using the critical path method
- show the assumed or actual Commencement Date
- show the start and finish date and float (if applicable) for each activity
- show the interdependencies between activities
- have each activity 'resource loaded' with labour, materials, equipment and be accompanied by print outs of planned and actual resource usage
- show the progress achieved on each activity
- show a clear critical path

The Contractor shall prepare and submit method statements in MS Word for approval by the Engineer prior to starting any new activity or section of the Works, or at such other time that the Engineer may reasonably require.

In the event that the Contractor's progress of work falls behind the approved programme through his own shortcomings, the Contractor shall provide an updated programming, detailing the delay and outlining how the Works will be expedited. This shall also detail how the Employer shall have no financial burden resulting from the delay. This programme shall be subject to the Engineer's approval, and until such time that the Contractor can provide an adequate programme, his progress shall be measured against the most recently approved programme.

1.18 Notice of Operations

The Contractor shall give full and complete written notice, including drawings and method statements, of all important operations to the Engineer, 7 days in advance for activities shown on the Programme, else 30 days in advance, to enable the Engineer to make such arrangements as the Engineer may consider necessary for inspection and for any other purpose. The Contractor shall not start any important operation without the written approval of the Engineer.

1.19 Working Hours

The Contractor shall plan his work on the basis of a six-day working week, and within the hours of 8:00 am and 5:00 pm and is deemed to have priced his work accordingly. Should the Contractor require additional working hours, or weekend working, he shall submit a request to the Engineer for permission to work extended hours, giving full reasons and justification for the requests. Approval to such requests will not be granted on a regular basis, but only in exceptional circumstances.

1.20 Staffing

The Contractor shall employ, within 30 days of the Commencement Date of the Contract, a full time, qualified[1] Environmental Coordinator for the project who is conversant with national legislation related to the environment

1 Qualified refers to a candidate who is approved by the Employer, has a relevant degree (or equivalent) and a minimum of five years relevant experience.

and with the World Bank's environmental and social safeguard policies. They should have an understanding of relevant ecological aspects.

The Contractor shall employ, within 30 days of the Commencement Date of the Contract, a full time, qualified Community Liaison Officer for the project who is conversant with the World Bank's social safeguard policies and can address resettlement, consultation and stakeholder communication, grievances and other community liaison issues that arise according to the project action plans.

The Contractor shall employ, within 30 days of the Commencement Date of the Contract, a full time, qualified Social Safeguards Officer for the project who is well conversant with the World Bank's social safeguard policies and can ensure that the methods statement is in compliance with the SSESMP of S4 to ring fence the work from areas subjected to Anti-Encroachment Drive and all works are carried out in accordance with the approved SSESMP of S4 and other E&S documents.

The Contractor shall employ, within 30 days of the Commencement Date of the Contract, a full time, qualified Health and Safety Officer for the project who is conversant with national legislation on occupational safety and work environments, and with the Ministry of Labour and Manpower and other ministry requirements and can manage and mitigate health and safety issues according to the Health and Safety Plan and the project action plans. They shall ensure that the HSE Plan is enforced through their continuous presence on site. They are also responsible for ensuring the implementation of the Emergency Response Plan in the case of any relevant incident.

The Contractor shall provide sufficient staff with appropriate skills who are regularly available in Sindh Province for adequate management of environmental, social and community liaison issues.

The Contractor shall agree to not use any child labour or exploitative or forced labour. The Contractor shall not hire staff that are less than 18 years of age or have delivered a child within six preceding weeks (or as per labour legislation at time of works). The Contractor shall provide staff with information regarding their rights relating to hours of work, wages, overtime, compensation and provide a grievance mechanism for staff to raise work place concerns, and ensure third party employers do the same. The Contractor shall not discriminate against any staff candidate on the basis of gender, race, nationality, ethnic, social and indigenous origin, religion or belief, disability, age, or sexual orientation. The Contractor shall provide staff with notice of dismissal and severance payments as per national law. The Contractor shall provide employment opportunities to members of the local community.

The Contractor shall comply with all Pakistan national, regional and local government labour and employment laws. In addition, the Contractor shall comply with the following international guidelines:

- World Bank Safeguard Policies
- International Finance Corporation (IFC): Policy and Performance Standards on Social and Environmental Sustainability (2012), in particular IFC Performance Standard 2 on Labour and Working Conditions;
- WBG General Environmental, Health and Safety (EHS) Guidelines, April 2007, as applicable;
- WBG Sector EHS Guidelines, as applicable;
- IFC and EBRD's guidance note on Workers' Accommodation: Processes and Standards (2009)
- IFC Labour Toolkit (2004);
- IFC Good Practice Notes on: Addressing Child Labour in the Workplace and Supply Chain (2002), HIV/AIDS in the Workplace (2002), Managing Retrenchment (2005), Non-Discrimination and Equal Opportunity (2006); and,
- ILO Labour Conventions, in particular the core labour conventions related to freedom of association and collective bargaining, elimination of forced and compulsory labour, elimination of discrimination in respect of employment and occupation, and abolition of child labour.

The Contractor shall include a plan for the recruitment and appointment of local staff within the CESMP (see Appendix B for further details).

The Contractor must be conversant with the Ministry of Labour and Manpower laws and their objectives related to:

(a) Formulation of a progressive and dynamic Labour and Manpower Policy;

(b) Human Resource Development, focus on education, training and skill development;

(c) Respect for human rights, gender balance, eradication of child and bonded labour;

(d) Promotion of dignity of labour;

(e) Promotion of social dialogue among the stake holders;

(f) Coordination with the Provincial Governments, International Labour Organisation (ILO) and other international agencies.

1.21 Training

The Contractor shall prepare a training plan as part of the Contractor's Environmental and Social Management Plan (CESMP - as detailed in Appendix B) which provides all personnel with adequate information, instruction and training on environmental and social awareness, cultural sensitivity, health and safety, and skills to implement the method statements. Training activities shall be recorded and reported on monthly.

The Contractor shall organise induction training for all staff. The Contractor shall not allow staff on site without having undergone induction training.

The Contractor shall ensure employees are trained in the proper use of equipment in their care to minimise the risk of accidents.

1.22 Code of Conduct

The Contractor shall develop a Code of Conduct within three months of the Commencement Date which outlines expectations regarding staff and:

(a) Proper use of Personal Protective Equipment (PPE) that has been provided;

(b) No poaching of illicit use of local natural resources;

(c) Discreet sexual behaviour that takes into consideration HIV / AIDS messages;

(d) Respect for the local community and its cultural norms;

(e) Presentation of professional behaviour and integrity when dealing with the public.

The Contractor shall ensure that each member of staff signs the Code of Conduct or provides a written explanation of why they have elected not to sign it (then to be reviewed by Contractor).

1.23 Communication Strategy and Stakeholder Management

The Contractor shall establish a Communication Strategy within one month of the Commencement Date. The Communication Strategy shall detail stakeholders and their information, disclosure, consultation and participation requirements. The Communication Strategy shall include the use of various media for providing information (for instance face to face meetings, leaflets, website and radio) and receiving comments (for instance telephone, fax, face to face meetings, text and email).

The Contractor's Communication Strategy shall identify how the Contractor shall provide details regarding employment opportunities at mobilization, and traffic management throughout the construction period, to the Employer for incorporation into the Employer's own communication strategy.

The Contractor shall establish a database for recording and tracking stakeholder complaints, accolades, comments and any responsive actions taken by the Contractor. The database shall begin functioning within 30 days of the Commencement Date and a summary of the stakeholder comments shall be provided to the Engineer on a monthly basis. The Contractor shall maintain a complaints register at the main camp office.

The Contractor shall prepare a final progress report which summarises project achievements and performance information for the Employer.

The Contractor shall provide key stakeholders with contact details for liaison regarding their own activities which interface with the project activities.

The Community Liaison Officer shall continually consult local communities, including a focus on women and girls, and shall provide advance notice to the community of the construction schedule.

1.24 Utilities

The Contractor shall locate on the site all utilities whether or not they are indicated on the Drawings and to make the necessary arrangements with the utilities authorities for any work in the vicinity of the utilities and or diversions of the utilities.

1.25 Contractor's Environmental and Social Management Plan Based on SS-ESMP of S4

Project area for excavation/desilting works must be confined to the canal bed width and side slopes. The embankments will be out of the scope of work and no civil works (permanent or temporary) including vehicle movement, temporary storage and any other relevant works will be carried out, no contractor operations will be allowed, and no dumping of excavated materials will be done on the embankments of these canals.

About initial 26 RDs of embankments of these canals are encroached and government has removed some of the encroachers under the anti-encroachment drive following the orders of the Supreme Court. Keeping this sensitivity in view, it is important to ensure that excavation/desilting works to be conducted in the project will be confined to the canal bed width and side slopes, and these embankments remain out of the scope of work and all social and environmental impacts are avoided on these embankments. To ensure this, PMO of SBIP has prepared a Site Specific Environmental and Social Management Plan (SS-ESMP) for excavation/desilting which has been reviewed and cleared by the Bank.

The Contractor shall prepare, and submit to the Engineer, the Contractor's Environmental and Social Management Plan (CESMP). The CESMP must be based on and fully comply with the SS-ESMP (provided by the Employer) and cover all mitigation measures listed. Further details on the CESMP are included in Appendix B. No Works shall be undertaken by the Contractor prior to the approval of this document.

All work executed by or on behalf of the Contractor in the performance of the Works shall be in accordance with the CESMP and SS-ESMP. In case of any inconsistency between specifications and any other E&S documents, provisions of the SS-ESMP will prevail.

The supervision of the Contractor's compliance with the CESMP, as well as the Clauses of this specification which are relevant to social and environmental management, shall be subject to full time supervision and audits undertaken by the Employer and the Engineer. Such audits will include a review of the Contractor's internal audit records including identified non- conformities and the effectiveness of the corrective action. The Contractor shall be provided with ten working days' notice prior to an audit being carried out.

On a day-to-day basis, the Contractor shall afford reasonable availability of staff and documentation for the Engineer to assess implementation of the CESMP and the Clauses of this specification which are relevant to social and environmental management.

The contents and requirements of the CESMP are defined in Appendix B.

1.26 Environmental, Ecological and Social Monitoring

The Contractor shall nominate staff who shall be responsible for day to day monitoring of compliance with the environmental, ecological and social requirements of this specification as well as the requirements of the CESMP.

The Contractor shall produce a monthly report to the Employer, copied to the Engineer, comprising a checklist of environmental, ecological and social actions required at each work site and their status on site. The report shall detail actions taken or proposed by the Contractor in response to any non-compliance identified by the Contractor, or identified and reported to the Contractor by the Engineer, Employer or any of their representatives.

The Contractor's Environmental Coordinator, Social Safeguards Officer and Health and Safety Officer shall be available to attend monthly meetings (when and where arranged by the Employer) to discuss environmental, ecological and social performance on Site. When instructed by the Employer or Engineer, any other member of the Contractor's staff shall be required to attend such meetings.

1.27 Safety

The Contractor shall prepare, and submit to the Engineer, a project specific Health and Safety Plan. Further details on the Health and Safety Plan are included in Appendix C. No Works shall be undertaken by the Contractor prior to the approval of this document.

All work executed by or on behalf of the Contractor in the performance of the Works shall be in accordance with the approved Health and Safety Plan. The Contractor shall observe high standards of safety for workforce and machinery at all times and with regard to safety and shall, inter alia, comply with local laws and ensure strict adherence to the following:

(a) The Contractor shall take appropriate precautions where personnel are required to work in confined spaces and other hazardous areas, and to only permit employees to work in confined spaces or other hazardous areas when there are adequate and continuous communication links with colleagues equipped to provide emergency assistance.

(b) The Contractor shall protect personnel working in excavations from slips by the proper shoring or sloping of excavations, and prohibit individual employees from working unsupervised in excavations.

(c) The Contractor shall protect personnel from the moving parts of the machines by installing and maintaining proper guards.

(d) The Contractor shall not permit casual observers close to excavating operations.

(e) The Contractor shall provide adequate fencing around the working areas and excavations.

(f) The Contractor shall ensure the appropriate medical care procedures are in place, for example provisions for first aid (may include requirement for paramedic on site), and developing a clear procedure for seeking medical attention at the nearest hospital / medical facilities in Sukkur.

(g) The Contractor shall prepare an emergency shutdown procedure and evacuation plan to cover all staff and affected members of the public in the event of any emergency incident (such as accident, flooding, fire, blast etc.), The Contractor shall ensure emergency access routes are signed and maintained and provide fire extinguishers throughout camps and work areas. Emergency communication procedures should be also prepared by the Contractor.

(h) The Contractor shall provide all necessary Personal Protective Equipment (PPE) to staff (including, but not limited to life jackets, safety harnesses, gloves, safety boots, hard hats, dust masks, ear protectors, safety goggles, personal protective clothing) and take all reasonable measures to enforce the use of such PPE by staff. Measures may include, but shall not be limited to awareness raising sessions, training sessions, and financial penalties for failure to use PPE.

(i) The Contractor shall prepare and submit accident reports to the Engineer following any accident on site. The reports shall detail actions to be taken to reduce the risk of reoccurrence of the accident.

1.28 Facilities for Labour and Construction Camps

The Contractor's staff quarters and labour camps shall be provided with all necessary services for drainage, lighting, roads, and paths, parking places, fencing, sanitation, cook-houses, fire prevention and fire-fighting equipment. All labour camps, workshops and storage areas shall be built on hard compacted ground with sufficient bunding and spill kits so as to prevent the loss or infiltration of leaked or spilt fluids into surrounding soils, ground water or water courses. Traffic signage shall be maintained in the camps.

The Contractor shall establish a drainage network, including end discharge, to drain storm water away from camps and settlements. Camps shall be established above the 1 in 50 year flood level.

The Contractor’s camps shall comply with the rules of the Pakistan Labour Camp Rules, 1960, issued by the Pakistan Health, Welfare and local Government Department and also the following benchmarks based on the “Workers’ accommodation: processes and standards. A guidance note by IFC and the EBRD” (April 2009).

All solid waste will be collected and removed from camps, treated, recycled and disposed in compliance with section 1.30.

1.28.1 General Living Facilities

Living facilities shall be located in areas not at risk of flooding or other natural hazards and within a reasonable distance from the worksite, to which safe, free transport is provided where required. The living facilities shall be built with adequate materials, kept in a good state of repair, clean and free from refuse.

The living accommodation, and immediate surrounding area, shall be provided with adequate drainage to avoid the accumulation of stagnant water.

Adequate ventilation, natural light and emergency lighting shall be provided. Windows shall provide a total opening area greater than 5% of the floor area of each room.

1.28.2 Drinking Water Supply

Access to a free, safe, readily available potable water source shall be provided at all times. Drinking water quality shall meet WHO standards and the Pakistan National Environmental Quality Standards. Prior to use, the Contractor shall arrange for tests on samples of each drinking water source from a laboratory approved by the Sindh Environmental Protection Agency. The results of these tests shall be submitted to the Engineer. Testing of water supplies shall be repeated annually. Each supply of drinking water shall be conspicuously marked by an appropriate sign. All water storage tanks shall be covered to avoid the risk of contamination.

The Contractor's arrangements for supply of drinking water must not reduce the quantity or quality of local water resources where these are relied upon by people in the vicinity of the project for any purpose.

1.28.3 Room/Dormitory Facilities

Floors to rooms/dormitories shall be constructed from 6 inch thick, float finished concrete, or other similar solid, washable material. Rooms/dormitories shall be maintained to a liveable standard, and cleaned daily.

A minimum floor space of 4.5m² (48ft²) shall be provided per resident with a minimum ceiling height of 2.10m (6.9ft). Separate sleeping areas shall be provided for men and women except in the case of family accommodation.

A minimum spacing of 1m (3.3ft) shall be provided between beds and one bed should be provided per resident. The use of bunk beds shall be avoided. Each worker shall be provided with an appropriate mattress, pillow, cover, clean bedding and mosquito net. Bed linen shall be washed regularly and treated with repellents as necessary. A minimum of one cupboard per resident shall be provided for personal storage, with separate storage being provided for any clothing or Personal Protective Equipment required for staff to carry out the work assigned to them.

1.28.4 Sanitary Facilities

The Contractor shall provide and maintain hygienic, well lit and ventilated sanitary facilities. Sanitary facilities shall be provided within separate buildings in the vicinity of rooms/dormitories. Separate latrines and washing facilities shall be provided for males and females with total isolation by wall or by location. Female and male latrines shall be clearly distinguished in a language understood by those using them to avoid miscommunication,

Washing facilities, including showers, shall be provided at readily available places within the immediate vicinity of every latrine. Washing facilities shall include a supply of clean running water, soap or other suitable means of cleaning, and a hygienic means of drying.

A minimum of one hand-wash facility, one latrine and one shower shall be provided between every ten persons.

All sanitary facilities shall be built from easily cleanable material and shall be cleaned daily. Sanitary facilities shall be built so as to provide adequate privacy. All doors shall be lockable.

Treatment and disposal of sanitary waste is detailed in Clause 1.30 (Disposal of Waste).

1.28.5 Canteen, Cooking and Laundry Facilities

Canteen, cooking and laundry facilities shall be built from easily cleanable materials and kept in a clean and sanitary condition. All such facilities shall be cleaned daily.

Adequate facilities for washing and drying clothes shall be provided. When work clothes are to be in contact with hazardous or dangerous substances, special laundry facilities shall be provided.

Canteens shall have a minimum floor space of 1.25m² (13.5ft²) per worker using the canteen at any one time and shall be adequately furnished. As a minimum, tables, benches, individual cups and plates, and drinking water facilities shall be provided.

Kitchens and other areas used for food preparation shall promote good food hygiene and protect against contamination. Kitchens shall include raised, smooth, easily cleanable, non-toxic and non-corrosive surfaces for food preparation. All kitchen fittings shall be easy to move to promote easy cleaning. All kitchen floors, ceiling and wall surfaces shall be built from durable, non-absorbent, easy cleaning non-toxic material.

Adequate facilities for cleaning, disinfecting and storage of kitchen utensils shall be provided throughout the Contract period. Kitchens shall provide facilities to promote good personal hygiene, such as adequate hand wash and hand drying facilities. Food waste and other refuse shall be adequately deposited in sealed containers and regularly removed from the kitchen.

Kitchens shall be sheltered and separated from living quarters. Walls next to cooking areas shall be fire resistant.

The Contractor shall provide sufficient fuel for cooking inside camps, so as to prevent the collection of firewood.

1.28.6 Standards for Nutrition and Food Safety

The WHO 5 keys to safer food process shall be implemented. Food shall be made available to workers and shall contain an appropriate level of nutritional value and take into account religious/cultural backgrounds. Food shall be prepared by cooks.

Suitable and sufficient facilities for cold storage of food shall be provided.

1.28.7 Medical Facilities

At least one first aid kit shall be provided and kept stocked at all times at each structure site, and an adequate number of staff shall be trained in first aid. A 24/7 first aid service shall be available, further discussed in Clause 1.40 hereof. Additional medical facilities should be provided where required, such as nurse rooms.

1.28.8 Leisure, Social and Telecommunications Facilities

Basic collective social/rest/recreational spaces shall be provided. Workers shall be provided with dedicated spaces for religious observance if so warranted.

1.28.9 Emergency Evacuation

The Contractor shall include an evacuation procedure for the camp and work sites as part of the CESMP. The evacuation plan shall identify and include any public areas and members of public at risk from fire in the camp. Emergency access routes shall be signed and maintained. Emergency evacuation drills shall be held at least annually.

1.29 Hazardous Materials

The Contractor shall provide designated areas for the storage of materials, including wastes, which are hazardous to the environment or the safety of the Contractor's staff or general public. Hazardous material storage areas shall be provided with concrete floors, covered, provided with necessary secondary containment and fire extinguishers and secured. Hazardous storage areas shall be secured and access shall be limited to staff having received adequate training. Hazardous material storage areas shall not be situated in areas immediately adjacent to a watercourse or at risk of flooding. The use of necessary PPE shall be enforced by the Contractor. The Contractor shall only use hazardous material storage areas identified on his approved site layout plan. Spill kits shall be provided at each hazardous material storage area. No hazardous materials shall be stored beyond designated areas.

Material Safety and Data Sheets (MSDS) for each material shall be kept on site.

The Contractor shall carryout weekly inspections of hazardous material storage areas and maintain documentation of such inspections and inventory of hazardous material. Hazardous material storage containers shall be stored with spaces between adjacent containers to facilitate these inspections.

The Contractor shall provide a concrete or masonry bund to the perimeter of hazardous material storage areas and generator platforms so as to prevent the loss or infiltration of leaked or spilt fluids into surrounding soils, ground water or water courses.

The Contractor shall mark fuel tanks and other hazardous material storage containers to identify their contents and hazard warnings. Fuel storage areas shall be provided with masonry or concrete secondary containment bunds with a capacity to contain 110% of the fuel stored within. The Contractor shall carryout daily inspections of fuel tanks and maintain documentation of such inspections.

Hazardous material including fuel shall be stored on ground at an elevation above the 1 in 50 year flood level.

1.30 Disposal of Waste

1.30.1 Waste Management

The Contractor shall separate domestic, sanitary, construction and hazardous waste and dispose of them using methods detailed below. All wastes shall be covered during transport. Disposal of inert waste materials shall be by burying, where burial of such materials is approved by the Engineer; or by removal from the construction area.

The Contractor shall place domestic waste collection bins within camps sites at a radius of no greater than 100ft and enforce use by staff. The Contractor shall arrange for the regular emptying of these bins and disposal of waste (using methods discussed below) such that they are not overfilled at any time.

The Contractor shall aim to minimise construction waste by returning excess construction materials to the supplier, and by making use of local recycling facilities where available.

All worn out parts, equipment and empty containers must be removed from the site, or to a proper storage location. Disposal of material by removal from the construction area shall be accomplished prior to the completion of any Works. All materials removed except trees, shall become the property of the Contractor.

All tree removal shall be carried out in accordance with the approved tree removal procedure discussed in Clause 1.36. All trees, tree roots and bushes not required by the Employer shall be burned or removed from the construction area by the Contractor.

1.30.2 Landfill

Landfills established by the Contractor shall be situated at least 300ft from any settlement in areas where the groundwater is low. A clay or geotextile lining shall be provided to landfills. Fencing shall be provided around landfill sites when in use. Sites shall be secured and unauthorised access prevented when in use. Following use, landfills shall be capped with a clay layer and covered with top soil to original ground level.

1.30.3 Burning

The Contractor shall not be permitted to burn hazardous waste.

1.30.4 Hazardous Waste

The Contractor shall pass hazardous waste to a Sindh EPA certified contractor for disposal. The Contractor's proposed methodology for disposal of hazardous waste shall be included in the CESMP, including the ultimate disposal location.

Medical waste shall be classed as a hazardous waste, and stored and handled as a hazardous material. The Contractor shall arrange for the disposal after treatment of medical waste at a medical incinerator through a Sindh EPA certified contractor.

Unused concrete shall not be disposed into the river water.

1.30.5 Sanitary Waste

Treatment facilities for each sewerage system shall collect all sanitary waste and be capable of treating sewerage waste to the level required by the Pakistan National Environmental Quality Standards for Municipal and Liquid Industrial Effluents, before release, unless this is released to a Government approved municipal treatment system.

The location of treatment facilities shall be chosen such that surcharging of this system shall not result in contamination of water bodies, or else reasonable measures must be taken to prevent this.

The Contractor shall only be permitted to use a government approved municipal system if he can show, through annual testing and submittal of result to the Engineer, that the release is within the limits for pre-treated waste water as per the Pakistan National Environmental Quality Standards and upon written consent of the operator of the system.

The Contractor's proposed methodology for the treatment and disposal of sanitary waste shall be included in the CESMP (see Appendix B). The methodology shall also include a maintenance plan for any treatment facilities and a plan for treatment and disposal of sludge from septic systems. Where the Contractor proposes the use of septic systems, the CESMP shall include designs or specifications demonstrating that the treatment rate of the system exceeds the loading rate.

The Contractor shall take reasonable steps to ensure that construction waste and sanitary wastes are not mixed.

1.30.6 Sediment Laden Construction Water

Sediment laden construction water shall be discharged into settling lagoons or tanks prior to final discharge.

1.31 Disruption of Local Communities

The Contractor shall take all measures necessary to avoid nuisance and disruption to local communities. In particular the Contractor shall ensure no damage is done to crops, pasture or woodland and outside the area for which the Engineer's approval for jungle (bush) clearance has been given, that all irrigation supplies to such areas are maintained and that the Contractor's operations do not cause flooding or pollution hazards. In addition, disruption from increased traffic from haulage routes must be kept to a minimum (see clause 1.32).

The Contractor shall note that the canal inspection and non-inspection paths are used by the Employer's staff for operation, inspection and maintenance purposes. The contactor shall allow for continued use of these by the Employer during the construction of the Works.

The Employer permits public access to parts of the canal inspection and non-inspection paths. The Contractor shall allow for the continued public use of these where permitted by the Employer.

The Contractor shall ensure that road and pedestrian access across all canals is maintained at all locations where existing crossings are present or in a reasonable location close to the existing crossing.

The Contractor shall ensure that Works do not prevent continued public access to any mosque or school.

The Contractor shall not allow migrant labourers to enter local villages other than in the course of their official duties.

The Contractor shall provide at least one staff member at each site who is fluent in the local language and able to communicate with the local community.

The Contractor shall notify nearby communities of expected dates of demolition work, and limit demolition works to the working hours given in Clause 1.19. The Contractor shall provide continuous water sprinkling at site of disposal works and on haulage routes periodically / as required.

The Contractor shall comply with national guidelines on noise levels, carryout noise monitoring in the event of complaint by local community and implement noise reduction measures, such as temporary noise barriers, where noise levels exceed national guidelines.

1.32 Traffic Management

All construction operations shall be coordinated to result in the least practicable delay of traffic. The embankments of canals which were subjected to Govt led anti-encroachment drive (namely RD0 to RD26 and any other RDs) will not be used for project related traffic and movement of machinery as specifyed in SS-ESMP. The Contractor shall maintain all existing roads in a traffic worthy condition, ensure the maintenance of uninterrupted movement of traffic and repair any damage to local roads. Where partial road closure is required and approved by the Engineer, one way traffic shall be maintained and traffic speeds restricted to 10 miles per hour. The Contractor shall provide flagmen, warning signs and barricades. Flag men shall be provided where haul routes cross and meet public roads.

Road closure shall not be permitted; except when authorised by the Engineer and Provincial, National / Local Highways Authority. In the event of any approved road closure, the Contractor shall place sign boards on the road to advertise the closure at least seven days in advance. The Contractor shall also identify and sign suitable diversions for the duration of the road closure. The Contractor shall be responsible for the maintenance of such diversions. All road closures shall be completed during non-peak hours of traffic flow.

The Contractor shall take all reasonable precautions and efforts to remove mud from public roads where this is as a result of operations. Ruts and scars on public roads resulting from the Contractor's operations shall be repaired promptly.

Vehicle traffic through communities will be avoided as far as possible, and low speeds shall be maintained if they pass through communities. Warning signs shall also be provided by the Contractor where haul routes pass adjacent to settlements. Prior to the movement of large plant, the Contractor shall inform any communities who live or conduct their business along or adjacent to the proposed route of this plant.

The Contractor shall not move plant outside of the working hours given in Clause 1.19. Vehicles shall not be operated between sunset and sunrise, other than on public roads or in an emergency. The Contractor shall limit the speed of his vehicles and plant to 30km/hr on haul routes. National speed limits shall be observed on public roads. All plant and vehicles when not in use shall be parked in designated areas as identified in the layout plan. The Contractor shall ensure that all drivers of vehicles hold a valid license. The use of horns is prohibited near settlements.

The Contractor shall fit audible alarms which activate automatically when vehicles reverse, or else provide a banksmen.

The Contractor shall ensure that the deliveries of loose material to site, and transport of loose material through the site, are covered during transportation. The Contractor shall make provision for the off road queuing of delivery vehicles in the layout plan, and not allow delivery vehicles to queue, load, or unload on public roads so far as is practicable.

The Contractor shall provide a project specific Traffic Management Plan within the CESMP, as detailed in Appendix B.

1.33 Archaeological Findings

The Contractor shall not trespass, excavate in or otherwise disturb graveyards whether shown on Drawings or not. In the case of unidentified graveyards or burial sites, the Contractor shall immediately cease works in the vicinity and notify the Engineer in writing. The Engineer shall make such design changes as required.

The Contractor shall erect fencing around any graveyards existing within the site and prohibit access to these areas by his staff.

There are no known cultural or archaeological heritage sites within the project area. However, the Contractor shall develop a procedure for “chance finds” in accordance with the Environmental and Social Assessment and World Bank OP 4.11.

1.34 Temporary use of Land

The Contractor shall be responsible for arranging the temporary use of privately owned or leased land where required for the completion of the Works. The Contractor shall enter into written, signed and witnessed agreements with the land owners, or lease holders, for the use of their land.

The Contractor will not use any areas subjected to anti-encroachment drive (namely RD0 to RD26) for temporary use, transportation, materials dumping or storage or any other activity related to civil works.

1.35 Landscape Preservation

The Contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, for approved construction roads and for excavation operations, all trees, native shrubbery, vegetation, fences and walls shall be preserved and protected from damage which may be caused by the Contractor's construction and restoration operations and equipment. Movement of crews and equipment over routes provided for access to the work shall be performed in a manner to minimise damage to grazing land, crops or property.

Prior to commencement of Works, including site clearance, the Contractor shall take, and make available on request to the Engineer or Employer until the end of the defects notification period, photographs of the undisturbed site.

1.36 Removal of Trees

1.36.1 Scope of Work

The work consists of removal of trees of 6 inches girth or larger along with their stumps and roots to a depth to ensure complete removal of roots and stumps and their disposal as instructed by the Engineer. The disposal of cut trees shall be as per the tree removal procedure outlined below.

Refer to Clause 4.2 for requirements relating to the removal of trees with a girth less than 6 inches.

1.36.2 Tree Marking

The Contractor shall clearly mark each tree that is required to be removed with a cross on all four sides using a highly visible paint. The marking shall be located at approximately 4.5 feet from the base of the tree.

1.36.3 Tree Inventory

The Contractor shall prepare an inventory of all trees to be cut. The inventory shall include the following details:

- Reference number
- Location
- Species
- Girth
- Approximate height

1.36.4 Approval

The Contractor shall obtain written approval from the Engineer before any trees are cut. The Engineer shall only approve tree cutting where a complete tree inventory has been submitted to the Engineer detailing all trees

included in the request. A joint visit between the Engineer and the Contractor (or their representatives) may be required to verify the inventory prior to approval.

1.36.5 Tree Cutting

Once the Contractor receives approval from the Engineer he can proceed to cut the sanctioned trees and shall store all cut section with a girth greater than 6 inches in a designated, secure storage area as directed by the Engineer. The Contractor shall mark each cut section of tree with a unique reference number that corresponds to a reference number given on the tree inventory.

The Contractor shall maintain the tree inventory to include the number of cut sections of each tree and storage details of each section removed from site. The tree inventory shall be kept up-to-date and available to the Engineer at all times.

The felling of a tree which houses an active nest of eggs shall be prohibited.

1.36.6 Tree Handover

The Contractor shall inform the Employer via the Engineer when a batch of trees is ready for handover.

The Employer shall visit the tree storage area to review the inventory of trees to be handed over. The Employer shall only assume responsibility of each batch of trees and arrange for their transportation from the storage area following signing of the agreed tree inventory and handover record by the Contractor and the Employer.

1.36.7 Compensatory Tree Plantation

The Contractor shall plant five trees for every single tree cut. Planted trees shall be saplings of native trees and the Contractor shall be responsible for aftercare until the end of the defects notification period, but for a period of no less than one year. The Contractor shall replace any newly planted tree that does not survive during the period for aftercare.

1.37 Pollution

1.37.1 Water

The Contractor shall comply with applicable regulations concerning the control and abatement of water pollution as follows:

- The Contractor's construction activities shall be performed by methods that will prevent entrance or accidental spillage, of solid matter, contaminants, debris and other objectionable pollutants and wastes into flowing streams, flowing or dry watercourses, lakes and underground water sources.
- Vehicle washing areas shall not discharge directly or indirectly to any drain, groundwater or surface water body. In the case that vehicle washout drains to a settling tank adequate lining shall be provided so as to fully impede any seepage from the tank, and proper disposal of the washout shall be arranged.
- The Contractor will provide suitable sanitary facilities for the use of his personnel.
- National water quality standards shall not be exceeded.

1.37.2 Ground

The Contractor shall confine contaminants immediately following a land based spill and clear contaminants using absorbent material. Contaminated soils and contaminated absorbent material shall be collected for treatment and disposal through Sindh EPA certified contractors.

1.38 Grazing of Livestock

The Contractor shall provide reasonable care by hiring watchmen to ensure that livestock are not allowed within the Site.

1.39 Protection of Wildlife

The Contractor shall take all necessary precautions to prevent danger to wildlife including endangered Indus River Dolphin of which main habitat is the river stretch between Guddu and Sukkur Barrages. The contractor shall follow all the wildlife protection and mitigation measures proposed in Sukkur Barrage ESIA, ESIA addendum and SS-ESMP as well as C-ESMP. The Contractor shall fully cooperate and assist as necessary with any protection plans developed by state authorities to avoid damage to or disturbance of wildlife.

1.40 Security

The Contractor shall provide appropriate security personnel (police /military or private security guards) and enclosures to prevent unauthorized entry to the Site and the camp areas. Entrances to Site and camps shall be monitored and restricted by the Contractor. The Contractor shall issue his staff with identity cards showing their association to the project. Armed security personnel shall be retained by the Contractor for travelling to selected project locations. Sindhi speaking staff shall be available at all active work sites to communicate with the local community. The Contractor shall coordinate with the Police and Rangers on matters of security and shall formalise an internal and external communication mechanism.

The Contractor shall prepare and keep updated a Security Management Plan for his personnel, equipment and various sites of work. This is to be in an approved format and shall be submitted within 30 days of the Commencement Date for approval from the Engineer.

1.41 Medical Facilities

Properly staffed portable first aid stations and dispensaries shall be provided by the Contractor at camps and other strategic locations, to administer first aid treatment at any time required and free of charge to all persons on the Site, including personnel of the Engineer and the Employer. The nature, number and location of facilities furnished and the Contractor's staff for administering first-aid treatment shall, as a minimum, meet the requirements of the Health Service of the Government of Pakistan. Dispensaries shall be stocked with appropriate medicines for likely incidents, diseases and ailments to occur on site, and restocked as necessary.

The Contractor shall ensure that all personnel have access to healthcare as required.

The Contractor shall monitor labourer’s health, safety and hygiene for the entire construction period.

1.42 Operation of Plant and Vehicles

1.41.1 Maintenance

The Contractor shall be responsible for servicing all plant according to manufacturer’s requirements. He shall ensure plant operators carryout daily checks for fuel and oil leaks, and that any such leaks are fixed immediately. The Contractor shall ensure that all acoustic guards, silencers, covers and doors provided on plant are retained in place during operation, and shall regularly monitor noise emissions from plant and vehicles against the Pakistan National Environmental Quality Standards.

1.41.2 Refuelling Land Based Plant

The Contractor shall only carryout refuelling of plant over a concrete pad surrounded with bunding or over portable drip trays so as to prevent the loss or infiltration of leaked or spilt fuel into surrounding soils, ground water or water courses. Spilt fuel shall be reused or disposed of as hazardous waste. The Contractor shall provide spill kits at refuelling points.

1.41.3 Wash Down

The Contractor shall wash down plant and vehicles in designated areas only. Such areas shall be identified in the Contractor’s camp layout plan and provided with a concrete base and means for the collection of wash down water, separation of oil and other contaminants and their disposal as hazardous waste to prevent infiltration of contaminants into surrounding soils, ground water or water courses. The Contractor is prohibited from using groundwater for the wash down of plant.

1.41.4 Air Emissions

The Contractor shall provide vehicles which do not exceed national guidelines on ambient air quality or the following International Finance Corporation limits:

- Particulate matter: 100 mg/Nm³
- Sulphur dioxide: 3% sulphur
- Nitrogen oxides: 1,460 mg/Nm³

1.41.5 Passengers

The Contractor shall ensure that no passengers are carried in or on site machinery unless it is purposely designed to carry passengers. No passengers shall be carried in the cabs of tractors, dozers, excavators or cranes or in the back of lorries, pick-ups or dump trucks.

1.43 Generators

The Contractor shall provide generators and generator stacks which meet guidelines given in Table 1.1.2 and Annex 1.1.3 respectively of the Environmental, Health, and Safety Guidelines, General EHS Guidelines: Environmental, Air Emissions and Ambient Air Quality, published by the International Finance Corporation (2007). Generators shall be routinely inspected and maintained by the Contractor and emissions shall not exceed national emission standards. Canopies shall be provided to generators for noise control.

1.44 Radio, Use of

If the Contractor wishes to employ air wave radio transmitting equipment for communications he shall be responsible for obtaining the requisite licenses and shall submit full details of these licenses to the Engineer.

1.45 Taking over of Contractor's Equipment

The Employer reserves the right to either take over major items of equipment used by the Contractor, or assign operation and maintenance-tasks to the Contractor for a renewable one year period.

If the Employer wishes to exercise his right to either take over equipment or to assign operation and maintenance tasks to the Contractor, he shall give notice to the Contractor not later than 60 days before the Completion Date of the Contract.

After giving notice to takeover equipment, the Employer shall request the Engineer to commission condition and valuation surveys of all Contractor's Equipment. The appointed surveyor shall be an independent specialist surveyor of construction plant to the mutual agreement of both Employer and Contractor.

The survey shall establish the condition of the Contractor's Equipment in general, any necessary repairs to bring it in to a condition commensurate with its age and the cost thereof and the replacement costs on an 'as is' (before repair) basis. The survey shall also give an indicative price for the sale value of the Contractor's Equipment on an 'as and where laying' basis.

This survey shall be completed by not later than 60 days before the end of the Time for Completion.

In the event that the Employer takes over Contractor's Equipment, the Contractor shall arrange to supply such spare parts as shall reasonably be expected to be required during the one years following take over. The requirement for, and value of, such spare parts shall be audited by the surveyor engaged as described above.

In the event that the Employer exercises his right to take over equipment or assign operation and maintenance tasks to the Contractor for, a renewable one year period a separate agreement between Employer and Contractor shall be drawn up to cover the means and terms of measurement and payment therefore and such other terms as may be agreed. The basis of this agreement shall be the obligations and rights as set out in this Contract, the valuation of Contractor's Equipment and spares as determined by the independent surveyor engaged as described herein and, for operation and maintenance tasks, the equivalent rates as applicable under this Contract adjusted

for reallocation of overheads and other on-costs and for changes in costs and prices as applicable to the tasks undertaken.

1.46 Tests on Completion

1.45.1 Requirement Preparatory to Final Inspection

The Contractor shall request the Engineer to perform a preliminary final inspection for the purposes of determining the state of completion. He shall notify the Engineer at least seven (7) days in advance of when this inspection is to be performed. From the information gathered from this inspection, the Engineer will prepare a list of minor defects, often termed a "punch list", which is a list of work to be performed, corrected, or completed before the Works will be accepted. All work on the "punch list" shall be completed by the Contractor prior to final inspection.

All temporary facilities shall be removed from site, unless directed otherwise by the Engineer.

1.45.2 Final Inspection

After all requirements preparatory to the final inspection have been completed, the Contractor shall notify the Engineer and Employer to perform the final inspections.

The Contractor shall accompany the Engineer on the final inspection, together with any subcontractors that the Engineer may request to be present,

If the works have been completed in accordance with the Contract, and no further corrective measures are required the Engineer will issue a Taking-Over certificate.

2 The Site and Working Constraints

2.1 Site Location

The Rice Canal off takes from Right Pocket of Sukkur Barrage, located at co-ordinates 27°41'12.71"N, 68°50'45.01"E on the Indus River adjacent to the Sukkur city, which is on right bank of the barrage. The Rohri town is on its left bank. The distance from Karachi is about 480km by road. The main broad-gauge railway line connecting Karachi to Rohri, is at a distance of about 4.5km by road from the Barrage.

Rice canal commands an area of 547,480 acres, around its length of about 132 km. The desilting requirements included under the project are in 24 km (82.4 RDs) long Head Reach, from Canal Head Regulator to Ruk Complex located at 27°48'57.78"N, 68°38'42.27"E. In this reach, the Rice Canal runs parallel to Dadu Canal on Left Side and NW Canal on Right Side.

2.2 Site of Works

The Site of the Works is the area of Rice Canal within the right-of-way lines, boundaries and limits shown on the Drawings and such additional areas adjacent thereto as may be designated by the Engineer from time to time for the construction to be performed under the Contract and all such areas and additional areas shall be comprised in the Site as defined in Clause 1.1.74 of the Conditions of Contract. The Contractor will not use any areas subjected to anti-encroachment drive (namely RD0 to RD26 and any other RDs) for temporary use, transportation, materials dumping or storage or any other activity related to civil works.

Within the areas which may from time to time be defined as the Site, the Contractor shall carry out and perform the construction of the Works, and subject to the approval of the Engineer, will be permitted to construct temporary roadways, camps, buildings and Temporary Works which he may require for the construction of the Works. If the Contractor wishes to use any land other than as aforesaid for construction of camps or for any other Contract purposes, the Contractor shall make all necessary arrangements with the owner(s) thereof and shall bear all rentals and other costs connected therewith.

The Employer will give to the Contractor possession of as much of the area designated and defined as the Site and shown on the drawings as may be required to implement the Works, when the Engineer's notice to commence work is given.

The Site is subject to seismic disturbances, dust storms, floods in river and heavy rainstorms insects and vermin are prevalent. Attention is drawn to the necessity for allowing for these factors in the design and specification of Temporary Works, materials, plant and equipment for which the Contractor may be responsible.

The Contractor shall maintain the Site in a neat, tidy and healthy condition and free from accumulation of waste or rubbish. The site should comply with good health and safety standards at all times and as per the minimum conditions set out in the CESMP.

2.3 Climate

The Site is located between Sukkur and Ruk town and the climatic conditions are those of a Semi-Arid region. Its aerial distance from sea is approximately 365 km. The mean maximum temperature in the vicinity of the Site remains above 30°C during May to September. The highest maximum temperature can reach 52°C during July. Minimum temperatures during winter seldom fall below the freezing point. The average temperature and rainfall data in the vicinity of the Site are shown on Drawings.

The maximum discharge in Rice Canal, during its operation from May to October is 13,550 cusecs.

2.4 River Discharges

The flows in Indus at Sukkur Barrage vary from low flows in winter to high flows in summer months of July, August and September, with high flood peaks. The monthly flows, historical frequency discharges are shown on Drawings.

2.5 Cooperation with other Contractors

The Contractor shall note the following stipulation with regard to multiple uses of the Site.

(i) It is in the nature of the Works that parts of the site may be required from time to time by a contractor for other contracts. It will also be necessary for there to be access across the site by other contractors.

The boundary of parts of the site coincides with or is near to the boundaries of the sites of one or more of the said other contracts and work on them may be concurrent with that of the Contractor.

Notwithstanding the provisions of Clause 20.1 of the General Conditions of Contract, the Contractor shall not be entitled to an Extension of Time nor Additional Payment in respect of such circumstance as are described above and provided for in this Clause.

(ii) In the event of another contractor wishing to make use of or occupy a part of the Site for the purpose of his contract the Engineer shall inform the Contractor.

(iii) Similarly, in the event of the Contractor wishing to use or occupy from a certain date land in the possession of another contractor carrying out works for the Employer, he shall not less than 30 days and not more than 60 days before the said certain date, request in writing to the Engineer that he inform the other contractor accordingly.

(iv) In either of the events described in (ii) an (iii) above the Contractor and the other contractor shall confer and reach agreement on a mutual adjustment of programs and inform the Engineer so that the possession of the relevant part of the Site may be transferred from one to the other for an agreed period or failing such agreement the mattered shall be referred to the Engineer whose decision shall be accepted by both parties.

(v) In the event of the possession of part of another contractor's land being transferred as aforesaid to the Contactor, the Contractor's obligations in respect thereof shall be as if that part were a portion of the Site.

(vi) The provisions in sub-paragraph (i) to (v) above have been and shall be incorporated in the terms of the other relevant contracts.

2.6 Other Contracts Affecting the Contract

Other contracts affecting the Works shall potentially include, inter alia, the following:

- Contract SBIP/S1: Refurbishment and Upgradation of Sukkur Barrage
- Contract SBIP/S2: Dredging in barrage pockets
- Contract SBIP/S3: Procurement of dredger

2.7 Access to the Works

Right of way for access to the Works from existing roads shall be provided by the Contractor through his own arrangements. The Contractor shall make his own investigations of the condition of available public or private roads and of clearance, restrictions (not to use areas subjected to past government anti-encroachment drive namely RD 0 to 26 and any other RDs), bridge load limits and other limitation that affect or may affect transportation and ingress and egress at the job sites, and shall bear all responsibilities in that respect.

Before the commencement of any part of the Works the Contractor shall make temporary access tracks including all necessary temporary diversions and bridge works to the part of the Site concerned, both for the Contractor's own access and for the maintenance of public access, all to the approval of the Engineer. The Contractor shall maintain such access tracks in a condition suitable for the safe and easy passage of Contractor's Equipment, vehicles, and pedestrians until these tracks are no longer required for the purposes of the Works. Other contractors may use such access. The Contractor shall also provide and maintain temporary drainage and shall divert and reinstate permanent drainage systems.

The width of new access tracks established by the Contractor shall be no greater than 10 ft. The use of existing access tracks should be preferred where appropriate. The Contract shall not remove dense vegetation, trees or

stands of *Acacia nilotica* or *Tamarix sp* in order to make a temporary access track unless approved by the Engineer.

The Contractor shall make a record to be agreed by the Engineer of the condition of the surfaces of any private lands or any public cultivated or maintained lands over which access for the Site lies before use for access and he shall keep such surfaces in a reasonable state of cleanliness and repair. On the termination of the Contractor's use of such access he shall restore the surfaces to a condition at least equal to that found before his first entry on them.

The Contractor shall implement continuous dust suppression measures, such as water sprinkling, on access roads where project traffic activates dust. Where requested, a water spraying schedule shall be prepared by the Contractor and submitted to the Engineer.

2.8 Haul Routes

The hauling of materials and other hauling and transportation over public highways, roads and bridges shall be in compliance with local regulations. Where haul routes cross public highways or roads, the Contractor shall provide barricades, flagmen and other necessary precautions for safety.

The Contractor shall plan haulage routes to take advantage of existing established tracks. Where new haul routes are to be established, these shall follow the contours of natural topography to reduce earthworks along these routes. The width of new haul routes established by the Contractor shall be no greater than 10 ft. The Contract shall not remove dense vegetation, trees or stands of *Acacia nilotica* or *Tamarix sp* in order to establish haul routes. The haul routes should not include the areas subjected to past government anti-encroachment drive namely RD 0 to 26 and any other RDs.

The Contractor shall implement continuous dust suppression measures, such as water sprinkling, on haul routes where project traffic activates dust. Where requested, a water spraying schedule shall be prepared by the Contractor and submitted to the Engineer.

The movement of plant or vehicles shall be prohibited between sunset and sunrise, except on public roads, or in case of emergency.

2.9 Damage to River, Canal and Drain Banks and Operating Roads

The Contractor shall limit his loads, speeds, and hauling operations over the existing roads so as to minimise damage to other existing facilities. Ruts and scars resulting from the Contractor's operations shall be repaired and any damage to drain, canal or river embankments shall be promptly corrected.

2.10 Clearance of Site

The Contractor shall clear the Site to the extent required by the Engineer for checking setting-out. The Contractor shall also clear the parts of the Site to be occupied by the Works of all vegetation and artificial obstructions.

The Contractor shall fill and make good with appropriate material those cavities and losses of soil which result from clearing for setting-out as specified in this Clause. The material arising from such clearance shall be removed from the Site and disposed of by the Contractor.

3 Materials and Workmanship

3.1 Testing Plan

Before the commencement of work at site the Contractor shall submit a testing plan indicating methods, standards, frequency of tests for the approval of the Engineer. The testing plan may be revised with the permission of the Engineer when required.

The testing plan shall also include all tests to be performed as specified in all the Chapters of the Specification unless otherwise stated.

3.2 Sampling

The Contractor shall provide for the approval of the Engineer samples of all construction materials and manufactured items required for the Permanent Works specified herein and in all Chapters of the Specifications, if ordered. All samples rejected by the Engineer shall be removed forthwith from the Site. All approved items shall be stored on the Site by the Engineer with assistance of Contractor for the duration of the Works under conditions which will prevent deterioration of the approved sample. Any materials or manufactured items subsequently delivered to the Site for incorporation in the Permanent Works shall be at least equal to the approved sample.

3.3 Records

The Contractor shall keep full and proper weekly records of the operation, production and progress of each item of Contractor's Equipment, including details of the ground and conditions of working and shall copy such records to the Engineer on a regular basis.

3.4 Quality of Materials

All materials, fixtures, fittings, and supplies furnished by the Contractor shall be new and unused, of standard first-grade quality and of the best workmanship and design. No inferior or low grade materials, supplies or articles will be either approved or accepted.

Prior to procurement, the Contractor shall furnish to the Engineer, for his approval, the names of the manufacturers of all equipment and materials which he contemplates incorporating in the Works. With this information the Contractor shall also furnish such pertinent information as to capacities, efficiencies and sizes, and such other information as may be required by the Engineer. Samples of materials shall be submitted to the Engineer for approval when so directed. Equipment, materials, supplies and articles installed or used without the Engineer's approval shall be at the risk of subsequent rejection.

3.5 Standards and Specifications

Except where otherwise specified all materials and workmanship shall conform with the requirements of the relevant British Standards and British Standard Codes of Practice hereinafter referred to as latest BS or CP issued by the British Standards Institution. Other equivalent National or International Standard Specifications may be substituted at the sole discretion of the Engineer or as may have been agreed in the Contract. A list of the relevant standards is included as A to this specification.

Where relevant BS and CP now quote metric units only, these are to be interpreted, if so required, as the nearest equivalent imperial (foot / pound) unit.

The Contractor shall obtain and keep on Site at least one copy of each BS, CP or other approved Standard and reference work which is referred to in these Specifications, and of each other Standard which applies to materials which are being supplied to, or workmanship executed on, the Works. If the Engineer is in possession of any

Standard, further copies may not be required, as the Engineer shall determine. These Standards and reference works shall be supplied to the Engineer within 40 days of the Engineer's instruction.

If the Contractor, at any time and for any reason, wishes to deviate from the above standards or desires to use material or equipment not covered by the above standards, he shall state the exact nature of the changes, the reason for making the change and shall submit complete specifications of the materials and equipment to the Engineer for approval.

3.6 Inspection and Tests

All equipment and materials furnished under these Specification and all work performed in connection therewith will be subject to rigid inspection by the Engineer. Inspection at the manufacturer's plant will be made to determine that the equipment and materials meet the requirements of these Specifications. The Contractor shall notify the Engineer not less than 14 days in advance of the date and place that the equipment or materials will be available for inspection. No equipment or material shall be transported until inspection by the Engineer at the manufacturer's plant has been made and final drawings have been furnished by the Contractor and accepted by the Engineer. Acceptance of equipment and materials or the waiving of inspection thereof shall in no way relieve the Contractor of the responsibility for furnishing equipment and materials meeting the requirements of the Specification.

4 Earthworks

4.1 Scope of Work

Earth works consist of all necessary work for excavation in irrigation channel and back fill or disposal by dumping of earth or other material from or to the canal or adjacent thereto, including excavation from trenches and backfilling, removal of unsuitable material, formation of canal banks, widening, desilting of canal, clearing, grubbing, selective removal of trees, removal of existing obstructions within the reservation width in accordance with these specifications and in conformity with lines, grades, sections and dimensions shown in the Drawings or as instructed by the Engineer.

4.2 Jungle Clearance / Removal of Trees

Jungle clearance includes removal of bushes, shrubs and trees of girth less than six inches and stumps along with their roots (to a depth to ensure complete removal of roots and stumps). Disposal will be as instructed by the Engineer.

No removal of trees with girth larger than six inches is expected as part of the Works.

4.3 Earthworks

The Contractor shall make excavations in any material and any conditions for the Works and shall dispose of the excavated materials all as specified, shown on the Drawings, and instructed by the Engineer. The earthworks specification is divided into two sub-divisions, as follows:

A. General

B. Channels

C. Disposal areas

A. GENERAL

4.4 Commencing Earthworks - Notice and Approval

The Contractor shall give the Engineer at least twenty eight (28) days written notice of his intention to commence earthworks on any part of the Site. A full work plan and methodology detailing how the Contractor plans to carry out the earthworks shall be provided along with the factual site investigation report and the aforementioned written notice. The earthworks shall not be commenced until the Contractor has received written approval from the Engineer.
The Contractor shall prepare a plan of earthworks operation for each particular part of the Works to be constructed at any one time, detailing the location and programme of excavation in channels etc.
Any approval given by the Engineer to the Contractor's method of working will not relieve the Contractor of his responsibility to meet the requirements the Specification set out herein.

4.5 Earthworks to Lines and Levels

The whole of the earthworks for the several parts of the Works shall be carried out to the dimensions and the levels shown on the Drawings or to such other dimensions and levels as may be ordered by the Engineer, and conforming to the specified tolerances. Dimensions, which are based on, or related to, ground levels or chainages, shall be referred to the Engineer before commencing earthworks at any locations

For the purpose of the Specification the term ground level shall refer to the original profile before the start of earthwork operations.

Before the start of earthworks operations a complete profile of the canal section shall be set up at intervals of 200 feet and at every change in section and at every change of direction. The profile shall be of a minimum length of 10 feet and be constructed to the correct levels and dimensions with overfilling to allow for settlement in accordance with Clause 4.10.

4.6 Excavation of Unsound Material

If any unsound material occurs in the bed or sides of a channel, the Contractor shall remove and dispose of it. Unsound material shall include roots, organic matter, mud, gypsum, surface layers of boulders, cobbles and gravel, and deleterious substances.

If the Contractor encounters any material, which in his opinion may be unsound, he shall immediately inform the Engineer who will instruct the Contractor in writing as to whether or not the material is to be treated as unsound.

4.7 Slips and Falls

The Contractor shall exercise the greatest possible care and take all necessary precautions to prevent slips and falls of material from the sides of the excavation and berms.
In the event of slips and falls accrue, the Contractor shall make good all earthworks and associated works and execute any requisite modifications of the Works, as directed by the Engineer.

B. CHANNELS

4.8 Construction Methods

Desilting of canals shall be carried out as outlined below or by a similar method subject to the approval of the Engineer. Full details of the Contractor's proposed method of working and earth moving equipment shall be provided as per Clause 4.4 hereof. Desilting of canals will be executed by excavation through mechanical means.

4.9 Excavation

The excavation in the channel and side slopes may include the stripping of grass, uprooting bush stumps, weeds, reeds etc. This shall follow the approved SS-ESMP while planning excavations in any areas. The Contractor shall undertake excavation using the equipment and methods to the approval of the Engineer in a pre-prepared methodology. The excavation shall be to the lines and levels specified in Clause 4.5 hereof except that the Contractor is not required to replace material in the channel section of that bed eroded, unless so ordered by the Engineer. In particular the bed width should be limited to that as shown on the Drawings and as instructed by the Engineer.

4.10 Tolerances on Earthworks for Channels

Tolerances on levels and dimensions of channels will be permitted as stated below in **Table 4:1**

Table 4:1 Tolerances on Earthwork

Description	Channels	Embankments
Bed width	± 6 inches	Not applicable
Bed level	± 2 inches	Not applicable
Side slopes	± 6 inches	± 6 inches
Centreline of channel	± 6 inches	± 6 inches

All surfaces shall be finished off neatly and cleanly.

4.11 Transitions

Except where otherwise shown, at all changes in cross section necessitated by design or any other reason, transitions shall be formed in the bed and side slopes of the channel such that the horizontal or vertical change in direction does not exceed a deviation of 1 in 10.

4.12 Over Excavation

The extent of excavations shall be the minimum practicable in the opinion of the Engineer for the construction of the Works.

The excavation in the irrigation channel shall at any one time be limited to lengths previously approved by the Engineer in writing. Should any channel be excavated or any embankment or any berm be formed beyond the tolerance specified, the Contractor shall form the specified cross section or such other section as the Engineer may direct. Except with the written approval of the Engineer, work on each approved length shall be completed before work on any new length is commenced.

C. Disposal areas

The material excavated from the channel shall be placed in the approved disposal areas within or outside the canal RoW as shown in the SS-ESMP and instructed by the Engineer. Material is must not be disposed of in any other areas.

Suitable material excavated from the canal shall, where approved by the Engineer and included in the SS-ESMP, be placed within the RoW. The Contractor will not use any areas (for haulage or disposal of material) subjected to previous anti-encroachment drive (namely RD0 to RD26).

Excavated material containing stumps, roots, vegetable matter and other objectionable material that are otherwise unsuitable shall be placed in the designated spoil areas as directed by the Engineer.

All spoil banks shall be levelled and sloped to a safe gradient and trimmed to reasonably regular line as directed by the Engineer. For the disposal areas within the RoW, the maximum level of spoil banks should not exceed 4ft above the level of the inspection path or non-inspection path where these are placed adjacent to the inspection path or non-inspection path. Final levels shall be approved by the Engineer.

5 Care and Handling of Water including Dewatering

5.1 General

The Employer does not guarantee or describe completely the conditions which may be encountered in performing the specified work. Ground water, surface runoff and sub-surface water may be encountered during construction of the Works.

5.2 Scope of Work

The work to be done under care and handling of water, including dewatering for construction of the Works, consists of, but will not be limited to the following:

a) Protecting the Works from damage by rains, surface runoff and sub-surface water.

b) Dewatering canal bed required for the Works and care of water to maintain all excavations and surfaces dry and free of water as required for proper construction of the works (including levelling and measuring).

5.3 Protection of Works

The Contractor shall construct and maintain all required temporary diversion and protective works as may be required to protect the Works from rains, surface runoff, sub-surface water, if any, as is necessary for their proper construction in accordance with the Specifications. After having served their purpose, all cofferdams or other temporary protection works shall be removed or levelled and graded so as not to interfere in any way with the operation and usefulness of the completed Works.

5.4 Plans to be approved by the Engineer

Prior to the beginning of construction of any protection or diversion work, the Contractor shall submit for the approval of the Engineer his proposed plan for such protection and diversion works, being wholly in accordance with Clause 1.31 hereof. The plan may be placed in operation upon its approval. Nothing in the Contract shall relieve the Contractor from full responsibility for the adequacy of the protection and diversion works. The Contractor shall repair any damage to any other part of the works caused by flood water / sub-surface water or failure of any part of the protection works undertaken by him, as directed by the Engineer.

Appendices

A. Standards

B. Contractor’s Environmental and Social Management Plan

C. Health and Safety Plan

A. Standards

The Contractor shall supply standards, the publications, stated herein, but not limited to the list when ordered by the Engineer. All amendments to each Standard (Published by the British Standards Institution) shall be included.

A.1 British Standards

BS410	Specification for test sieves.
BS 1377	Methods of test for soils for civil engineering purposes.
BS 5930	Code of practice for site investigations
BS 8004	Code of practice for foundations

A.2 Pakistan Public Works Department (PWD) Specification

Pakistan PWD	Specifications for Building and Road Works (1973)

A.3 Miscellaneous

US Bureau Reclamation	Earth manual
Department of Environment, UK	Analysis of raw, portable and waste waters, 1972

B. Contractor's Environmental and Social Management Plan

B.1 General

The Contractor's Environmental and Social Management Plan must demonstrate compliance with this specification as well as the:

- Environmental Code of Practices
- Environmental and Social Management Plan as defined in the 'Sindh Barrages Improvement Project – Sukkur Barrage Rehabilitation, Environmental and Social Assessment Report by Independent Environmental Consultants' dated December 2017 and supplemented by the Environmental and Social Management Plan of Cofferdams (An Addendum to Environmental and Social Assessment).
- The Site Specific Environmental and Social Management Plan for SBIP/S4 (SS-ESMP)

The CESMP must include in full the mitigation measures outlined in the Site-Specific-Environmental & Social Management Plan (provided by the Employer).

The general objectives of the environmental and social management for the implementation of the Works are:

(a) Implementation of measures to prevent or reduce negative impacts to acceptable levels or to enhance environmental and social conditions in the project.

(b) Implementation of measures to deal with environmental and social risks that arise during implementation and Defects Notification Period.

(c) Implementation of measures that ensure that the environmental and social actions are in phase with engineering and other project activities throughout implementation.

(d) Supervising and monitoring of significant issues during installation and operation.

Wherever stated within this document that any information or documentation shall be provided or submitted by the Contractor to the Employer and copied to the Engineer.

The Employer and the Engineer may nominate representatives to act on behalf of them for the provisions of this document. In such case, the Contractor shall liaise and make the necessary coordination with such nominated representatives for the fulfilment of his requirements under this document.

The Contractor shall prepare and implement the Contractor's Environmental and Social Management Plan (CESMP) setting out:

- a clear statement of environmental and social policy to be adopted for the Works
- details of specific actions and mitigations to be implemented on site to prevent or reduce the environmental and social impact of the Works
- details of measures as included in SS-ESMP to avoid areas subjected to anti-encroachment drive (namely RD0 to RD26) for temporary use, transportation, materials dumping or storage or any other activity related to civil works.
- details of proposed internal monitoring actions to ensure implementation of mitigations, and
- details of the administrative and organizational framework under which the plan shall be implemented.

The Contractor shall not commence any Works until the CESMP is approved by the Engineer.

B.2 Contents of the CESMP

The CESMP shall be divided into the following chapters.

B.2.1 Organisational Framework

The Contractor shall provide details of his organisational framework, in particular the designation of a senior manager to take overall responsibility and the designation of the following positions:

- Environmental Coordinator
- Social Safeguards Officer
- Community Liaison Officer
- Health and Safety Officer

The Contractor shall provide Curriculum Vitae for staff appointed to the positions above. The Contractor shall also include an organogram within the CESMP showing the managerial position of the staff members within the Contractor's team and detailing the superiors to whom they report and subordinates who they shall control to ensure the day-to-day implementation of the CESMP. The Contractor shall demonstrate in the CESMP that he has allocated sufficient personnel to achieve the objectives and actions detailed in other sections of the CESMP.

B.2.2 Ring fencing plan of Area Subjected to Anti Encroachment Drive

Following the provisions of approved SS-ESMP, the Contractor shall provide a ring fencing plan and working drawings to ensure that areas subjected to govt led anti encroachment drive are ring fenced and are not used for any civil works, temporary use, establishing construction camps, material storage, transport and disposal or for any other purposes.

B.2.3 Construction Camp Management Plan

The CESMP shall include a construction camp management plan on the basis of Environmental Code of Practice 16. The plan shall include layout plans for all construction and labour camp(s). All layout plans shall include the following details:

- Camp location
- Camp boundary
- Work areas
- Accommodation areas
- Kitchens and dining areas
- Sanitary facilities (including toilets and washrooms/showers)
- Location of sanitary treatment facilities and discharges
- Waste facilities
- Location of landfills
- Generators
- Batching plants (if applicable)
- Storage areas (including hazardous material storage areas)
- Fuel tanks
- Water supply
- Plant and vehicle parking
- Measures taken to segregate pedestrian and vehicle routes
- Evacuation routes and emergency exits
- Drainage
- Refuelling points
- Plant wash down points

B.2.4 Traffic Management Plan

The Contractor shall include a traffic management plan within the CESMP on the basis of Environmental Code of Practice 15 and which includes the following details:

- Access routes for deliveries to and from the main camp
- Queuing points for delivery vehicles
- Loading/unloading points for deliveries and Contractors plant and vehicles at the construction camp
- Access routes around the Site for transfer of materials and personnel
- Proposed access/haul routes identifying which shall utilise existing track and which are to be constructed

- Locations and details of warning signs to be erected on public roads
- Locations where banksmen shall be provided (if required)

The traffic management plan shall be discussed with the Sindh Irrigation Department and authorities responsible for roads and traffic prior to submitting the CESMP to the Engineer. The haulage routes specified in the SS-ESMP for the disposal area will form the basis of the plan, and the mitigation measures outlined in the SS-ESMP to be included in the CESMP. Access/haulage routes should avoid anti-encroachment drive area.

B.2.5 Erosion, Sediment and Drainage Control Plan

The Contractor shall include an erosion, sediment and drainage control plan on the basis of Environmental Code of Practices 4, 6 and 8.

B.2.6 Pollution Prevention and Control Plan

The Contractor shall include a pollution prevention and control plan within the CESMP on the basis of Environmental Code of Practices 1, 2,10, 11 and the World Bank EHS Guidelines (2007). This plan shall also include the following details:

- Actions to be taken to prevent the spill of contaminants on site
- Actions to be taken in the event of land and water based minor and major pollution events, including materials/equipment to be permanently based on site, regularly maintained and to be used during a pollution event

B.2.7 Waste Disposal and Effluent Management Plan

The Contractor shall include a waste disposal and effluent management plan within the CESMP on the basis of Environmental Code of Practices 1, 2 16 and the World Bank EHS Guidelines (2007). This plan shall also include the following details:

- Method of treatment and disposal of sanitary wastes. Where the Contractor proposes the use of septic tanks, he must include the designs or specifications of the system demonstrating that the treatment rate exceeds the loading rate and the methodology for treatment/disposal of the sludge
- Proposed method for disposal of hazardous waste as per requirement of Clause 1.30.4
- Proposed method for treatment of concrete batching plant washout water (if applicable), to include as necessary, flow and load equalisation, pH adjustment and sedimentation using settling basins or clarifiers
- Procedures for the collection and disposal of wastes, including domestic and construction waste

B.2.8 Disposal Area Management and Restoration Plan

The Contractor shall include a disposal area management and restoration plan within the CESMP on the basis of the SS-ESMP. This Plan will aim at minimizing the environmental and social impacts during disposal activities and restoring as much as possible the original natural situation of these sites by various measures (such as levelling or smoothening). Restoration methodologies will be included in the Plan.

B.2.9 Protection of Gas Pipeline Plan

The CESMP shall include a plan to ensure the proposed rehabilitation works will not damage the gas pipeline, along with precautionary measures to be taken. The Contractor shall also submit this to the utility company for the review and approval.

B.2.10 Drinking Water Supply and Sanitation Plan

The Contractor shall include a drinking water supply and sanitation plan within the CESMP on the basis of Environmental Code of Practice 3 which shall detail measures to ensure no shortages and/or contamination of local water supplies.

B.2.11 Management Plan for Protection of Flora and Fauna

The CESMP shall include a management plan for the protection of flora and fauna on the basis of Environmental Code of practices 12, 13 and 14 to address impact on Indus River Dolphins.

B.2.12 Fuel and Hazardous Substances Management Plan

The CESMP shall include a fuel and hazardous substances management plan on the basis of Environmental Code of Practice 2 and in accordance with the standard operating procedures, relevant guidelines, and where applicable, material safety data sheets. The Plan will include the procedures for handling oils and chemical spills.

B.2.13 Instream (canal) Construction Works Management Plan

The CESMP shall include an Instream (Canal) Construction Works Management Plan to address the environmental concerns associated with use of in-canal temporary works. The plan will address risk of spills, communication procedure to arrange rescue of stranded dolphins (i.e. alerting the Sindh Wildlife Department) safety of construction workers as well as the other potential risks identified in the Environmental and Social Assessment and SS-ESMP.

B.2.14 Emergency Plan

The Contractor shall include an emergency plan within the CESMP which includes the following details:

- Measures for fire prevention and fire fighting
- Indicators on site (for example, heavy rainfall) that shall prompt the shutdown of specified areas of work
- Procedure for shutdown of site, including transfer of plant, materials and personnel to safe areas (for example in the event of a flood)
- Procedures for working safely near to or in water, including use of boats and other water based plant and equipment
- Identification of public areas at risk from fire within camps or workshops.
- Emergency evacuation procedure for staff and members of the public likely to be impacted by emergency event on site (for example, fire, blast)

B.2.15 Training Plan

The Contractor shall include a training plan within the CESMP which details the programme for the delivery of training, demonstrating training shall be carried out initially at induction of staff and repeated intermittently throughout the project, to cover the subjects included in the following table.

Training Subjects for Inclusion in Contractors Training Plan

Subject	Target Audience
Handling, use & disposal of hazardous material	Construction workers with authorised access to hazardous material storage areas and required to use hazardous material during their works
Waste Management	All staff (construction and camp staff)
Efficient & safe driving practices, including road & vehicle restrictions	Mandatory for all drivers & mobile plant operators
Actions to be taken in the event of major or minor pollution event on land	All construction staff
Pollution prevention: Best practice	All staff
Pollution prevention: Refuelling waterborne plant and vehicles	Operators of waterborne plant and vehicles
Pollution control: Use of spill kits and flexible booms	All construction staff working near water
Health & Safety: Safe way to work & hazard awareness, including working on or close to water	All construction staff

Subject	Target Audience
Health & Safety: Safe use of plant & equipment, including water based plant and equipment	Operators of plant & equipment
Health & Safety: Working at height	Staff colony construction staff
Health & Safety: Use of PPE	All construction staff
Emergency procedures and evacuation	All staff
Fire fighting	All staff
Site inductions, including requirements under the Environmental Management Plan & details of environmentally sensitive areas of the site, with a focus on the Indus Dolphin Reserve	All staff
Protection of flora and fauna including Indus River Dolphine	All staff
Culturally sensitive awareness raising on HIV/AIDS and the spread of sexually transmitted diseases. Awareness raising on risks, prevention and available treatment of vector-borne diseases	All staff
Cultural sensitivities of the local population	On induction of all migrant staff

B.2.16 Monitoring Plan

The Contractor shall include details of the proposed environmental, ecological and social monitoring procedures, to ensure the construction site is operating satisfactorily and that problems are being dealt with promptly. This shall include the following:

- Checklists for day to day monitoring of compliance with environmental, ecological and social requirements of this specification and the CESMP.
- Details of the records to be kept to demonstrate compliance with environmental, ecological and social requirements of this specification and the CESMP
- A plan for day-to-day monitoring of the site and identification of staff responsible for this
- Proposed actions to be taken to correct non-compliances noted by the Contractor
- Internal reporting channels for non-compliances
- The format of a monthly report to be submitted to the Employer and Engineer which reviews the Contractors own compliance with the environmental, ecological and social requirements of this specification and the CESMP and identifies any problems
- A formalised mechanism to audit the effectiveness of the CESMP

B.2.17 Communication and Local Recruitment Plan

The CESMP shall include a Communication and Local Recruitment Plan, in compliance with clause 1.20 of this specification. The Plan shall demonstrate how the Contractor will communicate with local community leaders, provide details regarding employment opportunities at mobilization, and traffic management throughout the construction period. The contractor's communication plan should define a process for receiving, recording and responding to complaints and also monitoring of the success of any responsive action taken to prevent the escalation of any conflicts. The plan will be prepared in compliance with communication strategy provided in the Social Management Framework for this project[2].

The Contractor's Local Recruitment Plan shall demonstrate how the Contractor shall maximise the recruitment of local staff to the maximum extent possible. The Plan shall provide a methodology for the advertisement of local employment opportunities, including spatial extent, medium, timing and frequency of advertisements, as well as the number and nature of the job opportunities to be advertised. Mediums shall include SMS, television, radio and newspapers. The Plan shall include a target for the number of local population employed as a percentage of the Contractor's total workforce. The Plan should also include measures to encourage female applicants.

[2] Freely available on the World Bank website

B.2.18 Security Plan

The CESMP shall include a security plan, compliant with clause 1.39 of this specification.

B.3 Contractor's Responsibilities

The Contractor shall:

- Produce and implement the CESMP;
- Monitoring their own compliance with environmental and social requirements of this specification and the CESMP;
- Co-operate with the Engineer and the Employer or their nominated representatives;
- Provide the Engineer and Employer with access to records of the environmental management programme for the purposes of an audit, every six months.
- Produce a monthly report to the Employer, copied to the Engineer, which reviews the Contractors own compliance with the environmental and social requirements of this specification and the CESMP and identifies any problems. The report shall detail actions taken or proposed by the Contractor in response to any non-compliance identified by the Contractor, or identified and reported to the Contractor by the Engineer, Employer or any of their representatives.

C. Health and Safety Plan

C.1 General

The Contractor's Health and Safety Plan must demonstrate compliance with this specification as well as the World Bank Group EHS Guidelines (2007), Environmental Code of Practices and the Environmental and Social Management Plan as defined in the 'Sindh Barrages Improvement Project – Sukkur Barrage Rehabilitation and Modernization, Environmental and Social Assessment Report by Independent Environmental Consultants' dated December 2017[3] and supplemented by the Environmental and Social Management Plan of Cofferdams (An Addendum to Environmental and Social Assessment) dated August 2021.

The Contractor shall prepare a site specific health and safety plan that includes or addresses the following topics:

C.1.1 Description of Project

- Project description and programme details;
- Details of the Employer, designers, the Engineer, the Contractor and other contractors;
- Extent and location of existing records and plans.

C.1.2 Communication and Management of the Work

- Management structure, responsibilities (to include sub-contractors), supervision and reporting scheme;
- Health and safety goals for the project and arrangements for monitoring and review of health and safety performance;
- Identification of potential hazards relevant to the proposed works and the Contractor's chosen methodology, which may include, but not necessarily limited to the following:
- Safety risks:
  - excavation
  - services, including temporary electrical installations;
  - working in confined spaces (if applicable from excavations: should be avoided;
  - preventing falls;
  - working near water;
  - work with or near fragile materials;
  - control of lifting operations;
  - dealing with services (water, electricity and gas);
  - the maintenance of Contractor's Equipment;
  - poor ground conditions;
  - hauling/traffic routes and segregation of vehicles and pedestrians;
  - storage of hazardous materials;
  - dealing with existing unstable structures;
  - accommodating adjacent land use;
  - other significant safety risks.
- Health risks:
  - manual handling;
  - use of hazardous substances;
  - reducing dust, noise and vibration; and
  - other significant health risks.
- Proposed measures to reduce the risk of occurrence of hazards identified in (c) above, including identification of personal protective equipment requirements;

[3] Freely available on the World Bank website: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/356891516200660593/environmental-and-social-assessment

- Measures, which are specific and relevant to the proposed works and the Contractor's chosen methodology, to meet the requirements of the 'Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines: Occupational Health and Safety' as issued by the International Finance Corporation (April 2007).
- Arrangements for:
  - appointment of a qualified safety officer;
  - arrangement for medical care provision and first aid;
  - provision of personal protective equipment;
  - measures to enforce the use of personal protective equipment
  - regular liaison between parties on site including meetings of the safety committee;
  - consultation with the workforce; the exchange of design information between the Employer, designers, the Engineer, the Contractor and other contractors on site.
  - handling design changes during the project;
  - the selection and control of sub-contractors;
  - the exchange of health and safety information between parties;
  - security, site induction and on site training for workers and supervisors;
  - medical examinations, welfare facilities, first aid and emergency facilities;
  - the production and approval of risk assessments and method statements;
- System for the reporting and investigating accidents and incidents including near misses and a template for an accident report to be submitted to the Engineer and Employer following an accident;
- A plan for emergency transfer of Contractor's staff on site, or any member of the public who may be injured by the Contractor's activities, to suitable medical facilities in the event of a serious accident, including details of transport and medical treatment en-route.
- Site rules;
- Fire and emergency procedures;
- Site security.

C.1.3 Health and Safety File

- Layout and format;
- Arrangements for collection and gathering of information;
- Storage of information.