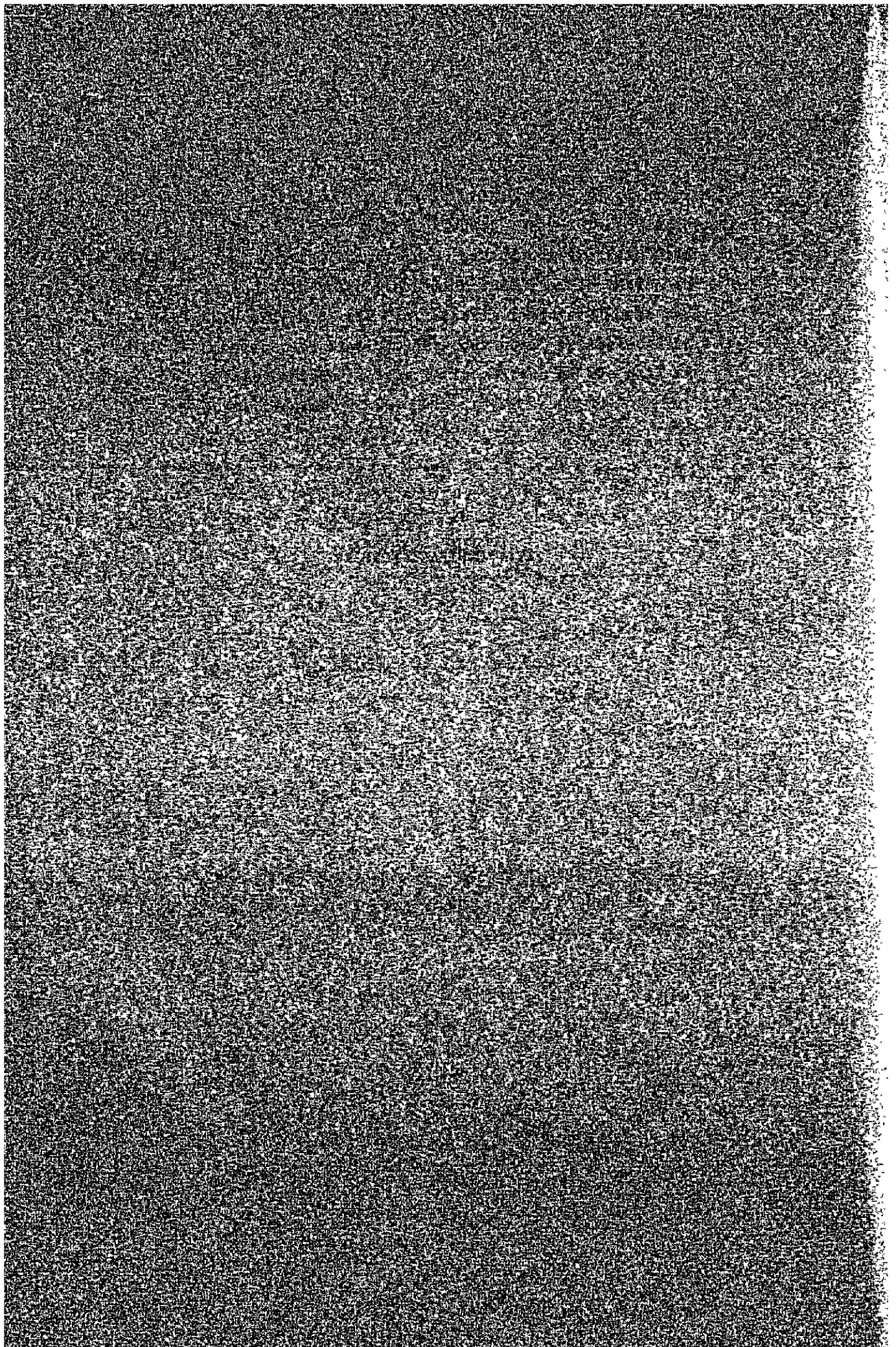


IV. CONTRACT FORM



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CONTRACT FORM

CONTRACT FOR _____

This Contract is executed and delivered this _____
day of _____, _____ A.D., at _____

hereinafter referred to as the _____ represented herein by
MR. _____, Representative of said Office and

hereinafter referred to as the Contractor, represented herein by
MR. _____ of said firm, a national of _____
and duly authorized to represent this firm in this Contract.

The JICA and the Contractor mutually agree as follows:

C-01 CONTRACT DOCUMENTS

The following documents are hereby incorporated and
made a part of this Contract, as though fully written out
and set forth herein:

- a) Invitation to Bid
- b) Instruction to Bidders
- c) General Conditions
- d) Technical Specifications
- e) Drawings
- f) Performance Bond
- g) Notice of Award
- h) Supplemental Notices

All codes, designations, standards, standard specifications and similar materials which are referred to in the General Conditions, Technical Specifications and Drawings are hereby made a part of this Contract.

All of the above documents are referred to herein as the Contract Documents.

C-02 ACCEPTANCE OF BID

The _____ has accepted the bid of the Contractor for furnishing equipment, supplies, materials, tools, labor and other incidentals for the _____

in conformity and in accordance with and subject to all terms and conditions of the Contract Documents. The

Contractor shall furnish performance security under this Contract as stipulated in the conditions of the Contract Documents.

C-03 AGREEMENT

The Contractor agrees to furnish equipment, supplies, materials, tools and labor and to perform the construction and the JICA- agrees to pay for such, as described in the Contract Documents.

C-04 OBLIGATION OF CONTRACTOR

The Contractor agrees to perform well and faithfully and of the Contract Work and furnish all of the equipment and materials described in the Contract Documents and to supply and to provide all equipment, materials, supplies, labor and other facilities requisite for or incidental to the successful completion of the Works and the carrying out of all the duties and obligations imposed by the Contract Documents.

C-05 OBLIGATION OF JICA

The _____ agrees, subject to the terms and conditions of the Contract Documents, to pay the Contractor the amount shown, at the rates and times and in the manner set forth in the Contract Documents.

C-06 MUTUAL OBLIGATIONS

The _____ and the Contractor mutually agree to perform fulfill, abide by and submit to any and all of the provisions and requirements and all matters and things contained or expressed in or reasonably to be inferred from the Contract Documents.

modification or alteration of this Contract shall be valid or binding on either party, unless expressed in writing and executed with the same formality as this Contract, except as may otherwise be specifically provided in this Contract.

C-09 JURISDICTION

The proper law, applicable to this Contract shall be the laws in force in the Republic of the Philippines.

C-10 COUNTERPARTS

This Contract is executed seven (7) identical counterparts, five (5) copies for the JICA- , one (1) copy for the Contractor, and one (1) copy to be submitted to the National Irrigation Administration, the Philippines.

C-11 APPROVAL BY THE BOARD

This Contract shall be subject to the approval of the

_____.

_____ PROJECT

Contractor

BY:

WITNESS:

(Acknowledgement)

V. TECHNICAL SPECIFICATIONS

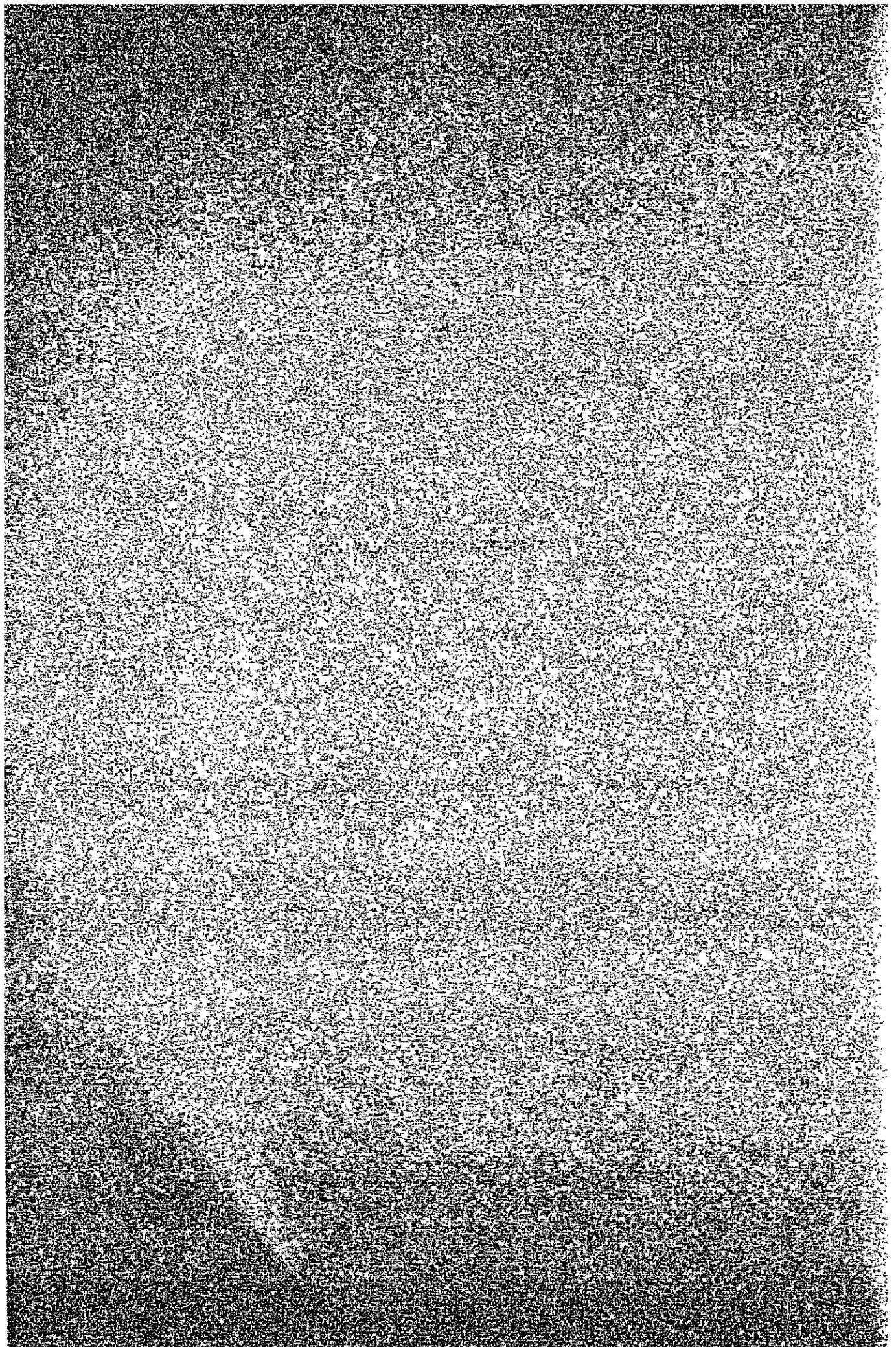


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SECTION I. TEMPORARY WORKS AND MOBILIZATION
OF CONSTRUCTION EQUIPMENT

101. Scope

(a) Temporary works

The Contractor shall furnish all materials, labor, equipment, tool and install such temporary works as are necessary for the successful completion of the Contract Works.

The Contractor shall submit to the Engineer for approval the Contractor's plan of the temporary works.

The temporary works consist of the following works.

- (1) Access roads, temporary detours, coffer dam and temporary diversion canal in any places required in the Site for construction of the works.
- (2) Contractor's camps, offices, store houses, workshops labor's camps and other facilities in the site.
- (3) Temporary power and water supplies in the site for construction of the works.

(b) Mobilization of equipment

The Contractor shall mobilize and move into the project site (in accordance with the approved Construction program and Equipment moving-in and Utilization schedule) the required construction equipment needed for the successful completion of the Contract work immediately after receipt of the approved Construction program.

SECTION II. CLEARING AND LAND RECLAMATION

201. Scope

- (a) The work under this section shall consist of the removal and disposal of all vegetations, trees, stumps, roots, brushes, rubbishes and all objectionable matters from the borrow area, the work area and the experimental farm.
- (b) The woods and others which are produced by the clearing and the grubbing in the above-mentioned work areas shall be treated in accordance with the direction of the Engineer.

202. Grubbing

- (a) Grubbing shall include necessary stripping of the natural ground surface to an adequate depth by effective means to remove all objectionable materials from the said work areas.
- (b) The proposed experimental farm areas shall be cleared and grubbed sufficiently by directions of the Engineer.

203. Land reclamation

- (a) Removal of rocks

The Contractor shall remove all stones and rocks exceeded 5.0-cm size by equipment or manpower within 15 cm thick of the top-soils at the experimental farm.

(b) Land leveling of farmland

All dents shall be filled up and made smooth surface. The tolerance of the land leveling of the paddy field surface is \pm 5.0-cm.

(c) Land plowing shall be done by suitable equipment until 15 cm depth from the ground surface.

SECTION III. EARTH AND FOUNDATION WORKS

301. Scope

The provisions of this Section shall cover the earth works and foundation works for structures such as Weirs and Canals, Roads, Pipes, Pumping-house and other small structures, except for Dam.

302. General

- (a) The work site shall be maintained well-drained and shall be kept free from the inundation caused by the rainfall or the spring during the construction.
- (b) The materials taken from the borrow areas shall not be used for embankment unless the Engineer approve the clearing and the grubbing works after the inspection of the works. The Contractor shall rearrange the land of the borrow areas according to the directions of the Engineer after the completion of the construction.
- (c) The sediment deposited during the construction in the drainage, manhole and the pipe shall be removed at the Contractor's own expense.

303. Excavation

- (a) Foundation shall be excavated according to the outline of the footings, floors or the foundation of the pipeline as shown on the Drawings or as directed by the Engineer, and shall be sufficient in marginal space for workers.

- (b) If at any point, materials are excavated beyond the lines and grades of any part of the structure, the over-excavation shall be filled back with selected materials approved by the Engineer at the Contractor's expense.
- (c) The excavated materials which are not suitable to the embankment shall be spoiled in the spoil bank.

304. Embankment and backfill

- (a) The thickness of the spreading of the embanking materials shall be less than 30 cm. The density of the compacted embankment shall be more than 90 percent of the standard testing dry density of the material.
- (b) The embankment work shall be suspended without any delay if it rains while working. After the rainfall, the embankment work shall not be resumed until the embankment materials become dry to the appropriate moisture content.
- (c) The slope of the embankment shall be finished to the designed gradient by providing fixed ruler.
- (d) Embankment or backfill works for the parts contiguous to the structures shall be carried out in a manner not to bring the partial stress to the structure.
- (e) Backfill for the construction of the pipeline shall be carried out in parallel with the pipe laying work. The backfill until 60 cm above the top of the pipe shall be made soon after the inspection for the joint works. The heavy equipment including truck shall not be used for the spreading and the rolling compaction of the above-mentioned backfill works. The backfill of succeeding layers can be carried out by the method and equipment approved by the Engineer.

- (f) The gravel foundation for the concrete structures shall be compacted in order to secure the uniform foundation.

305. Gravel paving

- (a) The gravel to be spread on the gravel road shall be unscreened gravel, and the grading shall be as follows:

<u>Sieve mesh</u>	<u>Percent by weight passing individual size</u>
40 mm	95 - 100
20	50 - 80
2.5	5 - 25

- (b) The spreading of gravel after compaction shall be made in the thickness of 15 cm on an average.

SECTION IV. EMBANKMENT FOR DAM

401. Scope

The provisions of this Section cover the preparation of the foundation, furnishing of all the equipment, labor and machines necessary to construction of a coffer dam and dam bodies and such works as are required for execution of the Project. These works shall be conducted in accordance with the Drawings and the specifications.

402. General

(a) Lines and slopes

The dam shall be constructed according to the line, slope and section as illustrated on the Drawings. If deemed necessary, the Engineer can modify the original designs in increase or decrease in excavation and embankment of the dam.

(b) Borrow-pit

Borrow-pit is designated on a terrain at vicinity of the dam site.

403. Materials

(a) General

Materials for embankment shall be taken from the borrow-pit and/or the excavation sites. Materials containing branches of trees, roots of trees, grass and other foreign materials shall not be used. At the borrow-pit excavation shall be made in such a way as to ensure satisfactory mixture of the materials to be taken, if necessary.

(b) Filing materials

The filling materials shall be such clayey soils as to be taken from the borrow-areas designated.

(c) Filter materials

Filter materials are to be taken from the designated borrow-areas. These materials however, shall be exclusive of organic materials and be such sand and gravel with a good grading distribution as are inclusive of those materials in the range from fine grains to coarse grains.

The grading of those materials shall be as follows:

$$(1) \frac{15\% \text{ grain size of filter materials}}{15\% \text{ grain size of materials protected by filter}} > 5$$

$$(2) \frac{15\% \text{ grain size of filter materials}}{85\% \text{ grain size of materials protected by filter}} < 5$$

15 percent or 85 percent grain size means grain size of materials finer than respective percentage by weight of total volume of the materials.

The maximum grain size of the filter material shall be 40 mm.

(d) Rock materials

The rock materials for the downstream toe of the dam shall be those materials which have taken from the designated quarry site, provided that five percent or more these materials by weight shall not pass through No.200 sieve.

(e) Riprap materials

Riprap materials are referred to such durable materials among the rocks excavated at the quarry site designated and permeable materials as are relatively large and solid, being neither flat nor plate in shape.

(f) Material for backfill

Unless otherwise designated on the Drawings, materials for backfill shall be referred to such materials as properly conform to the nature of soil and excavated materials at the place to be re-filled.

404. Preparation of foundation

After excavation for foundation and stripping is completed up to the level shown on Drawings, holes produced by removal of stumps, other holes and hollows shall be raked evenly, so that foundation materials and embankment materials may be combined well.

405. Embankment

(a) General

Until inspection of the foundation for embankment is made, no embankment shall be done on any foundation. The grading distribution of clayey soils shall not be fundamentally different from that of circumferential clayey material in terms of composition and grain size.

(b) Rock zone

On the downstream toe of the rock zone shall be constructed as specified on the Drawings.

(c) Riprap zone

Each riprap zone shall be constructed with highly durable materials along the line and slope as specified on the Drawings in such a way as to be void of the pocket of small stones or rock fragments. The thickness of riprap shall be constructed in 0.30 m with 0.10 m filter layer.

(d) Spreading

In order that compaction may be carried out on the heels of dumping, the materials required shall be spread almost horizontally over the whole surface of the projected embankment either by a bulldozer or other adequate machine. Unless otherwise directed specifically, the standard thickness of the layer to be formed in advance of compaction shall be 15 cm (+) as for impervious materials and 30 cm (+) as for filter materials, respectively. In case the surface of the materials compacted is so glassy that their connection with the next layer is likely to be hampered, their surface shall be loosened by a lakedozer or other adequate machine, prior to the spreading to the layer that follows. While materials are spread and adjusted to the adequate moisture content, the Contractor shall remove the pieces of wood, stump and other improper materials from every kind of embankment materials. Improper embankment materials shall be disposed to the designated area. The whole surface of the embankment underway shall be kept in good order, so that the machines required may pass through it smoothly, and the wheel tracks created on the surface of the layer shall be fully filled prior to commencement of the compaction.

406. Adjustment of moisture content

The materials for formation of each layer of embankment shall be a moisture content within the extent specified herein-below, so that compaction thereof may be made to the designated extent.

The moisture content of any part of the layer shall be as uniform as possible. The embankment materials shall have such a moisture content as to ensure the acquisition of minimum 90 percent of the degree of the standard compaction test. The materials have dried excessively, the Contractor shall pour water on each layer of embankment and shall adjust the materials by a harrow or other means until the moisture content has become uniform. In case the surface of the embankment is dry that the soil for embankment to be layed thereon is not likely to adhere thereto well the Contractor shall rake the surface and moisten the recked materials.

407. Compaction machine

The machines to be used for compaction shall be as follows:

(a) Tamping rollers

The roller to be used for compaction may either be of self-propelled type or be of tractor-pulles type, provided.

(b) Rammer & tamper

As to compaction of the zones at which compaction by roller can not be employed, such a rammer or tamper shall be used.

408. Compaction

(a) Dam body

The compaction shall be made by tamping roller at the rate of eight time passes or more and each pass of the roller shall overlap 0.3 m or more the proceeding pass. Where no roller can be used, the layer with the thickness of 10 cm shall be made and be compacted by rammer or tamper to the same density as roller compaction. Dumping, spreading, removal of inferior materials, adjustment for acquisition of the specified moisture content for the site, spraying of water, compaction and so forth may be carried out simultaneously on the indentical surface of embankment, provided that the area involved is so wide as to permit simultaneous execution of these works.

(b) Filter zone

Filter materials shall be dumped, spread and compacted by the vibration roller six times or more upon removal of large gravel.

(c) Downstream toe

As for the downstream toe of the rock zone, compaction by transporting machine and spreading manpower shall suffice.

(d) Supplemental compaction

In case the compaction of any one of the embankment is insufficient supplemental compaction shall be made in accordance with the Engineer's instructions.

SECTION V. CONCRETE WORK

501. Scope

The specifications are applicable to the concrete works which are to be used in this construction, i.e. Reinforced concrete (Class A), Plain concrete (Class B) and Lean concrete (Class D).

502. Cement

- (a) Cement used to concrete and mortar shall be Portland cement which conforms to the standard described in ASTM C-150 TYPE I.
- (b) The bagged cement shall be stored in the well damp-proofed warehouse of which the height of floor is more than 30 cm. The bagged cement which has been stored more than three month or which are suspected to be damped shall not be used unless otherwise approved by the Engineer.

503. Water

- (a) Water used for mixing concrete and mortar shall not contain harmful quantity of oil, acid, salt and so on which affect the quality of the concrete.
- (b) Even if the quality of the water is questionable, the water may be used if the concrete expecting to obtain 90 percent of the compressive strength at the age of 28 days of the concrete of which was made by using the city water.

504. Fine aggregate

- (a) Fine aggregate which is to be used in concrete and mortar shall be clean, sound and durable. It shall not contain the harmful quantity of organic impurities like salt and others.
- (b) Fine aggregate shall be well graded from large particle size to small one. Its grading shall conform to the standard shown in the following table unless otherwise approved by the Engineer.

<u>Sieve mesh</u>	<u>Percent by weight passing individual size</u>
3/8"	100
No.4	95 - 100
No.8	65 - 95
No.16	45 - 80
No.40	25 - 85
No.50	10 - 35
No.100	2 - 10
No.200	0 - 5

The fineness modulus shall be in the range from 2.3 to 3.00.
The design mix shall be redesigned when the fineness modulus of the fine aggregate deviate more than 0.2 from the one which was originally designated as design mix of the concrete.

505. Coarse aggregate

- (a) The coarse aggregate which is to be used in concrete and mortar, shall be clean, sound and durable. It shall not contain the harmful quantity of thin or elongated shape gravel, organic impurities like salt and others. The coarse aggregate shall conform to ASTM C-33.
- (b) The coarse aggregate shall have the proper grading from large to small in particle sizes. Grading shall conform to the standard shown in the following table:

<u>Sieve mesh</u>	<u>Percent by weight passing individual size</u>
1"	100
3/4"	90 - 100
3/8"	20 - 55
No.4	0 - 10

506. Design mix

- (a) For the approval of the Engineer, the Contractor shall design the mix proportion for every class of concrete before placing the concrete. The Contractor shall carry out the mix test in case being requested by the Engineer. The test is to be made at the expense of the Contractor.
- (b) The compressive strength at the age of 28 days shall be as follows:

<u>Class</u>	<u>Maximum size of coarse aggregate</u>	<u>Minimum 28 days compressive strength</u>	<u>Slump</u>
A (Reinforced concrete)	3/4"	210 kg/cm ²	7.5 ± 1.5 cm
B (Plain concrete)	3/4"	180 kg/cm ²	7.5 ± 1.5 cm
D (Lean concrete)	3/4"	135 kg/cm ²	15 cm

507. Mixing

- (a) Concrete shall be used a mixer unless otherwise approved by the Engineer in writing. The mixer shall produce homogeneous concrete and shall be subject to the approval of the Engineer.
- (b) The measurement of every ingredient of concrete shall be made in weight. Nevertheless, the measurement in volume is admitted subject to the approval of the Engineer.

- (c) The mixing time of concrete shall be more than one and a half minute. Overmixing, requiring the introduction of additional water to preserve the required consistency, will not be permitted. Overmixed concrete shall be wasted.
- (d) The mixer shall be completely emptied before receiving the materials for the succeeding batch and shall be kept clean and washed out after stopping the works at the end of each shift.
- (e) On commencing the works, the first batch shall contain sufficient excess of cement, sand and water to coat the inside of the drum to avoid the reduction of the required mortar content of the mix.

508. Hauling and placing

- (a) Concrete shall be hauled speedily to the placing site by the method which does not cause the segregation of the ingredient. The concrete shall be placed within 45 minutes after mixing. The concrete of which the ingredient is segregated shall be remixed.
- (b) The Contractor shall prepare a plan for the method of hauling and placing of the concrete and shall submit such plan to the Engineer for approval before commencement of the concrete work.
- (c) Before placing the concrete, the construction joint of concrete structure shall be cleaned and shall be covered with a layer of mortar at least 1.5 cm thick. The mortar shall have the same mix proportion of cement and sand as the concrete mix to be placed upon it.
- (d) Before placing the concrete, the inside of the forms shall be cleaned in order to keep from mingling of impurities.

- (e) The height from the lowest edge of the chute to the placing concrete surface shall be less than 1.5 m.
- (f) Before placing the concrete, the Contractor shall obtain approval of the Engineer as to the arrangement of the reinforcing bars and the setting of the forms.
- (g) The concrete shall be consolidated by internal vibrators. The form vibrator may be used together with the internal vibrator in such place as the thin wall in which the latter is difficult to use.
- (h) The vibrator shall be inserted vertically and with the constant intervals into the concrete. The vibrator shall be drawn out slowly and steadily in order to avoid remaining the void in the concrete.
- (i) The interval and the duration of vibration shall be subject to the direction of the Engineer.

509. Form

- (a) Forms shall have the sufficient strength to withstand the pressure resulting from placement and vibration of the concrete. In addition, the form is to conform to the shapes, lines and dimensions of the concrete shown on the drawings and shall be tight enough to prevent loss of mortar from the concrete.
- (b) Form may be of steel, plane wood and plywood. The form surface in contact with the concrete shall be completely smooth.
- (c) Unless otherwise instructed, the form shall be with chamfering of 2 cm x 2 cm in the corner of the concrete.

- (d) Bolts or steel bars may be used to tighten the forms. These clamps shall not be remained on the surface of the concrete after removal of the form.
- (e) The surface of the form shall be coated with shutter oil to prevent adherence of the concrete to the form.
- (f) The minimum time to elapse from concrete placing to removal of the form shall be as follows:

<u>Form</u>	<u>Minimum time required for removal of formers after concrete placing</u>
Vertical or near vertical faces of thick member	1 day
Vertical or near vertical faces of thin member	3 days
Slab	6 days

510. Finishing

- (a) Finishing shall be made by wood trowel. Nevertheless, the surface of the concrete which is required to be smooth and dense shall be finished by iron trowel with pressure after placing of the concrete as late as practicable.
- (b) The protrusion on the surface of the concrete shall be removed and shall be levelled. the honeycomb or faults in the concrete shall be wetted by water and shall be patched up by the concrete or mortar which are properly mixed and shall be finished after removing the incompleteness around them.

511. Curing

The placed concrete shall be covered by mat and kept continuously damp for a minimum of three days after placing.

512. Reinforcing bar

- (a) Unless otherwise shown on the drawings, the reinforcing bars shall be deformed bars and shall conform to ASTM-A15, A-305 and A-408.
- (b) The equipment and tool which are to be used to cut, bend and manufacture the bar shall be to the Engineer's approval. Hot manufacturing of the reinforcing bar is not permitted.
- (c) Before the bar is placed, the rust, dirt, grease or other foreign substances shall be removed from the surfaces of the reinforcing bars and the surfaces of any metal bar support and spacer.
- (d) The minimum cover for all main reinforcing bars shall be 5 cm. The errors in the covering and in the distance between the center of bars shall be less than ± 1 cm.
- (e) The radius of 90° bend of the bar in the members of the rahmen structures shall be more than 10 times of the steel bar diameter. The radius of 45° bend of the bar shall be more than five times of the diameter of bar.
- (f) Laps at joints of the reinforcing bar shall have a length at least thirty times of the diameter of bar and shall be bound by steel wire of which the diameter is bigger than 0.9 mm.

SECTION VI. GROUTED RIPRAP

601. Materials

- (a) The stones used for grouted riprap shall be free from fissures and cracks, have sufficient strength and durability against weathering and erosion by water and air, and have at least more than 15 cm diameter. The specific gravity of the stones shall be 2.6 or more.
- (b) Gravel for back-filling shall have sufficient resistance against weathering and alteration and shall be in the range from 10 to 150 mm in diameter.
- (c) The proportion of cement and sand in grouting mortar is one to three (1:3) in bulk. The quality of the sand for mortar shall be same as the concrete material.

602. Curing

The grouted riprap shall be covered with wet mats immediately after execution of work, and cured for at least three days.

603. Joint

The joints of grouted riprap shall be provided at 10 m intervals. The material of joints shall be one-centimeter thick wooden plate with corrosion inhibitor coated.

SECTION VII. STONE MASONRY WITH CONCRETE

701. Materials

- (a) The stones shall consist of field stones that are clean, sound, resistant to the action of water, and must have a specific gravity of at least 2.4. Such stones shall weight from 20 to 50 kilograms a piece.
- (b) Materials for the concrete binder shall be governed by Section-V for B-Concrete.

702. Curing

The stone masonry with concrete shall be covered with wet mats and cured for at least three days.

703. Joint

The joints of stone masonry with concrete shall be provided at 10 m interval. The materials of joints shall be 1.0-cm thick wooden plate with corrosion inhibitor coated.

SECTION VIII. PIPE WORKS

701. Earth works

For the earthworks required for piping, the specifications of Section III shall be applied to.

702. Reinforced concrete pipes and fittings

(a) Reinforced concrete pipes shall be designed subject to 10-ton Trucks loading with minimum overfills of 0.60 meters.

(b) Joint works

Joint of pipes shall be filled with stiff mortar composed of one part cement and one half parts of sand in bulk. The mortar shall be placed so as to form a durable watertight joint. After setting of the mortar joint, the construction of the reinforced concrete collar shall be done as per Drawings.

703. Galvanized steel pipes and fittings

(a) Galvanized steel pipes shall conform to JIS G-3442 or equivalent (JIS stands for Japan Industrial Standards).

(b) Joints shall be of flanged with all bolts, nuts, gasket seats, washers and joint rings as may be required, except otherwise specified as welding in the Drawings. All metal parts of joints shall be adequately protected with rustproof paint.

(c) All flanges shall be of steel pipe flange of 10 kilograms per square centimeter in nominal pressure used for connecting pipes, valves etc. and shall conform to JIS B2212 or

equivalent. Connecting with flanges and steel pipes shall be welded in such position and right angles to the axis of pipe.

804. Polyvinyl chloride pipes and fittings

- (a) Polyvinyl chloride (PVC) pipes shall conform to JIS K-6741 or equivalent for water services piping at five kilograms per square centimeter in nominal pressure.
- (b) The pipes shall be provided at one Taper Socket at the end of pipes in compliance with manufactures' standard. The connection's pipes and fittings shall be used suitable bonding agent which is approved by the Engineer.
- (c) Internal and external surfaces of pipes should be smooth without harmful flaws, longitudinal streaks, cracks, distortions and other defects.
- (d) Fittings such as bends, reducers, sockets, caps and socket tees shall be made of PVC conforming to JIS K-6743 or equivalent. Any said fittings shall be at Taper Socket in the required figure.
- (e) The Contractor shall submit full details of the materials dimensions and test pressures of the fittings offered.
- (f) Precautions shall be given to avoid damages to the pipes and fittings. In handling and storing the pipes and fittings, every care shall be given to avoid distortion, flattening, scoring or other damages. The pipes and fittings shall not be allowed to drop or strike objects.

805. Sluice valve

- (a) The sluice valves shall be of vertical and flanged type conforming to JIS B 2062 or equivalent.

- (b) The sluice valves shall be suitable for water services piping at the maximum operating pressure of static head up to 75 m.
- (c) Valve bodies shall be made of cast iron conforming to class 3 (FC 20) of JIS G5501 or equivalent.

806. Check valve

- (a) The check valves shall be of flanged swing type in accordance with JIS B2074 or equivalent.
- (b) The check valves shall be suitable for water services piping at the maximum operating pressure of static head up to 75 m.
- (c) Valve body and disc shall be made of cast iron conforming to class 3 (FC 20) of JIS G5501 or equivalent.

807. Hydrant

- (a) The hydrants shall be of 360 degrees swing type and be screwed with the valve socket.
- (b) The maximum operating pressure of the hydrant of static head shall be 75 m.
- (c) Valve bodies and disc shall be made of aluminium alloy and/or gun metal. The Contractor shall submit the sample of the hydrant for approval of the Engineer.

SECTION IX. TUBEWELL DRILLING

901. Application

Tubewell drilling works consist of;

- (1) Drilling of one tubewell at Dao experimental farm;
- (2) Casing and gravel packing;
- (3) Well development, and
- (4) Pumping test.

902. Drilling of well

- (a) The location of the well will be requested in the site by the Engineer according to the Drawing. The depth of the well will be 70 m.
- (b) The drilling of the well can be carried out by any kind of drilling machine; however, the diameter of the well to be drilled shall not be less than 200 mm.
- (c) To prevent collapsing of the well, mud water will be permitted to use.
- (d) Upon drilling works, the daily basis records shall be made on drilling speed, water intake, color of circulated water, drilled materials, changing layers drilled and so forth.

903. Casing and gravel packing of well

- (a) After completion of drilling, the well should be enclosed by steel casing pipe and wire-wrapped screen or the approved one by the Engineer. The diameter of casing pipe and screen shall not be less than 150 mm.

- (b) The slot sizes of the screen shall not be less than 2.5 mm .
(Slot No.100)

- (c) The outside portion of the well casing shall be packed by gravel ranging 1/2 into 1/5 inch in grain size. However, the portion that is 15 m there above should be packed by mortar or concrete.

904. Well development

- (a) After casing and packing, washing and development of the well should be followed by means of air lifting and/or pumping.

- (b) The development process should continue until clean water comes out and/or 24 hours.

905. Pumping tests

The following pumping test shall be conducted under the guidance of the Engineer.

- (a) After the well development, pumping tests shall be performed by using the submersible pump.

- (b) Pumping tests in two kinds shall be made; one is the so-called step drawdown-recovery test and the other the aquifer test.

- (c) In the step drawdown-recovery test, more than five grades of pumping rate, shall be applied to a course of drawdown.
The test shall be continuously carried out.

- (d) In the aquifer test, the pumping discharge shall be as directed by the Engineer and as constant as possible.
- (e) Measurement of discharge should be done by notch Box.
- (f) Measurement of drawdown at the well and the existing observatory well should be done.
- (g) All records and analysis of the pumping tests shall be conducted by the Engineer.

906. Measurement of tubewell drilling

Measurement will be made by the linear meter of depth of the developed well.

SECTION X. WELL PUMP FACILITIES

1001. Materials

The well pump with accessories shall be furnished by the Contractor. The Contractor shall submit to the Engineer the specifications and drawings in conditions assembled, disassembled and installed, which are prepared by the manufacturers, in advance.

The capacity of the proposed pump shall meet the following specifications or equivalent:

Type	:	Submersible tubewell motor pump
Well diameter	:	150 mm
Capacity	:	146 liter/min.
Total head	:	100 m
Actual head	:	60 m
Bore	:	φ40 mm
Motor	:	5.5 KW, 2P, 3,600 r.p.m
Electric power	:	3 phase, 220 V, 60 Hz

The pumping unit to be furnished shall be in accordance with the latest applicable standards in the country of origin for the type of pump to be supplied, unless otherwise specified herein. The efficiency of the unit to be furnished shall be as high as practicable and consistent with the best modern design. The pump shall ensure equal or higher quality than the specified special standard or the indicated design requirements of these Contract Documents.

1002. List of pump equipment and accessories

Well pump facilities shall be contained following equipment and accessories.

1. Submersible deep well pump 1 set
 (specified above)
2. Riser pipes $\phi 40$ mm 60 m
 (made of steel and should be connected by screws)
3. Discharge elbow 1 pc
 (should provides mountings for a compound gauge and
 automatic air vent and flange on suction piping side
 shall be of thin type to meet JIS 10 kg/cm²)
4. Check valve ($\phi 40$ mm) 1 set
5. Sluice valve ($\phi 40$ mm) 1 set
6. Automatic air vent valve 1 set
7. Compound gauge 1 set
8. Well cover and anchor bolts
 & nuts 1 set
 (should be of slit type to facilitate pump installation,
 support weight of pump and riser pipes, and have
 openings for necessary cabling)

9. Submersible cable with required length for power L.S
(should be easily installed and not swell or deteriorate)
10. Lower water level electrode with required length of submersible cable 1 set
11. Discharge pipes 1 set

1003. Installation

The pump shall be installed and incorporated with the structure as indicated in the drawings furnished by the manufacturer.

1004. Servicing and operation test

After the well pump is completely installed, the pump's accessories shall be cleaned and serviced by the Contractor.

The well pump shall be tested before take-over and shall operate smoothly.

1005. Guarantee of materials and workmanship

The Contractor shall submit testing records of the pump the test-run of which is to be made by the manufacturers.

The Contractor shall guarantee the quality of the equipment and be fully responsible for any defective equipment and parts found within one(1) year from the date of acceptance.

SECTION XI. PRESSURE TANK

1101. Application

A pressure tank will be installed the deliverly side of the pump as shown in the Drawing to absorb the water hammer of pipelines and to secure the automatic control of the submersible deep well motor pump. When the water is released from the hydrant, the pump is started automatically by reason of decrease in air pressure in the pressure tank. And when the hydrant is closed, the pump is stopped automatically by reason of increase in air pressure in the pressure tank.

The pressure tank shall equip a bladder which completely separates an air from the water in the tank to prevent solution of air in the water, and shall be of compact type to be installed in the narrow space of the pump house.

1102. Materials

The pressure tank shall be provided to meet the following specific requirement.

Type	:	Vertical type
Operation pressure	:	
(on)	:	2.4 kg/cm ²
(off)	:	8.0 kg/cm ²
Material of body	:	Steel

The pressure tank shall be in accordance with the latest applicable standard in the country of origin unless otherwise specified herein.

1103. Installation

The pressure tank shall be installed and incorporated with the structures as indicated in the drawings furnished by the manufactures.

1104. Servicing and operation test

After the pressure tank have been completely installed, the charged air pressure in the tank shall be adjusted by the working pressure of pump facilities in accordance with hydraulic condition of pipeline as directed by the Engineer at the site.

The pressure tank shall be tested before take-over and shall operate smoothly.

SECTION XII. STEEL GATE INSTALLATION

1201. Scope

The work under this Section shall consist of furnishing, transporting to the structure site, assembly, painting and installation of Steel Gates and lifting devices for water control in accordance with the Specifications and details shown in the Drawings.

1202. Materials

The steel gate with accessories shall be furnished by the Contractor. The Contractor shall submit to the Engineer the specification and drawings in assembled, disassembled and installation conditions prepared by the manufacturer, in advance.

1203. Installation

The gates shall be installed and incorporated with the structure as indicated in the drawings furnished by the manufacturer. No anchor bolts embedded in concrete shall be disturbed at least seven (7) days after said anchor bolts have been installed. If the steel gates are not supplied on time for their installation during the construction of the structure, necessary holes for the anchor bolts of the gates and lifting devices shall be provided in the concrete for their installation. The size and location of the holes will be subject to the approval by the Engineer.

1204. Painting

All the Steel Gates to be installed shall be given coat of painting in accordance with the provisions of Section XIII.

1205. Servicing and operating test

After the gates have been completely installed, the gates including sill frames shall be cleaned and serviced by the Contractor.

Gates shall be tested before acceptance. The gate shall operate smoothly when closed and open to its full opening and no seepage when closed.

SECTION XIII. PAINTING

1301. General

- (a) All metal surfaces shall be painted except the portions in contact with concrete. Unless otherwise specified, painting is not applied for galvanized surfaces and stainless steel surface.
- (b) All oil, grease and dirt shall be removed by the use of clean solvent and clean wiping material. All loose rust, loose mill scale and other foreign substances shall be removed by wire brushing or other effective means. All defective or damaged areas shop-applied prime coat shall be sufficiently cleaned and painted again at the Contractor's expense.
- (c) Each coat of painting shall be applied only after the previous painting has been sufficiently dried.

1302. Metal painting

Unless otherwise specified by the Engineer, the painting shall be carried out in accordance with the following table.

<u>Portions</u>	<u>Paint</u>	<u>Number of coat</u>
Ferrous surfaces which submerged or intermittently submerged	Self-curing inorganic zinc rich	1
(gates trashrack, step, etc.)	Coal tar epoxy paint	2
Externally exposed surface	Red lead	1
(gate lifting devices, handrail etc.)	Phenolic resin aluminium paint	2

SECTION XIV. MISCELLANEOUS

1401. Metal works

The work under this section consists of all metal works shown in drawings. Materials to be used shall conform to the requirement of the Philippines Standard or JIS wherever applicable.

Painting shall be complied with Section XIII of this specification.

1402. Water stop

The Contractor shall furnish and install polyvinyl chloride or rubber waterstops as shown in the Drawings or as directed.

The Contractor shall submit the sample of the waterstop to the Engineer for approval.

1403. Expansion materials

- (a) The expansion materials shall conform to the specifications of U.S.A. Federal Specification HH-F-341A and shall be 1.0 cm in thickness.
- (b) The expansion materials shall be fixed to the concrete which is placed precedingly by nail.

1404. Weep hole

As weep holes, PVC pipes of 50 mm in diameter shall be provided at the intervals shown on the Drawings.

The sand and gravel filter shall be provided behind the concrete wall at the position of the weep hole as shown on the Drawings.

SECTION XV. ELECTRICAL WORKS

1501. Regulations and standards

The complete electrical works shall be carried out as per the Specifications, complying with Electric Power Act and other related Rules and Standards of the Republic of the Philippines and/or current Japanese Electrical Standards and Codes of Practices.

1502. Materials

All materials used in the Project shall comply with the appropriate Standard Specifications in the Philippines or Japan where such applies.

1503. Power supply and incoming switch box

Power shall be taken from 60 cycles, 220 volts, three phase system of public line. The connecting point of public line and the Project will be directed by the Engineer at the Site. An incoming switch box with watt-hour meter shall be installed at the connecting point.

1504. Power control panel

A power control panel shall be designed and manufactured by the Contractor in accordance with following conditions.

For well pump facilities;

- (a) Pump shall be operative by both automatic and manual operation.
- (b) Power shall be fed from public line.
- (c) Pump shall be automatically stopped when the water level of the well reaches the limited low water level, or the air pressure in the pressure tank exceeds the specified upper limit, and shall be automatically started when the water level of the well recovers or the air pressure goes down to the lower limit.

1505. Inspection and test

When all works are completed, the Contractor shall test the electrical installations for ground and/or short circuits in the presence of the Engineer, or his authorized representative.

SECTION XVI. PUMP HOUSE

1601. Materials

All materials used in the pump house construction shall be subject to the Engineer's approval. The Contractor shall submit to the Engineer, samples of the said materials prior to the commencement of relative works for the approval.

1602. Earth works

(a) Leveling of grounds

The ground of the pump house shall be levelled before commencement of the works.

(b) Backfill

The portions around the foundations or other portions requiring backfill shall be filled with good materials and sufficiently compacted.

1603. Concrete works

(a) Materials

The cement used shall be Portland cement conforming to the standard of ASTM C-150-TYPE I. The coarse aggregate of concrete shall be 25 mm in maximum.

(b) Proportioning and strength

The 28 days age strength of concrete shall be as given in the following table. The proportion of concrete mixes shall be in conformity with the Reinforced Concrete Works Specifications instituted by the Architectural Institute of Japan or with any equivalent standards.

<u>Concrete</u>	<u>Design Strength</u> kg/cm ²	<u>Slump</u> cm	<u>Application</u>
Plain concrete		Proportion 1:3:6	Lean concrete
Plain concrete	150 or more	13 - 15	Floor
Reinforced concrete	180 or more	15 - 18	Footing & Footing Beam
Reinforced concrete	210 or more	18 - 21	Column

1604. Form work

The forms shall satisfy the requirements not to cause faults such as honeycomb and void in concrete and the forms for architectural concrete shall be guaranteed in the finish of the surfaces.

1605. Reinforcing bars

Reinforcing bars shall conform to the requirements specified under Section V.

1606. Concrete block works

(a) Materials

The concrete blocks shall be in conformity with JIS A 5406 Hollow Concrete Blocks or other equivalent standards. The thickness of concrete blocks for walls shall be 15 cm in the pump house.

1607. Carpentry

(a) Materials

The wood used shall be dried to 24 percent or less in moisture content. And the wood may be Yacal.

(b) Preservative treatment and insecticide treatment

All the surfaces of wood in contact with concrete, mortar, etc. shall be coated twice with phenol preservative.

Lauan not treated with insecticide shall not be used.

All metallic parts shall be coated with rust preventives, except the portions embedded in concrete.

(c) Protection

The portions which may be spoiled or damaged during working shall be protected by the covering of paper, board, or any other suitable materials.

1608. Roofing

(a) Material

All the roof materials shall be No.26 corrugated galvanized iron sheets. The overlapped portions shall extend more than 2.1/2 crests in crosswise direction and more than 30 cm in lengthwise direction.

1609. Joiner's work

(a) Window

The windows shall be of wooden sashes.

(b) Door

The doors shall be wooden flush doors.

(c) Hardwares

All the locks for fittings and other accessory hardwares shall be of first class quality, and their samples shall be submitted and approved by the Engineer.

Door locks : Cylinder locks with master keys
Knobs to be made of stainless steel

Door closers : With floor hinge stops

Hinges : Stainless steel
Hinges in office shall be pivot hinges

1610. Glazing works

(a) Materials

The sheet glass shall be polished sheet glass.

(b) Fitting materials

For edge keeping portions, Thiokol sealing agent shall be used.

1611. Painting

(a) General

All the facings of woods and steels in the buildings shall be painted in accordance with the Engineer's instruction.

(b) Painting schedule

The painting schedule shall be as shown in the following tables.

Alkyd resin paint

<u>Ferrous portions</u>		<u>Wooden portions</u>	
<u>Painting schedule</u>	<u>No. of coats</u>	<u>Painting schedule</u>	<u>No. of coats</u>
Unticorrosive coat	1	Surface preparation	1
Intermediate coat	1	First coat	1
Finish coat	2	Intermediate coat	1
		Finish coat	2

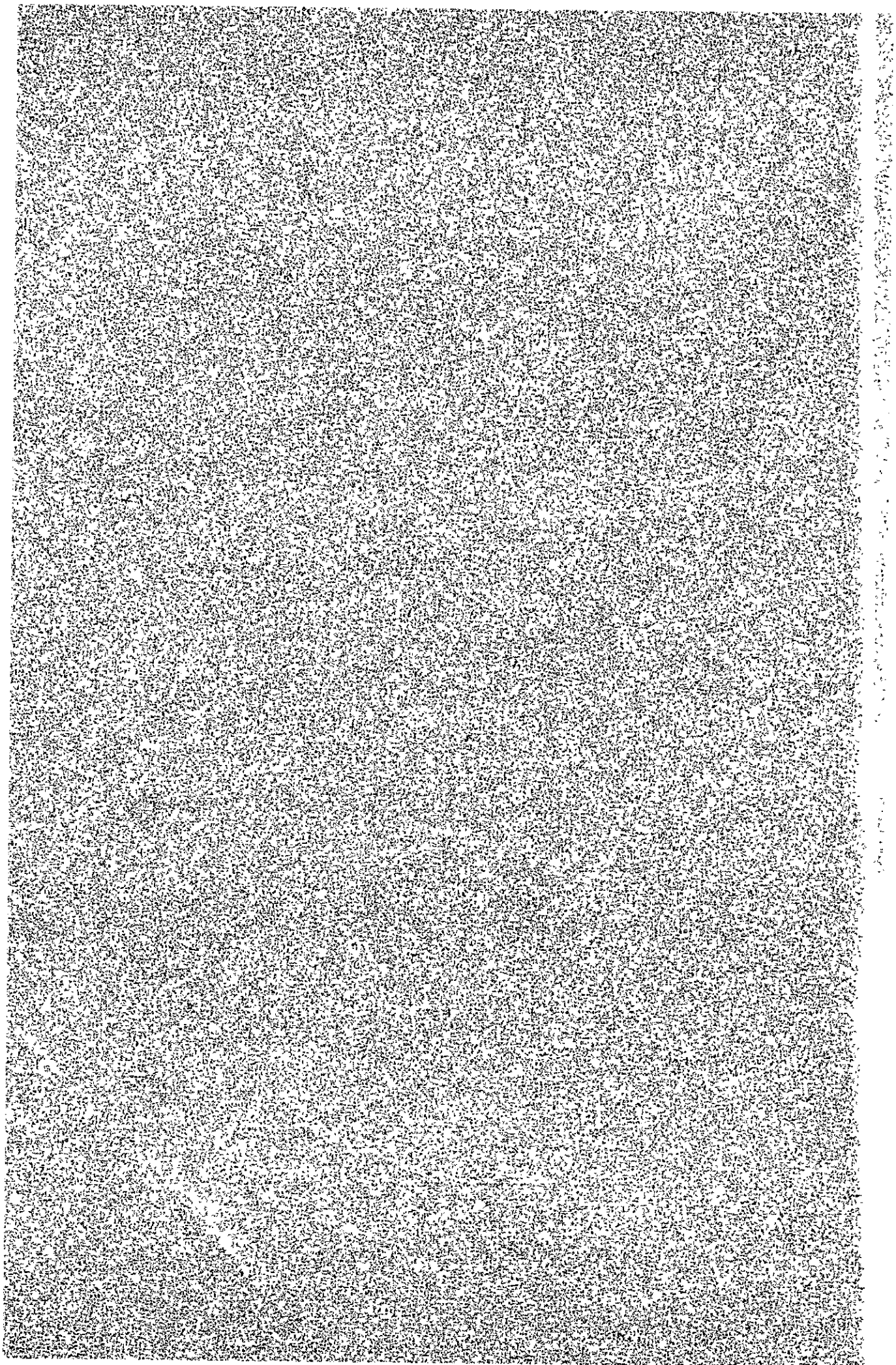
SECTION XVII. DEMOLITION OF EXISTING STRUCTURES

1701. Concrete demolition work

The work under this Section shall consist of the demolition, removal and disposal of all portions of the existing structures.

The Contractor shall submit his plans for accomplishing the demolition of structures to the Engineer for approval.

VI. TENDER FORM



TENDER FORM (BID NO. 17447/01)

TO: The Resident Representative
Japan International Cooperation Agency, Manila Office
c/o Embassy of Japan
2nd Floor, L.C. Building, 375 Buendia Avenue Extension
Makati, Metro Manila

P-01 BILL OF QUANTITIES AND BID PRICES

The undersigned Bidder, having carefully examined in their entirety of the Contract Documents for the (name of project) _____, hereby offers and proposes to perform all of the construction and services, to furnish all equipment, materials, supplies, labor and other items described in the Contract Documents, all at for the unit or lump sum prices stated in words and figures in the following Quantities:

(Name in Print & Signature)

- Bill of Quantities to be attached herein -

P-02 GUARANTY OF COMPLETION

The undersigned Bidder guarantees to effect the commencement, prosecution and completion of the Contract Works as described in Paragraphs concerned.

P-03 BID SECURITY

Bid security in the amount of _____ (words)
_____, _____ (figures)
in enclosed herewith.

I hereby certify that all statements herein are made on behalf of _____ (name of company);
Dated this _____ day of _____ 1983.

(Name in Print and Signature)

Title _____

Firm's Address _____

WITNESS

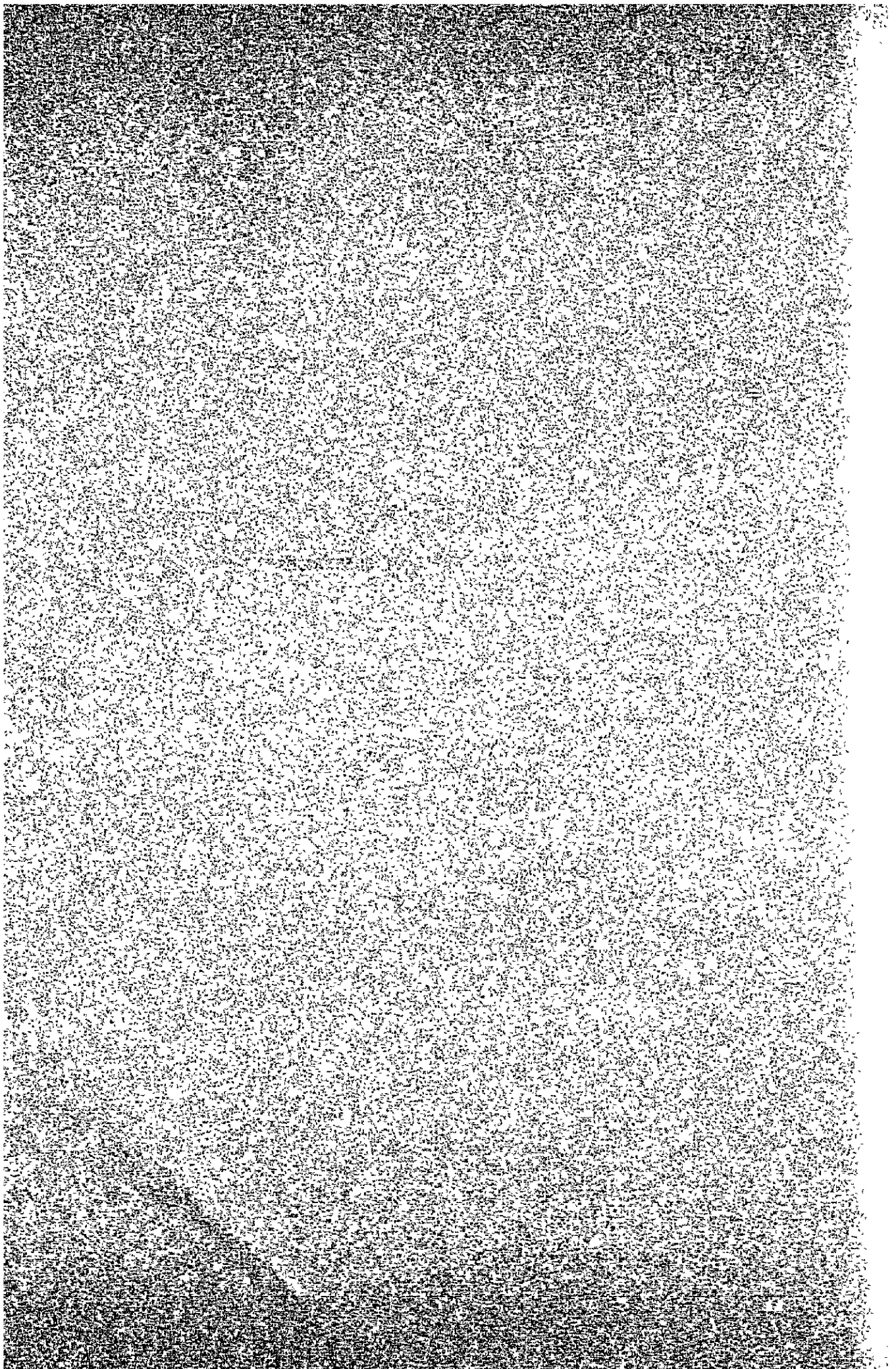
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Appendix III. Tender Prices and Bill of Quantities

VII. BILL OF QUANTITIES



ABSTRACT OF TENDER

<u>No. of B.Q.</u>	<u>Description</u>	<u>Pesos</u>
D-BQ-1	Preparation	_____
D-BQ-2	Land Reclamation	_____
D-BQ-3	Tube Well and Related Structures	_____
	<u>Sub-total</u>	_____
B-BQ-1	Preparation	_____
B-BQ-2	Diversion Weir	_____
B-BQ-3	Main Canal	_____
B-BQ-4	Land Consolidation	_____
	<u>Sub-total</u>	_____
U-BQ-1	Preparation	_____
U-BQ-2	Dam Body	_____
U-BQ-3	Spillway	_____
U-BQ-4	Connecting Pipeline	_____
	<u>Sub-total</u>	_____
	<u>Grand-total</u>	_____

D-BQ-1. Preparation

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
D-01	Survey for land reclamation and roads.	L.S				
D-02	Contractor's camp and accessories	L.S				
	<u>Total</u>					

D-BQ-2. Land Reclamation

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
D-11	Clearing and land reclamation of farm	ha	1.0			
D-12	Embankment of road	cu.m	380			
D-13	Gravel paving (thickness 15 cm, width 2.0 m)	cu.m	120			
D-14	Drainage ditch	cu.m	70			
D-15	Drainage pipe (R.C. pipe ϕ 200 m, L=1.0 m)	pcs	16			
	<u>Total</u>					

D-BQ-3. Tube Well and Related Structures

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
D-21	Deep well (D=200mm H=70m) including pumping test	Place	1			
D-22	Casing (Steel pipe D=150mm 19.8kg/m H=60m)	set	1			
D-23	Screen (Jonson type)	m	10			
D-24	Submersible motor pump (ϕ 40mm 5.5 KW) & Pressure tank	set	1			
D-25	Pumping house (reinforced concrete block t=0.15m)	sq.m	7.5			
D-26	Irrigation facilities (Galvanized pipe, P.V.C. pipe, Hydrant & etc.)	L.S				
D-27	Electric facilities	L.S				
	<u>Total</u>					
	<u>Grand Total</u>					

B-BQ-1. Preparation

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
B-01	Survey for diversion weir, canals, roads and farm land	L.S				
B-02	Access road	L.S				
B-03	Coffer dams for Bilar river	L.S				
B-04	By-pass canal	L.S				
B-05	Dewatering	L.S				
	<u>Total</u>					

B-BQ-2. Diversion Weir

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
B-11	Earth excavation	cu.m	230			
B-12	A-Concrete .	cu.m	75			
B-13	B-Concrete	cu.m	125			
B-14	Reinforced concrete pipe (ϕ 600mm L=1.0m)	pcs	5			
B-15	Stone masonry with concrete (t=300mm, B=2.83m)	m	105			
B-16	Backfill (Structure)	cu.m	140			
B-17	Embankment (Earth)	cu.m	180			
B-18	Backfill (Dike protection)	cu.m	273			
B-19	Hand rail (Steel pipe ϕ 1-1/4')	m	9.0			
B-20	Gate (Scouring sluice) (H=1.5m W=1.6m)	set	2			
B-21	Gate (Intake) (H=0.6m W=0.6m)	set	1			
B-22	Screen (1.0mx1.26m)	set	1			
B-23	Weep hole (PVC pipe ϕ 50mm)	pcs	8			
B-24	Water stop (b=200mm)	m	67			
B-25	Expansion material (t=1cm)	sq.m	20			
B-26	Demolition of existing structure	cu.m	45			
	<u>Total</u>					

B-BQ-3. Main Canal

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
B-31	Embankment	cu.m	490			
B-32	Gravel	cu.m	120			
B-33	Type-A Main canal (0.8m x 0.60m)	m	159			
B-34	Type-B Main canal (0.5m x 0.4m)	m	233			
(Appurtenant Structure)						
B-35	Road crossing					
B-35-1	Earth excavation	cu.m	30			
B-35-2	Gravel	cu.m	3			
B-35-3	A-Concrete	cu.m	8			
B-35-4	Reinforced concrete pipe (ø800mm, L=1.0m)	pcs	8			
B-35-5	- ditto - (ø600mm, L=1.0m)	pcs	6			
B-35-6	-ditto - (ø300mm, L=1.0m)	pcs	10			
B-35-7	Sand bed	cu.m	7			
B-35-8	Wooden stop log	cu.m	0.03			
	<u>Sub-total</u>					
	<u>Total</u>					

B-BQ-4. Land Consolidation

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
B-41	Land reclamation and Leveling of paddy field	ha	2.5			
	(Appurtenant Structure)					
B-42-1	Gravel	cu.m	7			
B-42-2	A-Concrete	cu.m	5			
B-42-3	B-Concrete	cu.m	5			
B-42-4	Reinforced concrete pipe (ø100mm, L=1.0m)	pcs	40			
B-42-5	- ditto - (ø300mm, L=1.0m)	pcs	30			
B-42-6	- ditto - (ø600mm, L=1.0m)	pcs	5			
B-42-7	Wooden stop log	cu.m	0.06			
B-42-8	Embankment by manpower	cu.m	17			
	<u>Sub-total</u>					
B-43	Road					
B-43-1	Embankment by machine	cu.m	950			
B-43-2	Gravel paving	cu.m	251			
	<u>Sub-total</u>					
B-44	Canal					
B-44-1	Excavation (Earth)	cu.m	240			
B-44-2	Excavation (Rock)	cu.m	90			
B-44-3	Embankment by manpower	cu.m	190			
	<u>Sub-total</u>					
	<u>Total</u>					
	<u>Grand Total</u>					

U-BQ-1. Preparation

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
U-01	Survey for profiles on dam axis and spillway	L.S				
U-02	Coffer dam and dewatering	L.S				
U-03	Contractor's camp and accessories	L.S				
	<u>Total</u>					

U-BQ-2. Dam Body

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
U-11	Clearing of Surface	sq.m	2,500			
U-12	Foundation excavation (Earth)	cu.m	380			
U-13	Dam embankment	cu.m	1,520			
U-14	Filter	cu.m	54			
U-15	Riprap	sq.m	195			
U-16	Toe rocks	cu.m	20			
U-17	Gravel paving on dam crest	cu.m	25			
U-19	Surface leveling	sq.m	300			
	<u>Total</u>					

U-BQ-3. Spillway

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
U-21	Stripping	cu.m	30			
U-22	Excavation (Earth)	cu.m	150			
U-23	A-Concrete	cu.m	85			
U-24	B-Concrete	cu.m	20			
U-25	Backfill	cu.m	50			
U-26	Weep hole (PVC pipe ϕ 50mm)	pcs	50			
U-27	Grouted riprap	sq.m	40			
	<u>Total</u>					

U-BQ-4. Connecting Pipeline

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Amount</u>	<u>Remarks</u>
U-31	Excavation (Earth)	cu.m	50			
U-32	Reinforced concrete pipe (ϕ 600mm L=1.0m)	pcs	20			
U-33	A-Concrete	cu.m	1			Inlet and outlet
U-34	B-Concrete	cu.m	5			
U-35	Backfill (Earth)	cu.m	44			
U-36	Motor (7.5 KW)	No.	1			
U-37	Electric facilities	L.S				
	<u>Total</u>					
	<u>Grand Total</u>					