

THE DEPARTMENT OF PUBLIC WORKS

MINISTRY OF PUBLIC WORKS

MASTON VOLCANO BARO AND

THE (MOUNT) CONSTRUCTION PROJECT

CONSTRUCTION OF A ROAD AND BRIDGE
IN THE MOUNTAIN AREA OF THE
A PROJECT OF THE YAWA REGION

1950

IN THE DEPARTMENT OF PUBLIC WORKS

THE REPUBLIC OF THE PHILIPPINES

MINISTRY OF PUBLIC WORKS

MAYON VOLCANO SABO AND
FLOOD CONTROL PROJECT

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**TENDER DOCUMENTS
FOR
CONSTRUCTION OF SABO FACILITIES
IN THE PAWA-BURABOD RIVER
A TRIBUTARY OF THE YAWA RIVER**

FEBRUARY 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

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TENDER DOCUMENTS
FOR
CONSTRUCTION OF SABO FACILITIES
IN THE PAWA-BURABOD RIVER
A TRIBUTARY OF THE YAWA RIVER

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VOLUME I

GENERAL PROVISIONS

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A. INVITATION TO BID

INVITATION TO BID

SEALED BIDS ON FORMS to furnished by the TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES,

for the construction of Sabo facilities of the Pawa-Burabod river, a tributary of the Yawa River, under the Mayon Volcano Sabo and Flood Control Project comprising of a Sabo dam, spur dikes, levees, ground sills and an irrigation intake will be received at the Office of the Director, care of The Committee on Bids, TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES, until 11:00 a.m., on _____, 1980, and then publicly opened.

Financial Requirement

Cash P _____
Credit Line P _____

Deadline:

Pre-qualification 5:00 P.M.,
on _____, 1980

Full particulars regarding bid bond, plans and specifications, proposal forms and other pre-requisites may be obtained at the abovementioned office by prospective bidders who are bonafide Contractors duly licensed with Category "A" by the Philippine Licensing Board for Contractors.

Director of Public Works

**B. 'STANDARD GOVERNMENT FORM OF' CONTRACT
(CONSTRUCTION)**

B.1 ADVERTISEMENT

B.2 INSTRUCTION TO BIDDERS

B.3 GENERAL CONDITIONS

B.4 PROPOSAL FOR .

B.5 SURETY BOND

B.6 ACKNOWLEDGEMENT SURETY BOND

B.7 AFFIDAVITS OF INDIVIDUAL SURETIES

REPUBLIC OF THE PHILIPPINES
MINISTRY OF PUBLIC WORKS AND COMMUNICATIONS
BUREAU OF PUBLIC WORKS

_____, Philippines, _____ 19_____

ADVERTISEMENTS, INSTRUCTIONS, GENERAL CONDITIONS,
SPECIFICATIONS, AND PROPOSAL FOR

B.1 ADVERTISEMENT

Sealed proposals will be received at the office of the _____
and _____ until 11 a. m., _____, 19_____
and then publicly opened for furnishing all the materials, labor and plant, and constructing complete

_____ at _____, Philippines,
for the _____

Envelopes containing proposals should be sealed and plainly marked, "Proposal for _____

to be opened at 11 a. m., _____, 19_____."

Instructions to bidders, general conditions, proposal forms and plans and specifications are available for issue at the office or offices above-named to prospective bidders who have filed a satisfactory "Confidential Statement," as prescribed on Chapter XXII-1 of the "Bureau of Public Works Manual" and are eligible in accordance with the provisions of section 1 of Act No. 4239. A proposal by a bidder who has not been issued plans and specifications will be rejected. Additional information will be furnished on request.

A deposit of ₱ _____ is required for the plans and specifications, which must be returned within twenty (20) days from the opening of bids, by those taking part in the public bidding and within five (5) days by those not participating, otherwise the deposit will be forfeited to the Government.

Bidders are requested to be present at the time stated above, when bids for the work will be opened.

Attention is invited to the provisions of section 1 of Act No. 4239; to Commonwealth Act No. 138; and to Commonwealth Act No. 211 as amended, to which all contractors on Government work are amenable.

Bids must be accompanied by a proposal bond in the form of cash, certified check or certificates of fixed deposits issued by any reputable banking institutions, payable to the _____, in the sum of _____

The right is reserved to reject any or all bids, to waive any informality therein, or to accept such bid as may be considered most advantageous to the _____

Address all communications to "The Director of _____, Manila, Philippines,"
or _____

Advertisement to be published from _____ to _____ inclusive.

B-1 _____

Director of _____

B.2 INSTRUCTIONS TO BIDDERS

- Parties who may bid. 1. No bids will be received for the work herein described from parties who cannot show a reasonable acquaintance and preparation for the proper performance of the class of work for which the bid is submitted, and evidence of such competence must be furnished if requested by the Director or chief of the bureau or office concerned.
- Preparation of bids. 2. Bids must be prepared without assistance from any person employed in this Office or belonging to the civil service of the Philippines. Bids shall be submitted on forms furnished in strict compliance with the requirements of the invitation and these instructions. Special care should be exercised in the preparation of bids. Bidders or their authorized agents are expected to examine the maps and drawings in this Office, which are open to their inspection and to visit the locality of the work and must make their own estimates of the facilities and difficulties attending the execution of the proposed contract, including local conditions, uncertainty of weather, and all other contingencies. All designations and prices shall be fully and clearly set forth. The proper blank spaces in the bid and guaranty forms shall be suitably filled in.
- Signature to bids. 3. Each bid must give the full business address of the bidder and be signed by him with his usual signature. Bids by partnerships must be signed with the partnership's name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing. Bids by corporations must be signed with the name of the corporation, followed by the signature and designation of the president, secretary, or other person authorized to bind it in the matter. The names of all persons signing shall also be typed or printed below the signature. A bid by a person who affixes to his signature the word "President," "secretary," "agent," or other designation, without disclosing his principal, may be held to be the bid of the individual signing. When requested by the Government, satisfactory evidence of the authority of the officer signing in behalf of the corporation shall be furnished.
- Information. 4. No person will be informed directly or indirectly by the Director, or any of his subordinates, of the name of any bidder or anyone intending to bid, or of anyone to whom any information has been given.
- Bids for all or part. 5. Where bids are not qualified by specific limitations, the Government reserves the right of awarding all or any of the items according to its best interests. Unless otherwise required in the specifications, bids for supplies shall be submitted in accordance with the numbered item or items given in the schedule.
- Expenses. 6. When samples are required, they must be submitted by the bidder so as to reach the office designated prior to the hours set for opening the bids. Samples shall be furnished free of expense to the Government, properly marked for identification, and accompanied by a list when there is more than one sample. The Government reserves the right to mutilate or destroy any sample submitted whenever it may be considered necessary to do so for the purpose of testing. Samples not required in connection with the award or delivery of supplies will upon request, if promptly made, be returned at the bidder's expense.
- Prices in words and figures. 7. In all bids, numbers and prices in Philippine currency shall be written in words as well as expressed in figures.
- Corrections. 8. Erasures or other changes in the bids must be explained or noted over the signature of the bidder.
- Bids to be delivered in time. 9. Bids with their guarantees shall be securely sealed in suitable envelopes, indorsed and addressed as required in the advertisement, and otherwise unmarked and must be in the possession of the Director before the hour appointed for the opening in the advertisement. No bids for any work received after the time set for opening bids for that work will be considered. No responsibility shall attach to said Director, or his representative, for the premature opening of any bid not properly addressed and identified. Unless specifically authorized, telegraphic bids will not be considered, but modifications by telegraph of bids already submitted will be considered if received prior to the hour set for opening.
- Guaranty. 10. Each bid shall be accompanied by cash, or certified check or certificate of fixed deposit made payable to the _____ in the sum of five per cent (5%) of the amount of the bid, as a guaranty that the contractor will, within five (5) days after notice of the acceptance of his bid, enter into contract with the Government for the faithful performance of all the work herein specified. In case security is in the form of a certified check, the Government may make such disposition of the same as will accomplish the purpose for which submitted. The cash or certified checks will be returned to the unsuccessful bidders after the awarding of the contract, and to the contractor after the execution of the contract and contractor's bond.

- Withdrawal of bid. 11. If a bidder wishes to withdraw his bid before the opening of proposals, he may do so without prejudice to himself by communicating his purpose in writing to the Director, and his bid, when reached, shall be handed to him, or his authorized agent, unread. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.
- Quantities are approximate. 12. It is understood and agreed that the quantities given are approximate only, but will be used as a basis in comparing bids, and that no claim shall be made against the Government on account of any excess or deficiency in said quantities.
- Award of contract. 13. The contract will be awarded to the contractor whose proposal appears to be the most advantageous to the Government, but the right is reserved to reject any or all bids, to waive any informality in the bids received, and to accept or reject any bid unless such bid is qualified by specific limitations; also to disregard the bid of any failing bidder, known as such to the Director, or any bid which is obviously unbalanced or below what the work can be done for. The right is also reserved to reject the bid of a bidder who has previously failed to perform properly or complete on time contracts of a similar nature, or a bid of a bidder who is not in a position to perform the contract.
- Bidders interested in more than one bid. 14. Reasonable grounds for supposing that any bidder is interested in more than one bid for the proposed work under this bidding, will cause the rejection of all bids in which he is interested.
- Contract and bond. 15. The contract shall be made and executed in quadruplicate and shall be accompanied by a bond or bonds given by the contractor, with two or more good and sufficient sureties or with a surety company, satisfactory to the Director, in a penal sum equal to twenty (20) per cent of the full contract price of the work, conditioned for the faithful performance of the contract according to its tenor and effect and the satisfaction of obligations for materials used and labor employed upon the same, pursuant to the provisions of Act No. 3688. In case personal bond is given there must be at least two sureties to the bond who own unencumbered real estate registered under a Torren's title, the aggregate assessed value of which is at least double the amount of the bond. In case any part of the assessed value is in the value of a building or buildings, the same shall be insured in an insurance company against fire, and ((or) earthquake, shock, riots, civil commotion, tidal wave, typhoon, and the policy covering the same is properly indorsed or assigned to the Government.
- Additional security. 16. Should any surety upon the bond for the performance of this contract become unacceptable to the Government; the contractor must promptly furnish such additional security as may be required from time to time to protect the interests of the Government and of persons supplying labor or materials in the prosecution of the work contemplated by the contract.
- Release of bond. 17. The contractor's bond will be released by the Government at the expiration of two months from the final acceptance of the work pursuant to the provisions of section 1923 of the Revised Administrative Code.

B.3 GENERAL CONDITIONS

DEFINITIONS

Definitions.

1. By "Director," as hereinafter used, is meant the Director or Chief of the Bureau or Office concerned, acting by and for the Government of the Political Subdivision involved and, where the sense of the context so requires, his duly authorized representative or representatives, agents, or employees.

By "Government" is meant the National, Provincial, Municipal or other branch of the Government concerned.

By "Head of the Department" is meant the Head of the Executive Department concerned.

"By Political Body" is meant the Provincial Board or the Municipal Council of the Political Subdivision concerned.

By "contractor" is meant the individual, firm, partnership, corporation or association that undertakes the construction and completion of the work hereinafter described.

MATERIALS AND WORK

By whom furnished.

2. All materials and all labor, of every grade and kind, not hereinafter stated to be furnished by others, shall be furnished by the contractor.

Information concerning materials.

3. The contractor shall furnish to the Director for his approval the name of the manufacturer of machinery, mechanical and other equipment which he contemplates installing, together with their performance capacities and other pertinent informations. When required by the specifications, or when called for by the Director, the contractor shall furnish the Director for approval full information concerning the materials or articles which he contemplates incorporating in the work. Samples of materials shall be submitted for approval when so directed. Machinery, equipment, materials, and articles installed or used without such approval shall be at the risk of subsequent rejection.

Quality.

4. The quality and quantity of material shall be of the best grade of their respective kinds for the purpose, and the quality of the work shall be in strict accordance with the requirements of the contract and specifications. The decision of the Director as to quality and quantity of work and material shall be final and precedent to the contractor's right to receive any money hereunder. Preference will be given to articles or materials of domestic production, conditions of quality and price, including duty, being equal.

Inspection.

5. The contractor shall furnish promptly without additional charge, all reasonable facilities, labor, and materials necessary for the safe and convenient inspection and test that may be required by the inspectors. All inspection and test by the Government shall be performed in such manner as not to unnecessarily delay the work. Special, full load, and performance tests shall be as described in the specifications. The contractor shall be charged for any additional cost of inspection when material and workmanship are not ready at the time inspection is requested by the contractor.

Examination of work.

6. Should it be considered necessary or advisable by the Government at any time before final acceptance of the entire work to make an examination of the work already completed, by removing or tearing out same, the contractor shall, on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any material respect, due to fault of the contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the actual cost of labor and material necessarily involved in the examination and replacement, plus 15 per cent, shall be allowed the contractor and he shall, in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

Defective work.

7. Defective work and material may be condemned by the Director at any time before the final acceptance of the work, and when such work has been condemned it shall be taken out immediately by the contractor and rebuilt in accordance with the plans and specifications. When defective material has been condemned, it shall be removed at once by the contractor from the line of the work.

Failure to conform.

8. Failure or neglect on the part of the Director, or any of his agents, to condemn or reject bad or inferior work or materials shall not be construed to imply an acceptance of the same if such bad or inferior work or materials are discovered at any time prior to the final acceptance of the work by the Government and the release of the contractor.

Placing.

9. When the contract contemplates the placing of materials in the work, all accepted materials shall be placed carefully and securely where directed by the Director, or his agent. When reinforcing bars for concrete structures are furnished they shall be cut, bent, and placed by the contractor to conform to the plans and specifications.

Contractor responsible.

10. The contractor shall be held responsible for any and all materials or work to the full amount of the payments made thereon, and he shall be required to make good, at his own cost, any injury or damage which said materials or work sustain from any source of cause whatever, before the final acceptance thereof. The contractor shall be responsible for all materials furnished him by the Government upon delivery of said materials to him.

Protection of finished work.

11. All work must be satisfactory to the Director at completion; it must be protected by the contractor and upon completion of the contract shall be delivered complete and undamaged.

LABOR

Force.

12. The contractor shall at all times employ such a force of competent workmen as, in the judgment of the Director, shall be sufficient to insure the completion of the job within the contract time, but in no case shall the contractor violate any of the provisions of the Eight-Hour Labor Law, Act No. 4123, as amended by Act No. 4242.

Competent men.

13. The contractor shall employ only competent, skillful men to do the work, and whenever the Director shall inform the contractor in writing that any men on the work are, in his opinion, incompetent, or unfaithful or disorderly, such men shall be discharged from the work and not again be employed on it. Such discharge shall not form the basis of any claim for compensation or damage upon the Government.

(Subcontractors.)

14. The contractor shall employ such subcontractors only as are acceptable to the Director, who shall have the right to a full and complete list thereof at any time on demand. If the Director notify the contractor in writing that any subcontractor is unacceptable and the contractor should thereafter accept and use on the job work or labor furnished by such unacceptable subcontractor, then the value of such work or labor so used shall be deducted from the contract price of the job.

Contractor responsible.

15. It is understood and agreed that the entire work called for by this contract shall not be sublet or subcontracted and that no part thereof may be sublet or subcontracted without the express prior authorization of the Director, and that a subcontract, even if authorized, shall not be so understood as to relieve the contractor and his bondsmen from their obligation and responsibility to the Government for the satisfactory completion of the work and for payment for wages of laborers and for materials furnished for the work.

METHODS AND APPLIANCES

Suitable appliances to be used.

16. The contractor shall use such methods and appliances for the performance of all the operations connected with the work embraced under this contract as will produce a satisfactory quality of work and rate of progress which, in the opinion of the Director will insure the completion of the work within the contract time. If at any time before the commencement or during the progress of the work such methods or appliances appear to the Director to be inefficient or inappropriate for producing the quality of work required, or insuring the required rate of progress, he may order the contractor to increase their efficiency or to improve their character, and the contractor must conform to such order; but failure of the Director to demand such increase of efficiency or improvements shall not relieve the contractor from his obligation to turn out the quality of work and rate of progress called for in the specifications and proposal.

PLANS AND SPECIFICATIONS

Specifications and drawings.

17. The contractor shall keep at the site of the work a copy of the drawings and specifications and shall at all times give the Director access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. It is the duty of the contractor to examine carefully, compare, and verify the data furnished by the Director. Any doubt as to the meaning of the plans (including notes thereon) or of the specifications, or any obscurity as to the wording of the specifications will be explained, and all directions and explanations necessary and proper to make more definite and certain any of the requirements of the plans (including the notes thereon) or of the provisions of the specifications and give them due effect, will be given by the Director. In any case of discrepancy in the figures or drawings, the matter shall be submitted immediately to the Director, before any adjustment shall be made by the contractor save only at his own risk and expense. The plans, designs, models, figures and detail drawings will be considered as part of the specifications and illustrative of the same. The Director shall furnish from time to time such detail drawings and other information as he may consider necessary, unless otherwise provided. All such property must be returned to the Director before final payment is made.

Shop drawings.

18. Shop drawings, copies of engineer's plans, templates, patterns, models, and all necessary measurements at the work are to be made by the contractor at his own expense.

CHANGES

Changes in plan and specifications.

19. The Director may at any time, by a written order, and without notice to the sureties, make changes in the drawings and (or) specifications of this contract and within the general scope thereof. Such changes shall be ordered by the Director in writing, and no change or omission from the plans and specifications shall be considered to have been authorized without written instructions signed by the Director.

Remuneration.

20. If such changes cause an increase or decrease in the amount due under this contract, or in the time required for its performance, an equitable adjustment shall be made and the contract shall be modified in writing accordingly, subject to the approval of the Head of the Department or the political body concerned. The express consent of the sureties in writing shall be obtained. In the event that the work involved is increased by such changes the contractor shall furnish proportionate additional bond.

Modification during construction.

21. If at any time during the prosecution of the work it be found advantageous or necessary to make such change or modification in the plans and specifications as to character and quantity as would materially either increase or diminish the cost of the work, the matter shall be adjusted as provided in the next paragraph.

Changed conditions.

22. Should the contractor encounter, or the Government discover, during the progress of the work, subsurface and (or) latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications, the attention of the Director shall be called immediately to such conditions before they are disturbed. The Director shall thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the drawings or indicated in the specifications, he shall at once, with the written approval of the Head of Department or the political body concerned, make such changes in the drawings and (or) specifications as he may find necessary and any increase or decrease of cost and (or) difference in time resulting from such changes shall be adjusted as provided in paragraph 20 hereof.

Claim for adjustment.

23. Any claim for adjustment involving questions of fact must be asserted within ten days from the date the change is ordered unless the Director shall for proper cause extend such time, and if the parties can not agree upon the adjustment the dispute shall be determined as provided in paragraph 40 hereof. But nothing provided in the preceding paragraphs 19, 20, 21, and 22 shall excuse the contractor from proceeding with the prosecution of the work so changed.

Unauthorized extra.

24. Except as otherwise herein provided, no changes for any extra work or material will be allowed unless the same has been ordered in writing by the Director and the price stated in such order.

Extra work.

25. In case any extra work shall be required in the proper performance of the work contemplated under this contract, it is understood that if the contractor and the Government fail to arrive at any agreement as to the price of such extra work, the Government reserves the right to have such extra work done by any other person, firm, or corporation than the said contractor, or to perform the same by day labor under the charge and supervision of the Director.

Suspension.

26. Should the Government award extra work or other contracts for additional work to any other person, firm, or corporation, the contractor agrees that he will not in any way interfere with or molest such person, firm, or corporation, and that he will suspend such part of the work herein specified or will carry on the same in such a manner as may be ordered by the Director so as to afford all reasonable facilities for doing such work. The contractor shall be entitled to no claim for damages or to any privileges or rights other than expressed by this contract by reason of the suspension to facilitate such work, except to an extension of the time for the complete performance of this contract.

GENERAL

Covenant against contingent fees.

27. The contractor warrants that he has not employed any person to solicit or secure this contract upon any agreement for a commission, percentage, brokerage, or contingent fee. Breach of this warranty shall give the Government the right to terminate the contract, or, in its discretion, to deduct from the contract price or consideration the amount of such commission, percentage, brokerage, or contingent fees. This warranty shall not apply to commissions payable by contractors upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business.

Local laws.

28. The contractor shall comply with all the laws, city and municipal ordinances, and all Government regulations, in so far as they are binding upon or affect the parties hereto, the work, or those engaged thereon, and obtain all required licenses and permits, and be responsible for all damages to persons or property which may occur in connection with the prosecution of the work.

Barriers and lights. Liability for damages.

29. The contractor shall put up and maintain such barriers and lights as will effectually prevent any accident in consequence of his work, and the construction, building, or work, in addition to any neighboring property or building, which may be jeopardized in any manner, must be thoroughly and substantially braced against winds, floods, settling, falling, or like occurrences, and when necessary, covered and protected from sun and rain at the expense of the contractor, and he shall be liable for all damages occasioned in any manner by his acts or neglect, or of his agents, employees, or workmen.

Traffic.

30. The contractor shall, when ordered by the Director, make suitable and adequate provisions for the safe and free passage of persons and vehicles around, over, or under the work while in progress; and such provisions for traffic shall be made to the satisfaction of the Director.

Drainage.

31. If it is necessary in the prosecution of the work to interrupt or obstruct the natural flow of rivers or streams, the drainage of the surface, or the flow of artificial drains, the contractor shall provide for the same during the progress of the work in such a way that no damage shall result to either public or private interests. For any neglect to provide for either natural or artificial drainage which he may have interrupted he shall be held liable for all damages which may result therefrom during the progress of the work.

Space occupied.

32. The contractor will encroach upon public streets and grounds as little as possible during the progress of the work, and will not be allowed to encroach farther than indicated by the Director.

Relation to other contractors.

33. The contractor shall, as far as possible, arrange his work and dispose of his materials so as not to interfere with the work or storage of materials of other contractors engaged upon the work. He shall also join his work to that of others in a proper manner, and in accordance with the spirit of the plans and specifications, and perform his work in the proper sequence in relation to that of other contractors, and as may be directed by the Director.

Clean up.

34. When the work is completed, the contractor shall remove all temporary structures, all surplus materials and rubbish of every sort, and leave the streets and grounds in as good a condition as he originally found them.

Old material.

35. All old material of value, found by the contractor upon the work, shall be carefully piled where designated by the Director, and the contractor shall be responsible for the same until final acceptance of the work.

Patents.

36. The contractor shall hold and save the Government harmless against all claims for the use of any patented article, process, or appliance in connection with the contract herein contemplated.

Unpaid claims.

37. The contractor shall pay punctually the workmen employed on the work and the persons furnishing material therefor, and deliver the work free from all claims of any description, and, if required he shall furnish the Director with a statement sworn to before an officer duly authorized to administer oath that all persons who have done work or furnished materials under this contract, and shall have filed any account of such claims with said Director, have been fully paid; and in case such evidence be not furnished as aforesaid, such amount as said Director may consider necessary to meet the lawful claims of the persons aforesaid shall be deducted from the moneys due said contractor, and shall not be allowed until the liabilities aforesaid shall have been fully discharged and the evidence thereof furnished said Director, or until their lack of equity has been established. If such written evidence is not furnished before the final payment under this contract falls due, said Director may pay such lawful claims in whole or in part to person or persons, firm, or corporation claiming the same, and charge the amount thus paid to said contractor, who shall accept the same as payment from the amount due on this contract.

Payment over 65 per cent.

38. No payment shall be made on contracts in excess of sixty-five per cent (65%) of the contract price, unless a statement sworn to before an officer duly authorized to administer oath is submitted by the contractor to the effect that all bills for labor, other than current wages, and all bills for materials have been duly paid by the contractor and his subcontractor, if any, excepting only such bills as may be enumerated in such sworn statement. It is understood that the retention of the usual ten per cent (10%) shall be continued in all cases regardless of whether or not claims for labor and for materials have been paid. (NOTE.—The ten per cent (10%) referred to is that contemplated by paragraph 56 and does not apply to final payments.)

Accidents and damages.

39. The Government shall not be responsible for the death of, disease contracted or injury received by the contractor, or by any employee or laborer of the contractor, for the contractor's plant or material, for any damage done by or to them from any source or cause, and damages caused by the contractor or his employees to any Government property shall at once be repaired by the contractor at his own expense, and to the satisfaction of the Director whose decision as to such matters shall be final. And in the event of failure of the contractor to repair at once such damages, the Director may repair the same and deduct the entire cost of such repairs from the payment due the contractor.

Disputes.

40. Except as otherwise specifically provided in this contract, all disputes concerning questions of fact arising under this contract shall be decided by the Director or his duly authorized representative subject to written appeal by the contractor within thirty days to the Head of the Department concerned or the political body concerned, whose decision shall be final and conclusive upon the parties thereto as to such questions of fact. In the meantime the contractor shall diligently proceed with the work as directed.

SUPERINTENDENCE AND SUPERVISION

Superintendence by contractor.

41. The contractor, if he supervises the work personally, must be a licensed engineer or architect; otherwise he must have in his employ a licensed engineer or architect acceptable to the Director who will supervise the work personally and inspect the project at least twice a month.

Foreman.

42. At all times when work is in progress there shall be a competent foreman on the ground with authority to act for the contractor. Instructions given to such foreman shall be considered as having been given to the contractor.

Supervision.

43. The work will be conducted under the immediate supervision and direction (but not control), of an assistant engineer, detailed from the Bureau of Public Works, and such number of inspectors as may be necessary, and the decision of the said assistant engineer as to the quality of material and workmanship, when in accordance with the terms of the specifications, and when confirmed by the Director of Public Works, shall be final.

LAYING OUT WORK

Director may lay out work.

44. The Director may send, if he deems necessary, an assistant engineer to lay out the work, and the contractor shall be guided by the lines and grades given by said engineer.

Contractor check layout.

45. The contractor shall check all the dimensions as a whole and in detail, and become responsible for the extent, position and elevation of all parts of the work. All stakes, bench marks, etc., placed by the Director in laying out the work shall be carefully guarded and preserved by the contractor, and in case such stakes or marks are displaced or rendered useless through the carelessness or neglect of the contractor or of his agents, employees, or workmen, they will be replaced by the Director, at the expense of the contractor.

TIME OF COMPLETION

Commencement and completion of work.

46. The contractor shall commence the work herein contracted to be done within _____ (_____) days from the date he receives a copy of the duly executed contract. The rate of progress of his work shall be such as, in the opinion of the Director, necessary for completion within the time specified in the contract. If the contractor undertakes actual construction on the proposed work including the delivery of equipment or materials (in the case of contract for furnishing materials) or the performance of any other kind of work whatsoever, before he receives a copy of the duly executed contract, he does so at his personal risk.

Liquidated damages for noncompletion of work.

47. It is understood that time is an essential feature of the contract herein contemplated, and that upon failure to complete the said contract within the time stipulated the contractor will be required to pay to the Government the sum of _____ pesos (P. _____), Philippine currency, per diem for each day of delay (Sundays and legal holidays excepted) in the completion of the contract, the said payment to be made as liquidated damages, and not by way of penalty; and the Government may deduct from any sum due or to become due the contractor any sums accruing for liquidated damages as herein stated.

Extension of time

48. Unless extraordinary and unforeseen events or conditions supervene, the contract time stipulated in this contract for the completion of the work shall not be exceeded.

Should the contractor be obstructed or delayed in the prosecution or completion of the work by the act, neglect, delay, or default of the Director or any other contractor employed by the Director on the work, or by fire, flood, lightning, earthquakes, or typhoons, by abandonment of the work by employees, by act of the Government, or by unavoidable calamity, through no fault or negligence of the contractor, then the Director, with the approval of the Head of the Department or the political body concerned may waive the time limit and permit the contractor to finish the work within a reasonable period, to be determined by the Director;

Provided, however, That no such extension of time shall be granted for any alleged failure of the Director to furnish materials or information unless they be required in the proper prosecution of the work in the order prescribed by the Director, and unless the contractor shall have made written request for them at least three (3) days before they are actually needed.

And provided further, That the WRITTEN CONSENT OF THE BONDSMEN must be attached to any request of the contractor for an extension of time and submitted to the Director for consideration.

Damaged.

49. The contractor shall not be entitled to the damages for any hindrance or delay due to any cause whatsoever in the progress of the work, but said hindrance may entitle the contractor to an extension of time for completing the contract as herein provided.

Resumption of work.

50. If the work is interrupted for any reason, it must be promptly resumed on the removal or cessation of the cause of delay.

Notice required.

51. The contractor shall give written notice to the Director at least ten (10) days prior to beginning, suspending (except in case of accident), or resuming the work, to the end that the Director may make the necessary preparations for inspection without delaying the work. All delays or losses resulting from failure of the contractor to give such notice will be at the contractor's risk; and all extra cost to the Government for such delay (said cost to be determined by the Director) shall be deducted from the final payment.

ABANDONMENT

Rescission of contract.

52. It is understood that, in case of failure on the part of the contractor to complete the contract as herein specified and agreed upon, or if the work to be done under this contract be abandoned by the contractor, or if this contract be assigned by the contractor otherwise than herein specified, or if at any time the Director is of the opinion, after verifying the fact, that the work is unnecessarily or unreasonably delayed, or that the contractor is willfully violating any of the conditions, covenants, and agreements of this contract, or is not executing said contract in good faith, or is not making such progress in the execution of the work as to insure its completion within the required time, then, in any of these cases, the Director shall have the power, with the approval of the Head of the Department or the political body concerned, to rescind this contract by giving notice in writing to that effect to the contractor and his bondsmen. Upon giving such notice, the Director shall then take over the work and proceed to complete the same by administration or otherwise, and use such tools, appliances and materials of every description as may be found upon the line of the said work or at points where material is built or framed for the work and also procure such other tools and materials for the completion of the work as may be required.

It is agreed and understood that, upon such rescission of the contract, the Director will ascertain and fix the value of the work completed by the contractor and not paid for by the Government and of all useable materials on the line of the work taken over by the Government at the time of said rescission. In the event that the total expenditures of the Government on completion of the work, including all charges against the project prior to rescission of the contract, are not in excess of the contract price, then the difference between the said total expenditures of the Government and the contract price may be applied to settle claims filed under paragraph thirty-seven (37), and the balance, if any, may be paid to the contractor, but no amount in excess of the combined value of the unpaid completed work, retained percentage and useable materials taken over by the Government at the time of the rescission of the contract shall be so paid, nor shall any claim for prospective profits on the work done after rescission of the contract, be considered or allowed.

Right to recover. 53. The contractor and his sureties shall be liable to the Government for any cost occasioned the Government in excess of the contract price.

Not a waiver. 54. Neither an extension of time nor the acceptance of any part of this work called for in the contract shall be deemed a waiver by the Government of the right to abrogate the contract for any of the cases expressly provided for in paragraph fifty-two (52).

PAYMENTS

Estimate. 55. In order to enable the contractor to prosecute the work advantageously, the Director shall once a month, on or about the last day of each month, make an estimate in writing of the amount of work done to said date, and of the value thereof, according to the terms of this contract. The first such estimate shall be of the amount or quantity and value of the work done since the contractor commenced the performance of this contract, and every subsequent estimate (except the final one) shall be of the amount or quantity and value of the work done since the last preceding estimate was made; and such estimates of the Director shall be final and conclusive evidence of the amount of work performed, and shall be taken as the full measure of compensation to be received at the time by the contractor. Such preliminary estimates of amount and quantity shall not be required to be made by strict measurement or with exactness, but they may, at the option of the Director, be approximate only.

Payments. 56. Payments will be made monthly, based upon the estimates of work satisfactorily completed by the contractor and accepted by the Director during the preceding month. Upon such estimates the Government shall pay to the contractor a sum equal to ninety per cent (90%) thereof up to and until such time as the total work shall have been completed or the contract cancelled, as herein provided.

Partial acceptance not final. 57. The acceptance of the work from time to time for the purpose of making partial payments shall not be considered as a final acceptance of the work in question.

Final payment. 58. Whenever this contract, in the opinion of the Director, shall be completely performed on the part of the contractor, the Director shall proceed promptly to measure the work, shall make the final estimates, shall certify as to the completion of the work, and accept the same. The Government shall then, excepting for causes herein specified, pay to the contractor promptly, after the execution of said certificate, the remainder which shall be found due, excepting therefrom such sum or sums as may be lawfully retained under any of the provisions of this contract: **PROVIDED, THAT FINAL PAYMENT ON THE CONTRACT SHALL NOT BE MADE UNTIL THE CONTRACTOR HAS SUBMITTED A STATEMENT SWORN TO BEFORE AN OFFICER DULY AUTHORIZED TO ADMINISTER OATH, SHOWING THAT ALL TAXES DUE FROM HIM, AND ALL OBLIGATIONS FOR MATERIALS USED AND LABOR EMPLOYED IN CONNECTION WITH THIS CONTRACT HAVE BEEN DULY PAID; AND PROVIDED, FURTHER,** That nothing herein contained shall be construed to waive the right of the Director hereby reserved to reject the whole or any portion of the aforesaid work, should the same be found to have been constructed in violation of the plans and specifications or of any of the conditions or covenants of this contract.

ASSIGNMENT.

Assignment. 59. This contract shall not be assigned to any other party or parties, and in case of such a transfer the Government may refuse to carry out the contract either with the transferrer or transferee; but all rights of action for any breach of this contract by the contractor shall be reserved to and remain in said Government.

Parts making up the contract. 60. The following documents are essential portions of the complete contract: The Advertisement, the Proposal, the Information for Bidders, the Instructions to Bidders, the General Conditions, the letter of acceptance, the Specifications, all drawings, maps, and plans hereto attached or on file in the office of the Director of Public Works and relating to this work, the Specific Contract, and the Contractor's bond.

B.4 PROPOSAL FOR

_____ , Philippines, _____, 19.....

To the _____

SIR: In accordance with your advertisement inviting proposals for _____

and subject to all the conditions and requirements thereof, and of your plans and specifications, which, so far as they relate to this proposal, are made a part thereof, we (or I) propose to furnish, deliver, and place and complete any and all necessary work as called for by the said plans and specifications, we (or I), will furnish all necessary plant, tools, appliances, and labor, and complete the work at our (or my) own expenses, at the following prices in Philippine currency.

ITEM	UNIT PRICE	AGGREGATE PRICE
	P	P
TOTAL	P	P

We (or I) make this proposal with a full knowledge of the kind, quantity, and quality of the articles and services required, and if said proposal is accepted will, after receiving written notice of such acceptance, enter into contract within five (5) days, with good and sufficient securities for the faithful performance thereof.

We (or I) inclose herewith cash or certified check, in the sum of _____ pesos (P _____), which is to be returned if this proposal is rejected, or retained if accepted, as security until the execution and delivery of a satisfactory bond in the sum of twenty per centum (20%) of the total contract price for the full and faithful performance of the contract.

We (or I) will build and complete the work in accordance with the plans and specifications within _____ (_____) calendar days (exclusive of Sundays and legal holidays) from the date we (or I) receive a copy of the duly executed contract.

(Signature) _____
P. O. Address _____

B.5 SURETY BOND

KNOW ALL MEN BY THESE PRESENTS: That we, _____ contractor of _____, Philippines, as principal, and _____, of _____, Philippines, and _____, of _____, Philippines, as sureties, are held and firmly bound unto the Government of the _____ and to any individual, firm, partnership, corporation or association supplying the principal with labor or materials in the penal sum of _____ (P_____), Philippine currency, for the payment of which sum well and truly be made, we bind ourselves, our heirs, executors, administrators, successors, and assignees, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION are as follows:

WHEREAS, the above bounden principal, on the _____ day of _____, 19____, entered into a contract with the Government of the _____ represented by the _____, to fully and faithfully _____

WHEREAS, said contract requires the said principal to give a good and sufficient bond in the above-stated sum to secure the full and faithful performance on its part of said contract, and the satisfaction of obligations for materials used and labor employed upon the work;

NOW, THEREFORE, if the principal shall perform well and truly and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extension thereof that may be granted by the Government, with notice to the sureties, and during the life of any guaranty required under the contract, and shall also perform well and truly and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, without notice to the sureties except when such modifications increase the contract price; and such principal contractor or his or its subcontractors shall promptly make payment to any individual, firm, partnership, corporation or association supplying the principal or his or its subcontractors with labor and materials in the prosecution of the work provided for in the said contract, then, this obligation shall be null and void; otherwise, it shall remain in full force and effect. Any extension of the period of time which may be granted by the Government to the contractor shall be considered as given, and any modifications of said contract shall be considered as authorized, with the express consent of the sureties.

The right of any individual, firm, partnership, corporation or association supplying the contractor with labor or materials for the prosecution of the work hereinbefore stated, to institute action on the penal bond, pursuant to the provisions of Act No. 3688, is hereby acknowledged and confirmed.

IN WITNESS WHEREOF, we have set our hands and signed our names on the _____ day of _____, 19____

IN THE PRESENCE OF:



Principal

Surety

Surety

B.6 ACKNOWLEDGMENT OF SURETY BOND

REPUBLIC OF THE PHILIPPINES }
PROVINCE OF } ss.

At the Municipality of this province,
on this day of, 19....., personally appeared before me
(1), and
(2), known
to me and to me known to be the same persons who have executed the foregoing document, which they
confirmed and ratified, declaring same to be their free and voluntary act and deed.

Not. Reg.
Page
Book
Series of

.....
Notary Public
My Commission expires

REPUBLIC OF THE PHILIPPINES }
PROVINCE OF } ss.

....., of the Philippines, having been duly sworn according to law,
states and deposes that the said of the Philippines
is a corporation duly organized and existing under and by virtue of the laws of the Philippines,
with its principal office at the City of, and duly authorized to
execute and furnish surety bonds for all purposes with the said Philippines; and that it is actually
worth the amount specified in the foregoing undertaking, to wit:

..... (P.....)
Philippine currency, over and above all just debts and obligations and property exempt from execution.

By

Subscribed and sworn to before me this day of, 19.....
at the City of, Philippines.

Not. Reg.
Page
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Series of

.....
Notary Public
My Commission expires

B.7. AFFIDAVITS OF INDIVIDUAL SURETIES

REPUBLIC OF THE PHILIPPINES

PROVINCE OF _____

} ss.

Personally appeared before me this day the undersigned surety, who being duly sworn, deposes and says:

That he is a resident of _____; by occupation a _____; that his office or principal place of business is located at _____; that he is one of the sureties on the foregoing bond; that he owns personal property worth P. _____; and real estate assessed at P. _____; said real estate being located in the Municipality of _____; Province of _____; that the value of his assets over and above his actual liabilities is P. _____ approximately; and that his total contingent liability on outstanding bonds and endorsed notes is P. _____

Surety

Subscribed and sworn to before me at _____, this _____ day of _____, 19_____

Not. Reg. _____

Page _____

Book _____

Series of _____



Notary Public

My Commission expires _____

REPUBLIC OF THE PHILIPPINES

PROVINCE OF _____

} ss.

Personally appeared before me this day the undersigned surety, who being duly sworn, deposes and says:

That he is a resident of _____; by occupation a _____; that his office or principal place of business is located at _____; that he is one of the sureties on the foregoing bond; that he owns personal property worth P. _____; and real estate assessed at P. _____; said real estate being located in the Municipality of _____; Province of _____; that the value of his assets over and above his actual liabilities is P. _____ approximately; and that his total contingent liability on outstanding bonds and endorsed notes is P. _____

Surety

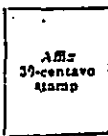
Subscribed and sworn to before me at _____, this _____ day of _____, 19_____

Not. Reg. _____

Page _____

Book _____

Series of _____



Notary Public

My Commission expires _____

The foregoing bond is hereby accepted, the securities therein being in my opinion responsible and sufficient to insure the payment of the full amount of the penalty of said bond.

C. GENERAL PROVISIONS

SUPPLEMENTARY GENERAL CONDITIONS
AND INFORMATION FOR BIDDERS

1. GENERAL

The requirements and conditions set forth in this portion of the Tender Documents are Conditions of Particular Application to the work contemplated under this Contract. It is understood that the "INSTRUCTION TO BIDDERS", Sections 1 to 17, and the "GENERAL CONDITIONS", Section 1 to 60 of the "STANDARD GOVERNMENT FORM OF CONTRACT" (CONSTRUCTION). Standard Form No.1, revised January 10, 1936 shall prevail in this Contract, subject always to the additions, amendments; Presidential Decrees, Letters of Instructions, Department Orders, and/or clarifications set forth hereinafter.

2. WORK TO BE DONE

The Works herein specified consist the construction of sabo facilities of the Pawa-Burabod river, or tributary of the Yawa river under the Mayon Volcano Sabo and Flood Control Project in Albay province of Republic of the Philippines.

The Works to be carried out under the Contract shall, except as otherwise provided in the Contract, comprise the supply of all materials, labor, equipment, construction plant, temporary works and other things necessary for the execution, completion and maintenance of the Works in strict accordance with the Contract and as directed by the Engineer.

The Works to be carried out by the Contractor under the Contract will include but are not limited to:

- 1) The construction of a sabo dam with a main dam and a sub dam of concrete gravity type.
- 2) The construction of two spur dikes with embankment protected by wet masonry.
- 3) The construction of levees including embankment, wet masonry and crib work.

- 4) The construction of two groundsills including timber log crib and cross concrete block groundsill.
- 5) The construction of a irrigation intake structure.

Details of the permanent works abovementioned are given in the Specifications and on the Drawings, which form an integral part of the Tender Documents.

3. CONTRACT TIME

3.1 General: All work shall be done in accordance with the specifications, TFFCRA's drawings entitled, "Mayon Volcano Sabo and Flood Control Project, Detail Design of Sabo Facilities in the Pawa-Burabod River, Tributary of the Yawa River" and other supplementary plans as approved by the Director, and shall be completed with the number of days hereinafter specified.

3.2 Completion Time: The Contractor shall commence the Work immediately after the commencement date of the Work designated by the Government and shall secure the completion of a part or whole of the Work by the designated time. The time of completion for the construction of sabo facilities shall not exceed the number of calendar days herein specified for the contract.

Bid Schedule - _____ calendar days

3.3 Bidders will note that the time within which this Section must be completed has been fixed by the Government. Proposals which specify a greater number of days for completing the work covered by this Contract than the time fixed by the Government will not be considered nor will any premium, bonus or other emolument be paid for earlier completion of the work than the time fixed and specified.

4. CORRELATION AND INTERPRETATION OF CONTRACT DOCUMENTS

4.1 The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. In case of discrepancy, defective description, errors, omissions, or ambiguity between or in any of the Contract Documents, the following shall be the rules of interpretation:

4.1.1 Drawings shall govern over the General Conditions; the Special conditions shall govern over the General Conditions and Drawings; the Technical Specifications shall govern over the Special Conditions, the General Conditions and the Drawings.

4.1.2 Detailed Drawings shall govern over general drawings. Figures written on drawings shall govern over the drawing themselves.

5. DEFINITIONS

Whenever the following terms are used in the Contract Documents, they shall have the following meanings;

Philippines The Republic of the Philippines, The Government of the Republic of the Philippines, represented by _____ in the Contract.

Minister The Minister of the Ministry of _____.

Consultant Local or foreign or associated firms which have been engaged to assist the Government in the design or engineering or supervision of the work to be done under the Contract.

Engineer The Engineer appointed from time to time by the Government who shall act as the Executive Head in the project site with due notice to the Contractor.

Bid-Tender The written offer of a bidder/tenderer submitted in the prescribed form in response to an advertisement to furnish the required labor, equipment and materials to perform to specified work within the time prescribed therein, in consideration of payment at the prices quoted in the bid/tender as submitted.

Bidder-Tenderer An individual, partnership, corporation, association, firm or joint-venture submitting a bid/tender to the Government to undertake the performance of a specific project.

Bidders Bond The bond posed by a bidder either in cash, or certified check or manager's check or cashier's check to guaranty his entering into contract with the Government.

Performance Bond The bond posed by the Contractor to guaranty full and faithful performance of the contract works, and payment of wages and materials used in the project and other claims arising out of the contract.

Credit Line The amount of credit extended the Contractor by a bank or other financial institution.

Contract The legally executed agreement between the Contractor and the Government for the performance of the contract works covered by the Government Documents.

Contract Price The sum named in the Bid/Tender subject to such addition thereto or deduction therefrom as may be made under the provisions hereinafter contained or stipulated.

Contract Time The stipulated period of time within which the Contractor shall complete the contract works including time extension duly granted by the Government either due to force majeure, extra work or change order.

Contractor The person or persons, firm or company whose bid/tender has been accepted by the Government and includes the Contractor's personal representatives, successors and permitted assigns.

Subcontractor The individual, partnership, corporation, association or syndicate having a direct contract with the Contractor for furnishing service or work under the Contract duly approved by the Government.

Calendar Days A period of twenty-four (24) hours extending from midnight to midnight which includes all days of the calendar.

Month A Gregorian Calendar month

Supplemental Notice The written additional information, provisions, and/or other documents issued by the Government before the opening of the bids and incorporated in the Contract Documents.

Sureties Bank or Banks and/or bonding company or companies which joined and severally bound with the Contractor to the Government insuring the Contractor's faithful performance of the Contract and the payment of all his obligations arising thereunder.

Permanent Works The permanent structures to be constructed and completed in accordance with the Contract Documents.

Works Permanent Works and/or Temporary Works.

Construction Plant All equipment, facilities, supplies and other incidentals required for the execution and completion of the work exclusive of materials or other things intended to form or forming part of the Permanent Works.

Plans All contract and construction drawings referred to in the Contract Documents and any modification thereof duly approved by the Government and such other drawings as may from time to time be furnished by the Government for the construction of the work.

Specifications The description in detail of the work to be executed, the character and quality of materials and workmanship and special responsibilities of the Contractor that are not covered by the conditions of the Contract. It includes supplemental specifications, Special Provisions and Bulletins referred to in or bound with the Contract Documents together with all the written agreement made.

Sites The lands or places on which the works are to be executed or carried out and other lands or places provided by the Government for the purposes of the contract.

Contract Works	The furnishing of all labor, materials, supplies, equipment, facilities and other incidentals necessary or convenient to the successful completion of the works and carrying out of all the duties and obligations imposed in the contract.
Original Contract Price	The total price originally agreed upon by the Contractor and the Government as payment for the completion of the entire Contract Work stipulated in the contract.
Adjusted Original Contract Price	The increased or decreased price of the stipulated original contract price fixed or agreed upon by the contracting parties based on valid grounds and in pursuance of existing laws, decrees, rules or regulations governing adjustment or escalation of contract prices.
Extra Works	Such additional labor, materials, supplies, equipment, facilities and other incidentals necessary to complete the works but not originally covered or called for in the contract.
Change Order	A written order issued the Contractor at any time during the prosecution of the contract works directing him to change or modify specific work within the general scope of the contract documents which is indispensable in the completion of the project resulting either in the increase in the original quantities of any or all items or work or in the reclassification of an existing item to another item provided for in the original

contract or decrease in the quantity of work due to underruns or deletion of portions or sections of the project.

Extra Work Order An order issued to the Contractor to perform additional work needed and necessary for the completion and/or improvement or protection of the project when such additional work was not included as an item or work in the contract.

Negotiated Supplemental Agreement The agreement signed by both parties supplementing the principal contract for the undertaking or a specific work beyond the limits of the project as awarded and not necessary for the completion of the project setting forth the necessity for the change and adjustment of unit price or prices agreed upon as satisfactory to both parties.

6. INSTRUCTIONS TO BIDDERS/TENDERERS

Only firms or joint ventures duly prequalified by the _____ to _____ participate in this bidding/tendering may submit proposals.

Bids/tenders shall be considered only from Bidders/Tenderers who have visited the project site and have registered at the Office _____ at _____.

7. PREPARATION OF BIDS/TENDERERS

7.1 All bids/tenders shall be prepared in English and submitted in triplicate, at the place on or before the time designated for receipt thereof in accordance with the invitation for bids/tenders, and shall conform to the following requirements:

7.1.1 One copy of the proposal shall be marked "Original". In case of discrepancies between the original and the copies, the Original shall govern.

The Original and copies of the bids/tenders shall be incorporated in the proposal which form part of these Contract Documents. They shall be returned in their entirety with all data called for in the Bill.

If erasures or changes are made, each erasure or change must be initialed by the person signing the bid/tender. Modifications of bids/tenders will be considered only through a letter duly signed by the signatory of the bid/tender provided they are received at the Office of _____ on or before the time fixed for the opening of bids/tenders.

7.1.2 Bids/tenders will be submitted for any or all packages. Bids/tenders submitted must be for all items in the Bill of Quantities of any or all packages and bids/tenders for only a part of any package will not be considered. Bid/tender prices shall be written in words as well as in figures. In case of discrepancy between the words and figures, the price in words shall prevail. In case of discrepancy in the unit price and the extension thereof, the unit price governs.

7.1.3 The proposal must be signed by a duly authorized person. Proposal submitted by a corporation, partnership or association must bear its seal and attested by its Secretary. Proposals submitted by joint ventures must be accompanied by the document of formation duly registered and authenticated before an officer authorized to administer oaths. The document of formation must define precisely the general conditions under which the joint venture shall function, its tenure, the persons authorized to represent and obligate it, the participation of the several firms and other information which will give full appraisal of its functioning.

7.1.4 The Government assumes no obligation whatsoever to compensate of indemnify the Bidders/Tenderers for any expense or loss they may incur in the preparation of their proposals, nor does the Government guarantee that an award will be made under these Contract Documents.

7.2 The form of the Contract to be awarded is on a Fixed Unit Price basis of payment to the Contractor, as specifically set forth in the Contract Documents. A proposal which is incomplete or qualified by the Bidder/Tenderer by inserting or attaching uncalled for terms or conditions will be rejected.

8. DELIVERY OF BIDS

8.1 Proposal shall be sealed in an envelope marked in capital letters, Construction of Sabo Facilities of the Pawa-Burabod river, a tributary of the Yawa river under the Mayon Volcano Sabo and Flood Control Project and must be addressed:

The Committee on Prequalification, Bids/Tenders and Awards

(Address)

8.2 Bids/Tenders together with the proposal bond shall be delivered on or before the designated time and date to be eligible for consideration. The Government will not be responsible for prematurely opened bids/tenders which are not properly marked. Modification of Bids/Tenders will not be allowed after its submission, unless withdrawn as provided in Section 11 of the "INSTRUCTION TO BIDDERS" hereunder and resubmitted on or before the time set for the opening of bids/tenders.

8.3 All bids must be submitted at the Office of the Director of Public Works, care of the Committee on Bids, Manila, by messenger, in person, or remitted by registered mail and recieved prior to the date and hour of opening of bids.

8.4 Bids/Tenders submitted through telex or telegrams without the necessary required documents and information shall not be considered.

9. AWARD OF CONTRACT

9.1 Bid/Tenders will be opened on _____
(date)
at _____
_____, Manila Standard Time.
(time)

Bidders/Tenderers who may desire to attend such opening shall be allowed.

9.2 Immediately after the opening of bids/tenders, the Government will undertake a through study and appraisal of the Proposals submitted. The Contract will be awarded to the bidder/tenderer whose bid is the lowest, complying and considered most advantageous to the Government.

9.3 Within _____ calendar days from receipt of the Notice of Award, the successful bidder/tenderer or his duly authorized representative must execute the Contract with the Government and furnish the credit line, cash requirement and letter of credit as performance securities.

10. BIDDER'S RESPONSIBILITY

10.1 The Bidder/Tenderer shall be responsible for having taken steps to carefully examine all of the Contract Documents, to have fully informed himself with all conditions, local and otherwise, relative to the carrying out of the contract work, and to have formulated an estimate of the facilities available and needed. Failure to do so will be at the Bidder's/Tenderer's risk.

10.2 It shall be the sole responsibility of Bidders/Tenderers to determine and satisfy themselves of whatever means they consider necessary in connection with all matters affecting this Contract;

including the location and nature of the work; climatic conditions, the nature and conditions of the terrain, geologic conditions at the site; transportation and communication facilities; requirements and availability of labor, water, electric power and roads; the locations and extent of aggregate sources, earth and other natural materials for use in the Contract work; and all other factors that may affect the cost, duration, and execution of the Contract Work. The Bidder/Tenderer, by submitting a proposal, acknowledges that he has inspected the Site and determined the general characteristics of the Contract Work and conditions afore-mentioned.

- 10.3 The Government will not assume any responsibility regarding information, interpretation or conclusions obtained by the Contractor, or information, interpretation or deductions the Contractor may obtain or arrive at from the data furnished by the Government. No verbal agreement or conversation with any officer, employee or agent of the Government or its Consultant, either before or after the execution of the Contract, shall modify or alter any of the terms of obligations contained in the Contract.

11. BIDDERS/TENDERERS COMPETENCE

The Government reserves the right to fully examine the competence and responsibility of a Bidder/Tenderer at any time before award of contract by further verification of the Bidder's/Tenderer's Prequalification Confidential Statement, or by any other means, and to reject any bid/tender when facts relative to business and technical organization or financial resources or construction experience have been misrepresented and in the Government's opinion would justify rejection.

12. INTERPRETATION OF CONTRACT DOCUMENTS SUPPLEMENTAL NOTICE

- 12.1 if a prequalified Bidder/Tenderer is in doubt of the true and correct meaning of any part of the Contract Documents, the Bidders/Tenderer may submit a written request for an interpretation to the Government allowing sufficient time for a

reply to reach him before submission of his bid/tender. Any substantive interpretation given will be issued by the Government in the form of a Supplemental Notice furnishing all prospective Bidders/Tenderers.

12.2 The Government may also issue to all prequalified Bidders/Tenderers Supplemental Notices prior to the date of opening of bids/tenders for the purpose of clarifying or modifying of the Contract Documents. Receipt of all Supplemental Notices shall be acknowledged by each prospective Bidder/Tenderer prior to submittal of bids/tenders and receipt of and compliance therewith shall be indicated in the Proposal. Verbal interpretations of the Contract Documents shall not be binding.

13. PRE-BIDDING CONFERENCE

13.1 Two pre-bid conferences may be held:

- (a) prior to prequalification where all parties may participate; and
- (b) after prequalification but before bidding where only those prequalified may participate

13.2 The Government is not bound to award the Contract to the Bidder/Tenderer submitting a bid/tender with the lowest indicated cost, but shall take into consideration the bid prices, unbalanced bids, guaranteed completion period, existing rules and regulations pertinent thereto and other relevant considerations.

14. DATA TO BE SUBMITTED WITH PROPOSAL

All proposals shall contain the following documents:

14.1 An Organization chart and the complete qualification and experience data sheet of the supervisory personnel the Contractor proposes to employ in the execution of the Contract. The Chart shall be accompanied by a bar graph showing the scheduled date and period of employment and a statement of their availability for employment on the project. Alternate key personnel of equal competence may be substitute subject to the Government's approval.

- 14.2 A construction schedule showing in detail the proposed plan of operation and construction of each main item in the Bill of Quantities from start to completion of the Contract Work and a Schedule of Utilization of the different items of major construction and plant equipment. The schedules shall include construction and plant equipment and manpower mobilization which shall be in a bar graph form with the months shown as the least unit of time and each main item on a separate horizontal line. The schedule shall likewise show the expected monthly accomplishment and financial requirements based on the Bill of Quantities.
- 14.3 A list of equipment proposed to be used for the performance of the Contract Work. The list shall specifically enumerate the number, name, type and capacity of all major items of equipment. Minor items of equipment, classified by categories, shall also be enumerated. The list of major equipment shall set forth separately the construction plan or equipment owned by the Bidder/Tenderer and that which he intends to purchase or provide from other sources and the sources thereof. Leased equipments must be supported by a copy of the lease agreement or certification under oath by the lessor to that effect.
- 14.4 Bidder's/Tenderer's declaration certifying that he has fully informed himself of all conditions, local and otherwise, affecting the carrying out of the contract work and that his Proposal has been prepared in strict accordance with the terms of these Contract Documents, which he unreservedly accepts.
15. VISIT TO SITE AND EXAMINATION OF DOCUMENTS
- 15.1 Before tendering the Tenderers shall visit the site of Works for necessary investigations of its nature and make themselves acquainted with the circumstances, on their own responsibility, for the purpose of making a Tender and entering into a Contract. They shall also carefully examine the Drawings, the Standard Specifications and the Special Provisions (including any Drawings

and other Specifications referred to therein), the Bill of Quantities and the General Requirements and Covenants, and if there should be or appear to be any ambiguity in or discrepancy between any of these or between figured and measured dimensions upon the Drawings, the Tenderer should immediately refer the matter in writing to the Government.

15.2 The Government will have personnel available to assist the prospective tenderers in clarifying any and all questions they may have regarding the drawings, the specifications, the special provisions, and the operating conditions. This service may be extended to include a conference to be held not less than _____ calendar days before the date of opening of the tenders.

15.3 All costs and charges in connection with visits to and examination of the Site and in the preparation of the Tender shall be borne by the Tenderer.

16. PROPOSAL FORM

prospective bidders are cautioned to submit proposals in strict compliance with the proposal form. Any proposal containing and condition whatsoever not called for by the proposal form, plans, instruction to bidders, information for bidders, or specifications may be rejected. Items which the Contractor has left unpriced will be deemed to have been included in the other sums and Unit Prices of the Proposal and although the quantities in such items may be increased, they will not be measured or paid for.

17. PRIVATE WORKS WITHIN RIGHT-OF-WAY

In case where private works have intruded on the rights-of-way of the project, the Contractor shall request in writing that the Director cause the immediate removal of such obstructions.

18. ACCESS TO SITE

The Engineer or any person authorized by him shall at all times have access to the work and to the site and to all workshops and places where works are being prepared or materials manufactured or articles or machinery are being obtained for the works and the contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

19. INSPECTION OF CONTRACT WORK

19.1 All Contract Work shall be performed in a skillful and workman like manner. Inspection of all the Contract Work shall be made by the Government while such Contract Work is in progress to ascertain that the completed works comply in all respects with the standards and requirements set forth in these Contract Documents. Notwithstanding such inspection, the Contractor shall be held responsible for the acceptability of the finished Works.

19.2 The Government and its representative shall at all times have access to the work whenever it is in preparation or in progress, and the Contractor shall provide proper facilities for such access, and shall furnish promptly, without additional charge, all facilities, labor and supplies reasonably needed for safe and convenient inspection. The Contractor shall give the Government timely notice of readiness of the Works for inspection and the Government shall conduct such inspection a manner that will not unnecessarily delay the Contract Work.

19.3 If any Works should be covered up without prior approval on consent of the Government, it must, if required by the Government, be uncovered for examination and properly restored at the Contractor's expense, unless the Government has unreasonably delayed the inspection after notice of readiness for inspection has been given.

19.4 Re-examination of any Works may be ordered by the Government, and if so ordered must be uncovered by the Contractor. If such Work are found to be in accordance with the Contract Documents, the Government shall pay the cost of re-examination and replacement. If such Works are not in accordance with the Contract Documents, the Contractor shall bear the cost of such re-examination and replacement and shall not be entitled to any extension of time.

20. WORK DONE TO THE SATISFACTION OF THE ENGINEER

Save in so far as it is regally or physically impossible, the Contractor shall prosecute, complete and maintain the work in strict accordance with the terms of the contract to the satisfaction of the Engineer and shall comply with and adhere strictly to the instruction and directions of the Engineer on any matter relating thereto.

21. SUPERINTENDENCE AND SUPERVISION

21.1 The Contractor shall give efficient superintendence to the works and shall employ in the project competent full time superintendent and assistants during the execution of the contract work who shall be available at all times during the inspection of the Engineer to explain the different phases of work accomplished or necessary to be accomplished. The contractor shall also provide necessary facilities at the site to enable the Engineer and other Government Officials to conduct their inspection in the most expedient and convenient manner.

21.2 The Superintendent is the authorized representative of the Contractor who shall receive directions and instructions from the Government. The designation of the Superintendent is subject to the approval of the Engineer which approval may for cause be withdrawn. If the approval is withdrawn, the Contractor shall as soon as practicable after due notice remove the Superintendent from the site and the latter shall not thereafter be employed in any capacity but must be replaced by another to be approved by the Engineer.

21.3 All expenses relative to removal shall be paid by the Contractor.

22. DRAWINGS AND SPECIFICATIONS

22.1 As a supplement to Section 17 of the "GENERAL CONDITIONS", the Government will furnish free of charge the following prints of drawings and specifications to the Contractor:

Contract drawings, not more than 2 sets

Specifications, not more than 2 sets

22.2 Additional sets of drawings and specifications needed by the Contractor will be furnished at the Contractor's expense.

22.3 As-built drawings will be maintained by the Contractor with all deviations from the plans clearly marked on the drawings in red pencil.

22.4 All deviations as marked shall bear the approval, date of approval and initial of the Engineer. Sets of as-built drawings and specifications shall be returned to the Director at the termination of the work.

23. CUSTODY OF DRAWINGS

23.1 The drawings shall remain in the sole custody of the Engineer but two copies thereof shall be furnished the Contractor free of charge. Upon completion of the Contract, the Contractor shall return to the Engineer all drawings under the Contract.

23.2 A copy of each of the drawings furnished the Contractor shall be kept by him at the site and the same shall at all reasonable times be available for inspection and use by the Engineer or by any other person authorized by him in writing.

24. LANGUAGE AND UNIT SYSTEM OF WEIGHTS AND MEASURES

All drawings, designs, specifications, manuals, nameplate, markings, operating instructions, estimates, statements, charts, schedules, reports, notices, documents and all written communications between the Government and the Contractor, shall be in English Language and metric system of weights and measure.

25. SETTING-OUT OF THE WORKS

25.1 The basic bench mark shall be the point as shown on the Drawings and reference points also shown on the Drawings are provided to the Contractor for reference.

25.2 Before using such other bench marks or reference points for setting-out of the Works, the Contractor shall carry out a check survey thereon at the Contractor's expense and satisfy himself as to their accuracy. The Engineer shall not bear any responsibility for the accuracy of such other bench marks or reference point.

25.3 The Contractor may establish additional temporary bench marks for his own convenience but each temporary bench mark so established shall be of a design and in a location approved by the Engineer, and shall be accurately related to the bench marks established by the Engineer.

26. LINES AND GRADES

The Contractor shall establish all necessary lines and grades for the execution of the work under this Contract by means of suitable stakes and/or marks which will be on the site and pointed out to the Engineer. The Contractor shall thereafter maintain said stakes and/or marks in their established positions.

27. INFORMATION CONCERNING MATERIALS

As an amendment to Section 3 of the "GENERAL CONDITIONS", the Contractor, where required by the specifications or when called for by the Director, shall furnish, for approval, full information and satisfactory evidence as to the kind and quality of materials

or articles which the Contractor contemplates incorporating in the work. The Contractor shall furnish, when so directed, all samples for the approval of the Director. Samples submitted shall be in duplicate of adequate size showing quality, type, color, range, finish and texture and completely labeled with materials' name, quality, manufacturer's name, date, project name and other pertinent data. The work shall be done in accordance with approved samples.

28. PLACING ORDER OF ALL MATERIALS

The Contractor shall place orders for all materials, whether locally available or to be imported, sufficiently ahead of the schedule of their incorporation to the work to avoid delay in the completion of the project. No request for extension of time will be entertained by the Government in case of delay due to this cause and no substitution of materials will be allowed due to negligence or inadvertence of the Contractor for the same cause.

29. TESTING OF MATERIALS

All materials specified or intended for use in this project shall be tested and approved by the Materials Testing Laboratory of the Bureau of Public Works on the Contractor's account, prior to their incorporation into the work, unless otherwise specified.

30. DEFECTIVE MATERIALS

30.1 As a supplement to Section 7 of the "GENERAL CONDITIONS", materials brought to the site of the work found unsatisfactory and not in accordance with the agreement, plans and specifications shall be removed at once from the premises by the Contractor.

30.2 Should the Contractor fail to remove such materials, the Engineer may, after _____ days from date of serving notice, remove such materials and the expenses incurred thereon will be deducted from any amount due to the Contractor.

31. SUBSTITUTION OF MATERIALS

Materials may be substituted with their equivalent only in cases of non-availability of the items specified and subject to the written approval of the Director of Public Works; provided, however, that in the substitution of a cheaper kind of item than that specified, a reduction in the contract price, equal to the difference in direct or indirect cost of the two kinds of items will be made in favor of the Government. Local market prices as of the date upon which authority for said substitution is granted, shall be the basis of said reduction in the contract price. The Contractor shall submit a list of the items specified and the corresponding items to be substituted to the Director of Public Works for approval.

32. DEFECTIVE WORK

As a supplement to Section 7 of the "GENERAL CONDITIONS", any part of the work that has been done and is not of the quality required by the plans and specifications shall be torn down or removed immediately and re-built to meet plans and specification requirements without additive cost to the Government. Any remedial work to correct minor defects shall be approved by the subsequently undertaken under the direction of the Engineer.

33. WORK PROGRESS PHOTOGRAPHS AND PROGRESS REPORT

33.1 The Contractor shall furnish the Engineer at the Contractor's expense, work progress photographs which shall be taken monthly during the duration of the work.

33.2 The photographs shall be 6" x 8". At each period, four (4) exposures where directed by the Engineer shall be taken.

33.3 Eight (8) prints, dull finish, two copies for each exposure and all negatives bearing the date of exposure and name of the work shall be delivered to the Engineer.

33.4 No partial payment shall be considered for approval without the above-mentioned prints and negatives.

33.5 The Contractor shall, before the tenth (10) days of each month or at any time designated by the Engineer, submit five (5) copies of a monthly progress report in a form acceptable to the Engineer detailing the progress of the work during the preceding month.

34. CONTRACTOR'S INSURANCE AND SAFEGUARD

34.1 The Contractor shall be solely answerable for the safety, protection and security of his personnel, third parties, the public at large, the works, equipment, installation and the like, and the owners, persons or occupants of adjacent buildings or structures affected by reason of his construction works. The Contractor shall provide and maintain all necessary barricades, warning lights, danger signals and other signs and shall take all necessary precautions in accordance with the standards set by the Safety Organization of the Philippines and the Bureau of Labor Standards.

34.2 The Contractor shall obtain and maintain at his own expense the following insurance coverage:

34.2.1 Comprehensive insurance for third party liability due to the Contractor's direct or indirect act or omission causing damage to third person(s).

34.2.2 Employer's Liability and Workmen's Compensation for all the Contractor's employees. The Contractor may choose to be self-insured if prior approval of the Bureau of Labor is secured.

34.2.3 Fire, earthquake, flood and such perils as the Contractor may deem necessary for the construction plants, temporary works and materials to be used.

34.3 In case the Contractor fails to observe the above-mentioned safeguard, the Government may, at the Contractor's expense, take whatever measure is deemed necessary.

35. CASE OF WORKS

From the commencement to the completion of the works, the Contractor shall take full responsibility for the care thereof and all temporary works from any causes whatsoever (save special risk as defined) shall at his own cost repair and make good the same in order that at completion, the works shall be in good condition and in conformity in every respect with the requirements of the Contract and the instructions of the Engineer.

36. CLEANING-UP

The Contractor shall at all times keep the premises free from the accumulations of waste materials or rubbish caused by employees or work and shall remove, upon completion of the work, all rubbish from the construction site including all equipment, scaffolding and surplus materials and shall leave his work in a finished and neat condition to the satisfaction of the Engineer.

37. PATENT, RIGHT AND ROYALTIES

37.1 The Contractor shall save harmless and indemnify the Government from the against all claims and proceedings for or on account of infringement of any patent, right, design, trademark, or name or other protected rights in respect of any construction plant, machines, work or material used for or in connection with the Works or Temporary Works or any of them and from and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

37.2 Except otherwise specified, the Contractor shall pay all damages and other royalties, rent and other payments or compensation for getting stone, sand, gravel, clay or other materials required for the works or temporary works or both.

38. CONSTRUCTION PROGRAMME

38.1 The Contractor shall submit to the Engineer for his review not later than thirty (30) days after issuance of order to commencement of construction, a PERT/CPM diagram including the cost of prosecuting such activity which shall show the order, procedures, and methods in which the Contractor proposes to carry out the Work.

The Construction programme shall be prepared subject to be sufficiently completed within _____ calendar days from the date of issuance of order to commencement of construction.

39. TEMPORARY SUSPENSION OF WORK

39.1 The Engineer, subject to the approval of the Director of Public Works, shall have the authority to suspend the work wholly or in part by written order for such period as he may deem necessary due to adverse weather, to conditions considered unsuitable for the proper prosecution of the work, or for failure on the part of the Contractor to correct conditions that may impair the safety of workmen or the general public, to carry out orders given, or failure to perform any provision of the contract. The Contractor shall immediately comply with such order to suspend the work wholly or in part as directed.

39.2 In case of total suspension, that is, suspension of all work in the project, not due to the fault of the Contractor, the number of calendar days within the elapsed time between effective order to suspend operations and order to resume work shall be allowed as time extension to the Contractor. No time extension shall be allowed for partial suspension.

39.3 The Engineer when issuing the suspension and resume orders shall immediately furnish the Director a copy of such orders.

40. SUBSURFACE AND/OR LATENT CONDITIONS AT THE SITE

As a supplement to Section 22 of the "GENERAL CONDITIONS" the words "subsurface and/or latent conditions at the site" shall be construed to mean and to refer solely to conditions of unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and specifications. Any modification of the contract shall be made in accordance with Section 40.3, 42 and 45 and all claims must be asserted in writing.

41. CHANGES AND INCREASED OR DECREASED QUANTITIES OF WORK

41.1 It is mutually agreed that due to latent and/or unforeseen conditions, adjustment of plans to field conditions which cannot be foreseen at the time of advertisement will be necessary during construction, and it is therefore the essence of the contract, to recognize such changes in plans as constituting a normal and expected margin of adjustment not unusual and differing materially in the meaning of this Section regarding changes and increased or decreased quantities of work and not involving nor permitting change or modification of contract unit prices; provided that resulting overruns from the quantities in the proposal schedule do not exceed reasonable percentages.

41.2 It is further necessary and expedient that the contract fix within itself reasonable percentage limits (normal and expected) and the percentage limits so fixed are as follows:

41.2.1 If any or all items are changed resulting in a sum total change of 25 percent, or less, of the cost of the contract calculated from the original bid quantities and the original contract unit prices, such changes shall not be considered to involve or constitute an increase or decrease in the amount due the Contractor, or any adjustment thereof.

- 41.2.2 Within the above stated sum total change, any change involving overruns or underruns in the case of one or more items, regardless of percent, shall not be considered to involve or constitute an increase, or decrease, in the amount due the Contractor, or any adjustment thereof, save the payment of the actual quantities at the original contract unit prices.
- 41.2.3 In no case shall a waiver of contract unit prices apply to any item, the quantity of which is changed less than 15 percent from the quantity appearing in the proposal schedule.
- 41.3 It is agreed that, if demand is made by either party, overruns and underruns in any or all items resulting in a sum total change of more than 25 percent of the total cost of the contract calculated from the original bid quantities and the original contract unit prices, shall require a negotiated change order or supplemental agreement signed by both parties setting forth the necessity for the change and adjustment of unit price or prices agreed upon as satisfactory to both parties.
- 41.4 The Contract does not obligate the Contractor to perform at original contract unit prices, overruns or underruns generating a total in pesos of additional work of more than 25 percent of the original contract.
- 41.5 If, as a result of the change in nature of the performance of the work, said work becomes materially more expensive due to a more difficult procedure or method for construction and/or due to the consequent need of additional or different materials and/or equipment, such change, regardless of percent of decrease or increase from the original bid quantities, shall require a negotiated change order or supplemental agreement and an adjustment of unit prices (of the items involved) agreed upon as satisfactory to both parties.
- 41.6 In case both parties fail to come to an agreement, the Government has the right to award the work to another Contractor.

42. CHANGE CONDITIONS

42.1 The Contractor shall promptly, and before such conditions are disturbed, notify the Government in writing of:

- (a) Subsurface or latent physical conditions at the Site, differing materially from those indicated in the Contract, or
- (b) Unknown physical conditions at the Site of an unusual nature, differing materially from those ordinary encountered and generally recognized as inherent in work of the character provided for in the Contract.

42.2 The Government shall investigate the conditions, and if it finds that such conditions do so materially differ, and provided, that the Contractor has submitted a claim therefor, then the Government shall direct the Contractor to perform such additional or Extra Work as may be necessary and grant the Contractor extension of time as may be justified.

43. EXTRA AND FORCE ACCOUNT WORK

43.1 Issuance of Change Orders, Extra Work Orders and Supplemental Agreements: Change Order or Extra Work orders should not involve an additional total cost of more than 25% of the original contract price or adjusted original contract price. No Change Order or Extra Work Order may be issued on Negotiated Contracts if such change order or extra work order shall exceed the amount authorized by the President of the Philippines. A supplemental agreement may be issued for works immediately beyond the project limits but are immediately abutting the project.

43.2 The proposed Change Order, Extra Work Order or Supplemental Agreement shall be approved by the Secretary of the Department of Public Works, Transportation and Communications.

43.3 Extra Work will be paid for, either at a lump sum or at unit prices, agreed upon, or on the following force-account basis:

43.3.1 For all labor, teams, and foremen in direct charge of the specific operations, the Contractor shall receive the actual current local rate of wage, as evidenced by certified copies of the payrolls, for each and every hour said labor, teams, and foremen are actually engaged in such work, to which shall be added an amount equal to 15 percent of the sum thereof.

The wages of any foreman who is employed partly on force account work and partly on other work shall be pro-rated between the two classes of work according to the number of men employed under the supervision of said foreman on each class of work.

43.3.2 For all materials furnished and used by the Contractor, he shall receive the actual cost of such materials including transportation charges as shown by original receipt bills, to which shall be added 15 percent of said actual cost.

43.3.3 For any machinery or special equipment other than government-owned equipment, the Contractor shall be paid reasonable rentals at rates which shall include compensation for fuel and lubricants, agreed upon in writing before starting the work, and to which sum no percentage shall be added. No allowance shall be made for the use of small tools and manual equipment. For government-owned equipment, the Contractor shall be paid on a rental basis at rates which shall be equal to the rentals paid to the Government by the Contractor plus the cost of fuel and lubricants and to which total cost shall be added the sum of 15 percent of the cost of fuel and lubricants.

43.4 No allowance shall be given for general superintendence.

43.5 The compensation as herein provided shall be received by the Contractor as payment in full for extra work done on a force account basis. For all work done on force account basis, the Contractor shall furnish certified copies of the payroll, receipted bills, invoices of all materials, and such other detailed information as may be required by the Engineer.

43.6 All force account shall be adjusted daily upon duplicate report sheets prepared by the Engineer and signed by both parties, which daily reports shall thereafter be considered the true record of the force-account work done.

44. WORK ORDERS

44.1 Work orders are written orders signed by the Engineer, or by his designated representative, of a contractual status requiring performance by the Contractor without negotiation of any sort.

44.2 Work orders do not embrace any change of the character defined in Section 40.3 nor any extra work defined in Section 42.

44.3 Work orders are applicable in cases arising during the construction where no payment of funds is involved but where written instructions are necessary concerning features, payment for which has been or is to be otherwise made under the contract, as follows:

44.3.1 Work orders are applicable where it is necessary to issue written orders to perform work or furnish materials embraced under the original unchanged contract where the said performance or furnishing is by the terms of the specifications included under the bid price for some contract items as necessary or subsidiary elements thereof, and consequently, is not eligible for direct payment by its measured quantities multiplied by its unit price. These cases may arise where the said work has not been brought to the attention of the Contractor or for other reasons has been held by the Engineer to require the issuance of a written order to secure its proper execution under the contract.

44.3.2 Work orders are used to require performance of any change recognized by Section 40.2 and requiring written orders.

44.4 Since in all cases where work orders as herein defined are used, automatic agreement on the part of the Contractor is presumed as of the essence of the original contractual agreement, specific assent to such work orders upon receipt are binding upon the Contractor who shall thereupon acknowledge them merely to establish the fact of receipt and proceed with the execution thereof.

45. CLAIM FOR ADJUSTMENT

As a supplement to Section 23 of the "GENERAL CONDITIONS" the following provisions are applicable in this contract:

45.1 In any case where the Contractor deems extra compensation to be due him for work or materials not clearly covered in the contract, or not ordered by the Engineer as extra work defined in Section 42 hereof, the Contractor shall notify the Engineer in writing of his intention to make claim for such extra compensation before he begins the work on which he bases the claim. If such notification is not given, or the Engineer is not afforded proper facilities by the Contractor for keeping strict account of actual cost, then the Contractor hereby agrees to waive the claim for such extra compensation. Such notice by the Contractor, and the fact that the Engineer has kept the cost as aforesaid, shall not in any way be construed as proving the validity of the claim. The claim must be acted upon by the Director. In case the claim is found to be just, it shall be allowed and paid for as extra work.

45.2 Should the Government, at any time during the effectivity of a contract, impose, abolish, modify any tax, customs duties, license impost, fee or other similar charges, or enact, amend or repeal any law affecting the number of hours a labor permissible a day or the number of days a week or the wages or salaries to be paid to laborers and employees, which would directly increase or decrease the cost of materials or the cost of the construction work beyond or under the amount stipulated in the contract, or should there be any abnormal or extraordinary increase or decrease

in the cost of construction materials due to any cause beyond the control of either of both parties, the contract amount shall be re-adjusted accordingly by a committee, hereby created for this purpose: Provided that the party seeking adjustment shall first apply for same in writing stating therein the reasons justifying the change as well as the data computation in sufficient detail which would determine accurately the amount of the change: Provided, however, that for projects behind schedule, unless properly covered by extension of time, no adjustment shall be considered: And provided further that change is more than 5% of project cost and pertinent Presidential Decrees are complied with.

46. BASIS OF PAYMENTS

46.1 The quantities of contract item and/or volumes of work stipulated in the proposal are approximate and do not govern final payment. They are furnished primarily to enable the bidders to submit proposals which are to be used bases in comparing bids. Payments shall be made on the actual quantities of contract item and/or volumes of work performed in accordance with the plan and specifications and which shall be based on the unit prices or lump sum prices stipulated in the proposal schedule, subject, however, to the provisions of Sections 55, 56 and 58 of the "GENERAL CONDITIONS" and Sections 40, 42 and 45 hereof. Payment in accordance with the above paragraph shall be considered full compensation for furnishing all materials, labor, tools, equipment, and for performing all work contemplated and embraced under the contract. It shall also be considered full recompense to the Contractor for all losses or damages arising from the nature of the work or from the action of the elements or from unforeseen difficulties which may be encountered during the prosecution of the work until its final acceptance by the Engineer, for all risks of every description connected with the prosecution of work, and for all expenses during periods of suspension of work due to adjustment of plans to field conditions found necessary during construction and for all expenses incurred in consequence of the work as herein authorized.

46.2 The payments shall also be considered full compensation to the Contractor for premiums on bid and contract bonds, interest on loans and capital, and other incidental expenses incurred in the prosecution of the contract. The payment of any partial estimate or of any retained percentage, except by and under the approved final estimate and voucher shall in no way affect the obligations of the Contractor to repair or renew any defective part of the construction, or to replace and defective material, or to be responsible for all damages due to such defects.

46.3 For purposes of determining the amount of payments to be made, all measurements shall be to the nearest hundredth of the respective unit of measure in the proposal.

47. WORKS TO BE MEASURED

47.1 All works accepted as completed shall be measured by the Contractor in joint measurement with the Engineer. The measurement and value shall be checked and approved by the Engineer in accordance with the Contract and specifications.

47.2 The Contractor shall, when he requires any part or parts of the works to be measured, give reasonable notice to the Engineer who shall attend or send a qualified agent to make all such measurements jointly using the Contractor's equipment and personnel. In the event of disagreement concerning the measurement, the decision of the Engineer shall be final.

47.3 Where the permanent work has to be measure with the help of records and drawings, the Contractor shall prepare the records and drawings month by month of such work and submit to the Engineer for approval giving reasonably sufficient time for the Engineer to examine and approve such records and drawings. The Contractor shall furnish all particulars required by the Engineer while measurements are taken or when these measurements are being checked by the Engineer.

48. METHOD OF MEASUREMENT

48.1 The Works shall be measured notwithstanding any general or local custom except as otherwise specifically described or prescribed in the Contract. The measurement of the Works shall be performed on the basis of the Specifications and the Contract Drawings. If the site measurements exceed those indicated in the Specifications and the Drawings, such excess shall be on the personal account of the Contractor and he shall not be entitled to any compensation thereof unless such excess is in the interest of the work and accepted as such by the Engineer.

48.2 If the site measurements are below those indicated in the Specifications and Drawings the following principles shall be applied. Dimensions shown on the drawings are the minimum required in the interest of the work. Therefore if the tolerance exceeds the permissible limits set forth in the Specifications, then the Engineer shall have the right to reject such work. However, the Engineer in exceptional cases and at his own discretion and judgment may accept the said work with penalty to the Contractor provided that said deficiency will not adversely affect the safety of the work.

49. PAYMENT FOR INCREASED OR DECREASED QUANTITIES

49.1 Except as provided under Section 40 hereof, the Contractor shall accept as full compensation payment at the contract unit prices for the quantities of work actually done involving alterations in plans or quantities of work as herein provided, and no allowance will be made for anticipated profits.

49.2 Compensation for work performed under supplemental agreements, change orders or extra work orders shall be stipulated in such agreements or orders. Agreed price for any item on such agreements or orders shall not in any case be more than 15 percent in excess of cost as estimated by the Engineer. If the prices cannot be agreed upon, payment shall be made on force-account basis under Section 42 hereof.

50. CERTIFICATE AND PAYMENTS

50.1 The Contractor shall submit to the Government after the end of each month a statement, in a format approved by the Engineer, showing the estimated contract value of the work satisfactorily completed up to the end of each month and the Contractor shall be paid monthly on the certification of the Engineer and approval by the Government of the estimated contract value of the works satisfactorily completed during the month and in addition such amount as the Government may consider fair and reasonable for the Contractor's Construction Camp, Construction Plant and other Temporary Works for which a separate item is provided in the Bill of Quantities.

50.2 The Contractor shall include for payment in his monthly progress reports a reasonable estimate of percent completion of lump sum items subject to the Government's approval.

51. LIQUIDATED DAMAGES REGARDING CONTRACT TIME

The amount prescribed in Section 47 of the "GENERAL CONDITIONS", as liquidated damages is hereby declared and understood to include all losses and costs (including inspections and surcharges) of whatever nature the Government will sustain by reason of failure of the Contractor to complete the contract within the specified time.

52. NIGHT, SUNDAYS, HOLIDAYS AND OVERTIME

Work at night, on Sundays, on holidays, as overtime shall be governed by the pertinent laws and regulations and shall be the sole responsibility of the Contractor. All costs and expenses associated with work at night, on Sundays and Holidays as overtime shall be paid by the Contractor and will be included in the bid prices submitted by the Contractor for this Contract. The Government shall for its own account provided the necessary inspection/testing personnel to permit the prosecution of overtime work, notwithstanding the five-day work-per week schedule provided by law.

53. LAWS

In submitting proposals, the bidder/tenderer is considered to have familiarized himself with all laws, acts and regulations of the Philippines which in any manner may affect or apply to the operation and activities of the contractor under the Contract or in connection therewith. The Contractor shall be the employer of the personnel whom he will engage in the prosecution of the Contract Work and is under obligation to comply with the Labor Laws of the Philippines.

The following laws, rules and regulations with corresponding brief statements, thereon, are hereby made and acknowledged by the Parties hereto to be part of the contract and to be bound by the provisions thereof.

R.A. No. 912 - Requires use of Philippine made materials.

R.A. No. 1031 - Requires deduction of 3% percentage tax for contractor.

Sec. 13, R.A. No. 5979 - Requires giving of preference to laborers in place where project is undertaken.

Sec. 2 & 3 R.A. No. 1374 - Provides for employment of laborers under the "Paquias" or "Takay" System.

Sec. 2, C.A. No. 444 - Prescribes eight (8) hours a day with 25% additional for work beyond eight hours.

R.A. No. 4629 - Requires minimum pay of P13.00 a day.

Sec. 10, (a) & (b), R.A. 5979 - Re-payment of wages of laborers by contractors and adjustment of contract price.

Act. No. 3628 - Requires of posting of bond for contract to guarantee work and payment of wages and materials.

Act. No. 3428 - as amended - Requires payment of claims for compensation for injury, sickness or death.

R.A. 5119 - Requires payment of additional 5% of compensation in case of failure to pay the same.

Act. No. 1874 - Requires employer to pay damages sustained by laborers in case of injury, sickness or death.

Article 1711, 1712, 1726, Civil Code of the Philippines - Require-employer to pay compensation for injuries or death of laborers and holds employer liable for claims of laborers.

Adm. Order No. 81, s. 1964 of the President - Prohibiting giving money or gift to secure contract and provided cancellation of contract as penalty for violations,

Res. of Committee on Awards - Proposes Award of Contract

R.A. No. 446 - Prohibit work on any Sunday, Christmas Day, New Year's Day, Holy Thursday and Good Friday except upon authority of the Secretary of Labor.

Acceptance and Award - Acceptance of Award by Contractor.

P.D. 1594 - Prescribing Policies, Guidelines, Rules & Regulations for Government Infrastructure Contracts.

54. CONTRACT DOCUMENTS

The contract documents shall consists of the following:

- (1) Invitation to Bid
- (2) Supplementary General Conditions and Information for Bidders
- (3) Instruction to Bidders
- (4) General Conditions

- (5) Technical Specifications
- (6) Drawings or Set of Plans
- (7) Certificate of Availability of Funds
- (8) Proposal
- (9) Bids and Abstract of Bids
- (10) Resolution of the Committee on Pre-qualification and Awards
- (11) Letter of Award from the Director of Public Works
- (12) Contractor's Letter of Acceptance of the Award
- (13) Contractor's Performance Bond
- (14) Certification of the Insurance Commissioner as to the soundness of the Surety Bond
- (15) Certificate of Cash Deposit and Credit Line
- (16) Contractor's License
- (17) PERT/CPM Diagrams
- (18) Contract 9or Agreement) Including All Modifications Thereof Incorporated in the Contract Documents before their Execution

D. PROPOSAL FORMS

PROPOSAL FORM

Construction of Sabo Facilities of the Pawa-Burabod River, a
Tributary of the Yawa River under the Mayon Volcano Sabo and Flood
Control Project, Manila _____, 1980.

To the Director of Public Works:

SIR: In accordance with your advertisement inviting proposals for the Construction of Sabo Facilities of the Pawa-Burabod River Bid Schedule, and subject to all the conditions and requirements thereof and of your plans and specifications, which so far as they relate to this proposal, are made a part thereof, we (or I) propose to furnish all labor, plant, equipment and materials to construct complete the Construction as per the items of work specified in the attached Proposal Schedule (Bill of Quantities).

We (or I) make this proposal with a full knowledge of the kind, quantity and quality of the articles and services required and if said proposal is accepted, will after receiving written notice of such, enter into contract within five (5) calendar days, with good and sufficient securities for the faithful performance thereof.

We (or I) enclose herewith _____ in the sum of _____ Pesos (P_____) which is to be returned if this proposal is rejected, or retained if accepted, as security until the execution and delivery of a satisfactory performance bond in the sum of twenty per centum (20%) of the total contract price for the full and faithful performance of the contract.

We (or I) will build and complete the work in accordance with the plans and specifications within _____ calendar days and contract time shall begin after the tenth calendar day following the date of the letter notifying us (or me) to commence work.

BIDDER: _____

By: SIGNATURE: _____

P.O. ADDRESS: _____

E. PROPOSAL SCHEDULE
(BILL OF QUANTITIES)

PROPOSAL SCHEDULE

1. PREAMBLE

1.1 Bill of Quantities in Proposal Schedule shall be read in conjunction with the Tender Document, the General Specification, the Technical Specification, the Instructions to Tenderers and Drawings. The Tenderer shall be deemed to have acquainted himself with the detailed description of the Works to be done and the way in which they shall be carried out and the requirements and standards of the finished works.

1.2 The brief description of the items given in the Bill of Quantities is purely for the purpose of the identification and in no way modifies and supersedes the detailed description given in the General Specifications and Technical Specifications.

2. GENERAL

2.1 PRICING

The Tenderer shall before pricing satisfy himself as to the meaning of every item in the Bill of Quantities, and the rates and prices inserted by him shall be deemed to cover all his obligations under the Contract and all other matters and things necessary for the proper construction, completion and maintenance of the Works, together with any temporary works and installations which may be necessary, and all general risks and liabilities set forth or implied in the documents on which the Tender is based.

Reference in the Bill of Quantities to items in the Technical Specifications and the General Specifications are for guidance only and shall not relieve the Contractor of observing all other relevant stipulations in the Contract Documents. No claim for additional payment will be allowed for any error or misunderstanding by the Tenderer in these respect.

The unit price shall be inserted in ink against each item in the Bill of Quantities and Schedule of Rates whether quantities are stated or not.

If there is any discrepancy between the Rate and the Amount entered for any item in the Schedule of Rates, the Rate shall be taken as correct.

Except where clearly indicates to the contrary in an item in the Bill of Quantities or in the Specification; all measurements shall be net in accordance with the Drawings with no allowance for waste.

Any additional labour, transport or materials required to make good defective work or used in repair or maintenance shall be at the expense of the Contractor and shall not be taken into account when determining the sum to be paid for each item or section of the Works.

No alterations shall be made to the Bill of Quantities and no extra item shall be inserted.

Further details of the unit rates and lump sum prices in the Bill of Quantities shall be submitted upon request of the Engineer. Such details shall comply with the Form attached hereto.

2.2 QUANTITIES

The quantities set forth in the Bill of Quantities are to be considered approximate only, but are believed to represent the character and magnitude of the work to be carried out, and are given for the purpose of enabling the Employer to compare Tenders on an equal basis. The quantities shall not be taken as the actual and the correct quantities of the works to be executed under the Contract.

The unit prices will not be subject to revision in case of differences between the indicated quantities and executed quantities. All work shall be measured net, unless otherwise specified, and the measurement shall only apply to entirely

finished works. Work executed in excess of what is specified, indicated on the Drawings or ordered by the Engineer will not be paid for.

All works shall be measured by the Contractor, which measurements shall be checked and approved by the Engineer. Permanent work shall not be covered up by backfilling until after the measurements have been approved.

2.3 VARIATION IN PRICES

The unit prices and rates entered in the Bill of Quantities are fixed and shall be considered to reflect cost present and anticipated throughout the duration of the Contract. No additional payment will be made for cost increases that can reasonably be foreseen: Only in the case of major economic crises resulting in monetary dislocation may prices be adjusted.

2.4 ALTERNATIVES

Tenderers shall base their tenders exclusively on the design and specifications stated in the Tender Documents.

PROPOSAL SCHEDULE

CONSTRUCTION OF SABO FACILITIES
OF
THE PAMA-BURABOD RIVER
A TRIBUTARY OF THE YAWA RIVER

SUMMARY OF COST

<u>Description</u>	<u>Construction Cost</u> <u>(PESOS)</u>
<u>Direct Cost</u>	
Section-1 General	
Section-2 Sabo Dam	
Section-3 Spur Dike No. 1	
Section-4 Spur Dike No. 2	
Section-5 Levee	
Section-6 Groundsill, Type A	
Section-7 Groundsill, Type B	
Section-8 Irrigation Take	
Sub Total	
<u>Indirect Cost</u>	
Contingency (_____ %)	
Contractor's Profit (_____ %)	
Surcharges (_____ %)	
Sub Total	
<u>Grand Total</u>	

Total tender sum, in words _____

Date _____

Signature _____

BILL OF QUANTITIES

SECTION - 1

GENERAL

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
1.01	Access road for Sabo dam	Lump	Sum			
1.02	Temporary Buildings	Lump	Sum			
1.03	Electric Supply	Lump	Sum			
1.04	Water Supply	Lump	Sum			
1.05	Geological Investiga- tion Check Survey and Redesign	Lump	Sum			
<hr/>						
Grand Total to General						

SECTION - 2

SABO DAM (Main and Sub Dam)

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Earthwork</u>						
2.01	Excavation, in com- mon, in foundation of main dam	7,300	cu.m			
2.02	Excavation, in com- mon, in foundation of sub dam	4,300	cu.m			
2.03	Excavation, in rock, in foundation of main dam	250	cu.m			
2.04	Excavation, in rock, in foundation of sub-dam	130	cu.m			
2.05	Backfill for main dam and sub dam	840	cu.m			

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Concrete and Formwork</u>						
2.06	Concrete, type A, in main dam	320	cu.m			
2.07	Concrete, type A, in sub dam	230	cu.m			
2.08	Rubble concrete, in main dam	4,900	cu.m			
2.09	Rubble concrete, in sub dam	940	cu.m			
2.10	Backfill concrete, type B, in main dam	530	cu.m			
2.11	Backfill concrete, type B, in sub dam	250	cu.m			
2.12	Form work, F2 finish, in main dam	1,400	sq.m			
2.13	Form work, F2 finish, in sub dam	420	sq.m			
2.14	Form work, F1 finish, in main dam	1,400	sq.m			
2.15	Form work, F1 finish, in sub dam	350	sq.m			
<u>Miscellaneous</u>						
2.16	Furnishing and placing 300 mm. dia concrete drain pipe in main dam	11	lin.m			
2.17	Furnishing and installing water stop in main dam	40	lin.m			
2.18	Furnishing and placing joint filler in main dam	220	sq.m			
2.19	Furnishing and placing joint filler in sub dam	40	sq.m			
<hr/>						
Grand Total to Sabo Dam						
<hr/>						

SECTION - 3

SPUR DIKE NO. 1

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Earthwork</u>						
3.01	Excavation, in common, at the toe of embankment	3,590	cu.m			
3.02	Embankment for spur dike	1,720	cu.m			
3.03	Backfilling cobble stone behind wet masonry	1,280	cu.m			
3.04	Riprap bedding	470	cu.m			
3.05	Backfill under ground surface	1,990	cu.m			
<u>Concrete and Formwork</u>						
3.06	Concrete, type B, in foot protection block	110	cu.m			
3.07	Concrete, type B, at crest of embankment	260	cu.m			
3.08	Concrete, type B, in foundation of wet masonry	190	cu.m			
3.09	Formwork F1 finish, in foot protection block	440	sq.m			
3.10	Formwork F1 finish, in foundation of wet masonry	670	sq.m			
3.11	Formwork F1 finish for concrete in joint	100	sq.m			
3.12	Formwork F1 finish for concrete in back-filling	2,290	sq.m			
<u>Wet Masonry</u>						
3.13	Backfill Concrete, type B, behind wet masonry	920	cu.m			
3.14	Wet-rubble masonry	2,290	sq.m			
3.15	Inter locking mortar in wet masonry	120	cu.m			
3.16	Joint filler	100	sq.m			
3.17	Reinforcing bar 16 mm dia.	0.21	ton			
<hr/>						
Grand Total to Spur Dike No.1						

SECTION - 4

SPUR DIKE NO. 2

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Earthwork</u>						
4.01	Excavation, in common, at the toe of embankment	4,310	cu.m			
4.02	Embankment for spur dike	1,130	cu.m			
4.03	Riprap bedding	380	cu.m			
4.04	Backfill under ground surface	1,600	cu.m			
4.05	Backfill cobble stone behind wet masonry	790	cu.m			
<u>Concrete and Formwork</u>						
4.06	Concrete, type B, in foot protection block	330	cu.m			
4.07	Concrete, type B, at crest of embankment	200	cu.m			
4.08	Concrete, type B, in foundation of wet masonry	160	cu.m			
4.09	Formwork F1 finish, in foot protection block	1,320	sq.m			
4.10	Formwork F1 finish, in foundation of wet masonry	530	sq.m			
4.11	Formwork F1 finish, for concrete joint wet masonry	70	sq.m			
4.12	Formwork F1 finish, for concrete in backfilling	1,720	sq.m			
<u>Wet Masonry</u>						
4.13	Backfill concrete, type B, behind wet masonry	560	sq.m			
4.14	Wet-rubble masonry	1,720	cu.m			
4.15	Joint filler	70	sq.m			
4.16	Inter locking mortar in wet masonry	90	cu.m			
4.17	Reinforcing bar 16 mm dia	0.51	ton			
<hr/>						
Grand Total to Spur Dike No.2						

SECTION - 5

LEVEE

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: GEN
<u>Earthwork</u>						
5.01	Excavation, in common, in foundation of levee and river bed	87,900	cu.m			
5.02	Embankment for levee	62,800	cu.m			
5.03	Backfill cobble stone behind wet masonry and at toe of levee	13,280	cu.m			
5.04	Filling rubble, in cribwork	14,147	cu.m			
5.05	Backfill in cribwork	10,561	cu.m			
<u>Concrete and Formwork</u>						
5.06	Concrete, type B, in top protection block	380	cu.m			
5.07	Backfill concrete, type B, behind wet masonry	4,857	cu.m			
5.08	Concrete, type B, in foundation of wet masonry	3,895	cu.m			
5.09	Formwork F1 finish, in top protection block	1,855	sq.m			
5.10	Formwork F1 finish, in wet masonry	1,676	sq.m			
5.11	Formwork F1 finish, in foundation of wet masonry	8,191	sq.m			
<u>Cribwork</u>						
5.12	Coconut trunk	151,049	lin.m			
5.13	Split bamboo	279,720	lin.m			
5.14	Reinforcing bar, 12 mm. dia.	23.4	ton			

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Miscellaneous</u>						
5.15	Joint filler, in top protection block	19	sq.m			
5.16	Joint filler, in wet masonry	489	sq.m			
5.17	Joint filler, in foundation of wet masonry	196	sq.m			
5.18	Weep hole, 5 cm. dia.	716	lin.m			
<u>Wet Masonry</u>						
5.19	Wet masonry	32,382	sq.m			
<hr/>						
Grand Total to Levee						
<hr/>						

SECTION - 6

GROUNDSILL, TYPE - A

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Earthwork</u>						
6.01	Excavation, in common	3,182	cu.m			
6.02	Backfill, in groundsill	441	cu.m			
6.03	Filling rubble, in cribwork	1,962	cu.m			
<u>Cribwork</u>						
6.04	Coconut trunk	20,952	lin.m			
6.05	Split bamboo	38,800	lin.m			
6.06	Reinforcing bar, 12 mm. dia.	3.5	ton			
<hr/>						
Grand Total to Groundsill, Type A						
<hr/>						

SECTION - 7
GROUNDSILL, TYPE - B

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Earthwork</u>						
7.01	Excavation, in common	1,165	cu.m			
7.02	Backfill, in ground-sill	161	cu.m			
7.03	Filling rubble, in cross concrete block	864	cu.m			
<u>Cross Concrete Block</u>						
7.04	Concrete, Type A	427	cu.m			
7.05	Formwork Fl finish	1,952	sq.m			
7.06	Reinforcing bar	8.0	ton			
<hr/>						
Grand Total to Groundsill, Type B						
<hr/>						

SECTION - 8

IRRIGATION INTAKE

Item No.	Description	Quantity	Unit	Rate	Amount	
					PESO	: CEN
<u>Concrete and Formwork</u>						
8.01	Concrete, Type C, in intake	9.4	cu.m			
8.02	Concrete, Type C, in sedimentary tank	7.2	cu.m			
8.03	Formwork F1 finish, in intake	37	sq.m			
8.04	Formwork F2 finish, in intake	12	sq.m			
8.05	Formwork F1 finish, in sedimentary tank	22	sq.m			
8.06	Formwork F2 finish, in sedimentary tank	15	sq.m			
<u>Furnishing and Placing bars</u>						
8.07	Reinforcing bar, in intake	0.61	ton			
8.08	Reinforcing bar, in sedimentary tank	0.63	ton			
<u>Miscellaneous</u>						
8.09	Finishing and placing 600 mm. dia. concrete drain pipe	8.0	lin.m			
<hr/>						
Grand Total to Irrigation Intake						
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VOLUME II

VOLUME II

TECHNICAL SPECIFICATION

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SECTION 1 GENERAL

1.1 General

This Specification applies for construction of Sabo facilities of the Pawa-Burabod river, a tributary of the Yawa river, under the Mayon Volcano Sabo and Flood Control Project. All work required by this Specification shall conform strictly to the accompanying "Drawings".

1.2 Description of Works

The principal items of work to be executed under this specification include all preparatory work and main construction work for the following Sabo facilities.

- 1) A main dam 10.00 m high by 79.50 m long, a sub dam 5.00 m high by 57.50 m long, comprising a total of 7,170 cu.m of concrete.
- 2) Spur dike No.1 200.00 m long, comprising 1,720 cu.m of embankment and 2,290 sq.m of wet masonry, spur dike No.2 162.00 m long, comprising 1,130 cu.m of embankment and 1,720 sq.m of wet masonry.
- 3) Levee 3,956.00 m long, comprising 62,800 cu.m of embankment, 32,380 sq.m of wet masonry and 6,993 nos. of crib work.
- 4) Groundsills are classified into two types, one is type A, 970 nos. of crib work and the other is type B, 305 nos. of crib work.
- 5) An irrigation intake is of concrete structure.

1.3 Site Exploration

The exploration shall be carried out to check the sub-surface conditions by the Contractor at the various work site, by means of boring, drilling exploratory holes, excavating trial pits, soil sampling and field testing, whenever considered additionally necessary.

The Contractor shall execute geological investigation for the dam foundation as directed by the Engineer, and shall prepare revised design of the Sabo dam taking into account the results of the investigation. The design of Sabo dam prepared by the Contractor shall be subject to the approval of the Engineer.

1.4 Materials to be Furnished by the Contractor

- 1) The Contractor shall furnish all materials required for carrying out the Works, and the cost of furnishing, hauling, storing and handling such materials shall be included in the unit prices for the various items tendered in the Schedules.
- 2) All materials that will become part of the completed works shall conform to this Specification. Where the requirements for any materials are not stated in this Specification, the materials shall conform with the appropriate and current international or national specification approved by the Engineer.
- 3) Materials furnished by the Contractor, which will become part of the completed works, shall be subject to inspection, examination and test when required.

1.5 Access Road

The Contractor shall provide, construct and maintain the access road, during the construction works. The access road is required to lead into the site of Sabo dam from the Bonga village.

The temporary access roads shall be constructed approximately 4,000 meters and effective width of access roads is 5.50 meters. Typical alignments and cross section of temporary access roads are not shown on the Drawings, the Contractor shall submit route alignment and general particulars of the access road to the Engineer for his approval.

1.6 Temporary Buildings and Yards

The Contractor at his own expense shall provide, maintain and subsequently remove where directed, such temporary buildings as the Contractor's office, workshops, quarters, labour camps and other buildings necessary for the execution of the works. The Contractor shall submit site plans and general particulars of temporary buildings to the Engineer for his approval. The construction of temporary buildings shall not be started without the Engineer's approval.

The Contractor shall also provide, maintain and subsequently remove where directed, temporary accommodation and living facilities for his employees or staff, including all necessary services for water supply, drainage, lighting etc. as approved by the Engineer. And the Contractor shall install at his own expense at least two (2) telephones in the office.

1.7 Contractor's Construction Plant, Equipment and Facilities

The Contractor shall provide and operate the undermentioned plant, equipment and facilities at his own expense for construction of the Works under the conditions specified hereinafter, and the cost of providing, operating and maintaining all construction plant, equipment and facilities shall be included in the unit prices for the various items tendered in the Schedules.

1.7.1 Cement storehouse

- 1) Cement shall be stored, immediately upon arrival on the site of the work, in substantial, dampper of storehouses, with a floor raised from the ground sufficiently high more than 0.3 meter to be free from dampness.
- 2) The cement storehouse shall have a capacity of about 3-7 days in daily required quantity at least.

- 3) Cement shall be stored in such a manner that the "first in" can be "first out".
- 4) Not more than thirteen (13) bags of cement shall be permitted to be piled up and this number shall be limited to seven (7) bags when the storage is expected to be longer than two (2) months. These bags of cement shall be piled up or stored so as to permit easy access for identification, inspection and testing.

1.7.2 Aggregate stockyard

- 1) Aggregate shall be stored in the stockyard having a capacity of about 3-7 days in daily requirement of peak period.
- 2) The stockyard shall be well drained, be protected from strong direct sun rays and be avoided the inclusion of foreign materials.

1.7.3 Reinforcement stockyard

Steel reinforcement bars shall be placed in racks raised above the ground and away from moisture and vegetation.

1.7.4 Water supply and drain facility

- 1) The adequate water supply system shall be installed, operated and maintained at all labor camps, offices, and places of work on the site.
- 2) Water supply facility shall have enough capacity and head to carry out such works as cleaning work of the dam foundation, concrete manufacturing, concrete curing, etc.
- 3) Water drain facility shall have mobility and enough capacity to take care of water in the structure foundation in early time.
- 4) The Contractor shall provide and pay for all water consumption and shall submit the plan of water supply to the Engineer for his approval.

1.7.5 Concrete mixing plant

- 1) The concrete mixing plant shall be the plant to weigh the materials and produce such a homogeneous concrete or mortar as required in this Specification.
- 2) The concrete mixing plant shall be located in a site closed to the dam site so as to facilitate transportation of the materials and concrete.

1.7.6 Electricity supply and air supply facility

- 1) The Contractor shall furnish at his own expense all temporary light and power, complete with all wiring, lamps and similar equipment as required for the completion of the work.
- 2) Electricity supply facility shall have enough capacity to operate the whole electric driven machine and equipment simultaneously, and shall be provided with sufficient spare parts and materials to cope with electric trouble.
- 3) Air supply facility shall have enough capacity for the carrying out of the Works.
- 4) The Contractor shall submit the plan of electricity supply to the Engineer for his approval.

1.8 Payment

- (1) Payment for the preparatory works, involved in Paragraphs 1.3, 1.4, 1.5, 1.6 and 1.7 will be made in accordance with monthly progress of the each work item of the "Works" for which the prices were tendered.
- (2) No damages due to flood and others during construction period will be compensated except a case due to the cause construed as force majeure.
- (3) Payment for the geological investigation, check survey and redesign of Sabo dam will be made in accordance with monthly progress of the "Works" for which the prices were tendered.

SECTION 2 EARTHWORK

2.1 Clearing Works Area

- 1) Such portions of the sites of embankments, borrow pits, excavation to be used for embankment material, and other areas, as the Engineer may designate shall be cleared of all trees, bamboo clusters, stumps, brush, roots, vegetation, logs, rubbish, and other similar encumbrances, except such trees and brush as may be designated by the Engineer for preservation.
- 2) On areas required for foundation, or structural excavation, all trees, stumps, roots, etc., shall be removed to a depth of at least 30 centimeters below the finished surface of the required grades and lines.
- 3) Materials from clearing operations shall be removed from the site of the work before the date of completion, or otherwise disposed of as approved.
- 4) The entire cost of clearing shall be included in the unit prices per cubic meter of excavation in open cut tendered in the Schedule.

2.2 Stripping

- 1) Stripping shall include the excavation within the area to be covered by embankment, if all top soil, peat, grass, weeds, muck, boulders, loose rock, perishable or otherwise objectionable matter, to such depths as may be ordered, in order that the earth embankment may be suitably bounded to a satisfactory natural foundation.
- 2) Unless otherwise specifically provided stripping will not be paid for directly. The entire cost of stripping shall be

included in the unit prices per cubic meters of excavation in open cut tendered in the Schedule.

2.3 Excavation

2.3.1 General

All excavation shall be carried out to the lines and level shown on the Drawings. The permanent excavations shall be trimmed to the levels and dimensions shown on the Drawing.

Before commencing excavation, the entire area shall be surveyed and levels determined at which excavation is to be carried out. The bench marks shall be used in such survey works. The surface levels so determined shall be subject to the Drawing.

Excavation in open cut will be classified for measurement and payment as follows:

(a) Excavation, in common

Excavation in common is the excavation of all material that can be efficiently excavated with neither ripping nor blasting.

(b) Excavation, in rock

Excavation in rock is the excavation of all materials that cannot be efficiently excavated without blasting and ripping.

2.3.2 Protection of Excavation

All planking, strutting and supports necessary to retain the sides of the excavations shall be provided, erected and maintained in a safe condition by the Contractor.

2.3.3 Excavation beyond True Lines

- 1) If for any reason the excavation other than for concrete work is carried out beyond the true line and level, such excavation shall be made good to the required line and level with proper material and in an appropriate manner as approved by the Engineer.

- 2) If for any reason the excavation for concrete works is carried out beyond the true line and level, such excavation shall be filled in to the required line and level with concrete similar in grade to that intended to be used in the true excavation.

2.3.4 Excavation for Structures

- (1) In excavation of the bottom and side slope upon or against which concrete is to be placed shall be excavated with care so as not to disturb the materials beneath or beyond the established excavation line.
- (2) After an excavation to the required lines of the structure foundation except rock foundation, excavated surface shall be compacted and consolidated with a tamper or other appropriate equipment so as to increase bearing strength of the foundation prior to concrete placing.
- (3) Whenever an excavation approaches its final line and further blasting may injure the rock upon or against which concrete is to be placed, the use of explosives shall be discontinued leaving more than 1.0 m of rock, and excavation shall be completed by wedging, barring, channeling, broaching and other suitable methods.

2.3.5 Blasting

- 1) All blasting operations shall be carried out using the standard blasting warning code in the Republic of the Philippines. Protected detonators shall be used in all blasting operations done by electric firing. Blasting will be permitted only after adequate provisions have been made for the protection of persons, the works, and public or private property. Damages to the works or to public or private property by blasting shall be repaired by and at the expense of the Contractor.

- 2) All blasting operations shall be strictly conducted in accordance with existing ordinances and regulations relative to blasting and the storage and use of explosives.
- 3) The blasting operations shall be conducted under the most careful supervision and shall be done only by experienced men. Sufficient warning shall be given to all persons in the vicinity of the work before blasting. The time of blasting and the number and size of charges shall be satisfactory to the Engineer.

2.3.6 Payment

Payment for the various items of excavation in open cut will be made at the applicable unit prices per cubic metre tendered therefore in the Schedule. These unit prices shall include the entire cost of clearing, of blasting, of excavating and transporting the materials from the excavation to disposal. No payment will be made for the additional excavation due to flood and others during construction period except a case due to cause construed as force majeure.

2.4 Disposal of Excavated Materials

- 1) Excavated materials, if suitable in the opinion of the Engineer, shall be used as much as possible for backfill for the structures and for embankment of the Fill-Embankment. Unsuitable materials and materials in excess of the embankment requirement shall be disposed at the places as directed by the Engineer.
- 2) Spoil unfit for re-use shall be removed to the designated area, trimming and regulate the spoil tips to profiles and levels as directed by the Engineer.
- 3) The cost of wasting of the materials removed in excavation shall be included in the various unit prices tendered in the Schedule for excavation.

2.5 Backfill

- 1) The Contractor shall place backfill to the locations where mentioned on the Drawing. Backfill for the Sabo dam on the Drawing shall be placed on the backfill concrete. Materials to be used for backfill shall be the selected and suitable materials from excavated material and riverbed material.
- 2) Backfilling shall, unless otherwise specified, be carried out with suitable materials and shall be well compacted in 30-50 centimeter horizontal layers and be moistened. The maximum size of any rock placed in the backfilling shall be 20 centimeters and topsoil, vegetation or other organic materials shall be excluded from backfilling materials.
- 3) Backfilling materials adjacent to structures shall be placed in such a manner as to ensure that they can be satisfactorily compacted without damage to the structures. Compaction adjacent to all structures shall be carried out by hand or by suitable hand operated compactor.
- 4) Payment for backfill will be made at the unit price per cubic meter tendered therefor in the Schedule.

2.6 Embankment

- 1) The term Embankment under this section shall be used to include embankments for levee and dikes built from materials taken from excavation and/or riverbed material.
- 2) Unless otherwise directed, the sites of embankments shall be prepared as regards clearing and grubbing and soil stripping as provided under Sections 2.1 and 2.2, respectively, to the end that all perishable or otherwise objectionable matter shall be removed. When, in the opinion of the Engineer, sufficient soil has been removed, and material has been uncovered to provide suitable foundation for the purposes intended, the surface of the material so uncovered shall be picked, plowed, or otherwise satisfactorily roughened, as directed, to make a bond with the

embankment material. Where embankment is joined to a fill previously placed, or to a natural bank, a satisfactory bond shall be secured between the old and new materials by breaking the old surface or otherwise.

- 3) Springs encountered in the base of the embankments shall be satisfactorily controlled by plugging, draining, or other approved methods.
- 4) No embankment material shall be placed until the foundation has been approved by the Engineer. All timber, posts, trestles, staging, etc., shall be removed to the extent directed by the Engineer.
- 5) Embankments shall be made of acceptable materials from the excavations, or from riverbed. Such materials shall contain a sufficient proportion of fine particles to render the embankment reasonably impervious to water. The maximum size, quantity, and placing of large stones, shall be as allowed by the Engineer. The material shall be sufficiently stable not to slide or slough at the prescribed slopes, under condition of saturation. Care shall be taken that no earth not acceptable for embankment purposes, or any roots, bush or other perishable material be incorporated within the embankment. Lumps of excavated material shall be broken down to such a size and riverbed material shall be selected to such a size that they will not interfere with the compaction of material, it shall not contain any particle size greater than 20 centimeters in size.
- 6) The embankment shall be carried up in approximately horizontal layers for the full width of the embankment and extending through a fill section of not less than 20 meters long. Each layer shall not exceed 30 centimeters in thickness and shall be compacted by not less than 4 passes of smooth-wheeled vibrating roller or an approved compacting equipment or by some other means satisfactory to the Engineer. Embankment material containing excess moisture shall be permitted to dry to the proper consistency before being compacted. The material if dry

shall be moistened before it is compacted. Such precautions shall be taken as will preserve the slopes and prevent improper segregation of materials.

- 7) The finished surfaces of the top and sides of the embankment present an even and neat appearance. The alignment, bank height and regularity of surface shall be as shown on the Drawing and shall be trimmed as necessary.
- 8) Payment for the embankment will be made at the applicable unit prices per cubic meter tendered therefor in the Schedule. The unit prices shall include the entire cost of excavating, selecting, transporting, spreading, watering, drying, compacting and grading. Fill material shall be measured as the volume after compaction in the levee and dikes between the levels of acceptable foundations and the profile as shown on the Drawings.

2.7 Backfilling Cobble Stone

- 1) Backfilling cobble stone behind wet masonry shall be placed on the slope of levee and spur dike and its thickness shall conform to the grade and dimension on the Drawings. Material used for the cobble stone shall be clean durable gravel or crushed stone uniformly graded.
- 2) Sand and gravel layers shall be constructed directly on the slope surface of the earthfill. The material shall be spread and compacted to a thickness more than 10 centimeters by hand or by suitable hand operated equipment.
- 3) The quantity of backfilling cobble stone to be paid for shall be the volume in cubic meters actually placed within the prescribed limit shown on the Drawings.

2.8 Filling Rubble

- 1) Cribwork for levee and ground-sill are shown on the Drawings. Voids of these structures shall be filled with stone and gravel. The stone and gravel used for such filling shall be

hard and durable and shall be obtained as rubble from riverbed and as selected material from the excavation.

- 2) The stone and gravel shall be placed on the bottom of the void and compacted. The thickness of the stone and gravel layer shall not be less than 30 centimeter, and the stone which shall be placed on the gravel layer may be of random size but no stone shall weigh less than 35 kilograms and their depth must not be less than 30 centimeters. The stone shall be placed with machinery and hand set firmly in place at right angles to the exposed surface and all interstices shall be filled with clean gravel with a minimum size of 50 millimeters and well rammed into place. Placing of such stones and gravels shall be made so as not to damage the crib and concrete block.
- 3) Payment for filling rubble will be made at the unit price per cubic meter tendered therefore in the Schedule.

2.9 Riprap Bedding

- 1) Riprap bedding shall be placed at the toe of embankment and its thickness and width shall conform to the grade and dimensions shown on the Drawings. Material used for the riprap bedding shall be clean durable gravel or crushed stone uniformly graded from 80 mm. to 300 mm. size and shall be obtained from riverbed
- 2) The material shall be spread and the compacted thickness of the riprap layer shall be more than 50 centimeters. The materials shall be dumped and graded off in a manner to ensure that the larger stone/rock fragments will be distributed uniformly among the smaller stone/rock fragments resulting in a uniform protective layer of the specified thickness.
- 3) Payment for riprap bedding will be made at the unit price per cubic meter tendered therefor in the Schedule.

SECTION 3 CONCRETE WORK

3.1 General

- 1) All concrete work shall be performed as established on the Drawings and shall be carried out in the presence of an inspector.
- 2) Concrete for structures specified in this contract, the measuring of concrete materials and proportioning of concrete mixes, the mixing, handling and placing, finishing, and curing of concrete, including the placing and removal of forms, shall conform to the respective requirements in this specification.
- 3) Where rubble concrete is specified, large stones of acceptable size shall be imbedded in concrete and shall be thoroughly incorporated in this mass and surrounded by an acceptable thickness of concrete. The stones shall be sound, hard, non-oil bearing, and of a kind known to be durable and shall be subject to the Engineer's approval. Stones shall be cleaned and thoroughly wetted before being imbedded. Unless otherwise provided on the Drawings, concrete for rubble concrete shall conform to the requirements of Type A concrete and the rubble volume shall be less than 25 percent of concrete volume.

3.2 Composition

3.2.1 Maximum Size Aggregate

The maximum size of aggregate for any part of the work shall be the largest of the specified sizes the use of which is practicable from the standpoint of satisfactory consolidation of the concrete by vibration. The maximum size aggregate shall be as designated in Clause 3.2.2. The maximum size of rubble aggregate shall be as designated in Clause 3.5.4. If, for the Contractor's convenience, smaller maximum size aggregate is used, the resulting increase in the cement required shall be at the expense of the Contractor.

3.2.2 Mix Proportions

- 1) Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water and admixtures as specified, all well mixed and brought to the proper consistency.
- 2) The mix proportions and appropriate water-cement ratio will be determined by the Engineer to obtain concrete having suitable workability, density, impermeability, durability and required strength, without the use of an excessive amount of cement.
- 3) The water-cement ratio of concrete shall not exceed 60 percent, by weight, for concrete in any structure.
- 4) The quantity of mixing water to be used shall be the minimum necessary to produce concrete of a workability specified in the following table.
- 5) Test of aggregate and concrete shall be made by the Contractor, and mix proportions will be adjusted whenever necessary for securing the required properties of concrete.
- 6) The concrete mix proportions to be used for the various classes of concrete are as follows:

Type of structure applicable	Type A Crest of maindam and subdam over-flow section, rubble concrete, cross concrete block	Type B Backfill concrete, protection block, foundation	Type C Reinforcing concrete, irrigation intake
Max. size aggregate (mm)	80	80	40
Water-cement ratio	< 60%	< 60%	< 55
Specific gravity of coarse aggregate	> 2.5	> 2.5	> 2.5
Slump at point of placement (cm)	5 ± 1	5 ± 1	5 - 10
Cement (kg/m ³)	215	185	280
Design strength at the age of 28 days (kg/cm ²)	> 200	> 160	> 240

- 7) All mortar, unless otherwise provided, shall be composed of 1 volume of Portland cement and 3 volume of sand.

3.3 Cement

- 1) For the permanent construction required by these specifications, bagged ordinary Portland cement shall be used for concrete and mortar, and shall be furnished by the Contractor.
- 2) The cement shall be packed in paper bags of the quality specified below. Each bag shall contain 40 kg cement in net content. Bags shall be of weatherproof kraft paper sufficiently strong to withstand rough handling for the Philippine cement manufacturers. The name and brand of the manufacturer, the type of cement, the year and month produced and the weight contained shall be clearly marked on each bag.
- 3) Cement shall conform to the requirements of the Standard Specifications and Test for Portland cement of the American Society for Testing Materials and subsequent revisions thereof. To meet local climatic conditions it will be necessary to make test at 27 degrees centigrade (80.6 degrees Fahrenheit).

3.4 Admixture

- 1) The Contractor shall furnish and use concrete admixtures so as to improve workability and finishability of concrete or mortar.
- 2) Admixtures will be accepted on the manufacturer's certification of compliance with specifications.
- 3) Only suitable admixtures shall be used in the concrete for the works as directed by the Engineer. When more than one admixture are to be used, each admixture shall be batched in its own batcher and added to the mixing water separately before discharging into the mixer.

- 4) The Contractor shall use an approved water-reducing admixture in all concrete unless otherwise directed.
- 5) All costs incidental to the use of admixture shall be included in the unit prices tendered in the Schedule for applicable items for concrete in which the admixture is used.

3.5 Aggregate

3.5.1 General

- (1) Fine aggregate for concrete shall be taken from river deposits near the project site. Coarse aggregate for concrete shall be taken from the riverbed as selected coarse aggregate.
- (2) The raw materials from the river deposits shall be processed at the aggregate plant. The processing shall include crushing and screening to produce fine and coarse aggregate meeting the requirements.
- (3) Rubble aggregate for concrete shall be taken from the riverbed.

3.5.2 Fine aggregate

- (1) Fine aggregate shall be clean, hard, durable and of proper grading, and it shall be free from objectionable quantities of dirt, silt, organic matter or other deleterious materials. The moisture content of fine aggregate as delivered to the batching unit shall vary not more than 1.0 percent within any one hour, and not more than 3.0 percent within the working time of one shift.
- (2) The fine aggregate as batched shall be well graded and when tested by means of ASTM Standard Sieves shall conform to the following limits:

ASTM SIEVE NO.	INDIVIDUAL PERCENTAGE BY WEIGHT RETAINED ON SIEVE
4	0 to 5
8	5 to 15
16	10 to 25
30	10 to 30
50	15 to 35
100	12 to 20
Pan	2 to 8

The finess modules of sand shall range between 2.4 and 3.2.

- (3) The amount of deleterious substance in fine aggregate shall not exceed the limits prescribed below:

	<u>% by weight</u>
Clay lump	1.0
Material passing No.200 sieve	3.0
Material retained on No.50 sieve and floating on a liquid having a specific gravity of 2.0	0.5

3.5.3 Coarse aggregate

- (1) Coarse aggregate shall consist of either gravel, crushed gravel, coarse stone, or a combination thereof, suitably processed and as approved. Coarse aggregate shall be clean, hard, durable and it shall be free from objectionable quantities of flat or elongated particles, organic matter or other deleterious material.
- (2) The maximum nominal size of the coarse aggregate shall be 40 millimeters in major structural concrete and 80 millimeters in mass concrete. The coarse aggregates shall be well graded within the limits specified, and shall conform to the following grading requirements as delivered to the batching hoppers.

Max. size of coarse agg. (mm)	Grading (% by weight)		
	80-40 mm	40-20mm	20-5 mm
80	40-20	40-20	40-25
40		55-40	60-45

- (3) The amount of deleterious substance in coarse aggregate shall not exceed the limits prescribed in the following table:

	<u>% by weight</u>
Clay lumps	0.25
Soft particles	5.0
Material passing No.200 sieve	1.0
Material floating on a liquid having a specific gravity of 2.0	1.0

3.5.4 Rubble aggregate

Rubble aggregate shall consist of clean hard, durable stones free from fissures and plane of cleavage, larger than coarse aggregate but not larger than one-man size stone of 50 kilogram.

3.6 Water

The water used in concrete and mortar shall be reasonably clean, clear and free from objectionable quantities of silt, organic matter, alkali, salts, acids and other impurities. The use of sea or brackish water is not allowed.

3.7 Batching

- 1) The equipment shall be capable of mixing the aggregates, cement, admixtures and water into a uniform mixture and discharging this mixture without segregation.
- 2) Batching of cement, fine and coarse aggregates entering each batch of concrete shall be made by weighing measurement. The amount of water and admixture shall be determined by weighing or volumetric measurement.

- 3) The combined accuracy of batching equipment in feeding and measuring the material shall be within the following limits:

Water and admixture	1%
Cement and aggregate	3%

- 4) When the weighing unit is found out of order, the Contractor shall make necessary adjustment, repair and replacement immediately.

3.8 Mixing

3.8.1 Mixing by Mechanical Mixer

- 1) Mechanical mixing of concrete shall be done in a batch mixer of approved type, which will insure a uniform distribution of the materials throughout the mass, so that the mixture is uniform in color and homogeneous. The mixer shall be equipped with a suitable charging hopper, water storage and a water-measuring device so constructed that the water can be discharged only while the mixer is being charged.
- 2) Unless otherwise directed or allowed, the mixing of each batch shall continue not less than 1.5 minutes after all ingredients. Time of mixing shall be determined after mixer efficiency test.
- 3) Water shall be added before, during and after the mixer-charging operations. Excessive overmixing requiring addition of water to preserve the required concrete consistency will not be permitted. Concrete which has been retained in any mixer for more than 45 minutes after charging the mixer shall be wasted.
- 4) The retempering of concrete or mortar which has partly hardened, that is remixing with or without additional cement, aggregate, or water is not permitted. Therefore

concrete shall be mixed in such quantities as are required for immediate use and shall be placed while fresh before initial set has occurred. Any concrete in which initial set has begun shall be wasted.

- 5) Mixers shall not be charged in excess of rated capacity and shall not be operated in excess of rated speed. Mixers shall not be over-loaded by more than 10% of their rated capacity.

3.7.2 Hand Mixing

- 1) Materials for hand-mixed concrete shall be mixed in batches of not more than 3/4 cubic meter on substantial water-tight platforms, and shall be kept entirely free from admixture of foreign matter.
- 2) In the mixing of concrete by hand, either of the following methods may be employed:

The proper amount of fine aggregate shall be measured and spread upon the platform, and the proper amount of cement shall be delivered and spread upon the same, fine aggregate and cement shall be turned over by means of shovels, until they are evenly mixed and of uniform color. They shall then be wetted and made into a thin mortar. The proper amount of coarse aggregate, having been drenched with water, shall then be spread upon the platform and the mortar spread over the coarse aggregate, and the whole mass shall be turned over, at least three times, to which additional water be added if necessary. The mixture shall be uniform in color and homogeneous throughout before it is removed from the platform and place in the work.

- 3) In wetting of the mixture of fine aggregate and cement to make the mortar, and in wetting of the subsequent mixture of coarse and fine aggregates and cement a spray or sprinkle shall be used. The water shall not be dashed upon the mass in buckets or in large quantities or by means of a jet.

3.8.3 Mortar Mixing

Mortar shall be mixed only in those quantities required for immediate use. Unless an approved mortar mixing machine is used, the fine aggregate and cement shall be mixed dry in a tight box until the mixture assumes a uniform color, after which water shall be added as the mixing continues until the mortar attains the proper consistency. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar will not be permitted.

3.8.4 Trial Mixes

The trial mixes shall be made under the direction of the Engineer, using the aggregates proposed for the work to ensure that the concrete is sufficiently workable and that segregation of the mix, during transportation and placing, does not occur. The composition of the trial mixes shall comply with the requirements of the specifications in all respects.

3.9 Placing

3.9.1 General

- 1) No concrete shall be placed until all formwork, installation of parts to be embedded, and preparation of surfaces involved in the placing have been completed.
- 2) Unless otherwise permitted, no concrete shall be placed in rain and standing water, and in no case shall concrete be placed in running water.
- 3) No concrete shall be placed until the Engineer has inspected and approval the formwork, the reinforcing steel and the surfaces upon which the concrete is to be placed.

3.9.2 Preparation for Placing

- 1) Immediately before concrete is placed, all surfaces of formation foundation to which concrete is to be bonded shall be cleaned of oil, mud, organic matter, wooden pieces, objectionable coating, debris, loose rock fragment, or other perishable materials by effective means.
- 2) The surface of rock foundations shall be moistened thoroughly before placing concrete and standing water shall be removed.
- 3) The surface of soil foundation to which concrete is to be placed shall be free from standing or running water, wooden pieces or other objectionable materials abovementioned. For soil foundation, the foundation shall be in damp condition before placing concrete.
- 4) The surface of construction joints upon or against which new concrete or mortar is to be placed shall be cleaned and damped by means. Cleaning shall consist of the removal of all laitance, loose or defective concrete, coating and foreign materials.

- 5) The surface of the hardened concrete shall be roughened, thoroughly cleaned of foreign matter and laitance, saturated with water, and forms re-tightened before fresh concrete is placed.

3.9.3 Temperature of Concrete

Temperature of concrete when it is being placed shall not be more than 32°C. If concrete is placed when the weather is such that the temperature of the concrete would exceed 32°C, the Contractor shall employ effective means, such as precooling of mixing water, to maintain the temperature of the concrete, as it is placed, below 32°C.

3.9.4 Transportation

- 1) The method and equipment used for transporting concrete shall be such that concrete having the required composition and consistency will be delivered to the point of placement without objectionable segregation or loss of slump in excess of 2.5 centimeters.
- 2) Addition of water to concrete after it has been discharged from the mixer or retempering will not be permitted.
- 3) In case that concrete is transported by the following types of equipment, the equipment shall be installed and handled according to the following precautions.
 - (a) Concrete bucket. Bodies of concrete bucket shall be smooth and watertight. Covers shall be provided when needed for protection against rainfall.
 - (b) Chute. In general, transportation of concrete by the use of chutes will not be permitted unless approved. The chute shall have a section with round corner and shall have a proper fixed slope so as to allow the concrete to flow easily and without segregation. The lower end of the chute shall be provided with a drop chute not less than 0.6 meters in height to avoid

segregation of falling concrete. Chutes shall be protected from the direct rays of the sun.

- (c) Belt conveyer. Transporting concrete by belt conveyers will not be permitted unless approved. Belt conveyers shall be used with such precautions that belts are protected from rain, wind and sunlight, and that a proper hopper or vertical chute at least 0.6 meters in depth is used at the end of each conveyer.

3.9.5 Placing

- 1) After the surfaces have been prepared satisfactorily, surface of rock and construction joints of concrete shall be covered with a layer of mortar. The mortar shall be spread uniformly and concrete shall be placed immediately upon it.
- 2) Any concrete which has become so stiff that proper placing cannot be assured unless retempered, or of which the slump has reduced by 2.5 centimeters or more shall be wasted to places designated, and shall be charged to the Contractor's expense.
- 3) Concrete shall be deposited in vertical dropping to minimize segregation and be placed so as not to strike hard against the forms assembled. The vertical free drop of falling concrete shall not exceed 1.5 meters.
- 4) All formed concrete shall be placed in horizontal layers continuously, the thickness of which shall not exceed 0.5 meter.
- 5) The height of one lift of concrete placing shall be within 0.5 meters to 1.5 meters.
- 6) Concrete shall be placed in continuous in a block or a lift so as to avoid cold joints where practicable. In the event of equipment breakdown, or if for any other reason

continuous placing will be interrupted, the Contractor shall thoroughly consolidate the concrete at such joints to a reasonably uniform and stable slope while the concrete is plastic. The concrete at the surface of such cold joints shall be cleaned and shall be surface-dry as required for construction joints before being covered with fresh concrete.

- 7) Backfill concrete shall be placed at the places as designated on the Drawings, and shall be placed simultaneously with the main structure concrete contacted.
- 8) Rubble concrete shall be placed at the places of Sabo dam, and prior to placing a new concrete, rubble aggregate shall be placed on the previous concrete surface by hand as directed by the Engineer. Rubble aggregate shall be previously wetted and thoroughly embedded in the concrete. No stone shall be closer than 1.0 meter to any surface or than 10 centimeters to adjacent stone.

3.9.6 Consolidation

- 1) Each layer of concrete shall be immediately consolidated with suitable appliances so that the concrete is compacted to the maximum practicable density, and closes snugly against all surfaces of forms. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified.
- 2) In general, concrete shall be consolidated with electric or gasoline power-driven and others approved by the Engineer, internal-type vibrators, operating at a speed of at least 7,000 revolutions per minute when immerced in concrete. The vibrating head shall be inserted in concrete vertically and at least 5 centimeters into the underlying layer. Where it is difficult to use internal vibrators, concrete may be consolidated with the external-type vibrator or compacted with the handplunger. The external-type vibrator shall be operated at a speed of 8,000 revolutions per minute and be large enough to effect consolidation.

3.10 Protection and Curing

- 1) The Contractor shall protect all concrete against injury or harmful effect due to sudden drying, loading, shock or vibration until it has hardened sufficiently to prevent damage. Exposed surface of all concrete shall be protected from the direct rays of the sun for at least the first 3 days after placement. All such protection shall be made effective as soon as practicable after placing of unformed concrete or after removal of forms from formed concrete.
- 2) Concrete shall be cured by water curing. Concrete cured with water shall be kept wet for at least 7 days immediately following placement of the concrete or until covered with fresh concrete. The concrete shall be kept wet by covering with water-saturated material or by any other method which will keep all surfaces to be cured continuously (not periodically) wet.

3.11 Payment for Concrete

Payment for concrete in the various parts of the work will be made at the unit prices per cubic meter tendered therefor in the schedule, which unit prices shall include the cost of finish applied to each item of concrete work. Payment will not be made for all wasted concrete or mortar, and for concrete required to be placed outside excavation paylines due to over excavation, or for any other reason.

3.12 Formwork and Finishes

3.12.1 General

- (1) Forms shall be used, whenever necessary, to confine concrete and shape it to the required line.
- (2) The forms shall have sufficient strength and rigidity to hold the concrete and to withstand the pressure resulting from placement and vibration without deflection from the prescribed lines. The surfaces of all forms to be in contact with the concrete shall be clean, rigid, and sufficiently tight to prevent loss of mortar.

- (3) Edges at intersections of concrete surfaces that will be exposed permanently to view shall be beveled or rounded not less than 2 centimeters by the use of molding strips.
- (4) Immediately before concrete is placed, precaution shall be taken to see all forms are in proper alignment, and that all form supports are thoroughly secure and tight.

3.12.2 Material

Lumber used in the forms shall be sound, straight, free from wrap, decay and loose knots and shall be dressed smooth and uniform in width and thickness prior to fabrication of formwork.

3.12.3 Construction Tolerances

- (1) Variation in alignment, grade and dimensions of the structures from the established alignment, grade and dimensions shown on the Drawings shall be within the tolerances specified in this clause. Concrete work that exceeds the tolerance limits specified herein shall be remedied or removed and replaced by and at the expense of the Contractor.
- (2) Construction tolerances for concrete construction
 - (a) Variation from the plumb, from specified batter, or from the surfaces of walls, vertical joint grooves and other conspicuous lines:
 - 12 mm in 3 m
 - 18 mm in 6 m
 - 30 mm in 12 m or more
 - (In buried construction, double the tolerance)
 - (b) Variation from the level or from the grades indicated on the Drawings in slabs, crests, slopes, horizontal joint grooves and other conspicuous lines:
 - 6 mm in 3 m
 - 12 mm in 10 m or more
 - (In buried construction, double the tolerance)

- (c) Variation of the linear structure lines from established position in plan:
 - 12 mm in 6 m
 - 18 mm in 12 m or more

- (d) Variation of dimensions to individual structure features from established positions:
 - 30 mm in 24 m or more
 - (In buried construction, double the tolerance)

- (e) Variation in cross-sectional dimensions and thickness of slabs, walls, blocks and similar members:
 - Minus 5 mm
 - Plus 15 mm

3.12.4 Installation and Preparation

- (1) Forms shall be installed so that the joint marks on concrete surfaces are in alignment both horizontally and vertically, and the joints between surfaces shall be smooth.

- (2) Before placing concrete, all forms shall be rigid and tight and shall be thoroughly cleaned, and all wooden chips, saw dust, dry mortar lumps, foreign matter and excess water shall be removed from between the forms. The forms shall be surface-treated with a commercial mineral oil.

- (3) Where forms for continuous surfaces are placed in successive lifts, care shall be taken to fit the forms tightly over the entire surface so as to prevent leakage of mortar from the concrete to maintain accurate alignment of the surface.

- (4) Forms to be used more than once shall be maintained in serviceable condition and shall be thoroughly cleaned before being reused.

considered "abrupt" irregularities. All other surface irregularities shall be considered "gradual" irregularities.

(2) Formed Surface

The classes of finish for formed concrete surfaces, except surfaces for which special finishes are required, are the designated two types namely, F1 and F2.

- a) Formed surfaces (Finish F1) which will be covered by fill material or by concrete shall be required correction of surface irregularities only for depressions which exceed 25 millimeters.
- b) Formed surfaces (Finish F2) which will be permanently exposed and where a reasonably attractive appearance is required including surfaces of dam slopes and inside surfaces of walls shall not exceed 6 millimeters for abrupt irregularities and 15 millimeters for gradual irregularities.

(3) Unformed surfaces

The classes of finish for unformed concrete surfaces are designated as type U1 and U2.

- 1) Finish U1 of unformed surface which will be covered by fill material or by concrete shall consist of sufficient levelling and screeding to produce uniform surfaces. Surface irregularities shall not exceed 25 millimeters.
- 2) Finish U2 of unformed surface is a floated finish applied to unformed surfaces which will be generally exposed to view, such as; dam and overflow crest, surface of crest concrete of spurdike and concrete blocks, top of wall, and other exposed surfaces of structure. Surface irregularities shall not exceed 6 millimeters for abrupt irregularities and 15 millimeters for gradual irregularities.

3.12.5 Embedded Ties

- (1) Embedded ties shall be of suitable design and adequate strength for the purpose. Wire ties will not be permitted where concrete surfaces will be exposed to weathering, or where discolouration of the finished surface would be objectionable. Wire ties will be permitted only light and unimportant works.
- (2) Embedded ties for holding forms shall be so arranged that embedded tie shall terminate not less than 3 centimeters from the formed surface of the concrete after forms are removed where the maximum size of aggregate is 40 millimeters, and not less than 5 centimeters where the maximum size of aggregate is 80 millimeters.

3.12.6 Removal

Forms shall not be removed until the concrete has hardened and is of sufficient strength to carry its own weight safely, together with any construction loads likely to be imposed upon it. Forms shall be left, in general, for period not less than 36 hours for dams and walls. Care shall be taken in removing forms to prevent damage to the concrete.

3.12.7 Finishes and Finishing

(1) General

The class of finish and the requirements for finishing of concrete surfaces shall be as herein specified. Finishing of concrete surfaces shall be performed only by skilled workmen. Concrete surfaces shall be kept condition where necessary to determine whether surface irregularities are within the limit hereinafter specified.

Surface irregularities which shall be distinguished from construction tolerances are designated "abrupt" and "gradual" for purposes of classifying finishes. Off-sets resulting from displaced, misplaced, or mismatched forms or loose knots in forms, or other similar form defects shall be

Damaged or Defective Concrete Surface

- (1) Defective concrete and concrete damaged from any cause shall be removed and replaced with acceptable concrete by the Contractor at his own expense. Irregularities of alignment due to inaccurate finishing of surfaces, bulging of forms, or other defects shall be rectified by and at the expense of the Contractor.
- (2) All porous and fractured concrete and surface concrete, to which additions are required to bring it to prescribed lines, shall be removed by chipping openings into the concrete. The chipped openings shall be sharp-edged and keyed and shall be filled to the required lines with fresh concrete or dry patching mortar. Where concrete is used for filling, the chipped openings shall not be less than 8 centimeters in depth and the fresh concrete shall be reinforced and dowelled to the surface of the openings.
- (3) Mortar for patching shall consist by volume of one part of cement, two parts of sand, and just enough water so that after thorough mixing of the ingredients the mortar will barely hold together when compacted by squeezing with the hand. The mortar shall be fresh when placed, and immediately prior to mortar application, the surface to which the mortar is to be bonded shall be dampened.
- (4) In repairing damaged or defective concrete at important locations, the Contractor shall use epoxy resin bonding agent if required.
- (5) All patches and repairs shall be kept continuously damp for a period of not less than 7 days and kept out of the direct rays of the sun for at least 7 days immediately following completion of the patch or repair.

3.12.9 Payment

Payment for forms will be made for the area of forms actually brought in contact with placed concrete and at the unit price including finishes per square meter tendered therefor in the schedule. Forms used to fill over-excavation shall be at the expense of the Contractor.

3.13 Reinforcing Bars

3.13.1 General

- (1) The Contractor shall furnish all reinforcing bars required for completion of the works.
- (2) Reinforcing bars shall conform to the requirements of the specification for Billet Steel Bars for Concrete Reinforcement of the AASHO Specification.
- (3) Unless otherwise specified, reinforcing bars shall be of the deformed type. Size and dimensions of the bars are shown on the Drawings.
If the Contractor will use the rolled round steel bars, the contractor shall submit the fabrication of bars to the Engineer for his approval.

3.13.2 Placing Reinforcing Bars

- (1) No reinforcing bars shall be placed until it has been thoroughly cleaned of mill and rust scale, and of coatings of any character that will destroy or reduce the bond.
- (2) The number, size, form and position of all reinforcement steel bar, fabric, ties, links, stirrups and other parts of the reinforcement are to be placed in accordance with the Drawings and kept in the correct position in the forms without displacement during the process of vibrating tamping and ramming the concrete in place.

- (3) Bars shall be bound together with 0.9 mm annealed iron wire and the binding shall be twisted tight with proper pliers. The free ends of the binding wire shall be bent inwards.
- (4) The minimum concrete cover of reinforcement steel measured from the outside of the bar shall be in accordance with the table below:

Member	Unit: cm			
	Against Natural Ground	Against Formwork & Backfill	Exposed to Weather	Not Exposed to Weather
1. Foundations	5	5	-	-
2. Slabs	5	4	3	2
3. Walls	5	4	4	3

Concrete cover on reinforcement shall in all cases be at least equal to the diameter of bars.

3.13.3 Payment

Payment for furnishing, cutting, bending and placing reinforcing bars will be made at the unit prices per ton tendered therefor in the schedule.

3.14 Contraction Joints

- 1) Contraction joints shall be provided concrete structures for preventing shrinkage cracks as shown on the Drawings or as directed by the Engineer. Contraction joints shall be formed in the concrete of dam, spur dike and levee where indicated on the Drawings as expansion joint.
- 2) Reinforcement or other embedded metal items bonded to the concrete shall not be permitted to extend completely through any contraction joints.
- 3) The joints shall be made by forming the concrete on the side of the joint and allowing it to set before concrete is placed on the other side of the joint.

- 4) The joint filler shall consist of preformed strips which have been formed from cane or other suitable fibers of a cellular nature, securely bound together and uniformly saturated with a suitable bituminous binder. The watertightness of joints and structures for which joint filler are provided shall be the Contractor's respective.
- 5) The cost of construction joints shall be included in the unit price tendered therefor in the schedule for the concrete in which the joint filler are required.

3.15 Waterstops

3.15.1 General

Plastic waterstop, 300 mm wide, shall be placed in contraction joints of dams at 50 centimeters from the along the upstream slope surface of dam. The waterstops shall be of extruded polyvinyl chloride complying with JIS K6773-1977, or approved equivalent.

3.15.2 Storage and installation

- (1) All waterstop shall be stored in such a way that the material does not deteriorate during storage.
- (2) All field splices of waterstop shall be made so as to provide watertight connections by such means as specified by the manufacturer.
- (3) The Contractor shall provide suitable supports and protection during the progress of work to protect the water-stop from damage, deterioration, or wrapping.
- (4) Waterstop shall be installed with equal widths of the material embedded in the concrete on each side of the joint. The concrete shall be carefully placed and vibrated around the waterstop for a complete bond between the concrete and all embedded areas of the waterstop.

3.15.3 Payment

Payment for furnishing and placing waterstop will be made at the applicable unit prices per linear meter, in place with no allowance made for laps, at splices, tendered therefor in the schedule.

3.16 Concrete Drain Pipe

- (1) Hume pipes, 300 millimeters and 600 millimeters of inside diameter, shall be installed for the drain pipe of main dam and irrigation intake respectively, at the places where designated on the Drawings.
- (2) Concrete surface and ground surface at where the pipes are to be placed shall be levelled evenly so as to place the pipes to the prescribed lines and level.
- (3) Joints of pipes shall be connected with an appropriate cover so that any mortar will not leak in the pipe during successive concrete placing on the pipe, and should any pipe become clogged or obstructed from any cause, it shall be cleaned out or replaced by and at the expense of the Contractor.
- (4) Payment for furnishing and placing pipe will be made at the unit prices per linear meter tendered in the schedule.

SECTION 4 SLOPE PROTECTION AND RIVERBED PROTECTION WORKS

4.1 Wet-Rubble Masonry

- 1) Wet-rubble masonrys, 45 centimeters of thickness and 30 centimeters of thickness, shall be set for the spur dikes and levee respectively at the places where designated on the Drawings.
- 2) Stone used for wet-rubble masonry work shall be hard and durable rock. It shall be sound, clean and free from any deleterious matters such as clay, earth, loam or decomposed rock.
- 3) The stone for spur dikes shall be of ranging from 30 to 45 centimeters in thickness and not less than 20 centimeters in longest demension of exposed surface. The stones for levee shall be ranging from 15 to 25 centimeters in thickness and not less than 20 centimeters in longest demensions of exposed surface.
- 4) Unless otherwise specified, concrete used for filling the space between the stones shall be Type B specified in clause 3.2.2 hereof. Cement mortar used for jointing shall consist of one part of cement to three parts of sand by volume mixed with sufficient water to make it workable.
- 5) Expansion joints shall be provided in the wall, normally at intervals of 15 meters, as shown on the Drawings or directed by the Engineer.
- 6) Weep-holes with poly vinyl chloride (PVC) pipes of 5 centimeters in diameter shall be made at three meters interval as shown on the Drawings. The upper surface of the wet-rubble-masonry wall shall be capped with concrete which has been smoothly finished by wooden trowels.
- 7) The finished surface of the wet-rubble masonry shall be fairly even and be true to the lines shown on the Drawings or as directed by the Engineer.

- 8) Payment for wet-rubble masonry will be made at the unit prices per square meter tendered therefor in the schedule, which unit prices shall exclude the cost of backfilling cobble stone and backfilling concrete, and which unit prices shall include the cost of gathering, transporting, handling and setting the rubble stone, filling the concrete in the space and jointing mortar.

4.2 Cross Concrete Block for Groundsill

4.2.1 General

Riverbed surface within levee work site shall be protected with Groundsill, type B, and these locations, lengths and widths are shown on the Drawings. Groundsill, Type A, shall consist of cross concrete blocks, 2.0 meters wide and 0.8 meters thick, which shall be made by placing in-site Type A concrete, as shown on the Drawings.

4.2.2 Earthwork and Concrete Work

- 1) Excavation works of the riverbed shall be carried out in compliance with Clause 2.3 hereof to the level designated on the Drawings.
- 2) Immediately before concrete is placed, all surfaces of formation foundation to which concrete is to be placed shall be levelled and be free from standing or running water, wooden pieces or other objectionable materials.
- 3) Concrete work shall be carried out in compliance with SECTION 3. Concrete of all the blocks shall be placed uniformly to keep the level designated on the Drawings.
- 4) Voids of each block and of between the blocks shall be filled with rubbles compactly to the top surface of blocks specified in Clause 2.8.

4.2.3 Payment

Payment for cross concrete block will be separated at the unit prices of concrete, formwork and reinforcing bars respectively tendered therefore in the schedule.

4.3 Cribwork for Levee and Groundsill

4.3.1 General

Riverbed surface and toe of levee within levee work site shall be protected with cribwork and these locations, lengths and widths are shown on the Drawings. Cribwork shall consist of timber frames with rubbles, 2.0 meters and 0.8 meters thick, as shown on the Drawings.

4.3.2 Earthwork

- 1) Excavation works of riverbed shall be carried out in compliance with Clause 2.3 hereof to the level designated on the Drawings.
- 2) Voids of each timber frame and of between the timber frames shall be filled with rubbles compactly to the top surface of timber frames specified in Clause 2.8.

4.3.3 Timberwork

- 1) Timber species for cribwork shall be the most suitable for each particular purpose, and shall, in all cases, be sound, dry, straight, and free from saps, dead knots, other defects.
- 2) Timber frame shall be made with log of coconut trunk or equivalent materials, not less than 10 centimeters diameter and shall be fabricated and installed as shown on the Drawings.
- 3) Each timber frame shall be made by connecting rigidly the logs with tie wire not less than 3.2 millimeters diameter and timber frame shall be connected longitudinally and laterally by hooked reinforcing bars of not less than 12 millimeters diameter.
- 4) Prior to filling the rubbles in the space of timber frame, split bamboo shall be set inside the timber frame, as shown on the Drawing.

4.3.4 Payment

Payment for cribwork will be separated at the unit prices of coconut trunk, split bamboo and reinforcing bars respectively tendered therefor in the Schedule.

VOLUME III

THE REPUBLIC OF THE PHILIPPINES
MINISTRY OF PUBLIC WORKS
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT
SABO FACILITIES IN THE PAWA - BURABOD RIVER
A TRIBUTARY OF THE YAWA RIVER

DESIGN DRAWINGS

FEBRUARY 1980

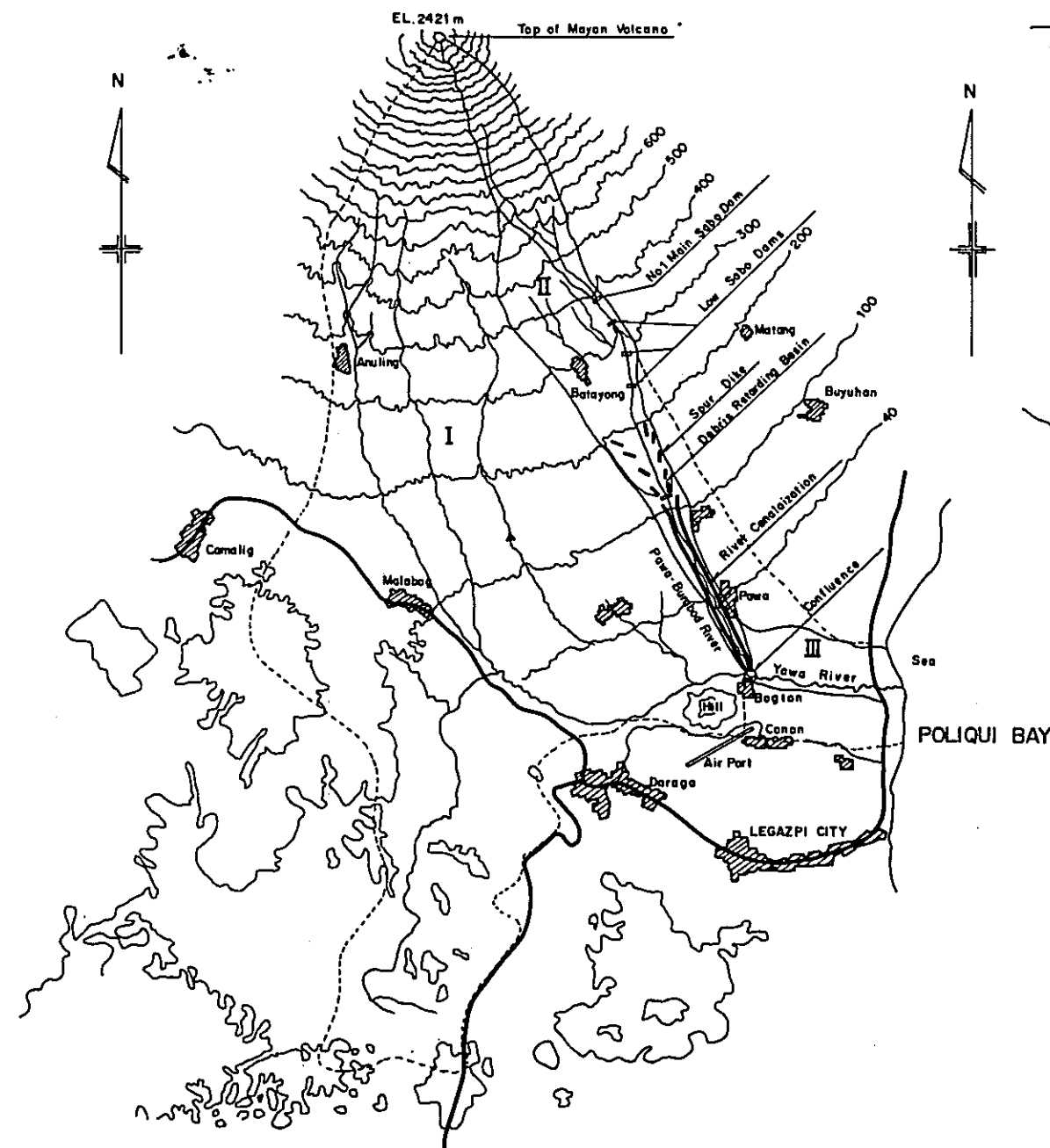
JAPAN INTERNATIONAL COOPERATION AGENCY

MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT
SABO FACILITIES IN THE PAWA – BURABOD RIVER
A TRIBUTARY OF THE YAWA RIVER

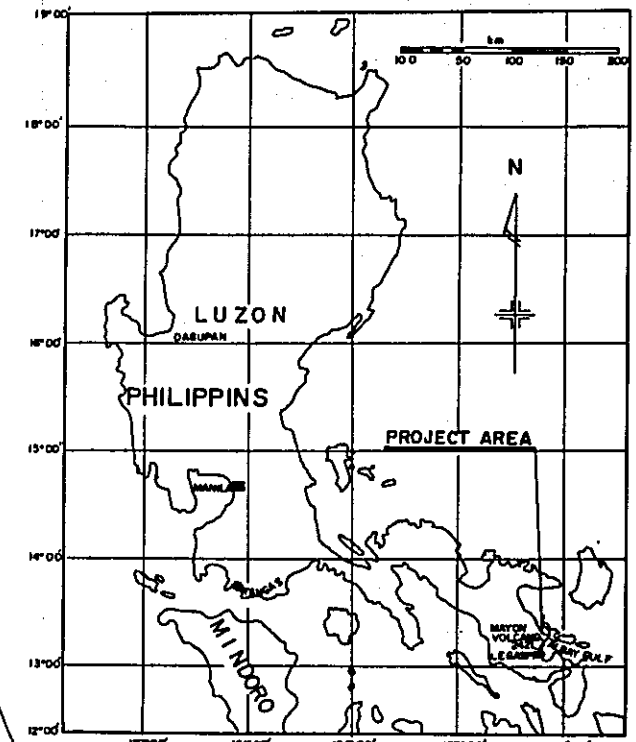
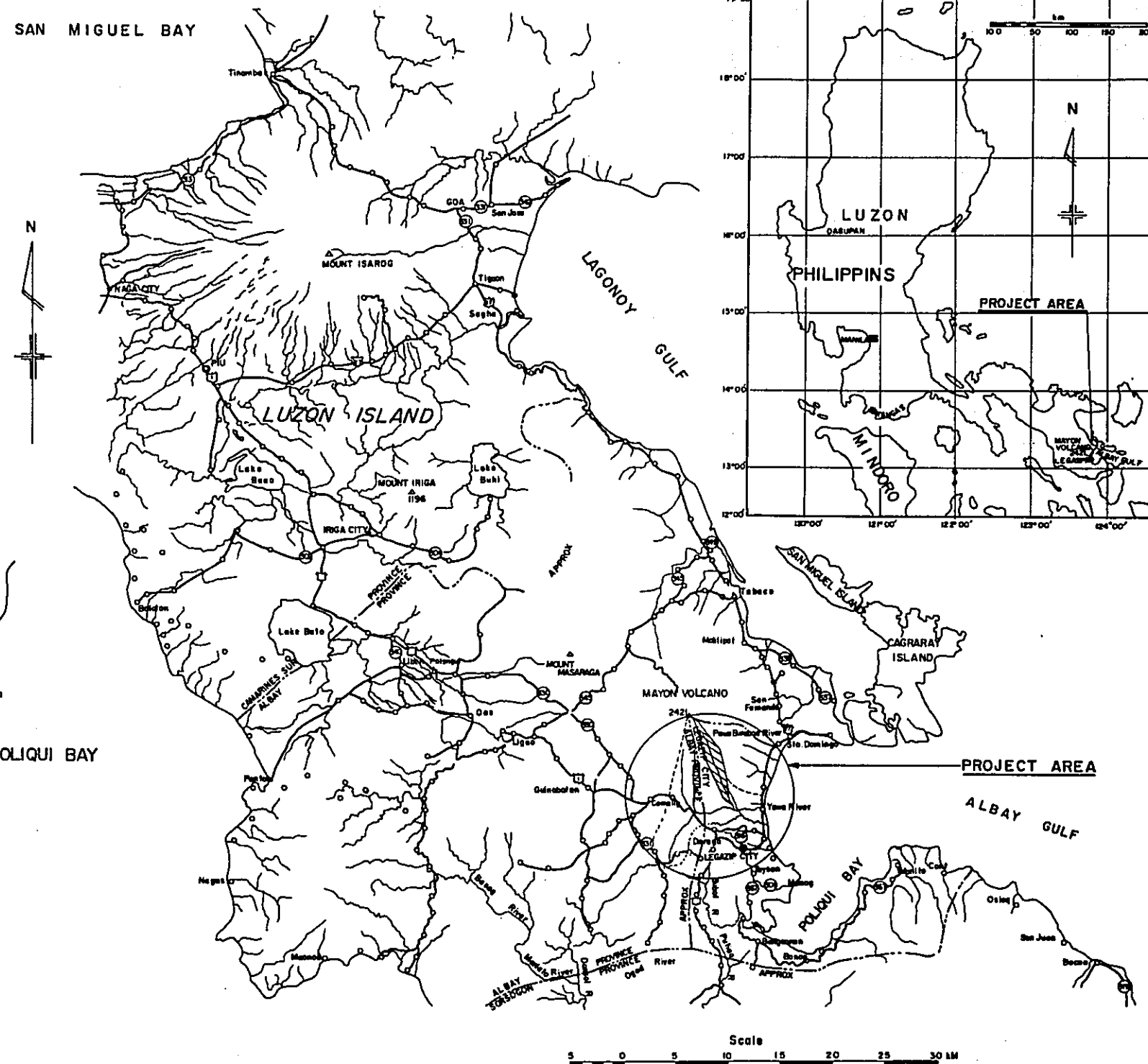
LIST OF DESIGN DRAWINGS

D.W.G NO.	TITLE OF DRAWING
M.V.S-D 001	LOCATION MAP OF THE PAWA – BURABOD RIVER
M.V.S-D 002	NO.1 SABO DAM, GENERAL PLAN
M.V.S-D 003	NO.1 SABO DAM, STRUCTURAL DETAIL (1)
M.V.S-D 004	NO.1 SABO DAM, STRUCTURAL DETAIL (2)
M.V.S-D 005	SPUR DIKES, GENERAL PLAN
M.V.S-D 006	NO.1 SPUR DIKE, PLAN, PROFILE & SECTION
M.V.S-D 007	NO.2 SPUR DIKE, PLAN, PROFILE & SECTION
M.V.S-D 008	RIVER CANALIZATION, PLAN (6-1)
M.V.S-D 009	" " (6-2)
M.V.S-D 010	" " (6-3)
M.V.S-D 011	" " (6-4)
M.V.S-D 012	" " (6-5)
M.V.S-D 013	" " (6-6)
M.V.S-D 014	RIVER CANALIZATION, PROFILE (2-1)

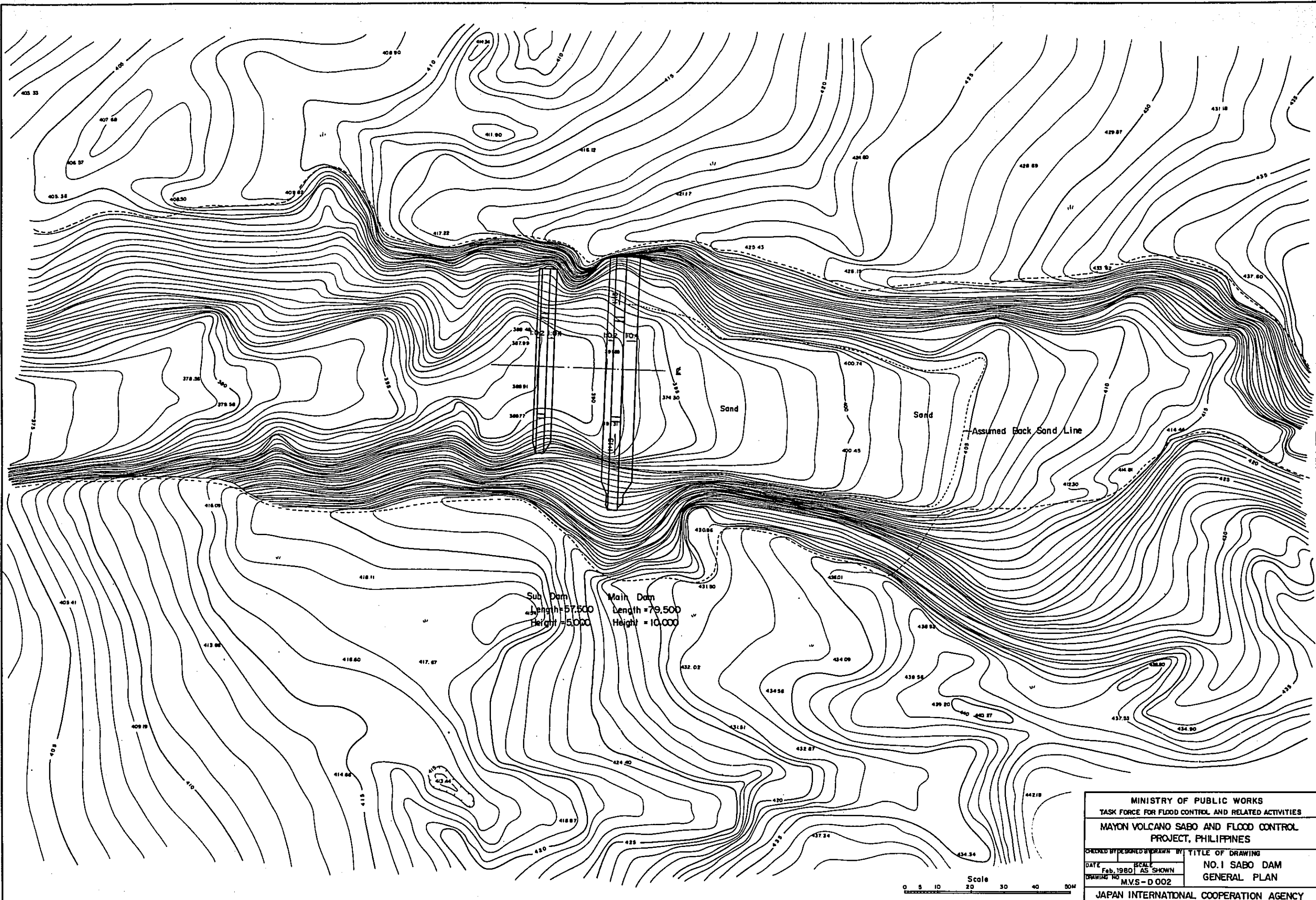
D.W.G NO.	TITLE OF DRAWING
M.V.S-D 015	RIVER CANALIZATION, PROFILE (2-2)
M.V.S-D 016	RIVER CANALIZATION, CROSS SECTION (10-1)
M.V.S-D 017	" " (10-2)
M.V.S-D 018	" " (10-3)
M.V.S-D 019	" " (10-4)
M.V.S-D 020	" " (10-5)
M.V.S-D 021	" " (10-6)
M.V.S-D 022	" " (10-7)
M.V.S-D 023	" " (10-8)
M.V.S-D 024	" " (10-9)
M.V.S-D 025	" " (10-10)
M.V.S-D 026	RIVER CANALIZATION, TYPICAL CROSS SECTION
M.V.S-D 027	RIVER CANALIZATION, STRUCTURAL DETAIL OF LEVEE
M.V.S-D 028	RIVER CANALIZATION, STRUCTURAL DETAIL OF GROUNDSILL
M.V.S-D 029	RIVER CANALIZATION, IRRIGATION INTAKE



Legend	
	Provincial boundary
	First and second class roads
	village, town
Y-O	Denotes site and Number of Sieving
	Test Pit for river bed materials



MINISTRY OF PUBLIC WORKS	
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES	
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT, PHILIPPINES	
DESIGNED BY/DESIGNED BY/DRANK BY	TITLE OF DRAWING
DATE	SCALE
Feb, 1980	AS SHOWN
DRAWING NO.	M.V.S-D 001
JAPAN INTERNATIONAL COOPERATION AGENCY	



Sub Dam
Length = 57.500
Height = 5.000

Main Dam
Length = 79.500
Height = 10.000

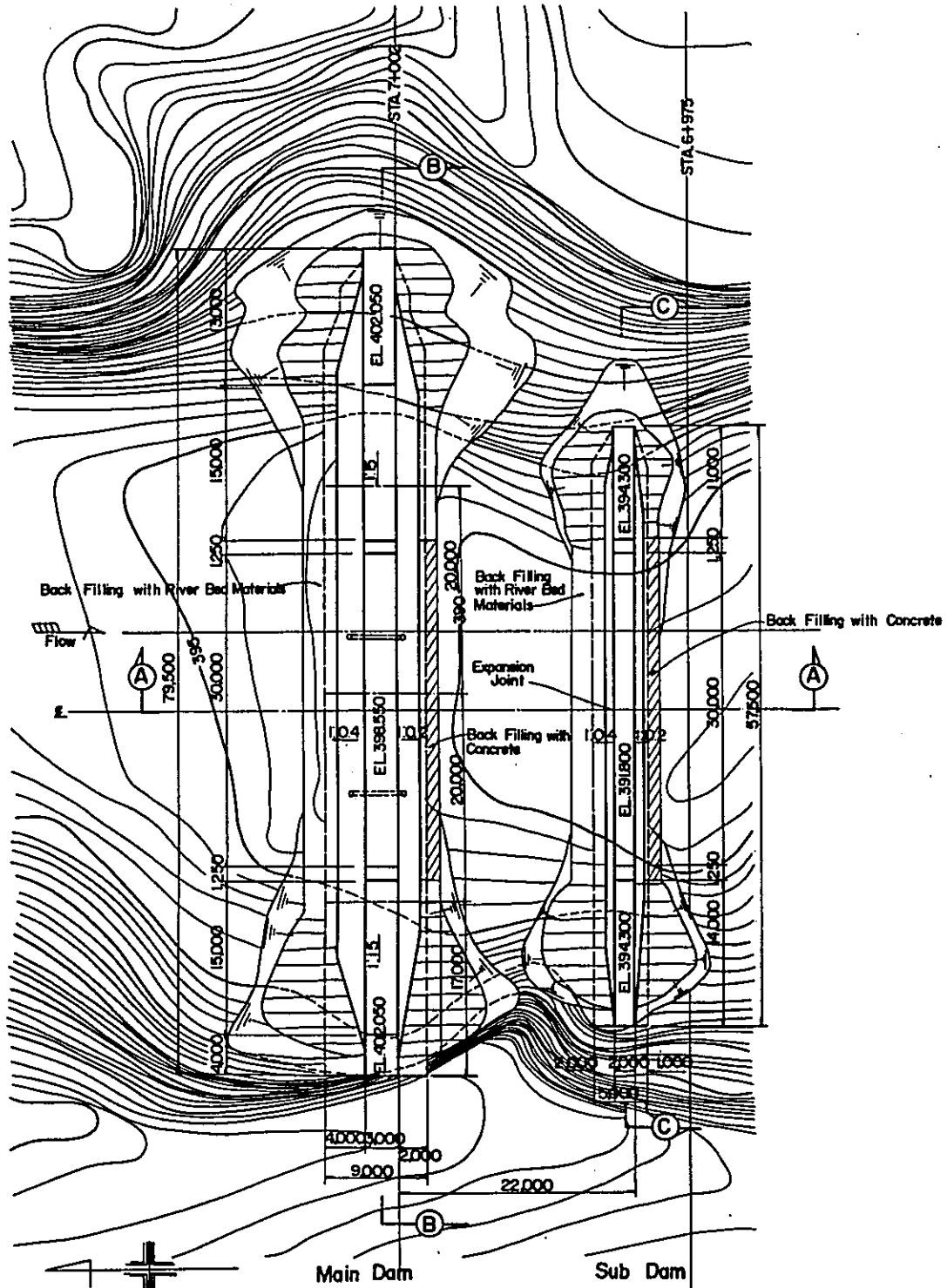
Sand

Sand

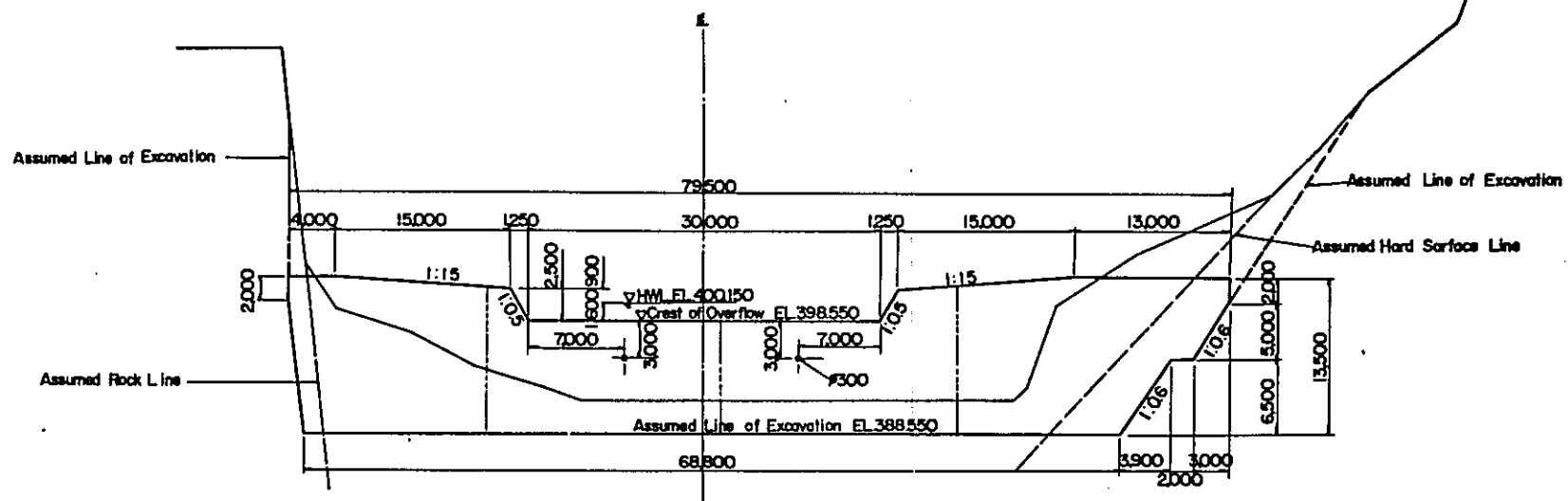
Assumed Back Sand Line



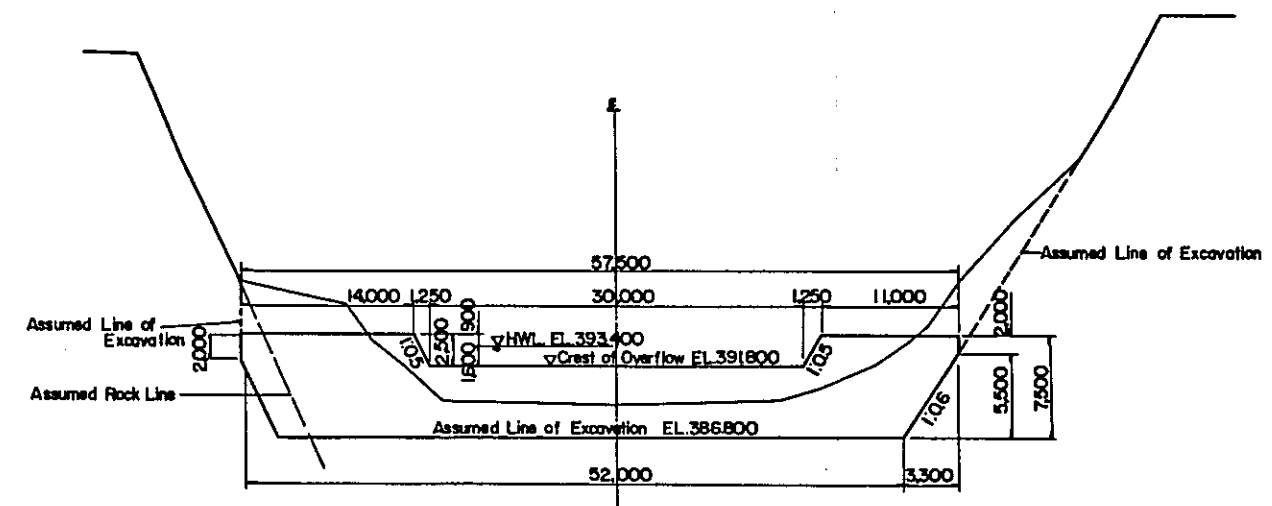
MINISTRY OF PUBLIC WORKS			
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT, PHILIPPINES			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	NO. 1 SABO DAM
DRAWING NO.	M.V.S-D 002		GENERAL PLAN
JAPAN INTERNATIONAL COOPERATION AGENCY			



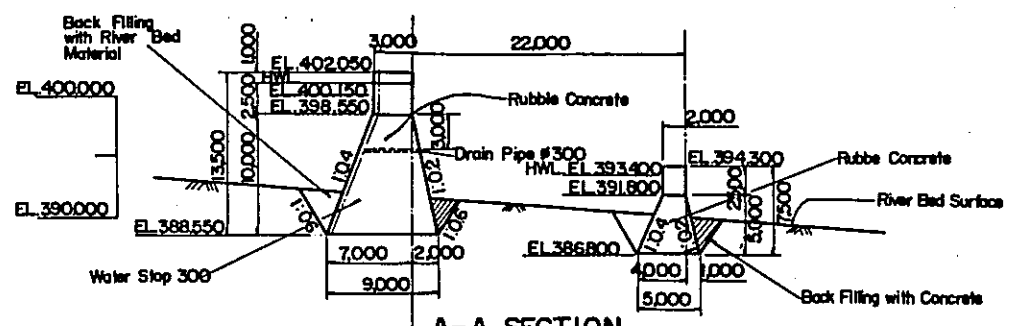
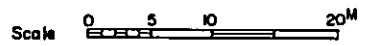
PLAN



B-B SECTION

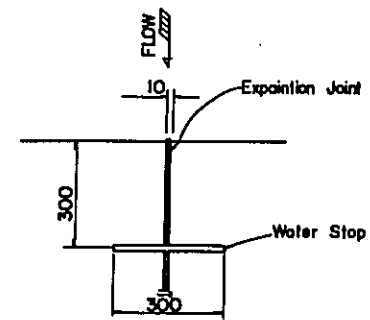


C-C SECTION



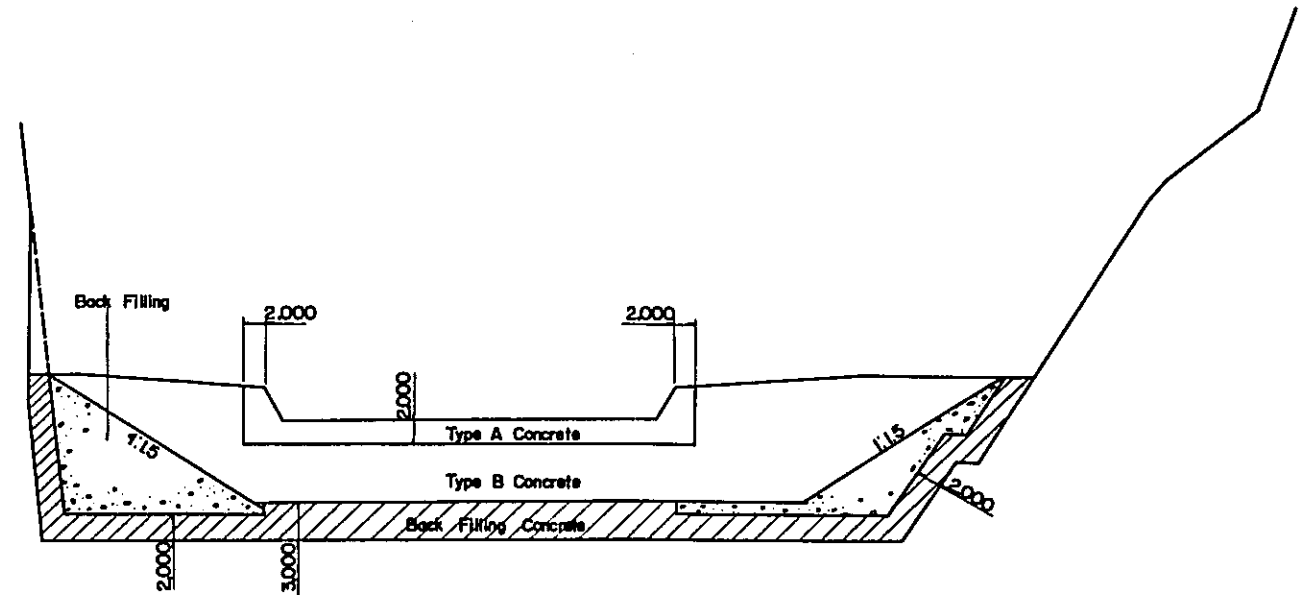
A-A SECTION

MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	NO. 1 SABO DAM
DRAWING NO. MVS D-003			STRUCTURAL DETAILS (II)
JAPAN INTERNATIONAL COOPERATION AGENCY			



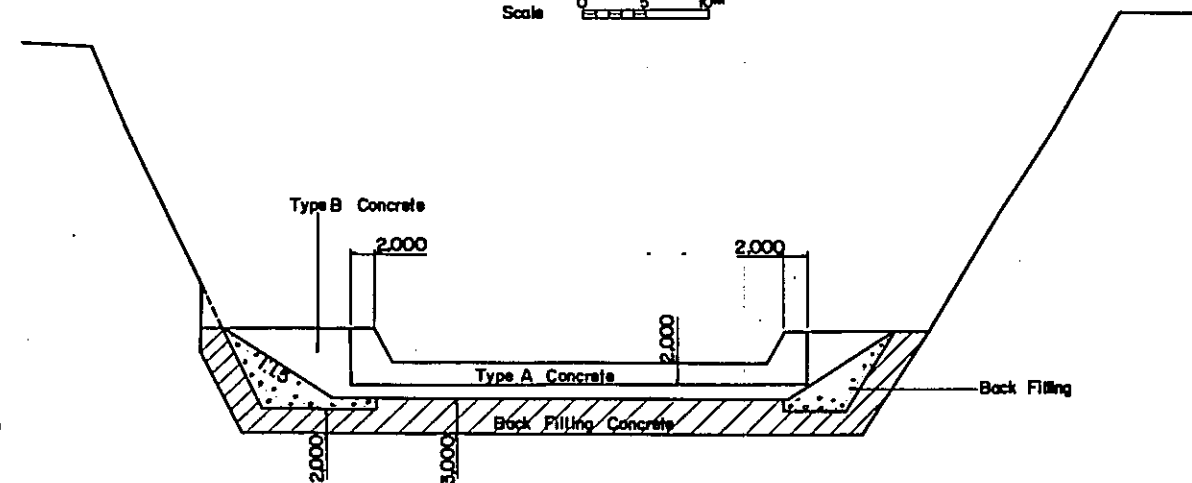
TYPICAL PLAN OF EXPANSION JOINT & WATER STOP

Scale 0 0.1 0.2 0.3 0.4 0.5^M



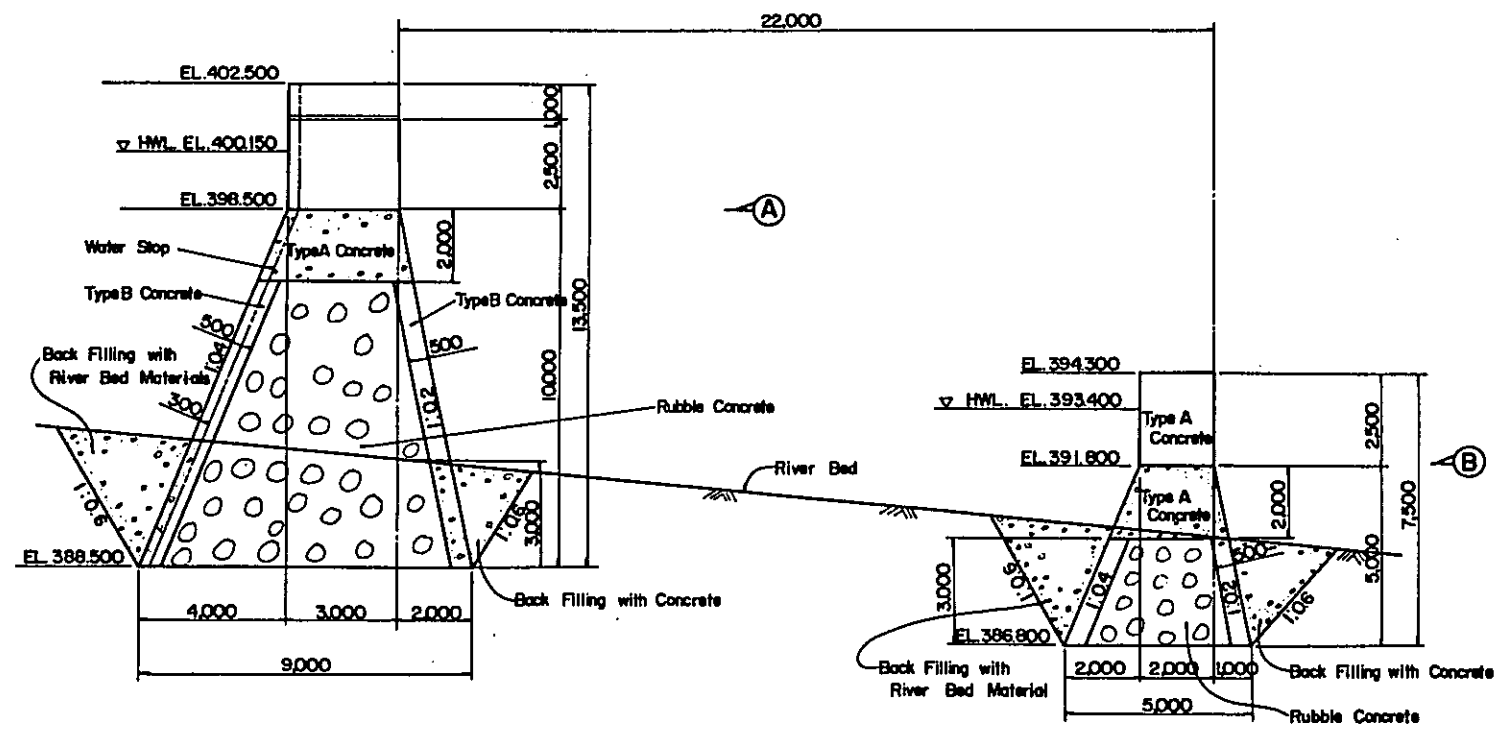
A FRONT VIEW

Scale 0 5 10^M



B FRONT VIEW

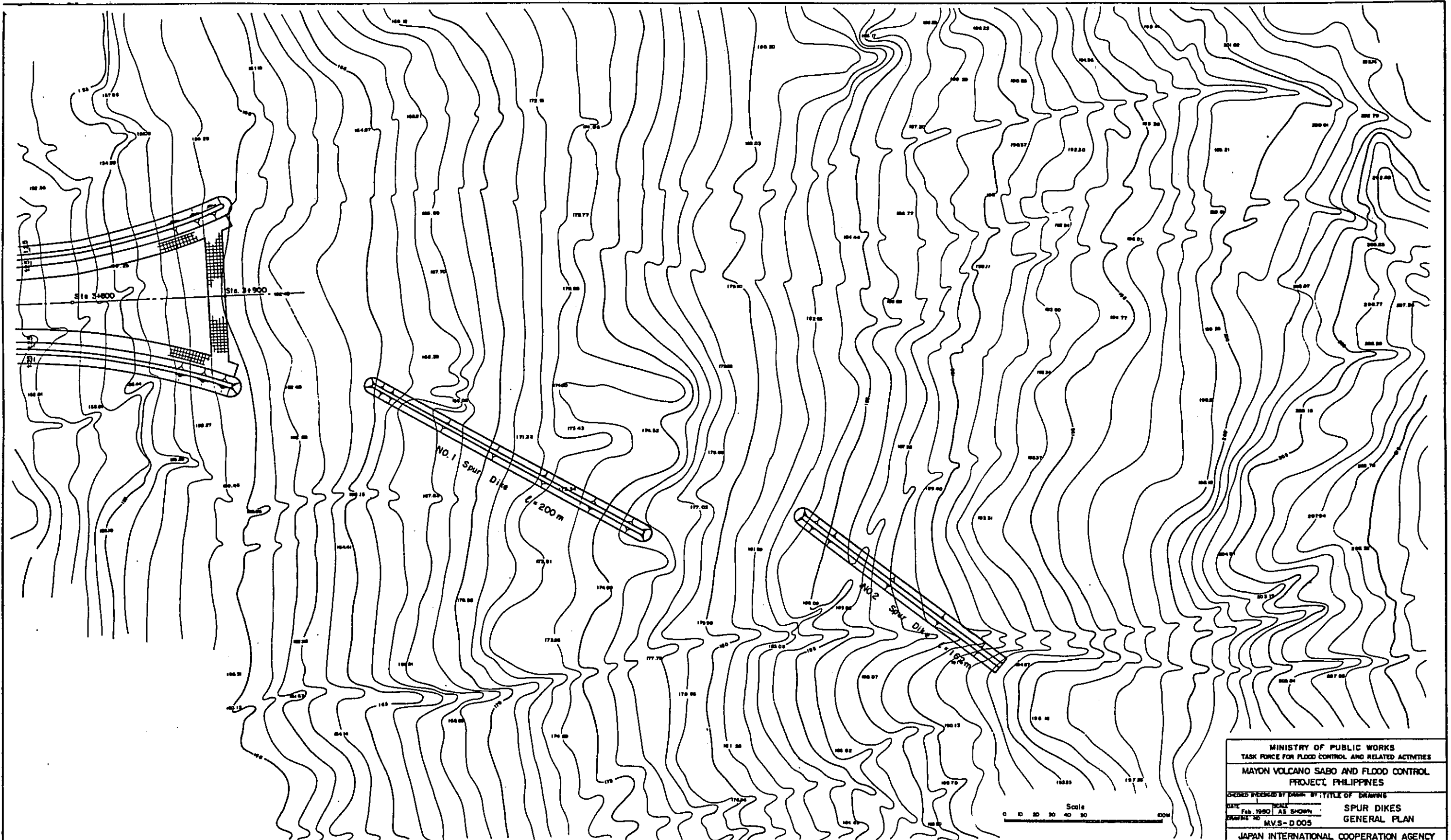
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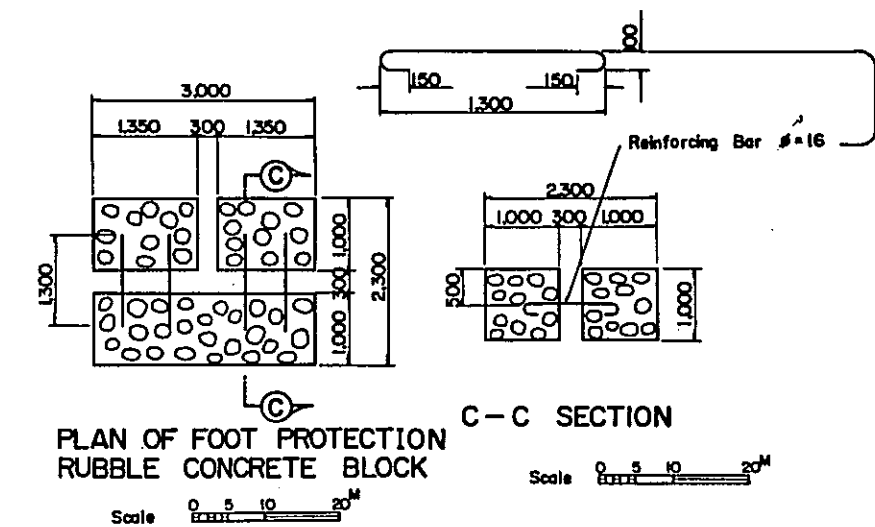
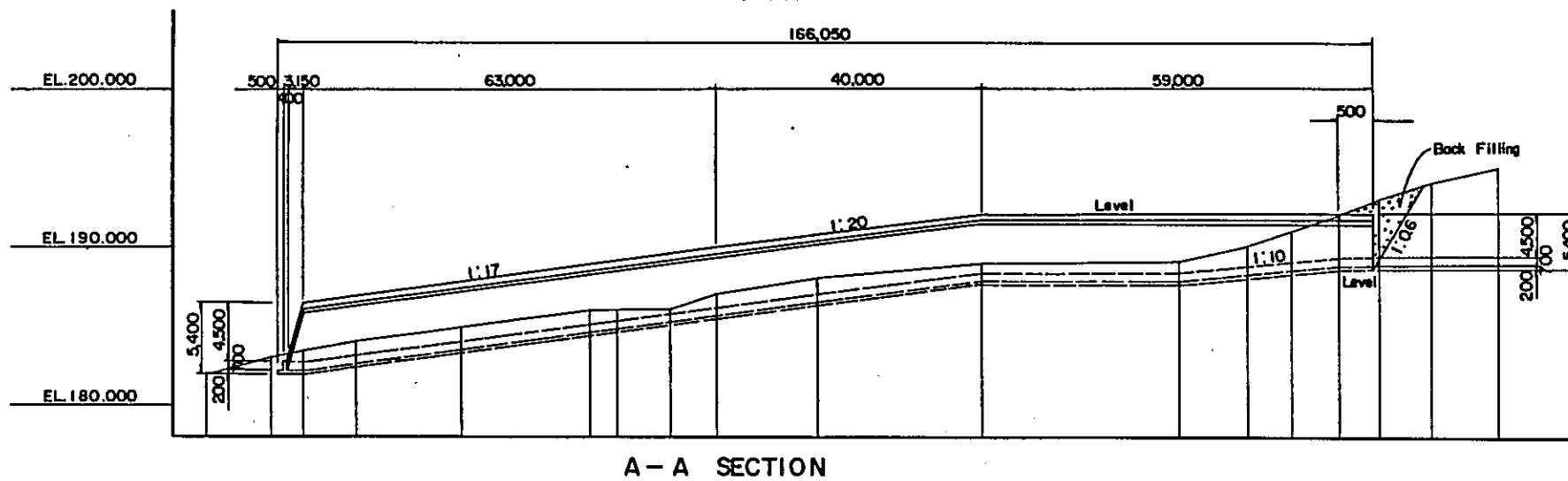
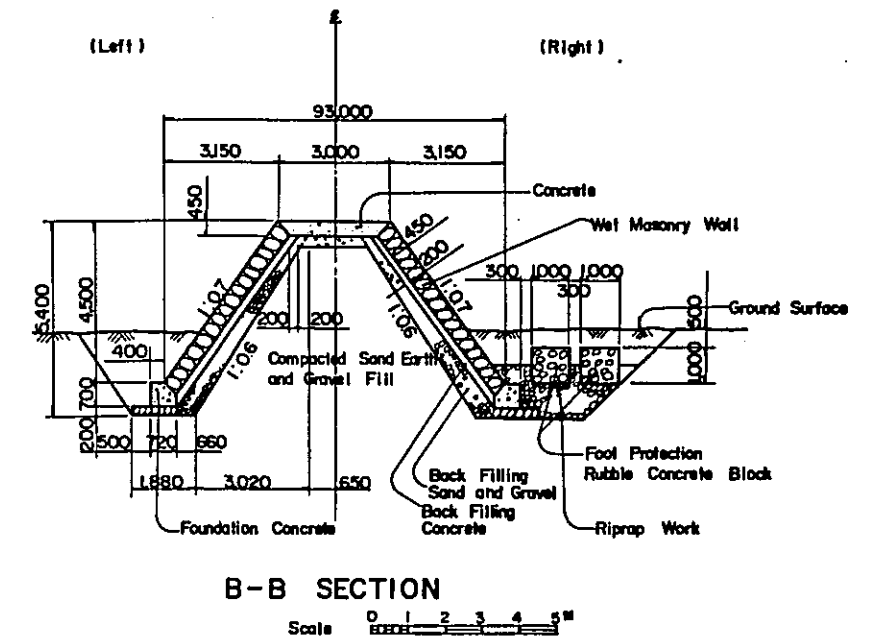
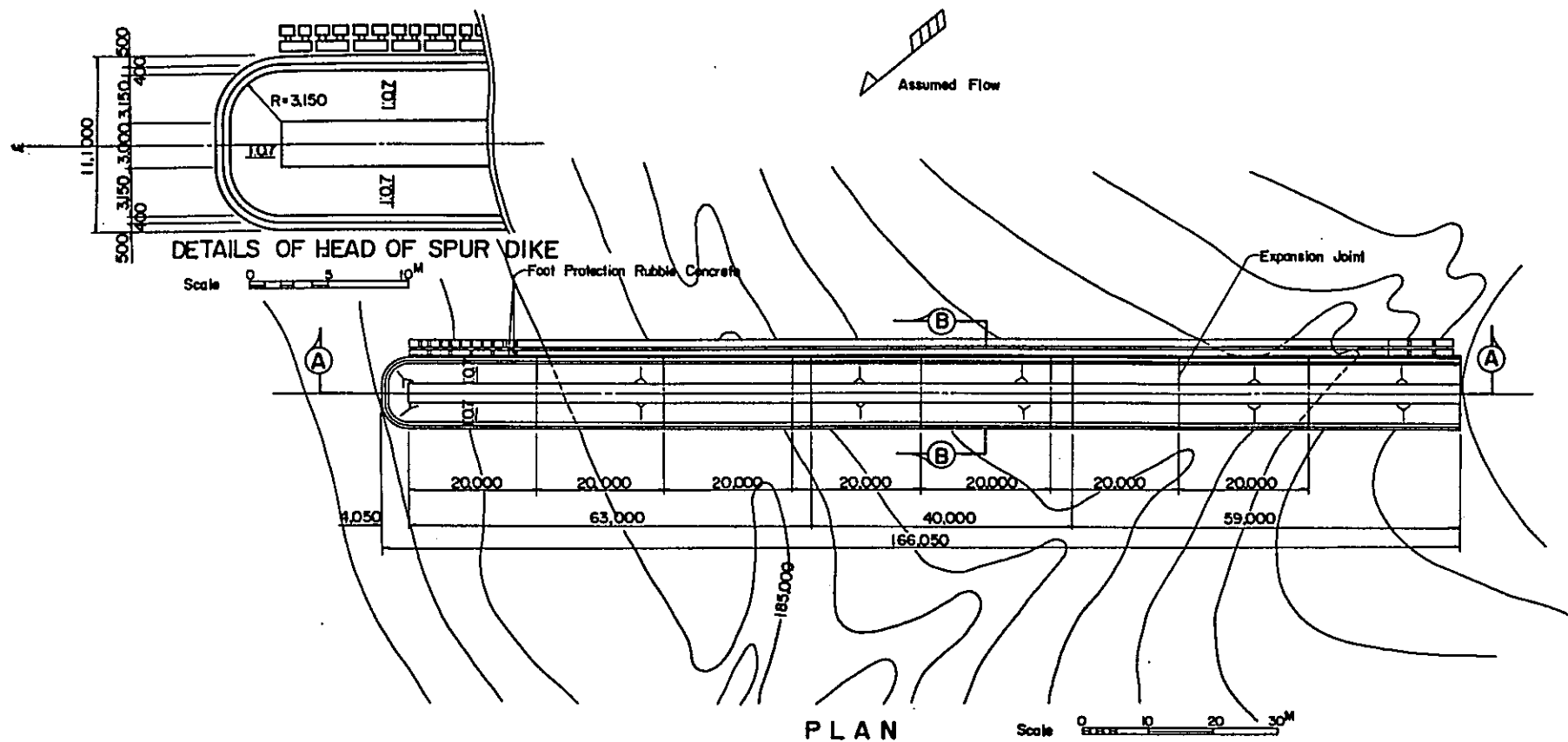
TYPICAL SECTION OF MAIN AND SUB DAMS

Scale 0 1 2 3 4 5^M

MINISTRY OF PUBLIC WORKS			
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MANILA, PHILIPPINES			
MAYON VOLCANO			
SABO AND FLOOD CONTROL PROJECT			
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DATE	SCALE	AS SHOWN	NO. 1 SABO DAM
DRAWING NO.	M.V.S.-D 004		
JAPAN INTERNATIONAL COOPERATION AGENCY			



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TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES	
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT, PHILIPPINES	
CHECKED BY: []	DATE: []
DRAWN BY: []	SCALE: AS SHOWN
DRAWING NO. MVS-D 005	
TITLE OF DRAWING: SPUR DIKES GENERAL PLAN	
JAPAN INTERNATIONAL COOPERATION AGENCY	



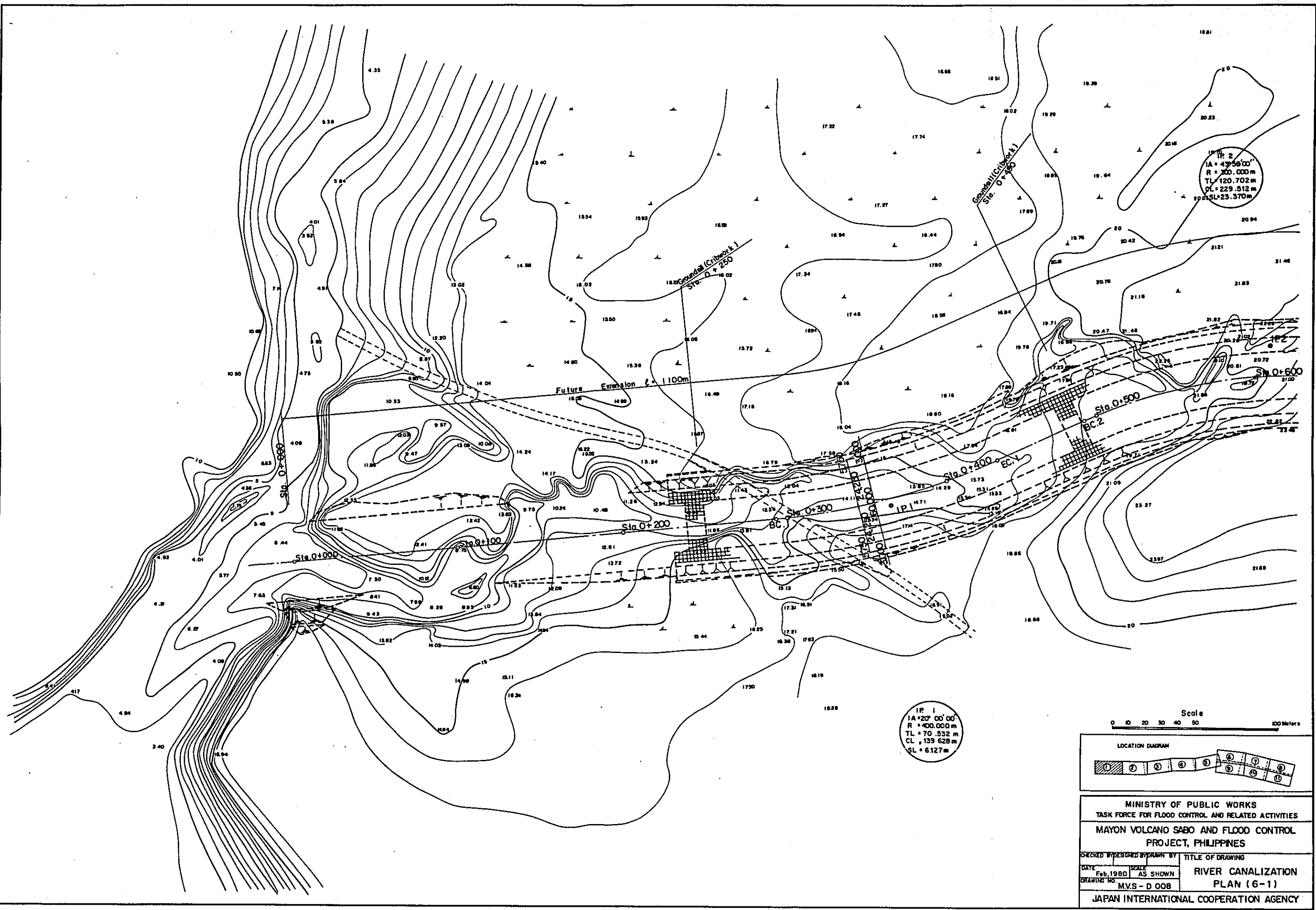
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Accumulated Distance	0.000	10.000	15.000	23.000	39.000	59.000	63.000	71.000	78.000	93.000	108.000	148.000	158.000	165.000	172.000	178.000	186.000	196.000	206.000
Ground Elevation	182.000	183.000	183.300	184.000	185.000	186.000	186.000	186.000	187.000	188.000	189.000	189.000	190.000	191.000	192.000	193.000	194.000	195.000	195.000
Formation Height of Top of Spur Dike			186.300					190.000		192.000					192.000				
Original Ground Surface Slope	1/100		1/100			Level		1/70		Level			1/200		Level		1/80		

MINISTRY OF PUBLIC WORKS
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
MANILA, PHILIPPINES

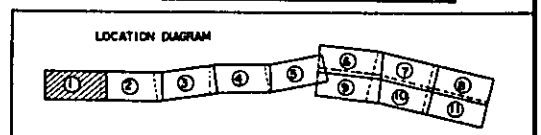
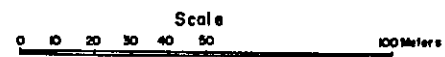
**MAYON VOLCANO
SABO AND FLOOD CONTROL PROJECT**

CHECKED BY: DESIGNED BY: DRAWN BY: TITLE OF DRAWING
DATE: Feb. 1980 SCALE: AS SHOWN NO. 2 SPUR DIKE
DRAWING NO. M.V.S.-D.007 PLAN, PROFILE & SECTION

JAPAN INTERNATIONAL COOPERATION AGENCY



IP 1
 1A = 40° 00' 00"
 R = 400.000 m
 TL = 70.532 m
 CL = 139.628 m
 SL = 6.127 m

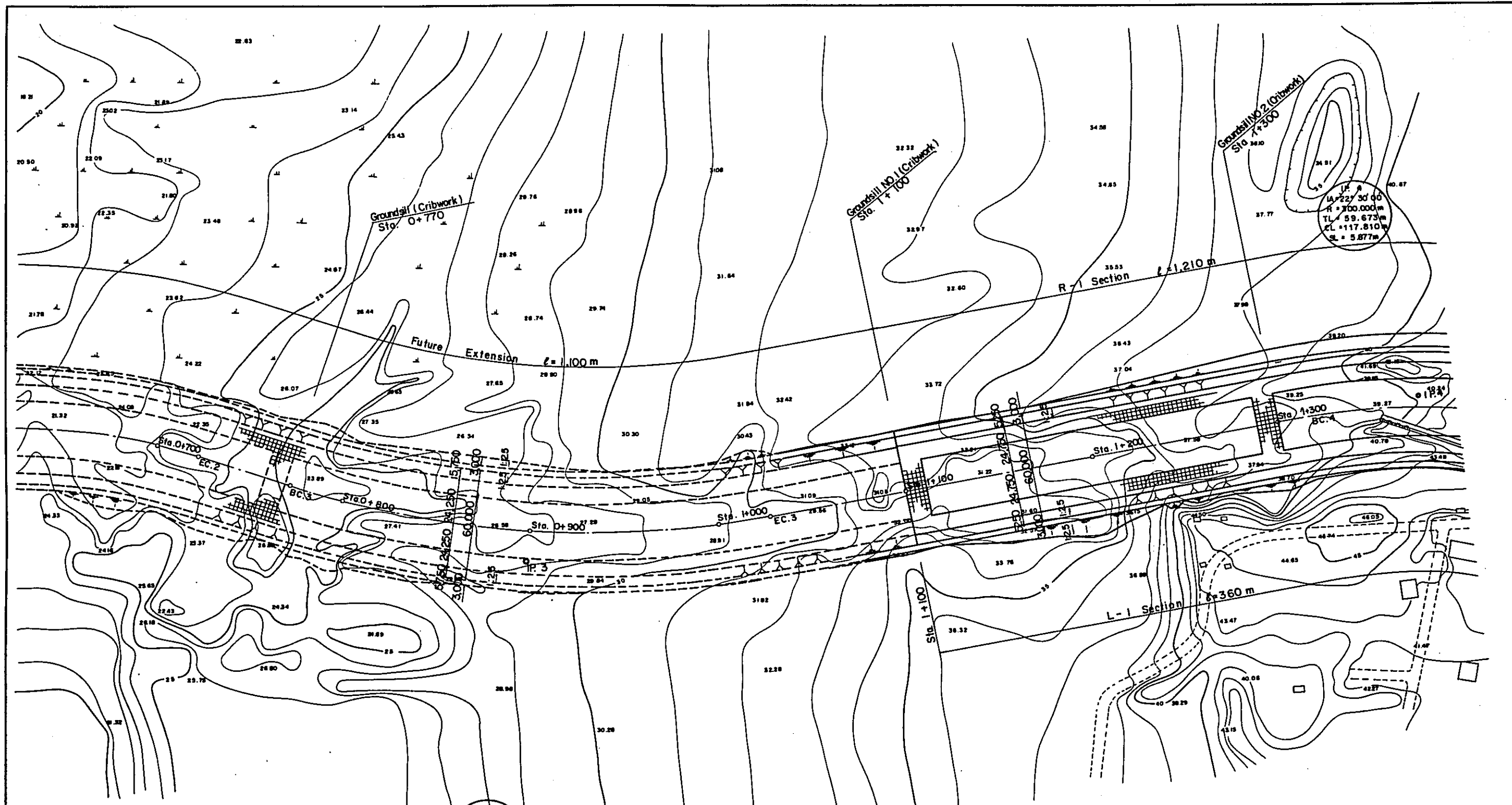


MINISTRY OF PUBLIC WORKS
 TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
 MAYON VOLCANO SABO AND FLOOD CONTROL
 PROJECT, PHILIPPINES

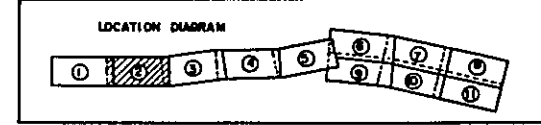
CHECKED BY: DESIGNED BY: DRAWN BY: TITLE OF DRAWING: RIVER CANALIZATION PLAN (6-1)

DATE: Feb. 1980 SCALE: AS SHOWN
 DRAWING NO.: MVS-D 008

JAPAN INTERNATIONAL COOPERATION AGENCY



IP 3
 IA = 29° 30' 00"
 R = 500.000 m
 T.L. = 130.860 m
 C.L. = 255.980 m
 S.L. = 16.440 m



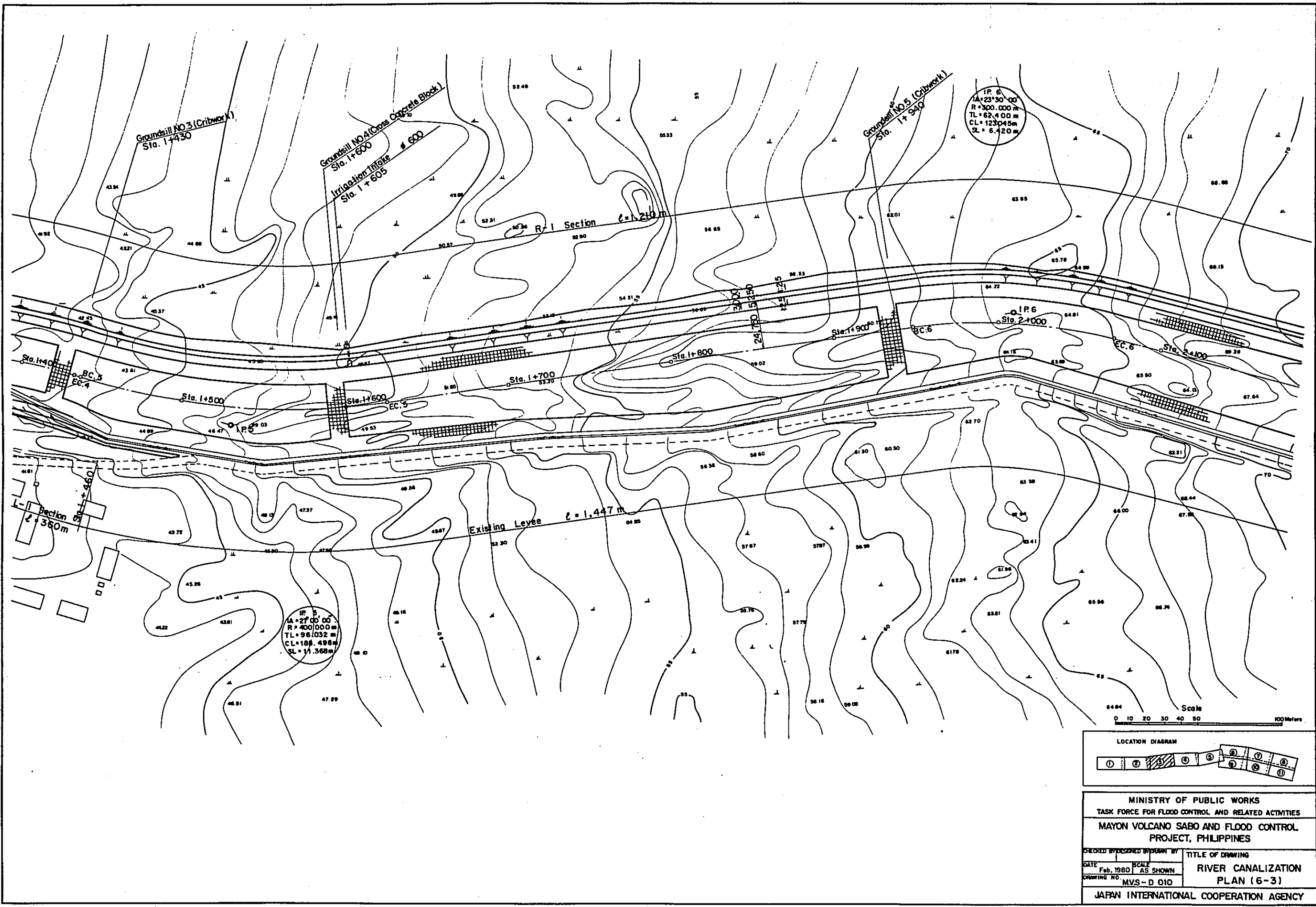
MINISTRY OF PUBLIC WORKS
 TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
 MAYON VOLCANO SABO AND FLOOD CONTROL
 PROJECT, PHILIPPINES

CHECKED BY: DESIGNED BY: DRAWN BY:

DATE: Feb. 1980 SCALE: AS SHOWN TITLE OF DRAWING: RIVER CANALIZATION PLAN (6-2)

DRAWING NO.: M.V.S-D 009

JAPAN INTERNATIONAL COOPERATION AGENCY



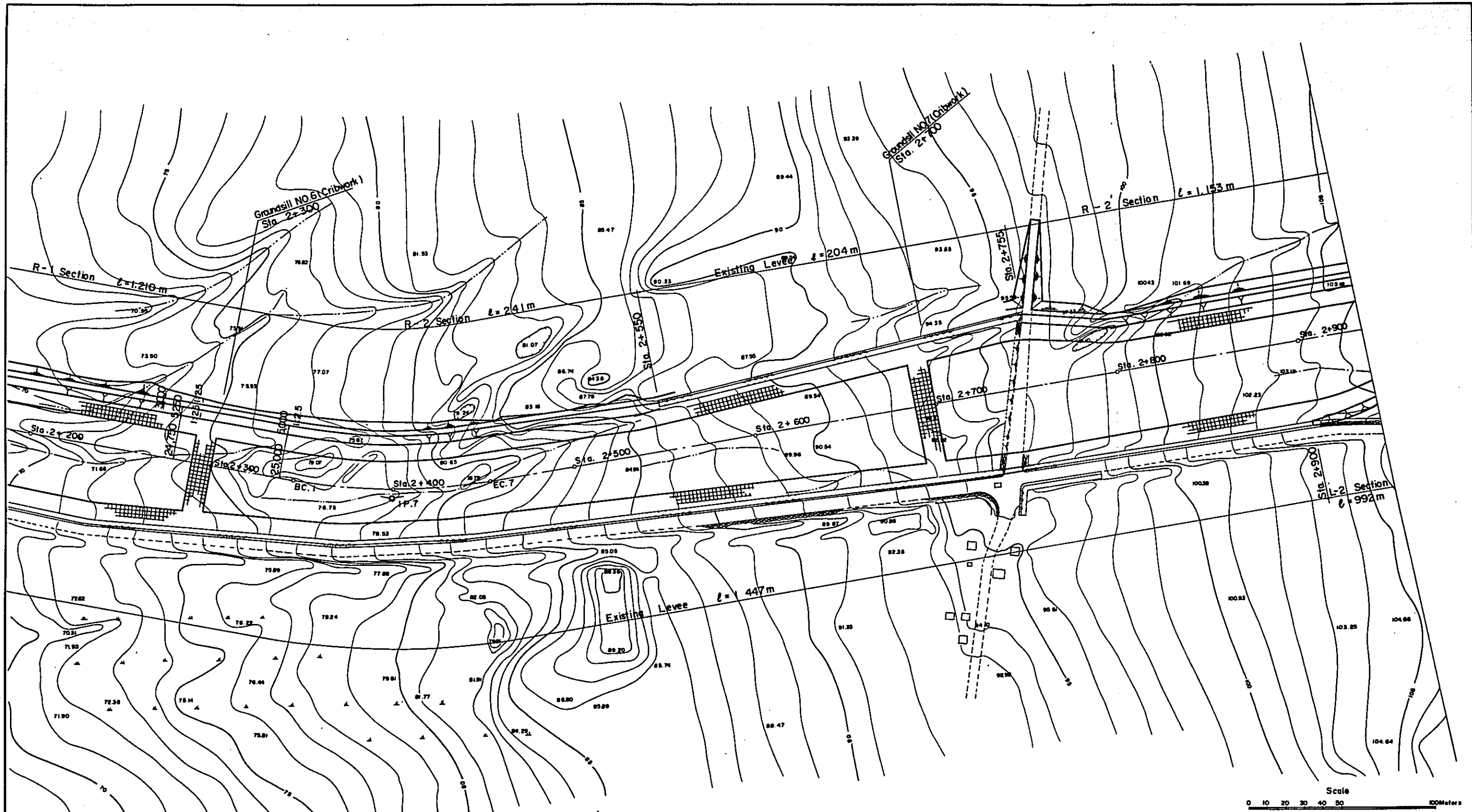
Scale 0 10 20 30 40 50 100 Meters

LOCATION DIAGRAM

MINISTRY OF PUBLIC WORKS
 TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
 MAYON VOLCANO SABO AND FLOOD CONTROL
 PROJECT, PHILIPPINES

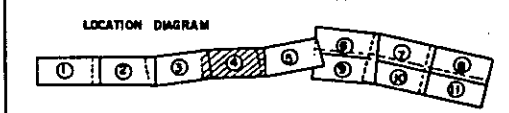
DESIGNED BY	DESIGNED BY	TITLE OF DRAWING
DATE	SCALE	RIVER CANALIZATION PLAN (6-3)
Feb. 1980	AS SHOWN	
DRAWING NO.	MVS-D 010	

JAPAN INTERNATIONAL COOPERATION AGENCY

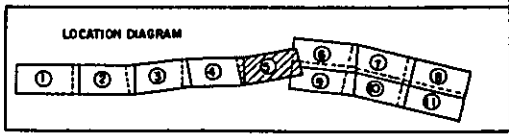
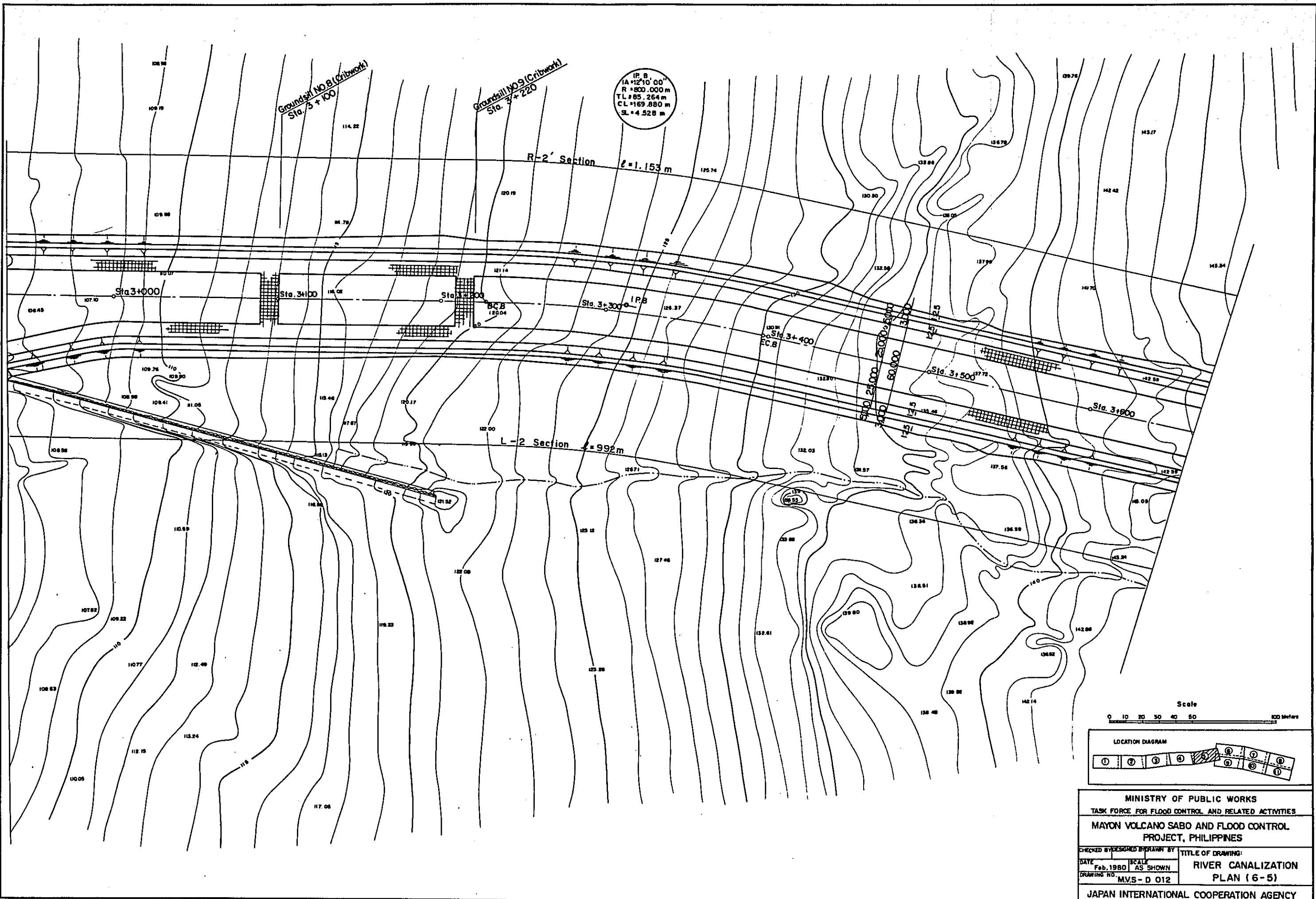


I.P. 7
 LA = 20°45'00"
 R = 300.000m
 TL = 54.924m
 CL = 108.648m
 SL = 4.986m

Scale 0 10 20 30 40 50 Meters



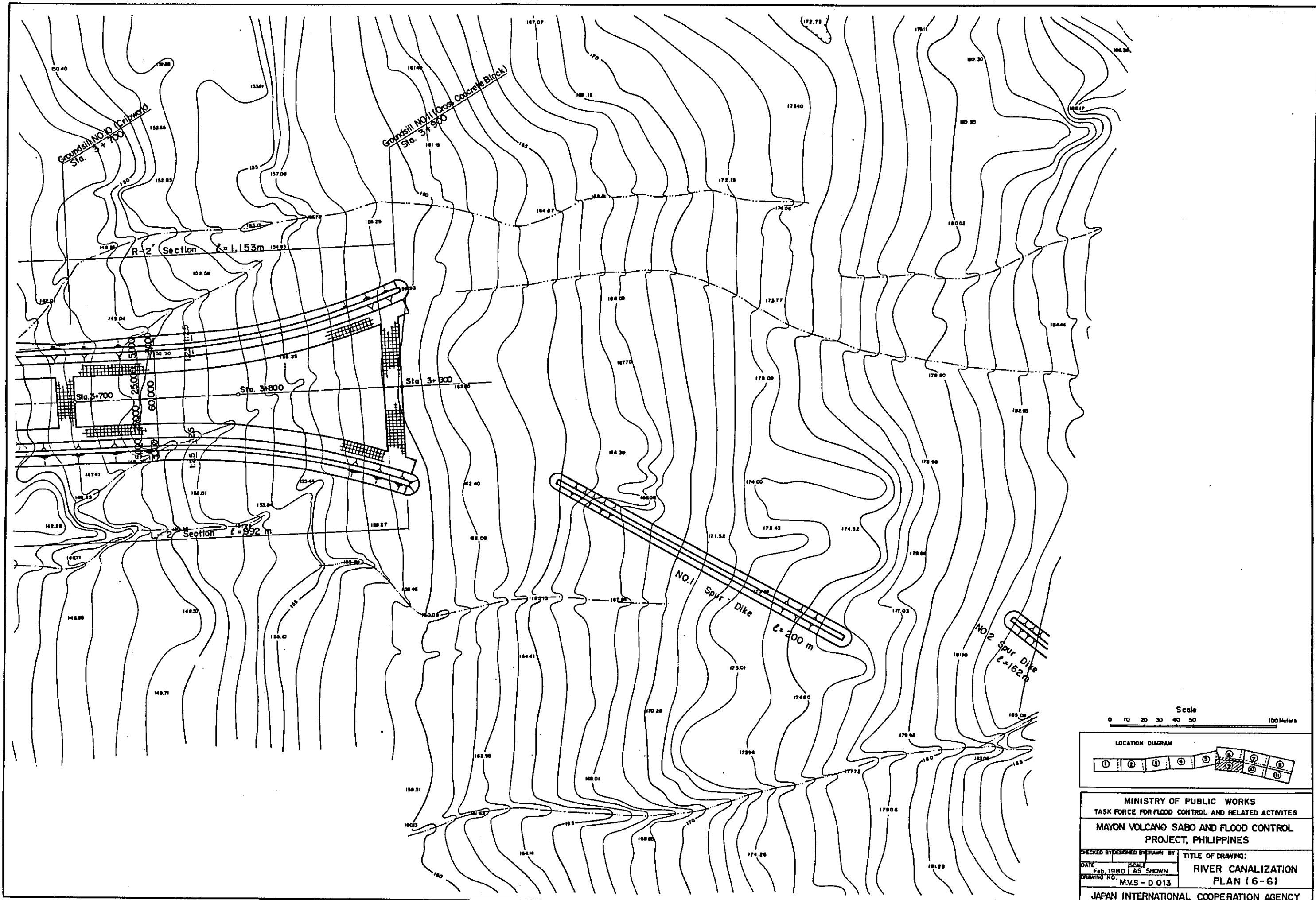
MINISTRY OF PUBLIC WORKS
 TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
 MAYON VOLCANO SABO AND FLOOD CONTROL
 PROJECT, PHILIPPINES
 CHECKED BY: DESIGNED BY: DRAWN BY: TITLE OF DRAWING
 DATE: Feb. 1980 SCALE: AS SHOWN RIVER CANALIZATION
 DRAWING BY: MVS-D 011 PLAN (6-4)
 JAPAN INTERNATIONAL COOPERATION AGENCY



MINISTRY OF PUBLIC WORKS
 TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
 MAYON VOLCANO SABO AND FLOOD CONTROL
 PROJECT, PHILIPPINES

CHECKED BY: DESIGNED BY: DRAWN BY: TITLE OF DRAWING:
 DATE: Feb. 1980 SCALE: AS SHOWN RIVER CANALIZATION
 DRAWING NO. MVS-D 012 PLAN (6-5)

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Scale
0 10 20 30 40 50 100 Meters

LOCATION DIAGRAM

MINISTRY OF PUBLIC WORKS
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
MAYON VOLCANO SABO AND FLOOD CONTROL
PROJECT, PHILIPPINES

CHECKED BY DESIGNED BY DRAWN BY
DATE: Feb. 1980 SCALE: AS SHOWN
DRAWING NO.: MVS - D 013

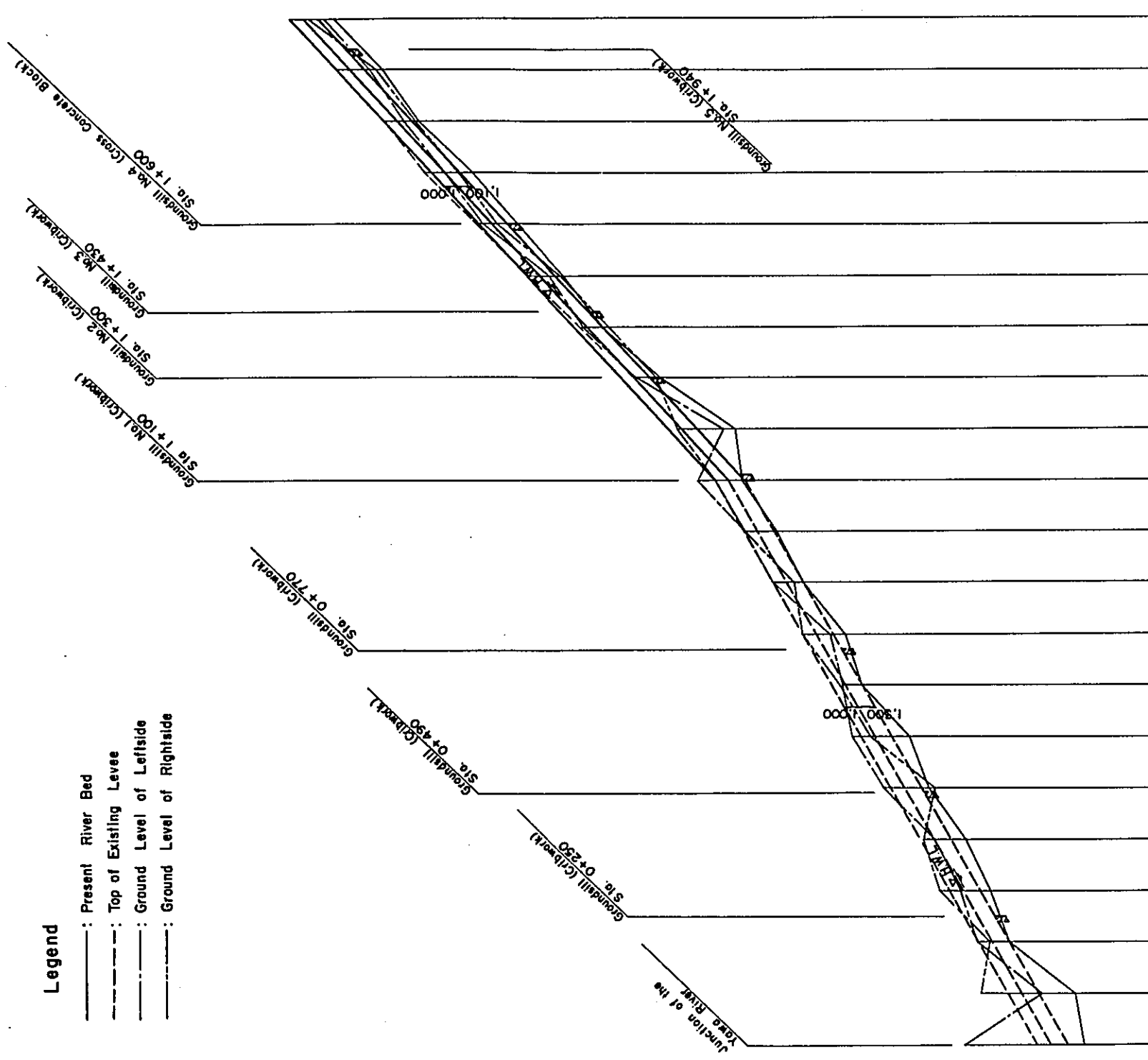
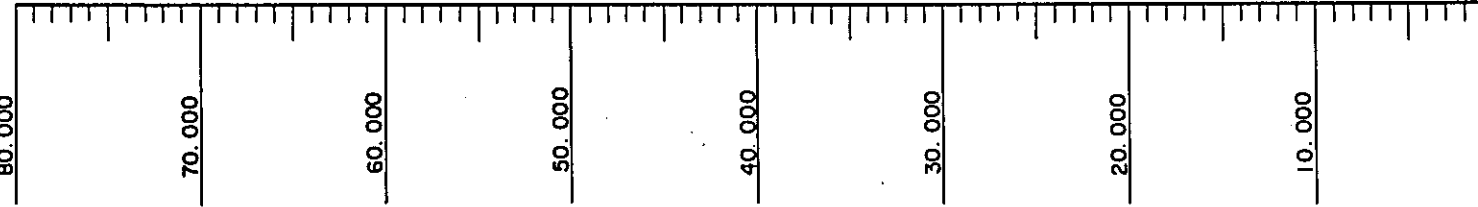
TITLE OF DRAWING:
RIVER CANALIZATION
PLAN (6-6)

JAPAN INTERNATIONAL COOPERATION AGENCY

Horizontal Scale
0 50 100 150 200 300m

- Legend**
- Present River Bed
 - - - Top of Existing Levee
 - · - · - Ground Level of Leftside
 - · - · - Ground Level of Rightside

EL (m)



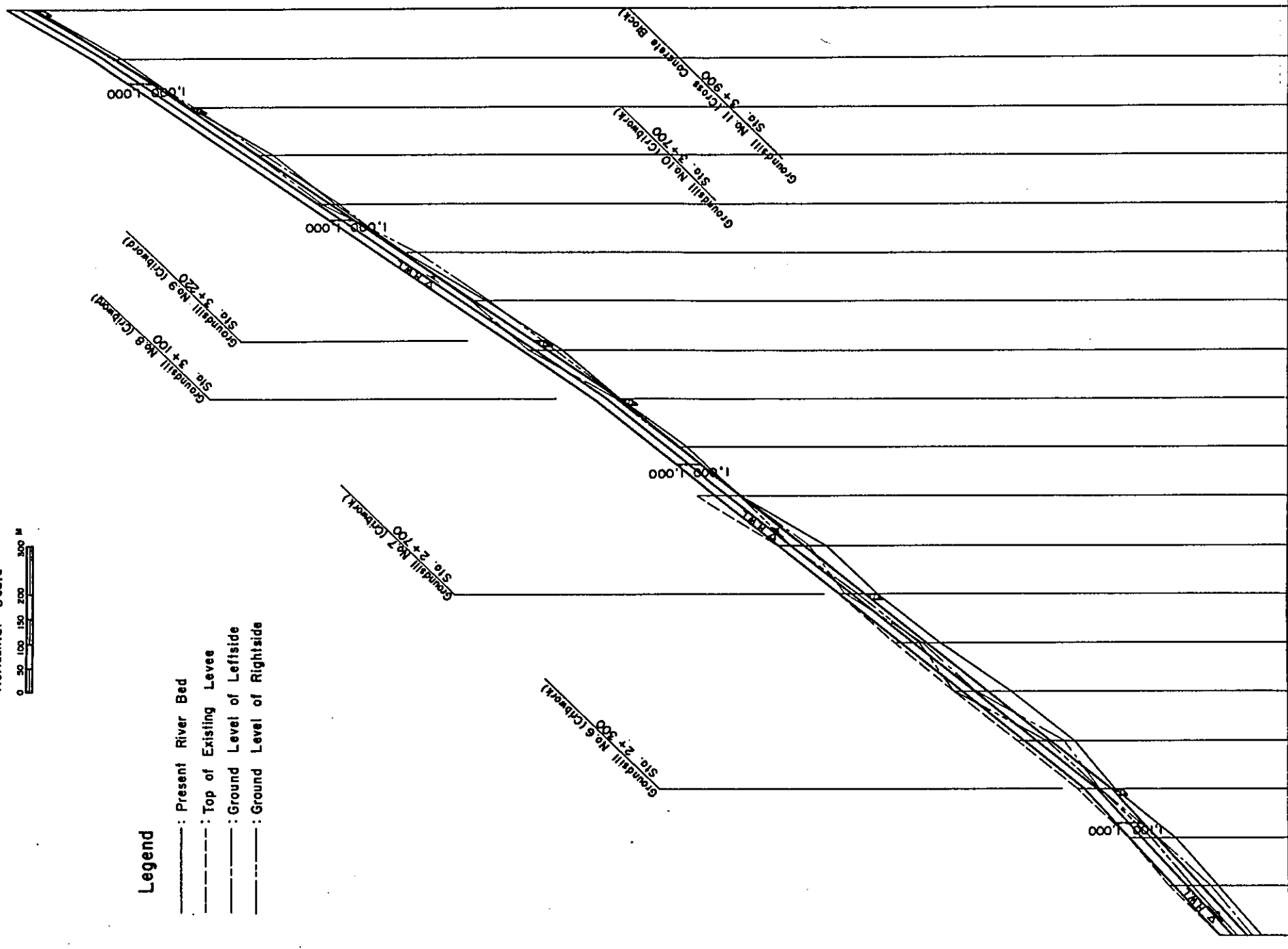
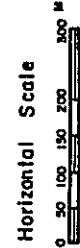
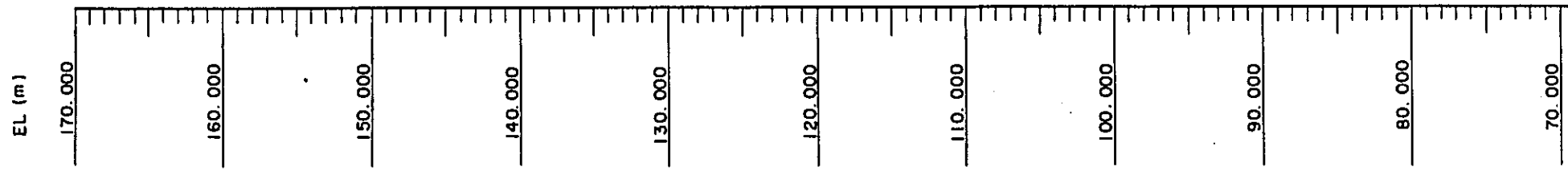
Station No.	Distance (m)	Accumulated Distance (m)	Formation Height of River Bed (m)	Design Flood Water Level (m)	Formation Height Top of Levee (m)	Planned River Bed Slope		Future Extension		R-1 Section		L-1 Section	
						Sec-Right Levee	Sec-Left Levee	Formation Height	Top of Levee	Formation Height	Top of Levee	Formation Height	Top of Levee
0+000	0	0	7.200	8.500	9.382	10.682	11.682	9.300	8.500	9.300	11.682	10.682	9.382
100	100	100	7.200	8.500	9.382	10.682	11.682	9.300	8.500	9.300	11.682	10.682	9.382
200	200	200	11.564	12.864	13.864	15.864	13.864	12.864	11.564	12.864	13.864	15.864	13.864
300	300	300	13.743	15.043	16.043	18.043	16.043	15.043	13.743	15.043	16.043	18.043	16.043
400	400	400	15.927	17.227	18.227	20.227	18.227	17.227	15.927	17.227	18.227	20.227	18.227
500	500	500	18.109	19.409	20.409	22.409	20.409	19.409	18.109	19.409	20.409	22.409	20.409
600	600	600	20.291	21.591	22.591	24.591	22.591	21.591	20.291	21.591	22.591	24.591	22.591
700	700	700	22.473	23.773	24.773	26.773	24.773	23.773	22.473	23.773	24.773	26.773	24.773
800	800	800	24.655	25.955	26.955	28.955	26.955	25.955	24.655	25.955	26.955	28.955	26.955
900	900	900	26.836	28.136	29.136	31.136	29.136	28.136	26.836	28.136	29.136	31.136	29.136
1+000	1,000	1,000	29.018	30.318	31.318	33.318	31.318	30.318	29.018	30.318	31.318	33.318	31.318
100	100	1,100	31.200	32.500	33.500	35.500	33.500	32.500	31.200	32.500	33.500	35.500	33.500
200	200	1,200	34.958	36.058	37.058	39.058	37.058	36.058	34.958	36.058	37.058	39.058	37.058
300	300	1,300	38.917	39.617	40.617	42.617	40.617	39.617	38.917	39.617	40.617	42.617	40.617
400	400	1,400	42.079	43.179	44.179	46.179	44.179	43.179	42.079	43.179	44.179	46.179	44.179
500	500	1,500	45.633	46.733	47.733	49.733	47.733	46.733	45.633	46.733	47.733	49.733	47.733
600	600	1,600	49.192	50.292	51.292	53.292	51.292	50.292	49.192	50.292	51.292	53.292	51.292
700	700	1,700	52.750	53.850	54.850	56.850	54.850	53.850	52.750	53.850	54.850	56.850	54.850
800	800	1,800	56.308	57.408	58.408	60.408	58.408	57.408	56.308	57.408	58.408	60.408	58.408
900	900	1,900	59.867	60.967	61.967	63.967	61.967	60.967	59.867	60.967	61.967	63.967	61.967
2+000	2,000	2,000	63.423	64.523	65.523	67.523	65.523	64.523	63.423	64.523	65.523	67.523	65.523

MINISTRY OF PUBLIC WORKS
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
MANILA, PHILIPPINES

**MAYON VOLCANO
SABO AND FLOOD CONTROL PROJECT**

CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE		RIVER CANALIZATION PROFILE (2-1)
Feb, 1980	AS SHOWN		
DRAWING NO.	M.V.S - D 014		

JAPAN INTERNATIONAL COOPERATION AGENCY



- Legend**
- : Present River Bed
 - - - : Top of Existing Levee
 - · · : Ground Level of Leftside
 - · - : Ground Level of Rightside

Station No.	Distance (m)	Accumulated Distance (m)	Formation Height of River Bed (m)	Design Flood Water Level (m)	Top of Levee (m)	Formation Height (m)	Planned River Bed Slope		Existing River Bed Slope	
							Left Levee	Right Levee	Left Levee	Right Levee
2+000	100	2,000	63.425	64.525	69.083	5.925	28.1	17.5	161.650	
100	100	2,100	66.983	68.083	72.642	6.983	28.1	17.5	154.950	
200	100	2,200	70.542	71.642	76.200	7.542	20.6	17.5	149.300	
300	100	2,300	74.100	75.200	79.750	8.100	20.6	17.5	143.583	
400	100	2,400	79.050	80.050	83.900	8.750	20.6	17.5	137.867	
500	100	2,500	83.900	84.900	89.750	9.450	20.6	17.5	132.150	
600	100	2,600	88.750	89.750	94.600	10.150	20.6	17.5	126.433	
700	100	2,700	93.600	94.600	99.450	10.850	20.6	17.5	120.717	
800	100	2,800	98.450	99.450	104.300	11.550	20.6	17.5	115.000	
900	100	2,900	103.300	104.300	109.150	12.250	20.6	17.5	109.300	
100	100	3,000	108.150	109.150	114.000	12.950	20.6	17.5	103.600	
200	100	3,200	118.717	119.717	120.717	13.650	20.6	17.5	97.900	
300	100	3,300	124.433	125.433	126.433	14.350	20.6	17.5	92.200	
400	100	3,400	130.150	131.150	132.150	15.050	20.6	17.5	86.500	
500	100	3,500	135.867	136.867	137.867	15.750	20.6	17.5	80.800	
600	100	3,600	141.583	142.583	143.583	16.450	20.6	17.5	75.100	
700	100	3,700	147.300	148.300	149.300	17.150	20.6	17.5	69.400	
800	100	3,800	153.017	153.950	154.950	17.850	20.6	17.5	63.700	
900	100	3,900	158.733	159.650	161.650	18.550	20.6	17.5	58.000	

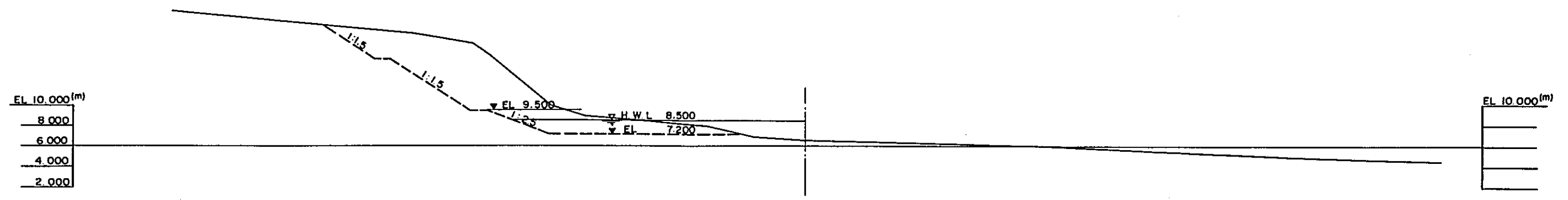
MINISTRY OF PUBLIC WORKS
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
MANILA . PHILIPPINES

**MAYON VOLCANO
SABO AND FLOOD CONTROL PROJECT**

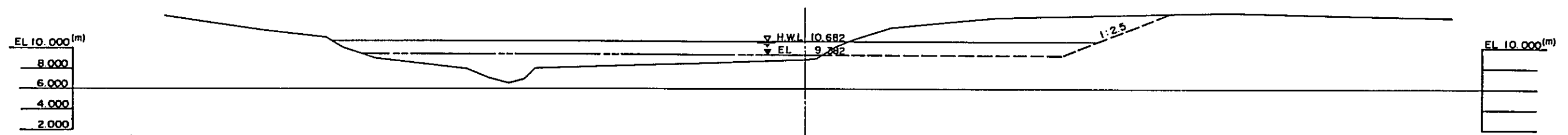
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING RIVER CANALIZATION PROFILE (2-2)
DATE	SCALE	AS SHOWN	
DRAWING NO.	M.V.S-D 015		

JAPAN INTERNATIONAL COOPERATION AGENCY

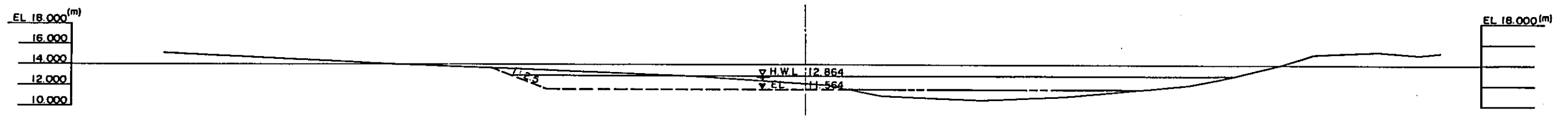
STA. 0+000



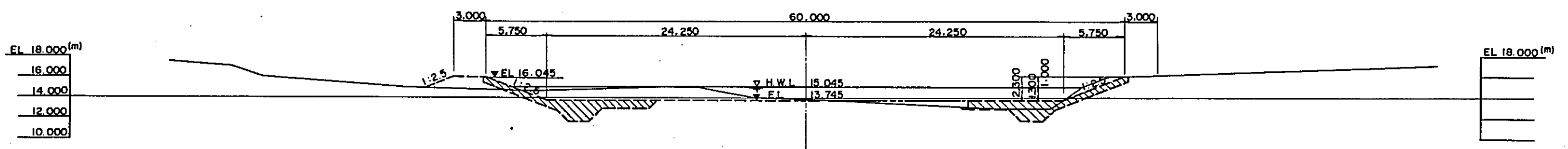
STA. 0+100



STA. 0+200

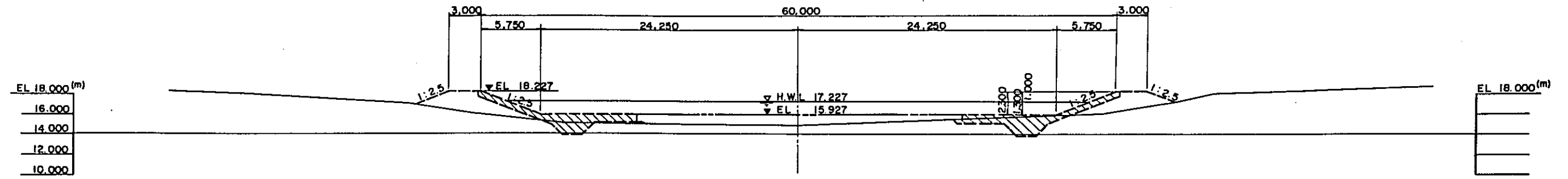


STA. 0+300

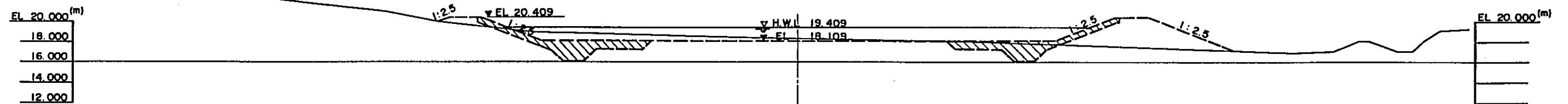


MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION CROSS SECTION (10-1)
DRAWING NO. M.VS-D. 016			JAPAN INTERNATIONAL COOPERATION AGENCY

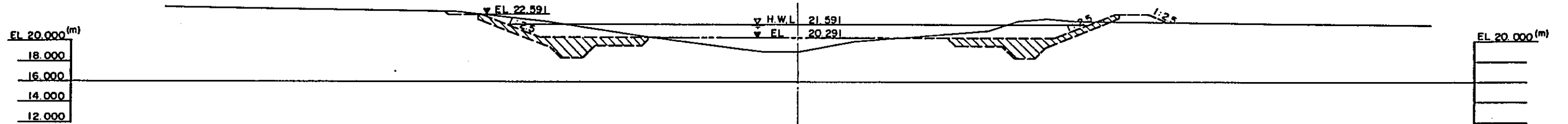
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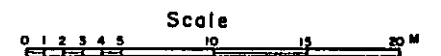
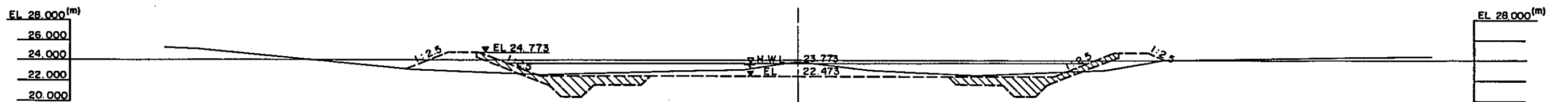
STA. 0+500



STA. 0+600

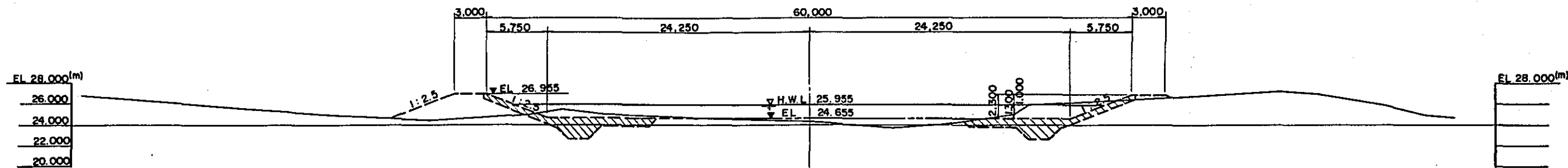


STA. 0+700

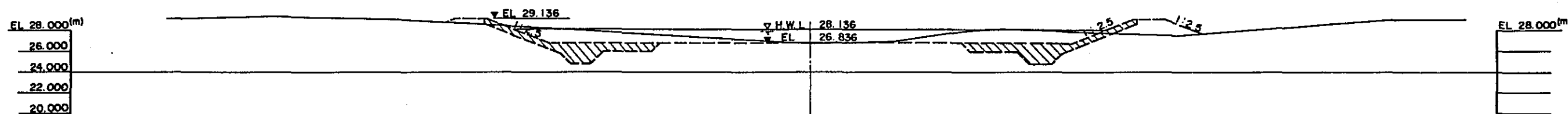


MINISTRY OF PUBLIC WORKS			
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES			
MANILA		PHILIPPINES	
MAYON VOLCANO			
SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	TITLE OF DRAWING	
DATE	TITLE	RIVER CANALIZATION	
Feb. 1980	AS SHOWN	CROSS SECTION (10-2)	
DRAWING NO. M.V.S-D 017			
JAPAN INTERNATIONAL COOPERATION AGENCY			

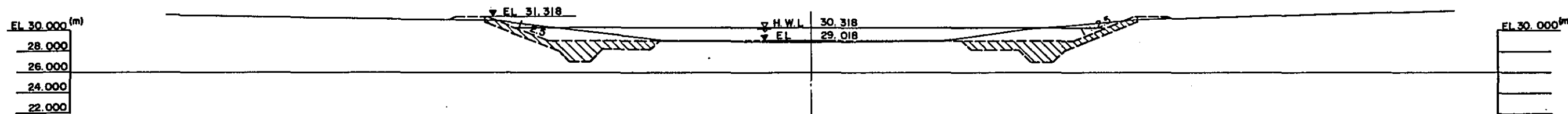
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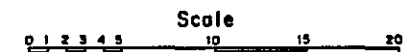
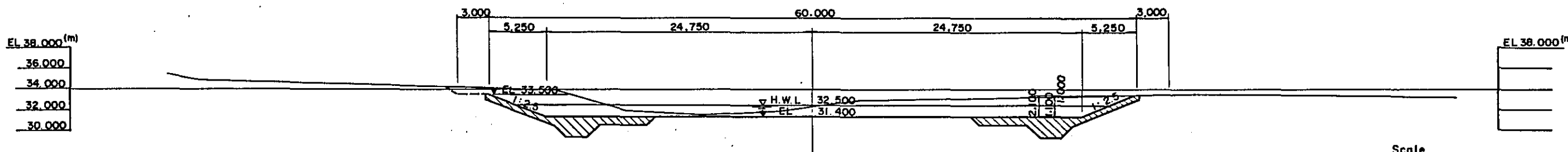
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STA. 1+000

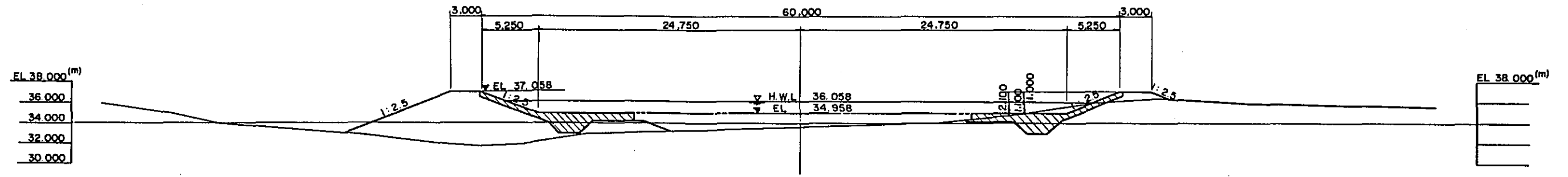


STA. 1+100

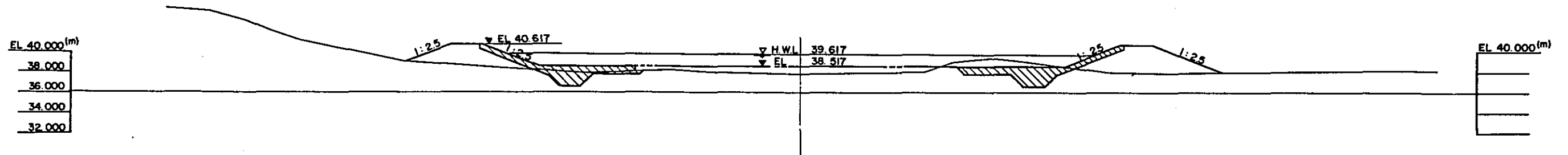


MINISTRY OF PUBLIC WORKS			
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES			
MANILA, PHILIPPINES			
MAYON VOLCANO			
SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION
Feb. 1980	M.V.S-D	OIB	CROSS SECTION (10-3)
JAPAN INTERNATIONAL COOPERATION AGENCY			

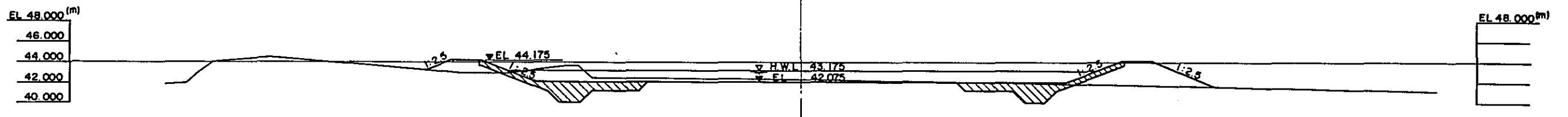
STA. 1+200



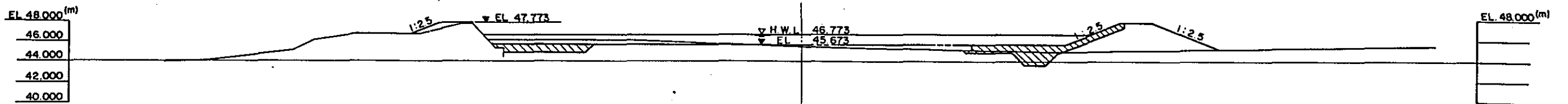
STA. 1+300



STA. 1+400

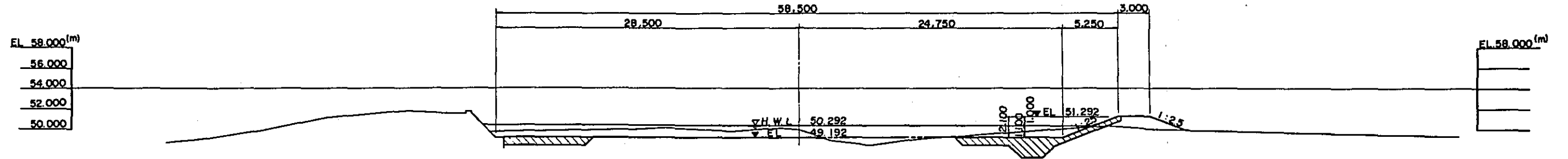


STA. 1+500

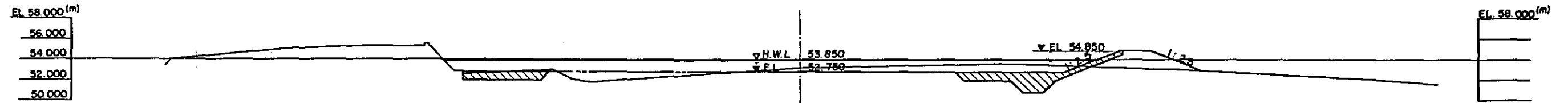


MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION CROSS SECTION (10-4)
DRAWING NO. M.V.5-D 019			JAPAN INTERNATIONAL COOPERATION AGENCY

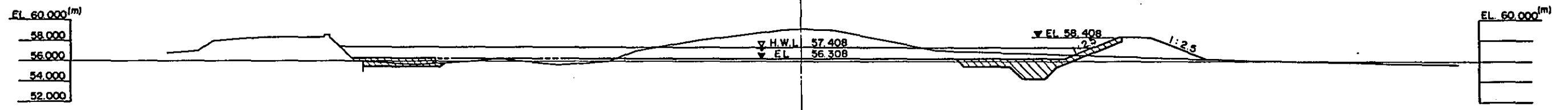
STA. 1+600



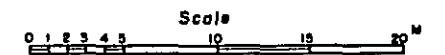
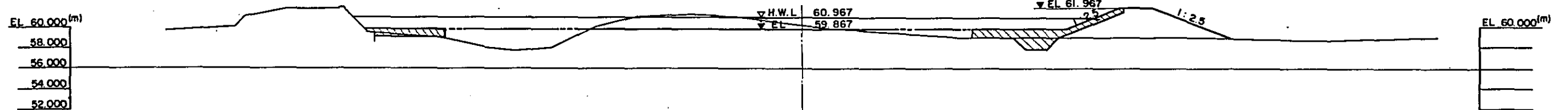
STA. 1+700



STA. 1+800

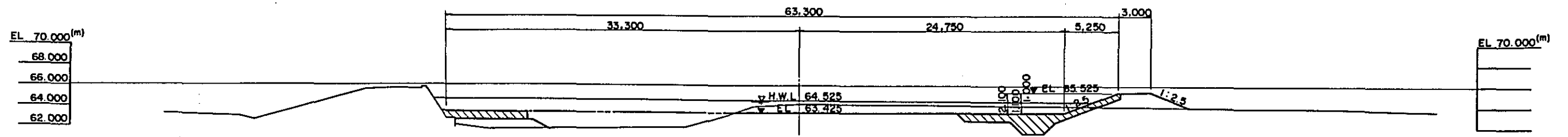


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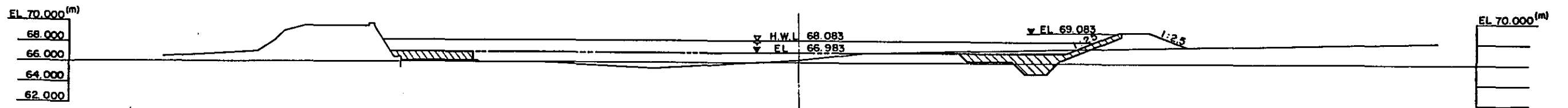


MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION CROSS SECTION (10-5)
DRAWING NO. M.V.S - D 020			JAPAN INTERNATIONAL COOPERATION AGENCY

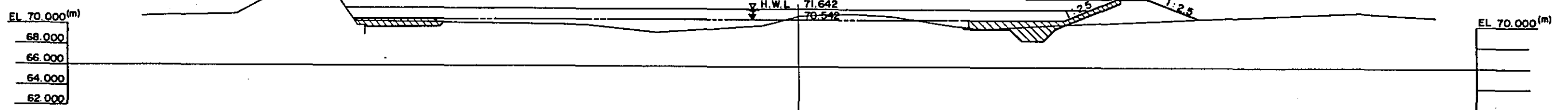
STA. 2+000



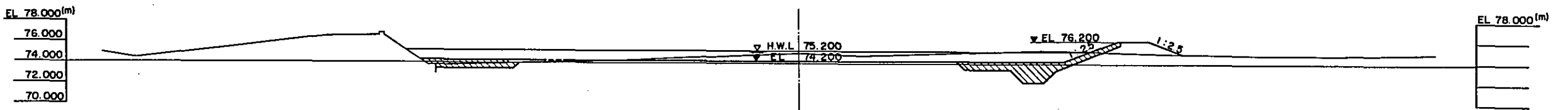
STA. 2+100



STA. 2+200

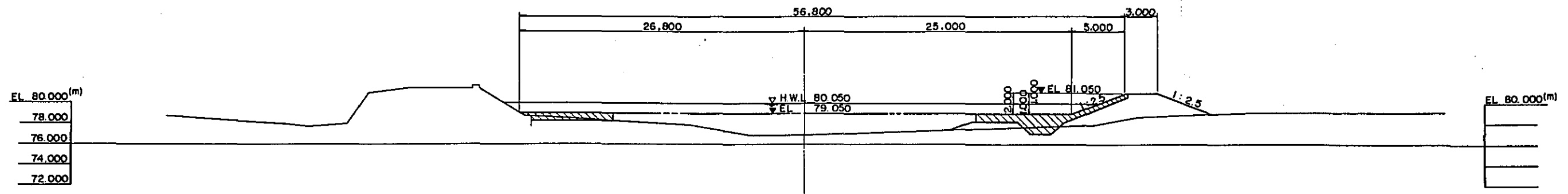


STA. 2+300

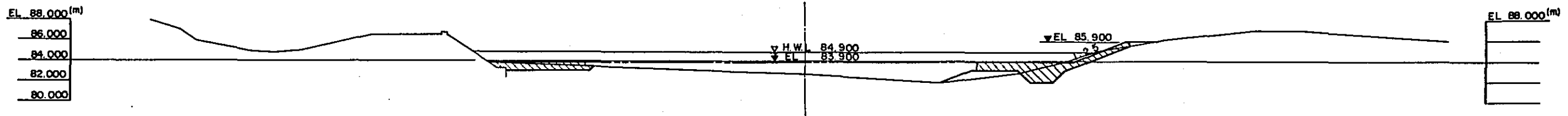


MINISTRY OF PUBLIC WORKS			
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES			
MANILA, PHILIPPINES			
MAYON VOLCANO			
SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION,
Feb. 1980			CROSS SECTION (10-6)
DRAWING NO. M.V.S-D 021			
JAPAN INTERNATIONAL COOPERATION AGENCY			

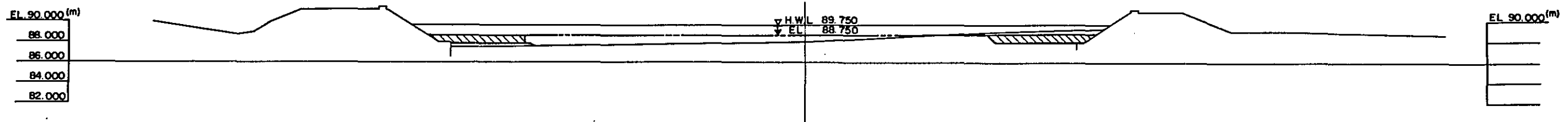
STA. 2+400



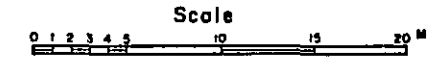
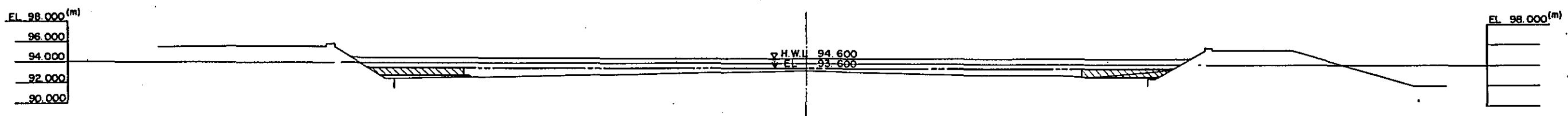
STA. 2+500



STA. 2+600

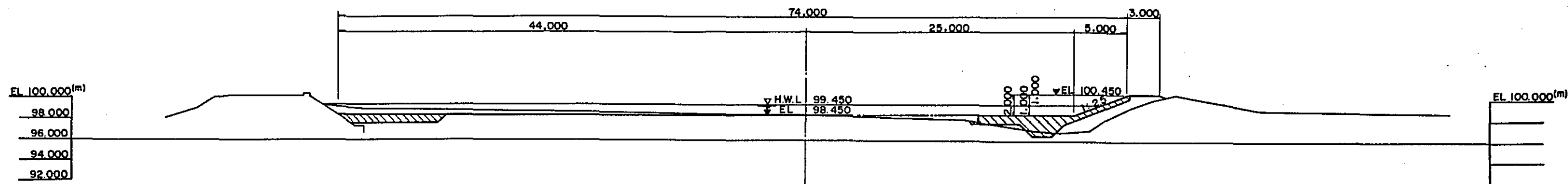


STA. 2+700

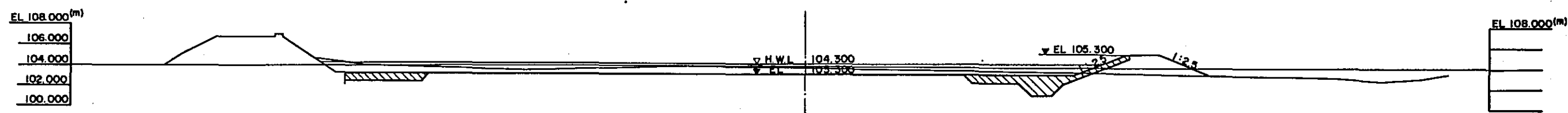


MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION CROSS SECTION (10-7)
DRAWING NO. M.V.S - D. 022		JAPAN INTERNATIONAL COOPERATION AGENCY	

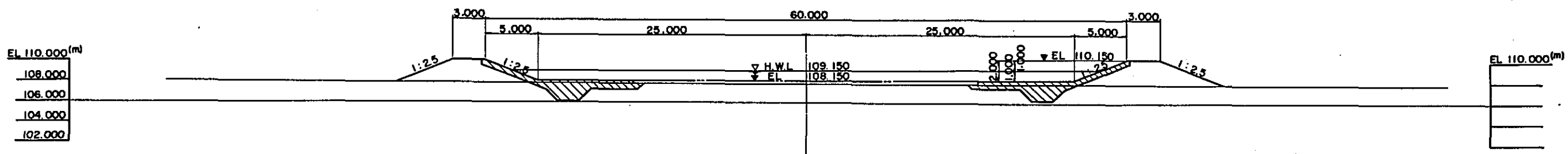
STA. 2+800



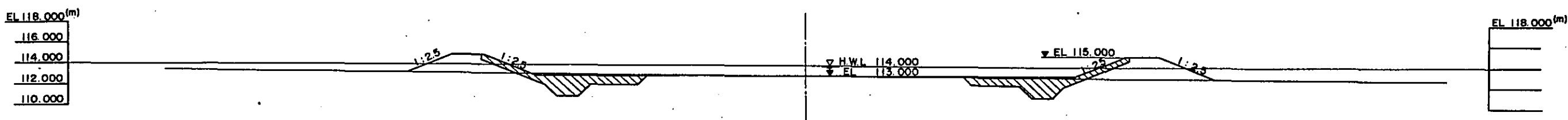
STA. 2+900



STA. 3+000

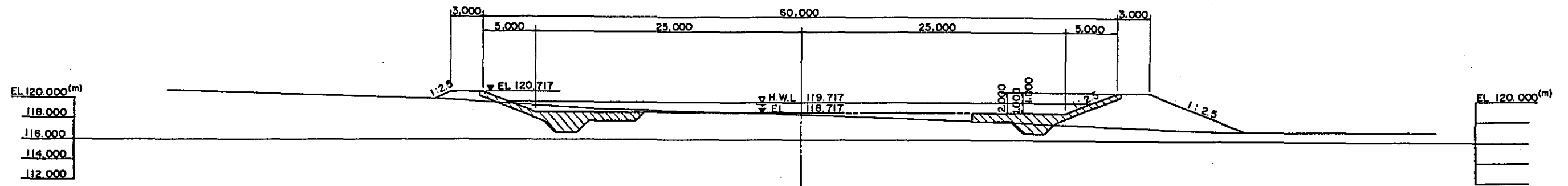


STA. 3+100

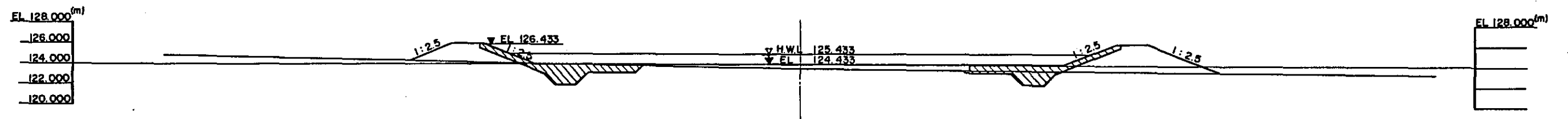


MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA . PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION CROSS SECTION (10-8)
DRAWING NO. M.V.S - D 023			JAPAN INTERNATIONAL COOPERATION AGENCY

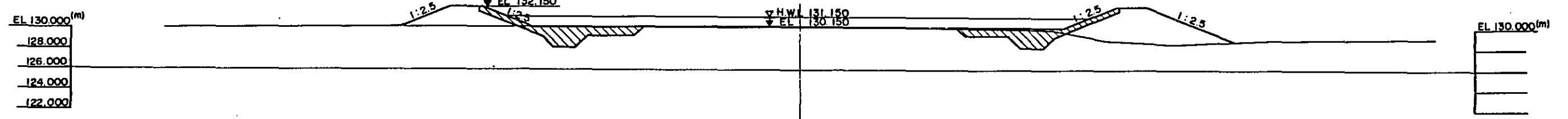
STA. 3+200



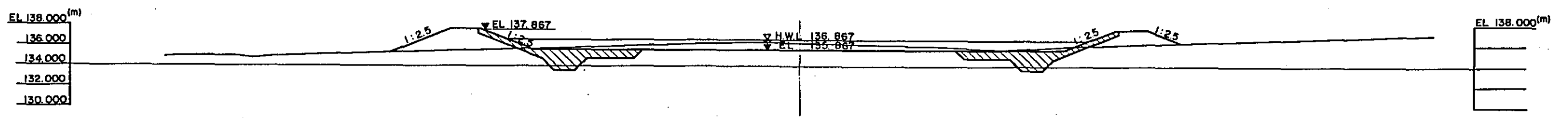
STA. 3+300



STA. 3+400

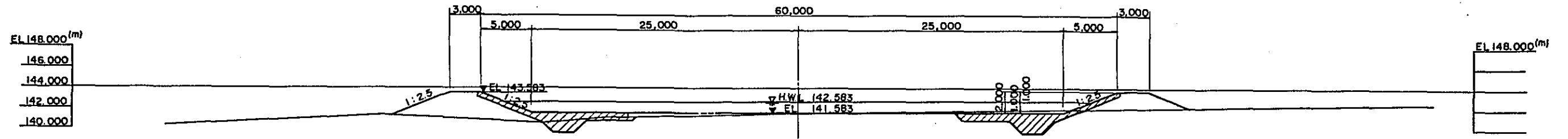


STA. 3+500

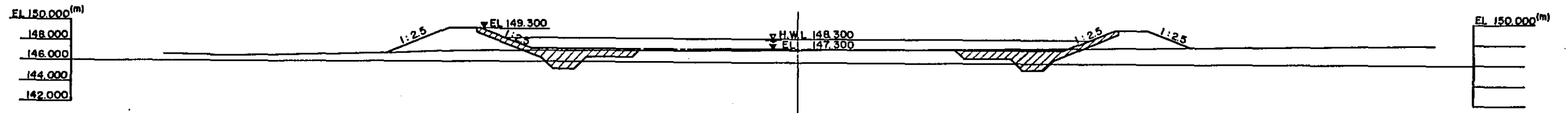


MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES	
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT	
CHECKED BY DESIGNED BY DRAWN BY	TITLE OF DRAWING
DATE: Feb. 1980 AS SHOWN	RIVER CANALAZITION CROSS SECTION (10-9)
DRAWING NO. M.V.S-D 024	
JAPAN INTERNATIONAL COOPERATION AGENCY	

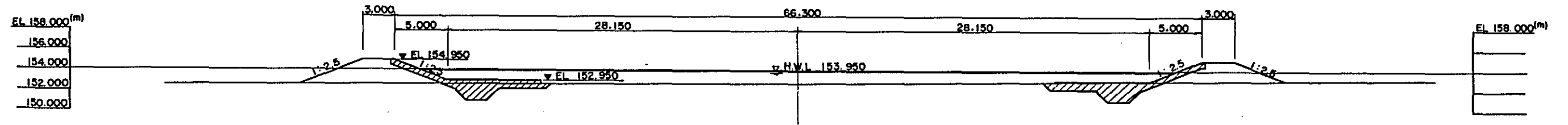
STA. 3+600



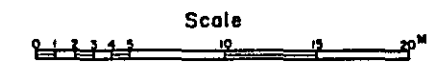
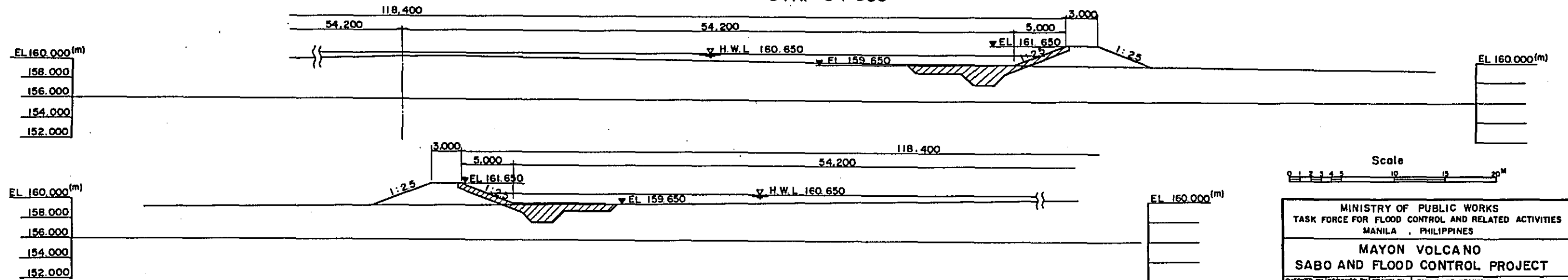
STA. 3+700



STA. 3+800

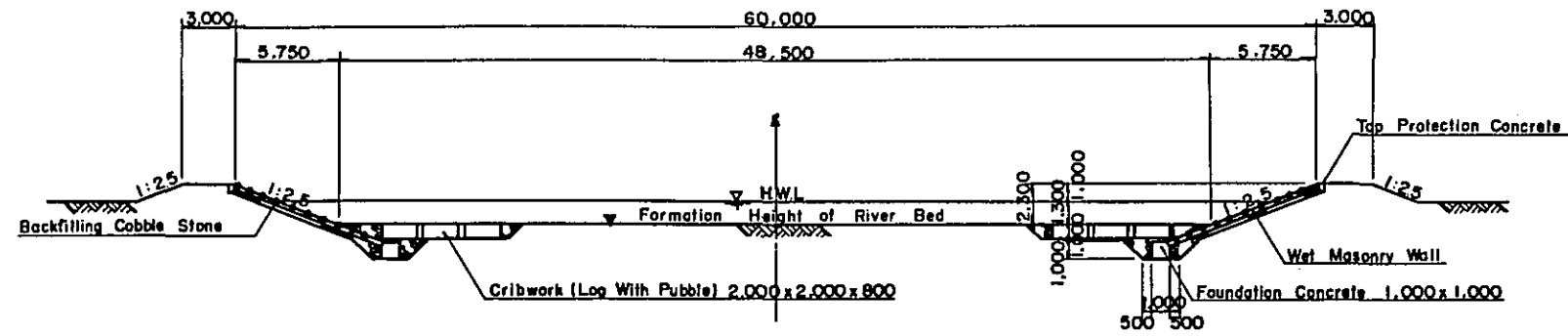


STA. 3+900

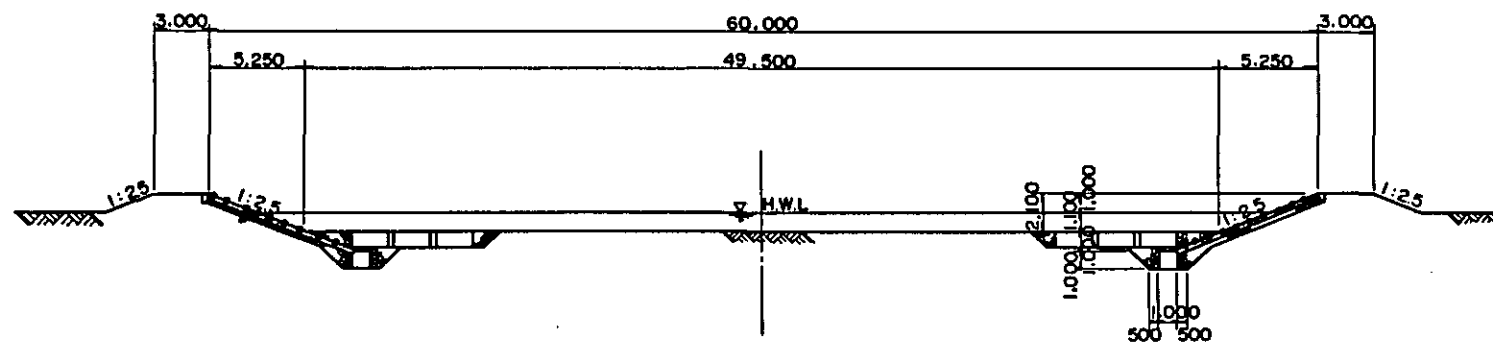


MINISTRY OF PUBLIC WORKS			
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES			
MANILA, PHILIPPINES			
MAYON VOLCANO			
SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE		RIVER CANALIZATION
Feb. 1980	AS SHOWN		CROSS SECTION (10-10)
DRAWING NO.	M.V.S - D 025		
JAPAN INTERNATIONAL COOPERATION AGENCY			

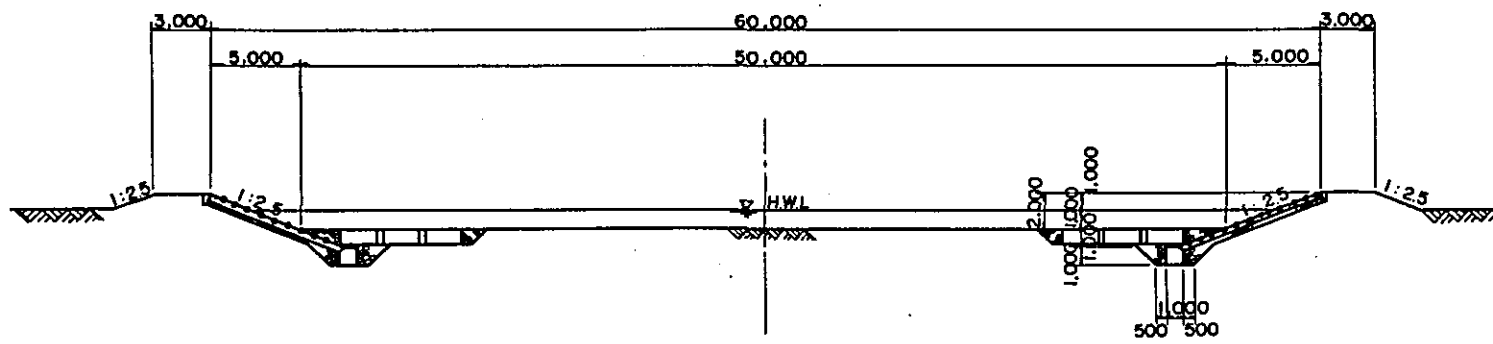
STA.0+000 ~ STA.1+100



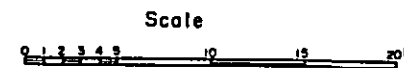
STA.1+100 ~ STA.2+300



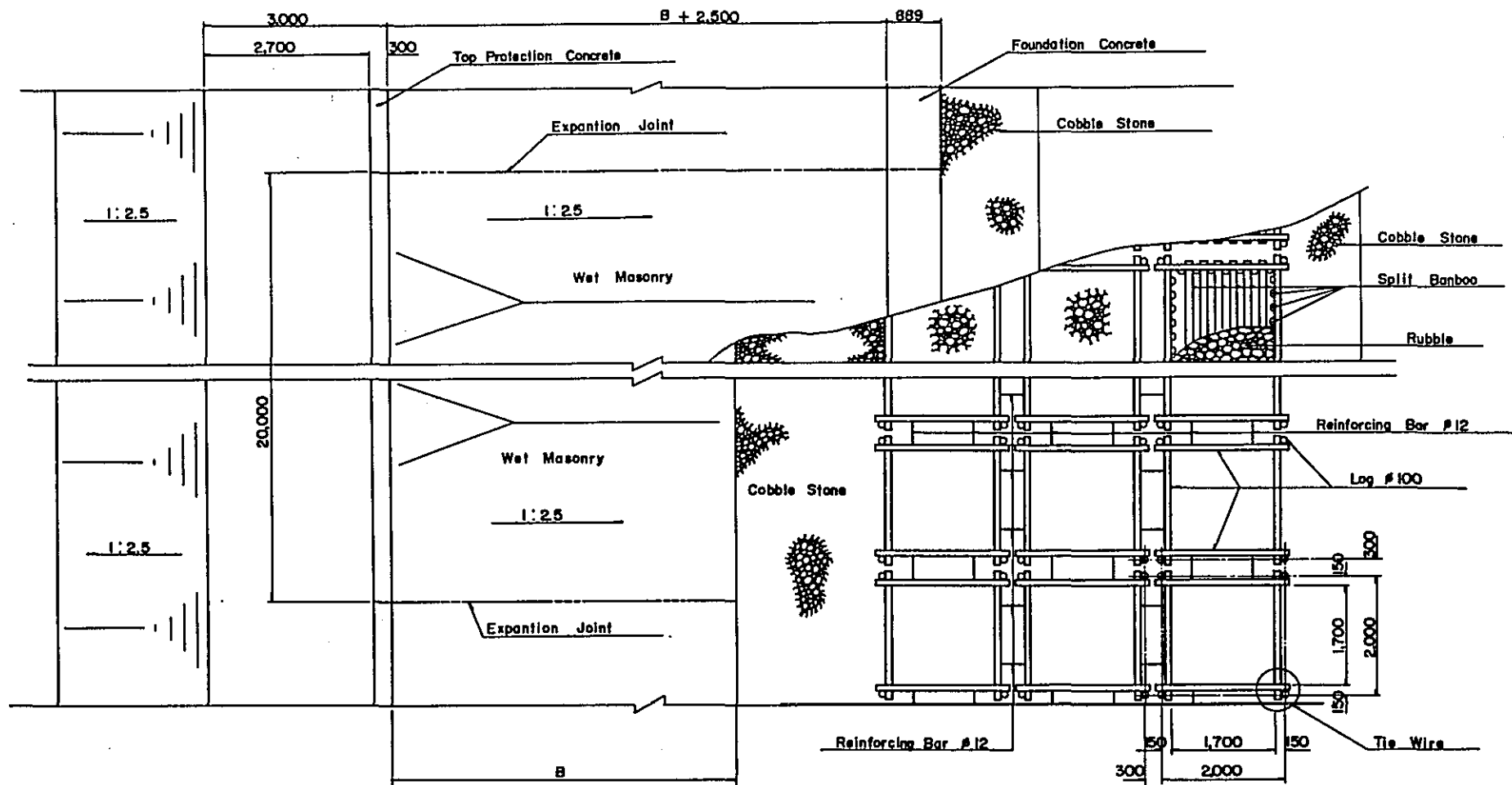
STA.2+300 ~ STA.3+700



TYPICAL CROSS SECTION



MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
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DATE	SCALE	AS SHOWN	RIVER CANALIZATION TYPICAL CROSS SECTION
DRAWING NO.	M.V.S-D 026		
JAPAN INTERNATIONAL COOPERATION AGENCY			



PLAN

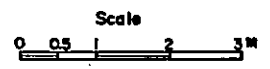
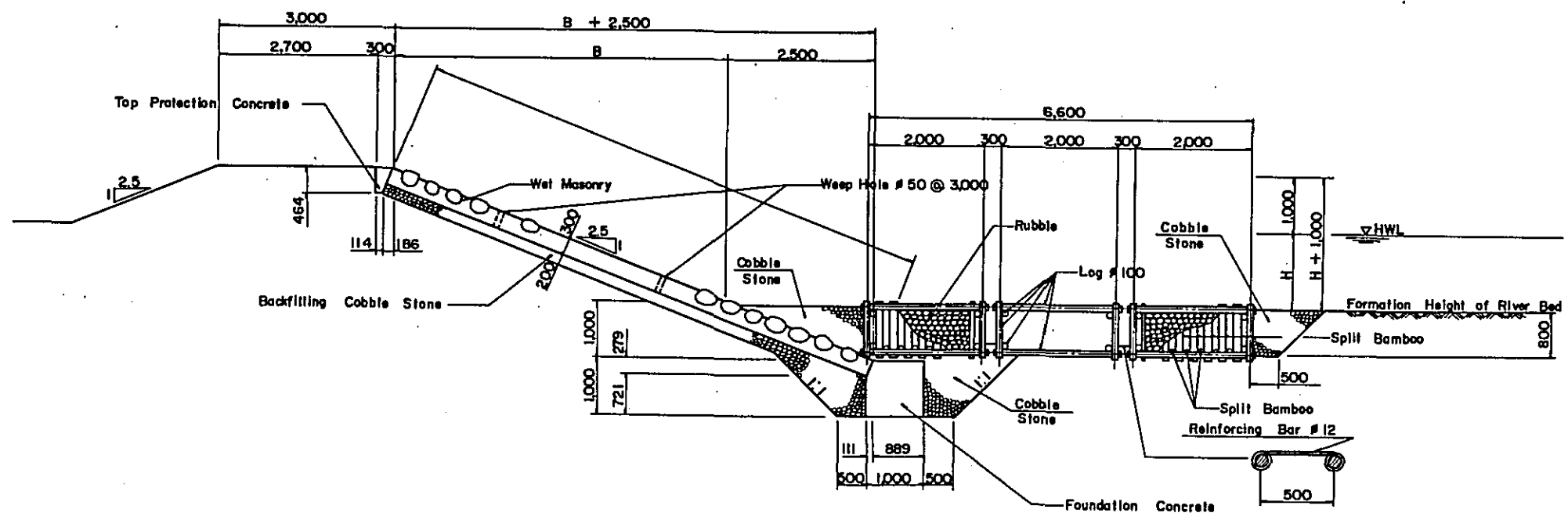


TABLE OF DIMENSION

Section	B	H	L	Remarks
Sta. 0+000 ~ Sta. 1+100 (Future Extension)	5,750	1,300	8,887	
Sta. 1+100 ~ Sta. 2+300 (R ₁ , L ₁)	5,250	1,100	8,348	
Sta. 2+300 ~ Sta. 3+900 (R ₂ , R ₂ , L ₂)	5,000	1,000	8,079	



TYPICAL SECTION OF REVETMENT AND FOOT PROTECTION

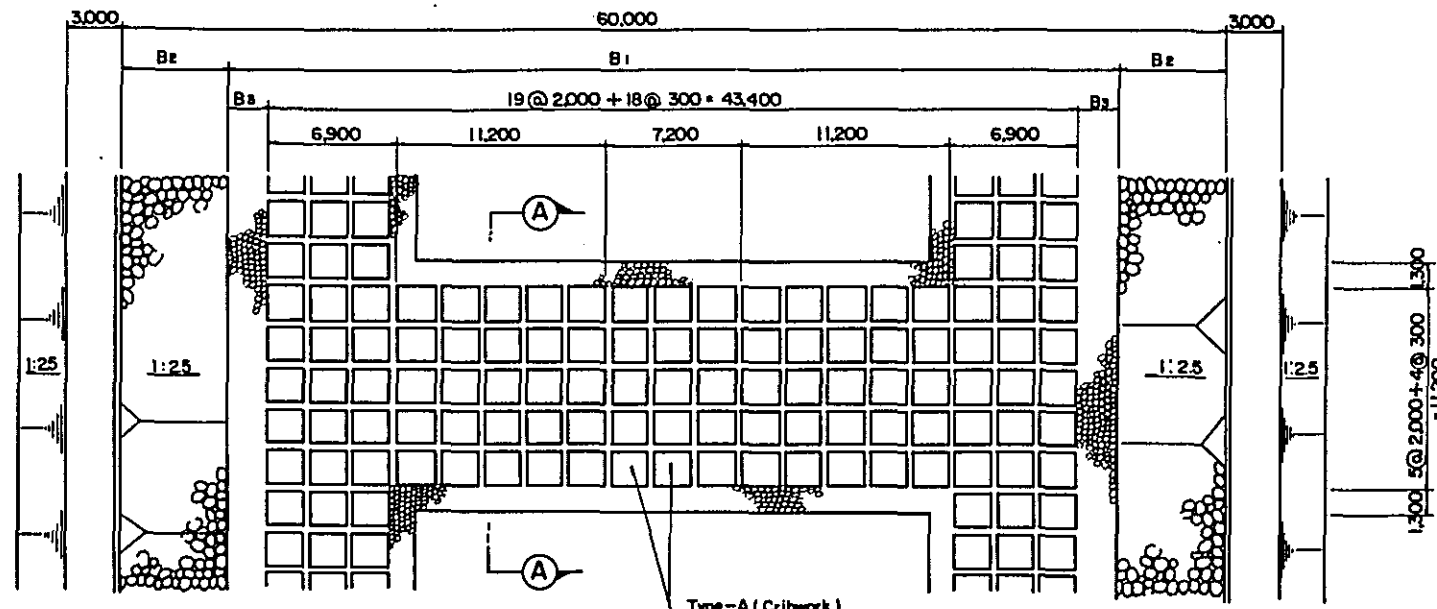


MINISTRY OF PUBLIC WORKS
 TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
 MANILA, PHILIPPINES

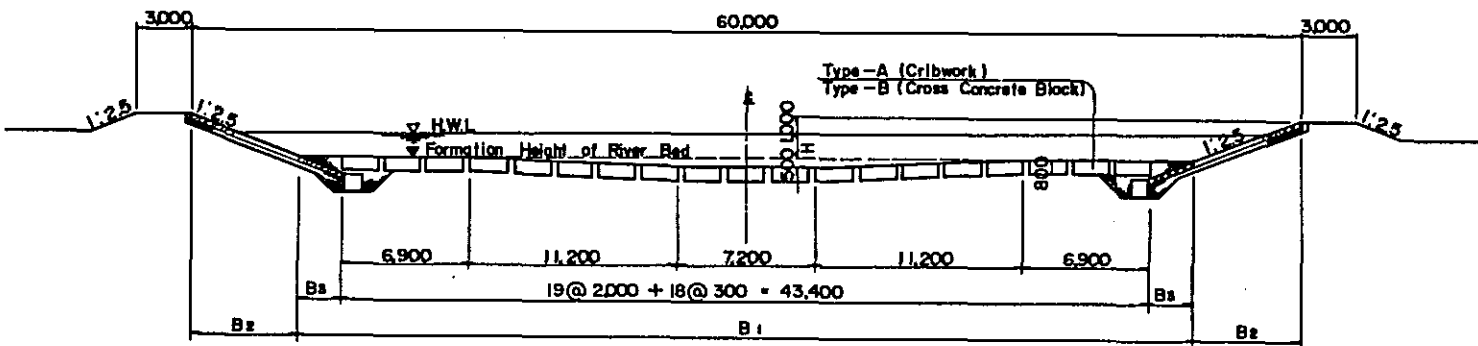
**MAYON VOLCANO
 SABO AND FLOOD CONTROL PROJECT**

CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION STRUCTURAL DETAIL OF LEVEE
DRAWING NO. M.V.S-D 027			

JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN

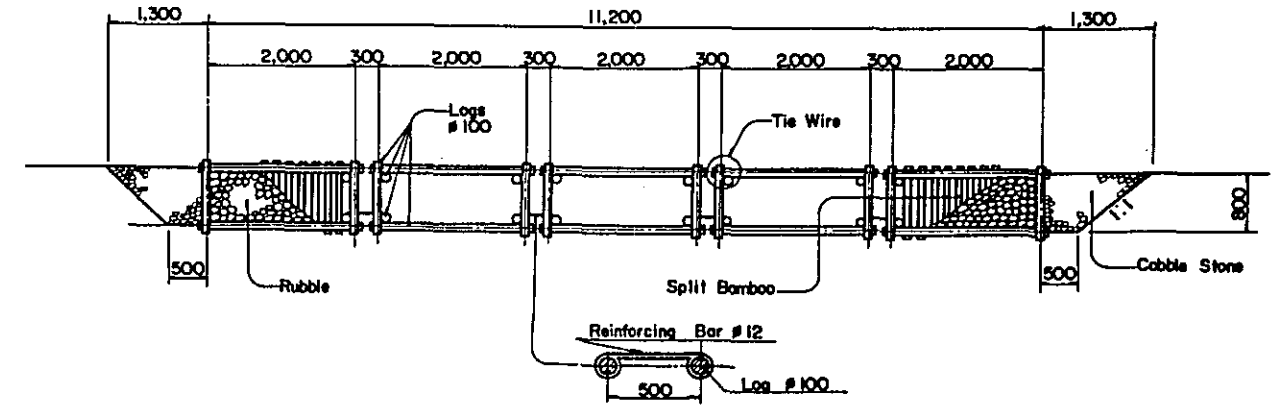


FRONT VIEW

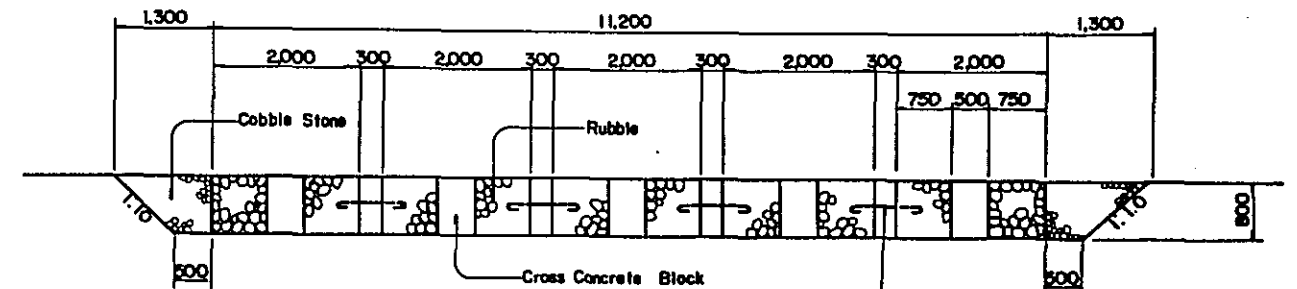


TABLE OF DIMENSION

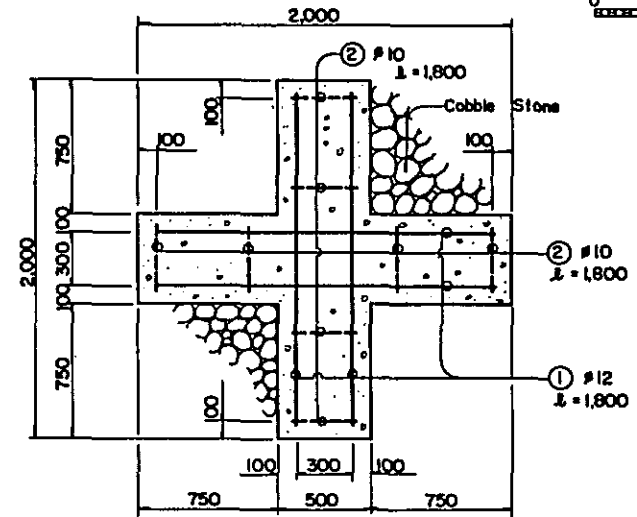
Section	H	B ₁	B ₂	B ₃
Sta. 0+000 ~ Sta. 1+100	1,300	48,500	5,750	2,550
Sta. 1+100 ~ Sta. 2+300	1,100	49,500	5,250	3,050
Sta. 2+300 ~ Sta. 3+700	1,000	50,000	5,000	3,300



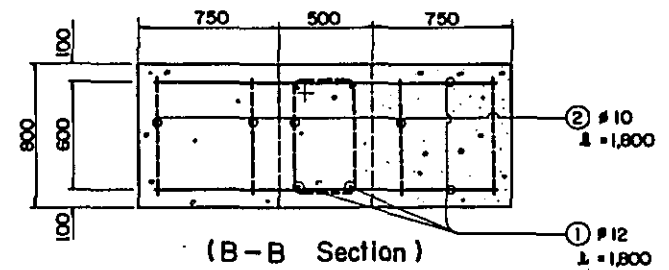
A-A SECTION (TYPE-A)



A-A SECTION (TYPE B)

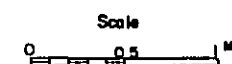


(PLAN)



(B-B Section)

DETAILS OF CROSS CONCRETE BLOCK

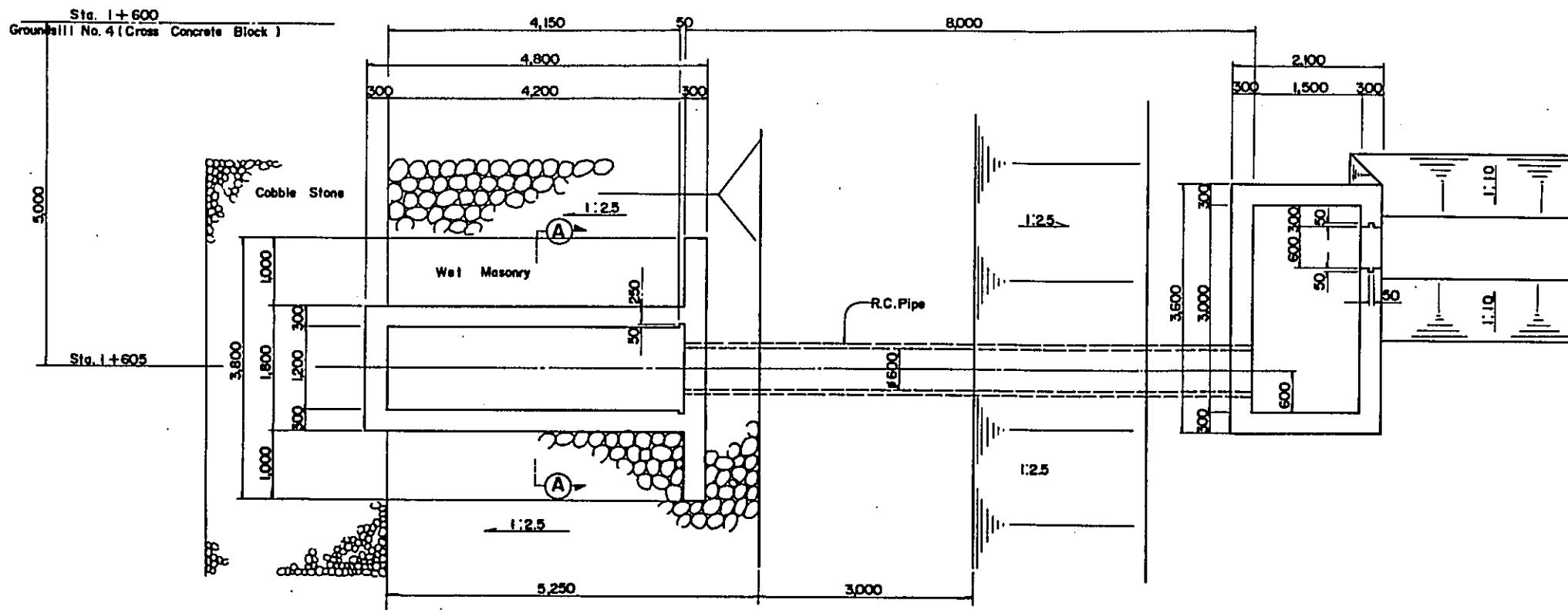


MINISTRY OF PUBLIC WORKS
TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES
MANILA, PHILIPPINES

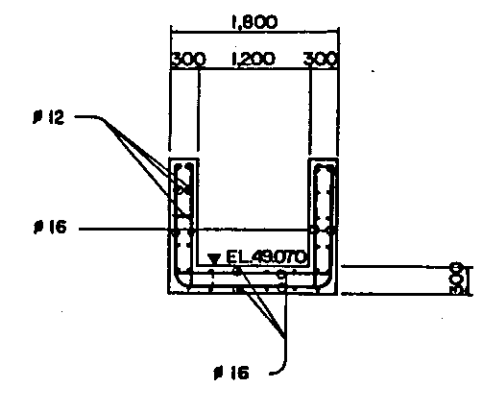
**MAYON VOLCANO
SABO AND FLOOD CONTROL PROJECT**

CHECKED BY: DESIGNED BY: DRAWN BY: TITLE OF DRAWING
DATE: Feb. 1980 SCALE: AS SHOWN RIVER CANALIZATION
DRAWING NO. MVS-D-028 STRUCTURAL DETAIL OF
GROUNTSILL

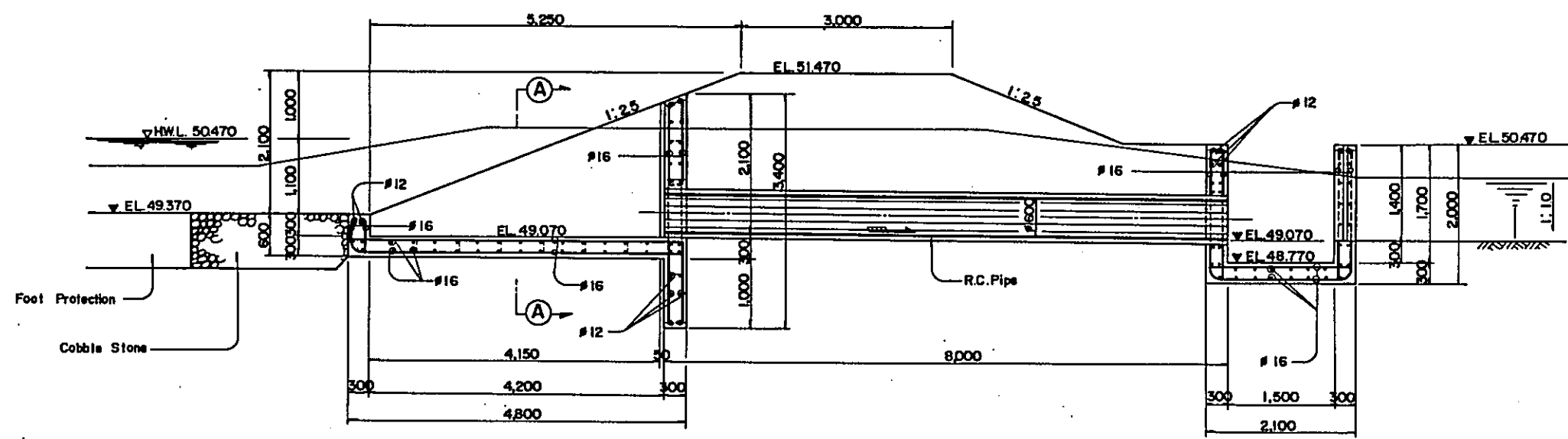
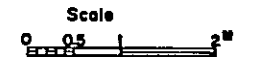
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PLAN



A-A SECTION



PROFILE



MINISTRY OF PUBLIC WORKS TASK FORCE FOR FLOOD CONTROL AND RELATED ACTIVITIES MANILA, PHILIPPINES			
MAYON VOLCANO SABO AND FLOOD CONTROL PROJECT			
CHECKED BY	DESIGNED BY	DRAWN BY	TITLE OF DRAWING
DATE	SCALE	AS SHOWN	RIVER CANALIZATION
Feb. 1980			IRRIGATION INTAKE
DRAWING NO. M.V.S-D 029			
JAPAN INTERNATIONAL COOPERATION AGENCY			

