

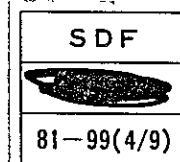
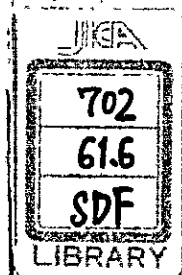
REPUBLIC OF BOLIVIA
BOLIVIAN NATIONAL RAILWAYS
RAILWAY CONSTRUCTION PROJECT, EASTERN LINE
(TAPERAS-ROBORE)

- Vol. 1. Instructions to Bidders
2. General Conditions of Contract
3. Bid Form
4. General Specifications
5. Technical Specifications
6. Special Specifications
7. Bill of Quantities
8. Drawings
9. Form of Agreements

Volume 4

March, 1981

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)



1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent data collection procedures and the use of advanced analytical techniques to derive meaningful insights from the data.

3. The third part of the document focuses on the role of technology in data management and analysis. It discusses how modern software solutions can streamline data collection, storage, and processing, thereby improving efficiency and accuracy.

4. The fourth part of the document addresses the challenges associated with data management, such as data quality, security, and privacy. It provides strategies to mitigate these risks and ensure that the data remains reliable and secure throughout its lifecycle.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It stresses the importance of ongoing monitoring and evaluation to ensure that the data management processes remain effective and aligned with the organization's goals.



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GENERAL SPECIFICATIONS

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4. The fourth part of the document discusses the importance of communication and reporting. It emphasizes that the results of the data analysis must be clearly and concisely communicated to the relevant stakeholders, and that regular reports should be provided to keep them informed of the organization's performance.

5. The fifth part of the document discusses the importance of continuous improvement. It emphasizes that the organization should regularly review its processes and procedures to identify areas for improvement and implement changes to enhance its performance.

6. The sixth part of the document discusses the importance of ethical considerations. It emphasizes that the organization should always act in a fair and honest manner, and should be transparent about its activities and the use of its data.

7. The seventh part of the document discusses the importance of security. It emphasizes that the organization should take appropriate measures to protect its data and information from unauthorized access, loss, or theft.

8. The eighth part of the document discusses the importance of compliance. It emphasizes that the organization should ensure that its activities and data handling practices comply with all applicable laws and regulations.

9. The ninth part of the document discusses the importance of collaboration. It emphasizes that the organization should work closely with its partners and stakeholders to share information and resources, and to achieve common goals.

10. The tenth part of the document discusses the importance of innovation. It emphasizes that the organization should encourage its employees to think creatively and come up with new ideas and solutions to improve its performance.

GENERAL SPECIFICATIONS

GS. 01 Definitions

In addition to the definitions stated in the General Conditions of Contract the following words and abbreviations are used in these Specifications and the extent and meaning shall be interpreted as follows:-

A.A.S.H.T.O.	- The American Association of State Highway and Transportation Officials
A.C.I.	- The American Concrete Institute
A.R.E.A.	- The American Railway Engineering Association
A.S.T.M.	- The American Society for Testing and Materials
Commencement Date of Contract Period	- (Refer to General Conditions of Contract Clauses 41 and 43.)
J.I.S.	- The Japanese Industrial Standards
J.R.S.	- The Japanese Railway Standards
Notice of Award	- A written notice to the successful bidder stating that this bid has been accepted by the Tender Evaluation Committee and approved by President of the Republic of Bolivia and that, in accordance with the terms of the notice to contractors and the specifications, he is required to execute the contract and furnish satisfactory contract bond.
Notice to Proceed	- A written notice by the Employer to the Contractor of the date on which he is to begin the prosecution of the work for which he has contracted and the Contract Period starts on this date.
Right-of-Way	- The land existing and/or to be acquired for and devoted to the railway. Its widths are as shown on the Drawings.

GS. 02 The Requirements of the Works

It is required that there be detailed drawings, including surveying and subsurface explorations, constructed, and completed in accordance with the annexed General Conditions of Contract, General Specifications, Technical Specifications, Special Specifications and Detailed Drawings, Railway Construction Project, Eastern Line (Taperas - Robore), as described hereinafter, for the Bureau of Tracks and Works, The Bolivian National Railway Public Corporation, Republic of Bolivia.

GS. 03 Description of Works

The works consist of the preparation of Detailed Drawings based on the Basic Drawings provided by the Employer as part of Tender Documents and the construction of a new railway of single line of approximately 101.93 km in length and 4 intermediate stations between Taperas and Robore on the Santa Cruz - Quiferro Line of The Bolivian National Railway (ENFE), including small improvement of the existing railway facilities such as the connection of the new railway to the existing railway at both end-junctions, the construction of a steel railway bridge of 20 m in span on the existing railway and the connection of the new telephone cable of 2 circuits including installation of telephones at 4 stations to the existing telephone wires at those junctions.

The new railway to be constructed branches off toward the south-western direction from the existing railway in the east of Taperas Station approximately at 310.17 km from Santa Cruz, climbing the hill along Cruz Rejala River to a highland eastside of Mount Cruz Rejala where the railway turns to the south-eastern direction and proceeds along the eastside of the mountain, and gradually sloping down to the north-eastern direction at the location where the highland ends, and after bypassing swamps and crossing Toroca River and Carlos River the railway links with the existing railway approximately at 412.00 km from Santa Cruz, reaching Robore Station therefrom bypassing through the existing railway track.

The topography along the new railway consists of open fields of tall woods and bush, sparse forests of slender trees and thick jungle, the elevation thereof being approximately 396 m in altitude in the vicinity of Taperas Station, 500 m - 530 m on the highland area and 276 m in the vicinity of Robore Station.

The geological formation of the new railway is mostly of such materials carried by aforementioned rivers and sedimented which are uplifted and spread over fan-shaped terrains, forming horizontal layers of Plezoic sandstone and clay slate. The rivers are on very flat gradients and wind freely, forming wide flood fields and swamps here and there on both sides of those rivers.

According to the weather characteristics observed at Robore Airstrip the average annual precipitation is approximately 1,200 mm. which is comparatively concentrated in wet season, the period between October and March, and the rest period of a year is dry season. The daily temperature varies from 20°C in early morning to 30°C - 35°C in daytime. The average monthly temperature varies in the range 22°C - 28°C, the daily lowest temperature goes down approximately to 10°C when the southern wind blows.

There lives almost no inhabitant along this new railway route presently except for the vicinity of Taperas and Robore areas and a few families of cattle breeders on the highland area on the Taperas side where it is seen some remains of forest fires which seem to be caused by cattle breeders' carelessness.

The efficient and reliable transportation route reaching to the Site from any part of this country to be utilized by the Contractor in his mobilization for the Works is the existing railway although there exists a new road, the portion between Taperas and Robore thereof was opened for traffic in 1979, but the conditions thereof in wet season particularly in the west of Robore are unfavorable for the passage of vehicles.

The village of Taperas which situates on the side of starting point of this new railway is of approximately 2,000 in population, while the town of Robore which situates on the side of ending point of this new track is of 15,000, having churches, schools, stores, two hotels, a hospital and an airstrip for landing and taking-off of small aircrafts and have provisions of supplying city water and electric power of 220 volts; but those both local communities have no public telephone system and, consequently, the Contractor will need to be equipped with a wireless device for his own effective telecommunication with other cities and towns during the construction period.

The bill of quantities of the Works estimated based on the Basic Drawings are presented in the Tender Documents, the followings are the brief summary of the types and quantities of Works:

- (1) Preparation of Detailed Drawings including setting out the alignment and cross-sections and related subsurface explorations for the Work of approximately 101.83 km of railway of single main track and its sidetracks at 4 intermediate stations and also installing the telephone system to cover the new section including affiliated telephone devices at each of new stations.
- (2) Conducting Subsurface Exploration to confirm the depth of supporting stratum and ground water and the suitability of materials to be excavated on the roadway and in borrow pits and perform alignment survey to set out to proposed alignment and leveling profile and cross-sections and plane-table survey to record the topography in the right of way.
- (3) The contents of Construction of the railway and its related facilities in this project are briefly summarized as follows:

Brief Summary of Construction Contents of the Project

- (a) Earthwork and track construction of a new single main track over a distance of approximately 101.83 km;
- (b) Earthwork and track construction of side tracks, namely a passing siding of an effective length of 750 meters each at four intermediate stations;
- (c) Construction of concrete and steel corrugated pipe culverts at approximately 54 locations;
- (d) Construction of Box-typed reinforced concrete culverts at 11 locations;
- (e) Construction of railway steel bridges of 20 m span of through typed plate girder at four locations in accumulated length of 340 meters;
- (f) Construction of a steel railway bridge of 20 m span of through typed plate girder on the existing main track on the Robore side;
- (g) Installation of various track signs along this new railway track at specified locations;
- (h) Construction of railway grade crossing at 4 locations.
- (i) Construction of railway station buildings, a platform and railway officials' residences including utilities at four intermediate stations; and
- (j) Installation of two railway telephone cable circuits covering the distance of approximately 101.83 km; including installation of two telephones at each of four intermediate stations, one is the magnetic type and the other the push-button type; and
- (k) Maintenance Work of the Project Works for a year of maintenance period after the completion of work and provisional acceptance.

GS. 04 Records of Exploratory Excavations and Borings

The Employer does not represent that the available geological data show completely the existing conditions and does not warrant the correctness of the designation of rock or other naturally occurring materials shown on the Basic Drawings and in other information made available to the Contractor by the Employer and does not warrant the correctness of any interpretation, deduction or conclusion shown in these records on the Basic Drawings. The Contractor shall make his own deductions and conclusions as to the nature of the materials to be excavated the difficulties of making and maintaining the required excavations and doing other work affected by the geology of the site and accept full responsibility therefor.

The Contractor shall visit the Site prior to making his Tender and shall ascertain the nature of the earth and rock, their qualities and quantities, locations, and suitability to meet the specified requirements, and he shall base his Tender estimates solely on his own soil investigation. After the award of the Contract no claim for a revision of Tender Prices depending on the source of soil information will be entertained.

GS. 05 Records of Weather

The Employer does not represent that description or interpretation on weather conditions provided by the Employer in the Tender Documents show completely the existing conditions and does not warrant the correctness of the conditions naturally occurring at the Site. The Contractor shall make his own investigation of the matter prior to his Tender. After the award of the Contract no claim for revision of Tender Prices depending on the source of weather information will be entertained.

GS. 06 Ruling Language and Units of Measure

As for Ruling Language refer to General Conditions of Contract Clauses 5 (1).
All units of measure used in these Specifications and in the Bid Schedule and the Bill of Quantities are according to the standard metric measure.

When the Bid Schedule calls for payment on a ton basis, the unit shall be the ton of 1,000 kilograms.

GS. 07 General Obligations of Contractor

(Refer to the General Conditions of Contract Clauses 10 through 38.)

GS. 08 Contract Documents

(Refer to the General Conditions of Contract Clauses 5 through 9.)

GS. 09 Supervision of Works by the Engineer

(Refer to the General Conditions of Contract Clause 2.)

GS. 10 Applicable Laws and Regulations and their Observation

(Refer to the General Conditions of Contract Clause 5 (2) and Clause 21 (3).)

GS. 11 Construction Programme

(Refer to the General Conditions of Contract Clause 18.)

GS. 12 Mobilization and Demobilization

(1) When the Bid Schedule contains a lump-sum item for "Mobilization and Demobilization", the following are understood to be paid for:

- (a) Transport of Constructional Plant, on the basis of the list of Constructional Plant submitted according to Clause GS. 23 of these Specifications, from the part through which they are imported to the site where they are to be used

- on the railway under Construction, and their installation;
- (b) The construction of fixed offices, housings, laboratory, workshops, stores, communication etc. of the Contractor;
 - (c) The supply and maintenance of the Contractor's own vehicles, living quarters, offices, laboratories, workshops, stores, communications, etc.; and
 - (d) The construction of the Engineer's and his staff's offices, living quarters including utilities, communication, supply of water and electric power, and maintenance of those facilities, and service and maintenance of vehicles of the Engineer's Team during the contract period.
- (2) The Contractor may, always subject to the authorization of the Engineer, at any time during the works, make any alterations, reductions and/or improvements to the Constructional Plant and installations without this causing any increase or decrease in the relative lump sum.

The lump sum is also intended to cover the dismantling of the Work Site by the Contractor, with the removal of all the installations, Constructional Plant and equipment, so that the Site is restored to the state it was before the installations, plant and equipment were placed there.

- (3) Within a period of 15 days of the date when the Contract became effective, the Contractor shall submit a mobilization programme to the Engineer for his approval. The Engineer will give his approval before the Commencement date of the Contract. The mobilization shall be completed within a period of 240 days, except for the completion of the office and housing which shall be completed within a period of 90 days, of the commencement date of the Contract and the supply and maintenance of vehicles for the use of the Engineer which shall start with the Contract period. If some installations or items of plant or equipment should be requested by the Employer at the end of the works, these may be handed over against payment to be agreed upon between parties. In that case, the reduction shall also be agreed upon between the parties of the cost of dismantling the site, which will have effect on the same date as the transfer agreed on.
- (4) The payment of this lump sum will be made in two installations as follows:
- 70% (seventy per-cent) on completion of the mobilization;
 - 30% (thirty per-cent) on completion of the dismantling.

<u>Pay Item No. and Name</u>	<u>Unit of Measurement</u>
1121 Mobilization & Demobilization	lump sum

GS. 13 Commencement, Prosecution and Completion of Works

The Contractor shall commence, prosecute and complete Works under the Contract according to the General Conditions of Contract Clauses 49, 51.

GS. 14 Liquidated Damages

(Refer to the General Conditions of Control Clause 55 (1) & (2).)

- (1) The Contractor shall set out alignment stakes establishing lines and grades in accordance with the Detailed Drawings and shall obtain the approval of the Engineer before commencing with the work of construction. The Engineer will, if he deems it necessary, revise the line and grade and require the Contractor to adjust the stakes accordingly. The Contractor shall give the Engineer in writing not less than forty-eight hours' notice of his intention to stake out or establish levels for any part of the work in order that arrangements may be made by the Engineer for checking. The Contractor shall measure the staking out and the Engineer will check the measurement. The approved measurements will be the basis of payments.
- (2) The Contractor shall set out all other construction stakes, reference stakes and protecting stakes as may be necessary for the execution of works.
- (3) The Contractor shall, as a requirement of the Contract and without extra charge, furnish for the exclusive use of the Engineer all necessary instruments, appliances, surveyor personnel and labour, and any other material that the Engineer may require for checking the setting out or for any other relevant work to be done.
- (4) The Contractor shall at his own expense make any additional surveys and measurements that are required for the construction of the work such as slope stakes, temporary grade stakes, and bridge and culvert layout, offset lines reference stakes, protecting stakes, etc. The Contractor shall be responsible for the accuracy of all surveys or measurements made by his employees.
- (5) The Contractor shall after the completion of earthwork restore all centerline stakes for tracks including side tracks and those stake showing the locations of turnouts and buffer stops on the completed subgrade surface for the reference of track construction and shall obtain the approval of the Engineer before the track construction is commenced.
- (6) Any stakes and marks made thereon by the Engineer or the Contractor shall be carefully preserved and, if disturbed or destroyed, shall be immediately replaced by the Contractor at his own expense and to the satisfaction of the Engineer. No construction work shall be carried out in the section until the necessary setting out in the section has been approved by the Engineer.
- (7) In the case of any alterations to the project Drawings, the Contractor shall submit to the Engineer three copies of the cross-sections of the setting out. The Engineer will endorse one copy with his approval, or his revision thereof, and return it to the Contractor.

The Contractor shall resubmit as above for approval any cross-sections that the Engineer may require to be revised.

The Contractor's cross-sections shall be drawn on tracing paper for print reproduction. When they have been finally approved, the Contractor shall give the Engineer the original tracings and three prints of the same.

The drawings of cross-sections shall have a title block and be of a size stipulated by the Engineer.

GS. 16 Subsurface Explorations

In the stage of detailed designing the Contractor shall conduct earth borings and soil tests as directed by the Engineer to confirm the characteristics of soils to be cut in roadway as well as in borrow pits whether they are suitable or not for roadway embankment and to utilize the data thereof in earthwork designing as well as in formulating earth moving plan of the Works.

The Contractor shall also conduct seismic explorations, electric resistivity explorations and exploratory excavations at such locations as directed by the Engineer to confirm the depth of supporting strata from ground surface or river bottom, their bearing capacities and thickness, the depth of underground water table and suitability for filling of soils to be excavated.

GS. 17 Preparation and Approval of Drawings

The Basic Drawings of this project are furnished as Contract Drawings and constitute part of Contract Documents.

The Contractor shall prepare and submit to the Engineer for review and approval the Detailed Drawings based on the Basic Drawings in strict conformity with the design criteria specified in the Technical Specifications Section 3 fitting to the Site conditions confirmed by his alignment location survey, the study of topography and subsurface explorations conducted by himself. The Detailed Drawings to be submitted are the original drawings drawn on transparent paper plus one blue print copy. Upon approval, the original drawings shall remain in the sole custody of the Engineer, but two copies thereof shall be furnished to the Contractor free of charge. The Contractor shall provide and make at his own expense any further copies required by him. At the completion of the Contract the Contractor shall return to the Employer all Drawings provided under the Contract.

It shall be anticipated that minor revisions of alignment, location, section and details of the Detailed Drawings may be made during the construction. The Contractor shall perform the works in accordance with the intent of the Basic Drawings and Specifications, and shall take no advantage of any error or omission in the Basic Drawings or discrepancy between Basic Drawings and Specifications. The Engineer will make such corrections and interpretations deemed necessary for fulfillment of the Specifications and Drawings. Where dimensions on Drawings are given or can be computed, scaled measurement shall not be used except when approved by the Engineer. Any deviation from the Basic Drawings due to field conditions not anticipated, will be determined by the Engineer and authorized in writing. Finished-surfaces in all cases shall conform with the lines, grades, typical sections and dimensions shown on the Drawings except when otherwise directed by the Engineer. The lines, grades, typical sections and dimensions shown on the Drawings are subject to adjustment by the Engineer during the construction.

The Detailed Drawings approved by the Engineer shall be supplemented by such Working Drawings as may be necessary adequately to control the Works. Working Drawings for structures or any other works deemed necessary shall be furnished by the Contractor following the design criteria specified in the Technical Specifications Section 3 and shall consist of such detailed drawings as may be required adequately to control the Works and are not included in the Basic Drawings furnished by the Employer or the Engineer. All Working Drawings must be approved by the Engineer, but it is mutually agreed that the Contractor shall be responsible for accuracy of dimensions and details, and for agreement and conformity

of his Working Drawings with the Contract Drawings and General and Technical Specifications. This approval shall not act to relieve the Contractor of any responsibility under the Contract for the successful completion of the Works. The Contractor shall submit upon request by the Engineer for review and approval not more than three copies of all such Working Drawings.

Upon the completion of the Works the Contractor shall submit to the Engineer for review and approval of originals of As-Built Drawings, in transparent paper and one copy in blue print thereof. Upon approval the original As-Built Drawings shall remain in sole custody of the Employer.

GS. 18 Approval by the Engineer and the Contractor's Responsibility for the Works

When the approval of the Engineer is required under these specifications, approval shall not relieve the Contractor of his duties or responsibilities under the Contract.

GS. 19 Orders to Foreman

Whenever the Contractor or his Site Engineer is not present on any part of the work where the Engineer may decide to give orders or directions, such orders or directions shall be received and obeyed by the Foreman or other person who is in charge of the particular work concerned.

GS. 20 Land to be used by the Contractor

The Contractor may use any part of land in the working area without charge irrespective of whether inside or outside of right-of-way for the purpose of execution of the construction work of the project including the construction of his office, constructional plant, motor pool and repair shop, living quarters, sheds, stores, service roads, service tracks, etc. Those lands shall, upon the completion of the project, be returned to their landowners after restoring them to their original conditions and to the satisfaction of the Engineer as well as of landowner.

GS. 21 Site for Detours, Plant, and Other Uses

Before any land belonging to the Government or to a private landowner is used for any purpose in connection with the prosecution of the Work, the Engineer's approval shall be obtained.

If any utility for water, electricity, drainage, etc., passing through the Site will be affected by the Works, the Contractor shall provide a satisfactory alternative utility in full working order to the satisfaction of the Owner of the utility and the Engineer, before the cutting or remove of the existing utility. On completion of the Contract, or earlier if so directed by the Engineer, all plant and any other encumbrance shall be removed, the site properly cleaned, all damage made good.

GS. 22 Contractor's Base, Buildings, Living Quarters, Sheds, and Stores

The Contractor shall supply, equip and maintain for the Contract period all living accommodation, sheds and stores necessary for the prosecution of the Work, and shall make his own arrangements, subject to the approval of the Engineer, with the owner of any land required.

The furnishing and maintenance of those buildings mentioned hereinbefore shall be paid for as provided in Clause GS. 12 "Mobilization and Demobilization".

GS. 23 Constructional Plant

- (1) In accordance with the General Conditions of Contract Clause 18 the Contractor shall submit a detailed list of the Constructional Plant that he undertakes to bring to the Site for the execution of the Works. This list shall satisfy the Engineer as to date of arrival, type, size-capacity or power and qualities of the items included. For each item of equipment, the type, make, identification number and year of manufacture, whether or not reconditioned, shall be stated. The Contractor shall in due time place on the Site all the Constructional Plant listed. In no case shall the Contractor remove plant, equipment, or portions thereof from the Site without the written approval of the Engineer.
- (2) The Contractor shall furnish all the Constructional Plant necessary for performing each phase of the work, and it must be on the Site and inspected and approved by the Engineer before work is begun on any particular phase. Any plant or equipment or portion thereof that becomes unduly worn, or defective, shall be immediately repaired or replaced to the satisfaction of the Engineer.
- (3) All costs of the furnishing of Constructional Plant, including equipment, facilities and personnel concerned, shall be deemed to have been included in various applicable pay items in the priced Bill of Quantities and the Schedule of Rates and Prices as provided in Clause GS. 35 "Work and Materials included in the Contract Prices".

GS. 24 Workshop

The Contractor shall have on the Site a suitable workshop, adequately equipped and provided with electric power, to allow for repairs of the equipment employed to carry out the Works. He shall also provide a warehouse for the equipment spare parts, mainly for the parts that frequently fail or are difficult to procure. The workshop must be managed by a chief foreman qualified for mechanical repairs, with an adequate labour force. All costs of the furnishing of the Workshop, including all equipment and facilities, will be paid for as provided in Clause Gs. 12 "Mobilization and Demobilization".

GS. 25 Laboratory

The Contractor shall supply, equip and maintain for the duration of the Contract, and approved fixed or mobile laboratory with facilities, furniture, equipment; personnel, apparatus, and installations for his own use and that of the Engineer. The laboratory will be operated by the Contractor under the supervision of the Engineer or by the personnel of the supervision staff.

The laboratory shall be equipped with all the necessary apparatus and materials for the performance of all the standard tests required by the Technical Specifications, namely:

- | | |
|---|----------------|
| 1. Determining field moisture equivalent of soils | AASHTO T-93-68 |
| 2. Sieve analysis of fine and coarse aggregates | AASHTO T-27-74 |
| 3. Amount of material finer than 0.075 mm sieve in aggregates | AASHTO T-11-78 |
| 4. Unit weight of aggregate | AASHTO T-19-96 |
| 5. Organic impurities in sands for concrete | AASHTO T-21-78 |
| 6. Compressive strength of cylindrical concrete specimens | AASHTO T-22-74 |

7. Making and curing concrete compressive and flexural strength test specimens in the field	AASHTO T-23-76
8. Quality of water to be used in concrete	AASHTO T-26-72
9. Specific gravity and absorption of fine aggregate	AASHTO T-84-77
10. Specific gravity and absorption of coarse aggregate	AASHTO T-85-77
11. Determining the liquid limit of soils	AASHTO T-89-76
12. Determining the plastic limit and plasticity index of soils	AASHTO T-90-70
13. Moisture-Density relations of soils using a 5.5-lb (2.5 kg) Rammer and 12 in (305 mm) drop	AASHTO T-99-74
14. Specific gravity of soils	AASHTO T-100-75
15. Resistance to abrasion of small size coarse aggregate by use of the Los Angeles machine	AASHTO T-96-77
16. Soundness of aggregate by use of sodium sulfate or magnesium sulfate	AASHTO T-104-77
17. Slump of portland cement concrete	AASHTO T-119-74
18. Plastic fines in graded aggregates and soils by use of the sand equivalent test	AASHTO T-176-73
19. Moisture-Density relations of soils using a 10-lb (4.54 kg) Rammer and 18 in (457 mm) drop	AASHTO T-180-74
20. Air content of freshly mixed concrete by the pressure method	AASHTO T-152-76
21. The California Bearing Ratio	AASHTO T-193-72
22. Unconfined compressive strength of cohesive soil	AASHTO T-208-70
23. One-dimensional consolidation properties of soils	AASHTO T-216-74
24. Determination of moisture in soils by means of a Calcium Carbide gas pressure moisture tester	AASHTO T-217-67
25. Density of soil in-place by the sand-cone method	JIS A1214
26. Density of soil in-place by the drive cylinder method	AASHTO T-204-64
27. Soil investigation and sampling by Auger borings	AASHTO T-203-64
28. Penetration test and split-barrell sampling of soils	AASHTO T-206-74
29. Fineness modulus	ASTM C-125
30. Compressive strength of cylindrical concrete specimens	AASHTO T-22-74
31. Making and curing concrete compressive and flexural strength test specimens in the field	AASHTO T-23-76

All equipment used for the performance of the above tests shall be of standard type and approved by the Engineer and properly housed by the Contractor. An adequate supply of water and electric power shall be provided at all times.

The furnishing and maintenance of the field laboratory, including water and electric facilities, will be paid for as provided in Clause GS. 12 "Mobilization and Demobilization".

GS. 26 Office, Housing, Vehicles for the Engineer and his Staff

(1) The Contractor shall provide at locations chosen by the Engineer and for the duration of the Contract, offices accommodation and housing for the use of the Engineer and his staff, with facilities, services, furniture, equipment, and installations and their maintenance during the duration of construction and shall provide maintenance and servicing for vehicles assigned to the Engineer's site teams, the number of vehicle being as specified in the Special Specifications, all as determined by and to the satisfaction of the Engineer.

(2) The supply, equipping and maintenance of those items described in this Clause shall be

paid for as provided in Clause GS. 12 "Mobilization and Demobilization" of these Specifications.

GS. 27 Medical Facilities

(Refer to the General Conditions of Contract Clause 39 (10).)

GS. 28 Provisions by the Government of Bolivia

(Refer to the General Conditions of Contract Clause 82.)

GS. 29 Transportation of Equipment and Materials

In transportation of equipment and materials into the Site and out therefrom the Contractor shall take utmost precaution so as not to interfere and endanger the existing road traffic as well as the existing railway traffic, and also he shall, during the transportation of his equipment and materials, take necessary and satisfactory precaution to prevent disintegration and falling of those loads from vehicles or railway freight cars and unbalanced loading thereof.

The Contractor shall obtain the approval of the Engineer in advance on the followings concerning the transportation of materials and equipment:

- (a) The method of transportation;
- (b) The locations, quantities, times of transportation of extraordinary heavy, large and long materials and equipment crossing or in the vicinity of the existing railway main line as well as on public roads;
- (c) The transportation of such loads by truck passing on the railway roadbed under construction or on the completed subgrade.

(1) Extraordinary Traffic on Public Roads

The Contractor shall observe the requirements of Clauses 34 and 35 of General Conditions of Contract and is responsible for carrying out any necessary investigations and the obtaining of approvals, licences, escorts and any other necessary facilities in order to enable extraordinary traffic to be moved on the roads in the project area.

Any expenses arising out of this requirement shall be deemed to have been included in the lump sum payment for "Construction, Maintenance and Protection of Traffic" described in Clause GS. 31.

(2) Temporary Road Works and Track Works

- (a) The Contractor shall furnish, maintain, and remove on completion of the work for which they are required, all temporary road works and temporary track works such as sleeper tracks, and stagings over roads, access and service roads, temporary crossings or bridges over streams or unstable ground, and temporary track works to transport equipment and materials into the Site, he shall make them suitable in every respect for carrying all Constructional Plant required for the work, for providing access and traffic for himself or others, or for any other purpose. Such temporary road works and track works shall be constructed to the satisfaction of the Engineer, but the Contractor shall nevertheless be responsible for any damage done to or caused by such temporary road works and track works.

- (b) Before constructing temporary road works and track works, the Contractor shall make all necessary arrangements, including payment, if required, when the public authorities or landowners concerned for the use of the land, and he shall obtain the approval of the Engineer.

Such approval will not, however, relieve the Contractor of his responsibility under its Contract. The Contractor shall be responsible for maintenance of those temporary road and track works to the satisfaction of the Engineer during their utilization period. Upon completion of the works, the Contractor shall clean up and restore the land to the satisfaction of the Engineer or the landowner concerned.

- (c) The Contractor may, upon the approval of the Engineer, in advance to construct a part or parts of the new main track to be constructed in this project, use the said portion or portions of track for the transportation of materials and/or equipment into the Site. In this case the Contractor shall submit to the Engineer a well-planned work schedule thereof which may be adjustable in the whole schedule of works approved already by the Engineer.

- (3) Payment for temporary road works and track works will be as provided in Clause GS. 31 "Construction, Maintenance and Protection of Traffic".

GS. 30 Temporary Traffic Control

- (1) In order to facilitate traffic through or around the Works, or wherever ordered by the Engineer, the Contractor shall erect and maintain at prescribed points on the work and at the approaches to the work, traffic signs, lights, flares, barricades and other facilities as required by the Engineer for the direction and control of traffic.
- (2) Where required, or where directed by the Engineer, the Contractor shall furnish and station competent flagmen whose sole duties shall consist in directing the movement of traffic through or around the work site.
- (3) In addition to the requirements of (1) and (2) above, the Contractor shall furnish and erect, within or in the vicinity of the project area, such warning and guide signs as may be ordered by the Engineer.
- (4) Payment for temporary traffic control will be as provided in Clause GS. 31 "Construction Maintenance and Protection for Traffic".

GS. 31 Construction, Maintenance and Protection for Traffic

The Contractor shall keep open to traffic on the existing railway and any existing road during the performance of the Works, provided that when approved by the Engineer the Contractor may bypass road traffic over a detour and/or bypass trains over a detour track.

The Contractor shall take necessary care at all times during the execution of the works to ensure the existing railway operation, the existing convenience and safety of local residents along and adjacent to the railway and any public road that may be affected by the Works. Any failure of the Contractor to meet this requirement will entitle the Engineer to carry out such works as he deems to be necessary and to charge the Contractor with the full cost thereof plus ten per-cent of such cost, which sum will be deducted from any money due or which may become due to the Contractor under the Contract. The cost to the Contractor

of meeting his obligations under this Clause together with similar obligations in Clauses GS. 21, GS. 29, GS. 30, shall be deemed to have been included in the Pay Item GS. 31 "Construction, Maintenance and Protection of Traffic".

<u>Pay Item No. and Name</u>	<u>Unit of Measurement</u>
1221 Construction, Maintenance and Protection of Traffic	lump sum

Payment of this sum will be made in three installments, as follows:

- 25% (twenty-five per-cent) when the mobilization was completed;
- 50% (fifty per-cent) with the monthly certificates in installments proportional to the cost of work executed; and
- 25% (twenty-five per-cent) with the final certificate.

GS. 32 Work Train Operation

The Contractor may, upon his request and the approval of the Engineer, use, by paying legal charge, Work Train Operation to transport equipment and/or materials into and/or out of the Site on the existing railway track, the temporary track approved by the Engineer as well as completed portions of new railway track. In such cases the Contractor shall submit to the Engineer at least 2 working days in advance of real need a well planned transportation schedule describing designated date of the Work Train Operation, Types and quantities of equipment and/or materials to be transported by work train, the location and method of loading and unloading of such freight and the time necessary for loading and unloading, the numbers of and types of freight cars to be used, etc.

In Operation of Work Trains it is not basically allowed to disturb the existing regular train schedule on the existing railway line. If such disturbances are inevitably anticipated, the Contractor shall inform to the Employer through the Engineer on the matter and shall obtain the approval from the Employer in advance through the Engineer.

The Contractor shall make all necessary preparations and precautions for such Work Train Operations so as not to cause any accidents or damages to the public, the existing railway track and rolling stock and also to the completed portions of the new railway track for which the Contractor shall be solely responsible for compensating for such accidents and damages due to the Contractor's carelessness and unpreparedness.

GS. 33 Materials

When required by the Engineer, the Contractor, before placing any order for materials or manufactured articles to be incorporated in the Permanent Works, shall submit for approval a complete description of such items, the names of the firms from whom he proposes to obtain them, and a list of such items that he proposes the firms to supply. When so directed, the Contractor shall submit samples and certificates for approval.

GS. 34 Storage of Materials

(1) Materials shall be stored so as to ensure preservation of their specified quality and fitness for the work. They shall be placed on a hard, clean surface and, when required, they shall be placed under cover. Stored materials shall be located so as to facilitate

prompt inspection. Private property shall not be used for storage purposes without written permission of the owner.

- (2) The stockpile site shall be prepared by clearing and levelling as directed by the Engineer.
- (3) The center of the storage area shall be raised and sloped to the sides as required so as to provide proper drainage of excess moisture. The material shall be stored in such manner as to prevent segregation and to ensure proper gradation and moisture content. Coarse aggregate storage piles shall be built up and removed in layers not exceeding one meter. The height of such stockpiles shall be limited to five meters.

GS. 35 Work and Materials included in the Contract Prices

- (1) The work to be performed and material to be furnished under the various clauses of these Specifications or shown on the Drawings, or the supplementary or explanatory drawings, or ordered by the Engineer, shall include and be considered compensation for the costs incurred for all labour, materials, Constructional Plant, organization of work, overheads, profits, royalties, taxes, custody of completed works, payment to third parties for damage to property, incidental work where herein specified for the proper completion of the work and is not paid for separately; temporary drainage to protect the work during construction, haulage, tools, explosives and materials for blasting, placing of material where herein specified or where directed; sheeting, shorting, staging, centering and supports, where no separate payment is provided for; and all other costs necessary or usual for the proper performance of the work.
- (2) In cases where the "basis of payment" clause or part of any clause in these Specifications relating to any item requires that the Contract Price therefor cover and be compensation for certain work or material essential to the item, this same work or material shall not be measured or paid for under any other item that may appear elsewhere in these Specifications.

GS. 36 Royalties for Patented Devices, Materials and Processes

If the Contractor desires to use any design, device, material or process covered by letters patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or patent owner. The Contractor and the surety shall indemnify and save harmless the Employer from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright in connection with the work agreed to be performed under this contract, and shall indemnify the Employer for any costs, expense, and damages which it may be obliged to pay for reason of any such infringement at any time during the prosecution, or after the completion of the work.

The Contractor shall be responsible for all compensation and royalties in respect of quarried materials. No separate payment will be made for the compensation of royalties, but such costs shall be included in the applicable unit prices in the priced Bill of Quantities and the Schedule of Rates and Prices.

GS. 37 Notice of Operations

- (1) The Contractor, when required by the Engineer, shall supply in writing full information regarding the localities in which the materials are being obtained and in which the work is being prepared.

- (2) No permanent work shall be undertaken without the Engineer's approval. Full and complete notice in writing shall be given to the Engineer sufficiently in advance of the time of the operation for him to be able to make such arrangements as he may deem necessary for its supervision.

GS. 38 Protection of Works from the Weather

The Contractor shall, at his own expense, carefully protect all works and materials from injury by the weather.

GS. 39 Standards of Workmanship

All workmanship shall be the best of its particular kind, and shall be carried out to the satisfaction of the Engineer.

GS. 40 Surveying Instruments, Templates and Track Guages

- (1) Sufficient surveying instruments, metal templates, track levels and track guages shall be supplied by the Contractor and used by the Engineer to check the finished surfaces of earthwork, structure and railway track. These instruments shall be submitted to the Engineer for his approval, and shall be maintained at all time in a condition to produce correct measurements and shall be checked at intervals and, if necessary, repaired or adjusted as directed by the Engineer.

- (2) The furnishing of those instruments above-mentioned will not be paid for directly, but all costs shall be deemed to have been included in the various items in the Bid Schedule.

GS. 41 Daywork

(Refer to General Conditions of Contract Clause 52 (4).)

GS. 42 Cleaning Upon Completion

The Contractor, upon completion of any part of the work, shall immediately, at his own expenses, fill up all holes and treches, or carry out the work to them as required by the Engineer, that he may have dug or excavated and are no longer required for the project, and he shall clear away from right-of-way all rubbish and materials, temporary structures and wastes that is no longer required for the prosecution of the work.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and financial management. The text notes that without reliable records, it is difficult to track the flow of funds and ensure that resources are being used as intended.

2. The second part of the document addresses the challenges associated with data collection and analysis. It highlights that gathering accurate and timely data can be a complex task, often requiring significant resources and expertise. The text suggests that organizations should invest in training and technology to improve their data management capabilities. Additionally, it stresses the importance of ensuring the integrity and security of the data collected.

3. The third part of the document focuses on the role of leadership in driving organizational success. It argues that effective leaders are those who can inspire and motivate their teams, set clear goals, and foster a culture of innovation and collaboration. The text provides several examples of successful leaders and their strategies, emphasizing the importance of communication and listening to the needs of others.

4. The fourth part of the document discusses the impact of external factors on organizational performance. It notes that organizations must be able to adapt to changing market conditions, technological advancements, and regulatory requirements. The text suggests that organizations should conduct regular risk assessments and develop contingency plans to mitigate potential threats. It also emphasizes the importance of building strong relationships with stakeholders and the community.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It reiterates the importance of accurate record-keeping, effective data management, strong leadership, and adaptability to external changes. The text encourages organizations to embrace a continuous improvement mindset and to regularly evaluate their performance against their goals. Finally, it offers some practical tips for implementing these recommendations, such as starting with small pilot projects and seeking feedback from employees and customers.

