

THE HASHEMITE KINGDOM OF JORDAN

PETRA DEVELOPMENT AND
TOURISM REGION AUTHORITY

TENDER DOCUMENT

FOR

THE CONSTRUCTION OF THE PETRA MUSEUM
(EXHIBITION WORK)

VOLUME 2

General Requirements

February 2017

TABLE OF CONTENTS

DIVISION	1	GENERAL REQUIREMENTS
SECTION	101	SUMMARY OF PROJECT
SECTION	102	CONTRACT DOCUMENTS
SECTION	103	CODES & STANDARDS
SECTION	104	PROJECT MEETING
SECTION	105	CONSTRUCTION SCHEDULES
SECTION	106	COORDINATION
SECTION	107	MATERIALS & SUBSTITUTIONS
SECTION	108	TESTS & INSPECTIONS
SECTION	109	SUBMITTALS
SECTION	110	TEMPORARY WORK & FACILITIES
SECTION	111	CONSTRUCTION SAFETY REQUIREMENTS
SECTION	112	PROTECTION WORK
SECTION	113	PACKING REQUIREMENTS
SECTION	114	COMPLETION OF WORK
SECTION	115	CLEANUP AND CLEANING
SECTION	116	COMPLETION DOCUMENTS
SECTION	117	RECORD PHOTOGRAPHS
SECTION	118	GUARANTEES & MAINTENANCE
SECTION	119	MISCELLANEOUS GENERAL REQUIREMENTS
SECTION	120	ENVIRONMENTAL MANAGEMENT

SECTION 101 - SUMMARY OF PROJECT

PART 1: GENERAL

1.1 GENERAL DESCRIPTION OF PROJECT

1.1.1 LOCATION: at Tourist Street, Wadi Musa

1.1.2 FLOOR AREA:

Display Area	About 1,000m ²
Museum Total Floor Area	About 1,800m ²

1.1.3 STRUCTURE: Concrete structure

1.2 SCOPE OF WORK PRIMARILY INCLUDES:

- a. Construction, completion and warranty of Contract Work; on property supplied by Client and within limits indicated on Contract Documents.
- b. Provisions for work under separate contracts to extent shown or specified.
- c. Labor, materials, equipment and related items necessary for Works included.
- d. Several and special services, activities and operations necessary to furnish and install or otherwise provide Work required.
- e. Incidental, accessory, auxiliary or ancillary items reasonably implied or inferred as necessary to achieve results and complete the Work as intended under the Contract Documents.
- f. Construction Plant and Temporary Works necessary to execute the Work required, including tools, consumable supplies and other items necessary therefor.
- g. Providing local labor to extent available; and providing local accommodations therefor.
- h. Arranging for and providing materials and equipment from local sources to extent available; and importation of other items and providing or arranging for local warehousing therefor.
- i. Cutting, patching, fitting and/or repair necessary to provide or perform the Work required.
- j. Ceremonies such as commencement ceremony, laying ceremony and completion ceremony which be organized by the Contractor.
- k. Compliance with all general and particular obligations as provided for under Contract Documents, including all costs incidental thereto.
- l. And obtaining necessary permits including completion certificates from relevant Authorities, incurred by this project.

PART 2: TERMINOLOGY

2.1 DEFINITION

- a. Client : The word “Client” means Petra Development and Tourism Region Authority, the Government of the Hashemite Kingdom of Jordan as “the Owner” of the Construction Contract
- b. Consultant (Architect) : The word “Consultant” means the Consortium of FreeTime International Inc., Yamashita Sekkei Inc. and INTEM Consulting, Inc. as “the Engineer” of the Construction Contract maisam architects and engineers as registered engineer
- c. RE : The word “RE” means the authorized Resident Engineer of the Consultant / Supervising Engineer.
- d. Contractor : The word “Contractor” means the construction company mentioned as such in the construction contract for the Work and shall include any person or persons authorized by the said company for the execution of the Work.
- e. Works : The word “Work(s)” means the exhibition construction work for the project stipulated in the construction contract agreement of the project.
- f. Drawings : The word “Drawings” means all drawings which are used for the construction work for the project including those that show modifications, corrections and additions of design with the approval of the Architect.
- g. Specifications : The word “Specifications” means all statements and all details which specify and control the quality of materials, equipment, techniques and all agreement related with the contract.
- h. Approved : The word “Approved” means when used to convey Consultant’s action on the Contractor’s submittals, applications and requests, “approved” is limited to Consultant’s duties and responsibilities as stated in the General Conditions of Contract.
- i. Directed : The word “Directed” refers a command or instruction by Consultant. Other terms including “requested”, “authorized”, “selected”, “required” and “permitted” have the same meaning as “directed”.
- j. Indicated : The word “Indicated” means requirements expressed by graphic representations or in written form on Drawings, in Specifications and in other Contract Documents. Other terms including “shown”, “noted”, “scheduled” and “specified” have the same meaning as “indicated”.
- k. Regulations : The word “Regulations” means laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, and rules, conventions and agreement within the construction industry that control performance of the Work.
- l. Furnish : The word “Furnish” means supply and deliver to Project site, ready for unloading, unpacking, assembly, installation and similar operations.
- m. Install : The word “Install” means operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

- n. Provide : The word “Provide” means furnish and install, complete and ready for the intended use.
- o. Project Site : The word “Project Site” means space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

2.2 LEGEND

-A-		-G-		RG	REFLECTIVE GLASS
A	ALUMINUM	GB	GLASS BLOCK	RM	ROOM
@	AT	GL	GROUND LEVEL	RE	RESIDENT ENGINEER
A/C	AIR CONDITIONING	GC	GENERAL CONDITIONS		
AD	ALUMINUM DOOR			-S-	
AL	ALUMINUM LOUVER	-H-		S	STEEL, SECTION
ANDZ	ANODIZED	H	HEIGHT	SD	STEEL DOOR
AEP	ACRYLIC RESIN PAINT (WATER PROOF SPRAY PAINT QUALITY, 3LAYER-TYPE)	HL	HAIR LINE FINISH	SEC	SECTION
				SGP	GALVANISED STEEL PIPE
AW	ALUMINUM WINDOW	-L-		SOP	SYNTHETIC RESIN OIL PAINT
		L	LENGTH	SP	STEEL PARTITION
		LSD	LIGHTWEIGHT STEEL DOOR	SR	STEEL ROLLING SHUTTER
				ST	STEEL TROWEL FINISH
-B-		-M-			
BAR	BAKED ACRYLIC RESIN	M	MALE	-T-	
BE	BAKED ENAMEL	MM(mm)	MILLIMETRE(S)	TB	TERMINAL BOARD
BLDG	BUILDING	MAX	MAXIMUM	TEL	TELEPHONE
		MIN	MINIMUM	THK(thk)	THICKNESS
-C-					
CG	CLEAR GLASS				
CH	CEILING HEIGHT	-N-		-V-	
CL	CLEAR LACQUER	N	NORTH	VE	SYNTETHIC ENAMEL PAINT
C.M.	CEMENT MORTAR	NO	NUMBER	VP	VINYL CHLORIDE RESIN ENAMEL
				VENT	VENTILATION
-D-		-O-			
DB	DISTRIBUTION BOARD	OC	ON CENTRE	-W-	
DN	DOWN	OD	OVERHEAD DOOR	W	WIDTH, WOOD, WOODEN
DP	DOWNSPOUT PIPE	OSCL	OIL STAIN CLEAR LACQUER	W/	WITH
DS	DUCT SPACE			WD	WOODEN DOOR
		-P-		WL	WOODEN LOUVRE
-E-		P	PAGE, PART	W/O	WITHOUT
ELEC	ELECTRICAL (ELECTRIC)	PE	POLYESTER ENAMEL	WT	WOODEN TROWEL FINISH
EPS	ELECTRICAL PIPING SPACE	PG	PATTERNED GLASS	W/W	WOODEN WINDOW
EP-2	PLASTIC EMULSION PAINT	PL	PLATE		
EXP. J.	EXPANSION JOINT	PS	PIPING SPACE	-OTHERS	
		PVC	POLYVINYL CHLORIDE	φ	DIAMETER
-F-					
F	FEMALE	-R-			
EF	FLAT BAR	R	RADIUS		
FH	FIRE HYDRANT	RCC	REINFORCED CONCRETE		
FL	FINISHED FLOOR LEVEL	RD	ROOF DRAIN		

SECTION 102 - CONTRACT DOCUMENTS

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements applicable and relating to use of Contract Documents for Work under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.
- 1.3 SUBMIT** three (3) complete sets of Contract Documents bind in black cover to the Consultant within one (1) week from the verification of the Contract.
In addition, submit one (1) A1 size and two (2) A3 size complete sets of Contract Drawings to the Consultant.

PART 2: ARRANGEMENT AND ACCURACY OF DOCUMENTS

2.1 DIVIDING OF DOCUMENTS:

- 2.1.1 DIVIDING OF CONTRACT DOCUMENTS** shall be deemed only for convenience of covering requirements, data and information in an orderly manner.
- 2.1.2 NO RESPONSIBILITY** either direct or implied will be assumed by Client or Consultant for omissions or duplications by Contractor or Subcontractors due to real or alleged error in arrangement of matter in Contract Documents; or for disputes arising therefrom.

2.2 SPACE REQUIREMENTS:

- 2.2.1 DRAWINGS** are necessarily diagrammatic and indicate general arrangements only; and Specifications are necessarily descriptive and indicate general aspects only; insofar as related to space requirements for various items of materials, equipment and apparatus required.
Extreme accuracy in regard to said space requirements cannot be guaranteed by graphic representations or written descriptions.
- 2.2.2 CONTRACTOR** shall provide coordination of physical arrangements to achieve design appearance, performance and quality of workmanship intended; and shall provide all investigations, layouts and other determinations and give directions necessary to properly fit, install and complete work as intended under these documents.
- 2.2.3 MINOR ADJUSTMENTS** necessary to correlate work shall be incorporated as necessary; or when directed by Consultant; at no added expense to Client.

PART 3: PRIORITY OF DOCUMENTS

- 3.1 FACE SHEETS** or appended sheets shall take precedence over standardized or form documents.
- 3.2 ARCHITECTURAL DRAWINGS** shall take precedence over other contract drawings for purposes of clarifying details and locating exposed items.
- 3.3 CONFLICTS** between Contract Documents not resolved by precedence shall be interpreted in favor of requirements providing greater quantity or higher quality or greater protection.

PART 4: INCORPORATION OF STANDARDS

- 4.1 CODES** and other statutory requirements, association standards and manufacturers' general and particular instructions referenced or referred to under these Specifications respective to Work or Materials specified shall be considered as incorporated as part of these Contract Documents to extent to which they apply to said Work or Materials.
- 4.2 INSTRUCTIONS** for handling or installing products, where not otherwise shown or specified, shall be

those as published by the respective producer or manufacturer; as specified under S103 - CODES & STANDARDS.

- 4.3 FOR** items not covered by any Contract Documents, relevant instructions of Petra Development and Tourism Region Authority, the Government of the Hashemite Kingdom of Jordan shall be applied.

PART 5: USE OF THESE SPECIFICATIONS

- 5.1 THESE SPECIFICATIONS**, in part, are of abbreviated or streamlined type and include grammatically incomplete sentences and phrases.
Omissions of words or phrases - such as 'the' or 'shall be', or others - is international and shall be supplied by inference by reader if necessary.
- 5.2 MISSPELLINGS**, omissions of words, lack of punctuation or other deviations in language shall not change obvious meaning and intent of requirements and provisions specified.
- 5.3 DEFINITIONS:** Refer to General Conditions
- 5.4 REFERENCING** and cross referencing given under and throughout these Contract Documents are for convenience and may not be entirely complete nor comprehensive.

PART 6: ABBREVIATIONS

6.1 SYMBOL DEFINITIONS

AASHTO: American Association of State Highway and Transportation Officials
ASTM : American Society of Testing and Material
ASME : American Society of Mechanical Emgineers
ACI : American Concrete Institute
AISC : American Institute for Steel Construction
AWS : American Welding Society
B.S. : British Standards Institution
F.S. : Federal Specifications, U.S. GSA.
DIN : Deutscher Narmenausschuss
JIS : Japanese Industrial Standard, Japanese Standards Association
JASS : Japanese Architectural Standard Specification
SSPC : Steel Structure Painting Council
JNBC : Jordan National Building Code

SECTION 103 - CODES & STANDARDS

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to codes and standards and relevant requirements applicable to Work required under this Contract.
- 1.2 **COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.
- 1.3 **CODES AND STANDARDS** listed or specified may not be entirely comprehensive. Requirements of other regulatory agencies having legal jurisdiction shall apply, unless otherwise specifically stated as not applicable. Authorized codes and standards not mentioned in this specification which are esteemed to be equivalent to Japanese Industrial Standards (JIS) may be applied with the approval of Consultant.
- 1.4 **ISSUE DATES** of codes or standards shall be as currently in effect, including currently issued supplements or modifications, on date of issue of these Contract Documents.
- 1.5 **REFERENCES** to codes and standards under these Specifications are designated by assigned abbreviation followed by an appropriate publications or series number.
 - 1.5.1 **LEGEND** used under these Specifications are listed and defined under S102 - CONTRACT DOCUMENTS.
 - 1.5.2 **PUBLICATION NUMBERS** used are those as assigned under index or catalog of agency, society, association or organization which issues the respective documents.

PART 2: GENERAL STANDARDS

- 2.1 Jordan National Building Code (referred to as JNBC).
 - For general requirements for architectural design, except as specified.
- 2.2 Japanese Industrial Standards (JIS), American Society of Testing and Material (ASTM)
 - For general requirements on materials.
- 2.3 **UTILITIES:** Standards and requirements of various utility companies or districts serving project, as applicable.

PART 3: STRUCTURAL STANDARDS

- 3.1 American Society of Testing and Material (ASTM) and/or Japanese Industrial Standards (JIS) for general requirements on materials.
- 3.2 American Concrete Institute (ACI) and American Institute for Steel Construction (AISC) and/or Architectural Institute of Japan for structural calculations.

PART 4: MECHANICAL AND PLUMBING STANDARDS

- 4.1 British Standard Specification (Bss), Japanese Industrial Standards (Jis), American Society of Heating, Refrigerating and Air-conditioning Engineers (Ashrae) and Uniform plumbing Code (UPC) or for general requirements on materials and equipment.

PART 5: ELECTRICAL STANDARDS

5.1 CODES & STANDARDS

- a. American Society of Testing and Material (ASTM)
- c. British Standard (BS)
- d. International Electrical Code
- e. Japan Industrial Standard (JIS)
- f. Japan Electrotechnical Committee (JEC)
- g. The Standard of Japan Electrical Manufacturers Association (JEM)
- h. Japan Technical Standard for Electrical Facilities (JTSEF)
- i. Other equivalent standards and regulations can be referred with the Consultant's approval.

5.2 WHERE APPLICABLE, an equivalent standard of another agency, society, association, etc.; or derived from within another country; may be offered for use in lieu of the Standard specified under the respective Technical Section provided that such substitution and use thereof.

5.2.1 **AS**, in all major aspects, comparable to the standard for which such substitution is proposed; and differs only in general mode of language, context and minor detail aspects;

5.2.2 **AND**, achieves or effects comparable results in quality and utility of Work same as intended under these Specifications.

5.3 **WHEN** such substitution is proposed, Contractor shall submit for approval by Consultant the complete and entire edition of each substitute Standard, including any appendices and interrelated or inter-referenced standards.

5.4 **WHERE** there exists an English translation of such substitute Standard, said translation shall accompany the original language version.

5.5 **PROPOSED** substitute standards as required above shall be submitted as part of Initial Submittals as specified under S109 - SUBMITTALS.
Later substitution of standards will not be permitted nor approved.

5.6 **SUBSTITUTION** of standards shall be subject to prior approval by Consultant; and, when approved, use thereof shall not be construed as permitting nor approving Work not comparable to quality intended nor otherwise not in compliance with Contract Documents.

PART 6: MANUFACTURERS' STANDARDS

6.1 PROVISIONS herein are applicable to proprietary materials or products and apply unless or except as particularly specified otherwise under various Technical Specifications.

6.2 INSTRUCTIONS not otherwise shown or specified shall be those of respective producer, as applicable, covering:

6.2.1 **PRIMARY MATERIALS**, auxiliary materials and accessories;

6.2.2 CONDITIONS OF HANDLING and for storage and protection;

6.2.3 PREPARATION of backup surfaces or substrates;

6.2.4 AND, installation, cleaning and maintenance procedures.

6.3 PUBLICATIONS of producers shall apply as particularly referred to; otherwise as regularly provided by producer; and shall include covering generalized installation publications and/or instructions, if any.

PART 7: PRIORITY AND CONFLICTS

7.1 PRECEDENCE between Contract Documents and statutory requirements (codes) or standards shall be in the order and as follows:

7.1.1 **CONTRACT DOCUMENTS** take precedence over statutory requirements or standards when requiring materials of higher quality or performance, or larger sizes or capacity, or greater protection, safety or quantity than required by said codes or standards.

7.1.2 This shall not operate to allow deviations from code requirements.

7.1.3 **MODIFICATIONS** to published statutory requirements currently adopted or enforced by regulating agencies having jurisdiction shall take precedence over said published requirements.

7.1.4 **STATUTORY REQUIREMENTS** or standards take precedence over Contract Documents when requiring materials of higher quality or performance or larger size or capacity, or greater protection, safety or quantity than required by Contract Documents.

7.1.5 This shall not operate to allow deviations from requirements for prior approvals and other provisions specified.

7.2 CONFLICTS between statutory requirements shall be interpreted in favor of legal or statutory requirements first; next, to local or provincial requirements at Project locale; next, to requirements specified or referenced under these Contract Documents.

7.3 MINOR adjustments necessary to correlate Work with codes or standards shall be incorporated as necessary; at not added expense to Client.

7.4 PRIORITIES BETWEEN CONTRACT DOCUMENTS:

Refer to S102 - CONTRACT DOCUMENTS.

SECTION 104 - PROJECT MEETING

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to various meetings required during construction under this Contract.
- 1.2 **COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.
- 1.3 **MINUTES OF MEETINGS** in English for pre-construction conference and progress meetings shall be submitted to the RE immediate after each meeting.
- 1.4 **ANY OF ESSENTIAL** contractor's members shall not be absent from the meeting without approval of RE.

PART 2: PRE-CONSTRUCTION CONFERENCE

- 2.1 **PRIOR TO** start of Contract Work, Contractor shall meet with RE and other representatives of Client as may be necessary to establish mutually agreeable construction limits, area assignments, administrative procedures and like or other routines.
- 2.2 **SUBMITTALS**
CONTRACTOR shall submit following documents:
 - a. Notice of Work Commencement
 - b. Schedule of staff
 - c. Schedule of subcontractors
 - d. Master construction schedule
 - e. Master lists
 - f. Insurance certificates
 - g. Temporary facilities plan
 - h. Procedure of Correspondence
- 2.3 **PROJECT PAMPHLET:** shall be furnished upon the commencement of the Work. This pamphlet will consist of project outline, perspective drawing, floor plan diagram, location map etc. Pages; approx. five pages, Material; art paper, Multi-coloured printing, A-4 size, Quantity; 300 sets.
- 2.4 **MASTER LISTS:** shall be submitted upon the commencement of the Work. The lists shall clearly depict the following items for each imported materials, if any.
 - a. Name of manufacturer
 - b. Country of origin
 - c. Cost
 - d. Quantity
 - e. C.I.F. value

PART 3: SCHEDULE OF STAFF

- 5.1 **THE CONTRACTOR** shall submit schedule of staff with implementation organization diagram to the Consultant for approval at the time of pre-construction conference.
- 5.2 **FORM:** Arranged to clearly depict:
 - a. Primary responsible field representative and each subordinate of Contractor's management staff assigned to Project.
 - b. Each member of work forces in direct employ of Contractor assigned to Project.
 - c. Each member of other work forces hired by the Contractor or Subcontractors, including labor subcontractors or otherwise retained for Work at Project Site or locale.
 - d. Name, date of birth, place of birth, local residence, nationality, passport number, and other information as may be required for each member.

- e. In addition to the items of 5.2.d, for primary Contractor' s personnel, curriculum vitae showing educational background, technical or managerial authorized qualifications job experience in projects similar to this Project, ability of foreign language including English.
- f. Other information as may from time to time be required by Client.

5.3 COPIES REQUIRED:

Not less than 2 each time issued or re-issued.

5.4 REVISIONS:

Maintain schedule current with members of work forces extent; on daily basis; revised and re-issued as specified above, or more or less often as may be required.

PART 4: SCHEDULE OF SUBCONTRACTORS

4.1 TIME REQUIRED: At the time of pre-construction conference.

4.2 FORM: Arranged to clearly depict:

- a. Each and all Subcontractors proposed.
- b. Name, E-mail address, telephone number and cable or telex addresses, if any, and name of primary foreman or representative for each proposed Subcontractor.
- c. Identification or description of Permanent Work to be performed and/or Temporary Work to be provided by each.

4.3 COPIES REQUIRED:

Not less than 2 each time issued or re-issued.

4.4 SUBCONTRACTORS for this Contract shall have enough experience and/or justification to perform Work. Prior to the final selection of the subcontractors, the Contractor shall obtain RE's approval.

4.5 REVISIONS:

Maintain schedule current with Subcontractors extent as Work progresses; revised and re-issued within 7 days whenever any change thereof occurs.

PART 5: PROGRESS MEETINGS

5.1 DURING Construction, Contractor shall meet with Consultant, on every week basis, unless otherwise deemed necessary by Consultant, for purposes of reviewing progress of construction with respect to Construction Schedule and other matters respective to Project.

5.2 CONTRACTOR shall require his managerial staff and Subcontractors to attend construction conferences when so requested by Consultant.

5.3 LIKEWISE Contractor shall initiate and/or attend similar meetings as necessary to plan for full coordination of work with that to be provided under other contracts.

PART 6: SCHEDULE OF DAY-WORK

6.1 REQUIRED to summarize Work required and as directed to be performed on a day-work basis.

6.2 TIME REQUIRED:

Each day of occurrence; and monthly summary; statement to affect that not day-work was provided for that period.

6.3 FORM:

Arrangement to clearly depict relevant information and as required by Consultant.

6.4 COPIES REQUIRED:

Not less than 2 each day submitted.

SECTION 105 - CONSTRUCTION SCHEDULES

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements relating to general and various other construction schedules required under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of contract Work; including collection and assembly of information and data required; and without separate payment therefor.
- 1.3 REFERENCES:**
S104-PROJECT MEETINGS
S106 - COORDINATION
- 1.4 EACH SCHEDULE REQUIRED HEREIN SHALL:**
- a. Be in forms and arrangements as directed or approved by Consultant.
 - b. Be carefully made in due consideration with working hours of the facilities and activities of departments in the existing facilities.
 - c. Be provided with sufficient footnotes, descriptions or other data necessary for clarification; and with supportive documentation or supplementary details as and when requested by Consultant.
 - d. Become part and parcel of Contract Documents as issued and approved or from time to time thereafter modified, re-issued and approved.
 - e. Be adhered to without deviation or variation from those as issued and approved or thereafter from time to time modified, re-issued and approved.
- 1.5 NUMBERS OF COPIES** specified herein are minimum required. Additional numbers and distribution of all copies required shall be as directed by Consultant.

PART 2: MASTER CONSTRUCTION SCHEDULE

- 2.1 THE CONTRACTOR** shall prepare and submit to the Consultant master construction schedule within fourteen (14) days after signing the Construction Contract.
- 2.2 PROVIDE** to generally indicate mobilization and early construction activities during initial phases of Work.
- 2.2.1 MOBILIZATION COMPRISES, but not limited to, movement of personnel, equipment, supplies and incidentals; and other work or operations which must necessarily be performed, or costs incurred therefor, prior to beginning Work on various contract items at Project Site.
- 2.2.2 INCLUDE SUFFICIENT DESCRIPTIONS, dates and other data necessary for clear portrayal of early activities.
- 2.3 REVIEW** preliminary schedule with Consultant at Pre-Construction Conferences; provide additional information therefore as requested; and incorporate adjustments in schedule deemed necessary.
- 2.4 COPIES REQUIRED:** Not less than 3 each
- 2.5 FORM:** method; constructed, arranged and provided to clearly depict:
- a. Incremental time scale respective to total time allotted for Project construction and maintenance; by respective years months, and days.
 - b. All Temporary and Permanent Work; and activities respective to Project; correlated one with the others; and each respective to overall time scale.
 - c. Dates anticipated for start and completion of each activity; including times for submittals, shipping, rough work, finish work and/or other important or critical events respective to each activity.
 - d. Dates anticipated for Consultant's interim and final inspections.

PART 3: MONTHLY REPORT

- 3.1 THE CONTRACTOR** shall submit monthly progress report with each outlining status of Work and activities respective to Construction Schedule as currently approved.
- 3.2 FORM:** method; constructed, arranged and provided to clearly depict:
- a. Incremental time scale respective to total time allotted for Project construction and maintenance; by respective years months, and days.
 - b. All Temporary and Permanent Work; and activities respective to Project; correlated one with the others; and each respective to overall time scale.
 - c. Dates anticipated for start and completion of each activity; including times for submittals, shipping, rough work, finish work and/or other important or critical events respective to each activity.
 - d. 20 to 30 photographs showing the progress of each month shall be attached. Refer to S-117 RECORD PHOTOGRAPHS.
- 3.3 WHEN FORMULATED,** review schedule with Consultant, provide additional data or details as requested; and incorporate adjustments or addition deemed necessary.
- 3.4 COPIES REQUIRED:** Not less than 6 each time issued or re-issued.
- 3.5 REVISIONS:** Maintain construction schedule current with real Work; revised and re-issued whenever significantly affected by:
- a. Change Orders duly executed to date of consideration.
 - b. Progress of an activity ahead of or behind anticipated dates or rate of progress sufficient to effect any other activity.
 - c. Changes in sequence of operations.
 - d. Establishment of any separate contract made known to Contractor and which may have any bearing upon requirements under this Contract.
- 3.6 CONTRACTOR'S OPTION:** Schedule required may be a CPM or computer analysis and bar-chart, provided they achieve same degree of representation required.

PART 4: TESTING PROGRAM

- 4.1 REQUIRED TO BE FORMULATED BY CONTRACTOR;** to coordinate correlate all architectural, structural, mechanical, sanitary, plumbing and electrical testing activities required under various technical sections.
- 4.2 CORRELATE WITH CONSTRUCTION SCHEDULE** per Article, herein and cooperate with contractors of other project contracts. Also refer to S114 - completion of work.
- 4.3 TIME REQUIRED:** Within days following latest date of signing of all of various contracts referred to under referenced section.
- 4.4 WHEN FORMULATED,** review program with Consultant and in joint Meeting with other contractors; and incorporate adjustments deemed necessary.
- 4.5 COPIES REQUIRED:** Each time issued, not less than:
- a. To RE : 2
 - b. To other Contractors : 2 for each contractor, if necessary.
- 4.6 REVISE AND REISSUE** at later times as and when necessary.

SECTION 106 - COORDINATION

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to coordination of Work required under this Contract; and that respective to related work to be provided under other contracts.
- 1.2 COMPLIANCE with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.

PART 2: WORK UNDER THIS CONTRACT

- 2.1 **COOPERATION AND COORDINATION** between the various subcontractors and trade activities shall be exercised for Project benefit.
- 2.2 **PARTICULAR ATTENTION** shall be given to required connections between various building elements and systems; and to design requirements to achieve visual relationships and alignments intended between adjacent or different types of work and finishes.
- 2.3 **UTILITY ROUGH-INS**, including required tests, and other Work to be covered up, shall be complete and approved before such is enclosed or otherwise made inaccessible.
- 2.4 **FLOOR ALIGNMENTS:**
- 2.4.1 **FINISH SURFACES ADJOINING FLOORS** are required to align flush, regardless of types of materials involved, unless particularly shown otherwise.
- 2.4.2 **SHARP OFFSETS** or abrupt stepping or steep ramping to meet this requirement will not be permitted except only where specifically shown otherwise
- 2.4.3 **PRE-PLAN** and coordinate related installations as necessary for compliance with these requirements.

2.5 CORRELATION/COOPERATION REQUIREMENTS

- 2.5.1 **GENERAL:**
- Provisions herein are in addition to Article as specified under the various Technical Sections.
 - Work includes correlation with other works, to provide and effect complete and operable systems and equipment throughout project as required by and intended under these Contract Documents.
 - Correlation includes, among others, considerations of locations, sizes, capacities and performance characteristics of systems or equipment required to be furnished and installed.
 - Correlation further includes providing adjustments in any of the work to meet needs of said equipment and cooperation with other Contractor or Subcontractors.
- 2.5.2 **MINOR ADJUSTMENTS;** Provide and where necessary or directed by Consultant; at no added cost to Client; as provided for elsewhere under Contract Documents.
- 2.5.3 **SUBSTANTIAL ADJUSTMENTS OR CHANGES** resulting from compliance with requirements specified herein and which result in substantial extra work or materials and any claims on that account will be considered only when fully justified by Contractor and duly processed in accord with provisions for changed conditions as provided for elsewhere under these Contract Documents.
- 2.5.4 **GENERAL CONSTRUCTION:**
- Review drawings for openings and access provisions to be provided for equipment required.
 - Verify sizes and locations are adequate and proper.
 - Arrange for additional opening where and as may be required.
 - Supply drawings, instructions or information necessary therefor.
- 2.5.5 **UTILITIES FOR SYSTEMS OR EQUIPMENT:**
- Verify services to be provided as Work under divisions MECH or ELEC; and incorporate adjustments to adequately and properly serve systems or equipment required.
 - For Mechanical Work;
 - Provide systems piping, service line controls, valves, unions or other items necessary for the

- various systems or equipment.
- 2) Rough-in services as and where required.
- 3) Locate valves, unions or flanges for easy and convenient access when Work is complete.
- 4) Connect services to equipment after installation as required.
- C. For Electrical Work;
 - 1) Provide conduit, cable, wire, service line controls or other items necessary for but otherwise not provided as part of equipment.
 - 2) Rough-in services as and where required.
 - 3) Locate outlets, switches, etc. for easy and convenient access.
 - 4) Connect services to equipment after installation as required.

2.5.6 UTILITY SYSTEMS ACTIVATION:

- a. Activate systems sufficiently in advance to permit completion of above specified operations not later than 30 days prior to official Date of Completion or date determined in advance by Consultant.

PART 3: EARLY COMPLETIONS

3.1 GENERAL

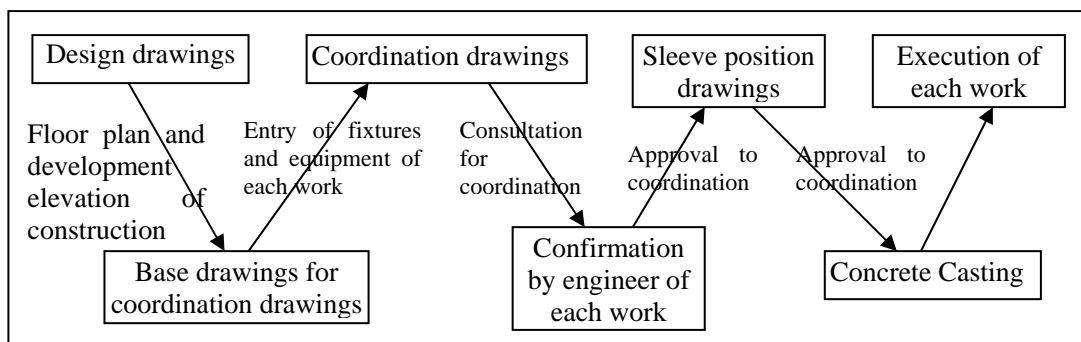
3.1.1 VARIOUS ROOMS, spaces or areas constructed under this contract within which Project related installations are to be provided under other contracts shall be made ready for commencement of such work sufficiently in advance to permit completion of all work.

3.1.2 THIS EARLY PREPARATION shall include completion of essentially all finishing work and cleanup and cleaning within such spaces.

3.1.1 FOR CERTAIN OF THESE SPACES, this shall also include completion of air conditioning and/or ventilating systems and early operation and special cleaning and protection.

PART 4: COORDINATION DRAWINGS

- a. The Contractor shall immediately prepare coordination drawings either before the commencement of the work or concurrently with the commencement of the work in such a way as to avoid interrupting the execution of the work.
- b. The coordination drawings are intended to allow the Contractor to understand the overview and the correlation among structural, electrical, plumbing, mechanical, and other relevant works, thereby ensuring the utilization of the coordination drawings for preparing other shop drawings appropriately and efficiently. To facilitate it, all the necessary information such as light fixtures and equipment, and the like included in each work are thoroughly indicated in the same floor plan or the interior elevations.
- c. The positioning of coordination drawings in the flow of work is shown below. Preparation of coordination drawings shall begin immediately after the contract agreement is signed, and shall be completed before preparation of shop drawings for each work starts. See the procedure below for preparation of coordination drawings.



- 1) The Contractor shall prepare floor plans and interior elevations of each room that serves as the base for coordination drawings, according to the instructions by the RE. The light fixtures and equipment, and the like exemplified below under the tender drawings and specifications shall be indicated on the floor plans and interior elevations at the scale of 1/50 in general.

(Floor) Manholes, floor pits, ladders, drain pipes, and built-in furnishings, etc.

(Wall) Doors and windows, louvers, door louvers, operating cabinet for roll up shutters, ladders, and mirrors, etc.

(Ceiling) Roll up shutter boxes, and inspection accesses, etc.

(Rooftop) Louvers, A/C equipment, etc.

(External) Manholes, drain pipes, drain ditches, water pipes, and signboards, etc.

(Notes)

① Coordination drawings shall also be prepared for the machine room, electrical room, and shafts.

② For the rooms without suspended ceilings, exposed beams, piping, etc. shall also be entered.

③ The beams on the upper and lower floors, and hanging walls shall be indicated as necessary even if they are concealed.

- 2) Persons in charge of plumbing, mechanical, electrical and other relevant works shall enter each work part and fixtures and equipment on the coordination drawings based on the tender drawings and specifications.
- 3) For the coordination drawings whose entries are completed, the Contractor and the persons in charge of each work shall cooperate with each other under the instructions of the RE to adjust the location of the light fixtures, other fixtures, equipment, and the like.
- 4) If a design change is needed as the result of coordination, the Contractor shall receive instructions by the RE for necessary measures to be taken.
- 5) The coordination drawings shall be revised and completed based on the result of the adjustment, and shall be submitted to the RE.

PART 5: COORDINATION WITH THE NOMINATED CONTRACTORS BY THE CLIENT

- a. CONTRACTOR shall coordinate works at the Site with the Exhibition work contractors to be appointed by the Client under the separate contract, which may start prior to the completion. Such cooperation shall include permission of entry to the site, use of temporary site utilities, and early termination of rooms for such works.
- b. CONTRACTOR shall coordinate works at the Site with the Equipment work contractors to be appointed by the Client under the separate contract, which may start prior to the completion. Such cooperation shall include permission of entry to the site, use of temporary site utilities, and early termination of rooms for such works.

SECTION 107 - MATERIALS & SUBSTITUTIONS

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements relating to materials and equipment required under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.

PART 2: GENERAL REQUIREMENTS FOR MATERIALS

2.1 GENERAL

- 2.1.1 THE TERM ITEM** used herein shall mean to be any product, equipment or other material thing respective to Contract Work.
- 2.1.2 REQUIREMENTS** herein shall be applicable to all and each type or kind of item respective to Contract Work.
- 2.1.3 EACH REQUIREMENT** herein shall be understood to include the phrase "unless otherwise shown or specified" .
- 2.1.4 EXCEPTIONS**, modifications, or special requirements for a particular material or product shall be as specified for each individual item under respective Technical Specifications.

2.2 MATERIALS OR ITEMS required shall be furnished and installed in types, kinds, models, styles or variations exactly as shown or specified; unless otherwise approved by Consultant; and provided in accord with the following provisions:

- a. Where multiple descriptions, names or options are given; or material is specified by reference to a non-proprietary standard; exact material; or item will be at Contractor's option to select and be approved by Consultant.
- b. Where a single description, name or option only is given, material or item shall be exact type or kind as shown or specified.
- c. When selecting an exact maker or brand, Contractor shall determine that such selection is equivalent to quality, use, capacity, capability, and general appearance and design standards of material or item as required under Contract Documents.
- d. In all cases, selections made or proposed shall be subject to review by and shall be approved by prior to their use or incorporation into work.
- e. Nothing under foregoing shall be construed as limiting competition nor to preclude offering items of equal or better quality, performance and durability.

2.3 NON-PROPRIETARY ITEMS specified by reference only to a standard shall comply with all applicable provisions thereof; except only as and where not applicable to the particular grade, quality or type required.

2.4 PROPRIETARY ITEMS specified by reference to a manufacturer's brand or trade name shall comply with all applicable provisions of manufacturer covering published specifications and catalog and technical data; except only as or where not applicable to particular series, models or versions required.

- a. Said items shall also comply with applicable standards where so referenced in addition to said brand or trade name.
- b. Pre-made and assembled or like items ready for setting in place, generally referred to as "hard" items, also shall be producer's standard types or kinds; with all standard catalog features or components; and with primary constituent materials, construction, fabrication and finishing conforming to producer's regular quality standards and processes.
- c. Items produced for job preparation or application, generally referred to as "soft" items, shall be manufacturer's standard composition, compound or formulation conforming to producer's regular quality standards.

2.5 MATERIAL ITEMS SHALL BE:

- a. New and of recent manufacture; and items older than “shelf age” stated or recommended by respective manufacturer shall not be used;
- b. First quality grade of manufacturer’s quality line or series specified; and imperfect, second or reconditioned items shall not be permitted;
- c. And, up-to-date models, series, styles or compositions as indicated in respective manufacturer’s catalogs or specifications in effect on issue date of these Specifications.
Out sided or otherwise non-current series or items will not be permitted.

2.6 MATERIAL FINISHES AND COLORS

- a. Entire quantity of each type or kind of factory finished item shall be from same production or color lot series; or otherwise identical in shade, pattern, texture or appearance.
- b. Colors for each item shall be selected by Consultant from manufacturer’s full range color palette standard for the item required.
- c. Allowance for combinations of colors or custom colors shall be included where particularly specified; and shall be as selected, directed approved by Consultant.

2.7 MATERIALS or items required or supplied for Work shall be free from factory, shop or field applied trade signs or advertising labels of any description exposed to view in completed Work; except only as specified for certain operational identifications, precautionary notice, etc.; and only as necessary to identify fire-rated work where so required.

PART 3: SUBSTITUTIONS

3.1 PROPOSED DURING TENDERING

N/A

3.2 SUBSTITUTIONS for specified items and materials may be proposed and, when offered, shall be inform of full and complete submittals complying with the following:

- a. Items proposed shall be submitted individually in writing, with each submittal accompanied by the following:
 - 1) Complete representational information consisting of catalog cuts, technical data, performance and capacity values and sizes, manufacturer’s specifications, finishes, patterns and colors; design or feature modifications or options, or other information as may be necessary or applicable;
 - 2) Statement(s) as to effects use of such items would produce, if approved, with respect to space requirements, adjacent details, contiguous or other operational systems, or other effects upon the work.
 - 3) And, list of comparable regional installations where item proposed has been used.

3.2.1 AFTER AWARD OF CONTRACT, substitutions shall be limited to one proposal for each type or kind of material or equipment item, unless otherwise permitted by Consultant.

3.2.2 DESIRED SUBSTITUTIONS shall be submitted as required not later than 30 days becoming effective. Material acquisitions or orders made in anticipation of substitution approvals shall be entirely contractor’s responsibility.

3.2.4 APPROVED substitutions shall comply with all other Contract provisions and requirements same as if originally called for; including submittals as may be specified or directed by Consultant and including coverage by general and special warranties, unless otherwise required for adequate safeguard to Client.

3.3 ADDITIONAL PROVISIONS

3.3.1 MOCKUPS shall construct on-site with submittal samples and as full-size and physical assemblies. Approved mockups are judged to establish the standard of the work.

Required Mockups: (referred to each division)

3.3.2 THE TERM “OR EQUAL” as used under these specifications shall be interpreted to mean that the specified product(s) or item(s) establishes the minimum quality and characteristic requirements which shall be met by any unspecified products(s) or item(s) offered in substitution of that or those specified.

SECTION 108 - TESTS & INSPECTIONS

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements relating to tests and inspections required for Work and materials under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.

PART 2: TESTING AGENCIES

- 2.1 TEST AND INSPECTIONS** required to be provided under the Contract; and paid for by Contractor in accord with Article 4.2.2, herein; shall be performed by appropriate public institutions:
- 2.1.2 EXCEPTIONS to the above shall be only the following
- a. Tests and inspections to be provided or performed by Consultant per 4.2.1, herein.
 - b. Concrete compressive strength tests required to be performed on premises of project per Part 6, herein.
- 2.2 REPORTS** of tests or inspections performed shall be prepared and distributed by testing agencies as requested by Consultant.
- 2.3 IRREGULARITIES** observed by testing agencies shall be immediately reported to Consultant and Contractor. Respective work shall not be permitted to proceed until the matter in question has been resolved.

PART 3: GENERAL REQUIREMENTS

- 3.1 TESTS AND INSPECTION** shall be provided by and at Contractor's expense, unless particularly provided for otherwise.
- 3.1.1 IN ADDITION, CONTRACTOR SHALL PROVIDE:
- a. Test, inspections or certifications required other than as specified under this Section 108.
 - b. Retesting or additional testing or inspections made necessary by receipt of substandard test results, or other factors which indicate Work to be below standards of these Specifications and where attributable to Contractor.
 - c. Repairs or replacements of Work damaged by above specified retesting or additional testing.
 - d. Repair or replacement of Work in place which fails to comply with specified test or inspection requirements.
 - e. The above specified retesting, additional testing, inspection, repair or replacements shall be performed or made as directed by Consultant, at no cost to Client.
- 3.2 SAMPLES FOR TESTING:** As part of work under each Technical Section, Contractor shall furnish all materials and samples for all required tests; supplied to places, in quantities and at times necessary; and including cutting, machining, labeling and other preparation and transportation as necessary.
- 3.3 TESTS AND CRITERIA** for evaluations shall be as included or referred to under particular standards by which materials are specified, unless otherwise specified or scheduled. Other tests or inspections required shall be as specified or scheduled herein or under Technical Sections.
- 3.4 FREQUENCY OF TESTS:** As specified; otherwise as deemed necessary by Consultant or testing agency to assure compliance with specified requirements.
- 3.5 COMPLIANCE** with specified material or property requirements may be substantiated by certificate, as specified and scheduled per CERTIFICATION OF MATERIALS under Section 109 - SUBMITTALS, when performed by producers, mills or plants maintaining established and regularly operating quality control facilities capable of performing tests of the types required. Otherwise, individual tests or inspections shall be performed by approved independent testing agencies and paid for

by Contractor.

PART 4: QUALITY ASSURANCE REQUIREMENTS

4.1 MANDATORY SUBSTANTIATION: Mandatory tests, inspections and certifications shall be as specified under this Section, S109-SUBMITTALS and Technical Sections throughout these Specifications.

4.2 COSTS FOR SUBSTANTIATION

4.2.1 TESTS AND INSPECTIONS respective to quality of work or materials and which will be paid for by Client shall be limited to those specifically to be provided or performed by Consultant, if any.

4.2.2 ALL OTHER TESTS and inspections required under the Contract shall be provided at Contractor's effort and expense, including any and all arrangements therefor, samples, deliveries, payment of costs or fees or otherwise respective to such tests and inspections.

4.2.3 TESTS AND INSPECTIONS not specifically provided for otherwise or not otherwise provided by Consultant shall be made as and when directed by Consultant and paid for as follows:

- a. When Materials or Work tested is determined, based on such tests and inspections, to be in compliance with requirements of Contract Documents, costs for said tests and inspections will be paid by Client.
- b. When materials or Work so tested are found to be otherwise, costs for said tests and inspections shall be paid by Contractor.

PART 5: WATER TESTING REQUIREMENTS

5.1 GENERAL

5.1.1 WATER TESTING REQUIRED:

- a. For work areas specified or directed upon completion of respective Work, except as follows:
 - 1) Prior to start of installation of any subsequent enclosing or covering work or finishes.
 - 2) Prior to installation of any adjacent interior wall finishes or finished ceilings below test areas.

5.1.2 INSPECTION DURING TEST PERIODS:

- a. Assign number of men appropriate for size of test area.
- b. Provide or arrange for adequate light and access as required for ready detection of leaks.
- c. Periodically and frequently inspect areas adjacent to, about, around and below test areas for early observance of any leaks.

5.1.3 OCCURRENCE OF LEAKS:

- a. Upon detection of any leakage, immediately drain test area or cease applications of water.
- b. Repair cause(s) of leakage.
- c. Retest entire test area where leak occurred.
- d. Repeat repair and retest procedures as many times as necessary until respective work proves watertight and free from leaks.
- e. Repair work adjacent to or below test areas where damaged by any leakage resulting from water testing.

5.1.4 UPON COMPLETION, each area or surface which is water tested shall prove watertight and free from conditions which permit passage of water through plane of test area or surface into concealed or interior spaces of structure.

5.2 TESTING HORIZONTAL SURFACES

5.2.1 EXTENT:

- a. Required for horizontal membrane, roofing, decking or flooring assemblies intended to be waterproof or impermeable to water.
- b. Includes entire extent of each area to be tested, whether dead level or sloped for drainage.
- c. Not required for vapor barriers under slabs on grade.

5.2.2 GENERAL PROCEDURE:

- a. Temporarily and effectively stop roof or floor drains; dam any other openings or perimeters which would otherwise permit escape of test water.
- b. Floor test area clean domestic water only; to depth not less than 10cm above highest point of test area plane.
- c. Maintain not less than 24 hours.
- d. Upon completion, remove all stops and dams.

5.3 TESTING OTHER SURFACES

5.3.1 EXTENT:

- a. Required for specific items of work as and when directed by Consultant.
- b. Includes exterior windows, roof fixtures or structures, or other surfaces or appurtenances as and where particularly designated by Consultant.

5.3.2 GENERAL PROCEDURE:

- a. Test area or surface designated using nozzled hoses and clean domestic water.
- b. Apply water in generous amounts; continuously spraying over, around, back and forth over test area; to simulate heavy rainfall driven by moderately strong winds.
- c. Maintain for 30 seconds; cease spraying and inspect for leaks.
- d. Resume spraying not less than 3 minutes or as directed.
- e. Thoroughly inspect test area or surface for leakage.

5.4 WATER TESTING AT OTHER AREAS

- 5.4.1 UPON COMPLETION, each area or surface which is later tested shall prove to readily drain water free from ponding exceeding specified limits.

PART 6: ON-SITE TESTING OF CONCRETE

6.1 GENERAL:

- 6.1.1 IN ADDITION to laboratory testing to be performed by public institutions per Article 2.1, herein, concrete shall be tested on-site and as work progresses.
- 6.1.2 THIS ON-SITE WORK shall be arranged for and paid for by Contractor and shall include the following:
- a. Furnishing all necessary testing equipment, instruments and other tools or devices necessary.
 - b. Retaining one or more personnel as necessary, who is (are) technically well qualified for the work intended and shall be subject to approval by Consultant.

6.2 THIS TESTING WORK, including preparations and related activities, shall be the responsibility of the approved personnel; provided per requirements therefor same as under-mentioned in CONCRETE; and with all tests actually performed with General Contractor and Consultant present.

6.3 ON-SITE TESTING of concrete shall consist of compressive strength tests of cylinders for concrete as placed in the work.

SECTION 109 - SUBMITTALS

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements relating to various submittals required under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.
- 1.3 REFERENCES:**
S107 - MATERIALS & SUBSTITUTIONS
S108 - TESTS & INSPECTIONS
- 1.4 SUBMITTALS** shall be provided as part of Work required under the Contract; shall be deemed and considered as representative only of the Work that Contractor intends to furnish and install; and, as such, are instruments of Contractor, who shall be responsible for all aspects thereof.
- 1.5 CONSULTANT'S REVIEW** and approval of any Submittal shall not imply nor infer approval or acceptance of respective Work as later furnished and installed not relieving Contractor of responsibility of providing Work in compliance with requirements under the Contract.

PART 2: GENERAL REQUIREMENTS FOR SUBMITTALS

- 2.1 SUBMITTALS REQUIRED** shall be:
- In kinds and quantities as defined and specified herein
 - Included as Work under various Technical Sections, as applicable;
 - Furnished with such additional or supportive data as may be specified under each Technical Section or as may be subsequently requested by Consultant when deemed necessary for evaluation;
 - Supplied or delivered with all shipment or mailing costs prepaid;
 - And, distributed to Consultant office or elsewhere as later determined necessary.
- 2.2 CONTRACTOR** shall ascertain and verify that, when forwarded to Consultant, each submittal:
- Is correct, accurate and complete;
 - Complies with applicable requirements of Contract Documents;
 - Conforms with structural or space conditions at points of installation; and access to places of installation;
 - Has been correlated and coordinated with any adjacent Work;
 - And is prepared and identified as specified herein.
- 2.3 EACH SUBMITTAL REQUIRED** shall be clearly identified with the following information:
- Submittal subject title; with dates of issue and revisions.
 - Project name and contract title.
 - References to respective drawings or specifications sections.
 - Names of contractor and subcontractor.
 - Contractor's stamp of approval; with date and signature of reviewer.
- 2.4 ANY VARIATIONS** or deviations within the submittals which reflect differences from the requirements of the respective Work as shown or specified shall be listed, described or otherwise clearly identified; either on or accompanying the submittal; and shall be so identified whether by reason of conforming to standard fabrication practices, necessary for coordination or otherwise.
- 2.5 SUBMITTALS REQUIRED** shall be of types enumerated under the various Technical Sections under which they are required.
- 2.6 SPECIFIC NATURE** of each type of submittal required is not always fully described, either herein or under Technical Sections; for reason that contractors and suppliers are assumed to be familiar with such related work usually required for their particular work or trade and are therefore expected to provide such ancillary submittals complete and to fullest extent necessary as intended for this Project.
- 2.7 CONSTRUCTION PLANTS AND EQUIPMENT** for which requirements are specified under any of

the Technical Sections shall be subject to review and approval the same as for items or materials required for the Permanent Work. Submittals therefore shall be furnished whether or not specifically called for. Also, refer to Section for related provisions.

- 2.8 MANUFACTURERS:** When the specifications require a manufacturer to meet certain qualifications, or where otherwise called for, the manufacturer shall provide the required evidence or documentation along with, as part of and the same as required for other submittals respective to the Work such manufacturer intends to furnish for the Project.
- 2.9 SUBCONTRACTORS:** When the specifications require a Subcontractor to meet certain qualifications, evidence of compliance shall be provided the same as specified above respective to manufacturers.
- 2.10 NUMBER OF SUBMITTALS** as specified herein are the minimum quantities required. Additional copies or sets shall be furnished when so directed by Consultant at no added cost.
- 2.11 INITIAL SUBMITTALS** returned to Contractor for resubmittal, for whatever reason, shall be revised, amended or otherwise changed or modified to meet requirements of the Contract Documents and resubmitted for further review by Consultant prior to commencement of respective Work.
- 2.11.1 **TERM FAVORABLE REVIEW** means that submittals for material list, shop drawings, material substitutions, schedules, etc., will be reviewed or approved with condition or mark corrections noted, in which case no further submittals are needed.
- 2.11.2 **SUBMITTALS** returned to contractor marked Resubmit or Amend and Resubmit or Rejected - Resubmit shall be corrected and resubmitted as specified under 2.11, above.
- 2.12 CONTRACTOR** shall be responsible for any and all materials ordered or Work performed in advance of receipt of approved submittals respective to such materials or Work.
- 2.13 ANY SUBMITTAL WHICH IS FURNISHED:**
- a. In other than English language shall be accompanied by not less than 2 copies of a complete and accurate English translation thereof.
 - b. Utilizing mensurations other than the Metric Systems as used or defined under the Contract Documents shall be annotated with complete and accurate conversions to said Metric Systems. Tables, formula, or other supportive data shall likewise reflect all necessary conversions.
 - c. For items based upon referenced standards or other non-proprietary type criteria other than as specified, whether similar to or criteria; together with any translations or annotations thereof for compliance as intended under Items a. and b., above.
 - d. Also refer to Section 103 - CODES & STANDARDS.
- 2.14 TIME REQUIRED OF SUBMISSION:**
- a. Submittals required shall be initially submitted not later than 14 days following latest Date of commencement of Work as determined from Notice of Work Commencement.
 - b. Resubmittals, when required, shall be furnished not later than 14 days following date of transmittal covering the return to Contractor of the respective prior submittal.
 - c. Exceptions are specified herein under Part 7 ON - SITE SAMPLES.

PART 3: MATERIAL LISTS

3.1 DEFINED AS:

- a. For Individual Items: An orderly listing of specific materials proposed for the Work.
- b. For Pieces of Equipment or Composite Systems: An orderly assembly in brochure form of manufacturer's catalog and specifications data for specific items proposed for the Work.

3.2 EACH ITEM listed or included shall be specifically identified respective to specifications requirements; each provided with sufficient information and data necessary to clearly demonstrate compliance therewith; and each accompanied by all applicable and complete manufacturer's published technical descriptive data and specifications.

3.3 PERFORMANCE CHARACTERISTICS, structural and/or chemical properties, capacities, test

results, and like data established by manufacturers shall accompany the respective submittals.

- 3.4 **PRE-PRINTED** or published data submitted, particularly when in composite type catalogs, shall be annotated or marked to positively identify the specific item(s) and all characteristics respective thereto.
- 3.5 **INFORMATION** submitted not so identified will be rejected as noncompliant.
- 3.6 **WHEN** so specified, Material List and Shop Drawing submittals shall be accompanied by basic service manuals.
- 3.7 **COPIES REQUIRED:** Not less than 3.

PART 4: SHOP DRAWINGS

- 4.1 **DEFINED AS:** Drawings prepared by Contractor, Subcontractors or vendors to indicate specific physical nature, characteristics, details and/or arrangements of the Work proposed; also occasionally referred to as Working Drawings; as distinguished from Contract Drawings and Supplementary Drawings as may be issued by Consultant from time to time. Shop drawings shall be submitted after coordination drawings as defined in section 106 part 6.
- 4.2 **SHOP DRAWINGS** shall be prepared and provided to clearly delineated, illustrate or otherwise portray complete layouts, dimensions, profiles, fabrication details, erection plans, location marks and schedules, connections to structurers, relationships with adjacent work, fastenings and other features as appropriate.
- 4.3 **SHOP DRAWINGS** for factory fabricated or pre-assembled equipment of other items requiring or depending upon prior preparations of structures, presetting of anchors, rough-ins of utilities or otherwise by critical dimensions or sizes shall also include or be accompanied by Certified Drawings therefor from the respective manufacturers.
- 4.4 **SHOP DRAWINGS** shall be submitted to the Consultant for approval at least fourteen (14) days previous to each work indicated by each series of shop drawing.
- 4.5 **FULL SIZE DETAILS**, tables, notes or other explanatory data or information shall be included as necessary for clarity and completeness.
- 4.6 **STRUCTURAL OR OTHER DESIGN CALCULATIONS** shall accompany the shop drawings as specified or later called for when deemed necessary to assure compliance.
- 4.7 **SIZES OF SHOP DRAWINGS** shall be A1 size, unless otherwise established and directed by Consultant.
- 4.8 **COPIES REQUIRED FOR REVIEW:** One sepia or like reproducible copy and 2 blue line type copies thereof.
- 4.9 **COPIES REQUIRED UPON APPROVAL:** Not less than 2 blue line type copies printed from reproducible set as approved.

PART 5: MATERIAL/COLOR SAMPLES

- 5.1 **DEFINED AS:** Actual physical samples demonstrating finish, texture, color and other appearance characteristics of prefabricated or pre-finished materials or items proposed for the Work; as distinguished from material samples required for purposes of testing and inspections.
- 5.2 **SAMPLE SIZES REQUIRED:**
 - 5.2.1 **UNIT ITEMS;** such as block, brick, tile, and the like; shall be full size unless larger than 60cm square.
 - 5.2.2 **SHEET ITEMS;** such as plywood, glass, plastics, fabrics and the like; shall be not less than 20cm square nor larger than 30cm by 30cm, unless otherwise requested or approved.
 - 5.2.3 **BULK ITEMS;** such as aggregates, paints, powders, and the like; shall be not less than one liter or approximate equivalent.
 - 5.2.4 **INDIVIDUAL ITEMS;** such as hardware, fittings, fasteners, fixture and the like; shall be full size units as proposed or required.
 - 5.2.5 **RUNNING ITEMS;** such as extrusions, trim, frames, wire and the like; shall be full size sections cut to lengths not exceeding 25cm where normal size exceeds one meter long.

5.2.6 **PRE-PACKAGED, PRE-SEALED ITEMS;** such as sealants, grouts, adhesives and the like; full size cartridges or packages as normally supplied by respective manufacturers, except not less than 250ml nor more than one liter each.

5.3 SAMPLES FOR APPROVAL OF COLORS AND TEXTURES:

5.3.1 **WHEN FINISHED** involve natural variations in color or texture, respective samples shall be supplied in sets demonstrating the representative full range to be expected; each set comprising the lightest and darkest, or finest and coarsest, ends of the range and the various intermediates.

5.3.2 **WHEN SELECTIONS** from standard series or ranges of colors or textures are provided for, respective samples shall be supplied in complete sets demonstrating the full range thereof as is available.

5.3.3 **WHEN CUSTOM COLORS** or textures are provided for, respective samples shall be prepared as directed by or in accord with samples furnished by Consultant.

5.4 UNITS REQUIRED: Not less than 2 each set, unless otherwise approved or requested by Consultant.

PART 6: CERTIFICATION OF MATERIALS

6.1 DEFINED AS: Reports to indicate compliance with requirements specified for materials, assemblies, or other items proposed for the Work; based upon tests or other applicable examinations as specified or referenced; made, prepared and certified by an approved Testing Agency; as distinguished and certified by an approved Testing Agency; as distinguished from any similar tests particularly specified or referenced under S108 - TESTS & INSPECTIONS.

6.2 WHEN SPECIFIED or otherwise approved by Consultant, certification required may be provided by the respective item manufacturer when maintaining comparable test facilities the same as similarly specified under S108 - TEST & INSPECTIONS.

6.3 WHEN APPROVED BY CONSULTANT, compliance with performance characteristics for certain types of composite assemblies may be evidenced by certified manufacturer's prototype tests in lieu of individual tests.

6.4 CERTIFICATION OF MATERIALS shall be mandatory for items where such is particularly called for; optional as part of Contractor's substantiation requirements respective to other items proposed.

6.5 COPIES REQUIRED: Not less than 2.

PART 7: ON-SITE SAMPLES

7.1 TECHNICALLY NOT A SUBMITTAL but is listed and scheduled as such for convenience and continuity of similar requirements.

7.2 DEFINED AS: Actual samples to be provided in advance of respective Permanent Work at or on Site; prepared in cooperation with and under direction of RE, to either determine or demonstrate or both the particular nature of colors, textures, or other appearance characteristics necessarily to be developed as the Work progresses.

7.3 SAMPLE SIZES REQUIRED and color or finish characteristics intended shall be specified under the respective Technical Sections.

7.4 UNLESS APPROVED as initially prepared, such on-site samples shall be removed and reconstructed as many times as may be necessary to effect the intended results.

7.5 WHEN PERMITTED by RE, on-site samples may be prepared as part of the Permanent Work; still subject to replacement if not approved.

7.6 WHEN APPROVED, such samples shall be maintained as a standard for like Work required; saved and protected against damage until removal is approved or directed by RE.

7.7 REQUIRED: One unit for each material type or finish type as specified and as approved.

SECTION 110 - TEMPORARY WORK & FACILITIES

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to temporary work and facilities and safeguards required for execution of Work under this Contract.
- 1.2 **COMPLIANCE** with provisions herein shall be Contractor's responsibilities to provide as part of Contract Work; and without separate payment therefore.
- 1.3 **REFERENCES:**
S111 - CONSTRUCTION SAFETY REQUIREMENTS
S112 - PROTECTION WORK

PART 2: GENERAL REQUIREMENTS

- 2.1 **TEMPORARY WORK**, facilities and safeguards shown, specified or required, including coordination in changes of services and like activities, shall be provided for proper performance of Work; as necessary to comply with all statutory regulations; and as necessary to expedite and properly execute contract Work.
- 2.2 **TEMPORARY CONSTRUCTION**, including permanent structures or portions thereof used as temporary construction, shall be adequate for intended uses and for all loads imposed without excessive settlement, deflection or deformation. All parts and members shall be properly supported, wedged, braced and secured to prevent displacement or failure.
- 2.3 **COMPLETION:**
 - 2.3.1 UPON COMPLETION OF WORK, or before if so required or directed, temporary structures, installations and utility services shall be disconnected and removed from premises.
 - 2.3.2 EXTERIOR AREAS used for temporary installations or work or construction plants shall be returned to their original condition, or Work otherwise completed as required at such areas.

PART 3: TEMPORARY UTILITIES AND SERVICES

- 3.1 **TEMPORARY UTILITIES** used for construction if available shall be adequate for intended uses and not overloaded or otherwise used or arranged in any manner endangering persons, premises or work. Connections shall be properly made; lines and wiring securely anchored in place; and protected against accidents.
- 3.2 **POWER UTILITY SERVICES** on adjacent to or near Project premises may be utilized for Project Work, provided proper arrangements are made by Client if available otherwise Contractor shall bear necessary cost for power utility services.
- 3.3 **PAY UTILITY SERVICES** not otherwise provided.
- 3.4 **PROVIDED GASOLINE** or other fuels as may be required.
- 3.5 **TEMPORARY UTILITY SYSTEMS** shall comply with all applicable safety orders or regulations of various public agencies having jurisdiction; or, when such is lacking, as may be required by Consultant.
- 3.6 **TEMPORARY ROAD**
 - a. Contractor shall construct necessary number and capacity of roads to perform Work, taking account of number and size of trucks used and the soil condition. They shall be layed properly, not to obstruct other related Work.
 - b. Contractor shall bear all necessary cost to restore the damages and changes caused by the Work.

PART 4: METERS

- 4.1 **FURNISH** and install where not otherwise provided by Government agency.
- 4.2 **INSTALL** or arrange for permanent meters at times required.
- 4.3 **CONTRACTOR** shall install meters necessary for calculation of charges.

PART 5: TEMPORARY WATER

- 5.1 CONTRACTOR** shall install a water meter to calculate accurate charges if water supply line exists; shall provide and maintain all means of transport and distribution of water necessary for all purposes required; and shall pay charges for temporary water. If there is no water supply system on adjacent to or near Project Sites, Contractor shall buy temporary water.
- 5.2 LINES CONNECTED** to water supply sources shall be provided with approved anti-back flow devices.
- 5.3 DRINKING WATER LOCATIONS** shall be reasonably well distributed and always available throughout various areas of Work.
- 5.4 NON-DRINKABLE WATER OUTLETS** or sources shall be duly posted with warning signs.

PART 6: TEMPORARY POWER AND LIGHTING

- 6.1 LOCAL ELECTRICAL POWER** is under jurisdiction of the authority who will provide sources of power for both Temporary Works if available.
- 6.2 CONTRACTOR** shall contact regarding arrangements for use, connections, costs, fees and related considerations; shall install a 100 ampere W · H meter to calculate accurate charges; shall provide and maintain all means of control and distribution of power for all purposes required under the contract; and shall pay for any and all initial and recurrent charges or cost therefore.
- 6.3 TEMPORARY AND/OR PERMANENT POWER** shall be supplied, on earliest date practical, for night lighting at the required main entry guard house if available.
- 6.4 TEMPORARY POWER AND LIGHTING** shall include all transformers, switchgear, safety devices, poles, lines outlets, etc. as necessary within the project premise.

PART 7: TEMPORARY SANITARY FACILITIES

- 7.1 ADEQUATE SANITARY FACILITIES** shall be provided and maintained as necessary for the number of persons employed; in reasonably accessible but out of the way locations; suitably arranged respective to race, status and creed as appropriate for persons working at Project.
- 7.2 TEMPORARY PORTABLE**, chemical type toilet facilities may be provided when available or supplied by Contractor, except shall be only as approved by Consultant. Otherwise, temporary structures shall be provided, each complete with all necessary ventilation, fixtures, piping and connections.
- 7.3 MAINTAIN FACILITIES IN SANITARY CONDITION;** cleaned on each work day and kept always adequately supplied. Upon completion of Work, dirtied soil in and around sanitary facilities shall be removed from the premises.

PART 8: TEMPORARY TELEPHONES SERVICE

- 8.1 LOCAL TELEPHONE SERVICE** is under jurisdiction of Post & Telecommunication Department; who will provide service to and within the Project premises if available.
- 8.2 CONTRACTOR** shall contact, regarding arrangements for service, connection, costs, fees and related considerations; shall provide all means for on-site distribution of service, instruments, etc. not otherwise provided by Telecommunication Authority and shall pay for any and all initial and recurrent charges or costs therefor.
- 8.3 TEMPORARY TELEPHONE SERVICE** will be supplied, on earliest date practical, for required consultant's and other construction offices.
- 8.4 IN CASE**, the temporary telephones are not supplied, the Contractor can use transceivers at his own expenses with the Clients permission for communication among the site, the Client's Office and the Contractor's Office.

PART 9: WASTE AND RUBBISH

- 9.1 PROVIDE** regular daily cleanup and removal of trash, waste, construction debris, etc., from site and construction areas.

- 9.2 TRANSPORT TO DISPOSAL AREAS** and dispose of as arranged with and directed by the public agency having jurisdiction.
- 9.3 BURYING** or burning of trash or rubbish on-site or else where not specifically designated or approved will not be permitted.

PART 10 : TEMPORARY FIRST AIDS FACILITIES

- 10.1 EMERGENCY CALLS:** Determine locations of local or nearest available police, fire, hospital or medical and ambulance services; and maintain list of phone numbers at all project telephones.
- 10.2 PROVIDE AND MAINTAIN** at construction office reasonable bandage and sterilant materials for first-aid treatment of minor injuries.

PART 11: FIRE PROTECTION

- 11.1 CONTACT LOCAL FIRE MARSHAL** to establish appropriate emergency routes and procedures;
- 11.2 MAINTAIN FIRE EXTINGUISHERS,** connected houses and other facilities required by Fire Marshal having jurisdiction or necessary for reasonable and adequate first-aid actions.

PART 12: CONSTRUCTION PLANTS AND EQUIPMENT

- 12.1 CONTRACTOR** shall provide sufficient, adequate and suitable construction plant and equipment necessary to perform Work required and to meet general and particular requirements therefore specified herein and elsewhere under Contract Documents.
- 12.2 ONLY PLANTS** and equipment adequate to produce quality of Work and Materials required will be permitted at Project; and when found otherwise shall be discontinued in operation and removed from Project upon order of Consultant.
- 12.3 CONSTRUCTION PLANTS** and equipment shall be designed and constructed in accord with good practices for such; and shall be of sufficient capacities to assure proper production or processing of sufficient and proper materials necessary to provide work of the types required and within the allotted construction time for the Project.
- 12.4 EACH PIECE OF VEHICULAR EQUIPMENT,** other than hand tools, shall be clearly marked with an identification number, stenciled in a conspicuous location and a list of such equipment shall be supplied to Consultant together with such data respective to sizes, capacities or other manufacturer's data as may be required by Consultant.
- 12.5 SCALES,** meters, gauges or other measuring devices respective to construction plant or equipment shall be only as approved and similarly identified and listed.
- 12.6 CONSTRUCTION PLANTS** and Equipment provided shall be for exclusive use on Work for this Project; and removal thereof from Project will not be permitted until so approved or permitted by Consultant.
- 12.7 PLANTS AND EQUIPMENT** provided to perform Work required shall be installed, serviced, repaired, reconditioned or otherwise maintained as necessary for continuous service to meet established construction programs and schedules.
- 12.8 IN ADDITION,** construction plants and equipment shall comply with all particular requirements therefor specified under various Technical Specifications.
- 12.9 CLIENT** shall not be liable for any damage to or loss of Contractor's plants or equipment other than as provided for under General Conditions.

PART 13: WORK AREAS

- 13.1 CONTRACTOR** shall provide, construct and maintain all necessary shops, work yards and other facilities necessary to produce, or execute all Work required.
- 13.2 LOCATIONS AND ARRANGEMENTS** of work areas shall be determined in cooperation with Consultant.
- 13.3 WORK AREAS** will be provided to Contractor for exclusive use of required under the Contract and furnished without cost to Contractor.

PART 14: SCAFFOLDING

- 14.1 METAL PIPE SCAFFOLDING** shall be provided as necessary for general use for exterior work; may be either new or used by shall be adequate for works and duration required. Wooden Scaffolding not permitted, unless otherwise approved by Consultant.
- 14.2 MOVABLE SCAFFOLDING** of similar type; shall be provided as necessary for general use for interior work.

PART 15: ADDITIONAL/MISCELLANEOUS REQUIREMENTS

- 15.1 PROJECT SIGN BOARD:** Provide and install plywood sign boards in respective construction site; 1 of size 1.8mH x 3.6mW and 2 of size 0.9mH x 1.8mW; with trim to protect plywood edges; entirely painted with white oil paint and the national flags of both countries, names of the donor, project executing agency, Consultant, Contractor, Subcontractors neatly hand lettered in English by skilled sign painter. Lettering sizes, wording, layout and sign support method and location of sign board as directed by RE. Sign board and lettering shall be maintained in good repair and readable condition for duration of construction period.
- 15.2 TEMPORARY CONSTRUCTION FENCE:** Contractor; shall assume complete responsibility for perimeter construction fence and gates; shall maintain such in good repair and condition, including painting, as may be necessary upon outset of work and for duration of work; shall relocate and/or revise same as it may from time to time become necessary for work as required; and shall remove and dispose of same upon completion of work.
- 15.3 GUARDHOUSE AND SITE GUARD:**
- 15.3.1 CONTRACTOR shall provide suitable all-weather guardhouse at main construction entrance gate.
- 15.3.2 AT LEAST one guard shall be provided and guard service shall be maintained on basis of 24 hours per day and 7 days per week.
- 15.3.3 UNAUTHORIZED PERSONS and vehicles shall not be permitted to enter project premises.
- 15.3.4 WHEN CONTRACT WORK necessitates construction fence and guardhouse to be removed, guard service shall be moved to inside of main entrance of building or elsewhere as directed.
- 15.4 CONSTRUCTION SITE LIGHTING:**
- 15.4.1 SECURITY LIGHTING for construction site shall be provided if available, maintained and operated around entire perimeter of site for as long as construction fence exist.
- 15.4.2 FIXTURES shall be adequate size and type for service required, with lamps or lenses wire guard protected; and may be construction fence mounted or otherwise as approved.
- 15.4.3 FIXTURES shall be spaced uniformly between fence corners or turns to provide sufficient amount of light for readily observing any persons in near vicinity of fence; and staggered or otherwise arranged to obviate any deeply shadowed areas immediately adjacent to and on either inside or outside of fence.
- 15.5 RESIDENT ENGINEERS' FIELD OFFICE**
- Refer to Preliminaries section of bills of quantities.
- 15.6 CONTRACTOR'S OFFICE AND OTHERS**
- Contractor's office, workers' resting place and quarters, temporary sanitary facilities etc., shall be provided in consultation with RE based on Preliminaries section of bills of quantities.

SECTION 111 - CONSTRUCTION SAFETY REQUIREMENTS

PART 1: GENERAL

1.1 THIS SECTION sets forth general requirements relating to Construction Safety Procedures of Work under this Contract.

1.2 COMPLIANCE with provisions herein shall be Contractor' responsibilities to provide as part of Contract Work; and without separate payment therefore.

1.3 REFERENCES:

S110 - TEMPORARY WORKS & FACILITIES
S112 - PROTECTION WORK

PART 2: GENERAL REQUIREMENTS

2.1 BUILDINGS or other improvements and adjacent sidewalks or roadways subjects to injury by nearby construction operations shall be enclosed, covered or otherwise protected.

2.2 TEMPORARY DIVISION ROADS walks and construction ramps shall be provided as necessary to facilitate movements in and about various work areas.

2.3 SAFETY HARDWARE: Persons working, visiting or otherwise within Project premises will be required to wear safety "hard hats" at all times. Maintain a reasonable supply of hard hats at field office for loan to authorized visitors.

2.4 TRENCHES intersecting through fares shall be provided with bridges or other crossings suitable for safely carrying type of traffic involved; with railings as necessary.

2.5 OPEN WELLS AND SHAFTS: openings in elevated floors, ramps, platforms, and other conditions with sharp vertical offsets more than 1.5 meters above adjacent floors or grades shall be protected by steady barricades or railings adequately secured into place.

2.6 SCAFFOLD, ladders, ramps, hoists, and other facilities shall be provided, maintained and operated as necessary.

2.7 STORAGE and shop areas shall be provided, arranged and maintained at approved locations as necessary to properly store, handle and fabricate various materials and equipment required.

2.8 CONSTRUCTION apparatus and equipment shall be placed in such locations as not to interfere with or delay completion of work; and shall be removed from locations where finishing operations are to occur.

2.9 FIELD MARKERS:

2.9.1 EXTENT: Provide and maintain at each existing or newly placed underground pipe or conduit and, valve, manhole, catch basin or other facility within Project Site.

2.9.2 TYPE: Wood or metal stake; exposed length not less than 60 cm above grade; painted white; located approximately 30 cm from item stake which faces the item.

2.10 BRACING AND SHORING:

2.10.1 FURNISH, install and maintain protection for workmen and excavations as necessary for conditions encountered; in accordance with Safety Orders.

2.10.2 STRUT and brace trenches and excavations 1.5m and deeper and sloping 1 to 3 and steeper or whenever condition of earth is hazardous to workmen or structures. Materials, arrangements and design shall be determined by Contractor.

2.11 POWER-ACTUATED FASTENERS shall be limited to uses particularly shown, specified or approved by Consultant; and operators shall be certified or qualified and as approved by Consultant.

2.12 CONSTRUCTION WARNING OR SAFETY specified or otherwise required to be posted on or about Project premises shall be clear, distinct and given in Arabic and English as directed.

2.13 COMMUTE between respective residence and Project sites shall be secured.

PART 3: SAFETY PROGRAMS

CONTRACTOR shall prepare a method statements on safety plan in accordance with the safety plan submitted as the tender document and in line with “the Guidelines for the Management of Safety for Construction Works in Japanese ODA Projects (preliminary Draft), and execute the safety plan during construction. The safety plan shall include the following articles.

- 3.1 CONTRACTOR** shall assign or appoint one or more of his personnel employed at Project premises whose duties, among others, shall be to:
 - a. Institute such safety programs and measures in and about the premises to avoid accident or injury to persons or property;
 - b. Instruct workmen as may be necessary for their understanding and observance of such safety rules;
 - c. And, observe and supervise work in progress as necessary to forewarn construction personnel of possible forthcoming dangers during the various work operations.
- 3.2 PERSONNEL** assigned these duties shall be sufficiently knowledgeable of construction and safety practices and procedures; and shall be allotted sufficient time - daily or otherwise; all as necessary to effect results and intended.
- 3.3 WORKMEN** shall be instructed to understand the fact that non-compliance with safety programs as established will be interpreted same as disorderly conduct and may be course for their dismissal from the work.
- 3.4 WORKMEN** shall put on helmets, safety belts and the other necessary safety devices through all the execution of construction work.

PART 4: SAFETY MANAGEMENT

4.1 CONSTRUCTION SAFETY

The contractor shall take all necessary steps to provide safety for project workers, the persons residing near the project, to the property of the public or others from the project activities arising as a consequence of his methods of operation.

The Contractor shall comply with all Safety Legislations and its Subsidiary Legislations, Regulations which are in force in the Country and any amendments or re-enactments.

The Contractor shall not permit any person to do anything not in accordance with the generally accepted principles of safe and sound practices. The Contractor shall ensure safe environment on site at all times. The Contractor shall ensure that necessary and sufficient precautions are taken by his workmen when safety provisions are used.

4.2 BARRICADING

The Contractor shall provide and maintain guards, fences or barriers around excavations, pits or other similar potential places of danger to prevent accidents. The barricade should be at least 1.1m high and strong enough to withstand a lateral point load of 50 kg.

4.3 WARNING SIGNS

The Contractor shall display warning signs of sizes 900 mm x 600 mm at a minimum of 4 points around the periphery of the site where the construction activities are located in near the residential area, roads, at locations where there is a chance of children can come to work site and where trespassing is likely to occur. Such signs shall have the words "DANGER - KEEP OUT OF SITE"

4.4 STORAGE OF FUELS

Fuels shall be stored in a room/ enclosed space, the room/ enclosed space shall have impervious platform and berm along the periphery of the storage area to contain spills of the fuels.

4.5 SAFETY OF MACHINERY

The Contractor shall employ only qualified operators for the machinery to be used on Site. All the machinery shall be locked when they are parked to avoid unauthorized operation of the machinery.

4.6 FIRST AID

At least two first aid kits shall be kept at site for attending the emergency treatment to the victims of accidents or chemical poisoning or excessive exposure to toxic substances. The first aid kit shall include a leaflet of standard

First-Aid procedure in addition to the medicines and medical tools. At least one staff member who has undergone First Aid training should be posted at site.

4.7 FIRE SAFETY, EMERGENCY AND RESCUE

The Contractor shall establish Fire Safety, Emergency and Rescue arrangements to contain fire and take necessary action during emergency. The contractor should place fire extinguishers at the work site, materials storage area and at site accommodation. The contractor should keep minimum 6 fire extinguishers within the work place.

4.8 ELECTRICAL SAFETY

All electrical equipment should be listed and labeled, free from hazards, and used in the proper manner. The electrician should be protected from electrical shocks and provided necessary safety equipment.

All temporary power distribution installations in the site shall be planned with appropriate earthing, over current protection and residual current devices in accordance with the relevant international standards such as BS7375, and should be verified regularly to ensure that all the leaks in the wires are rectified/ faulty wires are replaced. The contractor shall also ensure that all electric joints are leak proof.

4.9 PERSONAL PROTECTIVE EQUIPMENT

The Contractor shall provide and maintain suitable personal protective equipment for all workmen employed on the site to provide protection against falling objects and harmful substances which can cause injury. The Personal protective equipment shall include boots, hand gloves, helmet and goggles. The Contractor shall record the issuance of all equipment to his workmen and kept in the site office.

4.10 HOUSEKEEPING

The Contractor shall provide safe working environment by keeping the site neat and tidy, and free from debris. All materials shall be stacked safely. All accesses shall be kept free from hazards and debris.

Housekeeping shall be carried out in such a manner and at such times so as not to cause any inconvenience to either the adjoining owners, occupiers or the public. Debris shall be wetted to minimize the risk of dust. Containers for debris, rubbish and other wastes shall be provided at the designated places.

SECTION 112 - PROTECTION WORK

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to general protection of materials and finishes and other protection work required under this Contract.
- 1.2 **COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.
- 1.3 **EACH SECTION** providing Work under these Specifications shall include protection work as necessary to:
 - a. Protect respective Work under this Section;
 - b. And, to maintain adjacent works and materials clean and free from unrelated materials or damage by work operations, under liability as follows:
Adjacent existing or newly placed materials, finishes, surfaces, equipment or other improvements damaged shall be repaired or replaced by the responsible party; as directed by RE; at no added expense to Client.

PART 2: PROTECTIVE MATERIALS

- 2.1 **PLASTIC TAPE:** Pressure-sensitive adhesive-backed polyethylene tape, or equivalent in suitable weights and widths; guaranteed non-staining and to cause no damage to surfaces where used.
- 2.2 **PLASTIC SHEETING:**
Polyethylene, not less than 0.1mm, in suitable sheet sizes.
- 2.3 **PLYWOOD:**
Unsanded construction panels, not less than 6mm thick, in suitable sheet sizes; or equivalent as approved.

PART 3: GENERAL PROTECTION WORK

- 3.1 **PROVIDE** blocking or pallets to keep unit, piece or packaged materials and equipment above bare ground or concrete slabs.
- 3.2 **MAINTAIN** sheeting, tarpaulins or other suitable covering over and around materials and equipment stored at unprotected locations.
- 3.3 **PROJECT** sheeting materials which are draped over equipment or materials, hung at vertical surfaces or laid out on horizontal surfaces against blow-off or tearing. Provide weights, ropes, nailing through blocking and plastic or masking tape as required.
- 3.4 **CONSTRUCT** earth dams, drainage ditches and similar temporary work as necessary to prevent flooding of materials or equipment.
- 3.5 **INTERIOR** locations not yet roofed or adequately drained shall be considered as out-of-doors. Protect materials or equipment stored therein accordingly.
- 3.6 **COVER** exposed surfaces of materials and equipment installed, set in place or otherwise finishes using adequate sheeting, tarpaulins, drape cloths and like materials; with plastic tape at perimeter edges as required.
- 3.7 **STORE** finish materials inside well protected, enclosed, dry locations; inside permanent spaces where called for.
- 3.8 **ERECT** barricades to keep foot traffic and rolling equipment off newly placed paving, slabs and like

work; and maintain until drying, curing or other processes have been completed and areas are ready for use.

- 3.9 POST** warning signs when necessary to safeguard person, equipment and freshly placed finishes.
- 3.10 EXISTING** or newly erected structures exposed by any demolition or temporary removals shall be covered and protected at all times against entry of water into any concealed or interior spaces.
- 3.11 PROJECT** concrete or masonry corners, finished frames and like salient conditions with corner boards; substantially secured in place without damage to underlying surfaces.
- 3.12 PROJECT** building paper and plywood sheets at traffic areas over roofing, finished slab, flooring materials and like permanent finishes.
- 3.13 ROOFING, DECKING AND FINISH FLOORING** shall be protected against damage; and shall not be used nor traversed until in proper condition. Unnecessary traffic shall be prohibited. When necessarily used for Project Work, workmen shall be required to wear soft soled shoes only; and to perform work at said surfaces only when adequately protected. Provide plywood and paper covering as and where necessary.
- 3.14 RUBBER TIRE EQUIPMENT:** Carts, wheelbarrows and other wheeled equipment used inside or on buildings, etc. shall be equipped with pneumatic tires, unless particularly authorized otherwise by Consultant.

PART 4: PROTECTION OF PERMANENT BUILDINGS

- 4.1 WEATHERTIGHT** enclosures shall be provided for exterior openings as soon as practical after walls and roofs are in place. Doors shall be equipped with locks. Refer to under-mentioned in FINIFH HARDWARE. Windows may be permanently glazed as specified at Contractor's risk.
- 4.2 MAINTAIN** buildings and work areas locked during non-work times. Provide keys to Consultant and others as directed.

PART 5: DELIVERY REQUIREMENTS

- 5.1 SUFFICIENT QUANTITIES** of approved materials shall be at all times provided as necessary to maintain proper progress of Work.
- 5.2 PRIOR TO SHIPMENT:**
 - 5.2.1 **CEMENTS**, compound, powders or like items readily affected by water shall be contained in waterproof packaging and factory sealed against entry of moisture.
 - 5.2.2 **SEALANTS**, mastics, paints, coatings or like items readily affected by drying shall be contained in suitable packaging and factory sealed against entry of air or escape of vapors.
 - 5.2.3 **OTHER PRODUCED MATERIALS** shall be well protected in suitable factory applied wrappings, packages or containers as necessary.
 - 5.2.4 **ALL PACKAGES** or containers shall bear factory applied labels for clear and ready identification of manufacturer, type, kind, grade and use of materials contained.
 - 5.2.5 **PACKAGES CONTAINING FLAMMABLE**, toxic or otherwise hazardous products, in addition, shall bear suitable warning labels with instructions as to precautions in use and for emergencies.
 - 5.2.6 **ALL ITEMS** shall be crated, cartoned, containerized or otherwise as necessary for full protection against damage of any sort during handling, transport and storage under conditions which will be

encountered for this Project.

5.3 RECEIVING:

- 5.3.1 PACKAGED, canned or like container items shall be delivered unopened as factory sealed and labeled.
- 5.3.2 IMMEDIATELY upon receipt of items at Project Site or locale, or as soon thereafter as practical, Contractor shall thoroughly inspect all items to assure that they are compliant with requirement as specified; or are as approved; and are in proper and undamaged condition.
- 5.3.3 ITEMS FOUND NOT COMPLIANT, damaged or otherwise not as intended or approved shall be immediately identified as such and isolated from other items and removed and replaced forthwith without awaiting instructions to do so from Consultant.
- 5.3.4 CONSULTANT shall be immediately notified when such removal and replacement would have significant effect upon progress of Work.

5.4 ALSO refer to S113 - PACKING REQUIREMENTS.

PART 6: PROTECTION AGAINST DAMAGE BY NUISANCES

6.1 CONTROL OF DUST:

- 6.1.1 DUST shall be abated and minimized throughout entire construction period, including work days, holidays and weekends as required.
- 6.1.2 MAINTAIN dust control equipment available and ready for use at all times; and provide sprinkling and wetting as often and in amounts as necessary or as directed.
- 6.1.3 EXTRA or additional efforts shall be exercised to abate dust causing a nuisance in vicinity of existing buildings on premises.
- 6.1.4 ROADS or other areas adjacent to Project premises shall be maintained free from dirt droppings, dust, etc. by washing down as often as necessary.

6.2 CONTROL OF WATER:

- 6.2.1 WATER used, developed or otherwise occurring within the indicated work site shall be controlled and disposed of as necessary for proper execution of the work and protection of facilities.
- 6.2.2 FURNISH, install and operate such pumps or other devices as may be necessary to remove any seepage, storm water, sewage or construction water that may be found or may accumulate in the excavations. Placing any work under water will not be permitted. Provide such ditching, shaping of surfaces or other construction as necessary to collect waste, surplus, rain or other water as may develop and to dispose of same, including pumps, drain lines, etc. as may be necessary.
- 6.2.3 WATER DISPOSAL shall not damage any terrain, plants, trees, construction or structures, and shall not lead onto nor across established roads, parking areas, planting and lawns, or adjacent properties.
- 6.2.4 STORM DRAINS may be used for water disposal but shall be maintained free from clogging or silting caused by such use. This shall apply to existing or newly constructed storm drains and both on-site and off-site systems, as applicable.

6.3 CONTROL OF NOISE:

Noise produced by equipment of construction operations shall be minimized using adequate mufflers or other appropriate means.

PART 7: PROTECTION OF EXISTING TREES

7.1 REMOVAL of trees not required to remain: SITE WORK, if required.

7.2 GENERAL:

7.2.1 TREES adjacent to site work areas shall be preserved, protected and cared for as necessary, including roots, trunks, branches, stems and leaves.

7.2.2 HEAVY EQUIPMENT, stockpiling or dumping of refuse or waste of any description not permitted within required protective areas.

7.2.3 CHEMICALS or fires not permitted within distances from or otherwise used in a manner which would endanger any tree.

7.3 PROTECTIVE BARRIERS:

Provide and maintain for as long as necessary around single or group of trees as directed by Consultant and prior to start of work operations; as necessary to form continuous enclosure approximately 2.0m clear in all directions from any tree trunk; and consisting of suitable wood or metal posts supporting at least on 5 x 10cm wood rail up 1.0m and one at midheight.

7.4 UNAUTHORIZED cutting, pruning, trimming or other damage or mutilation of trees that are to remain will not be permitted. If required, arrange for in advance as directed by Consultant.

7.5 OPERATION occurring within branch spread of trees to remain:

7.5.1 TRENCHING:

Tunnel under or around roots by careful hand digging and without injury to the roots. Do not cut roots 5cm and larger without approval of Consultant.

7.5.2 RAISING GRADES:

When existing grade at tree is below new finish grade and fill not exceeding 40cm is required:

- a. Provide clean, washed gravel, graded from 5 to 10cm size.
- b. Place directly around tree and to 40cm minimum from trunk or as shown and finished grade at tree.
- c. Install gravel before any earth fill is placed.
- d. New earth fill in contact with tree trunks not permitted.

7.5.3 LOWERING GRADES: When new finish grade at tree is below existing grade:

- a. Perform grading by hand.
- b. Cleanly hand cut roots at 10cm below final grade.
- c. Using approved tree paint, treat cuts and scars.

PART 8: PROTECTION OF EXISTING FACILITIES

8.1 GENERAL

8.1.1 EXISTING FACILITIES adjacent to site work area shall be preserved, protected and cared for as necessary, including drainage, drain pipes, ditches, foundations, manholes and any underground.

8.1.2 PRIOR TO THE USE of equipment and/or construction machineries which produce noise, the Contractor shall consult with the Client and the Consultant.

SECTION 113 - PACKING REQUIREMENTS

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to protection during shipment and transportation of materials and equipment required under this Contract.
- 1.2 **COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.

PART 2: GENERAL PACKING REQUIREMENTS

- 2.1 **REQUIREMENTS HEREIN** shall supplement and are not in lieu of similar provisions specified under S107 - MATERIALS & SUBSTITUTIONS, and S112 - PROTECTION WORK.
- 2.2 **EACH ITEM** shall be packed or properly protected for shipment and transport from place of manufacturer to places of installation.
- 2.3 **TUBE ENDS** and other similar open ends shall be protected from both external damage and ingress of dirt and moisture during transit and while awaiting installation.
- 2.4 **FLANGED PIPES** shall have their open ends protected by adhesive type or jointing and then be covered with a wooden blank flange secured by service bolts.
- 2.5 **PRECAUTIONS** shall be taken to protect shafts and journals where they rest on wooden or other supports likely to contain moisture. At such points, wrappings impregnated with anti-rust composition or vapor inhibitors shall be provided; and wrappings used shall be of sufficient strength to resist chafing and indentation due to movement likely to occur during transit.
- 2.6 **INTERNAL CROSS BATTENS OF ALL PACKING CASES** shall be secured using screws. Nails will not be permitted.
- 2.7 **HOOP METAL BINDINGS OF CASES** shall be sealed where ends meet; and if not made of rust resistant material shall be painted.
- 2.8 **CONTENTS OF CASES** shall be bolted securely or fastened in position with struts or cross battens and not with wood chocks wedged in place, unless they are also fastened firmly in place. All struts or cross battens are preferably to be supported by cleats fixed to the case above and below to form ledges on which the batten may rest. Cases shall be up-ended after packing to prove that there is no movement of contents.
- 2.9 **WHERE PARTS** are to be bolted to sides of cases large washers shall be provided to distribute loads imposed on case members; and wood members shall be strengthened by means of additional wood block as required.
- 2.10 **ALL STENCIL MARKS ON OUTSIDE OF CASES** shall be either of a water proof material or protected by shellac or varnish to prevent obliteration in transit.
- 2.11 **WOODWOOL** shall be avoided as far as possible for packing purposes.
- 2.12 **WATERPROOF PAPER AND FELT LININGS** shall be overlapped at seams at least 5cm and seams secured together in an approved manner; and such enclosures shall be provided with screened openings to provide ventilation.
- 2.13 **WHERE PRACTICABLE**, all indoor items, such as electronic equipment, instruments and panels, machine components etc., shall be cocooned; or covered in polyethylene sheeting and sealed at joints; and such enclosures shall be provided internally with an approved desiccator.
- 2.14 **EACH CRATE OR PACKAGE** shall contain a packing list enclosed within a waterproof envelope; and triplicate copies of all such lists shall be forwarded to Consultant prior to dispatch. All items of equipment or material on each list shall be clearly marked for easy identification and comparison with like markings provided on such material or equipment.
- 2.15 **ALL CASES**, packages, etc., shall be clearly marked on outside to indicate total weight; shall show where weight is bearing a correct positions for slings; and shall bear an identification mark relating them to appropriate shipping documents.
- 2.16 **CONSULTANT** may require inspection of packing before items are dispatched. However, Contractor shall be entirely responsible for ensuring that packing is suitable for transit. Inspections so required shall not relieve Contractor from liability for any loss or damage due to faulty packing.
- 2.17 **PACKING CASES** shall at all times be handled and transported in upright positions and shall be so marked on outsides along with other identifications required.

SECTION 114 - COMPLETION OF WORK

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements relating to close-out of Work required under this Contract respective to;
- a. Condition of workmanship upon completion
 - b. Several procedures for Inspection and Acceptance
- 1.2 COMPLIANCE** with provisions herein shall be Contractor' responsibility to provide as part of Contract Work; and without separate payment therefor.
- 1.3 PROVISIONS HEREIN** shall be applicable to entire work; and to each designated portion of Work as and when so required under the Contract to be completed in advance of entire Work.

PART 2: WORKMANSHIP

- 2.1 CRITERIA HEREIN** is general and, as intended, shall be supportive of and to, not in lieu of, any other or more restrictive tolerances, limitations or requirements under various Technical Specifications.
- 2.2 GENERAL - AS APPLICABLE TO WORK REQUIRED:**
- 2.2.1 **PLANES OF STRAIGHT SURFACES** shall be flat and true to established lines, grades or levels; floors, ceilings, and soffits level; walls, corners and vertical returns plumb; sloping surfaces uniformly pitched or battered; corner intersections true to straightedge lines.
 - 2.2.2 **REPEATING MEMBERS** shall be uniformly, accurately spaced. Solid, tubular or like running members shall be straight, level or plumb as required; free from twists and winds; and with axes true to established planes or lines.
 - 2.2.3 **FRAMES AND UNIT ASSEMBLIES** shall be square, level, plumb, true to established planes or lines; all joints accurately formed and joined.
 - 2.2.4 **UNIT MATERIALS:** Layout for brick, block and like unit materials shall be symmetrical about floor, wall or ceiling center lines, or as shown; positioned such that necessary cut units at perimeter edges are not less than one-half natural unit width, except as particularly shown or specified otherwise.
 - 2.2.5 **FIXED PARTS OF MEMBERS** shall be secured tight in place, free from distortions, squeaks, rattles.
 - 2.2.6 **FINISHES** shall be free from bubbles, streaks, peeling, pits or other irregularities, except where rough materials are required.
 - 2.2.7 **FINISH SURFACES** shall be free from dirt, grease, mastics, fingerprints, scratches, dents, cracks, stains, chips or other damage or undesirable effects or conditions.
- 2.3 QUIETNESS OF OPERATION**
- 2.3.1 **EQUIPMENT AND DEVICES** shall operate quietly and free from vibration. Properly adjust, repair, and balance as necessary, or replace where producing objectionable noise or vibration. Provide additional brackets, bracing, etc., to prevent objectionable noise or vibration. All systems shall operate free from unnecessary hum, surge or rapid cycling.
 - 2.3.2 **DOORS, panels, operable hardware and various operative devices** shall be installed, adjusted and serviced as necessary for operating free from bind, squeak, vibration and other objectionable conditions.

PART 3: SUBSTANTIAL COMPLETION

3.1 PREREQUISITE CONDITIONS PRIOR TO COMPLETION INSPECTIONS:

- 3.1.1 CLEANUP and cleaning operations complete.
- 3.1.2 TEMPORARY FACILITIES and utilities properly disconnected and removed.
- 3.1.3 SYSTEMS, equipment and devices properly adjusted, serviced, tested and fully operable.
- 3.1.4 EQUIPMENT INSTRUCTIONS and identification labeling complete.
- 3.1.5 MATERIALS and finishes neat, clean and undamaged; accessory parts and items securely attached.
- 3.1.6 BROKEN OR DAMAGED WORK repaired or replaced as required.
- 3.1.7 EXTRA MATERIALS delivered and stored at premises as directed.
- 3.1.8 ALL SUBMITTALS assembled in an orderly manner and delivered to RE as directed.
- 3.1.9 REQUIRED WRITTEN NOTICE of readiness filed with RE.

3.2 NOTICE OF READINESS for Substantial completion Inspection shall mean that Contractor has:

- a. Inspected and checked all Work installed;
- b. Compared Work with Drawings and Specifications;
- c. And, confirmed that all conditions, provisions and requirements of Contract Documents have been fulfilled, other than Maintenance and incidental procedures necessarily to follow.

3.3 GENERAL PROCEDURE

- 3.3.1 CONTRACTOR shall determine date when he anticipates Work or designated portions thereof will be complete; and shall file with RE written Notice of Readiness for Completion Inspection not less than ten (10) days in advance of said date.
- 3.3.2 ALL ITEMS of Work which would remain incomplete or not corrected after said anticipated date shall be listed and filed with said Notice of Readiness.
- 3.3.4 PROVIDED said incomplete or uncorrected items are acceptable for later completion or correction by both Client and RE, Completion Inspection will proceed per Contractor' proposed date.
- 3.3.4 ALL OR ANY of said items not acceptable for completion or correction shall be remedied as necessary and Contractor' responsibilities to provide and complete Work as required under Contract.
- 3.3.5 WHEN RESIDENT ENGINEER DETERMINES by inspection and demonstration by Contractor that Work or designated portions thereof is complete, as represented by Contractor' s notice, RE shall issue a Certificate of Completion.

3.4 COMPLETION INSPECTION

- 3.4.1 CONTRACTOR shall attend such inspections and at such times deemed necessary by RE to check and verify various aspects of Work; and shall require such Subcontractors to be present as may be requested by RE.
- 3.4.2 SUFFICIENT QUALIFIED PERSONNEL of Contractor shall be present as necessary to operate and demonstrate the various equipment and systems comprising Work.
- 3.4.3 RESIDENT ENGINEERS INSPECTION and issuance of any Certificate of Completion shall signify

only that it is, to best of his belief, knowledge and information, that Work conforms to Contract Documents; and shall not imply nor infer any waiver of Contractor' responsibilities under Contract.

3.5 CERTIFICATE OF COMPLETION SHALL:

- 3.5.1 ESTABLISH AND CERTIFY to parties of the Contract the Date of Completion;
- 3.5.2 STATE THE RESPONSIBILITIES of said parties respective to Warranty Period, payments for utilities during subsequent periods, status of insurances and like considerations;
- 3.5.3 ESTABLISH TIME or times by which any listed uncompleted items are to be completed or corrected by Contractor;
- 3.5.4 BE SUBMITTED to both Client and Contractor for their written consent;
- 3.5.5 AND, shall be considered as accepted if written acceptance has not been made nor any protest thereof been filed with RE by either party within ten days following Date of Completion stipulated under the said Certificate of Completion.

PART 4: SPECIAL CLEANING AND PROTECTION

- 4.1 **ROOMS OR SPACES** in which sensitive electrical or electronic equipment is to be installed, whether under this Contract or separate contracts, shall be positively dust and dirt free when turned over for such installation work.
- 4.2 **AS MINIMUM REQUIREMENTS:** Upon completion of all other cleaning required within respective spaces, provide additional vacuuming, temporary seals or dust barriers around or at doors or other openings where any dust might enter or other safeguards as may be necessary to maintain said spaces in dust free condition until completion of equipment installations.

PART 5: TESTING ELECTRICALLY OPERATED SYSTEMS

- 5.1 **ALL ELECTRICALLY OPERATED SYSTEMS** required under this contract shall be tested under simulated normal and emergency operating conditions and in accord with electrical testing program as established and approved per S105 - CONSTRUCTION SCHEDULES, Part 4.
- 5.2 **ALL SUBCONTRACTORS** shall cooperate with contractor and operate and test respective systems as required.

SECTION 115 - CLEANUP AND CLEANING

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth general requirements relating to cleanup during, after construction and cleaning of work upon completion under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor' responsibility to provide as part of Contract Work; and without separate payment therefor.

PART 2: CLEANUP

2.1 CONSTRUCTION AREAS

- 2.1.1 **DEBRIS REMOVAL:** Section 110 - TEMPORARY WORK & FACILITIES
- 2.1.2 **MAINTAIN WORK AREAS** as orderly and free from encumbrance as practical to provide best conditions possible for various operations and installations required.
- 2.1.3 **REGULARLY REMOVE** construction waste and debris from Work areas and periodically remove from premises and dispose to indicated place.
- 2.1.4 **PERIODICALLY BROOM CLEAN SLABS**, floors, decks and other areas and leave clean and free from dust, shavings, litter, etc., upon completion of each phase of Work.

- 2.2 CLEANING METHODS**, solutions, agents, solvents, waxes or other materials shall be only as approved by manufacturers of materials installed, where so provided; otherwise per instructions issued by Consultant.

2.3 FINAL CLEANING OF BUILDINGS

- 2.3.1 **CONTRACTOR** shall retain established janitorial service, or provide other like or equivalent services, for final cleaning and polishing of finish hardware, bright and anodized metal finishes, glass, mirrors, plumbing fixtures, equipment, cabinets and other items or facilities.
- 2.3.2 **INCLUDE AND PROVIDE** all sweeping, brushing, dusting, vacuuming, dry and wet mopping, polishing, buffing and other operations, including supplies and equipment required, necessary to leave Work in immaculate condition ready for immediate occupancy and use by Client. Also refer to Article, herein.
- 2.3.3 **INCLUDE** all exposed surfaces, sills, recesses, corners, cabinet interiors and like areas exposed or accessible.
- 2.3.4 **REMOVE** protective tapes, wrappings, labels and other temporary covering.
- 2.3.5 **WASH AND BUFF** resilient flooring. Do not wax if specified.
- 2.3.6 **CLEANUP** roofs and decks as necessary.

2.4 FINAL CLEANING OF SITE

- 2.4.1 **THOROUGHLY CLEANUP** entire Site put into neat, acceptable condition.
- 2.4.2 **REMOVE** all construction waste and unused materials, dunnage, loose rock and stores, weeds, roots, and all debris of any description resulting from Work.
- 2.4.3 **HOSE DOWN** and scrub where necessary all new pavement and walks, and adjacent existing pavement and walks and as necessary.
- 2.5 SHOULD CONTRACTOR** fail to cleanup as required, Client may do same and cost thereof shall be charged to Contractor.

SECTION 116 - COMPLETION DOCUMENTS

PART 1: GENERAL

1.1 THIS SECTION specifies requirements for as-built record drawings to be provided as work under this contract and includes:

- a. Record Prints of as-built conditions, to be maintained as work progresses;
- b. Record Tracings of as-built conditions, to be prepared and submitted upon completion of work
- c. And, Record Tracing Albums, to be provided upon close-out of work.

1.2 RECORD INFORMATION REQUIRED

1.2.1 **RECORD** all actual locations of pipe, conduit, duct or other lines occurring below grade or within permanently concealed spaces; located by actual dimensions taken and referenced from permanent and readily accessible building lines, floor lines or monuments.

1.2.2 **DIMENSION** buried or concealed lines from readily accessible surface fixtures - hydrants, valve boxes, etc. - to indicated location of each change in alignment or grade, each valve, and like features.

1.2.3 **ACCURATELY LOCATE** the end of each capped, plugged or stubbed line.

1.2.4 **LOCATING DIMENSIONS** shall be taken from horizontal and vertical center line of pipe, duct, conduct or fixtures; and from face of exposed and readily accessible surfaces on building construction.

1.2.5 **SUFFICIENT DIMENSIONS** shall be included as necessary to accurately trace entire route of each concealed line or locate each concealed item.

1.2.6 **ADDITIONAL SUPPLEMENTARY** and properly referenced details or diagrams shall be provided as and where necessary to clarify crowded or complex conditions in the work; and at suitably expanded scales or sizes necessary to make them clearly readable and understood.

PART 2: GENERAL PROCEDURE

2.1 DAILY:

Maintain on a daily basis site Record Prints noted with change or adjustments as Work progresses.

2.2 MONTHLY:

Review with and demonstrate to Consultant that Record Prints are noted with work as executed up-to-date.

2.3 COMPLETION:

Prepare Record Tracings in complete and finished form showing all changes or adjustments of entire Work as executed.

2.4 **INCORPORATE ADDITIONAL DATA**, information or details as may be required when reviewed with Consultant for approval.

PART 3: REQUIREMENTS FOR RECORD PRINTS

3.1 **RECORD PRINTS** shall mean to be at least one complete set of Contract Drawings, including supplements as may be issued by Consultant from time to time, obtained by and maintained at Contractor's expense at and from time of start of work under the Contract.

3.2 **CONTRACTOR** shall preserve and maintain this set of Record Prints in Contractor's offices at site separate from all other working sets used for the construction; and shall make these drawings readily available to Subcontractors for purposes of indicating record information as required.

3.3 **CONTRACTOR** shall be responsible for accuracy and clarity of daily information made upon Record Prints, whether made by his personnel, Subcontractors or other persons.

3.4 **DAILY NOTATIONS** shall be made using pencil or pen colors clearly contrasting with color of the Record Prints.

PART 4: REQUIREMENTS FOR RECORD TRACINGS

4.1 **RECORD TRACINGS (AS-BUILT DRAWINGS)** shall mean to be a complete set of Contract Drawings, including supplements as may have been issued by Consultant from time to time; corrected

and/or updated to indicate conditions in the work as actually constructed; as prepared and submitted by Contractor to meet specified requirements.

- 4.2 **FORM OF THE RECORD TRACINGS** shall be permanent reproducible tracings of autopositive type; Revised tracings of original tracings for the Contract Drawings; and obtained during later phases of work when all foreseeable revisions thereto have been made.
- 4.3 **CONTENT OF THE RECORD TRACINGS** shall reflect all data accumulated on Record Prints; together with such supplementary or additional details, references, marginal or footnotes as constructed or installed where at variance with or not otherwise shown on the original Contract Drawings.
- 4.4 **REVISIONS** and other work on the Record Tracings shall be clear and in good workmanship.
- 4.5 **WHEN COMPLETE**, review Record Tracings with Consultant for approval prior to preparation of Record Tracing Albums.

PART 5: RECORD TRACING ALBUMS

- 5.1 **RECORD TRACING ALBUMS** shall mean to be complete sets of record tracing copies contained and bound in a suitable booklike form.
- 5.2 **RECORD TRACINGS (AS-BUILT DRAWINGS)**
Following as-built drawings of respective site shall be submitted to the Consultant after completion of the Work.

	For client	For consultant
a. Auto Cad drawing data and A-3 size(PDF) of the Project Drawings in CD-R (File name shall be in accordance with that of number and name of each drawings)	1 set	1 set
b. Print copies of the as-built drawings in A-3 size; in A-4 size booklike form	2 set	1 set

5.3 OTHER COMPLETION DOCUMENTS

The Contractor shall prepare and submit following documents to the Consultant upon completion of the Work.

	For client	For consultant
a. Completion document file in A-4 size files (refer to 5.4 for content)	1 set	1 set
b. Scanned PDF files of above all completion document files in CD-R	1 set	1 set
c. Autocad drawing data and A-3 size(PDF) of all the shop Drawings, and all documents listed below (e-h) scanned in pdf in CD-R (File name shall be in accordance with that of number and name of each drawings and documents)	1 set	1 set
d. Print copies of shopdrawings in A-3 size; in A-4 size booklike form	1 set	1 set
e. Manufacturer's drawings and manufacturer's test data; binded into A-4 size files	1 set	1 set
f. On-site test data; binded into A-4 size files	1 set	1 set
g. Operating instructions for architectural, electrical, mechanical and plumbing works as specified under Section 118 (also refer to 5.5)	1 set	
h. Service manuals including spare parts list, manufacturer's and agent's list with address, telephone number, name in charge for each work item (as specified under Section 118)	1 set	1 set

SPECIAL NOTE: Operation manual shall include basic maintenance explanation of the building as defined in Section 118, Part 4, 4.1.

5.4 COMPLETION DOCUMENT FILE

The Contractor shall prepare and submit Completion Document File to the Consultant upon the final inspection of the Work. The Document shall include following documents

1. Letter of handover and Certificate of completion
2. Project outline
3. List of permits and submissions to the authorities with certificates of handover to client
4. List of keys with certificate of handover to client
5. List of materials used. The list is to include type of material, manufacturer's name, production and/or serial numbers, and used quantity)
6. List of all sub contractors including address and contact numbers
7. List of manufacturer of major equipment including address and contact numbers
8. List of guarantees and original guarantees
9. List of contact numbers for service maintenances and emergencies
10. List of spare parts and certificate of handovers
11. List of manuals and certificate of handovers

5.5 ON SITE TRAINING

In addition to submission of 5.3 "g" Operating instructions, necessary oral instructions and on-site training for the local personnel using these instructions shall be held by the Contractor. Time schedule and list of trainees of the on-site training shall be submitted to the Consultant for record.

SECTION 117 - RECORD PHOTOGRAPHS

PART 1: GENERAL

- 1.1 THIS SECTION** specifies requirements for record photographs to be provided as work under this Contracts and includes:
- a. Record Photographs of existing conditions prior to start of work under the Contract.
 - b. Record Photographs to be provided monthly as work progresses;
 - c. Record Photographs Albums to be provide upon completion of work.
- 1.2 PHOTOGRAPHIC WORK** shall be performed preparatively by a personnel with sufficient experience but only when so approved by R.E.
Completion photographs shall be taken by professional photographer with sufficient experience on architectural photographs.
- 1.3 PHOTOGRAPHS** required shall be furnished without restriction as to publication rights; and additional copies of views selected shall be made available within reasonable time upon order from Client and at reasonable added cost to Client.

PART 2: PHOTOGRAPHIC WORK REQUIREMENTS

2.1 GENERAL:

- 2.1.1 EQUIPMENT, materials, developing, printing and photographic techniques shall be professional quality.
- 2.1.2 ORIGINAL NEGATIVE SIZE shall be standard 35mm or larger.
- 2.1.3 ALL WORK shall be in color; and may be either direct for slides or color reverse for prints, except shall be consistent for the duration of the work.
- 2.1.4 Instant print type photographs will be not accepted.
- 2.1.5 TRIPODS, lenses, filters, flash or flood lighting and other auxiliary equipment or devices shall be provided and utilized as and where necessary to best record the construction work as intended.

2.2 VIEW REQUIREMENTS:

- 2.2.1 PHOTOGRAPHIC VIEWS to be taken and provided shall be as directed by Consultant, the total of which shall comprise Fixed Views and Selected Views as follows:
- a. View shall mean a scene taken from one position and in one direction.
 - b. Fixed View shall mean a view determined by Consultant at commencement of work which shall be repeated from month to month.
 - c. Selected view shall mean a view to be taken at the discretion of and as directed by the Consultant.
- 2.2.2 EACH VIEW shall be free from double exposures, special treatments and irrelevant objects or subjects.
- 2.2.3 EACH VIEW shall be represented by not less than three exposed frames, made with a spread of exposure time and/or f-stop at photographer's discretion to best reproduce and record the conditions as intended.

2.3 PRINT REQUIREMENTS:

- 2.3.1 PROOF PRINTS and Selected Prints as work progresses shall be in color, glossy type, Service Size - 8 x 11cm, Prints as work completion in color, glossy type, Cabinet Size - 12 x 17cm and free from bends, cracks, tears or other damage or defects when delivered to Consultant.
- 2.3.2 Print Identification:
- a. Name of Client and Project, date of photograph and view location; typewritten on lower margin of front face.
 - b. Names of Contractor may appear on reverse side.
- 2.3.3 PRINTS shall be contained in substantial bend-resistant packages when mailed or delivered.

2.4 VIEWS AND PRINTS REQUIRED:

2.4.1 PRIOR TO START OF WORK UNDER THE CONTRACT:

a. View : 20 to 30

2.4.2 EACH MONTH AS WORK PROGRESSES:

a. Views : 15 to 20

2.4.3 RECORD PHOTOGRAPH DISPLAYED PROGRESS OF WORK

a. Views : 150 to 200

2.4.4 RECORD PHOTOGRAPH ON COMPLETION OF WORK (PHOTOGRAPH OF COMPLETION):

a. Views:

i) Interior : 15 to 25 (selected by Consultant among not less than 30 views)

PART 3: GENERAL PROCEDURE

3.1 MONTHLY PHOTOGRAPH ON EACH MONTH:

3.1.1 PHOTOGRAPHS shall be made as required, proof prints made of all exposures and one complete set supplied to RE for selection.

3.1.2 SIX SETS of prints selected shall be furnished to RE.

3.2 RECORD PHOTOGRAPH DISPLAYED PROGRESS OF WORK

3.2.1 Prints shall be selected by R.E. from among any of those provided on monthly basis and may include any made by not previously selected for a monthly group.

3.3 RECORD PHOTOGRAPH ON COMPLETION OF WORK

3.3.1 Photographs of completion shall be taken by a Japanese professional photographer approved by Consultant. Contractor shall submit Consultant the photographer's portfolio including a list of his photographic equipment for evaluation. Proof prints made of all exposures and one complete set shall be supplied to Consultant for selection.

PART 4: RECORD PHOTOGRAPH ALBUMS

4.1 RECORD PHOTOGRAPH ALBUMS shall mean to be complete sets of Record Photographs of those selected by Consultant and contained and bound in a suitable booklike form. Albums for photograph of completion shall include sheets describing summary and floor plans of this project.

4.2 ALL ALBUMS shall be identical in makeup, arrangement, prints contained and submitted to Consultant.

4.3 ALBUMS REQUIRED:

Record Photographs as work progress..... 1 sets

Digital copy of Record Photograph as work completion shall be for Consultant head office archive.

4.4 PHOTOGRAPH PANELS:

Besides aforementioned albums, Contractor shall provide 2 sets of A-2 size photograph panels for consisting of 3 selected views. Each photograph shall be mounted on panel neatly.

SECTION 118 - GUARANTEES & MAINTENANCE

PART 1: GENERAL

- 1.1 **THIS SECTION** sets forth general requirements relating to guarantees and maintenance which are required after completion of Work.
- 1.2 **COMPLIANCE** with provisions herein shall be Contractor's separate payment therefor.

PART 2: CERTIFICATION OF INSTALLATIONS

- 2.1 **DEFINED AS:**
Reports to indicate compliance with requirements specified for materials, assemblies, systems or other items installed or placed as Work applicable examinations as specified or referenced; made, prepared and certified by Contractor where so specified; as distinguished from any similar tests particularly specified under S108 - TESTS & INSPECTIONS.
- 2.2 **CERTIFICATION OF COMPLETION** shall be mandatory for items where such is particularly called for and inclusive of entirety of respective information required as specified.
- 2.3 **COPIES REQUIRED:** Not less than 3.

PART 3: MAINTENANCE INSPECTIONS

- 3.1 **DEFINED AS:** Complete specifications and instructions for best cleaning and upkeeping procedures for materials or finishes of Work as installed; expressly prepared by the respective manufacturer for the specific material involved; as distinguished from repair/service type instructions applicable to operative equipment or appliances.
- 3.2 **PROVIDE EACH** in appropriately organized and identified brochure or binder the same as similarly specified herein for Service Manuals; also inclusive of copies of original material specifications submittals as approved.
- 3.3 **COPIES REQUIRED:** Not less than 3.

PART 4: OPERATING INSTRUCTIONS - WRITTEN

- 4.1 **DEFINED AS:**
 - a. Written step by step and fully explanatory procedures to be followed for normal operation, start up, shut down, etc. of equipment, appliances, or systems; including all important warnings, precautions and emergency procedures; expressly prepared for Work as installed; to be included as part of respective Service Manuals.
 - b. This operating manual shall include basic instructions for building maintenance, such as cleaning method for each part of the building, maintenance of rood drains, and others.
 - c. Written step by step outline summary of full procedures as specified above; for posting at convenient locations respective to Work for which required.
- 4.2 **EACH PART** of required instructions shall be clearly stated and in type-written form and on pages sized to suit respective Service Manuals.
- 4.3 **OUTLINE SUMMARIES** for posting shall be equipped with clear glass or plastic covers enclosed in non-ferrous metal frames; sized appropriate for full display of the instructional text contained.
- 4.4 **COPIES REQUIRED:**
 - 4.4.1 **FULL TEXT INSTRUCTIONS:** Two copies for each Service Manual.
 - 4.4.2 **OUTLINE INSTRUCTIONS:** Two copies each for posting and Two copies for each Service Manual.

PART 5: OPERATING INSTRUCTIONS - VERBAL

- 5.1 **TECHNICALLY NOT A SUBMITTAL** as such as listed and scheduled but included herein for convenience and continuity of similar requirements.

- 5.2 DEFINED AS:** Time and effort to be provided by Contractor as part of Work under the Contract; for instructing Client's personnel respective to the various operative equipment, appliances or systems for Work as installed.
- 5.3 CONTRACTOR'S PERSONNEL** assigned pursuant to requirements herein shall be well qualified and proficient in all aspects of respective Work and sufficiently capable of communicating the information and instructions as installed.
- 5.4 WHEN DEEMED NECESSARY** for the best interests of the Project and the Work installed therefor and where the complexities of Work or systems so demands, verbal instruction periods shall be extended beyond the referenced Date of Completion, within reasonable and practical limits.
- 5.5 TIME REQUIRED:**
Not less than as specified under respective Technical Sections.

PART 6: MAINTENANCE DATA AND SERVICE MANUAL

- 6.1 DEFINED AS:** Complete compilation of information and data respective to particular equipment, appliances or systems of work as installed; to record such in a manner as necessary for ready and convenient future reference by Client's operating/maintenance personnel or other persons as may be responsible for repair/service of the Work.
- 6.2 WHERE PARTICULARLY SPECIFIED,** Basic Service Manuals shall be furnished with and as part of respective Material List submittals as specified under Section 109 - SUBMITTALS.
- 6.3 SERVICE MANUALS SHALL COMPRISE - AS APPLICABLE:**
- 6.3.1 ALL OTHER SUBMITTALS required for respective Work; annotated respective to any variations or modifications subsequently approved and incorporated during manufacture or installation with the same intent as provided for S116 - COMPLETION DOCUMENTS.
- 6.3.2 WIRING DIAGRAMS for electrical apparatus, devices and controls.
- 6.3.3 FLOW DIAGRAMS for piping systems, including controls therefor.
- 6.3.4 COMPLETE PARTS LISTS expressly prepared for each equipment item or system as installed; together with current price lists therefor and statement as to how many years such parts will be available.
- 6.3.5 LIST OF CRITICAL spare parts and name of suppliers for each equipment item; recommended by manufacturer or suppliers; to be maintained at Project premises by Client and lack of which would seriously impair Client's operations in case of failure or breakdown.
- 6.3.6 NAMES, addresses and telephone numbers of local or nearest official service representative or agency; and of official parts depots.

PART 7: SERVICE MANUALS:

- 7.1 SERVICE MANUALS SHALL BE:**
- a. Organized in an orderly and logical manner; indexed, subdivided and provided with tabbed dividers as necessary for easy and ready reference.
 - b. Contained in permanent, durable, hard cover binders in sizes equivalent to standard typewriter paper.
 - c. With shop Drawings or other oversize sheets neatly folded and contained in pocket or envelop type insets.
 - d. Insets of multiple binders when any one cannot be contained within one binder of ring size of 5cm or smaller.
- 7.2 HARDWRITTEN** or electrostatic type reproductions of materials contained in Service Manuals will not be permitted.
- 7.3 BASIC SERVICE MANUALS** shall comprise the data and information required as specified under S109 - SUBMITTALS Other than as to be incorporated following manufacture or installation of the respective Work.
- 7.4 COPIES OR SETS REQUIRED:**

7.4.1 BASIC SERVICE MANUALS: Not less than 2 each.

7.4.2 COMPLETE SERVICE MANUALS: Not less than 3 each.

PART 8: SPARE PARTS OF MAINTENANCE MATERIALS

8.1 EXTRA MATERIALS DEFINED AS:

Materials the same as used for Work under this Contract and to be supplied in quantities in addition to those necessary to complete Project Work.

8.2 EXTRA MATERIALS shall be provided as part of Work of various Technical Sections under which similar Work is required; and furnished in kinds or types and in quantities as particularly specified under each respective Technical Section.

8.3 EACH GROUP OF EXTRA MATERIAL shall be prepared and delivered per following requirements, as applicable to kinds of items required:

- a. Furnish in types or kinds exactly same as approved and used for Project Work.
- b. Supply from color lots or production runs identical to respective materials or items as actually installed.
- c. Each unit of group of items substantially wrapped and packaged; waterproof throughout; where any presents of moisture or water vapor might be critical; i.e. fabrics; fine instruments, etc.
- d. Each packaged identified as specified under S109 - SUBMITTALS
- e. Unit items: Packages of standard factory sizes; or equivalent volumes or area coverages.
- f. Piece Goods: Single rolls of standard factory width and length.
- g. Liquids: Metal corrosion-resistant containers with force-fit lids or screw caps; free from leakage.

8.4 ADDITIONALLY, Extra Materials shall be furnished in accord with applicable requirements specified under S113 - PACKING REQUIREMENTS and any others as may be particularly specified under respective Technical Section.

8.5 PROTECT, store, deliver and turn over Extra Materials to Client as directed by Consultant.

PART 9: GUARANTEES & MAINTENANCE

9.1 SEPARATE AGREEMENTS for maintenance of Work or designated portions thereof during or following Contract Warranty Period are not part of considerations of these provisions, except that existence of any said agreement shall not relieve Contractor or responsibilities under this Contract, unless specific waiver therefor is given in writing by Client.

9.2 DELIVERY of any written guarantees to Client shall not relieve Contractor from obligations assumed under any other provisions of this Contract.

9.3 GENERAL GUARANTEE AND MAINTENANCE

9.3.1 CONTRACTOR WARRANTS TO CLIENT THAT:

- a. All materials and equipment shall be new when supplied to Project, except or unless otherwise specified;
- b. All Work shall be of good quality, free from faults or defects and in compliance with Contract Documents;
- c. All Work and Materials not so conforming to standards of these Specifications shall be considered defective;
- d. And, at any time after commencement of Work, satisfactory evidence shall be furnished as to type, kind and quality of materials and equipment provided for Work under this Contract.

9.3.2 CONTRACTOR shall guarantee his Work by actual and real maintenance and care thereof; and to repair or replace as necessary any Work found or which becomes defective prior to expiration date of Warranty Period.

9.3.3 CONTRACTOR shall not be Responsible For;

- a. Maintenance of Work which did not provide or perform, except or unless duly contracted for as a

specific adjunct to this Contract.

- b. Ordinary wear and tear resulting from use of Work by Client.
- c. Natural deterioration of Work as normally results by passage of time.

9.4 WARRANTY REQUIREMENTS

9.4.1 WARRANTY PERIOD:

- a. Warranty Period for entirety of Work will be stipulated in the Contract.
- b. Where a separate Certificate of Completion has been issued for a designated portion of Work, Warranty Period shall commence respective to that portion.

9.4.2 WARRANTY BY CONTRACTOR SHALL INCLUDE:

- a. All necessary, searching uncovering and any other investigations necessary to examine and make any determinations respective to apparently defective Work.
- b. Warranty Work; comprising all labor, materials and other things the same as defined for Work; as necessary for removals, repairs, amendments, rectifications or otherwise required to restore or replace defective Work;
- c. Repair and restoration of Work others where necessarily or inadvertently damaged during or by Warranty Work under this Contract;
- d. And, general maintenance and servicing as necessary to uphold integrity of Work as accepted at Date or Dates of Completion.

9.4.3 DEFECTIVE WORK found or occurring during course of Warranty Period shall be repaired or replaced by Contractor forthwith and without delay and completed as rapidly as possible.

9.4.4 DEFECTIVE WORK revealed by any Warranty Inspection by or on behalf of Client shall be repaired or replaced within reasonable days agreed by the Client following expiration date of Warranty Period.

9.4.5 CONTRACTOR'S OPERATIONS during Warranty Period shall be coordinated with Client's requirements and regulations respective to operations of Project; as will be established subsequent to issuance of these Contract Documents; which will contain certain restrictions, the same as usually required for a National Institute, and which will necessarily limit Contractor's activities respective to times and locations and manner in which Warranty Work is to be performed.

9.5 WARRANTY WORK BY CLIENT

9.5.1 CLIENT shall be responsible for routine daily cleanup and general superficial care of Project and operation of systems therefor as is necessary respective to use of Project for which intended.

9.5.2 CLIENT RESERVES RIGHT TO:

- a. Make temporary or emergency repairs as necessary to keep systems operable or conditions effective without voiding guarantees or relieving Contractor of responsibilities;
- b. And, make repairs not performed by Contractor and recover from Contractor any expenses respective thereto.

9.5.3 CLIENT shall immediately notify Contractor of any actions respective to Warranty Work which may result in liability for payment under any provisions of this Contract.

9.6 COSTS OF WARRANTY WORK

9.6.1 UPON ORDER OF CLIENT OR CONSULTANT, when Contractor is required to uncover or investigate any conditions apparently defective, respective and resulting costs for repairs or replacements shall be paid for:

- a. By Contractor where found that Work is in fact defective.
- b. By Client where found that Work is not defective.

9.6.2 WARRANTY WORK performed by Client on behalf of Contractor, whether urgent or otherwise, whether by Client's staff or another Contractor, shall be paid for by Contractor.

SECTION 119 - MISCELLANEOUS GENERAL REQUIREMENTS

PART 1: GENERAL

- 1.1 THIS SECTION** sets forth miscellaneous general requirements applicable to Work required under this Contract.
- 1.2 COMPLIANCE** with provisions herein shall be Contractor's responsibility to provide as part of Contract Work; and without separate payment therefor.

PART 2: CORRESPONDENCE AND NOTICES

- 2.1 REFERENCE:**
S105 - CONSTRUCTION SCHEDULES
S108 - TESTS & INSPECTIONS
- 2.2 CLEARLY IDENTIFY** correspondence, notices and submittals with project name and subject; and with detailed references to drawing and specifications; as applicable
- 2.3 CORRESPONDENCE** relevant to matters relevant to this Contract shall be forwarded via RE, unless otherwise directed.
- 2.4 CORRESPONDENCE AND SUBMITTALS** sent to and from project vicinity by e-mail, and via public delivery service shall be via Air Mail only; or may be via private carrier providing comparable or better service.
- 2.5 NOTICE OF CHANGE OF ADDRESS:** Provide to RE in writing any time business address of Contractor or Subcontractor is changed.
- 2.6 NOTICE OF REQUIRED TESTS AND INSPECTIONS OR APPROVALS:**
 - 2.6.1 WHEN REQUIRED AT PROJECT SITE:** Notify RE not less than 2 working days in advance, unless otherwise specified.
 - 2.6.2 WHEN REMOVED FROM PROJECT SITE:** Notify RE not less than 10 working days in advance, unless otherwise specified.

PART 3: PRIOR TO STARTING A PARTICULAR TYPE OR KIND OF WORK

- 3.1 EXAMINE FOR RELEVANT INFORMATION;** all Contract Documents and subsequent data issued to Project.
- 3.2 CHECK** approved submittals and verify dimensions at site.
- 3.3 CONSULT** manufacturers and/or manufacturer's instructions for requirements applicable to conditions under which Work is to be installed.
- 3.4 INSPECT** areas, surfaces or construction receiving the Work. Start of work shall signify compliance with the above requirements and acceptance of previously placed construction or substrates as being in satisfactory condition to achieve proper installations and first quality workmanship as intended under these specifications.

PART 4: DAMAGE AND RESTORATION

4.1 REFERENCES:

General Conditions of Contract

4.2 DAMAGE to previously existing or newly placed facilities caused by movement of equipment or other operations, whether accidental or made necessary by reason of Contract requirements, shall be restored or replaced as shown, specified or directed by RE.

4.3 RESTORATION shall be equal to structural qualities or performance capacities of original work; and finishes shall match appearance of, as nearly as possible, like existing adjacent work. Restorations shall not add expense to Client, unless otherwise particularly provided for.

4.4 WORK not properly restored or where not capable of being restored as intended under these Specifications shall be removed and replaced as directed by RE, at no added expense to Client.

PART 5: PROTECTION AGAINST DETERIORATION

5.1 FERROUS METAL WORK permanently exposed to exterior or below grade shall be hot-dip galvanized; and related accessory members and fastening nonferrous, galvanized or made rustproof by approved methods; unless otherwise specified.

5.2 PRIME PAINTING

5.2.1 EXPOSED ferrous metal work not otherwise required to be galvanized or protective coated shall be prime painted; either factory or shop applied and before delivery to site.

5.2.2 PREPARATION OF SURFACES: per Structural Steel Painting Council (SSPC), Surface Preparation Specification Number as applicable to type of work required.

5.2.3 WORK AND MATERIALS shall comply with applicable requirements specified under-mentioned in PAINTING.

5.2.4 PRIMED SURFACES shall be repaired following any welding or cutting and where damaged or scratched by handling, tools or otherwise.

5.2.5 DAMAGED PRIME PAINTING: Before finish painting, repair damaged priming by thoroughly solvent cleaning, wiping dry and applying one coat of prime paint compatible with previous primer.

5.2.6 SURFACE found improperly prepared or pined shall be repaired or replaced as directed by RE.

5.3 PROTECTION AGAINST ELECTROLYSIS

5.3.1 GENERAL: Required to be provided between and to isolate ferrous and nonferrous or dissimilar metal components to protect against electrolysis; as specified or approved by RE.

5.3.2 FOR ARCHITECTURAL WORK, provide cork fillers, asphaltic coatings, neoprene gaskets or similar separation as necessary; and use stainless steel fastening only where interconnecting dissimilar parts.

5.3.3 FOR MECHANICAL AND ELECTRICAL WORK, provide dielectric unions or similar separation. In particular, provide isolation as necessary between exterior underground systems and interior above-grade systems where of dissimilar metals.

PART 6: MISCELLANEOUS REQUIREMENTS

6.1 WATERTIGHT INTEGRITY:

EXTERIOR work shall be made tight against direct or indirect entry of water into concealed or interior spaces of buildings. Joints or penetrations below grade or behind exterior trim and other conditions where water might enter structure shall be sealed same as for exposed exterior work.

6.2 KEYED LOCK REQUIREMENTS

6.2.1 GENERAL: Requirements herein shall apply to all locks throughout project which are required to be key locked, unless specifically specified to be non-masterkeyed.

6.2.2 TYPE: Each lock shall be capable of masterkeying with building lock system as furnished for Project under FINISH HARDWARE Section.

6.2.3 MASTER KEY to building system as directed and supply not less than 3 keys for each lock location.

6.3 N/A

6.4 CUTTING AND PATCHING

6.4.1 CUTTING AND PATCHING shall be provided as and wherever necessary for proper passage or support of Work under the Contract and where prior arrangements therefor have not been otherwise provided or incorporated into previous construction.

6.4.2 THIS SHALL MEAN to apply to both new construction under this Contract and under other contracts and to existing construction or improvements, such as off-site street paving, etc.

6.4.3 THIS SHALL INCLUDE any and all cutting and removals; sleeves, frames, escutcheons or other appurtenances required; replacements, repairs and patching; cleaning and re-finishing; and other work as may be required.

6.4.4 ALL AS DIRECTED in advance by and finally approved by RE.

SECTION 120 – ENVIRONMENTAL MANAGEMENT

0 PROTECTION OF ENVIRONMENT

The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation. The contractor shall also follow the requirements from the Environmental Impact Assessment report conducted by the Client.

During continuance of the contract, the contractor shall abide at all times by all existing enactments on environmental protection and rules made thereunder, regulations, notifications and bye-laws of the Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by Government or the local authority.

1 PREVENTION AND CONTROL OF WATER POLLUTION

1.1 Contamination of Ground and Surface Water

The contractor shall take all necessary precautions for the prevention and control of pollution of the ground and surface water from oil and waste oil spills, sanitary facilities, construction wastes, paints and any other chemicals used in the construction.

1.2 Drainage and Flood Control

Contractor shall take all necessary precautions to prevent the blockage of water flow from the construction materials like earth, stone, or appendage.

Stagnation of water within or outside the project area from the project activities should be avoided to prevent mosquito breeding and other vector borne diseases

1.3 Siltation of Water Bodies and Degradation of Water Quality

The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth. The contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby water course.

2 PREVENTION AND CONTROL OF AIR POLLUTION

2.1 Transportation of Construction Materials

All vehicles delivering fine materials to the site shall be covered to avoid spillage of materials and dust generation. Photographic record of this activity should be maintained.

2.2 Vehicles, Equipment and Machinery

All vehicles, equipment and machinery to be used in the project should have pollution control equipment such as exhaust dispersion systems and silencers.

2.3 Dust Generation from Construction Site

Dust generation from the construction site should be minimized by sprinkling water on the stock piles of wastes before loading for disposal and by covering the materials containing fine particles during the high winds

3 PREVENTION AND CONTROL OF NOISE POLLUTION

The quieter equipments available in the market shall be used in the Project. Diesel Generator Sets having acoustic enclosures shall be used for the project.

4 PREVENTION AND CONTROL OF SOIL POLLUTION

4.1 Control of Oil Spills

Contractor shall not carry out any vehicle/machinery maintenance on site to avoid contamination of ground. If the emergency maintenance is to be carried on site, proper collection and disposal systems should be arranged before carrying out the maintenance. In such cases the contractor should arrange for collection, storage and disposal of oil wastes generated during the emergency maintenance to the nearest work shop for further handling.

Contractor shall not dispose diesel, lubes, paints and any other materials on site which may contaminate the soil.

4.1 Demolition of Existing Structures

The contractor must recover all reusable materials generated from the demolition of the existing structures. All the reusable materials shall be reused in the project and unsuitable materials shall be disposed of as detailed in section 9.4.3.

4.2 Site Clearing

Topsoil generated from the clearing shall be preserved and reused in the landscaping of the project areas or can be spread in the borrow areas or disposed as directed by Client or RE.

The contractor shall take reasonable precautions to minimize disturbance to the native flora during the construction.

4.3 Collection and Disposal of Solid Waste

The contractor shall develop a waste management plan within one week on arrival at site and the same shall be submitted to Client or RE. The contractor shall implement the waste management plan throughout the life of the Contract.

The plan should include collection, storage, transportation and disposal of wastes generated from all activities of the project. The following guidelines may be used for the safe solid waste management.

Re usable materials should be used in the project as far as possible.

Biodegradable materials shall be disposed in compost pits/ disposed away from the habitations

Non biodegradable and non hazardous materials shall not be disposed on site and shall be disposed in a pit away from the habitation

Deposit all indicated recyclable materials in the containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition. Do not deposit contaminated materials into the containers until such time as such materials have been cleaned.

5 CONSTRUCTION MATERIALS

5.1 Construction Water

The contractor can use ground water /surface water as a source of water for the construction and he may set up own bore well facility for construction work or can take water from existing sources with written consent from owner of the bore well.

To avoid disruption/disturbance to other water users, the contractor will extract water from fixed location and details of the bore well will be recorded and filed.

If the new bore hole is created for the project water requirement, it should be left for the public use

5.2 Coarse and Fine Aggregates

The contractor shall procure coarse and fine aggregates from the legal suppliers. The Contractor should obtain receipts of the purchase of materials and file copies of these receipts.

5.3 Soil

Deep borrow areas shall not be created for the project. Depth of the borrow area shall be limited to 60 cm.

Top soil removed and preserved from the borrow area shall be spread after completion of borrowing of soil.

The waste materials generated from the excavation should be disposed in borrow areas created for the project, if they are not suitable for the filling.

5.4 Wood

Wood/timber shall be obtained from the licensed suppliers and the receipt of purchase of wood/timber should be recorded.

6 HAZARDOUS WASTE

All the hazardous wastes shall be disposed of as specified by the supplier

7 CLEANING OPERATION

On the completion of the construction, the contractor shall remove all waste materials and excess materials from the site to the satisfaction of Client or RE.

8 PREVENTION AND CONTROL OF SPREAD OF COMMUNICABLE DISEASES, PARTICULARLY HIV/AIDS

The contractor shall provide HIV/AIDS/STDs awareness training to all the workers of the project. The contractor shall also provide strict guidelines regarding contact with local residences and enforce these guidelines.

9 CONSTRUCTION CAMP/ SECURITY ROOM

The contractor shall provide proper water supply, cooking facilities, sanitation and solid waste collection and disposal systems to the construction camp / security room. The contractor shall preferably use unskilled labor drawn from local communities to give the maximum benefit to the local community to avoid impacts on the local environment

The contractor shall set the guidelines prohibiting poaching and collection of plants/wood with meaningful consequences for violation such as termination of the employment.

10 REPORTING

The contractor shall submit solid waste management plan. This plan shall include collection, storage and disposal of solid waste generated from the Project.

The contractor should submit a completion report on the environmental management practices adopted on the completion of all site activities. This completion report shall include details of the difficulties faced and methods followed for overcoming these difficulties. The completion report should include photographic records and copies of agreements and receipts for materials.