

DIVISION 14
CONVEYING SYSTEM

BUILDING WORK

DIVISION 14

CONVEYING SYSTEM

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SECTION 14-1 : Lifts

DIVISION (14) CONVEYING SYSTEM

SECTION 14 – 1 LIFTS

14-1 General Conditions

14-1-1 General

- One. The characterization of the project as presented below is general and refers to the principal equipment which is essential for execution of works, but does not cover all the items related to detailed planning and assembly and coordination works, which shall be the responsibility of the contractor.
- Two. In any case where an item or part is described in the singular, it shall also refer to several items or parts, as required for faultless of the work by the contractor, and no request for supplementary payment for the aforesaid shall be allowed.

14-1-2 Plans

The contractor shall submit detailed working plans for approval by the Inspector.

These plans shall include all the various parts and equipment, with the exact dimensions required for construction purposes. After they are checked and approved by the Inspector, these plans will be returned to the contractor to be used by him as a reference for execution.

No work or part thereof shall be executed and /or no parts shall be ordered or fabricated prior to receipt Of the approved plans. If the plans are not approved , the contractor shall resubmit them, at his own expense, with all modifications requested by the Inspector. All submissions shall be made with four copies of each plan.

In addition to the plans and details, the contractor shall submit all the following material:

- Technical data, name of manufacturer and country of manufacture of all mechanical and electrical parts.
- Assembly plans as made.
- Control plans and electrical plants diagram, as made.
- Electrical wiring plans, as made.
- Name of electrical and mechanical parts and their functions as shown on the plans.
- List of recommended spare parts, with their catalog numbers.
- Detailed maintenance instructions.
- Instructions for use of lift in normal operation and in emergency.

All the above material shall be delivered to the Inspector in an orderly fashion and in three copies. Furthermore, the contractor undertakes to submit to the Inspector at his request all plans and diagrams required for choosing the shape of the doors and door frames, colors and buttons, etc., all without special payment.

14-1-3 Dimensions

The contractor shall determine the dimensions of the building at the site, as they are in reality, and he shall not take them off the plans.

14-1-4 Work Progress Report

The contractor shall give the Inspector information on the progress of the entire project, without special requests.

14-1-5 Insurance

The contractor shall bear full liability, and shall undertake to compensate the Inspector for any damages caused to him. Or in the event that the inspector shall be liable for a penalty under the law, as a result of defective materials used by him or by the fault, and/or negligence, and/or neglect of his employees, and/or sub-contractors. Furthermore, the contractor undertakes to arrange insurance for the duration of the entire period of his assembly work and the service period provided by him to cover all damages, and with respect to any personal injury. The contractor undertakes to submit a copy of the policy to the Inspector.

14-1-6 Warranty and Service

The commencement of the warranty period shall be determined from the date of commencement of daily use of the lift and not from the date of acceptance of the lift by the qualified inspector. The warranty period is for **12 months** from the aforesaid date. The Inspector shall at the contractor's request give notice of the date of commencement of use of the lift, i.e. the commencement of the warranty.

All parts devices and materials supplied by the contractor shall be new and highly sophisticated. The contractor is liable for the faultless operation of the lift and all its parts and equipment. A warranty of **five years** shall be given on electrical motors and steel cables.

The contractor shall service the lift and all parts thereof during the warranty period and shall maintain it at all times in good and clean condition. The contractor shall rectify any defect occurring during the warranty period immediately and at his own expense, within a maximum of 24 hours from notice thereof. Checking of the plans and acceptance of the lift by the Inspector and/or its representative does not exempt the contractor from his warranty .

Upon conclusion of the warranty, the lift shall be re-accepted and the contractor must repair defects and replace defective parts, the lift shall be re-accepted and the contractor must repair defects and replace defective parts, etc. and rectify all faults discovered after use. Parts, which were replaced during the warranty period, shall be given a further **warranty of 12 months**. The aforesaid warranty of the contractor shall not apply to damage resulting from force major, misuse and electrical defects.

During the aforesaid warranty period, the contractor shall execute the service of the lift. The Inspector shall make a separate payment for the aforesaid service. Furthermore, other than defects, which the contractor is obliged to repair as aforesaid, the contractor shall at least once monthly inspect, lubricate and execute all works associated with service. A service log shall be placed in the plant room, in which all faults, works and their times shall be recorded.

The technicians who carry out the repair or service shall sign the log.

The aforesaid records shall be checked by the Inspector or its representative once every three months and shall be approved by them. The contractor hereby undertakes to keep further declares that the aforesaid spare parts are at his disposal at the time of submission of the bid.

- A. After six months from commencement of the lift operation date, and its delivery to the inspector for regular operation. The contractor undertakes to maintain the lift with minimum faults, so that the maximum number of faults which suspend the operation of the lift, shall not exceed six faults/ annum. For such 'purpose, whoever maintains the lift shall conduct a fault log which shall give precise details of the nature of the faults, alongside which the contractor's service technician shall insert the cause of the fault and the steps taken to repair it. The six-fault annum as aforesaid shall not include faults arising from the following causes:
1. Misuse by the users.
 2. Faults caused by dirt.
 3. Faults caused by irregular power supply.
 4. Faults caused by defects in the building, such as water leaks.
 5. Faults caused by wear and tear, such burnt out light bulbs.
 6. Faults in the lift caused by users.
 7. One repeated fault for which no solution was yet found.
 8. Repairs made during a night shift.
 9. Faults during emergencies.
- B. From the list of faults in the log, the consultant shall decide which are relevant to suspension of operation of the lift and arise from the provision of defective service and/or equipment and/or assembly and/or operation.
- C. The service contract shall be for full service, including spare parts, for a period of at least five years or with an undertaking by the contractor to replace or repair spare parts as necessary.
- D. The date determined for commencement of recording of faults is six months from the date of delivery of the lift to the Inspector.

14-1-7 Painting

All metal parts shall be chemically cleaned or sandblasted and shall be painted with an undercoat and two top coats, as specified by the Inspector.

14-1-8 Signs

The contractor shall supply all signs required in the plant room, car and panels (including warning signs and instructions for use). All signs shall be as specified by the Inspector and the text/numbers shall appear in **English and/or Arabic** as will, as requested.

14-1-9 Assembly and Delivery of Lifts

Experts and persons shall assemble the lift with extensive experience in the assembly of lifts. During the assembly, a foreman who is responsible for the work shall be present at the site.

The contractor shall supply all auxiliary materials, labor and hoists required carrying out the assembly. Furthermore, the contractor shall drill and fill all the holes required for assembly of the lift. The contractor shall further carry out all portage works related to the assembly.

Upon completion of the assembly of the lifts and all related equipment, the contractor shall order an inspection by the local Electric Authority and by a lift inspector qualified by the Electric Authority and by a lift inspector. The inspector shall be as specified by the Inspector. The cost of repeated inspections caused by the contractor should also be at his expense. Following the aforesaid inspections, the contractor shall, without additional payment, repair and modify parts of the plant, if demanded by the Local Electric Authority the qualified lift inspector or the engineer.

The Inspector shall instruct the representatives of the Inspector in the use of the lifts under normal and emergency conditions.

14-1-10 Quality of Work

The contractor undertakes to execute the work at a high professional standard and in accordance with existing or customary standards. He shall employ at the site skilled workers of the highest caliber in the number required by him to complete the lifts on time, in order to prevent delays in completion of the building. The Inspector is entitled to demand the removal, from the site of the workers who in his opinion are unsuitable in terms of skill or for personal reasons.

14-1-11 Damage to Building

The contractor shall be liable for any damage caused to the building, lift machinery or persons, if caused directly or indirectly by him or by his employees. The contractor shall compensate all damaged parties or damages as aforesaid in entirety. The contractor shall not drill holes in the structure, pillars, walls and/or ceiling without the approval of the Inspector.

14-1-12 Execution of Additional or Partial Works

If the contractor shall be required to execute works not included in the Bill of Quantities, the price of the work shall be fixed by the Inspector as estimated by him, on the basis of the labor and materials applied in the execution of those parts. Furthermore, the Inspector may order all the specified works or some of them only, at the price specified in the Bill of Quantities.

14-1-13 Sub – Contractors

The contractor shall submit for approval by the Inspector or his representative, the engineer, his intention to award any part of the project to a sub-contractor. The Inspector is entitled to approve or disqualify any such sub-contractor, if in the Inspector's opinion, he is unable to execute the work. The Inspector is further entitled to terminate the work of any sub-contractor if in his opinion the subcontractor is not executing the work in accordance with the requirements.

14-1-14 Guarantees

The contractor shall be required to give suitable guarantees for the quality of the equipment and operation of the lift, as specified by the Inspector.

14-1-15 Delivery Deadline

The deadline for delivery and operation of the lift shall be **12 months** from the date of the order, provided that lift shaft and plant room shall be at the disposal of the contractor five months prior to the end of the aforesaid period. In the event that the

delivery of the shaft and accordingly, but the period of assembly and operation of the lift shall remain five months as above, from the date on which the shaft and plant room were placed at the disposal of the contractor.

14-1-16 Conditions of Service after Warranty Period

The Inspector and the contractor shall sign a standard service contract. In consideration for the sum specified in the Bill of Quantities, the contractor shall supply all services specified in the standard service contract. In addition to the works specified in the aforesaid contract, the contractor undertakes to execute during normal working hours all repairs or service for no extra payment.

If parts or materials shall be required for the purpose of executing the aforesaid repairs, the Inspector shall pay only for such parts or materials the price, which does not exceed the normal market price.

The contractor's employees shall obtain the signature of the Inspector's representative at the site upon a suitable confirmation, which verifies that the materials or parts were actually supplied. Without the signature of the Inspector's representative the Inspector shall not be obliged to pay any account.

For work outside normal working hours, the contractor may request payment in the sum. Which shall be determined in advance. For such working hours, the signature of the Inspector's representative at the site shall be obtained. Without the signature of the Inspector's representative, the Inspector shall not be obliged to pay any account.

The above obligations do not apply to repairs and modifications demanded by competent authorities. For such repairs and modifications, the Inspector shall pay for both the parts and the labor. In any event, the price shall be fixed in advance prior to commencement of the work.

14-2 Technical Specification for traction geared motors lifts

14-2-1 General specifications

The lifts to be supplied have to be original lifts totally manufactured by one of the following approved manufacturers, or equal to them. In case other manufacturers are proposed, detailed catalogues and specifications shall submitted with bid to enable comparison and analysis.

No local cabins, doors, controllers and other parts are acceptable

Approved makes:

- Original Otis /France
- Original Mitsubishi/Japan
- Original Gold Star/Korea
- Jordan Lifts Co.

General For All Lifts

<p>Car Operating Panel</p>	<ul style="list-style-type: none"> - (N) Push Buttons with Braille numbers for the visually impaired - Alarm Button - Automatic Fan. - Door Open. Door Close Buttons. - Position Indicator. - Direction Arrows. - Emergency Car Light. - Emergency Fireman Service Key. - Overload Signal acoustic and luminous. - Car TellTale Lights. - Intercommunication Unit. - Priority Key Switch (VP) - Voice Synthesizer.
<p>Landing doors Type Clear opening</p>	<p>Automatic Center Opening. W. 1100 mm x H.2100 mm. Stainless Steel Finish.</p>
<p>Landing fixtures</p>	<ul style="list-style-type: none"> - All to be Vandal Resistant - Hall Position Indicator & Lantern with digital display at all floors. - Electronic Hall Buttons with illumination
<p>Electrical Equipment & Features</p>	<ul style="list-style-type: none"> - Emergency Final Limit Switch. - Top of Car Inspection Button. - Phase Protection Device. - Safety Circuits. - Traveling Cable. - Necessary Wiring and Tubing. - Over Load Device. - Emergency Power Operation. - Emergency Fire Operation. - Electrical Recall Operation. - Anti Nuisance Device. - Automatic Car Return Device. - Door Time Protection. - Nudging Feature. - Load by-pass.
<p>Mechanical Equipment</p>	<ul style="list-style-type: none"> - Progressive Safety Gear. - Speed Governor. - Counterweight Armature and Fillers. - Car & C.W> Guide Rails with Fastenings. - Steel Wire Ropes. - Oil Buffers under Car & Counterweight.

14-2 Cabin

14-2 Cabin Specifications:

14-2-1 Car Operating Panel:

The panel shall be made of stainless steel sheeting. The individual modular units remounted within a stainless steel panel and are designed for ease of operation by the handicapped. The panel shall contain the following features:

1. A bank of illuminated buttons corresponding to landing levels served
2. Alarm button
3. Stop button
4. Door open button
5. Door close button
6. Switch for Ventilation fan.
7. Car in use
8. Lights Key switch.
9. Overload indicator, acoustic and luminous
10. Inter phone system to connect with the reception
11. Battery alarm operated bell operating buttons
12. A car direction indicator
13. Cabling for paging & music system

14-2-2 Car finishes:

Side Panels	Matt stainless steel with mirrors on back sides, factory built
Ceiling	Lit stainless steel diffusers under fluorescent lighting and fan.
Flooring	Luck Strong.
Car Return	Stainless steel finish
Door Panels	Stainless steel finish
Hand rail	Approved metallic shape on three sides

14-2-3 Car Roof

A special service panel for operation by services personnel.

14-2-4 Additional Features Included in price

Emergency car light (1X18 w) min.	(ECL)	
Emergency light battery (Ni-Cadmium) unit with charger		(EBU)
Car direction indicator	(CD1)	
Car position indicator	(CP1)	
Hall position indicator on main floors	(HP1)	
Hall position indicator on all floors	(HP1-3)	
-Cabin ventilation fan	(Fan)	
Phase failure	(J)	
Full load device	(FLD)	
Overload device	(OLD)	
Light ray device	(LRD)	
Independent service (key operated)	(ISC-1)	
Gong to notify arrival to floor	(GNS)	
Braille sign for blind persons		
False Call Canceling	(FCC)	

Car re-opening by hall button
Nurse key switch.
Fire man switch

14-3 Machine:

The machine shall be of the worm geared traction type particularly designed for lift service. The phosphor-bronze worm wheel and cast iron traction sheaves are mounted on a common shaft. For quietness of operation the Electro-mechanical brake is operated from a dc. Supply.

14-3-1 Motor:

The motor shall be particularly designed for lift service with high starting torque.

14-3-2 Motion Control

14-3-2-1 Controller

The controller shall be vertical, steel, and cubicle type, with hinged doors, sufficiently ventilated, with easy access to all housed components.

All power contractors shall be electro-magnetically operated with carbon to copper contacts to prevent fusing. Control circuits shall have silver contacts.

All components of the controller shall have class B insulation.

The controller shall provide protection against the following:

1. No-Volt and sustained under-voltage
2. Phase reversal
3. Overload
4. Failure of any phase

The controller shall cut off the power supply, apply the break and bring the car to rest in ground floor/or to the nearest floor as directions, then open the door. If any of the above failures occurs.

14-3-2-2 Stopping accuracy

The lift manufacturer shall guarantee a stopping accuracy of no less than +/-5 mm

The mechanical break shall not be operative before the car has been electrically stopped and at speed zero.

14-4 Car

14-4-1 Car frame

A Car frame fabricated from treated for formed steel members shall be provided with adequate bracing to support the platform and car enclosure.

14-4-2 Safety gear and Speed governor

The safety gear shall be of the progressive type and shall be mounted on the members of the frame and shall be operated by an over speed governor, in the event of over speeding in the upward or downward directions. Guide shoes shall be mounted on top and bottom of the car frame to engage the guide rails and ensures smooth car operation.

The safety ear and governor shall comply with their requirements of BS5655.
A switch on the safety gear shall open the motor control and brake control circuits before the latter is applied. Breaking or slackening of the governor rope shall cause the lift to stop

14-4-3 Platform

The car platform shall be of all-steel construction.

14-4-4 Car Ceiling

The car ceiling shall be coated with (light) gray vinyl. Direct lighting shall be provided through a protruding translucent plastic diffuser

14-4-5 Flooring

The floor shall be constructed of steel platform at least 4mm thick supported on a suitable steel frame, covered in hard wearing flame resistant PVC material and plywood finish

14-4-6 Car doors

The car shall be provided with a (central opening) of two speed type horizontal sliding door the door shall be hung on shelf hangers with a steel track and quieted at the bottom by non metallic shoes sliding in a threshold groove
The side surface of the door shall be of the same material as the car façade.
The ear side surface of the door shall be finished in stainless steel.

Door Operation

Door on the car and at each hoist way landing shall be power operated by means of a quality operator mounted on top of the car. The door operator shall be powered by a variable speed DC motor and shall have positive control over door movement for smooth operation.

A safety shoe shall be furnished at the edge of the car door to cause instant reopening should contact be made with an obstruction during the closing cycle.

Door operation shall be automatic at each landing with door opening initiated as the car arrives at the landing.

A car door (electric) contact shall prevent starting the lift away from the landing unless the car door is in the closed position.

The time interval for which the lift doors remain open when a car stops at a landing shall be independently adjustable for response to car calls and response to hall calls.
The maximum time to completely open and to completely close the doors shall be 8 seconds.

The manufacturer shall guarantee a complete door time adjustable between 5 to 10 seconds.

The maximum door noise measured one meter from the landing entrance shall be 35dbA.

14-4-8 Full Selective Collective Microprocessor Control For All Cars

The lifts shall have full collective selective automatic operation whereby all lifts operate from a single line of push button at the landings, with up and down buttons at the intermediate landing call, and that car shall be the car nearest to the call and set for the direction of travel for which the call has been registered.

A group controller for **two/ three cabinets** will be installed.

The system shall also enables the passengers arriving late, to reopen the closing door by pressing the hall button.

14-4-9 LANDINGS

Landing Entrances

Automatic Sliding Doors

Complete center opening two speed sheet steel entrances shall be installed at each entrance.

The sheets shall be covered with stainless steel.

A small decorative frame, finished in stainless steel, shall be provided.

A total frame as approved by the Engineer shall be designed and approved for lift entrances at the landing (prime coat).

14-4-10 Landing Fixtures

Hall Button Fixtures

At each terminal landing, a push-button fixture shall be provided and at each intermediate landing, a button fixture shall be provided containing "up" and "Down" push buttons.

When a call is registered by momentary pressure on a landing button, that button shall become illuminated and remain illuminated until the car is answered.

Hall Position Indicator

A digital hall position indicator shall be installed at all landings

Hall Lantern

A Separate hall lantern shall be provided at all landings When a car is stopping at a landing the lantern indicating the direction in which the ear is traveling shall become illuminated prior to arrival or the car.

A gong shall sound to announce the arrival of the car The gong shall sound once for the "UP" direction and twice for the "Down" direction.

14-4-11 Fireman's Control

A fireman switch shall be provided at ground floor level, to enable the fireman to cut out all landing call button, bring the lifts to ground floor, and ensure that the lifts can only be operated from inside the car.

The switch shall be enclosed suitable flush mounted box access to which shall be obtained by breaking small glass panel on the front of the box Upon the switch being reset after use, the lifts shall return to their normal operation. The front cover of the box shall be clearly labeled:

“FIREMAN'S CONTROL”

The fire control in the lift controller shall also operate from fire alarm in the building

14-4-12 False Call Canceling

All calls will be automatically canceled to avoid unnecessary stops by registration of nuisance call cars the number of car calls registered does not correlate with the carload.

14-4-13 Passenger Sensing Doors

An ultra sensitive sensor mounted above the car entrance monitors passengers boarding or exiting to control door opening / closing time suitably.

14-4-14 Safety Door Edge

Each leading edge of the door panels shall be equipped with a safety edge, to re-open the closing door when any passenger or object touches any of the edges.

14-4-15 Overload Non Start

When a carload exceeds a predetermined weight the lift shall stop operation with the doors opened at the door, and alarm shall be actuated (buzzer and light).

The alarm stops when enough passengers have left the car 10 reduce load.

14-4-16 Automatic Bypass

If a car becomes near full capacity, the lift will automatically bypass all the calls along the service direction, responding to the car calls only,

14-4-17 Non-Service of Specified Floor

A key switch located inside the slide cover of the car operating panel can be activated to suspend lift service to specified floor(s), thus conforming to the current change of tenets in the building.

14-4-18 Car light and Fan Shut off

To save energy, car lighting and ventilation fan shall turned off automatically if there is no call registered within a pre-determined period at time.

14-5 HOIST WAY EQUIPMENT

14-5-1 Guide Rails

Planed steel tees shall be provided as guides for the car (and counterweight). The stem section of all guides shall be tongued and grooved provide match joints. The guide rails shall securely fastened to the building structure.

14-5-2 Counterweight

A structural fabricated steel frame with cast iron filler weights shall be furnished to provide proper counterbalance for smooth operation. The weight of the counter weight shall be equal to () % of the lift capacity plus the car weight

The counterweight frame shall be equipped with a mechanical safety device For the lifts with rear doors the counter weights shall be on the side, the manufacturer shall try to maintain the maximum load capacity and size for these two lifts.

14-5-3 Ropes

The hoist ropes shall be of traction steel of suitable size (special for lifts) construction and number to insure the proper operation of the lifts and give satisfactory wearing qualities. The supplier shall submit sample for approval with test certificate.

Compensating Ropes (chains) shall be provided to compensate for the weight of the hoist ropes

The ropes shall be designed with a minimum safety factor of 12 or as specified from manufacture.

Ropes suspension shall be provided with rubber or spring elements for car and counterweight.

14-5-4 Buffers

Suitable oil type buffers shall be provided for car and counterweight.

14-5-5 Electric Wiring

All necessary insulated wiring and conduit of tubing, together with necessary fittings, metal boxes, troughs and ducts, will be provided, except as specified as work by others.

14-5-6 Earthling

A) All conduit trunking and cable sheets shall be included and connected solidly or by suitable flexible metallic conduit and cable glands to all switch gear, conduit boxes, motors and all other electrical apparatus supplied, fixed by the Contractor.

B) an earth terminal with is provided in the isolator switch in the machine room, to which an earth conductor should be connected by the lift Contractor for the lift installation. All conduits

14-5-7 Radio Interference Suppression

The Contractor shall include in his lift specs, for interference suppression capacitors in the V.V.V system

Interference suppression components shall not be used in any part of the electrical circuits where their failure might cause an UN-safe condition.

14-5-8 Silence Operation

A Precautions shall be taken by the Contractor to ensure quietness of the lift installation, specially the motors, brakes, controllers reduction gear, terminal floor switched, solenoid operated ramps car gate-lock ramps, and gates to ensure that any vibration generated by the lift equipment is not transmitted to the building structure.

14-5-9 Tools in the Machine Rooms

- A) The Contractor shall provide and fix in each machine room, at an agreed position, a shelf on which shall be placed the traction shelve clamp and spanner and grease gun, and one liter pot of grease.
- B) The machine room and reception must be provided with a supervisory board showing each imposition in/out of service signal. Landing calls situation.

14-5-10 Testing & Acceptance

- A) The Contractor shall ensure that all equipment has been tested at the manufacture's works before delivery and installation on site.
- B) Site test shall be made in the presence of lifts consultant Engineers, for satisfactory performance of the complete installation and for compliance with the specified requirements and guarantee any metal stained or any damage done in testing shall be made good at the Contractor's expense.

14-5-11 Operation from diesel generator (emergency power supply)

Pre-arrangement for operation of lifts from emergency power supply (stand-by generator) shall be provided

One in use lift to be connected automatically to this emergency power supply by the lift supplier. Others will supply Cables and automatic transfer

14-6-1 For Dimension

Use standard BS 5655 Part 5 1989

Passenger's lifts: For ABU JABER House:

Basic Specifications	
Number of lifts	One (1) Hydraulic Lift
Type	Passenger Lifts.
Load (kg)	320 Kg.
Drive	VVVF-Variable Voltage Variable Frequency.
Speed (m/s)	1.60 m/sec.
Control	Computer operated with master & slave to keep monitoring & full feed back (Matching installed BMS.)
No: of floors	3
No. of entrances	3 not in line.
Rise	10 m approx.
Floor Designation	0,1,2
Power supply	400 V, 3-phase, 50 Hz.
Machine room location	In Ground Floor.
Hoistway	
Construction	Concrete.
Clear dimensions	W.1750 mm X D. 1600 mm.
Pit Depth	1400 mm.
Overhead	2.40 mm.
Car	
Inside dimensions	W. 1200 mm x D. 1000 mm x H. 2300 mm.
Enclosures	- Stainless Steel.
Ceiling	- Covered with Rubber.
Floor	
Fittings	- Handrail on three sides. - Kick plate. - Mirror Electric fan. - Balustrade on roof
Car Panels	Stainless Steel
Car Façade	Stainless Steel
Car Door	Automatic Central Opening.
Type	W. 1100 mm X H. 2100 mm.
Size	Stainless steel hairline finishes
Finish	
Entrance Protection	- InfraRed Curtain Device on full car door height Mechanical Door Protection.

End of Section