




OGDCL PAKISTAN:
OIL & GAS DEVELOPMENT
COMPANY LIMITED

KPD-TAY COMPRESSION PROJECT

ISSUED FOR TENDER

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OIL & GAS DEVELOPMENT COMPANY LIMITED
KPD-TAY COMPRESSION PROJECT
SPECIFICATION FOR LIGHTING MATERIAL

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PROJECT : KPD-TAY COMPRESSION PROJECT

SPECIFICATION FOR LIGHTING MATERIAL



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1. INTRODUCTION

This specification is intended to specify the basic requirements for design, engineering, selection, supply, inspection and testing of Lighting Materials; which deemed necessary for defining minimum requirement at preliminary stage and shall not be considered comprehensive and final for procurement. This specification does not absolve the CONTRACTOR from his responsibility of supplying, installing and commissioning suitable Lighting Materials complete in all respect.

The CONTRACTOR/VENDOR shall submit the technical details i-e offered lighting models, fixture photometric data, materials and finish details, type of mounting, dimensional data, installation details, catalogues, and ITP for the offered lighting fixtures and junction boxes based on this specification and other project document/drawings, and shall submit to COMPANY/CONSULTANT for review and approval. The CONTRACTOR shall not purchase any materials until the submittals have been approved by the COMPANY/CONSULTANT.

The offered Lighting Materials shall comply with the *Reference Sec. 2 Standards and Codes*. Where the manufacturer's standards differ from other supplementary requirements of this specification details shall be submitted to the COMPANY/CONSULTANT for approval.

In case discrepancies are found between this specification and other documents, COMPANY/CONSULTANT shall be referred for correct interpretation.

1.1. Definition

Where used in this specification, the following terms shall have the meanings indicated below unless otherwise clearly indicated by context of their use.

COMPANY – Oil & Gas Development Company Limited (OGDCL)

CONCESSION REQUEST - A deviation requested by the CONTRACTOR or VENDOR, usually after receiving the contract package or purchase order. Often, it refers to an authorization to use, repair, recondition, reclaim, or release materials, components or equipment already in progress or completely manufactured but which does not meet or comply with COMPANY/CONSULTANT requirements. A Concession Request is subject to COMPANY/CONSULTANT approval.

CONTRACTOR - The party which carries out all or part of the design engineering, procurement, construction and commissioning or management of the project.

DRAWINGS - Drawings provided by the CONTRACTOR/VENDOR.

SUPPLIER/MANUFACTURER - The party which manufactures and/or supplies the material/equipment, and provides technical documents/drawings and services to perform the duties specified by the COMPANY/CONTRACTOR.

PROJECT – KPD-TAY Compression Project



1.2. Errors & Omissions

- The review and comment by COMPANY/CONSULTANT of any CONTRACTOR's/VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve the CONTRACTOR/VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.
- Any errors or omissions noted by the CONTRACTOR/VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT.

1.3. Deviations

- All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONSULTANT as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONSULTANT prior to execution of Work. Such deviations shall be shown in the documentation prepared by the CONTRACTOR/VENDOR.

1.4. Conflicting Requirement

- In the event of any conflict, inconsistency or ambiguity between the CONTRACTOR's/VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, the CONTRACTOR/VENDOR shall refer to COMPANY/CONSULTANT whose decision shall prevail.

1.5. Reporting Procedure

- A reporting and documentation system shall be agreed between the CONTRACTOR/VENDOR and COMPANY/CONSULTANT for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. The CONTRACTOR/VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY/CONSULTANT.
- Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT.

1.6. Third Party Inspection:

- In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY/CONSULTANT during the manufacturing and shipment of the equipment/material, COMPANY/CONSULTANT may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.
 - Information w.r.t inspection and testing purposes as per applied reference Standards and Codes shall be submitted to COMPANY/CONSULTANT.
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1.7. Unit Responsibility

- The CONTRACTOR / VENDOR shall be responsible for the complete design, manufacture, supply, and inspection & testing of Lighting Material, including full compliance with all applicable design codes and standards, including those listed in *Section-2* of this document and the requirements of the certifying authority, if applicable. The CONTRACTOR/VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.
- The CONTRACTOR/VENDOR shall guarantee that all material and parts included in construction of the specified Lighting Material shall be new, unused and of the required/ specified grade.

1.8. Documentation

- Documents, calculation/data sheets, technical details, etc., to be submitted to the COMPANY/CONSULTANT shall be in English Language.
- Unless otherwise specified, the metric units shall be used in documents and drawings by the CONTRACTOR/VENDOR.
- The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet will be submitted to COMPANY/CONSULTANT for approval.
- Variations from or additions to this specification shall be called to the attention of the COMPANY/CONSULTANT and approved in writing by the COMPANY/CONSULTANT prior to starting manufacturing.
- Comments made by COMPANY/CONSULTANT on drawing/technical details submittal shall not relieve the CONTRACTOR/VENDOR of any responsibility in meeting the requirements of the specifications.
- Such comments shall not be construed as permission to deviate from requirements of the Purchase Order unless specific and mutual agreement is reached and confirmed in writing.
- The CONTRACTOR/VENDOR shall notify the COMPANY/CONSULTANT of any apparent conflict between this specification, the related data sheets, the Standards & Codes and any other specification noted herein. Resolution and or interpretation precedence shall be obtained from the COMPANY/CONSULTANT in writing before proceeding with the design manufacture.

2. REFERENCE STANDARDS & CODES

The Lighting material supplied by the CONTRACTOR/VENDOR shall comply with this Specification, and material selection shall confirm to the relevant and latest version of the following reference Standards and Codes.

It shall be manufacturer's responsibility to be, or to become, knowledgeable of the requirements of these reference Standards and Codes. Any changes, alteration and necessary re-certification of



the equipment for compliance with the applicable Standards and Codes shall be at the expense of the Manufacturer.

STANDARD	DESCRIPTION
IEC 60038	IEC standard voltages
IEC 60079	Electrical Apparatus for Explosive Gas Atmosphere
IEC 60364	Electrical Installation of Buildings

3. SERVICE CONDITIONS

3.1. Site Conditions

Equipment selection shall be based on the following environmental conditions:

PARAMETERS	VALUE/UNIT
MAXIMUM AMBIENT TEMPERATURE	118 °F
MINIMUM AMBIENT TEMPERATURE	36 °F
WET BULB TEMPERATURE (DESIGN)	88 °F
MAXIMUM RELATIVE HUMIDITY	77%
MINIMUM RELATIVE HUMIDITY	20%
WIND VELOCITY	101 (Miles/Hour)
ELEVATION ABOVE MEAN SEA LEVEL (GPF)	250 ft.
SEISMIC ZONE	Zone 2A of Uniform Building Code- UBC-1997.

3.2. Power Supply Characteristics

The rated characteristics of the power supplies are:

PARAMETERS	VALUE/UNIT
VOLTAGE	400 V ac \pm 10%, 3-PHASE 230 V ac 1-PHASE
FREQUENCY	50 Hz \pm 2Hz
NEUTRAL SYSTEM	SOLIDLY EARTHED

4. LIGHTING SYSTEM

This section covers the design/furnishing, inspection & testing, installing, and placing in operation of lighting systems. The lighting systems shall include all LED lighting fixtures, LED module/multiple LED, ballast, capacitance compensation, supports, controller/terminal compartment devices/constant current driver and other accessories i-e flange base, pole bolt, washer, mounting plates and other necessary facilities as required for a complete installation.

The CONTRACTOR/VENDOR shall submit complete information for proposed luminaries, including LED module rating and electrical data, fixture photometric data, materials and finish, type of mounting, dimensional data, lighting quality, lens design, and reflector design. The CONTRACTOR shall not purchase any materials until the submittals have been approved by the COMPANY/CONSULTANT.



Further, detailed lighting design calculations shall be submitted together with full technical details of the software used prior to development of detailed plant lighting layout, skid/packages lighting layouts and schemes to COMPANY/CONSULTANT for review and approval. The detailed lighting layouts shall comprise the details w.r.t fixtures, light controls, LED module types, sizes, colors and finishes. Sample approval of all electrical fittings and accessories including light fixtures, switches and sockets is mandatory prior to bulk supply and installation.

Acceptable manufacturers shall be as per COMPANY/CONSULTANT Approved Vendor List (AVL).

4.1. Materials

4.1.1. General

All equipment, materials and devices shall be design, constructed, installed and protected and shall be capable of being maintained, inspected and tested, so as to prevent danger so far as reasonably practicable.

All materials shall be suitable for service at full load in the climatic and site conditions as stipulated in *Section-2* in which they are installed.

All lighting systems shall be operated at 230VAC, 1 phase, 2 wires, 50 Hz derived from 400V, 3 phase, and 4 wire system.

Lighting fixtures and devices which are to be installed in hazardous areas shall comply to IEC 60079, or to the national standards of the country, provided they are not less stringent in their total requirement.

All LED modules/multiple LED shall be high efficiency, electronic type.

Fixture types and materials are included as follows, but shall not be limited to the information provided herein. Submittals for similar equipment and materials, additional fixture types and equivalent manufacturers shall be submitted by the CONTRACTOR to the COMPANY/CONSULTANT for approval.

All enclosures of outdoor installation shall have minimum degree of protection IP 66 & for indoor IP 51. In Zone 1 and 2 hazardous areas, the LED light fittings with LED modules shall be Ex d, and Ex de type.

All the light fittings shall be provided with internal earth terminals.

4.1.2. Lighting Fixture Types

The CONTRACTOR shall evaluate the requirement of lighting fixture types/selection of lighting modules during the detail engineering by carrying out the "*Lighting Calculation Study*"; and considering the below types of light fixtures. Lighting calculation study comprising of the fully details with regards to selection of lighting modules, uniform distribution of lux level, photometric details of selected light fixture/module, shall be submitted to COMPANY/CONSULTANT for review



and record. Comments furnished by the COMPANY/CONSULTANT against submitted lighting calculation report shall be incorporated/rectified by the CONTRACTOR.

- **LED Surface Mounted**

Fixtures shall be provided with prefinished steel housing, lens diffuser, and required accessories.

The CONTRACTOR to obtain COMPANY/CONSULTANT's approval on acceptable Manufacturers as per Approved Vendor List (AVL).

- **LED Surface Mounted (Industrial)**

General purpose fixtures shall be provided with prefinished steel housing and reflector, and required accessories. Fixtures for wet and dust locations shall be provided with reinforced polyester housing, high-impact acrylic diffuser with suitable gaskets etc.

The CONTRACTOR to obtain COMPANY/CONSULTANT's approval on acceptable Manufacturers as per Approved Vendor List (AVL).

- **LED Recessed Down Lighting**

Fixtures shall be provided with galvanized and/or prefinished steel housing and mounting frames, parabolic reflectors with various finishes, baffles, lens, and required accessories.

The CONTRACTOR to obtain COMPANY/CONSULTANT's approval on acceptable Manufacturers as per Approved Vendor List (AVL).

- **LED Wall Mounted Fixtures**

MANUFACTURER shall be able to provide a wide variety of fixtures which shall include, but not be limited to wall sconces and decorative diffuser fixtures in classic and contemporary styles.

The CONTRACTOR to obtain COMPANY/CONSULTANT's approval on acceptable Manufacturers as per Approved Vendor List (AVL).

- **LED High and Low Bay Lighting**

Fixtures shall be provided with aluminum reflector, LED module/multiple LED, thermal shock-resistant clear tempered safety glass lens, mounting fittings, and required accessories. Integrated LED module/multiple LED lamp shall be High Pressure Sodium type.

The CONTRACTOR to obtain COMPANY/CONSULTANT's approval on acceptable Manufacturers as per Approved Vendor List (AVL).

- **LED Flood Lighting**

Fixtures shall be provided with die-cast aluminum housing, weatherproof and corrosion resistant, manufacturer standard finish, thermal shock-resistant clear tempered safety glass lens, mounting fittings, and required accessories. Integrated LED module/multiple LED lamp shall be High Pressure Sodium type.



The CONTRACTOR to obtain COMPANY/CONSULTANT's approval on acceptable Manufacturers as per Approved Vendor List (AVL).

- **LED Bollard Lighting (for Landscaping and Walkway)**

Fixtures shall be provided with pre-finished extruded or cast aluminum housings, integrated LED module/multiple LED, anchor bolts, and accessories.

The enclosures of landscaping lights shall have degree of protection IP 56.

- **Emergency Systems**

Emergency LED lighting unit fixtures shall be provided with die-formed steel housing with Manufacturer's standard corrosion-resistant finish, glass sealed-beam integrated LED modules/multiple LED, nickel cadmium batteries, mounting fittings, and required accessories. Battery back-up shall provide for a minimum of 30 minutes of emergency lighting.

Self-contained battery with charger/inverter shall be provided for all emergency light unit fixtures.

Emergency exit signage units shall be provided with die-formed steel housings with Manufacturer's standard corrosion-resistant finish, single and double panel face, universal mounting fittings, knockout direction arrows, impact-resistant fiberglass color panels, compact LED modules, rechargeable nickel cadmium batteries with charger/inverter rated for 30 minutes, and required accessories.

- **Lighting Control**

Lighting controls shall include, but not be limited to, the following types: wall switches (including three-way, four-way, etc.), dimming system, and photo-electric cells. Dimming systems shall be the solid-state electronic type, with preset scenes provided and programmed as approved by the COMPANY/CONSULTANT.

The CONTRACTOR/VENDOR shall provide the factory test certifications of the supplied equipment.

COMPANY/CONSULTANT approval shall be sought before going to manufacturing / procurement of material. All the comments furnished by COMPANY/CONSULTANT shall be incorporated by the CONTRACTOR/VENDOR in letter & spirit.

4.1.3. Material & Construction

4.1.3.1. The Housing

The housing of the LED flood light fixture shall be made of high corrosion resistance, black epoxy painted die-cast aluminum body, and frame with toughened glass window. The fixture shall have good tensile strength and shall be scratch proof. The fixture shall be suitable for laterally (side entry) mounting.

The housing of the sterling light fittings industrial LED luminaire type shall be made of Glass fiber reinforced plastics (GRP) with polycarbonate diffuser and stainless steel retaining clips.

**4.1.3.2. Cover**

The LED light fixture shall be equipped with a clear highly shock-resistant acrylic cover. The sealing gasket shall be made of neoprene / silicone rubber subject to COMPANY/CONSULTANT review & approval, to provide a tight seal between the housing and the cover.

4.1.3.3. Cable gland

The LED lighting fixture shall be offered with a brass mechanical compression type cable gland and stopping plug as per installation environment. The gland shall be equipped with a chloroprene rubber ring / silicon rubber ring to relieve excessive tensile stress on the leads and to prevent water from entering the fitting via the cable gland. The cable glands shall be provided with shrouds in black PVC or PCP. Red Nylon sealing washers and steel compression washers to be provided with the unit to seal between the gland body and the luminaire.

4.1.3.4. Integrated LED module lamp holders

The construction of LED flood light lamp holder shall be such that as to withstand the high temperature arising from lamps. For industrial LED luminaire type, lamp-holder shall be standard type.

4.1.3.5. LED Controller Compartment

For LED flood light fixtures, all the electrical components like LED chip, LED driver, LED assay, PFC correction capacitor and internal wiring shall be mounted in the control gear module.

4.1.3.6. Power Factor Correction

Suitable power factor correction shall be installed in the lighting fixture to keep the power factor not less than 0.9 in any case.

4.1.3.7. Integrated LED Module Lamp / Multiple LED

The lamps shall be of integrated LED module/multiple LED and shall be furnished for all fixtures and of highest quality to ensure maximum efficiency and running-life. The LED lamp position shall be adjustable to optimize illumination for flood light fixture.

General lighting shall be of LED light fitting "white" color, unless listed otherwise. Immediate integrated LED module lamp replacement, whenever burnouts occur, shall be provided by the CONTRACTOR through the construction and warranty periods. The integrated LED module lamp type having short life shall not be used. Long life type lamps are preferable.

4.1.3.8. Reflector Plate

The reflector plate for LED flood light fixtures shall be wide beam high purity anodized aluminum. It shall cover the entire electrical installation and shall reflect the upwardly directed light. For industrial LED light fitting luminaire type, reflector shall be white polyester painted zinc coated steel.

4.1.3.9. Cable Entry

Cable entry: 2 x M20



Termination: Up to 6mm² for flood light fixtures type, and up to 4mm² for industrial LED light fitting luminaire type. Terminals for live, neutral, earth and looping to be provided and shall be internally earthed.

5. JUNCTION BOX

All junction boxes used for lighting circuits distribution (to be used for area lighting, and structure lighting) shall be of high impact resistance, excellent corrosion resistance, excellent resistance to UV radiation, flame retardant, having compact design and made from stainless steel/aluminum alloy EEx(e) type suitable for zone-1, zone-2 gas group II (refer Hazardous Area Classification Layout), temp class T6 with degree of protection IP 67 using closed cell neoprene gasket with detachable lid and stainless steel captive fixing screws. For classified area, enhanced protection level shall be selected during the detail engineering.

The CONTRACTOR/VENDOR shall submit the details w.r.t. make / model / type, technical arrangement drawings (general arrangement), wiring diagram for the offered Industrial type junction boxes/ and explosion proof junction boxes for COMPANY/CONSULTANT approval before procurement.

The CONTRACTOR/VENDOR shall ensure that the offered lighting junction boxes shall be equipped with the “fuse terminals” for each lighting fixture individually.

5.1. Earthing

Two (02) nos. of earthing studs shall be provided for external earth connection along with plain washer, spring washer nuts etc. The earthing stud shall be welded to prevent removal of the same.

6. DRAWINGS / DOCUMENTS

The CONTRACTOR/VENDOR shall provide the following drawings / documents w.r.t offered lighting fixtures and lighting junction boxes (as per approved vendor list- AVL) as a minimum:

- General arrangement drawing for lighting fixtures (all type of lights), and junction boxes
- Mounting and installation details
- Test certificates
- Manuals / and Catalogues with complete specifications
- Wiring Drawing