



THE INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS
IN CONJUNCTION WITH THE LIGHTING INDUSTRY RESOURCE COUNCIL

GUIDELINES FOR SPECIFICATION INTEGRITY

2009 EDITION

INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS

IALD

INTRODUCTION

INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS

The IALD is dedicated to setting the global standard for lighting design excellence. As part of that effort, the association provides these Guidelines for Specification Integrity to promote the use of the best procedures in the lighting design process by lighting professionals, as well as other specifiers of lighting, including architects, engineers and interior designers.

Other major areas of focus for the IALD include designer referral services, recognition of outstanding lighting designs, public awareness, education, energy policy and co-sponsorship of international lighting trade shows.

Since the initial creation and publication of the Guidelines for Specification Integrity in 2000, the lighting profession continues to evolve. These current guidelines have been updated to address issues including various project types, international specification, budget planning, sustainable design and more.

LIGHTING INDUSTRY RESOURCE COUNCIL

The Lighting Industry Resource Council (LIRC) is an adjunct organization of the IALD. It was established in 1996 by the IALD to provide a forum to foster communication between professional lighting designers and manufacturers of lighting and lighting control equipment. The LIRC adds a critical dimension to IALD activities and improves the quality of lighting overall. Membership in the LIRC is open to all manufacturers of lighting equipment. These guidelines are representative of the value of collaboration between specifier and manufacturer.

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OVERVIEW

The INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS (IALD), in conjunction with the LIGHTING INDUSTRY RESOURCE COUNCIL, has developed the following GUIDELINES FOR SPECIFICATION INTEGRITY, which suggest actions specifiers can take to build and preserve a specification of high integrity.

Quality lighting design depends on accurate information, quality specifications and follow through. These guidelines provide information to prepare lighting specifications with clarity and precision. They also provide information on how to communicate with owners/clients and manufacturers and their representatives concerning their standards of quality for lighting equipment. These guidelines strive to provide specification recommendations relating to various phases of a project's development, from the early design phases through completion of construction and commissioning.

One of the most essential aspects of producing a good lighting design is to get what you specify – to meet the project and client requirements. Therefore, it is critical to balance design parameters with the project's budget. Most professional lighting designers agree that obtaining a distributor net unit pricing from the manufacturer is one of the most important things one can do to help control the lighting design/specifications and minimize unnecessary substitutions by the construction team.

The following recommendations are intended as a guide only, and do not imply specific tasks that must be accomplished by a specific party. These guidelines do not intend to outline other aspects of a lighting designer's scope of work and/or responsibilities. The lighting designer is responsible for only taking on tasks for which he/she is capable, and which may have been contractually agreed upon. Further specific lighting design contract language with sample agreement can be downloaded from the IALD website, www.iald.org.



I FOUNDATION ELEMENTS FOR BUILDING A QUALITY SPECIFICATION

A DEVELOP A LIGHTING EQUIPMENT SPECIFICATION AND PRICING DATABASE.

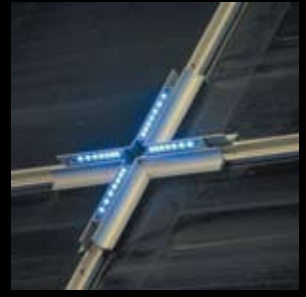
- 1 Establish categories for the key lighting products you specify, classifying them according to location, source and function, or application (e.g., recessed incandescent downlights, pendant fluorescent uplights, exterior metal halide floodlights, control systems).
- 2 Develop a standard luminaire typing system to organize your lighting equipment.
- 3 Develop a master lighting equipment and lighting specification database which identifies acceptable products by manufacturer and product (or catalog) number.
- 4 Track project pricing information in this database, allowing you to develop a history of unit price information which will be beneficial in evaluating lighting budgets for future projects. See Item 'F' on page 7 for factors that impact pricing.
- 5 Update your databases and products on a regular basis and stay abreast of manufacturer price increases.

B ESTABLISH CLEAR AND DEFENSIBLE STANDARDS OF QUALITY FOR THE LIGHTING EQUIPMENT YOU SPECIFY.

- 1 Determine your interpretation of differing specification product grades.
- 2 Foster dialogue with fellow design professionals to assist your development of quality standards for lighting equipment.
- 3 Develop and use a checklist of product performance evaluation criteria including:
 - photometric and visual performance
 - aesthetics, craftsmanship and finishes
 - construction materials and fabrication integrity
 - energy consumption and labeling for energy code compliance
 - electrical characteristics (e.g., power factor, thermal management)
 - cost, delivery and installation
 - manufacturer's warranty, long term availability, support and field service
- 4 Brief your local manufacturers' representatives on your requirements concerning products and luminaire equipment standards.

- 5 Adopt and maintain a company policy regarding specification integrity. Write a policy statement on luminaire specifications to be distributed to your design clients, key project decision makers, and other project team members.
- 6 Develop a strong relationship with the client so that they are educated and understand the need and benefits of a particular lighting product. Table top demonstrations and mockups can be helpful. In addition, many reputable manufacturers can often provide a list of projects locally or around the country, that may reference a helpful installation of the product.
- 7 Meet with key representatives of your local manufacturers' agencies to discuss your policy and how to work together to maintain the integrity of your lighting specifications. Maintain an up to date list of manufacturer's contacts with their phone numbers and email address.
- 8 Understand the channels of specification including project design team, electrical contractor, distributor, manufacturer and owner/client.
 - a A lighting manufacturer typically sells their products thru a distributor, who provides products and services to an electrical contractor. Markups added to the manufacturers price, by the distributor and electrical contractor are customary — but need to be carefully monitored. Markups can vary pending which contractor is selected, project type, product type, location and other factors.
 - b After the lighting designer specifies the lighting products and equipment for a project, electrical contractors bid for the project based on the documentation provided. Later, the electrical contractor purchases lighting and other electrical equipment, wiring, devices, etc. from a distributor. Sometimes "packaging" occurs when manufacturers representatives and/or distributors offer discounts for substituting the specified product with another brand that they regularly carry. Keep in mind, distributors can acquire ANY product, but may provide more competitive pricing on products from manufacturers they are authorized to represent or have pre-existing relationships with. Most qualified distributors and electrical contractors will provide the project as specified and documented.

Note: Be aware that the electrical contractor has typically been hired to provide the electrical portion of the project within a certain budget (eg. their bid proposal). An electrical contractor may wish to take advantage of "packaging" and substitution in an effort to make additional profit on the project, by substituting the more costly products with less expensive (and sometimes inferior) products and pocketing the difference. Other times, they may pass a marginal savings on to the owner/client as an incentive to allow the substitutions. Owners/clients may be encouraged about savings, but may not be fully informed or aware of the consequences.



If the lighting budget for the project has been reviewed, and continues to be out of line with quotes provided by the manufacturer, the lighting designer may suggest that the owner/client purchase lighting products directly from the authorized distributor and/or manufacturer. (However, be aware that the purchaser assumes liability for product on a job site unless arrangements are made with the general and/or electrical contractor). Typically that helps expose the source of the budget problem, or can provide savings for the owner/client.

C BE KNOWLEDGEABLE ABOUT THE LIGHTING PRODUCTS YOU SPECIFY.

- 1 Encourage manufacturers and their representatives to visit your office with working sample products, not just catalogs or internet research. Use these visits to evaluate the product performance.
- 2 When possible, visit manufacturers' facilities to see how the products are researched, developed, designed, manufactured, tested, and shipped. Consult manufacturers' websites for the most accurate information on their products and services. Manufacturers can also provide a list of completed work, so you can see the how products look installed.
- 3 Cultivate professional relationships at regional, national and international levels with key factory-based contacts for manufacturers' you specify. Rely on these contacts for assistance when special requirements arise on projects.
- 4 Attend seminars and trade shows which allow you to evaluate lighting equipment performance characteristics, compare products, and remain current on technology.
- 5 Obtain product samples of similar lighting products from multiple manufacturers for comparative evaluation. Record your assessments of the products' qualities and add this information to your luminaire product database.
- 6 Develop a reference of standard notes relating to lighting products which are to be used for quality assurance during the project design process.

D PROMOTE AND PROTECT THE CREATION OF UNIQUE DESIGNS.

- 1 Educate yourself, your professional colleagues, and your clients' decision makers as to the value of unique products and the necessity for protecting intellectual property.
- 2 Include language in your specification that addresses intellectual property and original designs. State your policy in upholding design copyrights and discouraging the consideration of "knock-offs".

E CONSIDER SUSTAINABILITY DESIGN ATTRIBUTES WHEN SELECTING THE LIGHTING PRODUCTS. THIS MIGHT INCLUDE:

- Long life and energy efficient light sources
- Mercury-free or other environmental friendly products
- Maintenance and recycling programs
- Use of energy management and lighting control systems
- Effective use of daylight
- Good cutoff luminaire's for exterior lighting
- Minimize potential glare, spill light, or other light trespass issues
- LEED rating system and credit compliance
- Other recommendations and guidelines as outlined in the IESNA Handbook

F SECURE ACCURATE BUDGET PRICING OF THE PRODUCTS YOU ARE SPECIFYING.

- 1 Manufacturers should assist with providing accurate budget pricing and should be advised to provide a competitive price if they are to be considered for the project. Better pricing is typically obtained earlier in the project schedule, not later during Bid or Construction.
- 2 Beware some of the following may have an impact when requesting pricing:
 - project type and location
 - quantities and product ordering information
 - any custom or other modifications information
 - clarify whether you are requesting budget or final pricing
 - pricing should be in the currency of the project location
 - lamps, taxes, delivery or any other items should be outlined as separate line items
- 3 Budget pricing should outline unit costs (not lump sums) and shall be for equipment only. Budget pricing should not include installation, delivery, taxes or miscellaneous electrical costs, unless outlined as a separate line item.
- 4 "Distributor net" costs are most informative so that actual product cost can be evaluated without markups. Be sure to note that distributor and contractor markups need to be added in addition, and can vary based on vendor and geographical location.
- 5 If final pricing is obtained, it should be guaranteed for the duration of a project. Be aware that the manufacturer may have price escalation clauses which may be involved if material purchase dates are extended.
- 6 Share these costs, on a confidential basis, with your owner/client and the project's decision-maker, as required.
- 7 Advise your clients that budget pricing may differ slightly from final purchase pricing.



II ACTIONS IN THE PROJECT'S DESIGN PHASE(S)

- A ASSESS THE PROJECT'S LIGHTING AND LIGHTING CONTROL BUDGET AND ESTABLISH PRODUCT QUALITY LEVEL.
- 1 Identify the level of luminaire system quality and cost desired by the Owner and supported by the budget.
 - a Make the Owner aware of tangible differences between various product quality levels.
 - b If necessary, provide the Owner examples of different levels of product quality (samples, installation, etc.) to assist in understanding both the benefits and limitations of various equipment designs.
 - 2 Communicate directly with the Owner and principal decision-maker whenever possible, to minimize the chance for confusion or miscommunication.
 - 3 Coordinate with project team in the preparation of lighting cost estimates/ budget:
 - a Clarify rationale for the project's lighting and lighting control budget and identify various influences. Understand your role and formal responsibilities in meeting the lighting budget.
 - b Learn to recognize potential lighting related budget problems early in the design phase. Provide constructive suggestions to decision-maker for addressing problems. Possible signals that there could be a problem include:
 - No information available as to the lighting hardware cost or budget
 - Fixture packaging
 - Products that do not match the lighting quality
 - Regional influences in pricing
 - Continued Value Engineering throughout the duration of a project phase
 - General Contractor in place very early in the project. Note: be sure to discuss and agree upon specifications and procurement methods
 - Team members learn of budget issues thru the Electrical Contractor, instead of via the owner/client and/or thru project team channels
 - 4 Evaluate and update costs on an add and deduct basis for the lighting products you are planning on specifying to minimize later budget problems.
 - 5 Identify construction bidding format (guaranteed maximum price, competitive bid, unit pricing, etc.) and its possible impact on your design process.

B IDENTIFY PROTOCOL FOR SECURING APPROVAL(S) OF SELECTED PRODUCTS.

- 1 Identify which project team members will influence the selection of lighting equipment.
 - a Enlist the owner/client, architect and/or engineer in assisting you in holding your specification.
 - b Determine the owner's position on specification integrity and assess likelihood of his support of your efforts.
- 2 Determine if "value engineering" or similar project scope and cost reviews may be a factor on the project. Note: In this event, obtain a VE target number in writing to know when you have achieved sufficient savings.
 - a Establish when value engineering activities are likely to occur in the project schedule.
 - b Ally yourself with the decision-makers to clarify in advance which products should not be substituted or compromised.
 - c Position yourself with the decision makers to be the only logical advisor on these matters, should they arise.
 - d Clearly communicate, in writing, anticipated compromises in performance, operation or maintenance that may result from value engineering.
- 3 Become familiar with regional conditions on your projects outside of the local area. Note: Refer to the "Additional Considerations for International Projects" section of this document.
 - a Find out who the local representatives are that represent the key products you specify and, if appropriate, make it known to them that you, as the lighting specifier, are available to answer questions on the specifications.
 - b Make local representatives aware of your policy regarding specification integrity.
 - c Understand any specific specification requirements or energy code requirements for lighting products for the region where the project is located, such as CUL, DIN, CIBSE, ASHRAE Standard 90.1, State Energy Codes (eg. Title 24 in California), and sustainable design considerations previously mentioned in this document.



C DEVELOP AND EMPLOY A METHODOLOGY FOR SELECTING LIGHTING PRODUCTS.

- 1 Obtain relevant project information to provide the most accurate and complete lighting specification.
 - a Determine all parameters and physical characteristics including room dimensions, finishes, ceiling cavity conditions, exterior conditions, etc.
 - b The design, specification and locations for remote power supplies to luminaire's, such as low voltage transformers or other power equipment, is typically within the services of the electrical engineer. However, alternate responsibilities within the project team may need to be discussed for coordination, as required.
 - c Identify estimated operating temperatures where products are to be located (i.e. ambient temperature can be a factor).
- 2 Conduct mock-ups to assess or demonstrate lighting performance, when necessary.
- 3 Understand and monitor the project design and construction schedule.

III ACTIONS IN THE PROJECT'S CONSTRUCTION DOCUMENT PHASE

A SPECIFICATION OF THE DESIRED PRODUCT(S).

- 1 Use an annotated luminaire schedule or table (a.k.a. lighting fixture schedule) and a written luminaire specification for each luminaire type to give explicit luminaire descriptions. Note: Refer to the "Specification Approaches" section of this document for detailed information on formulating a specification strategy.
- 2 Separate and identify special types from "commodity" items, especially when multiple name specifications are required. Note: Work with the manufacturer to give you a product number that they can identify and price the custom or special luminaire. This will help avoid confusion later in the bid phase.
- 3 Inform local manufacturer representatives of the lighting equipment you plan to specify. It is helpful to foster open communication on the project for assistance with providing accurate pricing, project tracking and allowing them to register the project for proper credit.

B PREPARE ADEQUATE DOCUMENTATION WHICH MAY INCLUDE PLANS, SPECIFICATIONS, SCHEDULES, DRAWINGS, DETAILS AND/OR OTHER DOCUMENTS WHICH MAY BE REQUIRED TO FULLY DESCRIBE PROJECT REQUIREMENTS FOR A SUCCESSFUL LIGHTING DESIGN.

- 1 Note any accessories, special finishes, atypical mounting devices, and other unusual requirements required for each luminaire type.
- 2 Make sure notes or specifications relating to a specific lighting product are shown in one location only to minimize errors if and when changes are made to the documents.

C PROVIDE PRODUCT DETAIL DIAGRAMS WHEN NECESSARY TO CLARIFY UNIQUE PROJECT CONDITIONS OR REQUIREMENTS.

- 1 Provide schematic diagrams of architectural integration of lighting products for the team review of any non-standard installations as required. The design team shall review the diagrams for their particular discipline and comment for integration into the Architects details.
- 2 Properly note and cross reference schematics to aid contractor in identification.

Note: The lighting designer may provide schematic diagrams to indicate integration with known elements for team coordination purposes, but always with disclaimers. The lighting designer should not, for example, detail structural elements to support the lighting elements. Diagrams by the lighting designer, are not in lieu of fully developed architectural drawings and details prepared by the Architect or other trades.

D LIGHTING SECTION OF THE PROJECT'S ELECTRICAL SPECIFICATION (TYPICALLY REFERRED TO AS "DIVISION 16")

- 1 Coordination between team members is required to maintain consistency and minimize any conflicts with regard to specifications. Refer to the "Specification Approaches" section of this document for additional general guidelines.
- 2 Make sure the specifications apply to all lighting products you specify on the job.
- 3 Delete or modify specification language which does not apply or may lead to misunderstanding.
- 4 Require that for all products where identical appearance across functions, lamps, etc. in a specific "family" of products (such as downlights, or exit signs, etc.) is essential to the appearance of the job, that the whole family be supplied by the same manufacturer - or by manufacturers that will coordinate with each other.



- 5 Include language in the lighting specifications that initial programming of the lighting control system shall be done by the controls manufacturer or factory authorized entity. The lighting controls manufacturer or factory authorized entity shall allow a minimum of 2 site visits to setup controls.
 - 6 Require pre-qualification of contractor offered substitution prior to bid date. Require the contractor to submit on the manufacturer product he intends to furnish within fourteen (14) days of the bid. State specifically that failure to submit within the deadline constitutes a guarantee that only the base specified product(s) will be supplied and that no other products, whether listed as alternates or not, will be considered.
 - 7 Agree with the owner/client and project team which specification technique is most appropriate for the project, and include all documentation necessary to assure proper bidding. *Note: Refer to the "Specification Approaches" section of this document for complete description of specification formats.*
- E PARTICIPATE IN COST REVIEWS FOR THE LIGHTING PRODUCTS AND EQUIPMENT, AND INFORM OWNER/CLIENT AND DECISION MAKERS OF ANY INCONSISTENCIES BASED ON PRICING QUOTES ON FILE FOR THE PROJECT.

IV ACTIONS IN THE PROJECT'S BIDDING PHASE

- A WHENEVER POSSIBLE, PARTICIPATE IN THE PROJECT'S PRE-BID MEETING TO ANSWER QUESTIONS AND REINFORCE YOUR EXPECTATION FOR THE BIDDERS SUBMITTALS.
- B PROVIDE COUNSEL TO THE DECISION-MAKER REGARDING LIGHTING RELATED BID ISSUES.
- C DISCUSS WITH THE OWNER/CLIENT OR PROJECT DECISION MAKER THAT SUBSTITUTIONS OR FAILURE TO INCLUDE THE SPECIFIED LIGHTING PRODUCTS AS PART OF THE BASE BID MAY INVALIDATE THE ENTIRE LIGHTING PRODUCT BID AND EXCLUDE THE CONTRACTOR FROM FURTHER CONSIDERATION.
- D REQUIRE COMPANIES THAT OFFER SUBSTITUTIONS TO PROVIDE A MANUFACTURER PROJECT LIST AND HOW LONG THE MANUFACTURER HAS MADE THE PRODUCT.
- E SHOULD THE RESULTING CONSTRUCTION BIDS REQUIRE A REDUCTION IN PROJECT SCOPE AND COST, BE IN A POSITION TO LEAD AND ADVISE ON THE LIGHTING PORTION OF THIS EFFORT. DO NOT ALLOW THE CONTRACTOR TO INFLUENCE DESIGN DECISIONS THROUGH ONLY A COST REDUCTION FOCUS.

Note: Contractor's may look for ways to substitute lighting products, without understanding the implications to the design of the project and associated conflicts. With accurate pricing on file, the lighting designer can review the contractor pricing. This often results in savings to the owner/client and typically your efforts will be supported.

If the lighting budget for the project has been reviewed, and quotes are unreasonable compared to budget quotes provided by the manufacturer, the lighting designer may suggest that the owner/client purchase lighting products directly from the authorized distributor and/or manufacturer. (However, be aware that the purchaser assumes liability for product on a job site unless arrangements are made with the general and/or electrical contractor). Typically that helps expose the source of the budget problem, or can provide savings for the owner/client. Refer to "Foundation Elements for Building a Quality Specification" at the beginning of this document.

V ACTIONS IN THE PROJECT'S CONSTRUCTION PHASE

A REVIEW AND ASSESSMENT OF CONTRACTOR SUBMITTALS.

- 1 Establish procedures, in advance, for the review and critical assessment of shop drawings, samples and other submittal materials required from the contractor by the specifications. This might include a shop drawing review log, etc. Note: It is important to inform the client of your procedures, so that you receive the necessary information in a timely manner and can respond accordingly.
- 2 Assist in the appraisal of samples, prototypes or mock-ups that are required by the specifications.
- 3 Inform the owner/client and decision-maker of any contractor responses that are inconsistent with the specifications or may jeopardize the possible delivery time of the product.
- 4 Use a standard submittal review checklist to review the submittals with the final specification documentation. Add project specific notes to the checklist as each set of documents is reviewed and issued. Evaluation criteria may include:
 - overall product dimensions, especially recessing depth, if applicable
 - wattage, voltage and lamping issues
 - mounting devices
 - trim details and finishes



B MONITOR CONSTRUCTION PROGRESS.

- 1 During site visits, observe that installation related requirements of the luminaire specification are being executed. Field reports may be submitted after each visit.
- 2 Respond to questions (Requests for Information - RFI) from the field in a timely manner so as not to jeopardize the Project's schedule. Advise promptly if there is insufficient or incomplete information which is necessary in order to respond.

C ASSIST ON THE OWNER/CLIENT'S BEHALF, WHEN REQUESTED, TO RESOLVE INCONSISTENCIES OR PROBLEMS.

- 1 Contact manufacturer's to verify shipment schedules and, if possible, obtain better delivery dates. Note: It is important that the contractor know that it is with the owner/client's permission that you are providing this service.
- 2 Request that manufacturers copy you on any project correspondence with the team, distributor and contractor, if appropriate. This will give advance notice of any delivery or availability problems.
- 3 Request that the construction manager/project manager copy you on construction reports, if appropriate, to assist in foreseeing possible problems.

VI ADDITIONAL CONSIDERATIONS FOR SPECIFIC PROJECT TYPES

A GOVERNMENT PROJECTS AND PUBLIC WORKS

- 1 Performance Specifications may be more common for this project type.
- 2 Try to use regional lighting products if possible to show support for locally based manufacturer's and their products and to be sensitive to local influences, as appropriate.
- 3 Speak to the Facilities Management staff to understand their lighting needs and maintenance issues.
- 4 Phasing the project could be an issue and the design may need to allow for this (eg. various contractors and procurement issues, construction techniques, and/or compatibility issues with the 1st Phase being constructed, such as dimming/controls systems, appearance of downlight trims and finishes, custom work, etc.)

- 5 Coordination with an extended team may be required such as interior designers of tenant spaces, landscape architects, LEED consultants, signage/graphic designers, or others.

B COMMERCIAL PROJECTS

- 1 Various procurement strategies or multiple name specification may be requested.
- 2 Value engineering (VE) procedures should be agreed in advance such as a limited number of reviews, or an agreed target lighting budget.

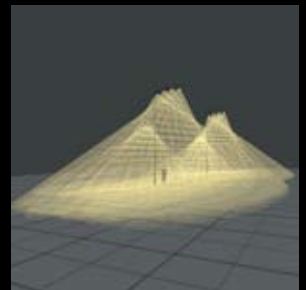
C RESIDENTIAL PROJECTS

- 1 Budget may, or may not be a key issue. It is important to discuss this with the owner/client in advance.
- 2 Table top samples can help clients make better and timely decisions.
- 3 Make sure controls systems have a user-friendly interface.



VII ADDITIONAL CONSIDERATIONS FOR INTERNATIONAL PROJECTS

- A The United States has some of the most developed and specific lighting guidelines which can be referenced in the [Illuminating Engineering Society of North America \(IESNA\) Lighting Handbook](#). Many lighting guidelines abroad are similar, and it is important to check specific guidelines that may be applicable in the region or country you are working (such as CUL, CIBSE, British Standards, DIN Standards, etc.
 - 1 Terminology differs in the USA and abroad. Some of the more common terms include: "Tender" which refers to the Bid Phase; and "Quantity Surveyor (QS)" which refers to Cost Estimator. Note: Refer to the "Terms" section of this document for definitions.
 - 2 Include language in the specifications that the manufacturer is required to fabricate according to all applicable codes & product ratings (eg. UL, CUL, DIN, IP ratings, or any other labels) which may be required in the jurisdiction the project is located.



- B Project phases in other countries are similar to the United States, but referenced differently depending on the country in which you are working. The following are a few examples and the approximate USA equivalent:

UNITED STATES

SCHEMATIC DESIGN
DESIGN DEVELOPMENT
CONSTRUCTION
DOCUMENTATION

BIDDING
CONSTRUCTION PHASE

FINAL INSPECTIONS

UNITED KINGDOM

STAGE C - Outline Proposals
STAGE D - Detailed Proposals
STAGE E - Final Proposals
STAGE F - Production Information
STAGE G - Tender Documentation
STAGE H - Tender Action
STAGE J - Mobilization
STAGE K - Construction to
Practical Completion
STAGE L - After Practical
Completion

UNITED STATES

SCHEMATIC DESIGN
DESIGN DEVELOPMENT

CONSTRUCTION
DOCUMENTATION
BIDDING
CONSTRUCTION PHASE
FINAL INSPECTIONS

GERMANY

HOAI PHASE 2 - Preliminary Design
HOAI PHASE 3 - Design Stage
HOAI PHASE 4 - Design for Approvals
HOAI PHASE 5 - Execution Design
HOAI Phase 6 - Preparation for Bidding
HOAI PHASE 7 - Assist with Bid Process
HOAI PHASE 8 - Project supervision
HOAI PHASE 9 - Project assistance and
documentation

It is important for a lighting designer to have a good understanding of these phases in order to satisfy the appropriate work and specification requirements. For further information regarding the above contact the Royal Institute of British Architects at, www.riba.org or the HOAI - Honorarordnung fuer Architekten und Ingenieure (Fee Structure for Architects and Engineers) at, www.hoai.de.

- 3 Try to use regional lighting products if possible to show support for locally based manufacturer's and their products and to be sensitive to local influences, as appropriate.
- 4 Get to know the manufacturers representatives and liaisons in the country you are working. They can assist with budget estimating, distributor and/or contractor markups for accurate final pricing and can advise with regard to any local customs or on-site issues.
- 5 Obtain budget pricing in the currency where the project is located. Exchange rates, taxes, etc. can seriously affect pricing. Note: Refer to "Foundation Elements for Building a Quality Specification" for detailed information.
- 6 Agree to the project specification language (eg. English, Spanish, French, other) and format (such as performance based, multiple name specification, or other format found when working in other countries) in advance.

- 7 Many countries outside the USA utilize different voltages, such as 220/240V therefore, low voltage power supplies may be more prevalent. Clarify scope of work with regard to the design and specification of remote (and/ or low voltage) power supplies to luminaire's, if necessary.
- 8 Take into account geographical lighting conditions of the project location such as daylight hours, climate and temperature issues, marine environments, etc.



VIII SPECIFICATION APPROACHES

A GENERAL INFORMATION

- 1 Luminaire specifications should be clear, concise and comprehensive. The sign of a professional specification is one that communicates both general and specific requirements in an authoritative, non-ambiguous manner. Defensibility, and respect for a luminaire design specification, is more likely if its writing reveals confidence and insight. The bidder needs to be made to realize that the author completely understands the design and construction process, and fully expects a professional and forthright response. Problems in getting what is specified are less likely when this climate is created.
- 2 Lighting specifications are typically done in Construction Specification Institute (CSI) format which is a standardized system for specifications in the construction industry. Architectural Lighting is found within "Division 16 – Electrical" and is customarily CSI "Section 16500" which specifically refers to luminaire's. This is typically the case for all domestic, and international specifications as well, since they often use the CSI Specification format.
- 3 Lighting specifications prepared by a Lighting Designer typically serve as the "primary" specification when it comes to lighting products and architectural lighting dimming/controls for a project. This is due to the high degree of performance, optical design, aesthetic quality and finish required for the areas in the scope of work of a Lighting Designer - regardless of any overall quantities or specification volumes involved. Lighting for other areas of a project which may be specified by other team members such as the Electrical Engineer, are typically covered in sufficient detail within the outline specifications of Section 16500 for Architectural Lighting.
- 4 Outline specifications should have the (3) main sections:
 - Part 1 - General (eg. Related sections, Submittals, Warranties, Quality assurance, etc.)
 - Part 2 - Products (eg. Fabrication, Luminaire's & components, Product performance, etc.)
 - Part 3 - Execution (eg. Delivery, Installation, Aiming & adjustment)

B SINGLE NAME SPECIFICATION (A.K.A. PROPRIETARY SPECIFICATION)

PURPOSE: WHEN ONLY ONE PRODUCT IS SUITABLE FOR THE APPLICATION AND/OR NO KNOWN EQUALS EXIST.

- 1 List the one and only product by manufacturer name and specific catalog number.
- 2 Advise the Owner and project team prior to the bid date that these particular products are set aside for this treatment because of their unique character
- 3 Indicate in the specification that submission of other than the listed product(s) will not be considered.
- 4 Make it clear in the specification that accurate pricing for all single name products has been secured prior to bidding and that the information has been shared with the owner/client.
- 5 Require unit pricing for product which clearly indicates what the contractor is charging the Owner for the equipment.
- 6 Prepare for the Owner in advance a detailed list of all the technical, performance and design features that warrant this product's special consideration.

C MULTIPLE NAME SPECIFICATION

PURPOSE: When several products are available that will meet the design, performance and budgetary requirements of the project/application, and gives the select manufacturers the opportunity to bid the job competitively.

- 1 List two or more products by manufacturer name and specific catalog number. Whenever possible, list a product with the ordering number to serve as the preferred choice and benchmark of quality. In addition, list up to 2 alternate choices with manufacturer name only - unless you have specifically agreed otherwise.
- 2 No two products are "truly equal" as this would most likely have copyright and patent infringements. Products which are 'substantially similar' may be appropriate to list in a multiple name specification.
- 3 Avoid using "or equal" in the specification. Such language is too vague. Instead use "or approved equal" or "accepted alternate per specification" in the specification. This keeps the specification open, but allows the designer to evaluate what might be submitted as an "equal."

Note: Multiple name specifications may not allow the project team to fully plan, budget, coordinate and detail the design since it is unknown which product will ultimately be provided to the project.

- 4 It is important to inform the owner/client and project team that there may be times only one product will work in a specific application and that multiple names may not be possible for that product.

D PERFORMANCE CRITERIA SPECIFICATION.

PURPOSE: Special requirements for many government and some private sector projects dictate the use of a performance criteria specification without the listing of manufacturers or specific catalog numbers. The performance specification attempts to identify, as completely as possible, both the quantifiable and qualitative aspects of a luminaire's performance. Any product submitted for consideration must meet or exceed the performance characteristics set forth in this specification. Note: In many cases, performance specifications generate the most wide competition and thus best pricing.

- 1 Clearly identify all aspects of luminaire performance that are important to the situation in which the product is applied.
- 2 Whenever possible, provide quantifiable performance measures in the specification so that the potential for interpretive disagreements are minimized.
- 3 If non-quantifiable, qualitative aspects of a luminaire performance are critical (style, craftsmanship, etc.), provide examples of similar products or applications that can be cited later for comparison.
- 4 Insist that the "burden of proof" with regard to a submitted product's ability to meet a performance criteria specification be placed solely on the submitting entity. The guidelines for submission are especially critical in a performance criteria specification.

Note: It is not unusual to request specific, highly developed calculations from vendors/manufacturers as a requirement for product submittal under a performance specification. This will not only help assure compliance with the design intent, but will discourage submission of "less-than-serious" product contenders.

E CUSTOM FIXTURE SPECIFICATION.

PURPOSE: When an original luminaire design is developed to fulfill a specific application on a project.

- 1 Custom designs should always make reference that the manufacturer is required to fabricate according to all applicable codes (e.g., UL, CUL, DIN, wet location and/or any other labels) which may be required in the jurisdiction in which the project is located.
- 2 Provide sufficient details within the construction documents to permit the contractor to reasonably assess requirements for assembly and installation.



- 3 If several manufacturers are identified as capable of producing a custom design, they should be mentioned by name with a predetermined product reference number/code. Provide contact names, telephone numbers and e-mail addresses whenever possible.
- 4 The custom luminaire manufacturer must include in his/her bid a working prototype and/or mock-up for review as part of the custom design and manufacturing process, if requested in the specification.
- 5 Accept absolutely no substitutions on custom designs. Decision-maker must understand the rationale for this prior to bidding.
- 6 Construct a separate 'deduct alternate' if budget may become an issue. This will keep the specifier more in control in case of "value engineering."
- 7 Custom designs should be fully worked out in the design phase if possible and finalized in construction documentation at the latest. This allows manufacturers to provide product numbers and appropriate unit costs so that detailing can be worked out with the architect and project team. Keep in mind that quantities have a significant impact on pricing for custom designs.
- 8 Custom luminaire designs often require longer lead times than standard products.

Note: Custom designs developed too late tend to get very expensive or simply value engineered and substituted with something off the shelf and undesirable.

F ALLOWANCE SPECIFICATION.

Purpose: When actual product has not yet been selected or specific design approved. Often used in situations where the bidding climate is uncertain or unknown. Always include an allowance when the schedule is issued for bid if a luminaire has not been agreed upon with your owner/client or design team.

- 1 Include enough information in the specification to allow the contractor to accurately price installation, electrical and special needs (weight, voltage, wattage, etc.).
- 2 Allowance should be a distributor net, plus "the distributor and contractor mark-ups."

Note: Allowances can be effectively used in the early design phases of a project when designs are still fluid. However, later in the project allowances can be easy targets of value engineering and should be avoided whenever possible.

IX TERMS

CIBSE: (The Chartered Institution of Building Services Engineers). Illumination standards of practice for the United Kingdom.

CONTRACTOR NET: The distributor's cost to the contractor, prior to contractor markups.

CUL: Underwriter's Laboratory approved for use in Canada, and the United States.

DIN: "Deutsches Institut fuer Normung" (Germany Institute for Standardization). Guidelines for practice in Germany.

DISTRIBUTOR NET: The manufacturer's cost to the distributor, prior to distributor markups.

IALD: International Association of Lighting Designers.

IESNA: Illuminating Engineering Society of North America.

IP RATING: International Protection code/rating. A two-digit rating system classifying luminaires according to their protection against the ingress of dust, solid foreign bodies and water.

LEED: Leadership in Energy and Environmental Design. A voluntary, green building rating system, consensus-based national standard for developing high-performance, sustainable buildings developed by members of the U.S. Green Building Council (www.usgbc.org).

LIGHTING DESIGNER (LD) OR LIGHTING CONSULTANT: A trained professional with expertise in preparing documentation for lighting and lighting specification.

LIGHTING FIXTURE SCHEDULE (OR TABLE): Typically an abbreviated summary of lighting products and/or lighting equipment specified for a project with product ordering information identified.

LIRC: Lighting Industry Resource Council.

MANUFACTURER: A fabricator of lighting equipment or control systems, their agents and/or representatives.

QUANTITY SURVEYOR (QS): Cost Estimator.

TENDER: Bid Phase.

UL: Underwriter's Laboratory.

VALUE ENGINEERING: A process of re-evaluating the project design to make cost savings to bring the project into the allocated budget.

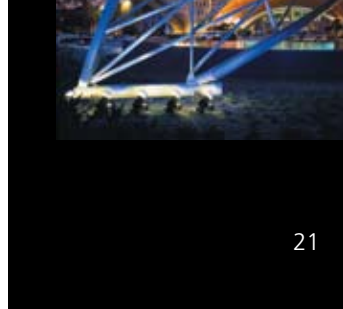
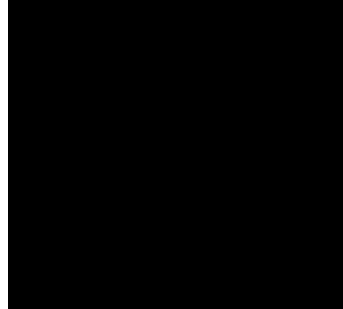
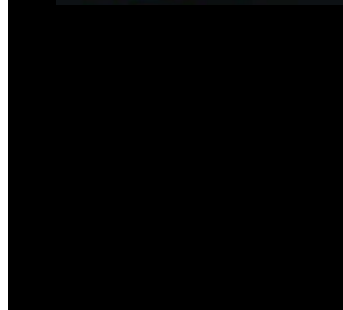
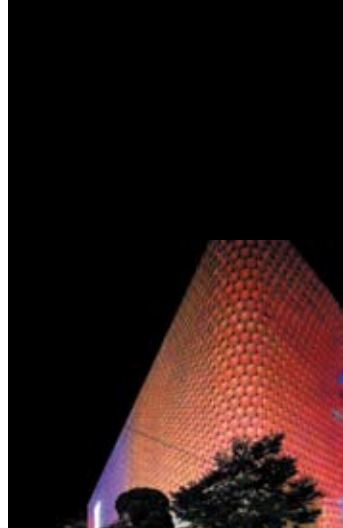


PHOTO AND PROJECT CREDITS

FRONT COVER

LEFT: Hanging Luminaires, Photo by David Levenson

CENTER: Bridge of Aspiration, London, UK; Lighting Designer: Speirs and Major Associates, London, UK; Photo by Edmund Sumner

Right: Jubilee Church, Rome, Italy; Lighting Designer: Fisher Marantz Stone Architectural Lighting, New York, NY, USA; Photo by ERCO Leuchten GMBH

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TOP, CENTER: Magna Science Adventure Center, Rotherham, UK; Lighting Designer: Speirs and Major Associates, London, UK; Photos by Edmund Sumner

BOTTOM: Magna Science Adventure Center, Rotherham, UK; Lighting Designers: Speirs & Majors Associates, London, UK; Photo by Colin Ball

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TOP, CENTER: M39/40 Office Building, Taipei City, Taiwan; Lighting Designer: chroma33 Architectural Lighting Design, Inc., Taipei, Taiwan; Photos by J.K. Yao, IALD

BOTTOM: Berlin Medical Society, Berlin, Germany; Lighting Designer: L-Plan Lighting Design, Berlin, Germany; Photo by Heinrich Hermes + Michael Rohde

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TOP, CENTER, BOTTOM: P3 High-bay Warehouse, Nordrhein Westfalen, Germany; Lighting Designer: Belzner Holmes, Heidelberg, Germany; Photos by ERCO

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TOP: Frost Bank Tower, Austin, Texas, USA; Lighting Designer: Cline Bettridge Bernstein Lighting Design Inc., New York, NY, USA; Photo by Patrick Y. Wong

CENTER: Light + Building Special Exhibit, Frankfurt, Germany; Lighting Designer: Uwe Belzner, Heidelberg, Germany; Photo by Uwe Belzner

BOTTOM: Bridge of Aspiration, London, UK; Lighting Designer: Speirs and Major Associates, London, UK; Photo by Edmund Sumner

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TOP: Golden Moon Hotel and Casino, Choctaw, Mississippi, USA; Lighting Designer: Brilliant Lighting Design, Miami, FL, USA; Photo by Robert L. Daniels, IALD

CENTER: BMW Autocenter, Munich, Germany; Lighting Designer: Gerd Pfarré Lichtplanung, Munich, Germany; Photo by Andreas J. Focke

BOTTOM: First Presbyterian Church, Evanston, IL, USA; Lighting Designer: Schuler Shook, Chicago, IL, USA; Photo by Barry Rustin

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TOP: The Nasher Sculpture Center, Dallas, Texas, USA; Lighting Designer: Arup Lighting, New York, NY, USA; Photo by Alistair Guthrie

CENTER: Rosenthal Center for Contemporary Art, Ohio, USA; Lighting Designer: Office for Visual Interaction, Inc., New York, NY, USA; Photo by Chris Cone

BOTTOM: Modern Art Museum of Fort Worth, Fort Worth, TX, USA; Lighting Designer: George Sexton Associates, Washington, DC, USA; Photo by David Woo

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TOP: MIT Building 7 Renovation, Boston, MA, USA; Lighting Designer: Available Light, Salem, MA, USA; Photo by Edward Jacoby
CENTER: Scottish Parliament, Edinburgh, UK; Lighting Designer: Office for Visual Interaction, Inc., New York, NY; USA; Photo by David Levenson
BOTTOM: NYC Streetlight Winning Entry, New York, New York, USA; Lighting Designer: Office for Visual Interaction, Inc., New York, NY; Diagrams by OVI

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TOP: Modern Art Museum of Fort Worth, Fort Worth, TX, USA; Lighting Designer: George Sexton Associates, Washington, DC, USA; Photo by David Woo
CENTER: Bullring WC's, Birmingham, UK; Lighting Designer: dpa lighting design, Edinburgh, UK; Photo by dpa lighting design
BOTTOM: Minneapolis Convention Center Auditorium, Minneapolis, MN, USA; Lighting Designer: Schuler Shook, Minneapolis, MN, USA; Photo by Myunghwan Cho

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TOP: Montage, Inc., Boston, MA, USA; Lighting Designer: Light This! Architectural Theatrical Lighting Design, Boston, MA, USA; Photo by Daina Yurkus
CENTER: Galleria West, Seoul, South Korea; Lighting Designer: Rogier van der Heide, IALD, Amsterdam, The Netherlands; Photo by Arup Lighting
BOTTOM: Work in concrete; Photo by Niall Hendrie

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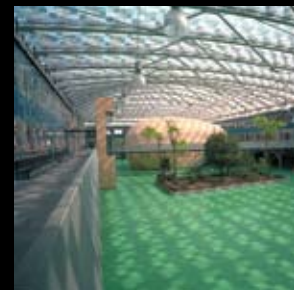
TOP: Galleria West, Seoul, South Korea; Lighting Designer: Rogier van der Heide, IALD, Amsterdam, The Netherlands; Photo by Arup Lighting
CENTER: Pullrose Power Station, Isle of Man, UK; Lighting Designer: Speirs and Major Associates, London, UK; Photo by Speirs and Major
BOTTOM: Morongo Casino Resort & Spa, Palm Springs, CA, USA; Lighting Designer: Visual Terrain, Van Nuys, CA, USA; Photo by Tom Paiva

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TOP: Pier One Imports Headquarters, Fort Worth, TX, USA; Lighting Designer: Cline Bettridge Bernstein Lighting Design, Inc., New York, NY, USA; Photo by John W. Davis, ASPM
CENTER: Kingsdale School, Dulwich, London, UK; Lighting Designer: Fulcrum Consulting, London, UK; Photo by Alex De Rijke
BOTTOM: Crown Fountain, Chicago, IL, USA; Lighting Designer: Schuler Shook, Chicago, IL, USA; Photo by Steve Hall-Hedrich Blessing

BACK COVER

LEFT: NYC Streetlight Winning Entry, New York, NY, USA; Lighting Designer: Office for Visual Interaction, Inc., New York, NY, USA; Rendering by Dbox
CENTER: BMW Autocenter, Munich, Germany; Lighting Designers: Gerd Pfarré Lichtplanung, Munich, Germany; Photo by Andreas J. Focke



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