

Exhibit D: "Project Design Procedures"

CHAPTER 300 PROJECT DESIGN PROCEDURES

Definitions

City of Durham (City) is the Owner of the project.

The Designer is the firm or firms of architects and/or engineers that have a contract with City of Durham for the project.

Project Manager (PM) is the Owner's Representative assigned to the project. The PM works in the Project Management Division of the General Service Department of the City of Durham.

Project Management Division(PMD) is a Division of General Services which is a Department at the City of Durham.

SECTION 301 GENERAL

- A. Project design phases prescribed below are reflective of what would be a "typical" new project in a normal built environment. Public projects are not always typical or in a normal environment so there must be some consideration to adapt the specific submittal requirements to the project. For that reason, please contact the assigned Project Manager (PM) in the Project Management Division (PMD) of the City of Durham General Services Department before proceeding to verify submittal requirements.
- B. It is the Designer's responsibility to determine and show all work required to accurately bid and construct the project. The phrase "As Required" can be extremely problematic during bidding and construction because the Designer has not indicated work required or scope to bid. Likewise "cash allowances" for work not defined are not permitted in public work that requires all work to be bid.
- C. It is clearly stated in the contract documents that the Designer will determine condition/quality.
- D. Verbally describing (that is, using text rather than drawings) requirements in the project manual and requiring the bidder to visit the site and inspect the conditions are not substitutes for graphic drawings detailing the work.
- E. The Designer should ensure that it has a copy of all City of Durham (CITY) and other regulatory agencies, procedural and technical guidelines including site investigations and existing conditions, *prior* to starting design work on the project.
- F. NOTE: PMD PROJECT ID# MUST BE ON ALL DOCUMENTS AND CORRESPONDENCE.

- G. NOTE: IT IS EXPECTED THAT THE DESIGNER HAS DONE A THOROUGH JOB CHECK AND DESIGN TEAM COORDINATION OF DOCUMENTS PRIOR TO EACH SUBMITTAL. IT IS NOT THE ROLE OF PMD TO RESOLVE ALL ERRORS AND OMISSIONS IN THE DESIGNER'S WORK.
- H. If you have any questions regarding submittals, requirements or review issues, please contact the PMD.
- I. If this exhibit requires a service or good to be provided but does not state who will provide it, then it will be presumed that the Designer will provide it.

301.2 REVIEW TIMES

The PMD and Client, Fire Department, for the Project will review each phase of design. The approximate review times for each phase are listed below. For each project, the Designer shall confirm the review timeframes with the PMD prior to setting up the design schedule. These times are calendar days from receipt of submittal until completion of the review for each stage of review required and are to be use by the Designer in estimating project schedules. For each project, the Designer shall confirm the review timeframes with the PMD prior to setting up the design schedule. Additional review times at each phase of design may be required depending on project size.

The times are:

Schematic Design-----	15 days
Design Development-----	15 days
Construction Documents -----	15 days
Final Approval -----	15 days.

Meeting these timeframes will be contingent upon the Designer providing finished, complete submittals as defined by the PMD Construction Manual for each stage of design.

SECTION 302 COMBINED SUBMITTALS

This project will have three separate submittals; Schematic Design (Study and Report Phase); Design Development (Preliminary Design Phase) and Construction Document (Final Design Phase).

SECTION 303 (Not Used)

SECTION 304 GENERAL STATUTE - CHAPTER 133 - PUBLIC WORKS

This chapter (133) of the General Statutes contains important requirements for designers involved in public work. These statutes are commented on most often in **City** design review for compliance. The Designer shall apply all laws that are pertinent to the Designer's services, keeping in mind that laws change from time to time. The Designer's attention is directed to one possible source of General Statutes, which is www.ncleg.net. The summary of five statutes below is not necessarily accurate, complete, or up-to-date, but it gives an idea of some of the current applicable statutes.

Throughout the design process, the Designer shall be mindful of the statutory requirements for specifications to be as competitive as possible in all public work. Although the "owner" is not mentioned in these statutes, if Designers & design professionals are employed by the public entity, they may be subject to compliance as well.

GS133-1 states it is unlawful for Designers to specify products or materials in which they have a financial interest.

GS133-1.1 defines the dollar and scope limits which require architects and engineers to be used on public work. Also refers to requirement for seals all documents.

GS133-2 states it is unlawful for Designers of public work to employ or allow any manufacturer or representative to write, plan or draw any part thereof.

GS133-3 Specifications shall be competitive by using performance specifications or specifying 3 or more brand names. Preferred alternates are permitted and substitutions are allowed prior to bid with Designer approval or disapproval.

GS133-4 Any person, firm or corporation violating GS Chapter 133-3 shall be guilty of a Class 3 Misdemeanor - loss of license to practice profession for 1 year and subject to \$500 fine.

SECTION 305 SCHEMATIC DESIGN PHASE (Study and Report Phase)

A. Not used.

B. When the scope of the project requires a structural and foundation design, the Designer shall initiate a basic soils investigation program and shall select a geotechnical engineering consultant using Qualification Based Selection procedures (subsurface investigation and geotechnical engineering activities are professional services that cannot be bid competitively). The exploration will be arranged and coordinated by the Designer. The contract will be between the Designer and the selected firm and will be paid for by the Designer. The results of the soil investigation shall be provided in a formal report and a copy provided to the PMD with the Schematic Design submittal. *The Designer shall consider the report's recommendations during formulation of the project design, plans and specifications. Mere reference to the report "recommendations" shall not suffice in lieu of properly evaluated and prepared specifications and plans by the Designer.*

C. The Designer shall develop a program and project requirements for the work that meets the City's vision and goals for the project; addresses all internal and external stakeholder input; and maintains the established schedule and budget. The SD process shall include the following major tasks: 1) Project Kickoff Meeting; 2) Visioning session with the City to clarify goals and project budget; 3) Planning meetings to define project scope, budget and construction phasing; 4)

the preparation of a Basis of Design Report (BODR). The BODR shall include the City's goal for energy conservation and energy use; sustainable design and construction including life cycle cost evaluations; and application and suitability of these goals for the particular project. The Designer hereby states that it has included the City's goal for energy conservation and energy use; sustainable design and construction including life cycle cost evaluations; and application and suitability of these goals for this project.

D. A life cycle cost analysis shall be initiated in the DD phase to ensure all preliminary decisions on site issues, orientation (including internal room arrangements) are being optimized to accommodate early life cycle cost decision making for all building systems. The Designer shall use LCCA in all decisions throughout the project design process. A formal analysis shall be provided with the DD submittal. Projects without LCCA report by the DD submittal will not be approved to continue to CD phase.

E. The Designer and its consultants shall confer jointly and with the PMD on the feasibility of various building systems (structural, mechanical, electrical, etc.) to meet the functional and space requirements and any special conditions of the program. A code analysis shall be initiated to confirm that the proposed facility is, at this level of development, within the current NC Building Code.

F. The Designer shall prepare schematic design drawings and other data illustrating the recommended implementation of the program and project requirements. It is essential that consultants for site work, structural, mechanical, electrical, etc., be involved in the early planning process. Submittal of the schematic design phase shall be forwarded concurrently to the PMD and regulatory agencies having jurisdiction such that all reviews are concurrent. The Designer shall forward a copy of the regulatory review comments to the PMD for review and consensus.

G. Please indicate on the transmittal letter any regulatory reviewing agencies receiving copies for review.

H. The Schematic submittal shall include a Basis of Design Report (BODR) which at a minimum provides the following information:

1. A written narrative and general description of the project based on the results of the Internal and External Stakeholder meetings indicating: the final program and project requirements; the vision and goals for the project; and a description of all project elements. The project elements description shall include the proposed construction materials; framing systems; and mechanical, electrical and plumbing systems. CSI/Master Format 2004 outline or narrative specifications are acceptable and desired but **no full specifications** please. They will not be reviewed at this level.
2. A scaled site plan, with a north arrow, showing the location and size of the proposed facility in relation to existing property lines, buildings, roads, walkways, parking and existing utility services. Importance shall be placed on the early determination of the adequacy and availability of all existing utility services. The Designer shall be responsible for examining all existing conditions and reviewing available as-built drawings related to the project.
3. Single line drawings of the proposed floor plan(s) that show the rooms and spaces, including mechanical and electrical rooms, service areas, etc. Rooms shall be identified by name or use for consideration of code implications.
4. A statement of probable construction cost based upon gross area, volume or other appropriate units. Separate line items shall be provided for site work, utility extensions and other items outside the structure. Provide a complete budget summary showing the breakdown of total appropriated funds and all line item funds reflected in the design contract. This is to verify Designer has a clear understanding of the design contract line items and the cost estimate summary.
5. A project implementation plan that includes demolition, utility interruptions, building and site construction and impacts to facility operations.
6. A design and construction schedule for the project. When the construction work is phased, the Designer with input from the City shall develop a construction schedule that

has minimal impact to the operation of the facilities undergoing construction or renovation.

7. Meeting minutes from the Internal and External Stakeholder Meetings.

I. The Designer shall provide a written response to Schematic review comments within a timeframe specified by the PMD. The Designer shall secure written approval from the PMD of the schematic submittal before proceeding into the next phase. PMD approval to move into the next phase of design will be contingent on PMDs receipt and approval. It is important that the Designer does not proceed into the next phase of design without PMD approval. If the submittal does not sufficiently outline the basic elements of the project, it will be returned for further development.

J. The Designer shall provide the following tasks:

- Review existing documentation and deficiency studies;
- Site investigations to verify existing conditions;
- Define and prioritize construction scope;
- Prepare as-built plans and other relevant as-built documents;
- Conduct regular design meetings;
- Prepare preliminary documents defining the design;
- Attend owner and CM meetings to coordinate and resolve value engineering, constructability, construction phasing and scheduling issues in the preliminary design;
- Develop cost model; Reconcile cost model with Construction Manager at Risk construction estimate;
- Update the design schedule.

SECTION 306 DESIGN DEVELOPMENT PHASE

A. Based on the approved schematic submittal, the Designer shall prepare the Design Development Documents, which shall set forth in writing and drawings all basic program elements, systems and materials to be used in the project. The Designer and its consultants shall confer jointly in preparing economic and LCCA studies of various systems and alternatives. Two or more structural, electrical and mechanical systems that are feasible for the project shall be considered and the Designer and PMD shall select the systems that are best suited for the project.

B. The design development submittal shall include but not be limited to the following:

1. A written response to Schematic Design review comments and questions.
2. A Code Summary sheet, Code Appendix B, that includes the basic code analysis and code decisions made supporting the proposed design. See NCSBC-Administration and Enforcement Requirements.
3. A scaled site plan showing in general: topographic information, benchmarks, site drainage and sedimentation control, utility infrastructure, roads and parking, adjacent structures and other site data furnished on the previous submittal. All site plans shall include information relative to flood plain involvement of this project.
4. The soil investigation report and all other reports or studies made for the project shall be considered by the Designer in its design and included in this submittal.
5. Outline specifications with brief descriptions of building systems and materials in CSI Master Format 2004 division format. No full specifications at this stage please. There is insufficient time to review full specifications at DD and again at CD.
6. Scaled architectural floor plans, building cross-sections at appropriate points to show major vertical spaces, and two or more elevations. A typical large-scale wall section detail. Plans must clearly indicate initial results of the building code analysis for the building type such as rated walls, egress and accessibility.
7. Room finish schedule showing basic materials proposed for the floors, walls and ceilings.
8. Structural submittals to include the following: the subsurface soil investigation report and boring logs; the allowable soil bearing pressure and live loads used in the design; a foundation plan showing the basic elements of the foundation and such additional details

and information as necessary to delineate the size, type and probable depth of special foundations (for example, piles or caissons); typical floor framing plan showing size, spacing and type of principal members; a roof framing plan; and the locations of shear walls and/or bracing with such additional details and information as necessary to describe the method of lateral load resistance.

9. Mechanical drawings showing major HVAC equipment rooms and layout; the basic layout of the heating, ventilating and air conditioning distribution system; a schematic of the temperature control systems; schematic diagram of air, hot water and/or steam systems, chilled water and condenser water systems. Rated walls shall be shown on plans.

10. Plumbing drawings showing general development of the plumbing system. The drawings shall show source of water supply and waste disposal termination; water distribution and waste collection plan schematic including fixtures.

11. Fire Protection – Sprinkler drawings showing basic distribution, sprinkler head layout, fire sprinkler room location, and other related elements required for permitting and construction. Indicate source of water and provide a current water pressure and flow test.

12. Electrical drawings: Show the basic electrical service equipment and its location to include: the electrical power distribution components, primary service switches, transformers, generators, main switchgear, motor control centers, and the location of the electrical and telecommunication rooms. Provide single line diagrams of the power distribution systems including primary, secondary and emergency power. Provide similar diagrams for fire alarm, telecommunications, security and all other systems included in the electrical scope of work. An as estimated load summary in KVA rating, the connected load, the demand load and DF are required with this submittal. Electrical floor plans shall show the basic layout of the lighting, emergency lighting, power receptacles, smoke and heat detectors, data/communications outlets or other systems in the project.

13. A statement of probable construction cost using, as a minimum, the CSI MasterFormat 2004, using units such as area, volume, linear feet, tons, BTU/hour, KW requirements, fixtures, etc., taking into consideration the actual systems and materials proposed. Provide a complete budget tabulation summary showing the breakdown of total appropriated funds and line items from the design contract. Site work and utility services shall be shown as separate items.

C. The Designer shall include in the submittal, a description of the engineering rationale leading to the utilization of systems shown on the drawings or described in the outline specifications.

D. Submittal of the completed design development phase shall be forwarded to the PMD, and regulatory agencies having jurisdiction for concurrent review. The Designer shall forward a copy of any regulatory review comments to the PMD for review, consensus and project files.

E. IT IS EXPECTED THAT THE DESIGNER WILL HAVE DONE A THOROUGH JOB CHECK AND DESIGN TEAM COORDINATION PRIOR TO EACH SUBMITTAL. IT IS NOT THE ROLE OF PMD TO RESOLVE SIMPLE ERRORS AND OMISSIONS IN THE DESIGNER'S WORK.

F. The Designer shall secure from the PMD written approval of the design development submittal before proceeding into construction documents. It is important that the Designer does not proceed into the next phase of design without approval from the PMD. If the submittal does not sufficiently outline the basic elements of the project, it will be returned for further development.

NOTE: The Design Development stage is a "hold point" for further approval until all outstanding comments and issues have been complied with or resolved before there is approval to begin Construction Document production. DD Submittals will not be approved when regulatory review comments are extensive, the cost estimate is not within design contract budget, the soils investigation are not provided for the project.

G. The Designer shall provide the following tasks:

- Develop architectural design plans and interior features supporting the design.
- Develop engineering schematics defining the scope of mechanical, electrical, plumbing systems.
- Conduct regular design meetings (a minimum of six meetings per building).
- Develop phasing concepts.
- Attend Owner meetings to coordinate and resolve value engineering, constructability, construction phasing and scheduling issues in the design.
- Prepare outline specifications including completed front-end documents.
- Update cost estimate and schedule;

- Present to local building department to review scope and approach.

SECTION 307 CONSTRUCTION DOCUMENT PHASE

307.1 GENERAL

A. Provide a written response to Design Development review comments. An e-copy of DD review letter can be used to facilitate response letter.

B. Based upon the approved design development submittal, the Designer shall prepare construction drawings and specifications setting forth all the work in detail and prescribing work to be done, including materials; workmanship; finishes; mechanical and electrical systems; special equipment; site work; utility connections and services. Bidding information; proposal, contract and bond forms; General and Supplementary General Conditions of the Contract; and any and all other information and documents required for receiving competitive bids on the project shall be provided and completed. Copies of construction documents shall be simultaneously furnished for review to the PMD and regulatory agencies having jurisdiction.

C. The Designer and his consultants shall retain design calculations for all systems, including structural, special foundations, mechanical and electrical designs and keep same in reproducible form for submittal to the PMD, if requested.

D. The Designer shall receive approval from the PMD that the CD are acceptable prior to bidding the work.

E. The Designer shall perform the following tasks:

Fully develop written specifications defining the contract requirements and level of quality;

Conduct meetings as required to receive owner input for design issues.

Attend Owner meetings to coordinate and resolve value engineering, constructability, construction phasing and scheduling issues in the design;

Submit for Owner and agency review and approval;

Update cost estimate and schedule;

Review cost estimate for reasonableness and compatibility with the Project scope and budget.

307.2 COST ESTIMATES

A cost estimate shall be submitted using Quantity take-offs of major sections of CSI MasterFormat 2004. Overhead, profit, taxes, insurance, etc., shall be included. Estimates must be prepared for all bid items, including alternates. A complete tabulation shall be furnished showing the design contract breakdown of total appropriated and line item funds. The Designer is responsible for bringing the project within the budget as set forth in the design contract. It is essential that accurate and proper construction estimates be developed by the Designer at this stage to avoid the delays and added cost to the City in the event of bids exceeding project funds.

Should the Designer's estimate be over the Construction Funds Available, the PMD suggests the base bid should be established at 90% of the Construction Funds Available with add alternates to 110 % of those funds to permit flexibility and ability to award contracts without negotiating down, which is not advantageous to the owner. An estimate considerably over the funds available cannot be approved for bids unless scope is reduced.

A. On large or time critical projects submittal of 2 complete sets of CD documents for review may reduce the time in review.

B. All forms and document formats required are available from the PMD. As noted below some are simply inserted into the manual and others require editing and modification for use on specific projects. Forms requiring editing will generally include directions and indications as to what needs to be modified or addressed by the Designer.

307.3 PROJECT MANUAL

The project manual shall be complete and contain all the City of Durham's collection of required advertisements, instructions for bidding, general conditions and supplementary general conditions, general requirements, technical specifications, bid forms, other attachments or appendices required, bond forms and construction contract forms and approval pages. The format shall be 8-1/2 x 11 securely side bound.

307. 4 SPECIFICATIONS - GENERAL

A. Divisions: CSI 2004 format is a construction industry standard and in language that shall be used for uniformity and consistency in all City projects.

B. Format for all specifications shall be in narrative or "imperative" form. So-called "streamlined" or "outline" specifications will not be acceptable for CD. Statements shall be complete and concise, in simple language known to the construction trades. Specification content shall relate only to the specific project requirements. Specifications and drawings shall be divided into separate *prime* contracts. The division of responsibility between contracts (such as between food service equipment and plumbing - electrical versus mechanical) shall be carefully coordinated and noted. The specifications shall be customized and tailored to the project.

C. Specifications shall be "typewritten" or printed (without reduction) so long as they are legible and securely bound. Review sets shall be complete with all forms and documents required by the PMD and edited for the project.

D. National standards such as UL, FM, NFPA, MasterSpec, etc. are appropriate.

E. Notice to Bidders and General Conditions is available in electronic form from the PMD.

307. 5 Division 1 - General Requirements

A. Temporary Utilities: Clarify with the PMD whether any City utilities may be used and how. Include any charges to be assessed. Who provides should also be addressed in the Supplementary General Conditions.

B. Alternates: List and describe Alternates to be used. Limit the use of alternates and "owner- preferred" alternates. An excessive number of alternates can discourage bidders as costly to estimate and can over complicate design and construction with errors. Keep the alternates simple and clearly identified in scope and details. If the "base bid" is set at 90% of the project construction funds with add alternates adding up to 110% of funds available, then award of contract may be expedited without time lost on negotiations or "value engineering".

C. Cash allowances are not used in public work, as there is no "competitive bidding" process as required by statute. Estimated quantity allowances are acceptable with a unit price solicitation on the Proposal Form to adjust the actual quantity up or down. Base bid quantities should be carefully estimated to ensure project contingency is not critically depleted.

D. Owner supplied items or work should be fully identified and explained to eliminate duplication and confusion during bidding.

SECTION 308 Technical Specifications – Divisions 1 through 49

SECTION 309 Drawings

309.1.1 Size

- A.** Drawing sheet sizes shall be 24" X36" unless otherwise approved by the PMD.
- B.** All drawings shall be securely edge bound. For convenience or ease of handling, large projects may be submitted as multiple volumes, preferably by GPME discipline.
- C.** Reduced drawings and electronic media are not suitable for review. (Submittals with a very large number of drawings sheets may include an additional half-size set as a useful cross-reference set for reviewers.)
- D.** Complete sets must be provided with each submittal-re-submittal. No single sheets or partial sets are acceptable. If review comments are minor or limited, corrected sheets may be submitted for review compliance and a complete bid set provided later when the project is issued for bids.
- E.** Note: All lettering fonts, notes, schedules and room names should be a minimum of 1/8". Lettering, dimensions, and notes should be clear and concise.

309.1.2 Orientation and Presentation

- A.** All site plans and building plans should have the same orientation on all drawings and all disciplines. Various plan orientations by different disciplines can cause errors and confusion by reviewers and bidders.
- B.** Column lines and designations should be included on all plan sheets, elevations and wall section for orientation and reference between disciplines.
- C.** All site plans and building plans should indicate true north and plan north. A survey benchmark shall be shown locating the building (X&Y) as well as elevation.

309.1.3 Cover Sheet and Titles

- A.** Cover sheet and all drawings shall have project name, Designer and consultants and the PMD Project ID number.
- B.** NCSBC Code Summary sheet shall follow the Cover sheet. This form is required by the State Building Code Volume 1-A- Appendix B to identify all code decisions and information for the project. An electronic template is available from The Department of Insurance.

Section 310 Final Submittal (100% Complete and Ready to Bid)

Final Submittal is not another project review. Final submittal is to review and verify the Designer's written responses to the Construction Document review comments from the PMD and verify that revisions required have been made to the Project documents. Evidence shall also be provided of approval from all regulatory review agencies having jurisdiction. Where Construction Documents submitted incomplete, the final review or Designer responses may generate additional questions or comments. If a Final submittal check shows non-compliance with previous CD review comments or has generated more comments, then a Not Approved is given and a re-submittal may be necessary.

Section 311 Setting of Bid Dates

The Designer in consultation with the PMD shall establish the date for receipt of bids.

Section 312 Record Documents and Final Report

- A.** Record Documents and the Final Report submittal is the conclusion of the construction project. The following are the minimum requirements for the Record Document materials provided to the City.
- B.** “As-Built Drawings” and specifications – The Designer shall correct the original bid/contract plans to include the “As Built Drawings” and specifications provided by the contractor at the end of the project.
- C.** Final documents shall be provided to the City. Prepare as-built documents based on information received from the contractor – printed and digital, in AutoCAD and PDF formats, and BIM if utilized. Submit two bound full size sets, two bound half size sets to General Services, and digital as-built documents on AutoCAD and PDF formats, and BIM if utilized.
- D.** Coordinate and review for compliance contractor closeout documents.
- E.** Present to required departments/agencies for review; Responsible for all State, County, and City permit applications and approvals.
- F.** Certify final application for payment.