Architecture, Engineering, and Construction Division

Standard Plan Documents
Development Standard

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All previous versions of this document are obsolete.

A copy of this document is available for download to Church employees from AEC Client First Contacts SharePoint site located at https://ldsteams.ldschruch.org/team/aem/default.aspx (go to Documents/CAD Standards)

Contact Tom Stonehocker in AEC with questions or suggestions for improvement.

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Introduction

**Guiding Principles:**

*Standards communicate the desired appearance and quality of facilities as established by the presiding councils of the Church and ensure consistency throughout the world.*

Purpose

The purpose of this document is to provide guidance to external consultants regarding outsourced Physical Facilities Department (PFD) work.

Audience

The audience for this document includes professional consultants external to The Church of Jesus Christ of Latter-day Saints Physical Facilities Department (PFD). Consultants may include but are not limited to:

- Architects
- Engineers
- Landscape architects
- Contractors
- Other sub-consultants

Scope

This guide provides the outsourcing standard for developing architectural, engineering, and landscape design and documentation for projects and standard plans. All parties that provide service to the Architecture, Engineering & Construction Division (AEC) are expected to follow the standards in this and the AEC CAD Standard documents. (Refer to document: AEC CAD-STD 2009)

CAD System

The required software used to perform these production services may include:

- AutoCAD® or AutoCAD® Architecture by Autodesk® Release 2006 or later, and or,
- REVIT® Architecture, REVIT® Structure, and REVIT® MEP by Autodesk® Release 2009 or later.
- Other design and production software as identified in the following individual sections.

The software applications used to provide drawings and other project deliverables are to be selected by the Project Manager and the consultant in accordance with this guideline and as appropriate for the scope and complexity of the project being undertaken.
Landscape/Irrigation Drawings Standard

Drawings Standard

Follow the AEC CAD Standard for creation of contract drawings. Ensure new projects maintain a high level of consistency and appearance with other similar projects. AEC will provide similar project documents for reference.

- Draw all plans in the set at a minimum scale of 1”=20’-0” (2.54 cm=609.6 cm).
- Develop landscape and irrigation drawings to comply with the fifteen (15) landscape style option eco-regions identified and described in the Design Guidelines- U.S. and Canada. Contact AEC to obtain a copy of the guideline. Develop separate planting and irrigation plans for each eco-region. These plans function as examples for the development of site specific plans on site adaptation projects.
- Include the following in the planting plan:
  - Planting Layout
  - Plant Material Legend
  - Design Criteria and Landscape Data Tables
  - Sample Planting Notes
  - Instructions to the landscape architect for the eco-region option
  - Plant Coverage Table
  - Eco-region Map [www.epa.gov](http://www.epa.gov)
- Include the following in the Irrigation plan:
  - Irrigation Layout
  - Irrigation Legend
  - Sample Irrigation Notes
  - Irrigation Coverage Requirements
  - Irrigation Flow and Pressure Calculations?
- Develop details and specifications to best accommodate each eco-region set of drawings.

Miscellaneous

Conduct an initial conference between the landscape architectural consultant and the AEC landscape architect to review the drawing methodology and expectations.

Submittals

Submittals for Drawings, Details and Specifications:

- 50% DD (50% Design Development Phase, also). For meetinghouses and Seminary and Institute (S&I) projects, the landscape architectural consultant is responsible for this phase, which includes:
  - Conceptual sketches, if and when, appropriate and useful
  - Landscape/Irrigation studies, if and when appropriate and useful
• 100% DD (100% Design Development Phase):
  o Preliminary planting/irrigation drawings
  o Typical specification (created from standard specifications provided by AEC)

• 50% CD (50% Construction Document Phase):
  In progress landscape/irrigation drawings
  o Landscape planting plan
  o Irrigation plan
  o Miscellaneous details
  o Coordination of disciplines report
  o In progress landscape/irrigation specifications (created from standard specifications provided by AEC - Division 31 and 32 – Sitework (as needed))

• 95% CD (95% Construction Documents Phase):
  In progress landscape/irrigation drawings
  o Landscape planting plan
  o Irrigation plan
  o Miscellaneous details
  o Coordination of disciplines report
  o In progress landscape/irrigation specifications (created from standard specifications provided by AEC - Division 31 and 32 – Sitework (as needed))

• 100% CD (100% Contract Documents Phase):
  Complete landscape/irrigation drawings
  o Landscape planting plan
  o Irrigation plan
  o Miscellaneous details
  o Complete landscape/irrigation specifications (created from standard specifications provided by AEC - Division 31 and 32 – Sitework (as needed))
Architectural Drawings Standard

Drawings Standard

Follow the AEC CAD Standard to create contract drawings. Ensure new projects maintain a high level of consistency and appearance with other similar projects. AEC will provide similar project documents. Ensure that gridlines are included on all plans in new project drawing sets. Coordinate with gridlines of other disciplines.

The Church’s Standard Plan documents are provided for reference and establish the standard for:
- Complexity of deliverables
- Drawing set organization and format
- Sheet detail
- Discipline coordination

Miscellaneous

For standard plan development, conduct an initial conference between the architect, his consultants, and the AEC project team to review the drawing methodology and expectations.

Submittals

Submittals for drawings, calculations and specifications:

- 50% DD (50% Design Development Phase).
  - Code analysis information including building capacity, exiting and restroom requirements, occupancy type, construction type, etc.
  - Complete plans, exterior elevations and preliminary building sections.
  - Preliminary coordination with mechanical (including HVAC, plumbing and fire protection), electrical, and structural
  - Presentation graphics for approvals as required (see Architectural Rendering Standards in this document)
  - Preliminary or schematic specifications

- 100% DD (100% Design Development Phase):
  - Updated code analysis information
  - Complete plans and elevations, refined building sections.
  - Complete layout for architectural sheets for CD phase.
  - Draft of specification for architectural items and coordination of all specification sections (created from standard specifications provided by AEC).

Presentation graphics for approvals as required (see Architectural Rendering Standards in this document)

- 50% CD (50% Construction Document Phase):
  - Updated code analysis.
• In progress architectural drawings
  ▪ Floor plans
  ▪ Roof plans and details
  ▪ Mechanical access plan and details
  ▪ Reflected ceiling plan and details
  ▪ Building elevations
  ▪ Building sections
  ▪ Enlarged plans and interior elevations
  ▪ Details
  ▪ Finish plans
  ▪ Preliminary finish, door and window schedules
  ▪ Steeple elevations, sections and details
  ▪ Wall types and wall types floor plan
  ▪ In progress specifications (created from standard specifications provided by AEC)
    ▪ All architecture related sections
    ▪ Coordination with other disciplines

• 95% CD (95% Construction Documents Phase):
  o Updated code analysis.
  o In progress architectural drawings
    ▪ Floor plans
    ▪ Roof plans and details
    ▪ Mechanical access plan and details
    ▪ Reflected ceiling plan and details
    ▪ Building elevations
    ▪ Building sections
    ▪ Enlarged plans and interior elevations
    ▪ Details
    ▪ Finish plans
    ▪ Preliminary finish, door and window schedules
    ▪ Steeple elevations, sections and details
    ▪ Wall types and wall types floor plan
    ▪ In progress specifications (created from standard specifications provided by AEC)
      ▪ All architecture related sections
      ▪ Coordination with other disciplines

• 100% CD (100% Contract Documents Phase):
  o Updated code analysis.
  o Completed architectural drawings
    ▪ Floor plans
    ▪ Roof plans and details
- Mechanical access plan and details
- Reflected ceiling plan and details
- Building elevations
- Building sections
- Enlarged plans and interior elevations
- Details
- Furnishings plans
- Completed finish, door and window schedules
- Steeple elevations, sections and details
- Wall types and wall types floor plan
- Completed specifications (created from standard specifications provided by AEC)
  - All architecture related sections
  - Complete coordination with other disciplines
Architectural Rendering Standard

Quality Standard

Ensure renderings for the Church’s meetinghouse projects are high quality and photo realistic. The intention of AEC is to provide information to the approving bodies which is accurate and reflects the building design intention as if in a real world situation.

Software

Software used to produce renderings can include the following: Form Z®, Cinema 4D®, 3D Studio Max®, Lightware 3D®, Maya® or equivalent as approved by AEC. You may use other software such as Photoshop® or Paint Shop Pro® to enhance and provide final renderings.

Models

The project’s outsource architect usually provides the models. The architect should provide models in a format compatible with the software listed above, usually a 3D Studio format.

Textures / Materials

Render all building material accurately. Represent material scale and color as closely as possible to the design options for actual building materials. Material tiling is acceptable as long as the “tiles” are imperceptible. The architect may provide a palette of materials for work with all church projects.

Scene

Ensure that project scenes reflect a real world site and landscape. Scenes for meetinghouse projects should reflect a site along the Wasatch Front. Include appropriate landscape for the Wasatch Front landscape option in the rendering. Carefully consider the scene to maximize the appeal and presentation of the building. Agree on view angles, lighting, materials and etc with AEC personnel.

Lighting

Lighting is critical in rendering accurate model presentations. A three light source rendering provides the minimum required reality for a scene. Consider using this type of lighting to develop preliminary renderings. The preferred lighting method is Global Illumination, with an appropriate number of ray traces, reflections and occlusions.

Output

Create preliminary renderings at 640 x 480 pixels at 72 pixels per inch with a film aspect ratio of 4:3. Create final renderings at 24” x 36” at 300 pixels per inch – suitable for printing at high resolution.
Structural Drawings Standard

Drawings Standard

- Follow the AEC CAD Standard to create contract drawings. Ensure new projects maintain a high level of consistency and appearance with other similar projects. AEC will provide similar project documents for reference.
- Ensure that gridlines are included on all plans in new project drawing sets. Coordinate with gridlines of other disciplines.
- Consult the Church’s Standard Plan documents which provide a reference and establish the standard for:
  - Complexity of deliverables
  - Drawing set organization and format
  - Sheet detail
  - Discipline coordination
- Set up all drawings so that they are easily adjusted to accommodate different structural criteria.
- Include the structural information in the structural drawings to simplify the design, site adapt and construction process. Minimize structural information of other disciplines in the drawings. To avoid coordination errors, show structural items but do not call them out in the drawings of other disciplines.

Miscellaneous

For standard plan development, conduct an initial conference between the structural engineering consultant and the AEC structural engineer to review the drawing methodology.

Submittals

Submittals for Drawings, Calculations and Specifications:

- 50% DD (50% Design Development Phase). For meetinghouses and S&I projects, the structural consultant is responsible for this phase:
  - Schematic calculations, if and when, appropriate and useful
  - Sketches and diagrams, if and when, appropriate and useful
  - Structural systems studies, if and when appropriate and useful
- 100% DD (100% Design Development Phase):
  - Preliminary structural design calculations
  - Preliminary framing drawings
  - Complete layout of structural sheets for CD phase
  - Typical detail sheets
  - Coordination of disciplines report
  - Draft of specification for structural items (created from standard specifications)
• 50% CD (50% Construction Document Phase):
  o In progress design calculations
  o In progress structural drawings
    ▪ Structural notes
    ▪ Dimensioned Foundation plans
    ▪ Floor framing plans
    ▪ Roof framing plans
    ▪ Foundation schedules and details
    ▪ Floor framing schedules and details
    ▪ Roof framing schedules and details
    ▪ Wall framing schedules and details
    ▪ Columns schedules and details
    ▪ Miscellaneous details
  o Coordination of disciplines report
  o In progress structural specifications (created from standard specifications provided by AEC)
    ▪ Division 3 – Concrete (as needed)
    ▪ Division 4 – Masonry (as needed)
    ▪ Division 5 – Metals (as needed)
    ▪ Division 6 – Wood and plastics (as needed)
    ▪ Division 31 and 32 – Sitework (as needed)

• 95% CD (95% Construction Documents Phase):
  o In progress design calculations
  o In progress structural drawings
    ▪ Structural notes
    ▪ Dimensioned Foundation plans
    ▪ Floor framing plans
    ▪ Roof framing plans
    ▪ Foundation schedules and details
    ▪ Floor framing schedules and details
    ▪ Roof framing schedules and details
    ▪ Wall framing schedules and details
    ▪ Columns schedules and details
    ▪ Miscellaneous details
  o Coordination of disciplines report
  o In progress structural specifications (created from standard specifications provided by AEC)
    ▪ Division 3 – Concrete (as needed)
    ▪ Division 4 – Masonry (as needed)
    ▪ Division 5 – Metals (as needed)
    ▪ Division 6 – Wood and plastics (as needed)
- Division 31 and 32 – Sitework (as needed)

- 100% CD (100% Contract Documents Phase):
  - Complete structural design calculations
  - Complete structural drawings
    - Structural notes
    - Foundation plans
    - Floor framing plans
    - Roof framing plans
    - Foundation schedules and details
    - Floor framing schedules and details
    - Roof framing schedules and details
    - Wall framing schedules and details
    - Columns schedules and details
    - Miscellaneous details
  - Complete structural specifications (created from standard specifications provided by AEC)
    - Division 3 – Concrete (as needed)
    - Division 4 – Masonry (as needed)
    - Division 5 – Metals (as needed)
    - Division 6 – Wood and plastics (as needed)
    - Division 31 and 32 – Sitework (as needed)
Structural Calculations Standard

Quality Standard

Ensure that standard calculations are complete and easily adjusted to sites for which the standard structural criteria differ. The standard structural criteria and guidelines are found in the AEC Structural Design Guidelines. The standard guidelines vary from project type to project type, but the calculations should maintain a high level of consistency and appearance among project types.

Software

Use either MathCAD® or Excel® to create the full set of structural calculations. Ensure that the layout and methodology of the structural calculations is similar to the structural calculations currently provided by AEC. Headers, footers, text size and color should mirror the format in the MathCAD calculation files available from AEC.

- Standard MathCAD calculation files for all project types are available for direct use by the structural engineer. Many different design “modules” for design are already developed and available for use. The structural engineer should check the calculations and make any necessary updates.
- Excel calculation files are not currently available but you can readily develop them from the available MathCAD calculation files and “modules”. Some Excel “modules” for design are already developed and available for use. Check and update these files as needed. Set up the calculations so that cells requiring input are unprotected and filled with a yellow background.
- Develop the entire set of calculations to ensure that users can readily adjust significant design factors and so that the analysis automatically updates. Do not use calculations you cannot adjust. Do not use PDF’s as a form of calculation unless the program used to generate the PDF is included in the calculations. Some of the many significant design factors that can change from site to site are:
  - Allowable soil bearing pressures
  - Roof snow and snow drift loads
  - Roof dead loads
  - Wind loads
  - Seismic Loads
  - Wood species and allowable stresses
  - Masonry allowable stresses
  - Steel allowable stresses
  - Concrete allowable stresses

Review the available standard MathCAD calculation files to identify other design factors that require adjustable calculations.
Miscellaneous

- For standard plan development, conduct an initial conference between the structural engineering consultant and the AEC structural engineer to review the calculation methodology.
- Consideration of overall project economy is extremely important. Use the most cost effective materials and methods available.
- Provide calculations at the different project design stages.
- In general, structural calculations should include the following:
  - Design Criteria:
    - Basis of design, including assumptions
    - Building codes used
    - List of live loads, snow loads, and similar design loads
    - Seismic design factors
    - Wind design factors
    - Soils assumptions used
    - List of structural materials used and allowable or ultimate stresses used
    - Special inspection requirements
  - Member location plans for roof, floors, etc
  - Vertical load analysis and design:
    - Roof structure
    - Floor structure
    - Framing structure
    - Columns
    - Walls
  - Lateral load analysis and design for seismic/wind forces
  - Foundation analysis and design
Civil Calculations Standard
(Not required for standard plan projects.)

Quality Standard

Provide complete calculations that are easily reviewed by peers, the authority having jurisdiction, or AEC.

Miscellaneous

Along with typical analysis required for calculation completion, the calculations must include items noted in the AEC Civil Engineering Design Guidelines and conform to the Church’s standard civil calculations format (see attached).
Mechanical Drawings Standard

Drawings Standard

- Follow the AEC CAD Standard to create contract drawings. Ensure projects maintain a high level of consistency and appearance with other similar projects. AEC will provide similar project documents.
- Ensure that gridlines are included on all plans in new project drawing sets. Coordinate with gridlines of other disciplines. Set up all drawings so that they are easily adjusted to accommodate different mechanical criteria.
- Include the mechanical information in the mechanical drawings to simplify the design, site adapt and construction process.

Miscellaneous

For standard plan development, conduct an initial conference between the mechanical engineer, his or her consultants and the AEC project team to review the drawing methodology and expectations.

Submittals

Submittals for drawings, calculations and specifications:

- 50% DD (50% Design Development Phase).
  - Schematic plumbing plans
  - Schematic mechanical plan
  - Fire riser location and fire department connection
  - Fire riser room with outside access
  - Coordination of disciplines report

- 100% DD (100% Design Development Phase):
  - Completed plumbing plan and schematics
  - Completed gas line schematic
  - Building waste and water fixture count
  - Schematic fixture schedule
  - Completed mechanical load calculations
  - Schematic mechanical plan showing single line duct work and equipment location
  - Schematic equipment schedules
  - Schematic identification of wet and glycol loop fire sprinkler system
  - Schematic fire protection system
  - Coordination of disciplines report

- 50% CD (50% Construction Document Phase):
o Plumbing plans completed
o Plumbing isometrics 50% complete
o Large scale plumbing plans 50% completed
o Plumbing fixture schedule completed
o Plumbing details completed
o Fire protection plans completed (dependant on completion of reflected ceiling plan)
o Fire protection sections 50% completed
o Fire protection details completed
o Mechanical duct work plans 50% completed
o Mechanical sections 25% completed
o Mechanical details 50% completed
o Equipment schedules 75% completed
o Temperature control plan completed
o Mechanical, Plumbing Fire Protection Specification 50% completed
o Heating and cooling load calculation space input data completed
o Coordination of disciplines report

• 95% CD (95% Construction Documents Phase):
  o Plumbing plans 100% completed
  o Plumbing isometrics 100% complete
  o Large scale plumbing plans 100% completed
  o Plumbing fixture schedule 100% completed
  o Plumbing details 100% completed
  o Fire protection plans 100% completed
  o Fire protection sections 100% completed
  o Fire protection details 100% completed
  o Mechanical duct work plans 100% completed
  o Mechanical sections 100% completed
  o Mechanical details 100% completed
  o Equipment schedules 100% completed
  o Control plan 100% completed
  o Control details and conduit/wiring diagrams 100% completed
  o Mechanical, plumbing, fire protection specification 100% completed
  o Load Calculations 100% completed
  o Coordination of disciplines report

• 100% CD (100% Contract Documents Phase):
  o Completed and coordinated fire protection, plumbing, mechanical and control drawings
    i. Completed heating and cooling load calculations
    i. Completed HVAC equipment notes
    i. Completed mechanical equipment cut sheets
    i. Completed diffuser and grille noise evaluation (NC) based on CFM’s
(value to be NC 25 or less)

- Duct static pressure loss calculations
- Completed fire sprinkler hydraulic analysis based on assumed standard plan condition (When applicable)
- Completed specification
- Exhaust fan selection and design notes
- Plumbing fixture count, pipe sizing (water and gas), water heater selection/sizing notes
- Load calculations e-mailed in HAP format for import and storage
Mechanical Calculations Standard

Mechanical Calculations

The consultant should obtain and understand Carrier’s Hourly Analysis Program (HAP). Perform all load calculations using the latest version of Carrier’s HAP program.

Documentation

Include the following general reports and place them in a folder marked “Input Data”:

- DOOR DATA
- ROOF DATA
- SCHEDULE DATA
- SPACE INPUTS
- WALL DATA
- WEATHER DATA
- WINDOW DATA

Include the following system/zone reports and place them in a folder marked “Zone #.” Create a separate folder for each zone (Zone 1, Zone 2, etc.)

- SYSTEM INPUT DATA
- AIR SYSTEM SIZING SUMMARY
- ZONE SIZING SUMMARY
- AIR SYSTEM DESIGN LOAD SUMMARY
- ROOM CFM

Include the Word documents described below. Modify these documents to match the particular standard plan project represented (Heritage, Legacy, etc.). Samples of these three (3) forms are included.

- Guidelines for Consultant Engineer
- Heating/Cooling Load Calculation cover sheet
- Explanatory Notes
Electrical Drawings and Calculations Standard

Drawings Standard

- Follow the AEC CAD Standard to create contract drawings. Ensure new projects maintain a high level of consistency and appearance with other similar projects. AEC will provide similar project documents.
- Ensure that gridlines are included on all plans in new project drawing sets. Coordinate with gridlines of other disciplines.
- Provide Electrical Calculations

For standard plan development, conduct an initial conference between the architect, his or her consultants and the AEC project team to review the drawing methodology.

- Lighting calculations
- Interrupting capacity calculations
- Voltage drop calculations
- Energy code compliance calculations

Submittals

- 50% DD (50% Design Development Phase):
  - Preliminary lighting layout
  - Preliminary power distribution layout
  - Main electrical panel located
  - Coordination of discipline report

- 100% DD (100% Design Development Phase):
  - Preliminary lighting plan
  - Preliminary power plan
  - Preliminary telephone/data plan
  - Preliminary lighting calculations
  - Preliminary lighting fixture schedule
  - Preliminary mechanical equipment schedule
  - Preliminary power single line diagram
  - Preliminary fire detection and alarm system riser diagram
  - Preliminary lightning protection system plan
  - Coordination of disciplines report

- 50% CD (50% Construction Document Phase):
  - Lighting calculations completed
  - Lighting plans 50% completed
- 95% CD (95% Construction Documents Phase):
  - Lighting plans 100% completed
  - Lighting fixture schedule 100% completed
  - Power plans 100% completed
  - Telephone/data plan 100% completed
  - Fire detection and alarm plan 100% completed
  - Lightning protection plan 100% completed
  - Mechanical equipment schedule 100% completed
  - Panel schedules 100% completed
  - Single line diagram 100% completed
  - Load tabulation table 100% completed
  - Coordination with mechanical and control plans 100% completed
  - Coordination with sound, television and satellite plans 100% completed
  - Electrical and fire detection and alarm specifications 100% completed

- 100% CD (100% Contract Documents Phase):
  - Completed electrical, fire detection and alarm, and lightning protection drawings
  - Completed lighting calculations
  - Completed electronic copy of lighting fixture cut sheets and printed copies in binder
  - Completed interrupting capacity calculations for main panel and all equipment fed from main panel
  - Completed voltage drop calculations
  - Completed energy code compliance calculations
  - Completed electrical and fire detection and control specifications
Sound Drawings Standard

Drawings Standard

Follow the AEC CAD Standard to create contract drawings. Ensure that new projects have a high level of consistency and appearance with other similar projects. AEC will provide projects which are similar.

Miscellaneous

For standard plan development, conduct an initial conference between the architect, his or her consultants and the AEC project team to review the drawing methodology.

To review the methodology of the sound, acoustical, and satellite aspects of the design, conduct an initial conference between the architect, and his consultants and the AEC project team.

- Wall shapes and finishes
- Ceiling shapes and finishes
- Power and cooling requirements for sound and video equipment locations
- Speech privacy methodology
- HVAC and other systems needing noise control
- Isolation from outside noise sources
- Preventing community noise problems

- 50% DD (50% Design Development Phase):
  - Preliminary speaker and microphone layouts
  - Satellite dish location
  - Sound and video equipment racks located
  - Preliminary systems block diagrams
  - HVAC and other systems noise control methodology
  - Methodology for isolation from outside noise sources
  - Methodology for preventing community noise
  - Coordination of disciplines report

- 100% DD (100% Design Development Phase):
  - Sound and Satellite equipment selection
  - Acoustical panel selection
  - Ceiling acoustical materials selection
  - Final wall and ceiling shapes determined
  - Acoustical estimates for chapel and cultural center RT60 and speaker coverage
• Coordination of disciplines report
• Review design with Church Musical Instrument Selection Committee if required.

• 50% CD (50% Construction Document Phase):
  • Speaker and microphone layouts 50% completed
  • Satellite dish location determined
  • Sound and A/V equipment racks located
  • Preliminary systems block diagrams
  • Coordination with electrical 50% completed
  • Coordination with ICS 50% completed
  • Coordination with mechanical 50% completed

• 95% CD (95% Construction Documents Phase):
  • Sound and Satellite equipment riser completed
  • Acoustical panel selection completed
  • Coordination with electrical 100% completed.
  • Coordination with ICS 100% completed
  • Single line diagram 100% completed

• 100% CD (100% Contract Documents Phase):
  • Confirm any changes have been addressed
  • Confirm details and sheet number references are correlated between architectural and acoustical
  • Confirm details and sheet number references are correlated between mechanical and acoustical
  • Confirm details sheet number references are correlated between electrical and acoustical
  • Completed electronic copy of sound product cut sheets and printed copies in binder
Cost Estimating Standard

(This section is targeted at the development of a standard plan, not a site-specific project.)

Preliminary Cost Estimate

After the architect prepares the design development documents and the owner approves them, the construction estimator prepares a detailed estimate of the above slab building costs with supporting data, and presents them for the architect’s review and owner’s approval.

Interim Cost Estimates

During the preparation of the construction documents the construction estimator updates and refines this estimate at appropriate intervals agreed to by the owner, architect and construction estimator. If any estimate submitted to the owner exceeds previously approved estimates or the owner’s budget, the construction estimator makes appropriate recommendations to the owner and architect.

Final Cost Estimate

When the drawings and specifications are sufficiently complete, the construction estimator prepares a final estimate of above slab building costs, summarized on the Physical Facilities Schedule of Values form, with detailed backup.

Basis of final Estimate

The construction estimator includes with the final estimate, a written statement of its basis, which consists of:

1. A list of the drawings and specifications used in the preparation of the final estimate.
2. A list of clarifications and assumptions made by the construction estimator in the preparation of the final estimate.

Software

The construction estimator should provide cost estimates in a Microsoft Excel spreadsheet. A copy of the spreadsheet template is available through AEC.
Specifications Standard

Quality Standard

- Standard specification for Church projects used in USA and Canada.
- Procurement documents that include the general conditions, supplementary conditions, bid forms, instructions to bidders and agreements are provided by the Church and are not part of the contract.
- Standard specifications should follow the MasterFormat 2004 by The Construction Specifications Institute for Master List of Numbers and Titles for the Construction Industry.
- Standard specifications should follow The Construction Specifications Institute uniform format for organizing specification text within specification sections contained in a project manual.
- Standard specifications should meet Church specifications. Use the same specification section names and numbers for existing sections used in the project manual.
- Standard specifications should not have site specific and unique individual project requirements. Supplemental specifications will be provided and are not part of the scope of this contract.
- Specification standards should be the same for all contracting engineering disciplines.
- Specifications in the project manual should not conflict with Division 01 requirements. Division 01 requirements should exist only in the Division 01 sections and not in the specification sections.
- Coordinate the Table of Contents with all disciplines and only those sections found in the Project Manual. Supplement sections are in hidden text. Instructions for dealing with hidden text can be obtained from Gail Olsen in AEC.

Software

Use Microsoft Word to create the full set of specifications or additional specification sections.

Division 01

- Do not add information to any technical specification section that repeats or conflicts with the provisions in Division 01.
- Do not make any change to Division 01 that changes owner's procedures.

The following are sections in Division 01. Do not change information in any section of the project manual that conflicts with Division 01 requirements.

Section 01 1200 MULTIPLE CONTRACT SUMMARY.

- The owner may issue separate contracts for operations scheduled to precede and
complete before beginning the work under this contract. These contracts are outside the scope of updating the specifications. Do not change any specification section that conflicts with this contract.

- Owner has issued or will issue separate contracts for operations scheduled to complete between Notice to Proceed and Substantial Completion. These contracts are outside the scope of updating the specifications. Do not change any specification section that conflicts with this contract.

- Owner has issued or will issue separate contracts for operations normally scheduled to follow Substantial Completion. These contracts are outside the scope of updating the specifications. Do not change any specification section that conflicts with this contract.

Section 01 3100 PROJECT MANAGEMENT AND COORDINATION

- Do not change the requirements of mandatory and non-mandatory Preconstruction Conferences.

- Many sections of the project manual refer to a mandatory preconstruction conference as outlined in Section 01 3100. If there are in any technical sections of the project manual where a conference can help ensure system and materials quality specified for that section, request this additional conference through AEC.

Section 01 4301 QUALITY ASSURANCE: GENERAL

- Where the heading 'VMR (Value Managed Relationship) Suppliers / Installers' identifies a list of specified suppliers and installers, the owner has established relationships that extend beyond the requirements of this project. No other suppliers or installers are acceptable. Follow the specified procedures to preserve the relationships between the owner and the specified suppliers and installers and the advantages that accrue to the owner from those relationships.

- Where the heading 'Acceptable or Approved Suppliers / Installers / Fabricators' identifies a list of specified suppliers, installers, and fabricators, use only one of the listed suppliers, installers and fabricators. No other suppliers, installers or fabricators are acceptable.

- Acceptable, approved, suppliers and installers have restrictions on sub-bids which the contractor may accept. Do not make any changes without submitting a request and receiving approval for the change.

Section 01 6200 PRODUCT OPTIONS

- Submit products equal to those specified by the owner to AEC for approval prior to including them in the specification.

- Bring any problems or deficiencies with owner specified products to the attention of AEC.

- Use only the products, systems, etc. specified in the final project manual. There is no 'approved list' of products, systems, etc, acceptable for use on owner's projects.

- Do not change in any section of the project manual that changes Category One
through Category Four requirements in the Approved Products / Manufacturers / Suppliers / Installers section.

- Do not change the Acceptable Products / Manufacturers / Suppliers / Installers in any section of the project manual without first submitting a request and receiving approval for a product evaluation. Document the reason for the change in the request.
- Do not change the Quality / Performance Standard Products / Manufacturers in any section of the project manual without first submitting a request and receiving approval for a product evaluation. Document the reason for the change in the request.
- Specify at least two and preferably three products or manufacturers when requesting approval for a change in Products / Manufacturers / Suppliers / Installers.
- Do not change in any section of the project manual that conflicts with the substitutions and equal products requirements.

**Section 01 6400 OWNER FURNISHED PRODUCTS**

- Do not change in any sections of the project manual that conflict with owner furnished products.
- Furnishings are not in the contract and are noted as such on drawings and in the specifications.

**Section 01 7800 CLOSEOUT SUBMITTALS**

- Do not change in any section of the project manual that conflicts with the closeout submittals process as outlined in Section 01 7800. Update each section of the product manual to reflect any changes.

**Editing Specification Sections**

- Record all revisions to the specification in the modification log with a date, the person who made the change, and a brief description of the change. The log is in hidden text.
- Do not delete procedural notes. Procedural notes contain coordination and design information and background information. Do not change information in these notes, but suggest changes or additional information to help clarify information for each section. These notes are not hidden text.
- Do not delete architect notes. Architect notes assist with editing the specification for individual projects. As with procedural notes, suggest changes or additional information to help with editing. These notes are not hidden text.
- Follow CSI MasterFormat recommendations for any changes. Each specification uses CSI MasterFormat section and page format.
- Follow the standard for adding additional dimensions. Dimensions are given in imperial and metric units specifically for projects in Canada.
- Do not change the header and footer.
- Do not change the font type, size, and color.
• Follow and match the existing format and style for any new specification sections.

Standard Plan Modules

• Do not delete any reference to module additions to standard plans.
• Use architect notes in the specifications to identify and make editing clear for unique module specification items.
• Ensure that any module changes do not conflict with specifications for the standard plan.
• Coordinate door, window and finish schedule if there are any changes.
• Coordinate door hardware and keying if there are any changes.

50% Review

• Evaluate drawings for any changes that affect the specifications.
• Identify new materials or products.
• Submit for product evaluation.
• Check the specification submittal folder for any provided additions. These sections will be renamed and added to the Table of Contents.

90% Review

• Ensure specifications are submitted in electronic form for review.
• Verify that specifications include all discipline specifications for review.
• Incorporate any approved changes into the specifications.
• Ensure specifications match drawings changes.
• Coordinate finish schedule items with specifications.
• Coordinate door schedule with floor plan.

100% Review

• Coordinate specifications with the drawings.
• Ensure the Table of Contents matches the specifications in the project manual.
• Submit all specifications in a folder on a disk with all the specifications sections listed in the Table of Contents. Include supplemental specifications in a separate, clearly identifiable folder.
• Update the specification modification log for each specification section changed.
• Incorporate all project objectives and changes into the specifications.
• Follow AEC Guidelines.