Clinical Engineering

Medical Equipment Planning Process
For Hospital Construction Projects

6/17/10
INTRODUCTION

Clinical Engineering (CE) has developed the capability to perform a wide spectrum of services for the planning, management and coordination of equipment for construction projects. Our in-house presence and knowledge of standardized medical equipment in the medical center allows us to identify and provide appropriate services at the right time, with special emphasis on equipment management including equipment programming, technology assessment and budget control. CE’s focus on equipment costs, time factors, standardization and quality will assure the maximum value for project dollar spent.

CE will perform following support services:

PHASE I - PLANNING

• Equipment inventory (Renovation/Expansion Projects only)
• Equipment programming and budget analysis
• Equipment specifications
• Division 11 equipment specifications (For Fixed Medical Equipment Only)

PHASE II - PROCUREMENT MANAGEMENT

• Equipment bidding support in collaboration with SCM.
• Equipment procurement initiation in collaboration with SCM.
• Equipment delivery scheduling and coordination
• Receiving, staging and installation management
• Conducting medical equipment incoming inspections
• Coordinating medical equipment training
EQUIPMENT INVENTORY

THE OBJECTIVE

- To provide an accurate listing of existing fixed and major moveable equipment as well as minor equipment.

THE PROCESS

1. Clinical Engineering will contact clinical users to confirm specific equipment inventory guidelines. These guidelines will address issues such as condition assessment, and any other issues specific to the project. The scheduling of the on-site inventory will also be addressed.

2. CE will perform a physical inventory on a room-by-room basis within each department identified within the scope of the project. This inventory will occur in the very preliminary stage of the project.

3. CE will identify equipment according to description, quantity, manufacturer and model, and provide an objective evaluation of the physical condition of the equipment, based on input from department personnel, CE, and general appearance. Condition evaluation categories will be as follows: E - Excellent condition - definite re-use; G - Good condition - probable re-use; F - Fair condition - marginal re-use; P Poor condition - not to be re-used.

4. Equipment dimensions and all utility requirements will be provided as available on all equipment inventoried. Tagging will be performed using the tagging system used by NYUMC.

5. Information obtained during the inventory will be entered into our Attainia® database system. This process permits systematized process for integration of the existing equipment with the new equipment requirements during the Equipment Programming phase of the project.

6. CE will present the entire computerized Existing Equipment Inventory Report to the clinical user in an Item Report by Department format.

THE RESULTS

- Computerized listing and assessment of existing equipment
EQUIPMENT PROGRAMMING

THE OBJECTIVE

- To plan and develop a comprehensive program and corresponding budget for fixed, moveable, and minor equipment.

THE PROCESS

1. The project management staff assigned to the project will undertake a comprehensive architectural and functional plan review.

2. The PM will develop a detailed Activity Schedule of equipment planning activities, coordinated with the project team, to meet the critical time frames of the overall project schedule.

3. The PM will confer with the project team to determine responsibilities associated with the planning, specifying, procuring, and installing of equipment. The decisions made will be incorporated into the Responsibility Checklist.

4. CE will generate a room-by-room computerized report based on functional/space program documents or most current set of architectural plans. This computerized documentation will be generated from Attainia®.

5. These reports will be known as Room Specific Equipment Datasheets, identify on a room-by-room basis, the individual items of fixed, major moveable, and minor equipment typically required for effective delivery of patient care. In addition, the Room Specific Equipment Datasheets will provide the basis for confirmation of room sizes.

6. These Room Specific Equipment Datasheets will also include Novation pricing for each equipment item that is identified thereby providing a very preliminary project budget based on all new equipment requirements.

7. This List will be sent to Senior Director for Nursing Operations for preapproval.
8. For those equipment items where the clinical user has obtained specific pricing, CE will incorporate that pricing into the project budget. These prices will be marked with an "x" next to the price on all reports.

9. The PM will develop a department-by-department schedule of equipment planning meetings.

10. Based on the approved schedule, an in-depth review of Room Specific Equipment Datasheets data will be undertaken by the PM and CE with representative personnel from specific clinical groups. The equipment requirements necessary to meet the specific program and functional requirements of each individual department will be addressed during these planning/programming meetings. The Architect may also attend these meetings if desired.

11. The input received during these equipment planning/programming meetings will be documented and adjustments made based on clinical user’s individual functional requirements, preferences, and will be integrated and updated into the project specific database.

12. CE will present the revised equipment list to the clinical user on a room-by-room basis grouped by department. This format permits ease in budget assessment by department and enables the clinical user to make the necessary modifications required to bring the equipment budget within approved parameters. This report will be the Preliminary Equipment Database with Budget.

13. In addition to Preliminary Equipment Database with Budget, CE will provide the clinical user with recommendations, for cost effective adjustments based on technology, program intent and alternate methods of acquisition.

14. After administration and the department heads/managers have finalized and approved their changes to the Preliminary Equipment Database with Budget, CE will meet with each department head to review their changes.

15. CE will enter all departmental changes into the project specific database thereby updating the projects preliminary equipment requirements.

16. The results of this second round of programming/planning meetings and review process will be known as Updated Equipment Database Review.
17. As the project progresses and further adjustments to the Equipment Program are required, CE will schedule a third planning session on-site with the department heads/managers to validate any scope changes.

18. The results of this validation process will be entered into the project specific database and the Final Equipment Database with Budget will be distributed to Nursing leadership, clinical users, PM and Architect. A Revision Summary Report, identifying those equipment items that have been added, deleted, or updated, will also be included.

19. One (1) set of reproducible hard copy reports of each Equipment Database with Budget will be issued to the interested parties. The "hard copy" report will be sorted by room and grouped by department. An Excel-formatted file of the project database will be provided as well.

20. Sign-off sheets will be included with the hard copy submittals and the department heads/managers will be requested to sign and return these sheets indicating that the Equipment Database with Budget reflect the equipment requirements identified during the planning/programming sessions.

21. Please note that the following are NOT included in this planning process:
   Casework or Millwork, Supplies, Computer Equipment, Surgical Instruments, Interior Design/Furniture, Pharmaceuticals, Drapery, Blinds, Disposables, Medical Gas System, Building Equipment, i.e., HVAC, Paging Background Music, PBX Telephone System, Equipment Supplied by General Contractor, Closed Circuit TV/Security System, Radio/ Hardware Communications, Dietary Equipment.

22. During the planning process CE will work closely with department heads and administration in standardizing equipment requirements. This standardization will include recommendations associated with criterion related to manufacturer and model selection.

23. Also during the equipment planning/programming sessions for the project, CE will, as much as possible, identify the options and accessories that affect design or budget.
THE RESULTS

- Activity Schedule
- Responsibility Checklist
- Equipment Program and Budget based on user meetings, signed-off by designated responsible parties
- Equipment Standardization
- Capital Acquisition Forecasting as appropriate
EQUIPMENT SPECIFICATIONS

THE OBJECTIVE

- To provide the PM, Architect and Engineer with a comprehensive technical report identifying manufacturer utility data, as well as providing technical data sheets on all architecturally significant equipment items planned for the project.

THE PROCESS

1. Based on manufacturer information obtained from equipment planning/programming Sessions, CE will provide utility data for architecturally significant items.

2. Architecturally significant technical data is retrieved from Attainia, which identifies utility requirements, clearances, options, accessories, etc for most of the medical equipment.

3. Architecturally significant equipment is defined as equipment that has significant implications related to electrical (requires electrical other than 120v or greater than 5 amps, hard wired and/or requiring dedicated outlets), plumbing (water, steam, drain) mechanical (vent, gases, vacuum) and structural requirements.

4. CE will include manufacturer technical data sheets on architecturally significant equipment. In addition, each technical data sheet will have a coversheet summarizing the specific equipment item by description, item number, utility requirements, and specific clearance requirements.

5. Dimensional "foot print" information will automatically be provided on ALL equipment and will be available in the preliminary Room Specific Equipment Datasheets phase. In addition, dimensions will appear on all equipment for all submittals of the Equipment Specification Report.

6. Existing equipment to be re-used will have information obtained during the inventory included on the report. CE will attempt to locate manufacturer cut-sheets on re-sued existing equipment. If no current cut-sheet is available, a current equivalent cut-sheet will be substituted as required.
7. Equipment Specification Reports will be issued in conjunction with the Preliminary, Updated and Final Equipment Program submittals. Technical data sheets are submitted only with the Updated and Final Equipment Program submittals.

8. The timing of the distribution of these Equipment Specification Reports will be used on the specific schedule requirements of the project. Key dates for distribution will be identified on the Activity Schedule.

THE RESULTS

- Computerized Equipment Specification Report
- Computerized Specification Coversheets
- Manufacturer Technical Data Sheets
DIVISION 11 EQUIPMENT SPECIFICATIONS

THE OBJECTIVE

- To provide written specifications on all Contractor Furnished/Contractor Installed fixed medical equipment (planned by CE) for inclusion in the Construction Documents for PM.

THE PROCESS

1. For the Contractor Installed fixed medical equipment (planned by CE) PM will schedule a meeting for CE to meet with the General Contractor and/or Construction Manager and/or Architect to review the Construction Documents and to coordinate the procurement specifications.

2. CE will review the design specifications for contractor-installed medical equipment with the appropriate department heads/managers to assure consistency with program objectives.

3. CE will meet individually, as required, with the department heads/managers to receive input regarding specification content and accessory selection. Bid specifications will be finalized based on the information obtained during these meetings.

4. As required, CE will provide a vendor for each contractor installed medical equipment. Where possible, local supplier participation will be included.

5. OR, alternatively, CE will provide written performance specifications for contractor installed medical equipment.

THE RESULTS

- Written specification on CFCI medical equipment in architect-approved format for inclusion in Division 11 of the Construction Documents.
- Updated computer printouts of OFCI equipment showing quantities and locations so that general contractors can bid accurately on installation costs.
EQUIPMENT BIDDING

THE OBJECTIVE

- To provide a cost effective and efficient process for the competitive bidding of medical equipment only.

THE PROCESS

1. CE will conduct a review of the approved equipment program with Director of Nursing and clinical managers to ensure its effectiveness and accuracy.

2. An Administrative Coordination meeting will also be held between CE and the buyer assigned to the project to determine the following issues:
   - Equipment items to be openly bid versus those that will be from preferred sources
   - Identify appropriate bid format and terminology to satisfy NYULMC policies
   - Identify time frames for bid response from vendor
   - Identify time frame for analysis of bids by CE
   - Review project schedule in relationship to delivery lead times

3. For the "contractor installed" equipment items, the PM will conduct Construction Coordination Meeting with the General Contractor to review required delivery dates necessary to maintain the construction schedules. A report of planned Contractor Installed Items will be provided and discussed. Delivery schedules responsive to various building trade requirements will be developed as a result of this meeting. This schedule will then be used to establish the necessary time frames for bidding, procurement and installation of owner furnished/contractor installed medical equipment.

4. CE will meet with department heads/managers for one (1) review session. The purpose of this review session will be to receive input regarding specification content like color, vinyl selection and accessory selection for non-architecturally significant equipment items not previously identified during the Equipment Programming phase of the project. This review session is NOT intended to re-plan or re-specify the items, but rather as a
meeting to identify options and accessories that will become part of the bid/price specifications.

5. CE will make every effort to provide standard Vendors for each major item of equipment. Where appropriate, local distributors will be invited to bid to enhance service and support to the facility.

6. Based on the required delivery/installation schedules, CE will develop, send out, receive and analyze the Requests for Quotations.

7. CE will make recommendations based on experience and knowledge of the products and the marketplace. All recommendations will be based on the best recourse for the user and will in all other instances be unbiased.

8. Should any equipment items offered in the Request for Quotation process differ from the original specifications, CE will work with PM to isolate those items and review them with the General Contractor and Clinical Manager to ensure their complete compatibility before any action is finalized.

THE RESULTS

- Issuance of Requests for Quotation/Proposal for medical equipment only.
- Management Oversight to Keep Process on Schedule
- Experienced, Impartial Bid Analysis
EQUIPMENT PROCUREMENT

THE OBJECTIVE

- To provide an efficient, cost effective and coordinated process for the acquisition of medical equipment only.

THE PROCESS

1. CE will conduct a review of the approved equipment list with NYULMC's purchasing manager(s) to verify completeness and accuracy.

2. From information obtained during the Construction Coordination Meeting with the General Contractor and the Project Manager (described in Equipment Bidding), a complete Required Delivery Schedule for contractor-installed items will be developed and coordinated with equipment lead times to ensure timely delivery. Timing of purchase order issuance for contractor-installed items will be driven by this schedule, taking into account time needed for any off-site staging, inspections and redeliveries.

3. An Administrative Coordination meeting will be scheduled by the PM between CE and the department head/manager of the materials management, purchasing, and receiving to determine the following issues:
   - Acceptance of previous bids, offers or contracts
   - Equipment standardization rules that are to be followed
   - Identification of contact personnel needed during the process
   - Review of purchase order format, approval process and paper flow
   - Delivery location(s) and responsibilities for receiving
   - Acceptance/rejection of deliveries, assembly, biomedical inspections, asset tagging and redelivery as needed

4. CE will review with the General Contractor those items to be delivered direct to a job site or construction site to determine schedules and receiving procedures as well as methods for notification of pending deliveries and completed deliveries.

5. A process will also be established for accepting substitute/replacement items that may impact utility or installation requirements.
6. Upon receiving approval from the administration, the buyer will prepare purchase orders. CE will assure that the requirements stated as part of the bid documents as accepted by the vendor are fully reflected by the procurement document.

7. The PM and CE will prepare and publish weekly reports on the status of the procurement process and the scheduled delivery dates to all affected parties.

8. Upon conclusion of the purchasing process, the PM and CE will provide a Purchase Summary Report indicating all budgeted costs for equipment and the actual price paid for budgetary review.

THE RESULTS

- Issuance of all Purchase Orders (in conjunction with Material Management Offices) in a timely fashion
- Vendor oversight to ensure compliance with bid specifications
- Adherence to budgetary requirements
- Experienced, effective management of the complete procurement process
EQUIPMENT DELIVERY SCHEDULING AND COORDINATION

THE OBJECTIVE

- To ensure through proper planning, the coordinated, on-time delivery of all medical equipment to the project.

THE PROCESS

1. As orders are placed for equipment, CE will identify the vendor's contact to verify delivery location and dates.

2. CE will use the information from the Required Delivery Schedule to advise each vendor when and where deliveries are expected. This will become part of the weekly update information provided to interested groups.

3. CE will maintain communication with vendors to ensure deliveries are met on timely manner.

4. A process will be established via computer or fax, depending on the project, with the receiving locations to advise CE as deliveries occur. This information will be used to ensure the Required Delivery Schedule is accurate each week.

5. If problems arise, CE will promptly advise the PM and Contractor to discuss optional means of resolving any issues before they become problems for the project.

6. CE will provide a Final and Complete Delivery Report showing all items delivered.

THE RESULTS

- Delivery of all items to the job site on an agreed schedule
- Expediting of items should that become necessary
- Regular Delivery Reports and status updates
RECEIVING, STAGING, AND INSTALLATION MANAGEMENT

THE OBJECTIVE

- To establish warehouse location both on-site and off-site (if required) for the receipt, inspection and holding of medical equipment for redelivery to the project site.

THE PROCESS

1. CE in conjunction with PM will meet with the Purchasing, Construction and Receiving Managers to determine:
   - Amount of space required for medical equipment and duration of time.
   - Space requirements for additional services such as CE inspections, property tagging, assembly and waste disposal.
   - Individuals responsible for each function and reporting responsibilities.
   - Process for delivering items to the job site for installation.

2. The PM will prepare and send out for competitive bidding Request for Proposals for off-site warehouse locations, based on the agreed requirements.

3. The PM will receive and analyze RFP responses, and make a recommendation based on experience in this arena.

4. Following the facility making a contractual award, the PM will oversee and manage (via telephone, fax and computer) the activities outlined in the RFP, ensuring properly prepared equipment is delivered to the job site for installation as needed.

5. CE will also coordinate the activity and timing of any owner-provided/vendor-installed equipment within the job site.

6. Upon completion of construction and installation, The CE will perform a punch list inspection of the entire job site to ensure all ordered equipment was received and properly installed.
THE RESULTS

- Efficient and thorough inspections of equipment as received
- Action taken on damaged goods by warehouse personnel
- Assembly (as required) of non-electronic items by warehouse personnel
- Trash removal by warehouse/redelivery personnel
CONDUCTING MEDICAL EQUIPMENT INCOMING INSPECTIONS

THE OBJECTIVE

- Perform incoming inspections on all new medical equipment.

THE PROCESS

1. CE will inspect the medical equipment for physical damage during shipment

2. CE will perform ESI (Electrical Safety Inspection) and full functional test to ensure the equipment is in acceptable working conditions.

3. CE will affix NYULMC asset tag on the equipment and log the equipment into Mediminer® which is hospital’s CMMS.

4. CE will certify the equipment to be used by trained hospital personnel

THE RESULTS

- Efficient and thorough inspections of medical equipment as received
COORDINATING MEDICAL EQUIPMENT TRAINING

THE OBJECTIVE

• To establish a successful training program for new and existing personnel on new and existing medical technology

THE PROCESS

1. CE will work with Department of Nursing Education and clinical user group to create a list of medical equipment which will require user training.

2. CE will contact vendors to determine training requirements and availability of training staff for on-site training.

3. CE will schedule user trainings in multiple ways including but not limited to:
   • Round Robin Program
   • Super User Training
   • Off-site Training Locations
   • E-Learning Packages

THE RESULTS

• All personnel successfully trained on medical technology to meet DOH requirements.