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# UNDERSTANDING GENERAL DESIGN REQUIREMENTS

Massport requires that the design be:

- ◆ cost effective
- ◆ practical
- ◆ functional

The following other general rules apply to design:

- ◆ The consultant must prepare Bid Documents according to both the executed Agreement and this manual's stipulations.
- ◆ The Consultant must request, gather and completely understand available documentation of the project's existing conditions and proposed design criteria (Exhibit 1) to ensure that the project is properly designed and constructed.
- ◆ The prime Consultant and Sub-consultants, where applicable, must certify on the design drawings, with professional registration seals and signatures, their endorsement that the design has been thoroughly checked, coordinated and prepared under the direct supervision of the person stamping the documents.
- ◆ Massport considers all original plans/tracings and specifications, including electronic files, its property.

## A. Horizontal Versus Vertical Construction

The Commonwealth of Massachusetts has two distinct construction bidding statutes:

**Horizontal Construction: MGL.c.30s.39M.** This statute governs all public construction contracts that have an estimated value exceeding \$25,000, but that do not include work associated with a building. It also governs all public construction contracts (building and non-building) that exceed \$10,000 but are less than \$25,000.

**Vertical Construction: MGL.c.149, s.44A.** This statute governs all public construction contracts associated with buildings that have an estimated value exceeding \$25,000. Consultants must have a complete working knowledge of the filed sub-bid process required by MGL c149. Furthermore, Consultants should be aware that allowances are prohibited under c.149.

At the beginning of the project, The Consultant must check with Massport's PM to find out which of the above statutes applies to the project for the preparation of the Bid Documents. Contracts of \$10,000 or less are not subject to the public bidding statutes.

## B. Applicable Building Codes and Agency Regulations

1. All applicable federal and state codes and regulations, including the State Building Code, Rules and Regulations of the Architectural Access Board, the Americans with Disabilities Act (ADA), the Massachusetts Plumbing Code, and the Massachusetts Electrical Code will govern the design, selection of materials, construction, renovation, repairs, demolition and/or removal associated with any building.

The Consultant should also refer to appropriate Massport documents, including Access Massport Guidelines for Barrier Free Facilities and Fire Protection Systems Approval and Acceptance Guidelines. (Refer to Exhibit 2 and Exhibit 20.)

2. All permanent and temporary construction must conform with the Fire Limits as noted in the Commonwealth of Massachusetts Building Code, in particular, Article 3 Logan International Airport has been designated as a Class I Fire District, excluding runway and taxiway areas. The contractor should verify the designations of all other facilities with the Massport Department of Public Safety.
3. The Consultant must have all the Department of Public Safety Inspector and the State Examiners of Plumbers Contract Documents approve all documents. The Consultant must submit one copy of these approved drawings to Massport.  
  
If any questions of code compliance regarding electrical and plumbing work arise during the project that require the respective state and city departments to collaboratively resolve such questions, the Consultant must ensure that this coordination occurs and that the project is fully compliant with the State Building Code's applicable requirements.
4. The planning of all buildings must comply with the applicable zoning regulations and Massport's requirements.

## C. Reference Standards

The Consultant may incorporate Reference Standards into the design and Bid Documents. In doing so, the Consultant must:

- ◆ Demonstrate knowledge of the standard.
- ◆ Properly incorporate the standard.
- ◆ Monitor/enforce the standard requirements.

The Consultant should refer to Exhibit 3 for a list of Reference Standards, and, if needed, request further definition of particular standards to understand a particular project.

## D. Hazardous Materials

The Consultant must immediately notify the Massport PM when it suspects the presence of hazardous material at the project site or surrounding areas.

On any demolition or renovation project where the Consultant suspects asbestos, the Consultant must state in the Bid Documents that the General Contractor must file a Notification Form for Asbestos Removal and General Demolition/Renovation with the Commonwealth's Department of Environmental Protection (DEP) Division of Air Quality Control within 10 days before the work begins.

## E. Energy Rebates

The Consultant must help the Authority obtain from NSTAR any rebates for the use of energy efficient measures. The Consultant can speak with the Massport Utilities Control Manager and contact an NSTAR representative, accordingly.

## F. Partnering

All parties must be conscientious members of the Owner-Consultant-Construction Contractor TEAM. In recent years, Massport has come to appreciate the positive effect that early partnering (team-building) can have on enhancing the team's project understanding and interaction. For all projects over \$5 million, the Consultant should include partnering requirements in the bid documents, if Massport's PM approves of this stipulation. On smaller projects, Consultants should also consider the advantages of partnering requirements with Massport.

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# UNDERSTANDING SPECIFICATION REQUIREMENTS

## A. Division I - General Requirements

Division I - A General Requirements is a standard Massport document that applies to every project. As the cornerstone of the Construction Documents, this document specifies all of the project's administrative, procedural, and temporary facility requirements.

The Consultant must review the Division I Requirements and recommend to Massport any additions, deletions or modifications required to meet a project's specific needs. If appropriate, the Consultant must incorporate these changes into the Division II document.

## B. Division II - Special Provisions

Massport's Division II Requirements stipulate special provisions for projects. This document modifies and/or augments the Division I General Requirements. Massport will provide the Consultant with a standard Division II Requirements format. The Consultant must expand and modify this standard form, as necessary, and prepare the final Division II document. If the consultant asks, Massport will make copies of available standard specifications (i.e., Temporary Light and Power, Staging, etc.) to add into the Division II document to meet the project's specific requirements.

## C. Division III - Technical Specifications

In addition to the Division II document, the Consultant must prepare the Division III document. This document should include all of the project's required technical specifications.

Massport requires that the Consultant prepare consistent, clear specifications in the Construction Specifications Institute (CSI) format. The CSI format organizes specifications into 16 related-topic divisions. It further divides these divisions into these three sections:

- ◆ Part 1 - General
- ◆ Part 2 - Products
- ◆ Part 3 - Execution

Exhibit 4 contains the outline of a standard CSI Section.

## D. Division IV - Sample Contract Forms

Massport will provide the Consultant with a standard Division IV document. This document should contain all of the necessary sample Contract Forms.

## E. Title Page

The Consultant must ensure that the Bid Document's title page complies with Massport's format in Exhibit 5. The cover's window, which Massport will give to the Consultant, must display the project's name and identification number.

## F. Specifications Document

The Consultant must ensure that the Final Specifications are detailed, complete, and fully coordinated with the plans and drawings. The inside front cover of the contract specifications (Exhibit 6) must contain the registration seal(s) and signature(s) of the responsible design professional(s).

Final Specification originals must be clearly and legibly printed on white quality bond paper with black ink. They must also be provided in an electronic format, preferably the most up-to-date version of word processing software in use by Massport (currently Word 2000), or a compatible format. The Specification must be 8 1/2 x 11 inches in size with large enough margins to allow binding and printing on both sides of each sheet. Massport will print the Final Specifications.

## G. Filed Sub-Bid Requirements

The Consultant must completely understand the following requirements:

- ◆ Massachusetts General Laws (MGL)
- ◆ C149 Filed Sub-Bid Requirements

Filed Sub-Bids for building projects only are required for the following classes of work where the cost of the work is estimated to be more than \$10,000:

1. Roofing and Flashing
2. Metal Windows
3. Waterproofing, Damp-proofing and Caulking
4. Miscellaneous and Ornamental Iron
5. Lathing and Plastering
6. Acoustical Tile
7. Marble
8. Tile
9. Terrazzo
10. Resilient Floors
11. Glass and Glazing
12. Painting
13. Plumbing
14. Heating, Ventilating and Air Conditioning
15. Electrical Work, including direct electrical radiation for heating
16. Elevators
17. Masonry Work
18. Any other class of work for which the Consultant deems sub-bids necessary, subject to the Massport Contract Administration Manager's approval.

The Consultant must ensure that all work classes for which sub-bids must be filed have proper titles, and detail all the labor, materials and work required for that particular sub-trade. Also, the specifications section must list all of the drawings showing work for that sub-trade. Exhibit 16 provides a sample of a Filed Sub-Bid Item; Exhibit 17 explains the process for filing a sub-bid. If appropriate, the electrical, plumbing and HVAC filed sub-bid sections must clearly identify any sub-sub-trades.

## H. Performance Specifications

Performance specifications specify established criteria that Massport uses to evaluate a project. The Consultant may only prepare and employ performance specifications with Massport's prior written approval.

When developing performance specifications, the Consultant should avoid providing specific material and process descriptions that might encourage the development of new means to achieve the established result(s).

The CSI three-part section format is still applicable for performance specifications.

## I. Cross-Referencing

The Consultant must clearly and accurately cross-reference specification sections using the applicable specific section and number.

## J. Use of "Or Equal"

The Consultant must adhere to the requirements of Massachusetts General Laws, Chapter 30, Section 39M "or equal" provision. This provision stipulates in part: that "for each item of material, the specifications shall provide a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials." The specification must indicate the words "or approved equal" after those places where the manufacturers' name or catalog reference specifies products or materials.

The Consultant will bear the responsibility of ensuring that the specification lists at least three equally qualified manufacturers for a service or product. All contractors must base their bids on the information provided in the specifications. For those services and products for which the specifications indicate three or more options, the contractor must choose from the options provided for such products or materials, and base its bid accordingly.

Massport will allow Proprietary Specifications to be used only when their use is beyond dispute. The Consultant must justify the use of proprietary or sole source items to Massport in written form.

## K. Material Substitution

After the General Contractor is awarded the Contract, if it wishes to use products or materials other than those specified, the General Contractor must request such use by writing to the Consultant. The request should name and describe the proposed substitutions and include associated shop drawings. The contractor should state what differences, if any, it has made in the contract price for such substitutions. When the Consultant has received complete information from the General Contractor, it must consider all aspects of the proposed substitution. Then, it must write a letter to Massport and the General Contractor recommending its approval or disapproval of the substitution. An item will be considered an "equal" substitute of the named and described item if it:

- ◆ is compatible in durability, appearance, strength and design.
- ◆ performs compatibly to the function that the general design for the work requires.
- ◆ conforms substantially, even with deviations, to the specification's detailed requirements for the item.

## L. Alternates

The Consultant's use of "alternates" in general bids will be subject to the Authority's PM's and Contract Administration Manager's approvals.

If the Consultant includes alternates in the Bid Document package, the alternates should be identified in the alternate's section(s) of the Division II - "Special Provisions." The Consultant should identify the alternates by number and explain the procedures it has established for bidding and comparing the alternates. The Consultant must also describe the changes that each alternate would require if approved. It should also list and cross-reference the divisions of specifications and drawings that each alternate would affect so Bidders can bid the job accordingly.

For building projects, the Massachusetts General Laws, Chapter 149 Section 44G will only accept alternates in ascending order. The Consultant should carefully designate the alternates and the order in which bidders should include them in the project.

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# UNDERSTANDING DRAWING/ AUTOCAD REQUIREMENTS

## A. Standards for Drawings

The Authority has the following requirements for drawings:

1. Materials/Standards: All original design drawings and record drawings must be on 3- to 4-mil-thick, double-matted Mylar. The Authority will not accept substitutes, such as sepia, sepia Mylar, vellum or cloth. Drawings must also be provided in electronic format. (See Paragraph B.1, Design Document Submittals.)
2. Size/Margins: The outside dimensions of both preliminary and final working drawings must be either 24 x 36 inches or 30 x 42 inches.
3. Within these dimensions, drawings must have a ½ -inch border on the top, bottom, and right sides, and a 1-inch border on the left side, as shown in Exhibit 7. The Authority will not accept drawings of any other size unless it has previously approved those drawings in writing. The Authority will return all inappropriate drawings to the Consultant to be redrawn according to these standards.
4. Lettering: A minimum letter size of 1/8 inch for notes and 1/4 inch for titles must be used to allow them to be reproduced in one-half of their size. All lettering must be in vertical capitals. Text font is Roman S for notes and Roman D for titles.
5. Scale: Each drawing must include graphic scales for each scale used on the drawings.
6. A/E Seal: Every sheet, including the Title Sheet, must include the applicable stamp of a Registered Professional Engineer and/or Architect licensed in the Commonwealth of Massachusetts, with the Engineer or Architect of Record's (Prime Consultant and all Sub-Consultants) signature over the seal. Both the seal and signature must be readable when reproduced. The Authority suggests that you use black indelible ink. The Authority will not accept a facsimile signature stamp.
7. Title Sheet: A Title Sheet must accompany each set of drawings, unless The Authority waives this requirement. The title sheet should contain a proper and accurate indexed list of applicable drawings. The Consultant must use mylar originals or electronic files of both sizes, which it can obtain from the Authority's Capital Program Department's Drafting Unit. Exhibit 8 presents a sample Title Sheet.
8. Title Block: The Title Block for each drawing must conform to the sample shown in Exhibit 9.
9. Legibility: Drawings must be clear and legible.

10. Drawing Revisions All drawing revisions must be identified in one of the following two ways:
- ◆ encircling the area to be clarified on the back of the drawing, and indicating the appropriate revision number.
  - ◆ recording the revision number, date, and general description of the change(s) in the space provided above the title block.

11. Sequence: The numbering and sequence of project drawings will be as follows:

Title Page .....	T
Site/Civil .....	C-1, C-2, C-3 etc.
Landscaping.....	L-1, L-2, L-3, etc.
Architectural .....	A-1, A-2, A-3 etc.
Structural.....	S-1, S-2, S-3 etc.
Fire Protection.....	FP-1, FP-2, FP-3 etc.
Plumbing .....	P-1, P-2, P-3 etc.
Mechanical .....	M-1, M-2, M-3, M-4 etc.
Electrical.....	E-1, E-2, E-3 etc.

The following additional numbering rules apply:

- ◆ HVAC, Electrical and Plumbing/Fire Protection must be drawn on separate drawings.
  - ◆ Legends, graphic symbols, and general notes must appear on the first sheet of each discipline's set of drawings.
12. Prints: Drawings submitted to The Authority must be BLUE OR BLACK LINE PRINTS ON WHITE. The Authority will not accept blue prints.
13. Index: All drawing sets must include a complete index on the cover sheet that lists individual sheet titles and numbers for all disciplines in the set.
14. North Arrow: An arrow indicating North must be shown at the upper left-hand side of the drawing of all floor plans, including site/civil, architectural, structural, plumbing, fire protection, mechanical and electrical drawings.
15. Plan Views: All drawings in a set must be oriented in the same general direction.
16. Key Plan: A key plan must be shown in the lower right-hand corner of all sheets having floor plans, elevations and building sections. The plan must identify the area depicted on the sheet. The key plan orientation must be the same as the floor plan orientation on the same sheet.
17. Scales: The scale of the drawings must be shown on each plan, elevation, section and detail. The following designated scales are required as a minimum:
- |                         |                        |
|-------------------------|------------------------|
| Floor Plans             | 1/8"=1'0"              |
| Mechanical/Toilet Rooms | 1/4"=1'0"              |
| Elevations              | 1/8"=1'0"              |
| Building Sections       | 1/8"=1'0"              |
| Refl. Ceiling Plans     | 1/8"=1'0"              |
| Wall Sections           | 3/8", 1/2" or 3/4=1'0" |
| Stairs                  | 1/4"=1'0"              |
| Roof Plans              | 1/16, 1/8"=1'0"        |
18. Clearances: Mechanical Room drawings must graphically show access door swings on A/C equipment and coil filter removal clearances.

19. Building Area & Volume: Drawings must show accurate building areas and volumes to foster accurate comparisons of the project areas and volumes compatible with construction industry standards. The Authority will review the criteria to be used. Exhibit 10 presents an example of this on a drawing. A permanent record of these calculations must be filed with all project files, and the building areas must be recorded on the Architectural Drawings.

## B. Standards for AutoCAD

The Authority maintains design drawings, and Record Drawings in AutoCAD format for coordination of MPA Contracts and for interfacing with other MASSPORT AutoCAD users, e.g., GIS. These standards have been developed to assist Consultants and user's, by providing consistent data, which meets the Authority's requirements. These standards include drawing set-up, title blocks and other pertinent data.

1. Design Document Submittals: The Consultant shall submit AutoCAD files at each submission. Documents are to be submitted on CD-ROM.
2. Authority Provided Drawing Data: The Consultant shall use all the Authority provided drawings, blocks, and set up files for each Contract. If the Consultant cannot use the Authority-provided data, the Director of Capital Programs and Logan Modernization or his designee, shall approve all data development prior to initiating the drawings.

Upon completion of the contract, the Consultant shall provide, to The Authority, one (1) set of all symbols, blocks, menus, font files or any other electronic data, which was used or developed to perform the drawing tasks, which were not provided by the Authority. The Consultant shall also provide an index of all drawing file names, menus and electronic format.

## C. AutoCAD Guidelines

1. Layer List: In order to standardize layers for all record drawings, the Authority is using the "CAD Layer Guidelines", prepared by The American Institute of Architects, as it's layering convention. The exception to the above is Site/Civil layering. Site/Civil layer designations are unique to The Authority's GIS system. The Site/Civil layering list is included with the drawing setup files.

The Authority currently has separate AutoCAD layering standards for site/civil drawings. These layers are listed within the drawing named "MPA-SITE-CIVIL-LAYERS.dwg." Layers created that have additions, deletions or enhancements should be named with the appropriate prefix added to the Authority's existing site/civil layering standards. Separate text layers must also be created for any new text added to the drawing. The following is a list of prefixes:

- Y – survey information
- ASB – as-built information
- DES – design or proposed information
- DEMO – demolished information
- ABD – abandoned information
- *Existing information uses the Authority's Site/Civil/Utility layering standards without a prefix*

An index that lists and briefly describes any new layers created by the consultant that are not covered by the Authority's layering standards should be included with the first

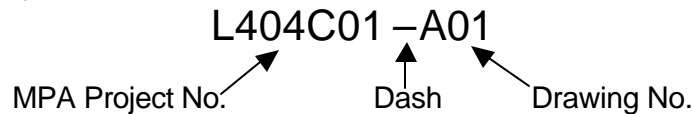
exchange of AutoCAD drawings presented to the Authority by the consultant. Any future drawings presented to the Authority by the consultant should include an updated index of any additional layers added to the AutoCAD drawing.

2. Abbreviations: The Utility Abbreviation List was developed to standardize the use of terminology for the Utility System and the Tank Management System attribute data as well as the CAD drawings. Examples would be CB for catch basin, EMH for electrical manhole, LV for low voltage and TK for tanks. (See list at end of this section.)

3. Electronic File Naming Format:

The naming of AutoCAD drawings and TIFF files shall be comprised of the MPA project number followed by the drawing number.

Example:



4. Drawing Setup File: The Authority will provide, on diskette, the appropriate standard drawing setup; which includes the border, title blocks, title sheet, site/civil layers and blocks. The Project Manager will designate the appropriate drawing size.
5. Color Codes: The Authority prefers, for visual review on a monitor, that all utilities be color coded in accordance with Authority site/civil layering standards.
6. Block Guidelines: The Authority uses standard engineering symbols as blocks for Record Drawings, and will provide copies of these blocks on the drawing setup file. The blocks include manholes, hydrants and other data. If the Authority does not have a particular block, the Consultant may use its symbol as the "block". However, the Consultant must provide all symbols used to create the drawings to the Authority in AutoCAD format. An index, in electronic and hard copy format, shall also be provided listing the block names and contents.
7. AutoCAD Drawing Configuration:
  - a. Model Space – All drawings are to be created in model space with true scale.
  - b. Paper Space – Plotting of drawings shall be in paper space. Insert title block and border in paper space. Paper space scale is 1 inch = 1 foot.
  - c. CTB (color dependent plot style tables) – CTB files are to be included with each drawing submission.
  - d. Site/Civil Drawing Coordinate System – AutoCAD site/civil basemaps supplied by the Authority are created in relation to its geographic location. The insert base point (0,0) can be related to a control network of other nearby sites. The horizontal control network of the basemap uses the Massachusetts Mainland State Plane Coordinate System (Zone 2001), as referenced to the North American Datum of 1983 (NAD83). The vertical component of the network is referenced to the National Geodetic Vertical Datum of 1929 (NGVD29).

Basemaps should **NEVER** be moved or rotated in a manner that removes the drawing from the control network. If the orientation of the basemap needs to be changed, the use of Paper Space with a User Coordinate System should be used to rotate the perspective of the basemaps.

Decimal units are used for all Authority site/civil/utility basemaps.

- e. Utility Data – Utility lines **SHOULD NOT** be broken for the purpose of annotation. Utility lines should run continuously from structure to structure. Lines should be annotated above or below the line.
8. AutoCAD Drawing Submittals: When submitting AutoCAD drawings, make certain that the following files reside within the same directory as the drawings:
- Xrefs (external reference files) –Xrefs should only be attached and not bound to the submitted drawings.
  - CTB files (color dependent plot style tables)
  - Non-standard AutoCAD font files

Using the AutoCAD Express Tools PACK (Pack & Go) command is one way of ensuring that all the associated files for the submitted drawings are included. When using the PACK command, make sure the Preserve Subdirectories box is **NOT** checked.

## D. As-Built Record Drawings

Refer to Chapter V: Completing the Project, Section 1, Paragraph B, Submitting As-Built (Record) Drawings.

## **ABBREVIATION LIST**

### **ABBREVIATIONS**

### **DEFINITIONS**

A .....	ABANDONED (WITH MANHOLE TYPE) CATCH BASIN
ACB .....	ABANDONED CATCH BASIN
ACM .....	ASBESTOS CONTAINING MATERIAL
ACCM.....	ASPHALT COATED CORRUGATED METAL
ADMH .....	ABANDONED DRAIN MANHOLE
AEMH .....	ABANDONED ELECTRICAL MANHOLE
AF .....	ABANDONED FUEL LINE
AGG .....	ABANDONED GAS GATE
ALP.....	ABANDONED LIGHT POLE
ASMH .....	ABANDONED SANITARY SEWER MANHOLE
BIF .....	BIRD ISLAND FLATS
BFV .....	BUTTERFLY VALVE
BPL.....	BRASS PLATE AT DRAINAGE CLEAN-OUT
BWSC.....	BOSTON WATER & SEWER COMMISSION
C.....	COMMUNICATION
CAL .....	CALL BOX
CB.....	CATCH BASIN
CDB.....	COMBINED DUCT BANK
CEN.....	CENTRAL AREA
CF.....	COMMONWEALTH FLATS
CI.....	CAST IRON
CLAY .....	VITRIFIED CLAY PIPE
CMH .....	COMMUNICATION MANHOLE
CMP .....	CORRUGATED METAL PIPE
CNTBX .....	ELECTRICAL CONTROL BOX
CP.....	COMMONWEALTH PIER
CS.....	COMBINED SEWER (If Applicable)
CSMH .....	COMBINED SEWER MANHOLE
CSS.....	COMBINED SANITARY SEWER
CV.....	CONTROL VALVE
D.....	DRAIN

DI.....	DRAIN INVERT
DIR .....	DIRECTION OF FLOW
DM.....	DUCT MARKER
DMH .....	STORM DRAIN MANHOLE
DPW .....	DEPT. OF PUBLIC WORKS
E .....	ELECTRICAL
EBP .....	EAST BOSTON PROPERTIES
EHH.....	ELECTRICAL HAND HOLE
EMH .....	ELECTRICAL MANHOLE
ESTA.....	ELECTRICAL SUB-STATION
F .....	FUEL
FDRPT .....	MANHOLES AND JUNCTIONS ALONG FEEDER
FDRNO.....	MPA IDENTIFICATION NUMBERS FOR CABLES
FDR.....	INDEX OF CABLES BETWEEN START POINT AND END POINT (FOR REF. ONLY)
FFV.....	FUEL OIL TANK FILL VALVE
FHYD.....	FUEL HYDRANT
FM .....	SANITARY SEWER FORCE MAIN
FMGV .....	FORCE MAIN GATE VALVE
FMH.....	FUEL MANHOLE
FP .....	BOSTON FISH PIER
FPIT .....	FUEL PIT OR FUEL TEST PIT
FSP .....	FIRE STAND PIPE
FTAN .....	FUEL TANK
G.....	GAS
GD .....	GAS DRIP
GFS.....	GLYCOL FILL STATION
GG .....	GAS GATE
GM.....	GAS METER
GP .....	GAS PUMP
GOV .....	GOVERNORS ISLAND
GTV .....	GAS TEST VALVE
HAN.....	HANSCOM FIELD
HHAT .....	HIGH HAT LIGHT POLE
HMLP .....	HIGH MAST LIGHT POLE

HOO .....	HOOSAC PIER
HV.....	HIGH VOLTAGE
HYD .....	HYDRANT
LDET .....	LOOP DETECTOR
LOG.....	LOGAN AIRPORT
LP .....	LIGHT POLE
LV .....	LOW VOLTAGE
MPA.....	MASSACHUSETTS PORT AUTHORITY
N/A.....	NOT AVAILABLE
NAP .....	NORTH APRON AREA
NMS .....	NOISE MONITORING SITE (SYSTEM)
NRC.....	NO MPA RECORD CONTRACT
NSA.....	NORTH SERVICE AREA
OHU .....	OUTSIDE HEATING UNIT
OR.....	OBSERVATION RISER
ORH .....	WORCESTER
PB.....	PULL BOX
PIV.....	POST INDICATOR VALVE
POD.....	TAXIWAY LIGHT POD
RAB .....	ROADWAY ALARM BELL
RCP.....	REINFORCED CONCRETE PIPE
RED.....	REDUCER
RICWIL .....	UNDERGROUND UTILITIES (STEAM), DIRECT BURIED
RMH .....	RICWIL MANHOLE (TUNNEL HOT WATER etc.)
S .....	SEWER
SAP .....	SOUTH APRON AREA
SB.....	SOUTH BOSTON PROPERTIES
SCS.....	SURFACE CONDITION SENSOR
SMH .....	SANITARY SEWER SYSTEM MANHOLE
SPKH.....	SPRINKLER
SS.....	SANITARY SEWER
STB .....	STATE TRANSPORTATION BUILDING
STH.....	STEAM TUNNEL HATCH
SWS .....	SOUTHWEST SERVICE AREA
T .....	TELEPHONE

TCB.....	TRAFFIC CONTROL BOX
TCHH .....	TRAFFIC CONTROL SYSTEM HAND HOLE
TERM.....	TERMINAL (TERMINAL A, C etc.)
THH .....	TELEPHONE HAND HOLE
TMH.....	TELEPHONE MANHOLE
TOB.....	TOBIN BRIDGE
TRD.....	TRENCH DRAIN
TRLT .....	TRAFFIC LIGHT
TRAN.....	TRANSFORMER
TRSIG .....	TRAFFIC LIGHT SIGNAL
TSLP .....	TRAFFIC SIGNAL LIGHT POLE
TUN .....	TUNNEL
TWLP .....	TAXIWAY LIGHT POLE
UDOR.....	UNDER DRAIN OBSERVATION RISER
UP.....	UTILITY POLE
VCP .....	VITRIFIED CLAY PIPE (SEWER)
XFMR .....	ELECTRICAL TRANSFORMER
W .....	WATER
WG.....	WATER GATE
WMH .....	WATER MANHOLE
YCLT .....	YELLOW CAUTION LIGHT

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# UNDERSTANDING BIDDING INSTRUCTION AND FORMS

The Consultant must prepare Bid Proposal Documents for the bid submittal in the Massport-provided format. This format includes the following information:

- ◆ Notice to Contractors
- ◆ Instructions to Bidders
- ◆ Bid Form (Lump Sum or Unit Prices)

Exhibit 15 presents examples of the above documents. The Consultant must confirm the document format with Massport before it submits its final bid documents. Consultants must prepare Bid Documents according to the Massachusetts General Laws, either Chapter 30, S39M or Chapter 149, S 44A-F.

The Form for General Bid will normally be either: Lump Sum, which may include filed sub-bids; Unit Price; or a mix of the two.

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# UNDERSTANDING CONSTRUCTION COST ESTIMATE REQUIREMENTS

Massport requires the following details and items on cost estimates:

- ◆ The consultant must have competent and experienced estimators prepare the detailed construction cost estimates.
- ◆ Final cost estimates must bear the estimator's name(s) and the estimate's date.
- ◆ The estimator must show all escalations to actual costs separately.
- ◆ The Consultant must also provide with the cost estimate submission an estimate of the number of calendar days required to construct the project.

## A. Preliminary (Budgetary) Cost Estimates

Preliminary cost estimates must be in as much detail as is allowed in the drawings and specifications. The Consultant must provide total costs for each section of the specification.

## B. Final Cost Estimate

The Final Cost Estimate must comprehensively include:

- ◆ cost subtotals for each section of the specifications.
- ◆ a complete and detailed breakdown of materials, labor, units (sq. ft., cu. ft.), unit costs and total costs.
- ◆ total cost for labor, including all insurance, state and federal payroll taxes and any other payments to unions.
- ◆ total cost for the project, including all General Contractor and Subcontractors' overhead and profit.

## C. Format

Cost estimates must be submitted in the format shown in Exhibit 11.

## D. Submission of Cost Estimate

Cost estimates must be submitted according to the Consultant's Agreement with Massport, as discussed in Section 2. They must be submitted at the same time as all other contract Bid Documents.

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# UNDERSTANDING CONSTRUCTION SCHEDULE REQUIREMENTS

## A. Preliminary Probable Construction Schedule

The preliminary probable construction schedule must be in bar graph form that depicts the logical sequence, relationships and interrelationships of the major activities required to complete the project.

## B. Final Probable Construction Schedule

The Consultant must prepare the Probable Construction Schedule in the form of a bar graph with CPM logic depicting the logical sequence, relationship and interrelationship of the various activities, and identifying the tasks necessary to complete the project's construction. The Consultant's schedule should contain a bar for each significant activity anticipated during the construction. The major subcontracted items should be broken down into their respective major components and represented by bars.

Each bar must include a portion representing Activity Duration, including Time Allowance for Shop Drawing Approvals and Allowance for Delivery Time. All key dates, included the following, must be included:

- ◆ Project start
- ◆ Shut-down periods (if any)
- ◆ Structural steel erection duration
- ◆ Roof installation period
- ◆ Building closed in (weather-tight)
- ◆ Planting seasons

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# UNDERSTANDING FEDERAL AVIATION ADMINISTRATION (FAA) GRANT REQUIREMENTS

The Consultant must be aware that much of the anticipated airport construction is eligible for Federal Grant reimbursement from the FAA, and that all FAA requirements must be met for Massport to receive the Grants.

The Consultant must determine with the Massport PM if the project will be eligible for an FAA grant. If so, the Consultant must perform the following tasks:

- ◆ obtain and comply with all applicable FAA requirements.
- ◆ raise any questions or concerns about the requirements, and resolve them completely with Massport before writing the below-referenced letter.
- ◆ write a letter to Massport's Director of Capital Programs stating that the Consultant has reviewed the requirements, received answers to all its questions, and will conform to them.

The following bullet presents an example of a FAA Project document requirement that Consultants should adhere to when providing airport-related services:

- ◆ "AFAA will pay 100 percent of Federal share of project costs or the grant amount (whichever is less) upon satisfactory completion of the project and satisfactory submission of final documentation."

Final documentation should include a final payment application and a report containing the following information:

- ◆ An explanation of overruns and under-runs of ten percent (10%) or more.
- ◆ A certification of payment of minimum wage rates.
- ◆ A summary listing of all approved change orders.
- ◆ Material quantity certificates.
- ◆ A statement pertaining to liquidated damages, including summary of contract time, start orders, stop orders and final completion dates.
- ◆ The date that the "As Built" drawings were submitted to FAA.
- ◆ A record of final inspection (attendees and exceptions).
- ◆ A record of clearance and of exceptions.

At the end of the project, the Consultant must confirm in writing to Massport that it has complied with all of the applicable FAA requirements.

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## UNDERSTANDING ARTPORT POLICY

The Consultant must become familiar with Massport's Art Policy and consider it in the design of all Massport projects. The following paragraph describes Massport's philosophy about the incorporation of art into their projects:

***“It is the intent of ARTPORT to provide for the incorporation of quality visual art in Massport property, in order to enhance the use of Massport facilities by the traveling public, our tenants, our employees and the neighboring community. Art in Massport’s spaces can enrich and humanize the environment and help Massport more effectively carry out its primary mission: to provide the best possible facilities for its user.”***

When Massport requires artwork, the budget for artwork should be about one percent of the project's total construction cost.

The Consultant must meet with Massport's Project Manager (PM) to review and become totally knowledgeable of the information contained in Massport's Artport policy and its applicability to the particular project.

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# UNDERSTANDING LOGAN AIRPORT ID CARD REQUIREMENTS

When an employee or sub-consultant's work requires access to secured areas at Logan Airport, the Consultant must apply for a badge using the Application Form in Exhibit 13. Massport's approval of badges will be subject to the discretion of both the Capital Program's Program Manager and the Department of Public Safety, and the issuance of badges should not be taken for granted.

The Consultant must return all badges to Massport's PM when it completes the work, or when any employee or sub-consultant is no longer with the firm.

Massport will levee substantial fines against lost badges and violation of the SIDA areas.

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# UNDERSTANDING ADDITIONAL SERVICES

The Consultant may not perform additional services beyond the Agreement scope without the Director of Capital Programs' official written approval.