LESSONS LEARNED
EASTSIDE EXTENSION

1716

This report on lessons learned responds specifically to item 1 from the March 21 motion by MTA Board Member Supervisor Molina.

Los Angeles County
Metropolitan
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March 29, 1996

TO: **BOARD OF DIRECTORS**

FROM: **JOSEPH E. DREW, CHIEF EXECUTIVE OFFICER**

SUBJECT: **METRO RED LINE, EASTSIDE EXTENSION RESPONSE TO MOTION BY DIRECTOR MOLINA DATED MARCH 21, 1996**

RECOMMENDATION

Receive and consider the attached report responding to Director Molina's motion dated March 21, 1996.

ORGANIZATIONAL IMPACT

Implementation of certain measures contained in the attached report will require modifications to the current organization and/or staffing levels. Specific details are provided within the report.

BUDGET IMPACT

Impacts on project budget, fiscal year budget, and fund sources are not determinable at this time.

ALTERNATIVES CONSIDERED

The alternatives considered are presented in the attached report, or have been previously been reported to the Board of Directors.

BACKGROUND/DISCUSSION

On March 21, 1996, at the Construction Committee meeting, Director Molina presented a motion which directed staff to present a series of reports at a special meeting of the Construction Committee to be held on April 4, 1996. The motion required that the following topics be discussed.

a. Lessons learned from prior subway construction projects and remedies for each with respect to the design, construction, and oversight of the Eastside Extension.

b. An organization plan and chart showing the roles and responsibilities of MTA employees and contractors/consultants.

c. A plan for provision of insurance by contractors.

d. A plan for the Joint Project Office.

e. The use of a construction manager vs. a job shop for employee procurement.

f. The Inspector General's plan to establish procedures to prequalify firms for project contracts.

These topics are addressed in the attached reports.

DBE PARTICIPATION

Potential impacts on the DBE participation expected on this Project can not be assessed at this time.

Prepared by:
Joel J. Sandberg, Deputy Executive Officer/Project Manager
Metro Red Line, Eastside Extension

Attachments

Stanley G. Phernambucq
Executive Officer, Construction

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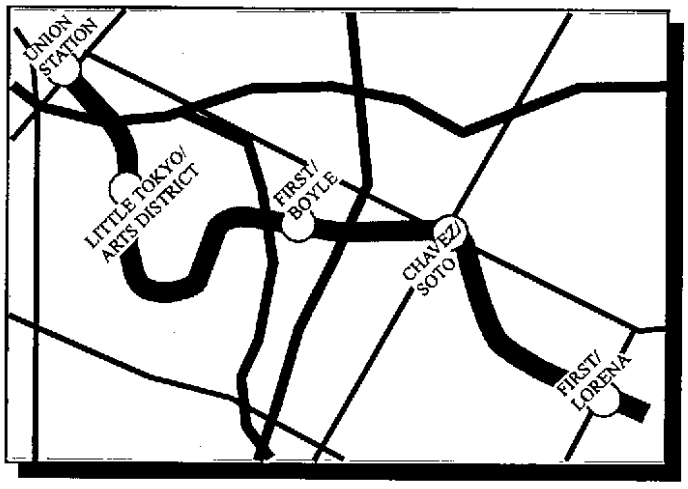
EASTSIDE EXTENSION

SPECIAL PRESENTATION TO
THE CONSTRUCTION COMMITTEE - APRIL 4, 1996

- Lessons Learned (2a)
- Joint Project Office (2b/d)
- Provision of Insurance (2c)
- Construction Management (2e)
- Prequalification of Contractors (2f)

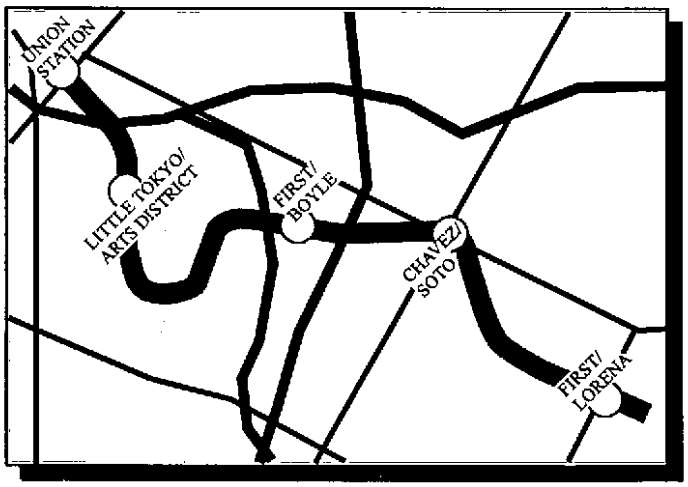


LESSONS LEARNED

EASTSIDE EXTENSION

2a

- Reducing Impacts on the Community
- Design: Project Quality Improvement and Cost Reduction
- Construction



LESSONS LEARNED
EASTSIDE EXTENSION

This report on lessons learned responds specifically to item 1 from the March 21 motion by MTA Board Member Supervisor Molina.

LESSONS LEARNED

HOW THE PROGRAM WORKS

- Learning from past experiences on the Los Angeles subway or on other properties, the Lessons Learned program improves our way of doing business.

- A database tracks and maintains electronically, all lessons learned and their impact on on-going and future projects. The database is available to all members of the organization on the network. Research on existing lessons learned can be performed using a search for key words.

- What are we learning from:

  - From the analysis of major events (settlement, water main failure, etc.) happening on previous segments

  - From the analysis of change orders given to construction contractors of previous segments

  - From MTA Operations feedback on the way the facilities and systems were built, behave in operation, and are more or less easy to maintain

  - From suggestions and ideas submitted by any member of the organization (MTA, EMC, CM, etc.)

- What the Lessons Learned program is affecting:

  - MTA Construction and Procurement Strategies - New tunnelling approach, better anticipation on the type of problems that might occur. This is detailed in the first part of this presentation, "Lessons Learned - Reducing the Impacts on the Community."

  - MTA Design Documents - The baseline documents used to prepare the contract documents are continually revised to incorporate the Lessons Learned from previous segments. MTA design criteria, baseline specifications, and standard and directive drawings are continuously maintained. This is detailed

in the second part of this presentation, "Lessons Learned - Design: Project Quality Improvement and Cost Reduction."

- MTA Construction Procedures - Construction procedures and construction manager roles and responsibilities are continuously revised to improve contract enforcement (cost reduction), construction safety, and to better mitigate construction noise. This is detailed in the third part of this presentation, "Lessons Learned - Construction."

REDUCING IMPACTS ON THE COMMUNITY

1. PRECONSTRUCTION SURVEY AND BUILDING PROTECTION

- An extensive preconstruction survey file will be prepared on each structure within the tunnel and stations excavations zone of influence. Conditions of each building will be documented before construction starts.

- This will allow the clear identification of any damages we might cause and facilitate the settlement of any future claims.

- Provision of compaction grouting from surface before tunneling approach will be explored to reduce damages to structures.

2. TUNNELING

- Evaluation for use of positive face control versus open-face tunnel boring machine is being performed. This is as recommended by the Eisenstein Tunnel Advisory Panel (ETAP). On Segments I and II, only open-face tunnel shields were used.

- Also considered is grouting capability from inside the tunnel boring machine in areas where grouting is not feasible at surface.

3. CONTRACTING APPROACH

- Specifying a particular type of tunnel boring machine is a consideration for the East Side Extension. Using tunnel boring machines(s) purchased by the owner will also be considered in accordance with the Eisenstein Tunnel Advisory Panel (ETAP) recommendations.

4. GEOTECHNICAL

- Extensive field investigations and laboratory testings are performed. Total of 84 boreholes drilled, 28 groundwater observation wells installed. This equates to 4 boreholes per 1,000 feet of the alignment versus about 3 boreholes per 1,000 feet for Segments I and II. Total footage drilled equals 6,200 feet. One borehole explored per 250 feet

length interval on East Side Extension, versus 500 feet length interval generally used in the industry average.

- At tunnel envelope depth (40-foot zone) soil samples were collected at 3-foot intervals versus 5-foot intervals in Segments I and II. To determine soil grain sizes in alluvial type soils, larger number (550) of laboratory tests were performed to identify fine and coarse grain particles. Two 30-inch diameter bucket borings were performed to determine cobbles and boulder sizes. One hundred shear strength tests are performed on rock/soil samples to measure stiffness.

- Performed two pump tests (3-day) to determine dewatering (quantity/quality) at stations and tunnels. In addition, performed slug tests (mini-pump test) at all 28 observation well locations. Information gathered will enable MTA to prepare the design of the dewatering system, rather than leaving that to the construction contractors.

5. MISCELLANEOUS REPAIR CONTRACT

- On the East Side Extension project a new approach is implemented: Before construction starts, a contractor (whose scope is to fix any damage to the properties along the alignment) will be hired. During tunneling under and adjacent to various buildings and structures, if minor cracks develop due to settlements, the contractor, on a standby basis, will provide services for repairing architectural type damage by patching and painting. This approach will provide timely repair and will help avoid negative publicity and relieve homeowners' concerns and fears.

6. PRIVATE UTILITIES REPAIR

- If during tunneling, utilities or underground pipes get damaged or break, contractor on a standby basis will provide early emergency services to private properties. This contractor will be hired before construction begins.

7. WATER MAIN INSPECTION AND REPAIR

- This contract will provide the services of a specialty contractor to inspect water main conditions (age, corrosion level, etc.) along the alignment and provide preventive repairs, if required.

8. NOISE MITIGATION

- Taking into account our experience on previous projects and in order to minimize the impact on the residents living or working close to our construction sites, MTA will evaluate the possibility to negotiate a fair and reasonable compensation with the owners any time a partial or a full-take certification is not needed. MTA will conduct site-specific studies and implement the most practical mitigation for each case.

- This approach (used by the Portland project) will demonstrate MTA responsiveness to the East Side community.

DESIGN: PROJECT QUALITY AND COST REDUCTION

1. REVISION OF BASELINE DOCUMENTS

The baseline documents consists of the following items:

- Specifications - Documents that describe or define functional, design, application, workmanship, acceptance criteria, and installation requirements for materials, equipment, systems, processes or structures. The contract Specification forms the basis for acceptance of the finished product.

- Standard Drawings - Drawings prepared by the General Engineering Consultant defining elements of continuity and facilities which will be repetitively used throughout the MTA System.

- Directive Drawings - Drawings prepared by the General Engineering Consultant defining the arrangements or configuration of specific components of facilities. They provide direction to the design office but shall not be used as contract drawings.

- Design Criteria - Provide a uniform basis for the design of the Metro Rail Projects and are intended to express requirements to direct designers and engineers in the various disciplines.

When a Lessons Learned is initiated it can impact any of the above-mentioned types of baseline documents. The East Line project design will receive the benefit of all of the Lessons Learned identified from the previous segments. In particular, review of all Segment 1 change notices produced numerous design change notices which impacted other segments such as Segment 2 and 3 contracts and resulted in modifying the above baseline documents. East Side Extension design has started using the revised set of baseline documents.

- The breakdown of the above revisions to the baseline documents is as follows:

  Facilities:
  Electrical: 14
  Mechanical: 80
  Electrical/Mechanical Interface: 41
  Architectural: 106

Structural: 28
Civil/Utilities: 1
General: 15
Systems: 16

Total: 401

- These 401 revisions can also be broken down into
  198: Design
  102: Construction
  101: Operations & Maintenance

2. APPROPRIATE LEVEL OF DESIGN DETAIL

- An Increased Detail Design (IDD) Program has been implemented: it increases the level of detail performed in the design of congested areas, thus eliminating potential physical conflicts and interferences between various components (ductbank, piping, etc.) The Vermont/Sunset Station (Contract B-261 of MRL Segment 2) was used as a test case for this program.

- As a result of the IDD and Lessons Learned Programs, the entire EMC and MTA teams, as well as the various Section Designers, are coordinating better through increased communications and directions. This will result in reduction of change orders from construction contractors during construction and startup phases of the East Line extension.

3. MODULAR STATION

- EMC Modular Station Design has allowed completion of an efficient and standardized layout: the main box of a subway station is conceptually subdivided into "modules", and each module comprises a combination of standardized rooms.

- Completed modular elements can then be repeated in other stations, with some adjustments: this results in reduced design time and cost.

- Modular Station Design also allows a more maintainable and compressed design schedule, resulting in an earlier start of construction.

- Modular Station Design optimizes project viability, increases efficiency and improves design quality by standardizing such station elements as elements of continuity at public areas and ancillary and equipment layouts.

- Modular Station Design simplifies construction and reduces costs by standardizing station elements.

- Standardization reduces learning curves and errors during both design and construction phases of the project.

4. CADD

- From a manually-completed design for Segment 1 and Segment 2 stations, EMC has evolved: all Segment 3 stations have been microstation-CADD designed. All East Extension design will also be microstation-CADD designed.

- East Extension Section Designers are trained to also complete their design in CADD. The experience gained by EMC in coordinating the Section Designer's work is one of the assets that will be used on East Extension project.

- Three-dimensional (3D) design capabilities have be developed: Advance applications for which EMC CADD personnel have been trained permit 3D design, resulting in improved productivity and cost savings.

- Interference checks made through CADD on our design minimize field changes, resulting in cost savings.

- MTA's new CADD manual is now recognized as an industry standard in the transit industry.

5. COORDINATION WITH THIRD PARTIES

MTA third-party coordinators are alerting EMC of any potential problem areas related to the construction of the stations that may have an impact on third-party Agencies. For example, East Extension project will incorporate a revised design for the water discharge system. Several options are being considered to resolve this issue: use of biodegradable oil; use of oil

separation system within the sum pump pit. The selected solution will be incorporated in the baseline documents to be used for East Extension project.

CONSTRUCTION

- Implement stricter control of changes as required by the AB 1869 bill. This should result in a reduction of the amount and dollar value of change orders given to contractors.

- A cohesive and firm approach using all MTA resources (MTA, EMC, CM) should be able to reduce the amount of change orders given to contractors.

- Brief East Extension Construction Management on the Lessons Learned program: As soon as the East Line Construction Manager is on board, MTA shall arrange a presentation of how the Lessons Learned Program works. The Lessons Learned database will be distributed. The CM will participate in the Program, attend Lessons Learned workshops, and visit the Segment 2 and 3 construction sites. Meetings will be held at the sites with the Resident Engineers and inspection staff, to identify any potential problem areas that need greater attention during construction, start-up, etc.

- Review and approve Contractor's designs for specific locations and use. Do not accept generic solutions to specific applications.

- Test critical materials used in temporary structures.

- Test soils for bearing pressure capacity for design of temporary structures.

- Where dewatering is necessary as determined from test performed by the MTA and its consultants, the MTA will specify detail dewatering requirements in the construction contract documents and have the bidders price it in their bids.

- Tunnel contracts should have a construction industry review at the Prefinal design stage, to obtain input from the industry on construction means and methods, staging areas, laydown requirements, and type of tunnel machine or machines to suit the geology for the contract.

- Enhanced Quality Control
  - Construction Manager QC organization
  - Written Quality Control Inspection Instructions
  - Inspectors Training and Certification
  - Readiness Reviews Prior to Start of New Construction Activities
  - Strict Adherence to Specification Requirements
  - Construction Work Plans Revised

- CM Quality Program
- Use of Certified Independent Testing Laboratories
- MTA Monitoring of CM Quality Program

- Implement Spot Surveillance of Inspection and Contractor Activities

- Tunnel Construction
  - Ensure sufficient Inspectors assigned to tunnel work activities to monitor all critical operations
  - Use of computerized tunnel machine guidance system, as recommended by the Eisenstein Tunnel Advisory Panel (ETAP), with appropriate level of manual alignment checks.
  - Increase number of data points monitored for surface settlement
  - Daily review and analysis of geotechnical and survey data to adjust construction methods to reduce settlement
  - Increased safety oversight
  - Greater frequency of tunnel alignment checks

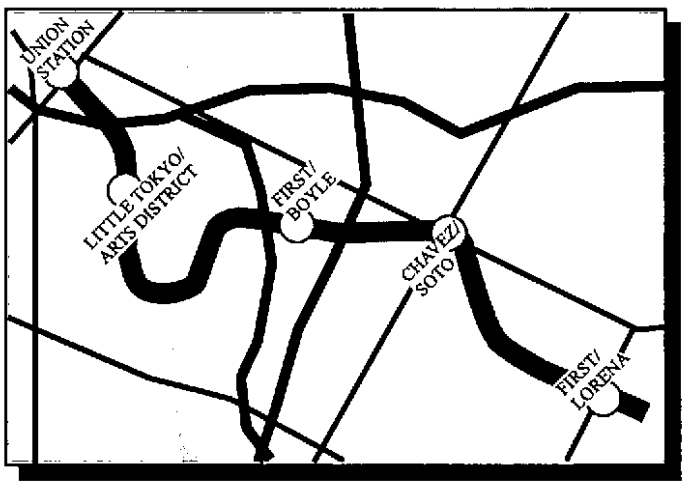
- Environmental Mitigation
  - Unit price bid items created in lieu of negotiated changes for hazardous waste operations
  - Clarify construction noise requirements in contracts documents
  - Daily discharge storm-water monitoring

JOINT PROJECT OFFICE

EASTSIDE EXTENSION

2b/d

- Organization Plan
- Organization Chart
- Roles and Responsibilities
- Accountability
- Timeline for Implementation
- Construction Management



JOINT PROJECT OFFICE ORGANIZATION
EASTSIDE EXTENSION

This report on the joint project office concept responds specifically to items 2 and 4 from the March 21 motion by MTA Board Member Supervisor Molina

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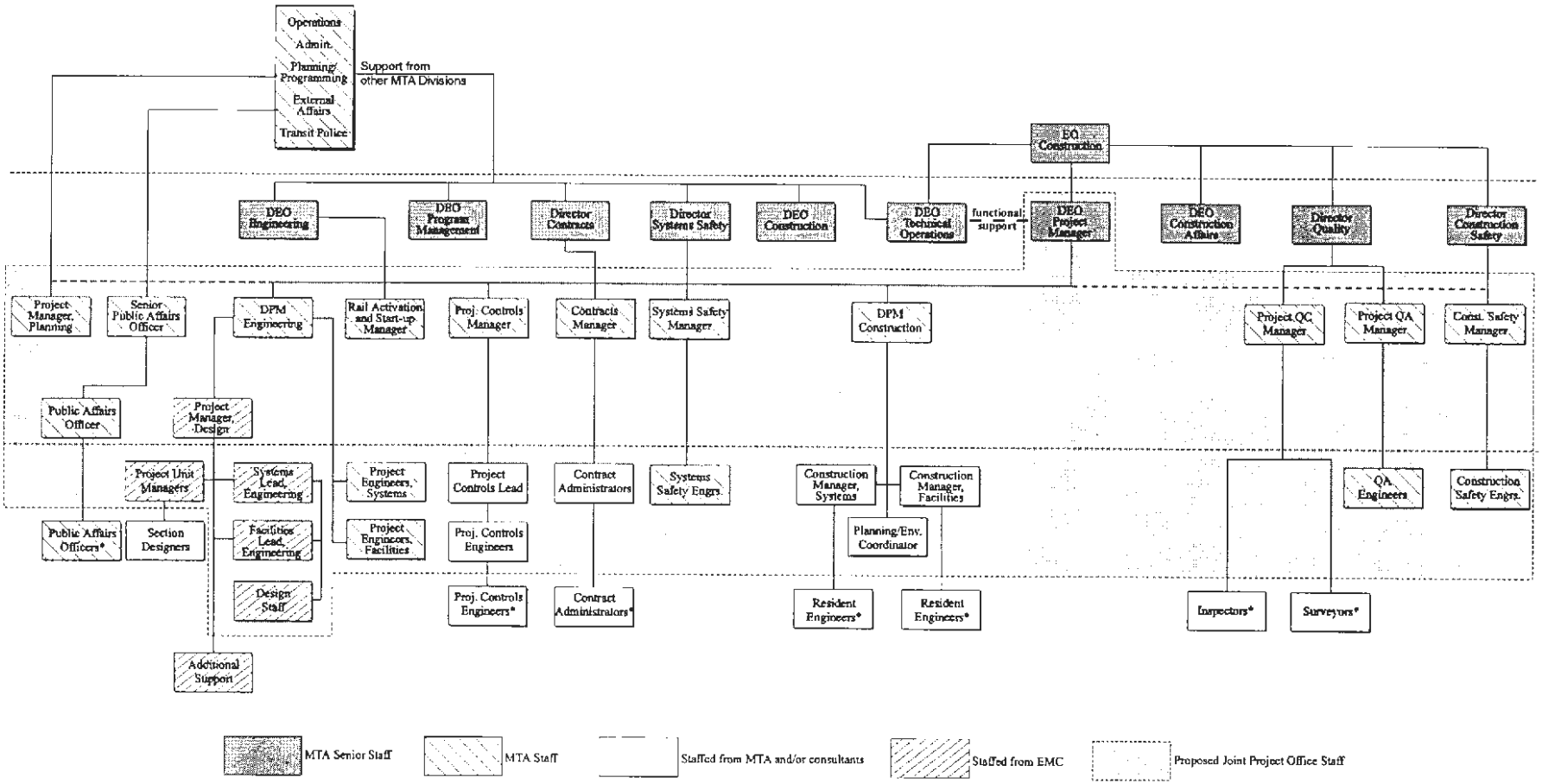
INTRODUCTION

In November 1995, in response to a Los Angeles County Metropolitan Transportation Authority (MTA) Board motion, Fluor Daniel, Inc. (FDI) issued a report on the investigation of innovative construction approaches, management structures and other potentially beneficial alternatives to consider for the Eastside project. The report recommended that the MTA implement an integrated project office approach for the Eastside project. Subsequent to the issuance of the Fluor Daniel report, a workshop on the East-Side project was held on December 8, 1995.

In response to a request made during the workshop, by MTA Board member Supervisor Molina, a Briefing paper was issued by MTA on February 21, 1996 providing clarifications to the questions raised by Supervisor Molina. On March 21, 1996, Supervisor Molina made a motion seeking additional information on various issues relating to the joint project office for the MRL Eastside Extension. This report responds specifically to items 2 and 4 of the March 21 motion.

ORGANIZATION CHART - EASTSIDE EXTENSION
JOINT PROJECT OFFICE



EO = Executive Officer DEO = Deputy Executive Officer * = In Construction Field Office

Note: Key personnel are defined as those residing in the Joint Project Office.
A full listing of these key personnel is presented in the roles and responsibilities section.
Some, but not all, non-key personnel are also presented on this organization chart.
The actual number of personnel will be determined in the Implementation Plan.

KEY ROLES AND RESPONSIBILITIES

MTA Deputy Executive Officer, Project Manager

The MTA Project Manager (MTA PM) is responsible for the overall management of the Metro Red Line, Segment 3, Eastside Extension project and for ensuring that the project is executed in accordance with the Project Management Plan. The MTA PM is responsible for the project budget, contract management, schedule adherence, design quality, construction quality, operational functionality, safety, site security, and community relations (public affairs) during the design, construction and integrated testing for the project. The MTA PM is the primary authority for rail project design, construction, testing, close-out, and transfer to the operating division. The MTA PM is responsible for identifying and defining the necessary resources, including that organization and staffing required to successfully manage and execute the project in all design and construction phases and for the coordination and assignment of Metro Construction staff and consultants to the project team, working with the appropriate MTA Construction Division functional Deputy Executive Officers and Directors. The MTA PM reports directly to the Executive Officer of Construction.

The Project Team

The core project team includes the following positions:

- Deputy Project Manager of Engineering
- Deputy Project Manager of Construction
- Project Control Manager
- Contracts Manager
- Managers of Construction and System Safety
- Managers of Quality Assurance (QA) and Quality Control (QC)
- Senior Public Affairs Officer
- Project Manager, Planning (Central Area Team)

These core team members are responsible for managing, executing, coordinating, facilitating, and expediting project work requirements and meeting established project management goals in their areas of responsibility.

MTA Deputy Project Manager of Engineering (DPM/E)

The DPM/E is responsible for managing the MTA engineering support staff and MTA oversight of the design consultant and design work activities, ensuring that the project design is performed in a cost-effective manner, consistent with

established cost, schedule and quality goals and all applicable systemwide and project-specific design requirements. The DPM/E supervises the activities of the MTA Project Engineers, Systems and Project Engineers, Facilities and the Utility and Third-party Coordinators.

MTA Project Engineers, Systems

The MTA Project Engineers, Systems, report to the MTA DPM/E and are responsible for oversight of all project systems engineering, including design to established cost, schedule and quality goals, in accordance with established policies, procedures and standards and the design Project Implementation Plan. They conduct design reviews of systems contracts at design milestones and other times, audit quality of systems drawings, reports and deliverables; ensure compliance with EIS requirements; conduct systems design meetings and take all necessary actions to ensure systems design information is communicated and coordinated. They assist the DPM/E with interface and coordination requirements, including meetings with Board, public, other agencies and officials. They ensure contract documents are ready for advertisement, perform readiness check, assist with pre-bid conference, respond to questions, support bid evaluation and recommendation for award. Oversight of design support during systems equipment production and installation is also their responsibility.

MTA Project Engineers, Facilities

The MTA Project Engineers, Facilities, report to the MTA DPM/E and are responsible for oversight of all project facilities engineering, including design of facilities to established cost, schedule and quality goals, in accordance with established policies, procedures and standards and the design Project Implementation Plan. They conduct design reviews of facilities contracts at design milestones and other times, audit quality of facilities drawings, reports and deliverables; ensure compliance with EIS requirements; conduct facilities design meetings and take all necessary actions to ensure facilities design information is communicated and coordinated. They assist the DPM/E with external facilities interface and coordination requirements, including meetings with Board, public, other agencies and officials. They ensure contract documents are ready for advertisement, perform readiness check, assist with pre-bid conference, respond to questions, support bid evaluation and recommendation for award. Oversight of design support during construction is also their responsibility.

EMC Project Manager, Design (EMC PMD)

The EMC PMD is responsible for managing and executing the design of facilities and systems contracts to established cost, schedule and quality goals according to

the approved Design Project Implementation Plan and in accordance with established MTA policies, procedures and standards. The EMC PMD reports to the MTA DPM/E. The EMC PMD responds to design reviews of facilities and systems contracts at design milestones and other times; maintains quality of contract drawings, reports and deliverables; complies with EIS requirements and responds, through the MTA DPM/E to internal and external interface and coordination requirements. The EMC PMD produces contract documents ready for advertisement; attends pre-bid conferences, responds to questions and supports MTA's bid evaluation and recommendation for award process. The EMC PMD takes actions to ensure full and necessary communication of all design related information and recommendations for corrective actions. The EMC PMD is responsible for ensuring performance of design support during construction including review of contractor submittals, response to Requests for Information and production of design changes as necessary.

EMC Project Unit Managers

The EMC Project Unit Managers (PUMs) are responsible for managing final design of facilities and systems by section designers or EMC forces. They are responsible for section designer compliance with all technical and contractual requirements, including adherence to defined cost, schedule and quality goals. They are responsible for monitoring progress, coordinating and resolving issues and actions with adjacent and related contracts, and working with the other PUMs, recommending changes and corrective actions to the EMC PMD. They initiate and process changes after review and approval by MTA. PUMs also are responsible for ensuring required design support during construction for assigned contracts.

EMC Systems Lead, Engineering

The EMC Systems Lead, Engineering manages and implements the design of systems contracts to established cost, schedule and quality goals to the defined Project Implementation Plan including defined deliverables and cost limits, in accordance with established policies, procedures and standards. The Systems Lead manages progress and recommends adjustments and corrective actions as appropriate; responds to design reviews of systems contracts at design milestones and other times; maintains quality of systems drawings, reports and deliverables; attends systems design meetings and takes actions to ensure communication of systems design information to others.

EMC Facilities Lead, Engineering

The EMC Facilities Lead, Engineering, manages and implements the design of facilities contracts to established cost, schedule and quality goals to the defined

project implementation plan including defined deliverables and cost limits, in accordance with established policies, procedures and standards. The Systems Lead manages progress and recommends adjustments and corrective actions as appropriate; responds to design reviews of facilities contracts at design milestones and other times; maintains quality of facilities drawings, reports and deliverables; complies with EIS requirements; attends facilities design meetings and takes actions to ensure communication of facilities design information to others.

MTA Project Controls Manager

The MTA Project Controls Manager is responsible for defining and overseeing project-specific cost and schedule goals, objectives and procedures and ensuring that project control and reporting systems are adequate and that the activities of the MTA Project Control staff and consultants are in compliance with MTA's overall program control standards and requirements.

Project Controls Lead

The Project Controls Lead is responsible for implementing project-specific cost and schedule goals, objectives, and procedures for the overall project. The Project Controls Lead ensures that the activities of the Project Controls area staff are in compliance with overall program goals, control standards and requirements. The Project Controls Lead coordinates and integrates cost and schedule information with other project controls personnel responsible for specific geographic areas or systems work, so that there is consistency in application for the overall project. The Project Controls Lead supervises the activities of the project controls staff, including the activities of cost engineers and schedule engineers assigned to the project.

Project Controls Engineers

Project Controls Engineers are responsible for implementing project-specific cost and schedule goals, objectives, and procedures for the project. These team members ensure that project control activities for the specified unit are in compliance with defined project goals, control standards and requirements. The Project Controls Engineers may supervise the activities of cost engineers and schedule engineers assigned to this specific area of the project.

MTA Contracts Manager

The MTA Contracts Manager is responsible for planning, organizing, implementing, managing, supervising, and evaluating all necessary contracting activities to support the design and construction goals and activities of the project, through all phases of

procurement including selection of consultants, initiation of work, changes and change process, bid and award, construction and operation and contract close-out. The Contracts Manager oversees all contractual activities, interfaces with all levels of the project team as necessary and is responsible for contractual compliance with MTA policies and procedures, authorization limits and applicable laws and regulations. The Contracts Manager supervises the activities of contract administrators who are assigned to work on the project.

Contract Administrators

Contract Administrators are responsible for implementation and all necessary contracting activities to support the design and construction goals and activities of the project through all phases of procurement including selection of consultants, initiation of work, changes and change process, bid and award, construction and operation and contract close-out, for their assigned contracts. The Contract Administrators are responsible for contractual compliance with MTA policies and procedures, authorization limits and applicable laws and regulations for assigned contracts.

MTA Systems Safety Manager

The Systems Safety Manager reports to the MTA Systems Safety Director and is responsible for system safety, safety certification, fire/life safety and system assurance and security. Each of the programs are interrelated and the manager is responsible for ensuring implementation of required safety certification activities throughout project design, construction and testing and for production of a formal certification report upon verification of the successful obtaining of the safety requirements prior to the revenue operation date.

MTA Deputy Project Manager, Construction (DPM/C)

The DPM/C is responsible for overseeing and directing all construction management-related activities of the integrated staff. The DPM/C is also responsible for interfacing with the involved public agencies and assuring that the construction work being performed meets the cost, schedule and quality requirements of the project. The DPM/C reports directly to the MTA Project Manager and supervises the activities of the construction managers assigned to the project.

Construction Manager, Systems

The Construction Manager, Systems reports to the DPM/C and is responsible for the Systems Group. The Systems Group is responsible for technical management

of procurement of design and furnish or design, furnish and install contracts for such systems as train control, communications, and traction power.

The Construction Manager, Systems has the following responsibilities: coordinates and supervises the REs assigned to the systems contracts; makes regular observations of the progress of the work and decides on and directs actions necessary to expedite the project for completion on schedule; analyzes specifications to determine scheduling of construction, personnel required, equipment and materials procured; provides interface between the Systems Resident Engineers and other construction management personnel.

Construction Manager, Facilities

The Construction Manager, Facilities, under the direction of the DPM/C, is responsible for overall civil construction. The Construction Manager, Facilities coordinates and supervises the various phases of facilities construction and directs action to be taken to expedite job completion. The Construction Manager, Facilities works with other MTA and consultant staff regarding engineering and construction, specifications, progress estimates and prosecution of the work.

The Construction Manager, Facilities has the following responsibilities: coordinates and supervises the REs assigned to the facilities contracts; makes regular observations of the progress of the work and decides on and directs actions necessary to expedite the project for completion on schedule; analyzes specifications to determine scheduling of construction, personnel required, equipment and materials procured; provides interface between the Facilities Resident Engineers and other construction management personnel.

Resident Engineers (REs), Construction (Systems and Facilities)

The REs oversee the performance of the contractors and are responsible for maintaining complete contract files. All correspondence and communications between the project and the subcontractors are channeled through the REs unless otherwise specified. The REs ensure that measurement of and payment for work performance of the contractors are in strict conformance with the specifications and contract provisions. The REs monitor the contractor's performance against the schedule and budget.

Senior Public Affairs Officer

The Senior Public Affairs Officer reports to the Manager Public Affairs, Construction, within the External Affairs Division, and is responsible for managing the outreach program developed to communicate project construction impacts to

residents, business owners, and commuters in the construction areas. After development of the Community Outreach Plan, typical assignments include coordinating community meetings to disseminate information and obtain input about the project and its impact on the community, staffing project exhibits and displays, responding to complaints and ensuring timely notification to the community of construction activities.

Project Manager, Planning (Central Area Team)

The Project Manager, Planning, (Central Area Team) is responsible for overseeing the implementation and coordination of tasks related to station concept plans, intermodal connectivity, joint development coordination and overall support to the project team and consultants to facilitate project consistency with the project goals and objectives defined during the planning phase.

Project Quality Control Manager

The Quality Control Manager is responsible for the implementation and management of the Quality Control Program. The Quality Control Manager reports to the Director Quality and assures that each contract is staffed with quality control personnel having the required competency and qualifications. The manager ensures that QC staff act with the necessary authority and freedom of operation. Other responsibilities include: review contract documents and changes thereto; inspection of construction activities; preparation and dissemination of quality control inspection instructions (QCII) and procedures; control of and documentation necessary to substantiate the quality of material and workmanship; interface with and coordination of inspection and test activities with appropriate staff; response to and resolution of problems identified by staff; and provision of summaries of QC activities and identified quality programs as required by staff.

Rail Activation and Start-Up Manager

The Rail Activation and Start-up Manager reports to the Director of Rail Activation and Start-up within the Engineering Department and is responsible for reviewing test procedures, preparing the test log of items to be tested, witnessing the testing of equipment and systems, coordinating the resolution of test problems and retesting, and turnover of properly-tested and maintained equipment to MTA Operations. The Rail Activation and Start-up Manager directs the Rail Activation Group comprising representatives of Construction, MTA Operations and Consultants. The Group is responsible for managing the Test Program Plan, Systems Integration Testing, and commissioning of the line.

Project Quality Assurance (QA) Manager

The Project QA Manager reports to the Director Quality and is responsible for overall management of the effective implementation of the quality requirements set forth by the Metro Construction Quality Program Manual and the requirements of the specific Project Management Plan. The manager establishes QA goals and measures for program quality objectives and recommends a strategy to achieve these goals and measures; monitors the implementation of the QA program for design and construction; reviews contractor QA plans for conformance with project requirements; audits QA activities and reports deficiencies and non-conformances; recommends program and project specific changes to eliminate deficiencies and non-conformances.

Construction Safety Manager

The Construction Safety Manger reports to the Director Construction Safety and is responsible for developing policy, implementing procedures and monitoring compliance with the project Safety and Health Program.

The Construction Safety Manager develops and recommends evaluation methods and controls necessary to minimize or eliminate employee and public exposure to occupational safety and health hazards. This manager specifies the design and quality of necessary personal protective equipment and prescribes the standards for their use; ensures compliance with applicable MTA, local, state, and federal regulations relating to safety and industrial hygiene activities; conducts and supervises periodic audits of field operations for technical adequacy and observance of Safety and Health provisions; directs investigations of serious accidents; studies causes and devises preventative measures to eliminate or control hazards and potential liability.

ACCOUNTABILITY

The roles and responsibilities of the key staff have been described earlier in this report. Current MTA policies and procedures define the process for implementation of the MTA responsibilities under the current management structure. The policies and procedures will require revisions, as needed, to implement the responsibilities of the MTA under the joint project approach.

Appropriate checks and balances will be required to ensure the accountability of the key MTA employees. These should be incorporated during the proposed revisions to the MTA policies and procedures. Some of the measures under consideration to enhance the accountability of MTA staff and management are listed below:

- As part of the Joint Project Office Implementation Plan, establish clear definitions of roles and responsibilities for all critical MTA and consultant staff positions.

- Ensure that the selected CM consultant providing staff to the Project is held accountable for the qualifications and performance of its personnel.

- Establish an MTA policy that clearly distinguishes oversight role over the design process and EMC's performance responsibility of the design.

- Establish a set of operating principles for achieving performance goals that will be applied consistently through out the project.

- Establish an MTA management performance review process that includes an evaluation of MTA key staff's compliance with MTA operating principles.

- Establish an independent management review team to periodically evaluate the effectiveness of the execution of MTA project management group's oversight role during the design phase as well as its effectiveness in the execution of the project during the construction phase.

- Establish internal management overview practices and controls that ensure appropriate attention and actions are taken by the construction division to maintain cost, schedule, quality and safety during the design and construction phase.

- Conduct semi-annual assessments of the project staff's effectiveness and PM performance. When deficiencies are discovered, implement specific training programs to improve staff's performance and accountability.

- Select and fill key project staff positions with well qualified people whether they are recruited by MTA directly or through the CM firm.

Final Design

The MTA will be in an oversight role for the final design work. The responsibility and accountability for performance of the design in accordance with the MTA's agreement with EMC will rest with EMC.

EMC is responsible and accountable for providing the deliverables in accordance with the EMC's Project Implementation Plan (PIP) which is subject to MTA approval. The following actions are being implemented to enhance the performance and accountability of EMC.

- MTA should thoroughly review the EMC's PIP prior to approval. Improving definition of deliverables and their acceptance criteria in the contract permits enforcement of the standard of performance expected.

- MTA DPM/E monitors EMC's performance throughout the design phase at regular intervals to ensure that EMC is complying with the PIP requirements related to deliverables, schedule, quality and budget. Any shortfalls in the performance are brought to the attention of the EMC's Project Manager so that corrective actions can be taken in a timely manner.

- MTA Project QA Manager conducts periodic audits of EMC to ensure that EMC's QA/QC processes are being implemented by EMC.

- MTA uses its contracted authority to assure that EMC's Project Manager and key staff meet the qualifications and experience required to execute the design of the project in an efficient and professional manner.

- Thoroughly review invoices to ensure payment for only legitimate work completed.

- Freeze the design upon completing constructability review of the preliminary design to minimize alterations and additions during the final design.

- Negotiate firm fixed-price subcontracts with Section Designers for final design of stations.

- Resolve validity of and obtain settlement for potential errors and omissions immediately after they are detected or identified.

- Take full advantage of opportunity provided by collocation with the EMC for MTA Engineering Managers to monitor work in progress on a daily basis.

- Conduct periodic audits to assure validity of time sheet reporting.

TIMELINE FOR IMPLEMENTATION OF JOINT PROJECT OFFICE

Item	Description	Estimated Completion Date
1.	Develop Preliminary Implementation Plan for JPO for staffing, facility and budget requirements.	April '96
2.	Board decision on JPO site selection.	April '96
3.	Board decision on CM selection.	April '96
4.	Complete office site negotiations.	May '96
5.	Issue Limited Notice to Proceed to CM for required services.	May '96
6.	Negotiate and finalize contract work order modification with EMC to reflect JPO requirements and obtain Board approval.	July '96
7.	Fill key staff positions.	July '96
8.	Complete final Implementation Plan details for JPO.	July '96
9.	Complete initial move and commence JPO operations.	Aug. '96

CONSTRUCTION MANAGEMENT

The Eastside integrated project team will be comprised of MTA project staff and personnel from the selected CM firm. The integrated project team has the overall responsibility for the administrative and management direction of the project. The construction management services are provided through the Deputy Project Manager Construction (DPM/C). The DPM/C and his staff are responsible for the planning, integration and execution of all construction management functions for the Eastside Project. Unlike the traditional oversight role, the MTA construction management personnel will function as a project organization in which the DPM/C, certain key second line managers and supervisors, and others on the team from the specific functional disciplines such as construction management, contracts, estimating and scheduling, are assigned full-time to the project.

Specifically, the DPM/C and the construction management staff assigned to the Eastside Project will have a lead role in functions related to day-to-day project management and control, management and coordination of construction contractors, safety and security, and support for testing and start-up. To avoid duplication of efforts and unnecessary expense, and to provide continuity/conformity with other MTA construction projects, the Eastside construction management group will draw on MTA functional department resources for fulfilling certain functions. The primary responsibility and accountability for construction for the Eastside Project remains with the DPM/C and the construction management personnel assigned full time to the Project. Personnel seconded from a consultant firm will be considered members of the integrated project team and operate under the same project policies and procedures. The ultimate responsibility for successful execution of the project rests with the MTA PM.

The Eastside construction management team will operate on a day-to-day basis with the MTA management philosophy for the project which will delegate to the field, maximum allowable authority for construction management decisions. This philosophy envisions that the primary task is to perform the Resident Engineer functions to assure the safe construction of a quality facility on time and within budget.

The management emphasis will be in the RE offices, ensuring that the necessary technical and administrative expertise to fully administer the provisions of the construction contracts are available. To avoid and control claims, a philosophy of "partnering" will be instilled in the contractors and the construction management group organization. The Resident Engineer's authority to work with the contractors will be enhanced by providing a reasonable level of approval for field changes. However, the field change requests will first be submitted to the MTA contract administrator and legal counsel for review and approval, per AB1869, prior to issuance by the Resident Engineer.

PROVISION OF INSURANCE

EASTSIDE EXTENSION

- Plan for the provision of insurance by contractors and how it will reduce risk, assure accountability and protect the public from liability
- Providing engineering and design consultants with an owner provided professional liability insurance program
- Accountability and assumption of risk
- Discuss exemptions if any
- Legal implications

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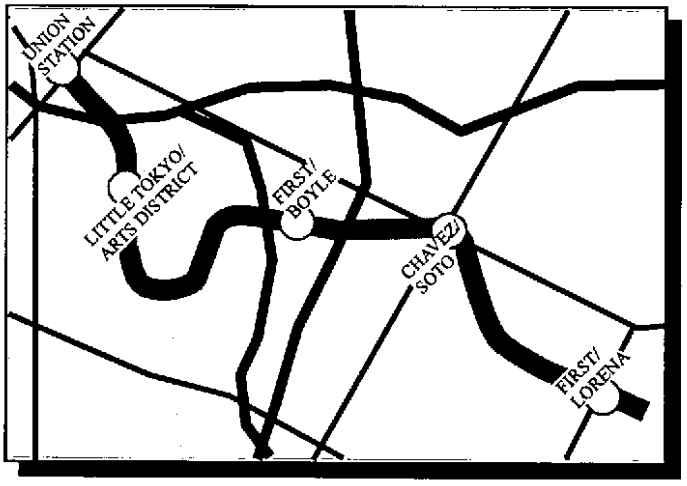

PROVISION OF INSURANCE FOR CONTRACTORS
EASTSIDE EXTENSION

This report on provision of insurance responds specifically to Item 3 from the March 21 motion by MTA Board Member Supervisor Molina.

OBJECTIVE:
To develop the strategy, recommendations and plan for the provision of insurance for Eastside Extension contractors.

BACKGROUND:
Since 1984 MTA and/or its predecessor organizations have insured their construction projects through the use of Owner Controlled Insurance Programs (OCIPs). Traditionally, these programs have provided to the owner, contractor and subcontractors of every tier, workers' compensation, general liability, and builders' risk insurance for all work performed at a designated work site or associated with a construction project.

This arrangement has allowed MTA to effectively manage insurance costs associated with construction of various projects. Additionally, an OCIP is consistent with the type of insurance program in use for similar construction projects in the United States.

Beginning in November 1992, MTA implemented a project specific professional liability insurance program to insure the exposure to losses associated with design and engineering errors and omissions. A primary purpose for implementing this program was to enable the employment of M/W/DBE design contractors who would not otherwise be able to work on the MTA project for lack of a satisfactory professional liability insurance program.

CURRENT STATUS:
On March 21, 1996, Supervisor Molina introduced a motion requesting a presentation to the Board on insurance provisions. Risk Management has been asked to respond to item #3 of the Molina Motion. The following issues have been reviewed:

ISSUE #1:
Discuss the plan for the provision of insurance by contractors and how it will reduce risk, assure accountability and protect the public from liability.

RESPONSE:
The recommended insurance plan for the Eastside Extension is an OCIP. An OCIP typically requires the owner to purchase, for the benefit of itself, the contractors, and the subcontractors of every tier workers compensation, general liability, and builders risk insurance.

ADVANTAGES:
- Purchase of adequate limits of liability dedicated solely to claims arising from project construction

- Removal of adversarial relationships between parties involved in the construction project in the event of loss or claim
- Control of legal and allocated claims expenses through use of a single defense attorney for claims involving one or more parties
- Opportunity for improved worksite safety through coordinated loss control management
- Potential for significant reduction in construction costs due to decreased overhead costs from each contractor bid
- Potential for deferral or premium/dividend return due to good loss experience on claims

DISADVANTAGES:

- Potential for increased construction costs as a result of poor loss experience on claims
- Potential for increased construction costs due to a poorly designed and administered OCIP

RECOMMENDATIONS:

Given the substantial benefits of an OCIP, especially balanced against the national norm that OCIPs most often result in a 25%-35% reduction in construction insurance costs, staff recommends an OCIP be implemented for the Eastside Extension. An OCIP shall insure the project is adequately insured for direct damage losses as well as other legal liabilities arising from the course of construction.

ISSUE #2:

Discuss the issue of providing engineering and design consultants with an owner provided professional liability insurance program.

RESPONSE:

Since November 1992, the MTA has arranged for professional errors and omissions insurance for all design professional and construction managers. The provision of a project professional liability insurance program (PPLIP) as opposed to requiring each design professional to utilize their own practice program is widely debated. The benefits of an owner provided PPLIP include the following:

ADVANTAGES:

- Provides limits of liability specific to the interests of the MTA and design professional
- Provides opportunity for subcontractors, who may be otherwise unable to obtain required professional liability insurance
- Extends liability coverage limits beyond those normally available to individual firms

- Ensures the PPLIP is available for duration of the construction project

DISADVANTAGES:

- Significant premium cost for a PPLIP
- Potential for design professionals to be less accountable for design errors
- Potential for professional liability insurance underwriters to dictate unfavorable terms based on the necessity that a single insurance program be maintained for the duration of the project
- Potential for exhaustion of aggregate limits due to adverse loss experience prior to project completion

The best approach to preserve the benefits yet reduce the risks associated with a PPLIP, is to require each design professional to contribute to the cost of the program based on their relative exposures to loss as compared to the total cost of the PPLIP. The contributions would be directed into a pool to fund self-insured losses within the PPLIP. Traditional "excess" insurance would also be available to fund losses. The contributions would be adjusted annually based on underwriting criteria, including loss exposures. Implementation of this type of pooling arrangement would continue to recognize the benefits of a PPLIP while encouraging good risk management and quality control.

RECOMMENDATION:

Staff recommends a PPLIP be established for the Eastside Extension. However, the recommended PPLIP program, if available from underwriters, must be developed with a provision for cost sharing by the design professional.

ISSUE #3:

Discuss the issue of accountability and assumptions of risk for each participant for the construction project.

RESPONSE:

A construction insurance project usually consists of three key parties: owner, design professional, and the contractor. Any loss or claim is usually the result of the joint and several liability of each of these parties. Although the contractor may be primarily responsible for a loss, the injured party may charge the owner with negligent supervision and the design professional with negligent design. In such a circumstance, the three parties must each defend on their own behalf while filing cross claims against one another.

These circumstances serve to adversely impact an orderly and cooperative project completion environment. Consequently, it is difficult to determine individual accountability and assumption of risk for each party without the specific facts of an event being known. One of the primary purposes of both an OCIP and a PPLIP

is to eliminate this type of cross-over claim through the implementation of a single insurance program(s) that insure all the parties to an insurance contract.

RECOMMENDATION:
Given the significant benefit of both an OCIP and PPLIP, the potential adverse financial risk is an acceptable business risk and the programs should be continued.

ISSUE #4:
Discuss which, if any, of the project participants would be exempt from insurance requirements, including the rationale, advantages, disadvantages of such an exemption.

RESPONSE:
To fully achieve the benefits of an OCIP and PPLIP, there should be few, if any, exemptions in the participation of the programs. It has been the historical practice of MTA to include all contractors and subcontractors in the OCIP and all design professionals in the PPLIP. The rationale for this practice has been that to do otherwise reduces the effectiveness of the OCIP and could substantially increase the financial and administrative risk to MTA. The specific advantages include:

ADVANTAGES:
- Participation of all participants in the applicable program
- Maximum cost saving from deletion of insurance-related overhead of construction and design costs
- Maximum productivity enhancement from the consolidation of loss control programs through coordinated loss control efforts
- Maximum potential for insurance premium return due to favorable loss experience

DISADVANTAGES:
Any disadvantages would only be experienced in the event of unfavorable loss experience. In order to minimize potential of this occurrence, there must be strong administrative oversight of both the OCIP and PPLIP as well as a direct working relationship between MTA Risk Management and Construction Management. Given the fact the Eastside Extension is the newest project to be undertaken by MTA, maximum benefits can be achieved through implementation of a "best practices" approach in administration of the OCIP and PPLIP.

RECOMMENDATION:
Based on significant advantages available through implementation of both the OCIP and PPLIP, it is the recommendation of staff that these programs be established for the Eastside Extension. Both Risk Management and Construction

Management shall work towards maximizing the benefits of these insurance programs.

ISSUE #5:
Discuss legal implications to MTA in the event that problems are encountered with implementation of the OCIP and PPLIP.

RESPONSE:
The primary legal implication resulting from implementation of the OCIP and PPLIP would arise from the contractual obligation of the contractors and design professionals to maintain these insurance programs for the entire duration of the construction project. Failure to provide these insurance programs could result in MTA self-assuming the insurance obligation with the consequence that significant uninsured legal and indemnity expense would be incurred.

It is critical the OCIP and PPLIP be implemented only with insurers of adequate financial integrity to provide coverage through completion of the construction project. If such insurers are not available, the alternative is to require each contractor and design professional to provide insurance.

RECOMMENDATION:
Recommendation to be provided by County Counsel.

CONSTRUCTION MANAGEMENT

EASTSIDE EXTENSION

- Use of Construction Manager as a Clearinghouse for Employees
- Use of a Job Shop for Employee Procurement

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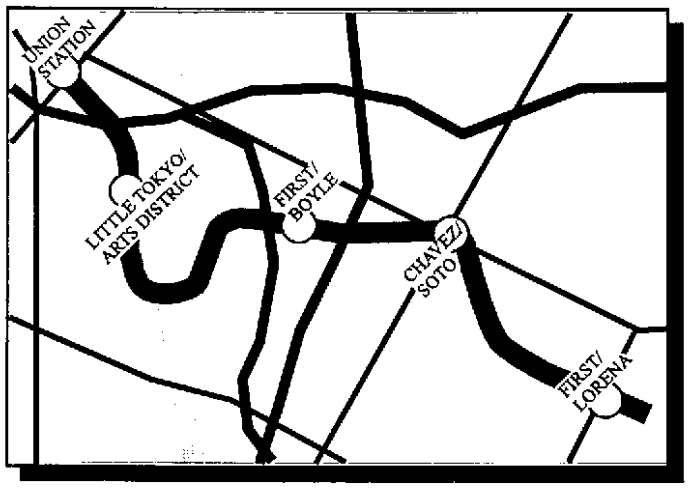


COMPARISON BETWEEN THE USE OF A CONSTRUCTION MANAGER AS A CLEARINGHOUSE FOR EMPLOYEES VS. USE OF A JOB SHOP FOR EMPLOYEE PROCUREMENT. EASTSIDE EXTENSION

This report responds specifically to item 5 from the March 21 motion by MTA Board Member Supervisor Molina

The comparison of using a construction manager as a clearinghouse for employees versus the use of a job shop for employee procurement is presented below. Staff is currently developing estimates with the intent of including them in the presentation on April 4, 1996.

CONSTRUCTION MANAGER AS CLEARINGHOUSE FOR EMPLOYEES

1. COST

   The construction manager will generally burden the direct salary of the employees provided with the basic direct labor burden rate used for its own employees. The direct salaries will be whatever the rate may be for those employees. However, a lower burden rate may be negotiated if identified and agreed in advance of cost incurrence. Generally, a construction manager may be expected to have a significantly higher burden rate than a job shop. The construction manager is chosen on the basis of overall qualifications, and not on cost, under FTA regulations, California law, and MTA policy.

2. LIABILITY

   Since a construction manager is procured as having overall responsibility for the management of the construction project, by providing employees, the CM will also assume the liability for providing suitable employees for MTA needs and for the effective performance of those employees. Undivided liability.

3. ACCOUNTABILITY

   The CM provides seconded employees as one of many services it performs for the Authority. Generally, the provision of employees will have less importance for the CM than for a firm that relies totally upon furnishing employees for its revenue. A job shop may therefore be more responsive. However, by using the job shop to furnish employees, the MTA has divided responsibility and also accountability. A CM firm is more likely to have had previous employment experience with the employees it proposes to furnish and therefore have a better idea of how the employee would perform in the position required. There is also the possibility of a more effectively integrated team.

JOB SHOP FOR EMPLOYEE PROCUREMENT

1. COST

Generally, a job shop will have significantly lower burden costs than a CM firm. Also, when placing the contract for employee procurement, the forces of competition should keep the costs lower. Contracts with job shops will likely be awarded on the basis of price and cost, not qualifications. However, since the MTA has not awarded this type of contract before, it is unknown precisely how many qualified firms would propose, and thus what the amount of price competition would be.

2. LIABILITY

The liability of the job shop would be limited to providing potential employees who meet the requirements specified in its contract. The MTA would assume the liability of precisely defining the skill and experience levels required. The job shop does not guarantee that its employees will be able to perform the tasks required. If a provided employee is not performing, the job shop probably would be required to just provide a replacement.

3. ACCOUNTABILITY

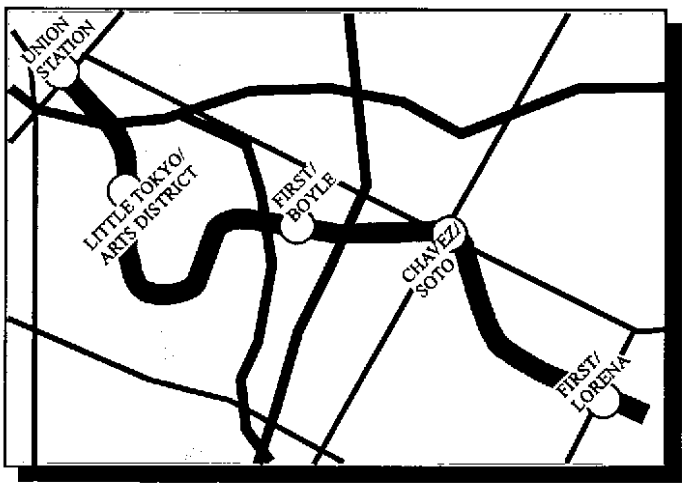
The only business of a job shop is supplying employees, therefore, a job shop has more incentive to do that job well. Job shops can also generally provide and release employees more quickly. However, as noted above, a job shop must only provide employees who meet the specified requirements and does not guarantee a result. However, the MTA might consider awarding multiple indefinite delivery type contracts that provide for a minimum and maximum amount of services required. As needs arise, if one job shop proves itself more responsive and accountable than others, that job shop would be given orders for more of the requirements.

The MTA does not currently employ job shops to provide employees, although may local aerospace companies and some local government agencies effectively and economically use job shops. MTA staff at this time knows of only two transit projects which employ job shops, but staff is in the process of obtaining more complete information. Certain project needs may be too specialized to reasonably employ a job shop. However, many firms have established pools of resources in response to anticipated MTA rail construction needs and it may be expected that job shops might be able to draw from or even expand upon those pools of resources.

PREQUALIFICATION OF CONTRACTORS

EASTSIDE EXTENSION

- Prequalification of Contractors



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PRE-QUALIFICATION OF CONTRACTORS
EASTSIDE EXTENSION

This report on pre-qualification of contractors responds specifically to item 6 from the March 21 motion by MTA Board Member Supervisor Molina

Although there is a belief in certain quarters that the AB1869 requirements for prequalification of contractors/suppliers do not overturn other prohibitions in the law prohibiting its use, the MTA staff is preparing to implement a prequalification program.

The prequalification system would rely upon a questionnaire to be prepared by the MTA Inspector General. Firms desiring to be prequalified would provide answers to questions posed by the questionnaire. According to AB1869, the questionnaire shall, at a minimum, solicit information on all of the following subjects regarding the firm:

(1) Experience;
(2) Quality and timeliness of past performance;
(3) Reliability and responsibility;
(4) Compliance with equal employment requirements.
(5) Compliance with wage, hours, and other fair labor standards;
(6) Subcontractors used by the firm;
(7) Integrity of the firm and its key personnel;
(8) Gifts given, or contributions made, to members or alternate members or employees of the authority.

Neither the authority nor any of its organizational units shall contract or do business with any responding firm that knowingly provides false information in the questionnaire.

The prequalification of construction and related professional service contractors/consultants will be performed by a team of cross-functional analysts. The Construction Contracts Department will manage the program, which will commence its efforts on July 1, 1996. The existing staff will be augmented with the following:

Contract Administrators (2)
Attorney
General Engineer
Administrative Aide
Auditors (2)

The Contract Administrators will coordinate with the Inspector General and Technical Staff in order to refine the data questionnaire used to obtain contractor/supplier prequalification proposals. They will then prepare advertisements in local newspapers and trade publications In order to provide for the widest possible dissemination of the program solicitation requirements. They will prepare the specific RFIQ (Request for Information and Qualifications) which

will be provided to all firms responding to the advertisements. They will receive, log, and prepare for evaluation all prequalification proposals submitted in response to the Request for Information and Qualifications. They shall coordinate the multi-disciplinary review and evaluation of all such proposals. They will personally review and evaluate the responses of firms as they relate to the business qualifications of the firm to perform the work. The Contract Administrators will assure that all responsibility factors included in AB1869 are investigated during the prequalification review.

The Attorney member of the team will review the proposals and certifications contained therein in order to determine and establish the integrity of the firms proposing.

The General Engineer member of the team will review the proposals and certifications contained therein as well as previous contractor performance evaluations performed by MTA or other facilities contracting organizations in order to assess the past performance of the firms as well as to establish the capability/responsibility of the firms to accomplish work of the general and specific nature required by the MTA.

The Administrative Assistant will assist the contract administrators in all administrative aspects of the prequalification, will maintain all case files, and will establish/manage the database of prequalified firms.

The Auditors will review the proposals and certifications contained therein (particularly the certified financial information included in the proposals) in order to assess the degree to which the firm can be considered financially responsible. In addition, for cost reimbursable work, the auditors will review the accounting systems of the proposing firms in order to assess the degree to which the accounting systems of the firms can provide the MTA with the assurance that only reasonable, allowable, and allocable costs will be charged to MTA's contracts. Lastly, for cost reimbursable contracts, the auditors will review the books and records of the firms submitting proposals in order to establish acceptable forward pricing rates for overhead/burden and General and Administrative (G&A) rates.

It is anticipated the 7 member staff will be needed during the two year period needed to complete the prequalification of the large population of firms expected to request prequalification and inclusion on MTA's bidders lists. Subsequent to that initial period, staffing can be reduced to three (a contract administrator, an engineer, and an administrative assistant) to provide for database maintenance and to respond to requests from firms not considered in the initial prequalification efforts.

Prequalification will be performed initially for construction firms. This phase (expected to take 3-6 months) will be followed by a phase of prequalification of construction management firms, a phase which should be completed in a similar period of time. This will be followed by prequalification of all other professional service contractors (consultants), which should be completed within a 12 month period.

The prequalification program will assure that the MTA contracts only with firms which are responsible, and capable firms, with the integrity demanded of firms doing business in the public sector.