

FIFTH ANNUAL WORK PLAN

for

CONSTRUCTION MANAGEMENT PHASE II – CONSTRUCTION SERVICES

for the

LOS ANGELES METRO RAIL PROJECT

PART I – DEFINITION OF WORK PROGRAM

presented to

**Southern California
Rapid Transit District**

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PDCD

A JOINT VENTURE OF THE RALPH M. PARSONS COMPANY, DILLINGHAM CONSTRUCTION, INC AND DE LEUW, CATHER & COMPANY

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METRO RAIL CONSTRUCTION MANAGEMENT SERVICES

FIFTH ANNUAL WORK PLAN

FOR

CONSTRUCTION SERVICES

Prepared for

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

PART I - DEFINITION OF WORK PROGRAM

11 April 1988

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Month June Year 1988

Southern California Rapid Transit District

PDCD, A JOINT VENTURE
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FOREWORD

This document presents the Fifth Annual Work Plan for the period 2 July 1988 to 30 June 1989 for the Metro Rail Construction Management Services contract. It encompasses Phase II - Construction Services and Construction and Procurement Related Activities as defined in Articles 3.1.2 and 3.1.3 of PDCD's contract with the District.

The plan is based on the Contract Unit Description Book, revised as of January 1987, and Revision 6, to the Level 3 MOS-1 Construction Schedule dated January 14, 1988.

The Annual Work Plan is organized so that the CM Services information is presented in two parts with a separate document for each part. Part I covers the "Definition of the Work Program. Part II covers the "Cost and Staffing" related to that work program.

This document is Part I and includes the following sections:

- Section 1 - Staffing Plan
- Section 2 - Staffing Plan Justification
- Section 3 - Cost Proposal

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SECTION 1

PROJECT DESCRIPTION AND WORK BASIS

This Fifth Annual Work Plan (AWP) has been prepared to cover Phase II - Construction Services, to be performed during the Construction Management Services contract period extending from 2 July 1988 thru 30 June 1989. It is based on the project description outlined below and on the scope of work, schedules, and staffing plan presented in the subsequent sections of this plan.

Future work on subsequent portions of the Starter Line (MOS-2 or SB1995) is not included in this plan.

1.1 PROJECT DESCRIPTION

The Los Angeles Metro Rail project encompasses the design and construction of the initial segment, or Starter Line, of the ultimate 150 mile rapid transit network for the Los Angeles urbanized area. The Metro Rail Project is a conventional heavy rail system, 18.6 miles in length, with 18 stations serving the Central Business District, Wilshire Boulevard, Fairfax, Hollywood, and North Hollywood area. During the Second Annual Work Plan, the Seventh/Flower Station design was expanded to include the Long Beach Light Rail Station interconnect and associated advance utility relocations.

The yard and shop area is an at-grade facility located between 1st and 6th Street and between the Los Angeles River and Santa Fe Avenue in an area currently occupied by the Santa Fe Railway. Access tracks from the yard and shop will enter a tunnel in the vicinity of the Santa Ana Freeway and will connect the yard and shop to the southernmost station on the line at Union Station. The initial segment of the project, i.e., the stations and line segments from Union Station to and including the Wilshire/Alvarado Station (about 4.4 miles) and the at-grade yards and shops are defined as the Minimum Operable Segment (MOS-1) (Figure 1-1).

By Federal law, contingent to the funding legislation of December 1985, the SCRTD is required to investigate alternate routes for the second phase of construction to avoid tunneling through the area designated by the City of Los Angeles Task Force as a "potential risk zone". The proposed locally preferred alignment, known as Mitigation Candidate Alignment MM1 (Figure 1-2) calls for an aerial structure going north on Vermont Avenue from Wilshire, turns west onto Sunset Blvd., then north in the vicinity of the Hollywood Freeway to Hollywood Blvd., then goes underground beneath the Hollywood Freeway and Hollywood Blvd. before turning north toward the San Fernando Valley. If this alignment is approved by SCRTD and UMTA, the Starter Line will increase to 20+ miles in length and serve 19 stations.

1.2 SCHEDULE

The District's Master Level 0 Schedule for MOS-1 is presented in Figure 1-3.

1.3 WORK BASIS

The work basis for this plan consists of the Scope of Services defined in Section 3 and the schedules presented in Section 5.

The PDCD CM Team staff will be located in the central Project Office in downtown Los Angeles at 600 South Spring Street and at eight field offices in the Yard and Shops area, and at the 1st and Hill, 4th and Hill, 7th & Flower, Wilshire/Alvarado, and Union Station areas.

The plan is based on the scheduled construction activities for the period 2 July 1988 to 30 June 1989.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MINIMUM OPERABLE SEGMENT-1

APRIL 1987



METRO RAIL PROJECT

PROJECT UNIT INDEX

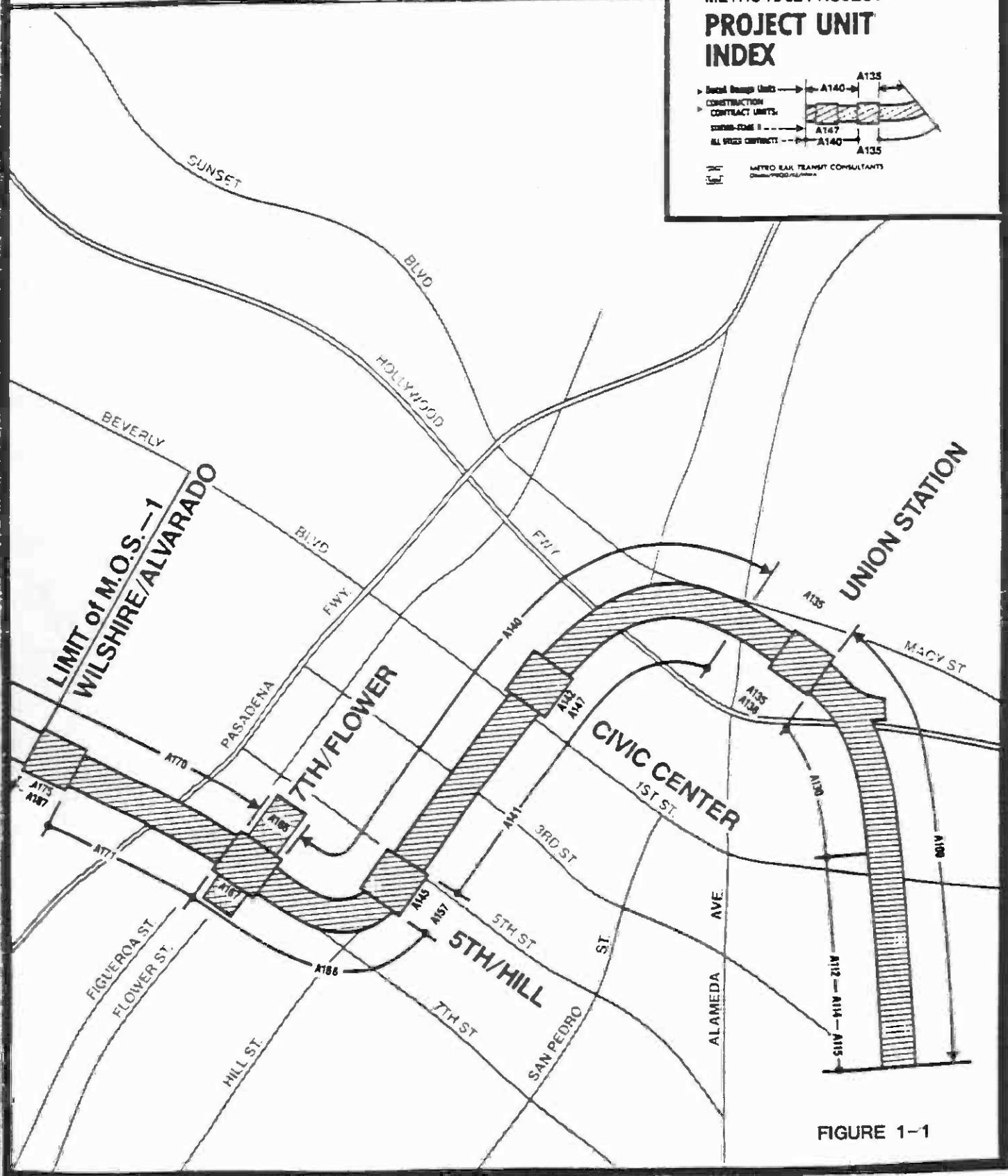
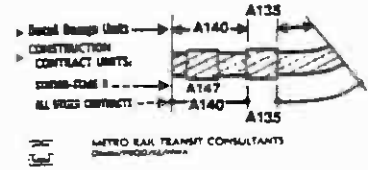


FIGURE 1-1

CORE STUDY

MITIGATION CANDIDATE ALIGNMENT MM 1

19 STATIONS LENGTH : 20.37 MILES

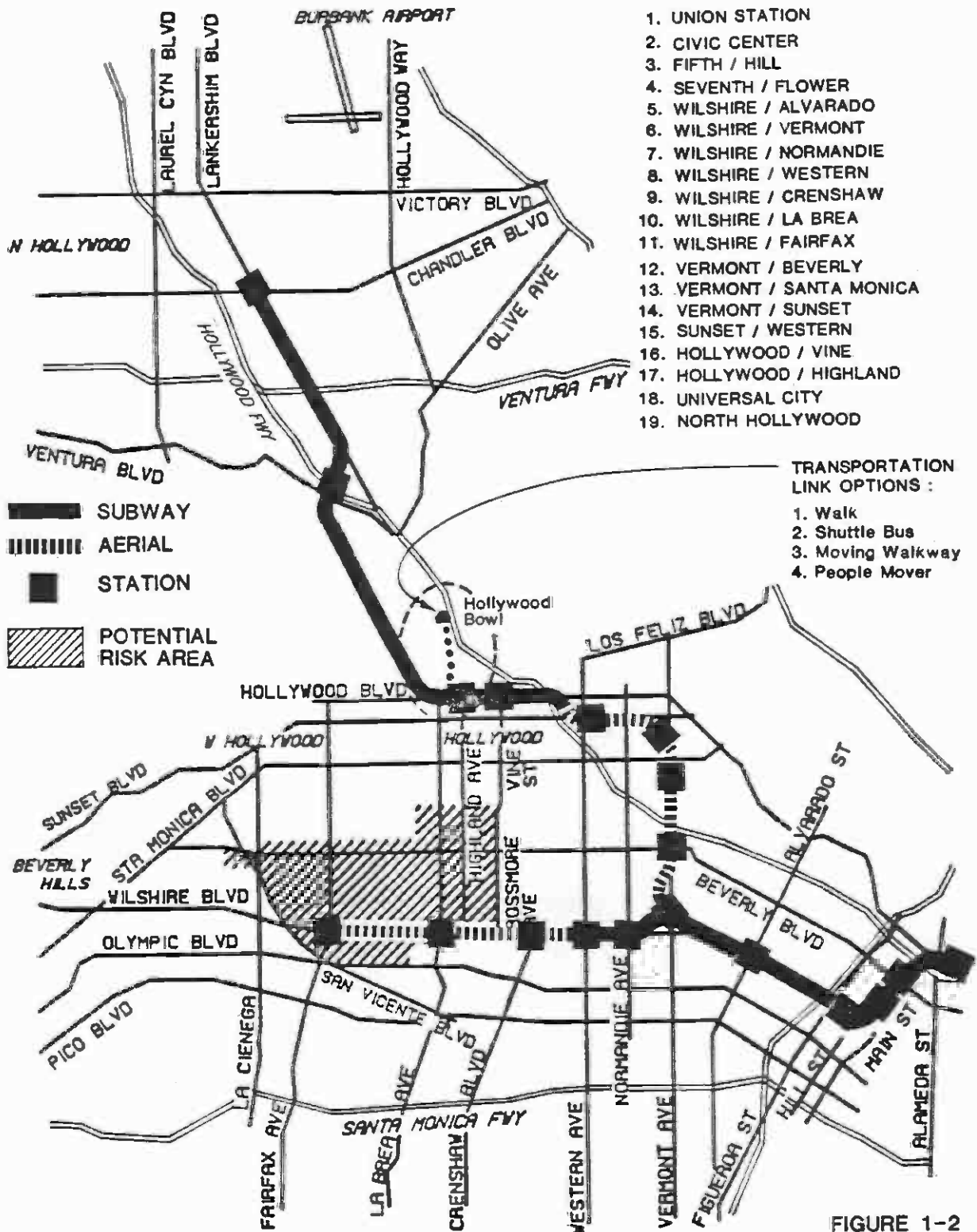


FIGURE 1-2

METRO RAIL PROJECT

MINIMUM OPERABLE SEGMENT - 1

LEVEL 0 EXECUTIVE SCHEDULE



REVISION 6 01/14/88

1-5

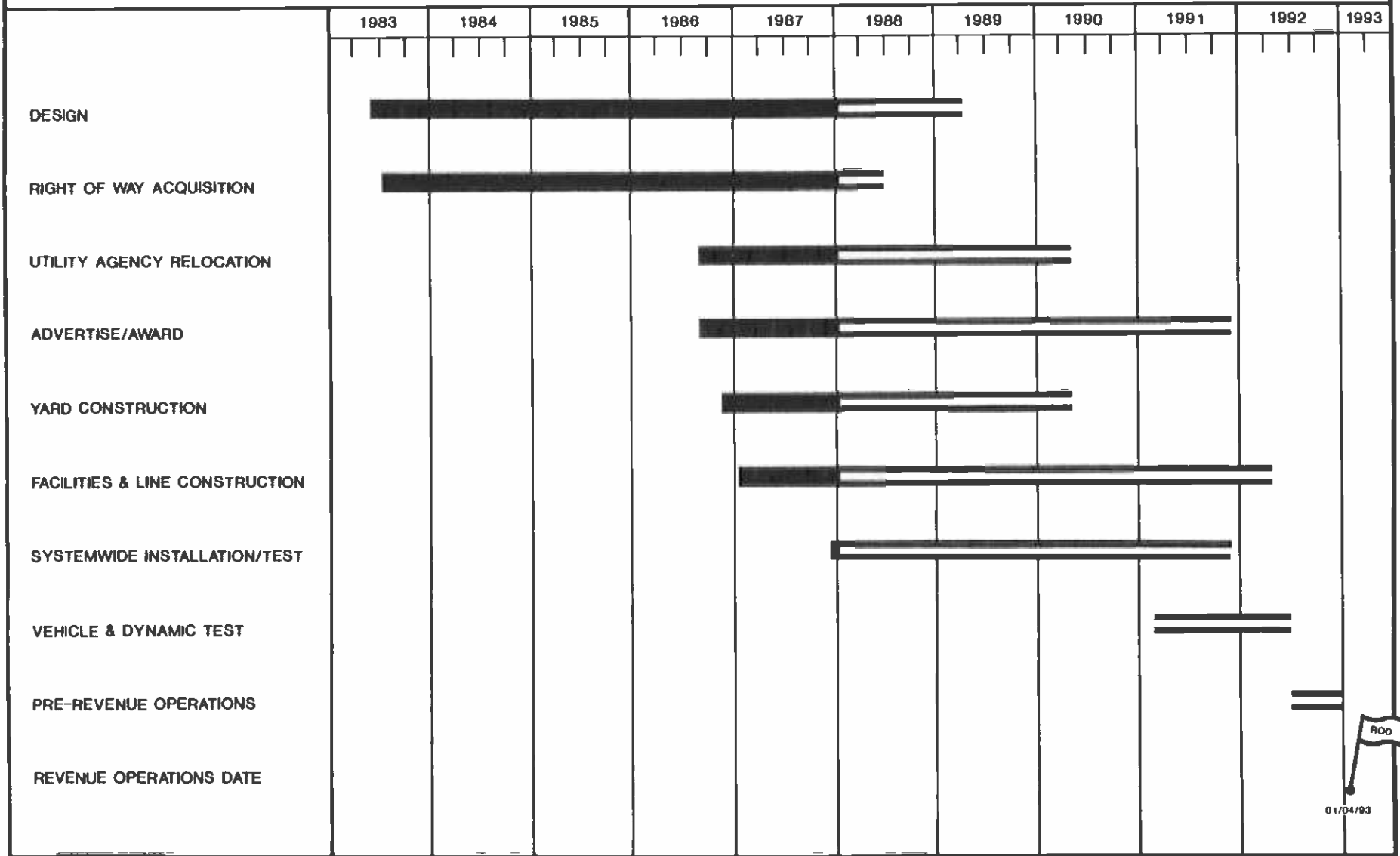


FIGURE 1-3

SECTION 2

PROJECT PARTICIPANTS AND THEIR INTERRELATIONSHIPS

The identification of and the various interrelationships among the participants in the construction of the Metro Rail Starter Line are defined in this section.

2.1 PROJECT PARTICIPANTS

Major participants during construction are the Southern California Rapid Transit District, the General Consultant (responsible for overall design), the Construction Manager (responsible for construction management services), the District Insurance Administrator (responsible for the Insurance Program), special consultants, the Project Management Oversight Contractor (PMO), equipment suppliers, local utility companies and railroads, and general construction contractors. The identification and broad responsibilities of each are presented below together with a discussion of their interrelationships.

2.2 PARTICIPANT RESPONSIBILITIES AND INTERRELATIONSHIPS

In general, the responsibilities of and interrelationships among the major participants are as follows:

2.2.1 SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The Southern California Rapid Transit District has overall responsibility for all aspects of the Metro Rail Project. In that connection the District will provide overall project management and supervision and has final approval of all construction drawings and specifications, change orders, procurements, acceptance of construction and equipment installation, and contractor payments.

2.2.2 GENERAL CONSULTANT

The General Consultant (GC) is a Joint Venture of Daniel, Mann, Johnson and Mendenhall/Parsons, Brinckerhoff, Quade and Douglas/Kaiser Engineers/Harry Weese and Associates, operating under the name Metro Rail Transit Consultants (MRTC), and is under direct contract to the District. The GC has overall design responsibility, provides the District with bid documents for contract advertising and engineer's estimates for comparison to bids. The GC also provides construction contract packaging and identification of long-lead procurements, and during construction will provide design analysis of change orders and interpretation of plans and specifications as required. Project designs are performed by design subcontractors under contract to MRTC or by in-house MRTC personnel.

°Material from the GC to the CM is transmitted through the District. Review comments and recommendations by the CM are returned to the District for screening and forwarding to the GC. The District will resolve any differences of opinion that arise from the CM review. The CM will cooperate fully with the GC and coordinate their respective activities on a daily basis; however, the CM will not deal directly with any design, engineering, supply, or manufacturing subcontractor under contract to or supporting the GC, but will work through the District and the GC whenever contact is necessary.

2.2.3 CONSTRUCTION MANAGER

The CM is PDCD, a Joint Venture of The Ralph M. Parsons Company/Dillingham Construction, Inc./and De Leuw, Cather & Company. Under contract to the District, the CM is responsible for constructibility and claims avoidance reviews of designs, schedules, and bid documents; reviews of cost estimates; assistance in procurement of long-lead materials and equipment; assistance in evaluating bids from construction contractors; implementation of a safety program; supervision and inspection of construction; and the scheduling and cost control of construction. The CM is also responsible for certain systems aspects of the project, including systems integration, supervision of systems installation, startup, testing, and systems certification. The CM maintains offices of Equal Opportunity, Community Relations, Safety/Security, and Quality Assurance to assure that project objectives in these areas are achieved.

Management of the Joint Venture is represented by the Construction Manager who is responsible to a Joint Venture Executive Board, which supports the performance of the Construction Manager and also provides a direct point of contact between the District and the management of the Joint Venture companies. Sub-contractors and special consultants are under contract to the Joint Venture.

2.2.4 GENERAL CONSTRUCTION CONTRACTORS AND EQUIPMENT SUPPLIERS

Construction contractors and equipment suppliers selected for the Construction Phase will be under contract to the District. The CM, acting for the District, will manage and supervise the construction contractors. The CM assists in evaluating bids; performs onsite supervision, coordination, quality control, and safety inspection of all construction; reviews detailed schedules prepared by the contractors; reviews and evaluates shop drawings and change order requests; certifies contractor payments; verifies contractor compliance with Equal Employment Opportunity requirements; supports the community relations program; and exercises cost and scheduling control. Final approval of changes or revisions recommended by the CM and the authority to direct their implementation rests with the District. The CM will oversee the work performed by equipment suppliers, perform expediting and shop inspection services and coordinate and schedule delivery, checkout and acceptance testing.

2.2.5 UTILITIES AND RAILROADS

Utility and railroad relocation work associated with Metro Rail construction may be performed by utility and railroad force account personnel, under contract or agreement with the District. The CM will coordinate, inspect and/or monitor this work as directed by the District and will review force account records and periodic billings.

2.2.6 DISTRICT INSURANCE ADMINISTRATOR

The District Insurance Administrator (DIA) is a Joint Venture of four brokerage firms headed by the Fred S. James & Company of California, under contract to the SCRTD to procure the necessary insurance coverage and implement the Owner Controlled Insurance Program (OCIP). The DIA is responsible for implementing the OCIP, administers the OCIP and functions as the District's Technical Advisor on insurance policy and issues insofar as they concern the Metro Rail project.

The CM will consult with the DIA on all questions relative to insurance requirements as they relate to the CM and its subcontractors. The CM will work closely with the DIA and assist as required and requested in implementation of the OCIP.

2.2.7 SPECIAL CONSULTANTS TO DISTRICT

The District may engage special consultants to obtain expertise in a given area. The CM will cooperate with and assist such consultants in the performance of their assignments.

2.2.8 PROJECT MANAGEMENT OVERSIGHT

Under the provisions of the Full Funding Contract, UMTA has engaged a Project Management Oversight (PMO), Hill International, Inc. The PMO assists UMTA during their on-site quarterly progress reviews and monitors, evaluates, and reports to UMTA on such activities as: performance of quality control, performance of quality assurance, performance of Project execution with respect to budget, schedule, and construction management; and such other activities as UMTA from time to time may consider appropriate.

SECTION 3

SCOPE OF SERVICES

The Fifth Annual Work Plan (AWP5) for Construction Management Services to the Southern California Rapid Transit District for the Metro Rail Project includes ongoing Construction Phase Services, and Construction and Procurement Related Activities. These Construction Phase services began on September 4, 1986 when PDCD received notification from RTD to start Phase II Construction Services. PDCD is now fully involved in the Construction and Procurement Services phase of the project, providing such services as construction surveillance and inspection, coordination of work with other agencies, measuring and reporting of construction progress, approval and processing of progress payments, maintenance of the baseline schedule, environmental compliance monitoring, coordination of permits, traffic, railroad and utility relocations, quality assurance surveillance, configuration control, change order processing, claims processing, review and approval of shop drawings, geotechnical instrumentation monitoring, material testing, safety program implementation, survey control, implementation of a community relations program, and EO compliance monitoring. The CM also provides specialty support in labor relations as requested by the District; and as necessary, provides General Condition items such as security guards, watchmen, testing laboratories, preparation for ceremonies, site tours, photographs, refuse disposal, and temporary weather protection.

3.1 SCOPE OF SERVICES AND STATEMENT OF WORK

CM activities during the Fifth Annual Work Plan as defined in Articles, 3.1.2 and 3.1.3 of PDCD's Contract with the District, include Construction Services and Construction and Procurement Related Activities, as follows:

3.1.1 CONSTRUCTION SERVICES

The specific services to be provided during construction are as indicated below, by task:

- A. Assist in pre-bid conferences and assist in evaluation of bids including comparative analyses of bid items. Provide recommendations to the District regarding individual contract awards.
- B. Review the contractor's detailed construction schedule for reasonableness and compliance with contract requirements and either recommend acceptance to the District or have it revised for acceptance by the District.
- C. Upon acceptance of the contractor's detailed construction schedule, develop a current summary level network showing the critical path of scheduled

contract activities, along with appropriate detail cost and manpower information for incorporation into TRACS. The network and detail cost shall be subject to the District's review and approval.

- D. Prepare and submit to the District periodic reports on the status of all the individual construction contracts and on the construction program in the aggregate. Formats of report requirements will be approved by the District. Such reports shall include, but not necessarily be limited to, the following:
 - (1) Cost Analysis - Provide the budgeted, committed, and obligated costs by contract bid items, using the District's TRACS. Provide reasons for significant changes, explanations of actual vs. projected cost variances, evaluations of all anticipated changes and liabilities impacting cost-to-complete.
 - (2) Schedule Analysis - Compare planned performance with actual performance. Address the effect of change orders, design revisions, schedule recovery and explain trends impacting schedule.
 - (3) Construction Reports - Provide a report for District approval on activities completed, work in progress, long-lead material deliveries, problems encountered and recommended actions, status of items reported previously, and plans for succeeding months.
 - (4) Project Exception Report - Identify and treat specific problem areas (problem description, history, recommend action or disposition).
- E. Continue participation in periodic District Management meetings to make presentations, provide back-up information, and make recommendations pertinent to issues under discussion.
- F. Notify the District of any changes to the work and of potential claims. This notification shall include an evaluation of the impact of changes on the contract, project costs, and schedules.
- G. Continue preparation and submission of monthly reports on the status of the CM's activities.
- H. Examine all shop and working drawings submitted by contractors and approve for conformance with contract documents. In the event such shop or working drawings change design, such drawings shall be brought to the attention of the District which will arrange for the original designer and the GC to check and approve or comment on the change indicated on the drawings.
- I. Ensure that all materials furnished and work performed on the project are in accordance with contract documents.
- J. Perform noise, vibration, and air quality monitoring as required during construction to assure contractor compliance with the contract, legal, and safety requirements.

- K. Implement and administer an instrumentation program. The CM shall become knowledgeable of the subsurface information obtained during the engineering design phases of the project. In implementing and administering the instrumentation program, the CM shall:
 - (1) Consult with the District in specifying the various items of monitoring equipment.
 - (2) Procure instrumentation equipment not being provided by construction contractors.
 - (3) Perform appropriate pre-installation equipment tests so as to calibrate and determine the acceptability of the instruments.
 - (4) Supervise the installation of all equipment required to satisfactorily perform the various monitoring functions.
 - (5) Maintain instrumentation equipment.
 - (6) Perform or supervise the performance of monitoring measurements and read-outs.
 - (7) Collect, evaluate, and interpret data obtained from various monitoring and test stations. The District and contractors should be immediately informed of deviations from the design phase data or from established monitoring patterns.
 - (8) Prepare and submit instrumentation program progress reports in accordance with schedule specified by the District.
- L. Review and evaluate requests for Change Orders, and make recommendations to the District regarding their disposition, and with District concurrence and within authorized limits, will approve/disapprove; participate in negotiations with contractors.
- M. Review and certify monthly invoices submitted by the contractors to assure accuracy, and compliance with all applicable terms and conditions of the contracts and recommend payment by the District.
- N. Prepare, on a current basis, a marked-up set of as-constructed contract plans and specifications.
- O. Implement and maintain a Project-wide construction safety program in coordination with the District's Insurance Administrator.
- P. Recommend to the District, the institution of any partial or complete default action against contractors; assist the District in determining the amounts due under default settlements, and prepare budget estimates for completion of work.
- Q. Provide site tours for prospective bidders.

- R. Ensure that project construction contractors obtain all required permits, licenses, certificates, and insurance.
- S. Coordinate all aspects of construction work with all local municipal authorities, other governmental agencies, utility companies and others who may be involved in the Project.
- T. Provide a qualified, full-time, on-site supervisory staff for the management and inspection of all construction work being performed on the Project. Responsibilities assigned to the staff shall include, but not necessarily be limited to, the following:
 - (1) Coordinate the activities of contractors.
 - (2) Furnish interpretation of contract documents to contractors.
 - (3) Coordinate the movement of equipment and material through job sites.
 - (4) Recommend construction techniques to expedite the Project and assure job safety.
 - (5) Monitor contractor compliance with environmental requirements.
 - (6) Recommend "off-hour" construction when desirable.
- U. Insure through proper inspection that all materials furnished and work performed on the Project are in accordance with contract documents. This includes, but is not necessarily limited to, the following:
 - (1) Check construction contractor materials certifications and samples.
 - (2) Inspect delivered materials and equipment.
 - (3) When requested by the District, perform shop inspection of contractor-furnished special equipment and fabricated construction elements.
 - (4) Inspect work in progress and in place.
 - (5) Oversee construction operations and field testing of construction materials.
 - (6) Direct and supervise the sampling of construction materials and soils borings for laboratory analysis by a District approved laboratory.
- V. Check contractor survey layouts and controls for line, grade and dimension for conformance with the plans and specifications, and spot check contractor detection of movement points.
- W. Furnish and install all permanent monumentation required for track and other systemwide facilities.

- X. Assist the District with respect to utility work by:
 - (1) Coordinating and scheduling utility work to be performed by others.
 - (2) Coordinating contractor activity with all utility companies and affected municipal agencies.
 - (3) Monitoring utility work performed by others.
 - (4) Processing and finalizing work authorizations, and changes involving utility relocations.

- Y. When requested, assist the District in negotiating with or seeking approvals from, such governmental agencies as have jurisdiction over the work to be performed.

- Z. When requested by the District, attend conferences with officials of the District, governmental agencies, or other persons.

- AA. Recommend adjustments to the work to accommodate changed conditions and anticipated interferences.

- BB. Obtain from each contractor a complete list of all critical material and equipment items, the name of each supplier, and the required and promised delivery dates for such items. The CM shall take appropriate steps to see that shop drawings and samples are submitted and approved on a timely basis.

- CC. On completion of each contract, the CM, accompanied by representatives of the District, shall inspect the work. The CM shall, within ten days after this inspection, present the contractor with a list of all deficiencies and omissions. Upon correction of these, the CM shall notify the District that the work is complete and ready for acceptance inspection. The CM shall prepare and furnish to the District marked prints of contract drawings showing as-built conditions. The CM shall further ensure that as-built shop drawings showing actual conditions are prepared by contractors and submitted to the District and that all shop drawings, catalog cuts and diagrams, and such other information prepared by contractors or furnished to contractors by suppliers and manufacturers that are necessary to properly maintain the accepted facility, are furnished to the District.

- DD. Receive, check for accuracy and submit to the District all releases of liens and claims required of contractors.

- EE. When requested by the District, provide liaison with the District's Community Relations Department to coordinate contractor programs to minimize and solve community-associated construction problems.

- FF. Detailed designs for the construction of the various elements of the project will be furnished by the District. Where it becomes apparent that a change in design is advantageous to the District, make such studies or clarifying sketches as may be necessary to define the most desirable scope

of the change, and submit these to the District for decision. Design changes will be made by the original designer, as approved by the District. Furnish information and data for the original designer regarding the status of construction work and its effect upon the proposed change.

- GG. Provide such field office space as is necessary to provide the Services. All offices are subject to approval by the District.
- HH. When requested by the District, verify the labor compositions shown on Contractor Equal Employment Opportunity Compliance Reports.
- II. Pursuant to the District's Disadvantaged and Women-owned Business and Equal Employment Opportunity Programs, provide during the life of this contract an office of equal opportunity. This office will be staffed by EEO and DBE personnel and will perform the following tasks:
 - (1) Implement the work plan for conducting reviews of contractor compliance with the relevant Federal EEO and DBE rules and regulations.
 - (2) On a monthly basis, submit to the District a summary report for the construction Affirmative Action Plan. Format of such report is subject to the District's approval.
- JJ. The CM will prepare an as-built set of reproducible contract documents by transferring as-built field data from the red-lined set of documents maintained in the R.E. field offices to a conformed set of contract document reproducibles furnished by the District.

3.1.2 CONSTRUCTION AND PROCUREMENT RELATED ACTIVITIES

- A. The CM shall have primary procurement management responsibility for all systems/subsystems, unless otherwise advised by the District. Tasks to be performed by the CM include:
 - (1) Perform or cause to be performed all necessary off-site quality control inspection and acceptance of systems and components thereof.
 - (2) Perform all necessary on-site acceptance and checkout tests for incoming systems or elements thereof.
 - (3) Provide for storage including adequate protection and security for systemwide procurements of materials which will be installed on an incremental basis.
 - (4) Provide for delivery of materials noted in (3) to appropriate site locations in accordance with governing schedules.
 - (5) Perform or cause to be performed operational and start-up tests and runs of equipment, including tests to verify the compatibility of interrelated systems.

- (6) Provide training for operational personnel.
 - (7) Support the District in performing verification of reliability requirements set forth in system specifications.
 - (8) Support the District in enforcing warranty provisions set forth in system specifications.
- B. The CM's responsibility for resolving compatibility problems associated with interrelated systems, equipment, and products will be determined by the District.

3.1.3 CONTRACT DELIVERABLES

Contract Deliverables are defined as products of the CM functional services which are prepared and submitted to RTD on a regular, infrequent or one time basis. These deliverables are listed below by functional unit:

A. CONSTRUCTION OPERATIONS

- (1) General Services Department
 - o Sample collection and laboratory documentation report.
 - o Field Water Quality Monitoring Report
 - o Hazardous Materials Report
 - o Periodic reports on traffic haul routes, street closures and Worksite Traffic Control
 - o Summary Construction Permits Report
- (2) Systemwide Construction
 - o In-Plant Manufacturing Assessment Report (Quality Assurance Survey Report)
 - o Change Requests
 - o R.E. vs. Contractor Correspondence
- (3) Facilities Construction
 - o RE weekly progress report
 - o Inspection reports
 - o RE vs. Contractor Correspondence

- o Change Requests

B. PROJECT CONTROLS/ENGINEERING SERVICES GROUP

(1) Project Controls

- o Monthly Construction Network Analysis
- o Monthly Liquidated Damages Report
- o Contract Sequence Report
- o 90 Day Window Report
- o Input to RTD's Monthly Status Report
- o Construction Estimates as required
- o Progress Payment Estimates
- o Annual Work Plans
- o Summary of Executed Change Orders
- o Status of Estimates in process

(2) Engineering Services/Systems Integration

- o Reports on special technical studies
- o Marked-up As-Constructed Documents
- o As-built contract document reproducibles

(3) Change Control

- o Status update on RTD Change Log
- o Potential Claims Log

C. ADMINISTRATION/STAFF SUPPORT

- o Monthly Contract Performance Report
- o Biweekly Personnel Status Report
- o Itemized Equipment Inventory
- o CM Procedures Manuals (9)
- o CM Organization Chart
- o EO Penalty Assessment Report (monthly)
- o EO Site Visit/Employee Interviews (monthly)
- o UMTA DBE/WBE Quarterly Report
- o Monthly Employment Utilization Report
- o Input to Metrograms and New Bulletins
- o Monthly report on complaints/resolutions

D. QUALITY ASSURANCE/QUALITY CONTROL

- o Safety certification checklist
- o Summary QA/QC Activity Report

E. SAFETY/SECURITY

- o Daily Field Safety Inspection Report
- o Special safety reports
- o Field Safety Status Report

SECTION 4

ORGANIZATION AND RESPONSIBILITIES

The project organization for achieving the scope of services defined for the Fifth Annual Work Plan for Phase II - Construction Management Services is presented in this section together with the assignment of responsibilities and duties necessary to perform these services.

4.1 CONCEPT OF ORGANIZATION

The Construction Management Team, a Joint Venture with subcontractors and special consultants, is a unified organization, structured to be fully responsive to the needs of the project, with all members integrated into the project organization and working under the management control of the Construction Manager.

The project organization was revised, effective January 1, 1988, to make it more streamlined and efficient for managing construction of MOS-1 and to be more responsive to the District.

4.2 ORGANIZATION FOR CONSTRUCTION MANAGEMENT SERVICES

Figure 4-1 presents the basic functional organization chart for the Construction Management Team for Phase II - Construction Services. Figure 4-2 presents a more detailed breakdown of the DCM-Operations organization for provision of field construction services.

This organization provides clear lines of authority and responsibility. The primary line of authority flows from the SCRTD to the PDCD Construction Manager and then to the two Deputy Construction Managers and three Managers who report directly to the CM. Work orders, instructions, directives, and other delegated matters flow from the District Project Manager to the CM who makes assignments to the applicable DCMs/Managers as appropriate for execution. Reports, recommendations, and directed deliverables flow upward through the same channels to the SCRTD.

The Joint Venture firms comprising the Construction Management Team are represented by an Executive Board to which the CM is responsible internally for the performance of this project. This Board also provides an alternate point of contact between the District and the top management of the member firms, if the District so desires, and assures availability of company resources required.

4.3 RESPONSIBILITIES

The responsibilities of the key personnel within the CM organization are defined below.

A. Construction Manager

The Construction Manager has overall responsibility for the construction management services contract. He is the prime point of contact with the District and interfaces directly with the District's Director of Construction. He reports internally to an Executive Board comprising a senior officer of each Joint Venture firm and one of the subcontractors, and has complete authority from the Board to take any necessary action to ensure the highest level of performance in response to the District's needs. He is authorized to commit the Joint Venture for services within the limits of the negotiated cost budget and schedule. He assigns personnel to the project subject to District approval.

The Construction Manager has complete responsibility for providing all CM services to the District, including planning, scheduling, cost control, community relations, administration, engineering and engineering support, procurement assistance as requested by the District, construction supervision, and coordination as defined by the terms of the contract.

B. Safety Manager

The Safety Manager establishes safety guidelines to be incorporated into a total construction safety program covering systems, construction, and public safety. He reviews bid documents for safety requirements, monitors contractor safety programs for compliance with approved guidelines and prepares and maintains the project safety procedures manual. He also prepares security guidelines, prepares and implements the construction emergency preparedness program, and monitors jobsites for security, as well as safety.

C. Quality Assurance/Quality Control Manager

The Quality Assurance/Quality Control Manager establishes the construction quality assurance/quality control program in cooperation with the District covering all aspects of construction, procurement, installation, testing, and acceptance. He reviews and monitors quality procedures prepared and conducted by contractors for compliance with the requirements of the QA program and conducts internal QA audits of the CM Team as directed by the Construction Manager.

D. Manager, Administration and Staff Support

The Manager, Administration and Staff Support is responsible for coordination, supervision, and management of administrative and special staff. He assists the CM in the development of administration policies, develops and implements project administration procedures, maintains current organization charts and ensures that prompt, reliable administrative services are provided to the CM organization.

The Project Administration Manager is responsible for securing and monitoring appropriate working space and providing services for secretarial, drafting, typing, reproduction, mailing/shipping, office equipment and supplies, transportation and other administrative functions, including personnel and financial/accounting support to the organization.

The Community Relations Manager is responsible for coordination with the District to develop an aggressive community relations program that will provide a conduit between the community and the construction effort, solicit public opinion, identify actual and potential problem areas, and offer corrective or preventative actions to mitigate or avoid conflict with the public. The Community Relations Manager also reviews and monitors the public relations programs of all construction contractors to ensure that they are consistent with the District's objectives and are effectively managed, and is responsible for organizing and conducting special events.

The EO Administrator prepares and monitors an EO program for the CM Team pertaining to its personnel management and to the construction and supply contracting programs. She reviews and monitors the EEO practices of all construction contractors and suppliers, offering counseling where necessary and reporting performance against District goals. In addition, she is responsible for the administration of the DBE/WBE program.

The Legal Counsel provides legal services to the CM and Executive Board primarily in the areas of reviewing proposed contract language (construction and procurement), contract interpretation, disputes, claims, and EEO matters.

E. Deputy Construction Manager - Engineering Services/Project Controls

The Deputy Construction Manager for Engineering Services/Project Controls, is responsible for engineering services, project control, and contracts and procurement. His responsibility for engineering services is exercised through an Engineering Services/Systems Integration Manager who has a full-discipline staff of engineers and specialists to review criteria and standards, review design drawings for constructibility and cost effectiveness, conduct shop drawing reviews, review change orders, perform special engineering studies and analyses to include value-engineering analysis, and prepare as-built drawings.

The DCM's project controls responsibilities include planning and scheduling, cost control and analysis, estimating, review of cost estimates, change control, claims support, document control, and publications. Under contracts and procurement, he is responsible for the administration of the prime contract, of all subcontracts to the Joint Venture, and for all procurement directed by the District, as well as procurement for Joint Venture needs. In both project controls and contracts/procurement, he is supported by functional area managers.

The Engineering Services/Systems Integration Manager is responsible for coordinating the engineering services of a multidisciplined staff of engineers and specialists who review criteria and standards; design drawings, specifications, and bid documents for constructibility and cost effectiveness; shop drawings; special engineering studies and analyses; field engineering

services; value engineering analyses; and the preparation of as-built documents. He is also responsible for the proper interfacing and coordination, of systems and site work. In cooperation with the DCM Operations and the Systemwide Construction Manager, he identifies and resolves interface problems and prepares any required procedures, schedules, drawings, and specifications in this regard.

The Project Controls Manager is responsible for planning and scheduling; cost analysis and control, change estimates and estimate reviews, change control, claims support and document control.

The Contracts/Procurement Manager is responsible for the administration of the prime contract, the Joint Venture Executive Board resolutions, all subcontracts to the Joint Venture, all procurement for the Joint Venture, and all procurement directed by the SCRTD to be performed or administered by PDCD.

F. Deputy Construction Manager - Operations

The Deputy Construction Manager for Operations is responsible for all field construction operations, field engineering, specialized support services, and systems integration. He directly supervises and coordinates all the activities of the Facility Resident Engineers who report to him on all construction matters. He is responsible for evaluating the performance and the services provided by facility and systemwide construction contractors, assisting in evaluation of construction schedules, coordinating of contractor interfaces, evaluating construction changes and ensuring completed work meets plans and specifications. He is assisted by a Systemwide Construction Manager, who is supported by Resident Engineers responsible for traction power, automatic train control communications, mechanical systems (such as elevators, escalators, and HVAC), systems testing and startup, and final acceptance; and a General Services Manager responsible for interfacing with utility companies, topographic surveys and monumentation, traffic coordination, preconstruction surveys, instrumentation monitoring, and environmental monitoring.

The Systemwide Construction Manager is directly responsible for construction and/or installation of systems that are common to the entire project. He coordinates with the Engineering Services/Systems Integration Manager to effectively integrate his contract work with that assigned to the facilities R.E.'s. He conducts startup and testing of all segments of the systems assigned to him and assists in the final acceptance and certification of such systems. The Systemwide Construction Manager is supported by Resident Engineers to handle procurement and installation of systemwide elements.

The General Services Manager is directly responsible for the performance of construction surveys and monumentation; coordination of utility relocations, traffic coordination, permits, preconstruction surveys, and instrumentation; and environmental monitoring. He is responsible for coordinating these activities with ongoing field construction (R.E.s) and with the Community Relations Manager as applicable.

The Labor Relations Advisor monitors the labor practices of the general construction contractors and sub-tier contractors as called upon by the DCM-Operations, primarily to assist in avoiding of labor problems rather than

reacting to them. This includes evaluating and assessing project labor needs, maintaining a harmonious relationship between management and labor, and developing their interest in and support of the project. He assists and advises the District's Continuation of Work Agreement Oversight Committee when called upon in methods to prevent or resolve labor problems.

4.4 SUBCONTRACTORS AND RESPONSIBILITIES

Specific areas of the work scope require special expertise for completion. Accordingly, PDCD as part of its integrated team has subcontracted with the following firms to undertake this work:

ASSOCIATE SUBCONTRACTORS

<u>FIRM</u>	<u>AREA OF PARTICIPATION</u>
BETTER PERSONNEL EMPLOYMENT SERVICES	SECRETARIAL & ADMINISTRATIVE SERVICES
CONSTRUCTION CONTROL SERVICES CORPORATION	ENGINEERING SERVICES
DAMES AND MOORE	GEOTECHNICAL ENGINEERING SERVICES
ENGINEERING-SCIENCE, INC.	ENVIRONMENTAL ENGINEERING SERVICES
HAYAKAWA ASSOCIATES	MECHANICAL ENGINEERING SERVICES
JACOBS ASSOCIATES	ENGINEERING AND OTHER TECHNICAL SERVICES
JENKINS, GALES & MARTINEZ, INC.	ARCHITECTURAL ENGINEERING AND OTHER TECHNICAL SERVICES
MARTIN & HUANG INTERNATIONAL	STRUCTURAL ENGINEERING AND OTHER TECHNICAL SERVICES
NORTH PACIFIC CONSTRUCTION MANAGEMENT	RESIDENT ENGINEER, INSPECTION AND PLANNER/SCHEDULING SERVICES
OCHOA & SILLAS	LEGAL SERVICES
RANDOLPH & TATE ASSOCIATES	ART COORDINATION SERVICES

4.5 GENERAL CONDITION ITEMS

General Condition Items relate to the performance of work or the provision of facilities or services by the CM which do not lend themselves readily to inclusion in other construction or procurement contracts, or items of minor construction work when it is not feasible for the District to secure competitive bids or proposals thereon.

General Condition Items may include, but are not necessarily limited to, the following: Laboratory testing of materials, the provision of security guards, signs, watchmen, safety barricades, cleaning, preparation for ceremonies, temporary toilets, fencing, first aid stations, special equipment, temporary utilities, photographs, general maintenance, miscellaneous project custodial work, contractor work and storage areas, printing, refuse disposal, surveys, temporary weather protection, and temporary movement and/or storage of personal property in buildings requiring underpinning.

The following are Contractors that were active during the 4th AWP and planned for use under the "General Condition Items" provision during the 5th AWP based upon their successful re-solicitation.

4.5.1 GEORGE GRAY/PHOTOGRAPHER

Description: Provides construction progress photographs; scope of services permits the photographing all Metro Rail construction related activities/events.

Interfaces: Resident Engineers, PDCD Contracts/Procurement and RTD Public Relations.

End Product: For construction progress - 8" X 10" color prints. A negative and a proof sheet of all photos taken during any photo-taking is supplied. Slides, enlargements and black and white prints are also provided as requested.

4.5.2 SMITH-EMERY COMPANY

Description: Provides a variety of laboratory testing services for all Metro Rail construction. Also provides technicians for taking samples, inspection/testing of various activities (i.e. concrete mixing), training and in-plant inspection.

Interfaces: Resident Engineer's staff, PDCD Contracts and Procurement, and PDCD's Quality Assurance Manager and staff.

End Products: Written test results, written reports, and training of individuals leading to ACI Certification.

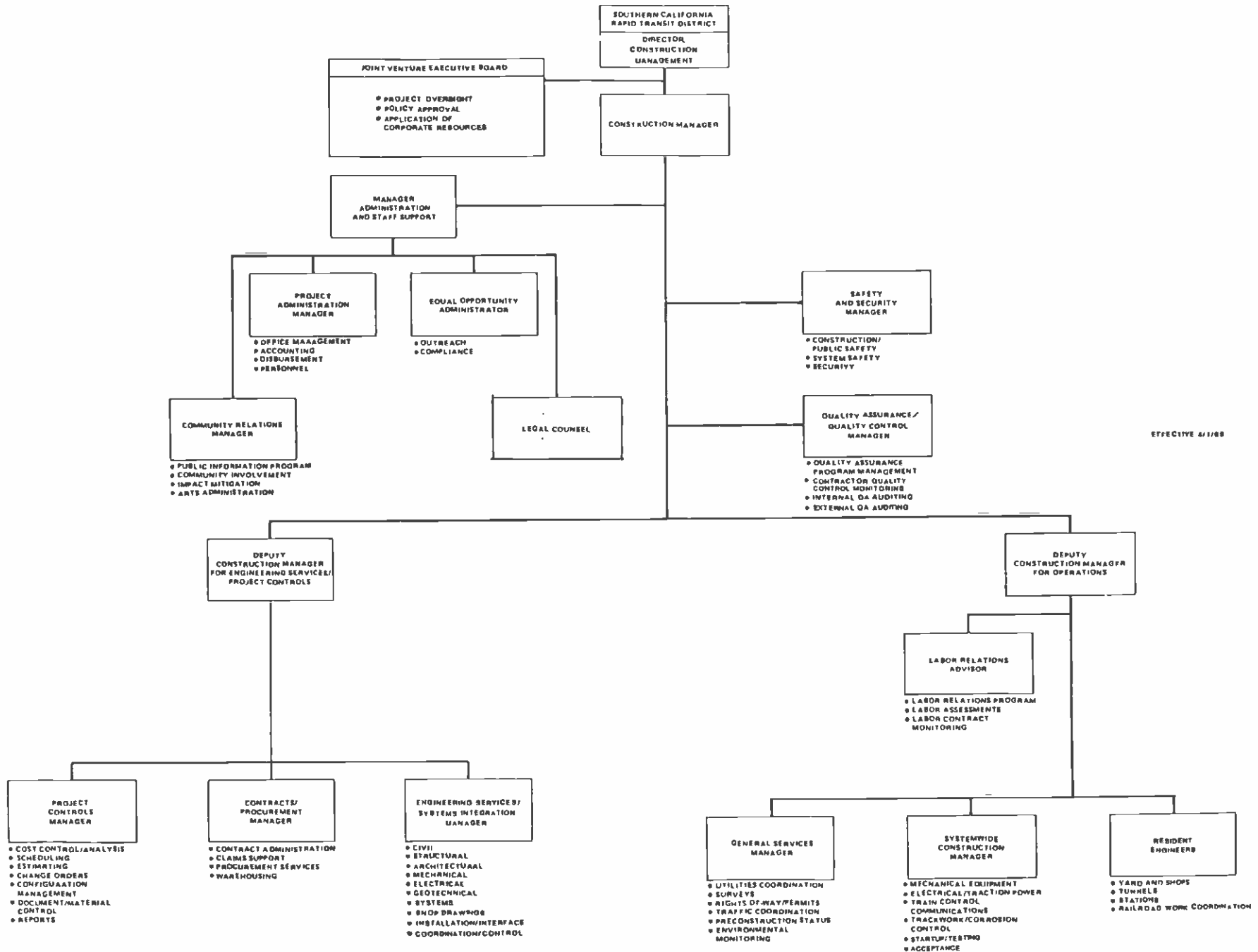
4.5.3 COLEMAN SECURITY SERVICES, INC.

Description: Provides mobile armed patrols for ensuring security at all Metro Rail construction sites. Also provides armed foot patrols as required.

Interfaces: PDCD Safety and Security Manager, PDCD Contracts/Procurement, LA Police Department.

End Product: Daily log of events; increased work area security.

PDCD FUNCTIONAL ORGANIZATION



EFFECTIVE 6/1/88

A-7

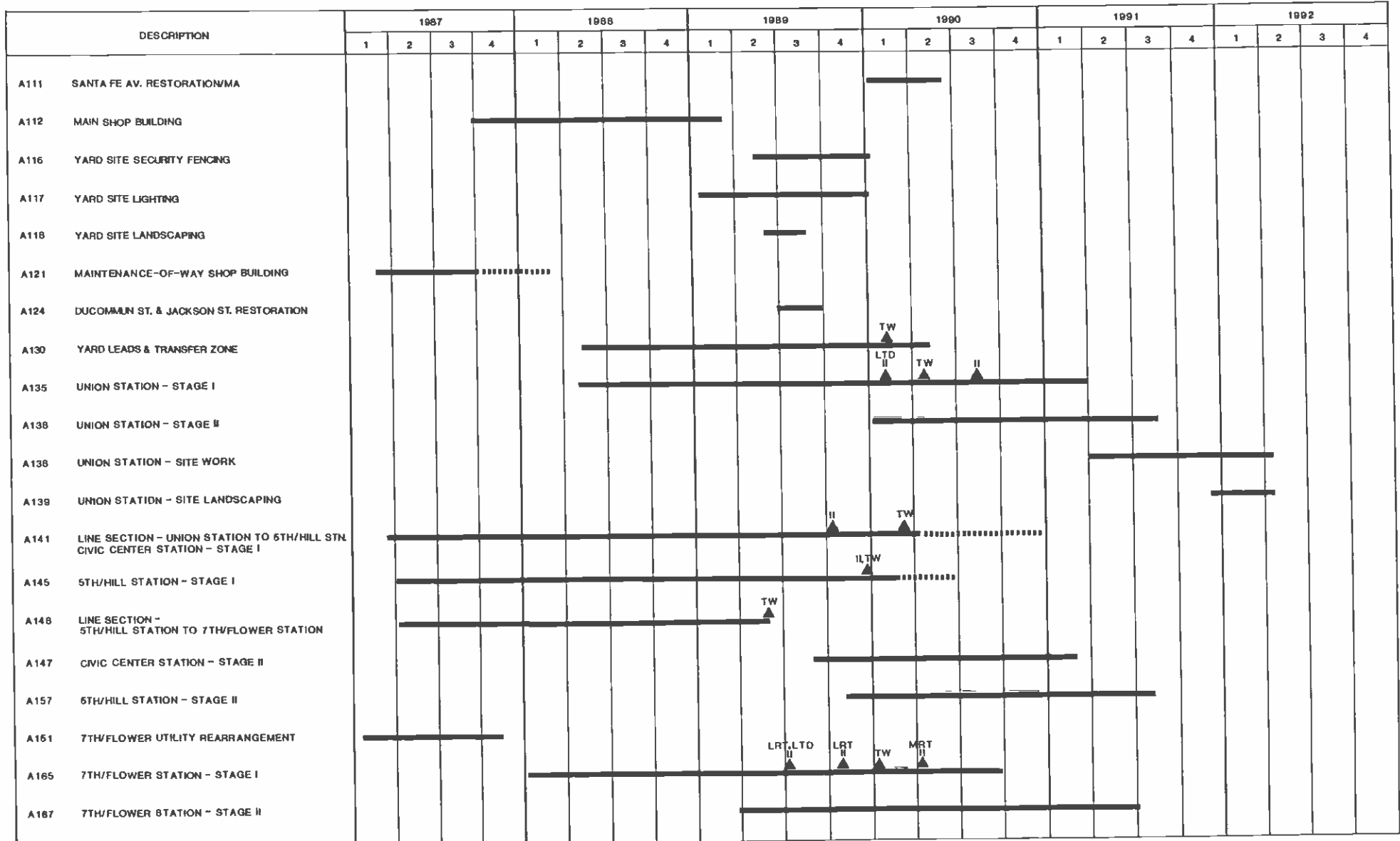
-FIGURE 4-1

SECTION 5

ANNUAL WORK PLAN SCHEDULE

This section presents the schedule basis for work during the Fifth Annual Work Plan. The Level III Construction Schedule - Revision 6, dated January 14, 1988, displays the contracts scheduled for construction during AWP5 for which the construction staffing was developed. Schedules are presented in barchart and tabular forms. In addition, a barchart indicating the number of active construction contracts by month is included.

LEVEL III CONSTRUCTION SCHEDULE REVISION 6 JANUARY 14, 1988



5-2

DESCRIPTION	1987				1988				1989				1990				1991				1992			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
A 171 LINE SECTION - 7TH/FLOWER STN. TO WILSHIRE/ALVARADO STN.	-----TW																							
A 175 WILSHIRE/ALVARADO STATION - STAGE I	-----II TW																							
A 185 WILSHIRE/ALVARADO STATION - SITEWORK	-----																							
A 186 WILSHIRE/ALVARADO STATION - LANDSCAPING	-----																							
A 167 WILSHIRE/ALVARADO STATION - STAGE II	-----																							
A 810/ TRACKWORK INSTALLATION A 115 (INCLUDING YARD STORAGE AREA)	-----																							
A 812 CONTACT RAIL	-----S C																							
A 815 PROTECTIVE COVERBOARD	-----S C																							
A 816 DIRECT FIXATION FASTENERS	-----LRT MRT C																							
A 820 AUTOMATIC TRAIN CONTROL	-----																							
A 830 TRACTION POWER EQUIPMENT	-----S C																							
A 831 TRACTION POWER INSTALLATION	-----																							
A 840 COMMUNICATION	-----																							
A 850 PASSENGER VEHICLES	-----S C																							
A 655 TRANSPORTATION TEST CENTER TESTING	-----																							
A 671 DIESEL LOCOMOTIVE	-----																							
A 672 FLAT CAR	-----																							
A 676 CRANE FOR FLAT CAR	-----																							
A 680 OPERATIONAL GRAPHICS	-----																							

6-5

DESCRIPTION	1987				1988				1989				1990				1991				1992							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
A710 ESCALATORS															S													
A720 ELEVATORS															S													
A730 SHOP EQUIPMENT (FIXED)																												
A736 SHOP EQUIPMENT (FREE STANDING)																												
A740 FANS						S																						
A748 TPSS-AIR HANDLING EQUIPMENT										S						C												
A760 SIGNS & GRAPHICS																												
A770 RUBBER - TIRED VEHICLES																												
A776 MOBILE EMERGENCY/MAINTENANCE EQUIP.																												
A780 FURNITURE																												
A785 FIRE SUPPRESSION EQUIPMENT																												
A790 FIRST STORES & CONSUMABLES																												
A796 UNINTERRUPTIBLE POWER SUPPLY																												

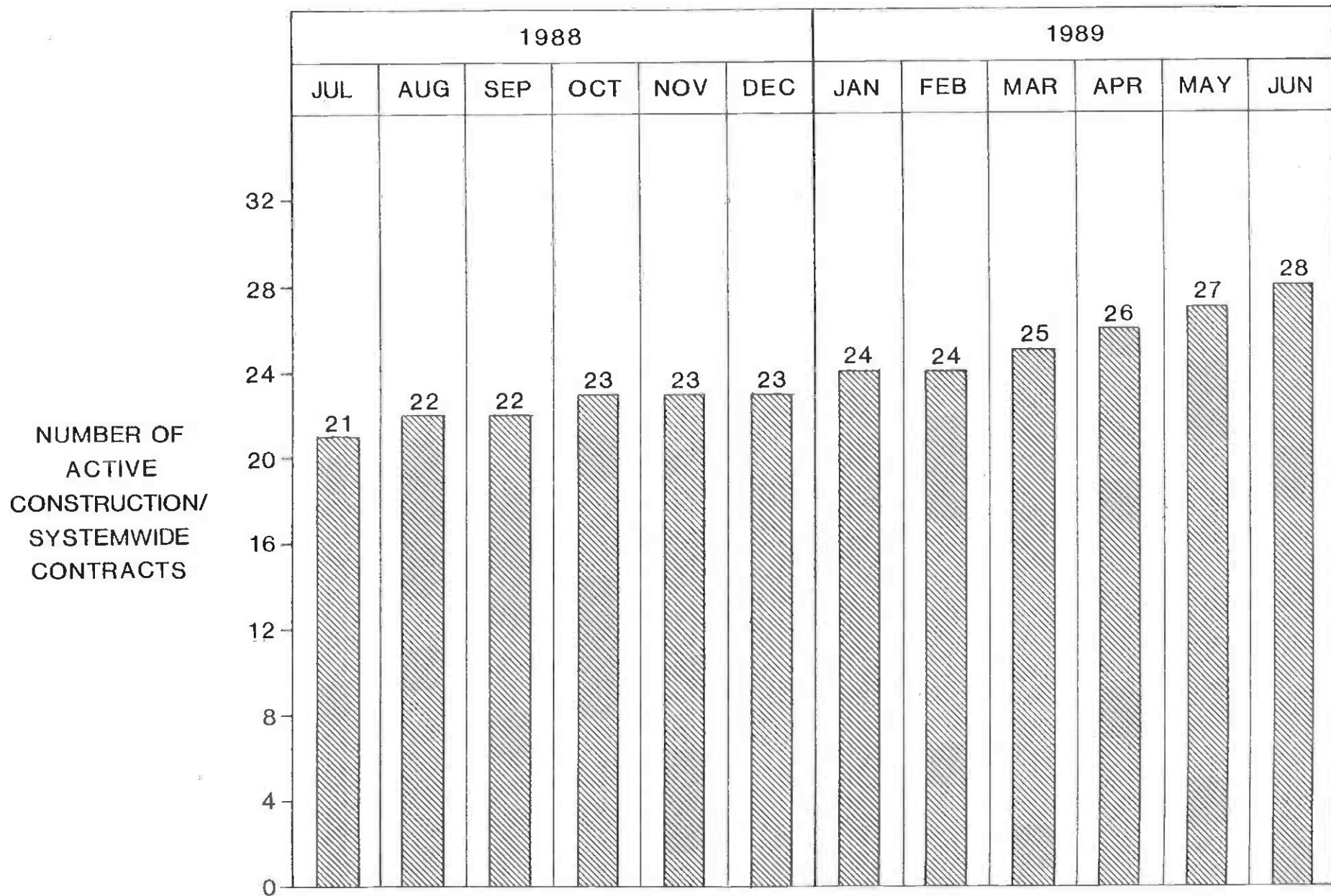
5-4

LEGEND: - CONTRACT CONSTRUCTION DURATION - STAGE II ACCESS MILESTONE MRT - METRO RAIL TRANSIT
 - FORECAST COMPLETION - START DELIVERY EQUIPMENT/MATERIALS LRT - LIGHT RAIL TRANSIT
 - TRACKWAY AREA ACCESS MILESTONE - COMPLETE DELIVERY EQUIPMENT/MATERIALS LTD - LIMITED ACCESS

LEVEL III CONSTRUCTION SCHEDULE
REVISION 6
JANUARY 14, 1988

#	DESCRIPTION	NTP	CONTRACTUAL COMPLETION	FORECAST COMPLETION
A111	SANTA FE AVE RESTORATION	01/05/90	06/11/90	06/11/90
A112	MAIN SHOP BUILDING	09/28/87	03/16/89	03/16/89
A116	YARD SITE SECURITY FENCING	05/12/89	01/09/90	01/09/90
A117	YARD SITE LIGHTING	01/16/89	01/05/90	01/05/90
A118	YARD SITE LANDSCAPING	06/01/89	08/25/89	08/25/89
A121	MAINTENANCE OF WAY SHOP BUILDING	02/27/87	03/02/88	03/25/88
A124	COMMUN STREET & JACKSON STREET RESTORATION	06/28/89	09/29/89	09/29/89
A130	YARD LEADS & TRANSFER ZONE	05/06/88	05/07/90	05/07/90
A135	UNION STATION STAGE I	05/02/88	04/01/91	04/01/91
A136	UNION STATION STAGE II	01/05/90	08/19/91	08/19/91
A138	UNION STATION SITE WORK	04/01/91	04/22/92	04/22/92
A139	UNION STATION SITE LANDSCAPING	12/03/91	04/22/92	04/22/92
A141	LINE SECTION U/S-S/H & CIVIC CENTER STAGE I	03/16/87	04/12/90	12/18/90
A145	5TH & HILL STATION STAGE I	04/02/87	02/25/90	06/22/90
A146	LINE SECTION 5TH/HILL TO 7TH/FLOWER	04/06/87	05/30/89	05/30/89
A147	CIVIC CENTER STATION STAGE II	08/29/89	02/28/91	02/28/91
A157	5TH & HILL STATION STAGE II	11/07/89	08/07/91	08/07/91
A161	7TH & FLOWER UTILITY RELOCATION	01/19/87	11/15/87	11/15/87
A165	7TH & FLOWER STATION STAGE I	01/05/88	09/28/90	09/28/90
A167	7TH & FLOWER STATION STAGE II	03/27/89	07/03/91	07/03/91
A171	LINE SECTION 7TH/FLOWER TO WILSHIRE/ALVARADO	02/02/87	07/23/89	07/23/89
A175	WILSHIRE ALVARADO STATION STAGE I	07/27/87	03/09/90	03/09/90
A185	WILSHIRE ALVARADO SITEWORK	07/13/90	03/01/91	03/01/91
A186	WILSHIRE ALVARADO LANDSCAPING	07/13/90	03/01/91	03/01/91
A197	WILSHIRE ALVARADO STATION STAGE II	09/14/89	03/08/91	03/08/91
A210/A115	TRACKWORK INSTAL./YARD STORAGE AREA	01/04/88	08/13/90	11/06/90
A212	CONTACT RAIL	05/12/88	02/23/90	02/23/90
A215	PROTECTIVE COVER BOARD	08/11/88	02/23/90	02/23/90
A216	DIRECT RAIL FIXATION FASTENERS	10/14/87	05/16/89	05/16/89
A220	AUTOMATIC TRAIN CONTROL	03/01/88	04/16/92	04/16/92
A230	TRACTION POWER EQUIPMENT	05/09/88	07/20/90	07/20/90
A231	TRACTION POWER INSTALLATION	10/13/88	04/10/91	04/10/91
A240	COMMUNICATION	06/09/88	11/25/91	11/25/91
A250	PASSENGER VEHICLES	06/01/88	01/16/92	01/16/92
A255	TRANSPORTATION TEST CENTER TESTING	04/30/90	11/28/90	11/28/90
A271	DIESEL LOCOMOTIVE	04/25/89	10/23/90	10/23/90
A272	FLAT CAR	10/27/89	10/23/90	10/23/90
A275	CRANE FOR FLAT CAR	10/27/89	10/23/90	10/23/90
A280	OPERATIONAL GRAPHICS	08/02/89	04/18/90	04/18/90
A710	ESCALATORS	05/16/88	08/22/91	08/22/91
A720	ELEVATORS	07/27/88	08/22/91	08/22/91
A730	SHOP EQUIPMENT (FIXED)	10/13/89	10/23/90	10/23/90
A735	SHOP EQUIPMENT (FREE STANDING)	10/13/89	10/23/90	10/23/90
A740	FANS	03/01/88	06/05/90	06/05/90
A745	TPSS AIR HANDLING EQUIPMENT	02/16/88	12/19/89	12/19/89
A750	SIGNS & GRAPHICS	07/18/89	06/27/90	06/27/90
A770	RUBBER TIRE VEHICLES	10/27/89	10/23/90	10/23/90
A775	MOBILE EMERGENCY / MAINTENANCE EQUIPMENT	04/18/90	10/22/90	10/22/90
A780	FURNITURE	11/07/90	05/14/91	05/14/91
A795	FIRE SUPPRESSION EQUIPMENT	05/15/90	10/22/90	10/22/90
A790	FIRST STORES & CONSUMABLES	05/31/90	10/22/90	10/22/90
A795	UNINTERRUPTABLE POWER SUPPLY	04/18/88	12/24/90	12/24/90

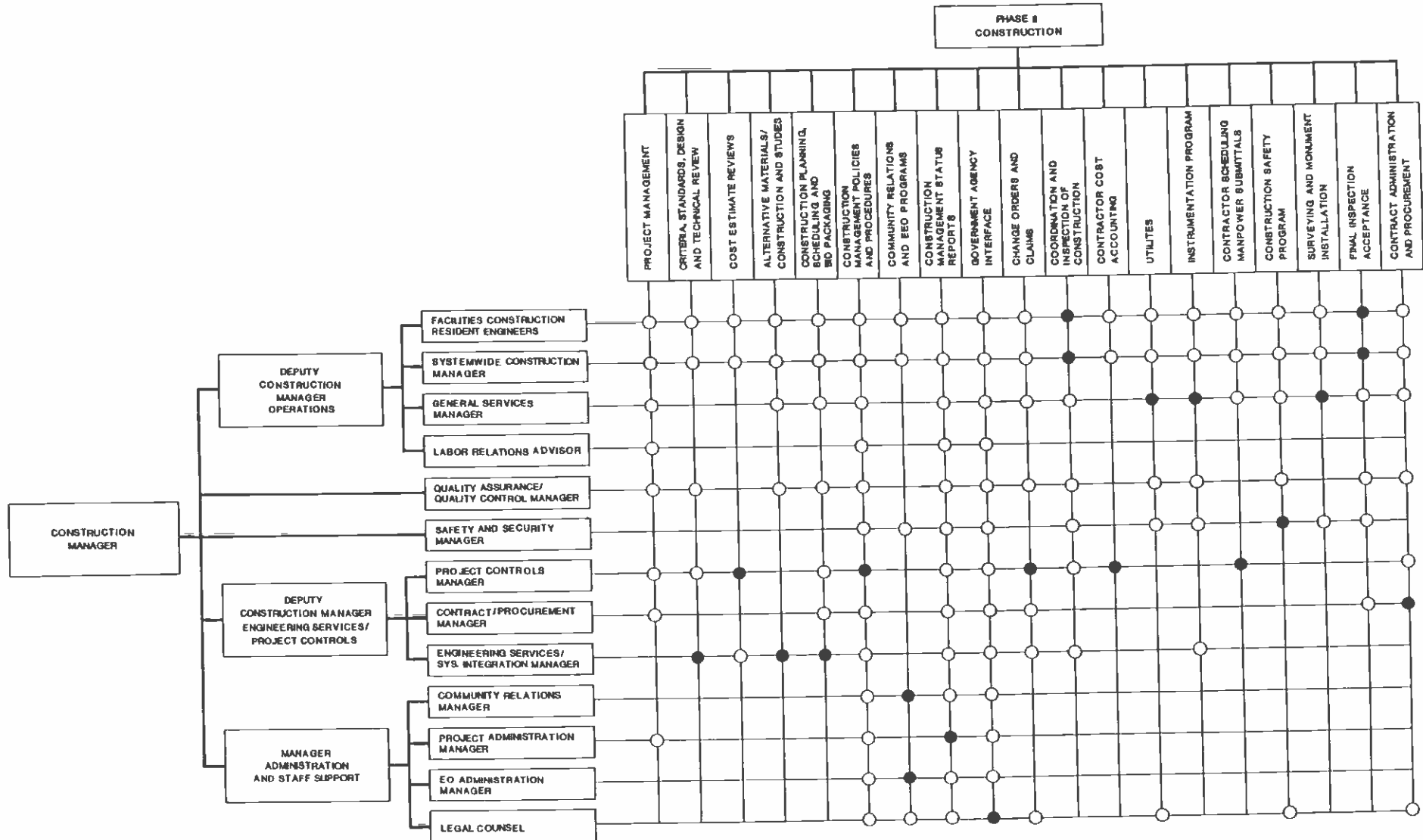
5TH AWP ACTIVE CONSTRUCTION/SYSTEMWIDE CONTRACTS



NUMBER OF
ACTIVE
CONSTRUCTION/
SYSTEMWIDE
CONTRACTS

SECTION 6
WORK BREAKDOWN STRUCTURE

Following is a matrix showing the interrelationships of organizational responsibilities to the Work Breakdown Structure.



LEGEND ● PRIMARY RESPONSIBILITY
○ SUPPORT/PARTICIPATION

ORGANIZATIONAL RESPONSIBILITY MATRIX
PHASE II CONSTRUCTION