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SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT
CA-03-0130-5
PRE-CONSTRUCTION WORK PROGRAM
SUBMITTED: OCTOBER 10, 1984
APPROVED: OCTOBER 26, 1984

US Department
of Transportation

**Urban Mass
Transportation
Administration**

REGION IX
Arizona California
Hawaii Nevada, Guam

211 Main Street
Room 1160
San Francisco, California 94105

RECEIVED
OCT 29 1984
GENERAL MANAGER
S.C.R.T.D.

OCT 26 1984

Mr. John A. Dyer
General Manager
Southern California Rapid Transit District
425 South Main Street
Los Angeles, California 90013

Re: Project No. CA-03-0130-5
Pre-Construction
Work Program

Dear Mr. Dyer:

Your October 10, 1984 letter forwarded the District's Scope of Work (SOW) for the Pre-Construction Work Program under the above-referenced grant project. We have reviewed the proposed SOW, find it satisfactory, and authorize the District to proceed in accordance with the SOW. This approval removes this special condition placed on all three grant projects that fund the work program: CA-03-0130-5, CA-09-X059-1, and CA-90-0080.

Sincerely,

Brigid Hynes-Cherin
Regional Administrator

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

PRE-CONSTRUCTION WORK PROGRAM

FOR

THE METRO RAIL PROJECT

OCTOBER 1984

P&C-19.21
09/25/84

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

INTRODUCTION & PURPOSE

This document describes the tasks which will be performed during the Pre-Construction Phase of the Southern California Rapid Transit District Metro Rail Project (Project). The purpose of this phase is to complete the design for the Minimum Operable Segment-1 (MOS-1) and all systemwide elements and design to the 85% level the remaining facilities, acquire the necessary right-of-way, initiate construction management and owner-controlled insurance activities, prepare cost estimates and related activities which will enable the Project to be properly managed and constructed.

DEFINITION AND SCOPE OF THE PRE-CONSTRUCTION PHASE

The Pre-Construction Phase will complete the designs and specifications of the facilities and systems for MOS-1 and continue design for the facilities past MOS-1. Designs and specifications have already been developed to the 50% to 85% level as a result of the work which was completed in the Preliminary Engineering and Continuing Preliminary Engineering Phases of the Project.

Designs will be completed to 100% and biddable construction contract packages will be prepared for all facilities within MOS-1 from the Yard and Shops to the Wilshire/Alvarado Station.

Systems and systemwide facilities designs for the entire 18.6 mile Project will be completed to 100%, including biddable procurement packages. Installation designs for these systems

will be developed to 100%, and installation contract packages will be prepared to achieve, at a minimum, an operable segment from the Yard through the Wilshire/Alvarado Station.

Designs will be completed to an approximate 85% level for all facilities remaining in the 18.6 mile Project beyond the Wilshire/Alvarado Station; the only exception being the Hollywood Bowl Station which will be developed to the 50% level. The 85% level will be accomplished by completing design development of Stage I construction packages (civil and structural for stations and tunnels); and Stage II construction to only that level required to complete the Stage I construction package. Thus, the architectural, landscaping, electrical and mechanical design will be suspended beyond mid-point, but at less than 85%.

The following is a list of design milestone submittals and their purpose, definition and scope:

A. In-Progress Submittal (60 percent complete).

The purpose of this submittal is to provide a clear indication of progress toward design solutions for problems outlined in the preliminary design. In order to accomplish the above, the in-progress submittal shall include, but not be limited to:

a. Civil Design

1. Completed mathematized horizontal and vertical track alignment.

2. Highway and roadway modifications developed to include details of typical sections, pavement structure and mathematization.

3. Locations, types, supporting devices and selected details of surface traffic control systems, except for signalization and striping.

4. Inclusion of maintenance of traffic requirements in sufficient detail in specifications to permit coordination with various agencies.

5. Other elements of the civil design advanced to the degree that satisfies the previously stated purpose of the submission.

b. Utility Design

1. All elements of the drainage shall be nearing completion.

2. Utility solutions will be coordinated with utility owners for relocations, abandonments and temporary supports.

c. Architectural Design

Architectural design of major items and spaces should be nearing completion. Locations of special features and equipment should be indicated but need not be detailed. Lighting layouts and fixture schedules should be sufficiently advanced to coordinate with electrical design. Plans, elevations, sections and details shall be sufficiently complete to enable review for compliance with the Project criteria, building codes and standards and good standard practice.

d. Structural Design

1. The structural design of major items should be nearing completion. All members shall be sized although details of dimensions need not be shown.

2. Plans, sections and details shall be sufficiently complete to enable review for compliance with criteria for project drawings of the Metro Rail's System Design Criteria, all applicable codes and standards. Locations of special joints and water-stopping should be called out but need not be detailed.

e. Mechanical Design

1. Design of fire protection, plumbing systems and drainage elements should be nearing completion.

2. Subway and station mechanical systems including fans, attenuators, dampers, controls, piping, pumps and related equipment should be nearing completion.

f. Electrical Design

1. Location and arrangement of duct banks and duct bank transitions should be established.

2. Requirements for cross-bonding, special ducts, and stub-outs should be established.

3. Define lighting layouts, circuiting, conduit and cable schedule, equipment layout and all other work to complete the line section and the station, except those items to be installed by subsequent or concurrent "System" Contractors.

4. This information shall include controllers, supervisory and control and other interface cabinets, lighting fixtures and all power control wiring.

5. Provide riser diagrams for auxiliary electrical items, fire alarm system, PABX telephone, intercom, security system, CCTV, public address system and fire emergency phone system.

g. Specifications

Specifications work to be included in this submission shall be compatible to the level of design.

h. Design Computation

Design computations shall be submitted commensurate with the level of design as shown on the drawings.

i. Construction Cost Estimate

Estimate shall be prepared commensurate with level of design.

B. Pre-Final Submittal (85 percent complete)

The purpose of this submittal is to provide an opportunity for the General Consultant, the District, and all agencies to review the proposed construction, to serve as a basis for obtaining concurrence from the city, county, state and federal agencies, and franchised utilities, and to provide a basis for a control estimate of construction costs.

a. Level of Design. The design, including all disciplines, shall be complete and checked for completeness and form. Plans shall show all details necessary for construction and shall be coordinated among the various disciplines prior to submittal. Detailed checking of the set by the designer may proceed during the 85 percent review period. Resolution of all previous design review comments will be

accomplished and incorporated in the drawings and specifications.

b. Contract Documents. Contract Documents and specifications work will be included in this submission.

c. Construction Cost Estmate. A construction cost estimate shall be prepared using the quantity take-off procedure. Quantity take-off sheets shall show the procedures and state the supplementary assumptions used. Prices for each quantity item will be inserted on the bid list form and items extended and footed to a total construction cost for the contract.

d. Lighting calculations and keyed lighting plans as described in Volume 3, the SCRTD Criteria for Architecture Design will be developed.

C. Final Submittal (100 percent complete)

The purpose of this submittal is to provide proof of final completion of design including incorporation of 85 percent review comments. Drawings shall be checked, stamped and countersigned by the designer. Prints of this submittal will be used to obtain concurrence to advertise bids.

UMTA OVERSIGHT AND COORDINATION

As the agency of the U.S. Department of Transportation responsible for issuing and managing federal grants for mass transportation, the Urban Mass Transportation Administration (UMTA) is charged with monitoring technical progress on all phases of the Project. In addition to reviewing applications for funding, UMTA is responsible for overseeing financial, contract and procurement compliance by the District. The overall UMTA project management and monitoring function is conducted by the UMTA Region IX office in San Francisco, with principal on-site responsibility delegated to the regional office's Chief Area Engineer located in Los Angeles.

During the Pre-Construction Phase, SCRTD will submit quarterly progress reports to UMTA detailing the technical and financial progress of the Project, and will periodically submit other materials to UMTA for review and comments. Detailed reviews will also be held each quarter, or at such times as mutually agreed to by SCRTD and UMTA. UMTA participation in the Metro Rail weekly status meetings will continue during the Pre-Construction Phase as well as participation in any other meetings or conferences necessary for UMTA to meet its oversight responsibilities.

TASK DESCRIPTIONS

Work during the Pre-Construction Phase will be performed by the District, the General Consultant (GC) or Construction Management Consultant (CM) under contract to the District, or by

subcontractors to the GC or CM. The following sections describe the tasks that are to be performed during this phase.

A. PROJECT MANAGEMENT

During the Pre-Construction Phase of the Project, SCRTD will perform the following project management functions:

- Provide definition of all necessary interfaces and dependencies, both organizational and functional, between Transit Systems Development staff, the General Consultant, Construction Management Consultant, Construction Management Oversight Consultant, Insurance Administrator and others;

- Continue to coordinate design requirements of the light rail systems planned by the Los Angeles County Transportation Commission (LACTC). Make appropriate provisions in the design of the Metro Rail Project not to proclude furture interface with light rail systems, and identify design and construction costs necessary to accommodate interface requirements;

- Conduct weekly status meetings with Transit Systems Development staff and consultants to discuss Project progress and define problem areas. Establish plans for resolution of these problems, assign responsibilities and follow through to a solution;

- Conduct Change Control Board meetings to address proposed changes to the Project scope, design or cost. The Assistant General Manager for Transit System Development, or his designee, has the authority to approve, disapprove, modify or send back for further clarification any change brought to the Board for consideration;

- Conduct quarterly reviews with UMTA officials to inform them of Metro Rail progress. Items to be discussed will include facilities and systems engineering and design, right-of-way acquisition, construction management, insurance, cost and schedule development, and other items as agreed to by SCRTD and UMTA;

- Continue the Value Engineering (VE) program to determine areas of potential cost savings, and implement cost savings measures when possible. Each VE report will be sent to UMTA for their review;

- Coordinate development of construction contract bid documents;

- Provide information on the Metro Rail Project to public/private agencies and organizations in order to foster local support.

PRODUCTS

- Updated Project Management Plan to reflect MOS-1.
- Formal Policies and Procedures
- Plan for resolution of conflicts.

B. ARCHITECTURAL DESIGN

The District will carry the architectural design of the first five stations (Union, Civic Center, 5th/Hill, 7th/Flower, Wilshire/Alvarado) and the Yard and Shops facilities to the 100% level of completion; the remaining stations to North Hollywood will be developed to the 85% level of completion (except the Hollywood Bowl Station which will be designed to the 50% level). The work to be prepared by Consultants are designs, drawings, specifications, renderings and models, as necessary, indicating station architectural design features.

1. The work shall include development of standard designs for those station elements which will be similar for purposes of economy, ease of maintenance, and necessary to retain a balanced system. Station site plans will be individually tailored to meet existing site conditions. Architectural plans shall include station configuration drawings and details showing all sitework, concourse and platform layouts, station entrances, provisions for future entrances, and auxiliary facilities.

2. Architectural standard drawings will be completed for the systemwide elements of continuity. These are lighting fixtures, maintenance equipment, gates, barriers, surveillance, communications, graphics, stairs, escalators, elevators, hardware and fare collection equipment. The elements of variable design include such elements as site

design, material selection, light fixture locations, railing, benches and artwork.

3. Station Maintenance Report will be prepared documenting that the station design meets the specific requirements of maintainability of the facility as required by the Project criteria.

4. Special consideration shall be given to the design process such that all facilities used by handicapped patrons shall incorporate design features which fulfill the requirements that are specified in the Project criteria.

PRODUCTS

Architectural plans, specifications, renderings, models and cost estimates to the 85-100% approved level of completion, as previously defined.

C. STRUCTURAL DESIGN

Structural elements of design shall include development of details for all structural elements including foundations, tunnels, piers, girders and other structural members. This will include the completion of all plans, profile cross-sections, fabrication and installation drawings for cut-and-cover sections, tunnel sections and at-grade facilities for all Project conditions. The overall structural design will be completed to the 85-100% level of completion, as delineated in the definition section. Structural elements of design would also be applicable to and required for tunnel liners and cut-and-cover sections, underpinning and support of structures for utilities. In addition, the District will perform the following:

1. Protection of Existing Structures. Evaluate the need to protect adjacent buildings, bridges and other structures which are within the zone of influence and which may be affected by the construction. Prepare a report containing the recommendations for protection of each structure. It is anticipated that the recommendations will fall into one of the following categories:

   a. Structures requiring underpinning or a protection wall system or combination thereof which is

recommended to be designed by Consultant. These designs will be prepared by the Consultant.

b. Structures requiring protection which are recommended to be designed by contractor. The Consultant shall outline the design parameters.

c. Structures which do not require special protection. The Consultant shall outline on the drawings the caution and care required by the contractor during the construction.

2. Excavation Support. Prepare a report which shall analyze and recommend applicable excavation support systems including, if appropriate, dewatering requirements and staged construction. Said report shall take into consideration the recommendations contained in the geotechnical report.

a. Locations and types of excavation support systems are to be designed by the Consultant only on a conceptual preliminary design level.

b. Locations of excavation support systems for use in construction are to be designed by the Contractor, based on Standard Criteria.

PRODUCTS

Detailed structural design, drawings, specifications and estimates at the 85-100% level of completion, as previously defined.

D. CIVIL DESIGN

The District will, through subcontractors, cause to perform engineering designs to the 85-100% level of completion, as delineated in the definition section. Environmental mitigation measures will be included. The work will include, but not be limited to, the following:

1. Alignment and Grade

Review, check and mathematize the final horizontal and vertical alignment. Also prepare alignment drawings with sufficient data for field layout in accordance with design criteria.

2. Utilities Relocation Design

Provide all necessary composite and other utility drawings such as plans, profiles, sections, etc. of existing facilities, using supplemental drawings, where appropriate, as provided by other agencies for facility areas with requirements for utility relocations.

Prepare contract drawings, specifications and cost estimates delineating the utilities rearrangements. These drawings shall include:

(a) Composite plans

(b) Cross sections

(c) Large-scale detail of critical locations

(d) Profiles

For 100% design sections, prepare contract documents for construction contractor and advance other sections to the 85% level of completion. This will include the preparation of solutions for relocation, abandonments, temporary support or other disposition of affected utilities. Prepare the design and contract documents for permanent relocation of utilities affected by construction. Design shall be in accordance with Public Master Utility Agreements worked out with agencies and utility companies. Design shall also include the method of accomodating the utilities during construction and the location of essential service connections. Designate in the contract documents the utility relocation work items to be performed by others.

Prepare for betterment of relocated or revised facilities:

(a) A written description of each betterment

(b) Drawings delineating each betterment

(c) A cost estimate which identifies the cost differential between the designed facility and a "replacement in kind" facility. The District will only be responsible for the cost of a "replacement in kind" facility and any additional costs for betterments will be borne by the affected utility company.

Betterments shall be defined as occurring when the replacement facility provides an increase in capacity beyond that provided by the existing facility, except as otherwise agreed to in the Master Agreements. Betterment may be a more efficient system, an extension of service, a more durable facility, or as otherwise defined in the applicable Master Agreement or in an Implementing Agreement consummated between a public agency, a utility owner or a railroad and the District.

3. Street and Highway Relocation Design

Prepare the design, drawings, specifications and cost estimates for temporary and permanent relocations of streets and highways affected by Metro Rail construction. Designs shall be based on the provisions of the Master Agreement and shall include plans for the maintenance of traffic, including detours, which shall be based on requirements and traffic flow data furnished by the District.

Prepare for necessary betterments of relocated streets, highways and railroads the following data:

(a) A written description of each betterment

(b) Drawings delineating each betterment

(c) Cost estimates which identify the cost differential between the designed facility and a "replacement in kind" facility.

For 100% design sections, prepare contract documents for construction contractor; advance other sections to the 85% level of completion.

4. Civil and Structural Plans

The District will develop, or cause to be developed, detailed designs, plans, specifications and cost estimates will be prepared for Civil and Structural design elements to the 85-100% level of completion, as previously defined. Plans shall include, but not be limited to, the following:

- Detailed Right-of-Way drawings including lot descriptions
- Horizontal and Vertical Alignment
- Yard and Shop Areas
- Access Roads and Traffic Rerouting Plans
- Highway and Railroad Relocation Plans
- Parking Facilities
- Utility Plans
- Facility Locations
- Security Provisions
- Environmental Management Provisions
- Storm Drainage Plans
- Track Layouts
- Station Complex Plans

PRODUCTS

Civil engineering designs, drawings, specifications and cost estimates at the 85-100% level of completion as previously defined.

E. MECHANICAL DESIGN

The District will develop, or cause to be developed, designs and specifications for all the equipment required for ventilation, emergency exhaust, and climate control concepts, including cooling and forced air ventilation. Systemwide elements of the fire protection system and plumbing will be included in this group of design requirements. These designs will be developed to the 100% level of completion for MOS-1 and in sufficient detail to complete Stage I Construction packages beyond MOS-1.

Layout and space requirements of mechanical service rooms and facilities at passenger stations and electrical substations are to be included in this design work. Designs will be provided for air supply facilities, including fan and vent shafts and other mechanical elements of the system, to the 100% level of completion.

The following tasks will be performed for the mechanical systems in order to achieve the specified levels of completion:

- Development of designs and technical specifications
- Further development and refinement of standard, directive, and contract drawings
- Refinement of design criteria

- Evaluation and incorporation of the design review comments
- Development of contract packaging recommendation
- Development of general and special conditions for procurement contracts
- Organization of specifications and drawings in accordance with the contract packaging recommendations
- Preparation of Information to Bidders
- Develop cost estimates at the specified level of design.

PRODUCTS

Mechanical engineering designs, drawings, specifications and construction cost estimates at the 85-100% level of completion as previously defined.

F. ELECTRICAL DESIGN

The District will develop final designs for general operating power for the facilities. These designs will describe the power sources, required voltages, current characteristics, general characteristics of substations and standards for equipment quality, performance and reliability. Specifications for automatic operation for standby and emergency requirements shall be prepared. These designs will be developed to the 85-100% level of completion, as delineated in the definition section of this document.

This design shall include all wiring, cable, terminals, raceways, conduit, panels, relay rooms and other ancillary equipment details and lockers, to the 85-100% level of completion.

PRODUCTS

Electrical engineering designs, drawings, specifications and cost estimates at the 100% level of completion for MOS-1 and as previously defined beyond MOS-1.

G. LANDSCAPING DESIGN

Detailed landscape design will be prepared in accordance with approved criteria and standards, which will result in aesthetically pleasing products performing functional requirements for visual buffering. These designs will be developed to the 100% level of completion for MOS-1 and to a lesser level of completion beyond MOS-1 as delineated in the definition section of this document. Landscaping standards will be adaptable to the various system conditions, and shall be in keeping with the local climatic conditions, as well as reasonable maintenance requirements. The maintenance requirements shall be set forth, including water requirements and number of landscape maintenance personnel required.

PRODUCTS

Landscaping designs, drawings, specifications and cost estimates at the 100% level of completion for MOS-1 and as previously defined past MOS-1.

H. SURVEYING AND AERIAL MAPPING

The District, through subcontracts, will obtain necessary field survey services including, but not be limited to, the following activities:

- Verifying the network of horizontal and vertical control points, which will serve as a basis for all design and construction surveys to be performed throughout the project and to furnish "mile" and/or "kilometer" markers for use during operation of the system.

- Establishing additional ground control points required in connection with the controlled aerial photo surveys of the system.

- Obtaining and providing all necessary project facilities design and right-of-way surveys.

- Obtaining complete ground topographical surveys of the project area parcels to be acquired for the project, including information on structures and other improvements, etc., within those parcels. This includes geodetic control, cadastral, route location and design and construction surveys.

- Checking the horizontal and vertical dimensions and positioning of installed facilities.

This work is in addition to survey activities required by construction contractors. Appropriate review will be conducted to avoid any possible duplication in survey work.

PRODUCTS

Completed ground, and ground control surveys, and topographic surveys for all design units.

I. SUBSURFACE INVESTIGATIONS

The District, through subcontracts, will continue the soils boring program for the Project and prepare subsurface investigation and foundation design reports suitable for final design and construction. This task includes obtaining specific soils engineering information required for individual project sections and facilities.

PRODUCTS

Geotechnical Investigation Reports and Foundation Design Reports for all design sections.

J. RIGHT-OF-WAY ACQUISITION

The acquisition of right-of-way is one of the major components of the development and construction of the Project. Comprehensive policies and procedures have been developed to assure the timely availability of real estate.

The Project will require the acquisition of a variety of real estate interests including full fee takes, partial takes, and easements of various types. Since a majority of the system will be in subway, a large portion of the acquisitions will be for subsurface easement rights. Other easements may include temporary construction easements, utility easements, and the like. Real Estate requirements under this statement of work involve the acquisition of certified interests in 82 parcels and the relocation of 43 businesses and 24 residential occupants between the Yard and the Wilshire/Alvarado Station. For a list of the parcels to be acquired and maps showing the location of each, see Appendix A.

Work will continue on identifying property owners, obtaining title information and property certifications, and gathering of appraisal data for the line segment beyond the Wilshire/Alvarado Station to the North Hollywood Station.

PRODUCTS

Acquisition of right-of-way required from the Yard through the Wilshire/Alvarado Station.

K. SYSTEMS DESIGN

The District, through contracts will bring systems design in the Pre-Construction Phase to the 100% completion level. This will be accomplished through the following activities:

1. Development of systems procurement packages.
2. Provide design support to the development of specifications for facilities-related systemwide procurements.
3. Support development of specifications for Yard and Shops equipment.
4. Support development of specifications for stations ancillary equipment.
5. Provide bid evaluation planning to Construction Management.
6. Provide scheduling support to Program Control.

The 100% level of completion will be reached through a series of intermediate milestones:

Preliminary (30% completion)

In-Progress (60% completion)

Pre-Final (85% completion)

Final (100% completion)

Each milestone refines the previous submittals in response to formal review comments and advances the design to produce the final procurement package. Because each system procurement has uniquely different characteristics in areas of hardware, interfaces, industry peculiarities, procurement processes, packaging and scheduling, there is no uniform definition at

each step of the new material added, of the type of review involved, or of the levels completed in Continuing Preliminary Engineering (the starting point of Pre-Construction). A schedule for each step of a typical system procurement development is as follows:

30% o First draft of major technical sections and drawings

60% o Drafts of all technical sections & drawings
o First appearance of latest draft of General Conditions
o First draft of Special Conditions.

85% o Submitted for industry and peer reviews
o Final packaging defined.

100% o Final bid packages expecting only a "clean" review.

1. Development of Systems Procurement Packages

Procurement packages will be developed for the following systems:

Passenger Vehicle

Communications and Central Control

Automotive Train Control

Auxiliary Vehicles and Mobile Equipment

Fare Collection

Traction and Auxiliary Power

The Procurement Packages will enable bidders to accurately determine the terms and conditions of the purchase, detailed technical aspects of the supply, interfaces with other suppliers, the limits of their supply, and installation requirements of Districtfurnished equipment. Each Procurement Package will comprise the following documents:

- o General Provisions

  The General Provisions will consist of the legal terms and conditions that can apply to any Metro Rail system. Any tailoring of these provisions to a specific system will be done by deletion, if needed, or subsequent additions to the Special Provisions.

- o Special Provisions

  The Special Provisions will consist of the legal terms and conditions which are unique to each Metro Rail system procurement. Examples of these are the contractor's statement of work, delivery requirements, the District's payment provisions, warranty requirements, contract modifications and schedules.

- o Standard Technical Specifications

  The Standard Technical Specifications will consist of those specifications common to all systems, and will consist of:

- Contractor Management Program
- Quality Assurance Program
- System Safety and Assurance
- Verification and testing approaches.

  Slight modifications may apply to each system in particular, but the overall format and contents will be common to all systems.
- Technical Specifications

  The Technical Specifications will consist of all detailed technical aspects applicable to each particular system.

- Contract Drawings

  The Contract Drawings will apply to each system in particular, and will illustrate all features, equipment and components dictated by the District. Examples of these are logotypes, passenger vehicle seating arrangements, contact rail location, faregate arrays, etc.

  Some of the specific tasks to be performed in achieving the above are as follows:

- Perform trade-off studies to select from specific design options.

- o Develop a procurement packaging plan including choices of one/two step, design/furnish/install and hardware groupings.
- o Interact with industry and other transit districts (peers) following their reviews of our packages.
- o Develop systemwide interface and test requirements.
- o Follow project change request and trend monitoring procedures.

2. Support Development of Specifications for Systemwide Procurement

Systems Design will provide system integration support to Facilities Engineering in the development of systemwide equipment specifications. This support will consist of resolution of interfaces, supply of required data, engineering calculations, negotiations with public utilities, and other activities associated with systems and fixed facilities interfaces. Areas of involvement will be:

- o Tunnel emergency ventilation fans
- o Station ventilation equipment
- o Fire protection systems
- o Elevators and escalators
- o Seismic and gas detection sensors
- o Other hardware areas as required.

3. Support Development of Yard and Shops Specifications

Engineering support will be provided to Facilities Engineering in the development of Yard and Shops facilities and equipment specifications for the following areas:

- o Yard control tower
- o Wash rack
- o Shop maintenance equipment
- o Passenger vehicle hoists
- o Wheel truing equipment
- o Other areas as required

4. Development of Facilities Specifications

Engineering support will be provided to Facilities Engineering in the development of station designs for the following areas:

- o Location of conduit and cable trays
- o Location of fare collection equipment
- o Train control and communications equipment
- o Supervisory and data acquisition system
- o Heating, ventilation and air conditioning
- o Electrical facilities design
- o Other areas as required

5. Provide Bid Evaluation Planning Support to Construction Management

System Design will assist in the development of specific bid evaluation processes for each system procurement. This assistance will include providing Construction Management with the following for each procurement:

- o the final procurement package
- o procurement scheduling inputs as needed
- o review draft procurement plans for each system (process, resources and schedules).

6. Provide Scheduling Support to Program Control

Systems Design will assist Program Control in the refinements/revisions to the Levels I and II Schedules and the development of Level III Schedules. Specific work will include:

- o definition of scheduling interfaces among contracts
- o estimation of lapsed times required for tasks
- o identification of precedence/accessibility needs for systems installation and testing, and
- o review of draft schedules involving systems elements.

PRODUCTS

The following documents will be produced for all Metro Rail systems:

- o General Provisions
- o Special Provisions

- Standard Technical Specifications
- Technical Specifications
- Contract Drawings

L. SYSTEMS ENGINEERING AND ANALYSIS

Systems Engineering and Analysis activity during the Pre-Construction Phase will consist of operations analysis and planning, systems analysis and design support, and test planning. Operations analysis and planning will include development of the remaining sections of the System Operation Plan and update of those sections prepared during Preliminary Engineering and Continuing Preliminary Engineering. This activity will also involve: identification and resolution of operational issues; completion of the Failure Management Plan initiated during CPE; development of a revised operations cost estimate reflecting the final system configuration and operating plan; and development of a detailed outline of the Standard Operating Procedures Manual.

Systems Analysis support includes those activities necessary to assure adequate consideration of system-level requirements during the Pre-Construction Phase. These activities range from engineering analyses and special studies to review of plans and specifications. Engineering analyses and special studies will be conducted as required to assure adequacy of facilities and equipment quantities and verify interface requirements. Planned activities include: fare collection policy and system simplification studies; development of a functional plan for Central Control; identification of management information requirements; and preparation of heavy

rail/light rail/bus integration plans. Design support effort will involve: system integration and interdisciplinary coordination support; participation in design reviews, including action item resolution to insure compliance with system integration and operational requirements; participation in reviews of change requests to assess system-level and operational impacts; and updating of the System Specification as required during Final Design.

Test planning activity during the Pre-Construction Phase will include development of basic criteria, plans and schedules for conducting necessary system testing, and support for development of test requirements to be included in procurement specifications. An early element of this effort will be completion of the test management plan, initiated during Continuing Preliminary Engineering, which will define activities and roles for test planning, testing and reporting. A detailed schedule defining initiation and duration of test activities from subsystem deliveries through prerevenue system test and demonstration will be developed. Other activities will include development of operational verification requirements, definition of environmental test criteria, and refinement of previously developed plans and criteria as necessary.

PRODUCTS

- System Operating Plan
- Failure Management Plan
- Updated Operating Cost Estimate
- Central Control Functional Plan
- Updated System Specification
- Integrated Test Management Plan
- System Test Schedule
- Results of Special Studies (as required)

M. SAFETY, SECURITY AND SYSTEM ASSURANCE

The intensive safety, security, reliability, maintainability and quality assurance effort required to ensure system safety and dependability will require substantial support for final designs. These efforts are as follows:

- o Safety
- o Security
- o System Assurance

Safety

The SCRTD System Safety Program Plan identifies numerous plans, procedures and activities that are essential to the overall system safety program. For this period, the SCRTD will focus its efforts on those tasks assigned in the System Safety Program Plan:

- o Consolidate the SCRTD Safety, Fire/Life Safety and Security Program Plans.
- o Prepare the Preliminary Emergency Preparedness Plan.
- o Develop Safety and Security Data Requirements.
- o Review and Comment on safety documentation, including:
  1. Updated System Safety and Fire/Life Safety Criteria
  2. Safety Criteria Conformance Checklists
  3. Hazard Analyses submitted by contractors and/or consultants
  4. Fire Hazard and Toxic Materials Lists
  5. Safety Specification Conformance Checklists

- Provide safety considerations for contingency plans.
- Develop a methodology for preparation of a Metro Rail Safety Certification Program and Plan.
- Provide assistance to other Metro Rail staff and consultants in such areas as:
  1. Preparing a Contractor Safety Monitoring Plan
  2 Participating in Fire/Life Safety Committee Meetings and Working sessions
  3. Developing Emergency Equipment Lists
  4. Developing a Construction/Facilities Fire/Life Safety Program
  5. Implementing Safety Documentation Procedures.
- Coordinate safety activities with regulatory agencies in the State of California.

Security

The SCRTD System Security Program Plan identifies numerous plans, procedures and activities that are essential to the overall system security program. For this period, the SCRTD will focus its efforts on those tasks assigned in the System Security Program Plan:

- Refine the Security Staffing Estimates.
- Review and Comment on Security documentation, including:
  1. Updated Security Criteria
  2. Security Criteria Conformance Checklists

3. Security analyses submitted by contractors and/or consultants
4. Security Equipment Lists
5. Security Specification Conformance Checklists
6. Appropriate specifications and drawings.

- o Review existing arrest policies and procedures, management policies and procedures for bomb threats, barricaded hostage, etc. for application to Metro Rail.
- o Provide assistance to other Metro Rail staff and consultants, in such areas as:
  1. Developing a Security Incident Report Form
  2. Preparing a Security Equipment Assessment
  3. Participating in Security Subcommittee meetings and working sessions.
- o Refine Security Dispatch Center Requirements or CCF.

System Assurance

The SCRTD System Assurance Program identifies numerous plans, procedures and activities that are essential to the overall system assurance program. For this period, the SCRTD will focus its efforts on those tasks assigned in the System Assurance Program Plan:

- o Update the SCRTD System Assurance Program Plan.
- o Finalize the Warranty Protection Plan.
- o Develop Warranty Procedures, Forms and Instructions.
- o Finalize Quality Assurance, Quality Control, Inspection and Sampling Guidelines.

- o Develop a Failure Reporting, Analysis and Corrective Action System.
- o Review and Comment on System Assurance documentation, including:
  1. Updated System Assurance Criteria
  2. System Assurance Criteria Conformance Checklists
  3. Subsystem Numerical Indices
  4. Facilities/Construction Quality Assurance Plan
  5. Supplier and Subcontractor Monitoring Plans
  6. Appropriate specifications and drawings.
- o Provide assistance to other Metro Rail staff and consultants, in such areas as:
  1. Identifying Reliability and Maintainability Analyses for Specifications
  2. Defining Sampling, In-Process and End Item Test Requirements
  3. Attending Design Reviews.
- o Update Reliability and Maintainability Indices and Predictions.
- o Prepare a Study of Maintainability Problems at other Systems.

PRODUCTS

The following are the Safety, Security and System Assurance deliverables which will be completed during the Pre-Construction Phase:

- o Safety and System Assurance Program Plans.

- Fault Tree and Hazard Analyses.
- Reliability and Maintainability numerical indices.
- Contractor Monitoring, Resident Inspection, and Construction/Facilities Plans.
- Warranty Provisions for specifications.
- Safety Certification Methodology and Plans (Preliminary).
- Emergency Preparedness Plans (Preliminary).
- Others as required.

N. COST ESTIMATES

The District will establish a cost estimating group to coordinate, consolidate and approve all construction cost estimates prepared by the General Consultant or Section Design Consultants for construction and system procurement/installation contracts. The District will maintain cost control by establishing design to budget target estimates for each design section, monitoring cost estimates at specified milestones and directing the section designer to re-design if appropriate when the final cost estimate exceeds the target estimate by more than ten percent. Engineering type cost estimates will generally be prepared. Where applicable, contractors-style estimate will be prepared including person hours by labor category, equipment cost, overhead and profit. Where lump sum items are used, a basis for determination will be used and fully documented. The estimates will be in current year dollars and will show the procedures and state the assumptions used. The estimate back-up data will be based on the latest available information pertaining to the labor, equipment and material costs in the District area, and will include the basis for cost escalation. The estimates will include the construction contractor's overhead, profit and contingency rate. The bid items shall be on a balanced basis and no adjustment shall be made for early money or other factors that may be used in unbalancing bid items.

The construction cost estimates for the route segment from the Yard through Wilshire/Alvarado Station will be the final estimate at the 100% design level, however, the cost estimates for the remaining route segment will be at the 85% design level. The cost estimates for the systemwide elements will be done at the 100% design level.

PRODUCTS

- Cost estimates will be developed to the 85-100% design level for facilities and systemwide elements. The schedule for the cost estimates is as follows:

100% Estimates

Contract Unit	Forcasted Completion Date
A100	11/14/84
A135	10/08/84
A140	06/10/85
A165	10/15/84
A170	11/09/84
A620	04/19/85
A612,A615,A630,A631	04/30/86
A640	07/30/85
A650	02/15/85
A660	01/02/86
A670	02/15/85
Trackwork	05/15/85

85% Estimates

A195	09/21/84
A220	03/04/85
A240	11/15/84
A245	09/07/84
A250	03/04/85
A275	09/27/84
A310	06/25/85
A350	01/02/85
A410	09/28/84
A415	09/14/84 (50% only)
A425	11/19/84
A430	10/08/84
A445	01/31/85

- Overall Project Cost Estimates will also be developed.

O. JOINT DEVELOPMENT

Joint development activities involve the coordination of land development in the station impact area with Metro Rail to insure that the transit system and land use are mutually supportive. Value capture activities such as the implementation of benefit assessment are also included in this work area. The District will perform the following tasks for Joint Development:

1. Continue work with the City of Los Angeles, the Los Angeles Community Redevelopment Agency, and the County of Los Angeles to implement coordinated land use plans. This work will also address land development prior to Metro Rail construction.

2. Develop a strategy of land development for each station in conjunction with local governing bodies which consider user needs and community requirement at each station.

3. Establish cooperative agreements with local governing bodies, defining the roles and responsibilities of each agency in the implementation of land use and joint development.

   These agreements will cover the following areas:

   - o goals and objectives at each station;
   - o differentiation of institutional responsibilities;

- o requirements for interagency coordination, including resolution of disputes;
- o disposition of land;
- o development of District-owned property;
- o design changes and cost allocation;
- o public improvements required as a result of development; and
- o benefit assessment implementation.

4. Citizen Participation

A citizen participation program will be designed to utilize existing mechanisms and established groups/committees of other principal public agencies. The citizen involvement program will be organized and structured to allow for a full discussion of issues and technical presentation of key aspects of infrastructural needs, parking and circulation plans.

5. Benefit Assessment District Implementation

As part of the financial program supporting the implementation of the Metro Rail Project, new state legislation was passed permitting the District to obtain and bond monies from benefit assessment districts created around each of the 18 stations in the system. This law became effective January 1, 1984. Following enactment of this legislation, the District executed contracts with the City and County of Los Angeles to perform station area master

planning studies to determine the type and amount of development to be permitted at each station site. The development described in the station master plans conforms to locally adopted land use plans and is classified into (1) an immediate station impact area (0-600 feet from a station entrance), (2) the primary station impact area (601-1200 feet from station entrance), and (3) the secondary impact area of beyond 1200 feet but not greater than one mile in the Central Business District (Union Station, Civic Center Station, 5th & Hill Station, and 7th & Flower Station), and one-half mile for stations in the rest of the system. Development forecasts for each of the station areas are to be prepared as part of task 2 of this work scope.

This is a critical element in the implementation of the Metro Rail Project. The procedures and analyses must be documented, easily repeated by independent authorities, and fully supportable in a court of law. Above all, the District must seek to develop criteria and establish benefit assessment boundaries which are uniform in application, and which treat the same classes of property equally. The actual amount of the assessment will vary by impact area and by station location. Note, assessment Districts will be created only for stations contained in the construction program. For all other stations, background data will be collected and boundaries established.

Tasks to be accomplished under this work scope include:

a. Establish criteria for the selection of District boundaries around each station;

b. Preparation for Board approval of alternative methods of benefit computation. Sample computations of benefit for each alternative will be prepared;

c. Computation of the benefit received and preparation of summaries of long-term benefits (and revenues) for classes of property for each of 30 years beginning in FY '85;

d. Analyses of the legal, procedural, and practical aspects of implementing special benefit assessment districts;

e. Preparation of policy papers for consideration of the District Board concerning assessment rates, impact of inflation on fees collected, treatment of property which converts to higher uses, and consideration of petitions for inclusion in Assessment Districts;

f. Conduct of community participation meetings to inform assessed property owners of the process adopted for implementation by the District and the likely assessment rate;

g. Determine the basis for and recommend alternative rates of assessment by parcel;

h. Hold implementation meetings with the City Council, Board of Supervisors, and CRA Board, as appropriate;

i. Preparation of sensitivity analyses of the effect on revenue stream caused by the exclusion of various classes of property;

j. Preparation of analyses of specific requests for exclusion from District assessments for review by the RTD Board; and

k. Provide information as requested to Investment Broker/Bond Counsel. This includes patronage revenue and other investment forecasts for a 30 year period to coincide with bonding requirements. Associated analyses of system operation, fares, parking costs, etc. will also be undertaken.

6. Joint Development Performance Analysis Model

The District will undertake the development of a joint development project performance analysis model as part of the implementation of Board-adopted policies and procedures. The fundamental purpose of this task is to develop a real estate cash flow model that can demonstrate the impact of and prepare the SCRTD to negotiate the full spectrum of joint development/value capture proposals. This model will become an integral analysis tool in the District's overall Metro Rail Station area joint development program.

The performance model will be developed in a four-stage process. First, the prevailing Los Angeles unit construction and maintenance costs will be documented by major land use categories to establish basic model inputs for subsequent operational testing. Second, a detailed input variable matrix will be developed that will minimally include: unit construction costs, interest rates, property taxes, benefit assessment formulas, station cost-sharing parameters, lease costs and defined categories of operating costs. This matrix will be organized under accepted real estate development industry standards of "hard" and "soft" costs. Third, the model's analysis function will then be designed to integrate the net difference of a given variable (e.g. parking costs, connector fares, shared station costs) with the demand as well as the supply side of the development of the real estate equation. The results of the first three stages in the development of the model will be documented in a functional performance model description report.

The fourth stage of model development will involve operational testing on at least two existing Metro Rail joint development projects. A report will then be prepared that documents the results of the testing, which will also serve as an operational manual.

7. Joint Development Project Packaging

The District will consummate the actual implementation of the joint development/value capture projects in direct relation to the Metro Rail System. There are three key elements to the joint development packaging process. The first element involves monitoring negotiations with ongoing real estate projects to ensure coordination with the Metro Rail Project and compliance with the adopted public/private coventure program. The second element relates to site specific project packaging. The third element encompasses carrying out the final development review and approval with provision for the full ombudsman support. Mechanisms within the City and County agencies will be put in place to support this effort.

PRODUCTS

- Refinement of station area development opportunities.
- Station area master plans for each station.
- Execution of Interagency Cooperative Agreements.
- Implementation of Benefit Assessment Districts.
- Continuation of Citizen Participation Activities and, in particular, development of programs to include the private sector along the entire corridor.

- Development of a Metro Rail Financial Plan with O & M costs, fares, auxiliary and other revenues, and subsidy requirements and sources.

P. PROGRAM CONTROL

During the Pre-Construction Phase, Program Control will establish the necessary management controls for overseeing the Metro Rail Project, including the District force account, General Consultant, Construction Management Consultant and other consultant contracts. These controls will include the following activities:

- o Establish/update detailed baselines for Project cost and schedule control.
- o Review cost and schedule submittals from the consultants and measure performance.
- o Analyze deviations from cost and schedule plans, isolate the causes and suggest corrective action.
- o Prepare monthly progress reports and evaluation of performance for Project Managers and other District managers.

Program Control will use the Transit Automated Control System (TRACS) to assist in monitoring cost and schedule performance. Some of the subsystems and their roles within TRACS are listed below:

- o Scheduling subsystem is used to develop networks and bar charts.
- o Graphic subsystems through which schedule and cost information can be plotted.

- Budgeting subsystem which will define budget elements based on the approved Work Breakdown Structure (WBS).
- Procurement subsystem which will allow monitoring of the procurement process from requisition initiation to contract completion.
- Real Estate subsystem which will monitor the real estate process from parcel identification to tenant relocation.
- Change Order subsystem which will track the change order process from initial recognition of a change to the actual execution of work.
- Report writing subsystem which will format management reports in many different styles.

Schedule control during the Pre-Construction Phase will consist of maintaining, updating and reviewing all schedules produced during this phase. Specifically, Program Control will:

- Review the Section Designer's Critical Path Network, Design Control Register and other schedule-related contract submittals for accuracy and compliance with planned levels of completion. Problem areas will be identified and brought to the attention of management for resolution.
- Prepare Pre-Construction Readiness Schedules showing all those activities required prior to the start of construction for each contract.

- Prepare Construction Sequence Schedules showing all activities to be completed during construction and system start-up.
- Hold weekly meetings with Project Engineers to determine and analyze the current status of Pre-Construction schedules.
- Establish a Schedule Control Board to resolve actual and potential schedule impacts.

Cost control during the Pre-Construction Phase will consist of the establishment of detailed budgets for discrete elements of work and the measurement and analysis of actual performance against these budgets. This will be accomplished through the following activities:

- Preparation of the Fiscal Year Budget for the Metro Rail Project.
- Analysis of purchase requisitions to determine if the expenses are within the Fiscal Year Budget.
- Maintain a contingency log.
- Maintain and update the Project WBS.
- Maintain a Trending Program which reflects all changes to the Project cost and scope.
- Prepare updated Funding Sources Schedules as needed.
- Assist Grants Administration in the preparation of Grant Applications and Amendments.
- Prepare ongoing analyses of each design consultants cost performance showing productivity trends,

forecasted cost at completion, earned costs and conclusions that can be drawn from past performance.

- Prepare special cost analyses for management on an as-needed basis.
- Prepare and maintain a time-phased budget.

PRODUCTS

- Pre-Construction Readiness Schedule
- Construction Sequence Schedule
- Critical Path Networks
- Time-Phased Budget
- Fiscal Year Budget
- Updated WBS
- Monthly Progress Report (Cost and Schedule)
- Monthly Trend Reports

Q. CONSTRUCTION MANAGEMENT

The District will perform, or cause to be performed through contracted construction management services (CM), the following tasks during the Pre-Construction Phase:

A. Evaluate criteria and standards for cost-effectiveness and constructibility.

B. Review standard and directive drawings and provide an evaluation of cost-effectiveness and constructibility.

C. Review the preliminary designs and specifications for cost-effectiveness and constructibility.

D. Evaluate preliminary construction cost estimates for reasonableness.

E. Provide comparative cost studies of alternate materials and construction methods. For specific elements of the Project, comparative cost studies of alternate materials and alternate construction methods will be made. Typical elements which may be studied include excavation support systems and alternate tunnel liners (concrete vs. steel/precast vs. cast-in-place).

F. Review contract packaging and long lead time procurements, and implement modifications, if appropriate.

Contract packaging will be reviewed against such criteria as:

- optimizing package sizing to accommodate industry capability

- o assuring maximization of competition
- o DBE/WBE involvement
- o bid bond capacity
- o similar skills
- o minimizing disruption to the public

Long Lead Procurements will be reviewed to assure timely availability. The following factors will be considered:

- o Manufacturing lead time which precludes the ability of the contractor to furnish and meet contract schedules.
- o Quantity purchases which will assure reduced cost to the RTD and availability of materials when needed.
- o Standardization, where essential, to minimize maintenance costs.

Long lead procurement items will be scrutinized to reduce their number in order to place maximum responsibility on the construction contractor and minimize the potential for future claims inherent in owner supplied equipment and material.

G. Review construction and procurement schedules and implement modifications, for practicality and reasonableness, considering time frames for similar work, utility relocation timing, traffic flow maintenance, interfaces with other contracts, interfaces between construction and procurement schedules, and the relationship to the overall system construction critical path.

H. Provide comparative cost studies of alternate materials and systems.

For selected items, comparative cost studies of alternate materials and systems will be made using accepted life-cycle cost principles. Typical elements which may be studied include:

(1) Tolerances/clearances for system installation

(2) Vibration isolation methods

(3) Equipment handling

(4) Noise and vibration control methods

I. Review final design, drawings, specifications and bid documents for the Minimum Operable Segment (MOS-1) will be reviewed as they are developed by the General Consultant or section designers for constructibility and for areas of possible cost savings. The review will consider such factors as completeness, compatibility of plans and specs, bid items and appropriateness of type of bid, interface with other construction, contractor lay-down/work areas, haul-routes plans, compatibility with District-furnished materials and equipment, incorporation of previous review comments, traffic maintenance plans, contractor QC, safety, construction milestone schedules, project controls requirements and EEO compliance requirements.

J. Identify, prior to start of construction, all required permits, licenses, certificates, and insurance needs. A research of involved agency requirements, applicable federal, state, county and local (city) regulations, codes, ordinances and other documents will be conducted and a checklist of requirements developed. Each package will be reviewed against the checklist, and required items identified and entered into the schedule. A follow-up system will be established to assure conformance.

K. Develop plans for coordinating all aspects of construction with local municipal authorities, other governmental agencies, utility companies and others who may be involved in the Project. A checklist of such organizations will be developed, points of contact identified and methods for performing coordination established with the organization. Coordination points will be included in detail schedules.

PRODUCTS

- Criteria & Standards Evaluation Reports
- Standard and Directive Drawings Evaluation Reports
- Cost Estimate Evaluation Reports
- Alternate Materials/Systems Reports
- Alternate Materials/Construction Methods Reports
- License/Permit Requirements List
- Utilities/Agency Coordination Checklist

R. CONSTRUCTION MANAGEMENT OVERSIGHT

During the Pre-Construction Phase, the District will retain the services of a qualified professional services firm to perform Construction Management Oversight (CMO). The objective of CMO services is to assure that the Project is completed in accordance with established procedures, specifications and principles in a timely manner. The contractor shall perform oversight of District's construction management activities as they apply to the preconstruction, construction, and start-up phases of the Metro Rail Project. Although the contract for CMO services is with the District, the contractor shall report directly to and be responsible to UMTA.

The specific tasks of the CMO contractor are:

1. Review of Project Documents and Selected Interviews

   The CMO contractor shall review pertinent project documents and perform selected interviews in sufficient detail to become familiar with all aspects of the Project. Documents to be reviewed shall include but not be limited to design criteria, plans, specifications, technical reports, EIS, organizational charts, personnel tasks, contracting procedures and project management strategies. Personnel to be interviewed shall include but not be limited to Metro Rail's personnel, design and CM staff and consultants, suppliers and UMTA personnel.

2. CM Review

The contractor shall perform a survey of the Metro Rail Construction Management Program. This survey shall include, but not be limited to, the Metro Rail Project organization, policies, procedures, line of authority, personnel and training as they relate to all CM functions including Metro Rail's consultants and contractors. The objective of the survey is to evaluate the applicability and effectiveness of Metro Rail's CM program in effecting a quality project in a timely and cost effective manner.

3. Review of District Functions

During the Final Design Phase of the Project, the CMO contractor shall monitor Metro Rail's functions as they relate to development and implementation of design and construction specifications, policies, procedures and organization. Functions to be monitored under this task include but are not limited to the development and/or implementation of procedures for:

a. Change orders
b. Shop drawing approval
c. Testing and acceptance of completed work
d. Training of personnel
e. Contract packaging and sequencing
f. Constructability Reviews
g. Schedule and Cost Reporting
h. Quality Control

i. Quality Assurance

j. Integration of design changes with systems and contracts

k. System Safety

l. Risk Management

m. Security

4. Construction/Start up Phase Oversight

During the construction/start up phase of the Project the CMO contractor shall monitor the District's functions as they relate to control of the Project's costs, schedule and quality. CM functions to be monitored under this task include but are not limited to the development/ implementation, and effectiveness of:

a. The Project's status including:

- o Timely management decisions
- o General activities
- o Schedule analysis
- o Cost analysis
- o Manpower analysis

b. The technical inspection of construction work for conformance to plans and specifications including materials and finished work.

c. The change orders procedures

d. The as built plans

e. The staffing and training of personnel

f. The start up procedures

g. The Quality Assurance Program

h. The Quality Control Program

i. The Safety Certification Program

5. Contract Implementation Plan

The CMO contractor shall develop and submit for review, comment and approval a Contract Implementation Plan (CIP). The CIP shall include but not be limited to the following:

a. A description of each work task. The work description shall define the proposed task approach, describe the means and source of data collection, specify the analysis, survey and audit techniques to be used and describe the expected products and results.

b. Individual personnel assignments, man-hours budgeted, and cost estimate for each task.

c. Milestones and schedule for each task, including deliverables and briefings.

PRODUCTS

- Contract Implementation Plan
- Monthly Progress Reports to UMTA
- Mid month Bullet Reports to UMTA
- Final Report to UMTA
- Other reports as required by UMTA

S. OWNER-CONTROLLED INSURANCE PROGRAM

During the Pre-Construction Phase the District will retain the services of a District Insurance Administrator (DIA) to design and administer the Owner-Controlled Insurance Program (OCIP). The main responsibilities of the DIA shall be as follows:

A. Procurement of Insurance

The DIA shall procure the following insurance coverages for the OCIP:

1. Workers' Compensation and Employers' liability insurance of all construction contractors, subcontractors of any tier, and architects and engineers.
2. Comprehensive general liability insurance for all construction contractors, subcontractors of any tier, and architects and engineers.
3. Builders' all-risk insurance.
4. Architects' and engineers' professional liability (errors and omissions) insurance. The coverage of such insurance shall extend for the statutory discovery period beyond commencement of revenue service on the Metro Rail Project. As may be required, such insurance shall provide "excess" coverage following limits of individual consultants' insurance, with no break in coverage.

5. Other insurance coverages as may be required, including, but not limited to, railroad protective and "difference in conditions" insurance.

B. Marketing the Insurance Program

The DIA shall use its professional expertise and knowledge of the insurance market to establish the levels for each of the above, so as to achieve a proper balance between the objectives of responsibility, adequate protection and cost containment. All such levels shall be submitted to District for approval.

1. After receipt of concurrence from the District, the DIA shall competitively market the Insurance Program.
2. In selecting insurance markets from which insurance contracts are to be purchased, the DIA shall develop and present to the District competitive quotations giving due consideration to all insurance markets throughout the world including, but not limited to domestic stock and mutual companies, reciprocals, Lloyds, foreign companies and other markets.
3. The DIA shall present to the District all proposed contracts for the purchase of insurance coverage along with substantiating information and recommendations. The substantiating information shall include copies of the actual premium quotations submitted by the insurance companies.

C. Pre-Construction Survey

The DIA shall prepare a solicitation for the procurement of pre-construction in survey program subconsultant services. Such services shall indicate:

1. Procedures for carrying out the pre-construction survey.
2. Identification of structures and facilities which could suffer adverse physical damage.
3. Establishment of a schedule for carrying out the pre-construction survey.
4. Organization and maintenance of all survey findings.
5. Providing expert testimony, if necessary, concerning claims arising out of Project construction.

D. Safety Program

The DIA shall assist the District in the design of a project-wide safety program. This safety program shall include:

1. A safety and reporting procedures manual to be used in monitoring the program and instituting procedural changes as required.
2. A monthly safety report including an analysis of accident causes, frequency and severity, with appropriate recommendations relating to the program's effectiveness.

3. Safety meetings with contractors' safety superintendents, construction managers, safety superintendent and resident engineers and the District's Safety Representative.

4. Daily supervision of the loss control program including job pre-planning, safety training, accident investigation and loss control surveys.

5. Recommendations concerning any hazards and occupational disease exposures that may exist on the job sites.

E. Claims Administration

1. General Responsibilities

The DIA shall process to a conclusion any and all claims which may arise during the term of the contract, regardless of when or how settled. It is expressly understood that, at District's option, responsibility shall continue beyond any termination or expiration of the contract, and DIA shall be entitled to compensation of its costs of handling such ongoing claims.

2. Claims Personnel

The DIA shall provide qualified claims personnel, on its staff or on a subcontract basis experienced in their respective areas of responsibility, and possessing any licenses required by law.

3. Procedures

Prior to commencing claims administration, DIA shall develop appropriate claims administration procedures. Such procedures shall be updated as required.

4. Reports

The DIA shall furnish the District with monthly reports showing history and status of each claim in process, and such other analytical information as the District may require.

5. Standards of Service

In performing services as claims administrator, the DIA shall use accepted insurance industry standards. The DIA shall use its best efforts to settle claims in a manner so as both to conserve funds and to be fair to insurance carriers, the District, contractors and injured parties.

6. Workers Compensation Claim Administration

For the purposes of the DIA contract, it is assumed that the workers compensation claims management program will be handled by insurance carriers. The District reserves the right to select alternative methods for workers compensation claims administration as recommended by DIA.

F. DBE/WBE Bonding Program

The DIA shall assemble and implement a surety bond packaging program to assist in bonding of disadvantaged and women-owned business enterprises (DBE's/WBE's) on the Metro Rail Project. DIA shall, specifically,

1. Perform technical reviews of DBE/WBE contract opportunities.
2. Identify contractor surety needs.
3. Assist contractors in preparing and completing forms necessary for obtaining surety.
4. Identify and recommend to the District appropriate surety companies.
5. Submit surety bond guarantee packages to the District for review and approval.
6. Provide necessary ongoing assistance, to include monitoring field progress, counter-signing, fiscal supervision, and obtaining lines of credit through a working capital support fund.

G. Additional Responsibilities

1. The DIA shall prepare summaries of project risks prior to marketing all insurance coverages.

PRODUCTS

- Pre-Construction Survey Reports
- Insurance Related Financial Management Program
- Regular Management Reports

- Project Risks Summary Reports and placement of the following insurance coverages:
    - Worker's Compensation
    - Comprehensive General Liability
    - Builders' All Risk
    - A/E Professional Liability
    - Surety Bond Program
    - Miscellaneous Coverages

T. COMMUNITY RELATIONS

Before actual construction activities commence in any community, it is the responsibility of the Community Relations staff to coordinate an information program to prepare the impacted communities on the specifics of the construction program.

The Community Relations Department's Pre-Construction Phase activities include, but are not limited to, the following tasks and areas of responsibility:

- o Assist the Marketing Department with the public information program regarding changes in bus routing and scheduling. While the Marketing Department will have the lead activities in this task, Community Relations must assist in keeping constituency groups and individuals informed on an ongoing basis.
- o Inform the public of street closures, detour and traffic management plans and utility relocation activities affecting vehicular and pedestrian mobility.
- o Work with property owners and tenants in coordination with the construction management team (District, PDCD and individual contractors) regarding maintenance of customer and employee access, delivery of goods and services and other related commercial and public requirements, including necessary signage.
- o Notify and provide liaison with appropriate elected officials and public agencies.

- Prepare generic publications covering construction methods and schedules, construction site safety and security, etc. Also publication(s) describing procedures for mitigation of negative construction impacts dealing with accidents, utility disruption, etc.
- Assist News Bureau with media briefings and press events related to all phases of construction.
- Coordinate groundbreaking activities and related events.
- Hold public meetings with property owners, property management firms and tenants regarding impacts of construction.
- Hold public meetings with property owners, managers and tenants regarding real estate acquisition and relocation activities.
- Hold public meetings with property owners regarding benefit assessment districts, their formation and implementation.

PRODUCTS

- Public information publications on the Metro Rail Project

FISCAL YEAR 1984
FUNDING SOURCES ANALYSIS
($ in millions)

FUNDING SOURCE	PRE CONSTRUCTION	REVENUE FINANCING	PRE-CONSTRUCTION WITH REVENUE FINANCING	FUNDS AVAILABLE FOR FUTURE MATCH	TOTAL FUNDS AVAILABLE
UMTA SECTION 3	$ 105.4	$ - 0 -	$ 105.4	$ - 0 -	$ 105.4
STATE	8.4	7.0	15.4	12.0	27.4
LACTC	11.6	9.8	21.4	16.6	38.0
UMTA SECTION 9	13.0	10.9	23.9	16.3	40.2
CITY OF L.A.	2.1	1.8	3.9	3.1	7.0
TOTAL	$ 140.5	$ 29.5*	$ 170.0	$ 48.0	$ 218.0

*Does not include Revenue Financing of $2,083,000 from Grant Amendment No. 4.

10.04.84
P&C-19.29

FISCAL YEAR 1984
FINANCIAL PLAN
($ in thousands)

MACS CODE	DESCRIPTION	PRE-CONSTRUCTION FUNDS	FUNDS AVAILABLE FOR FUTURE MATCH	TOTAL FUNDS AVAILABLE
20.02.01	Support Vehicles	$ 30	$ - 0 -	$ 30
20.02.02	Support Equipment	1,490	1,000	2,490
20.02.07	MIS Equipment	1,000	- 0 -	1,000
20.02.08	Communication Eqmt.	100	- 0 -	100
20.06.10	Right-of-Way	60,863	14,800	75,663
20.08.01	Prof. Servs. Contracts Eng. & Design	70,517	- 0 -	70,517
20.08.02	Prof. Servs. Contracts Const. Mgmt.	9,000	23,400	32,400
20.11.01	Owner Controlled Insurance	4,000	- 0 -	4,000
20.13.11	Railroad Track Relocation	17,000	- 0 -	17,000
20.15.02	Force Account	3,500	3,000	6,500
20.16.00	Adm. Support Servs.	500	160	660
20.16.90	Other Supporting Servs.	1,000	640	1,640
32.00.00	Contingencies	1,000	5,000	6,000
	GROSS PROJECT COST	$ 170,000	$ 48,000	$ 218,000
41.00.00	Revenue Financing	(29,467)*		
	NET PROJECT COST	$ 140,533		

*Does not include Revenue Financing of $2,083,000 from Grant Amendment No. 4

10.04.84
P&C-19.28

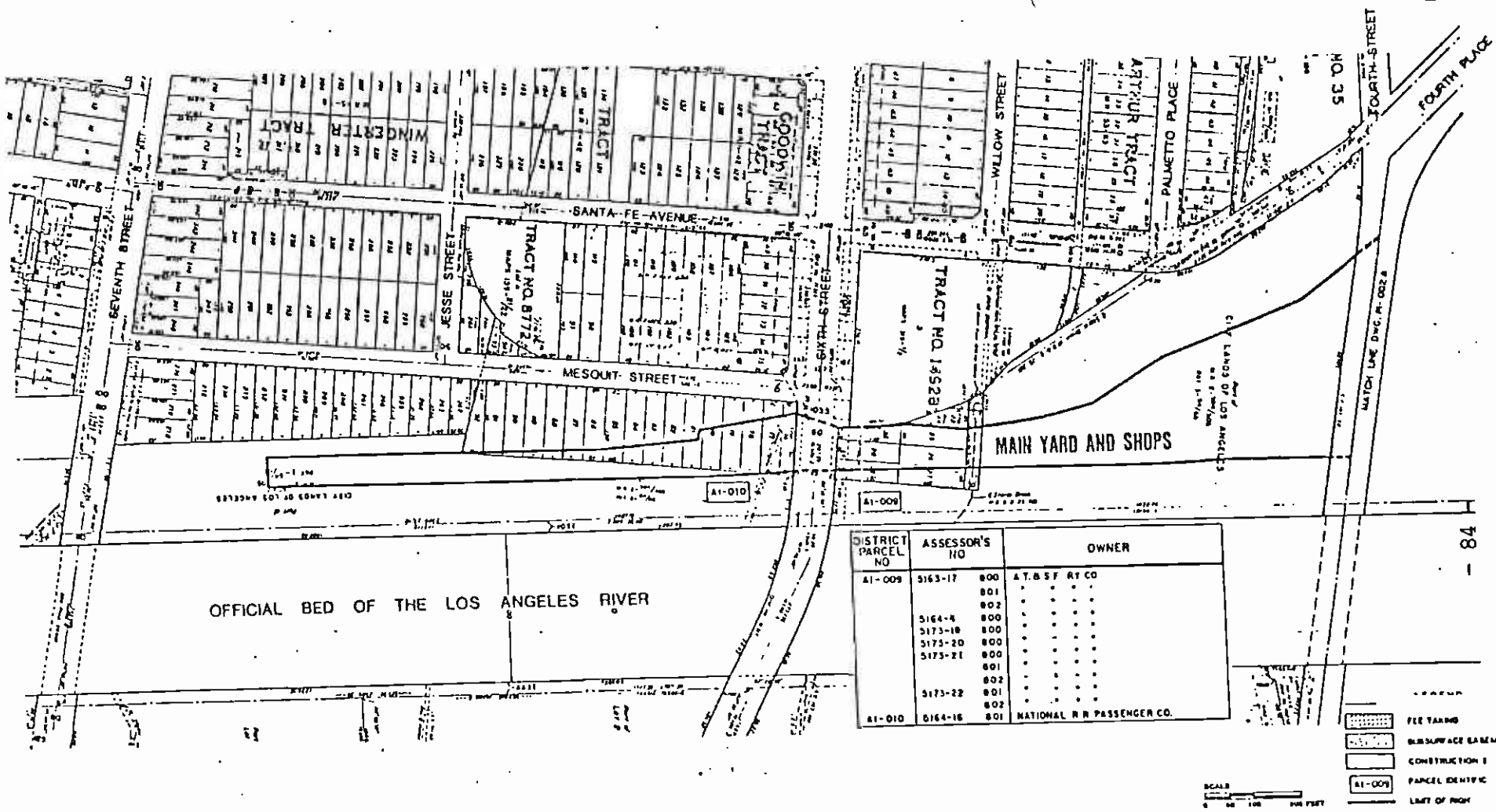
APPENDIX A
REAL ESTATE PARCELS

*PARCEL NO.	MINIMUM REQUIRED INTEREST	COMMENTS
CCU: A-100		
A1-009	Partial Take	Railroad Owned (5 Relocations)
A1-010	Partial Take	Railroad Owned (Amtrak)
A1-015	Full Take	1 Relocation
A1-016	Full Take	1 Relocation
A1-017	Partial Take/Temp. Const. Esmt.	Railroad Owned
A1-019	Partial Take/Temp. Const. Esmt.	1 Relocation
A1-020	Full Take	Railroad Owned
A1-021	Full Take	1 Relocation
A1-023	Sub-Surface Easement/Temp. Const. Esmt.	Caltrans Owned
A1-024	Full Take	1 Relocation
A1-034	Sub-Surface Easement/Temp. Const. Esmt.	Caltrans Owned
CCU: A-135		
A1-025	Full Take	Union Station
A1-026	Full Take	Union Station
A1-027	Partial Take/Temp. Const. Esmt.	Union Station
A1-028	Full Take	Street Vacation
A1-029	Full Take	City Owned
A1-031	Full Take	N/A
A1-032	Full Take	N/A
A1-033	Full Take	Union Station
CCU: A-140		
A1-101	Sub-Surface Easement	N/A
A1-102	Sub-Surface Easement	N/A
A1-103	Sub-Surface Easement	N/A
A1-104	Sub-Surface Easement	N/A
A1-106	Sub-Surface Easement	County Owned
A1-107	Sub-Surface Easement	County Owned
A1-108	Sub-Surface Easement	County Owned
A1-109	Sub-Surface Easement	Caltrans Owned
A1-110	Sub-Surface Easement	City Owned
A1-111	Sub-Surface Easement	County Owned

PARCEL NO.	MINIMUM REQUIRED INTEREST	COMMENTS
CCU: A-140 (cont.)		
A1-122	Sub-Surface Easement	County Owned
A1-124	Partial Take/Temp. Const. Esmt.	County Owned
A1-125	Partial Take	County Owned
A1-138	Partial Take	N/A
A1-139	Partial Take/Temp. Const. Esmt.	County Owned
A1-140	Partial Take/Temp. Const. Esmt.	County Owned
A1-141	Partial Take/Temp. Const. Esmt.	CRA Owned
A1-142	Partial Take/Temp. Const. Esmt.	1 Relocation
A1-143	Partial Take/Temp. Const. Esmt.	N/A (Parking Lot)
A1-144	Sub-Surface Easement	City Owned Park
A1-145	Partial Take/Temp. Const. Esmt.	N/A (Parking Lot)
A1-150	Partial Take/Temp. Const. Esmt.	1 Relocation
A1-161	Sub-Surface Easement	N/A
A1-162	Sub-Surface Easement	N/A
A1-163	Sub-Surface Easement	N/A
A1-164	Sub-Surface Easement	N/A
A1-166	Sub-Surface Easement	N/A
A1-167	Sub-Surface Easement	N/A
A1-168	Sub-Surface Easement	N/A
A1-169	Sub-Surface Easement	N/A
A1-170	Sub-Surface Easement	N/A
A1-171	Sub-Surface Easement	N/A
A1-172	Sub-Surface Easement	N/A
A1-173	Sub-Surface Easement	N/A
CCU: A-165		
A1-174	Partial Take	5 Relocations
A1-175	Partial Take	N/A
A1-176	Full Take	1 Relocation
A1-178	Partial Take/Temp. Const. Esmt.	N/A
CCU: A-170		
A1-177	Sub-Surface Easement	Caltrans Owned
A1-179	Sub-Surface Easement	N/A
A1-180	Sub-Surface Easement	N/A

PARCEL NO.	MINIMUM REQUIRED INTEREST	COMMENTS
CCU: A-170 (cont.)		
A1-181	Sub-Surface Easement	N/A
A1-198	Sub-Surface Easement	N/A
A1-199	Sub-Surface Easement	N/A
A1-200	Sub-Surface Easement	N/A
A1-201	Sub-Surface Easement	N/A
A1-202	Sub-Surface Easement	N/A
A1-203	Sub-Surface Easement	N/A
A1-204	Sub-Surface Easement	N/A
A1-205	Sub-Surface Easement	N/A
A1-206	Sub-Surface Easement/Temp. Const. Esmt.	N/A (Parking Lot)
A1-207	Full Take	City Owned (Fire Station)
A1-208	Full Take	5 Relocations
A1-209	Partial Take	N/A
A1-211	Partial Take	N/A (Parking Lot)
A1-220	Partial Take	N/A (Parking Lot)
A1-221	Full Take	5 Relocations
A1-222	Full Take	26 Relocations
A1-224	Full Take	4 Relocations
A1-225	Full Take	2 Relocations

*Additional parcels will be added as design progresses.



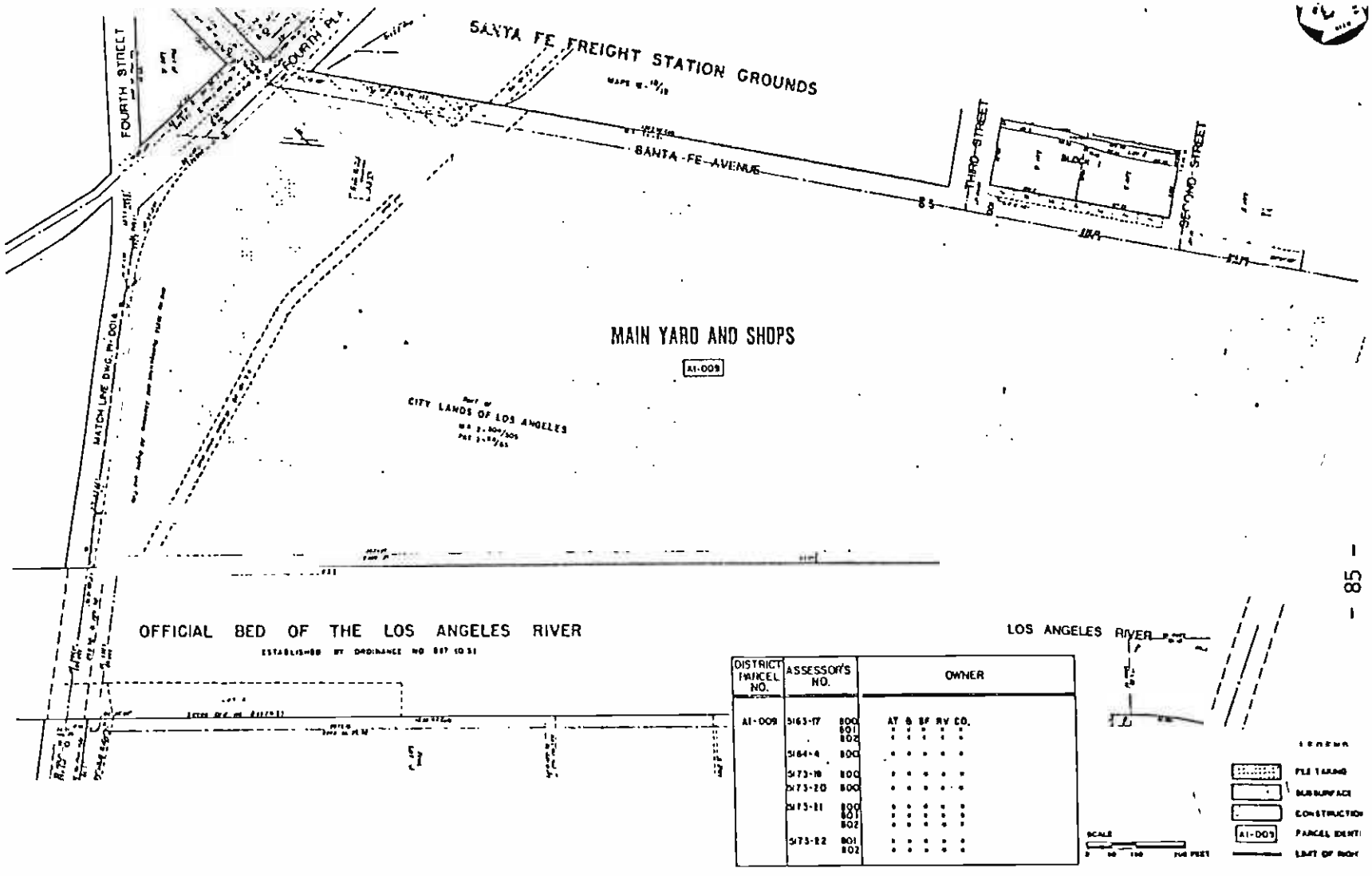
DMJM PBQD

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT

RTD

CBD TO NORTH HOLLYWOOD LINE
PROPERTY IDENTIFICATION PLAN

SANTA FE AVENUE & FOURTH STREET TO
SANTA FE AVENUE & SEVENTH STREET



DMJM PBQD

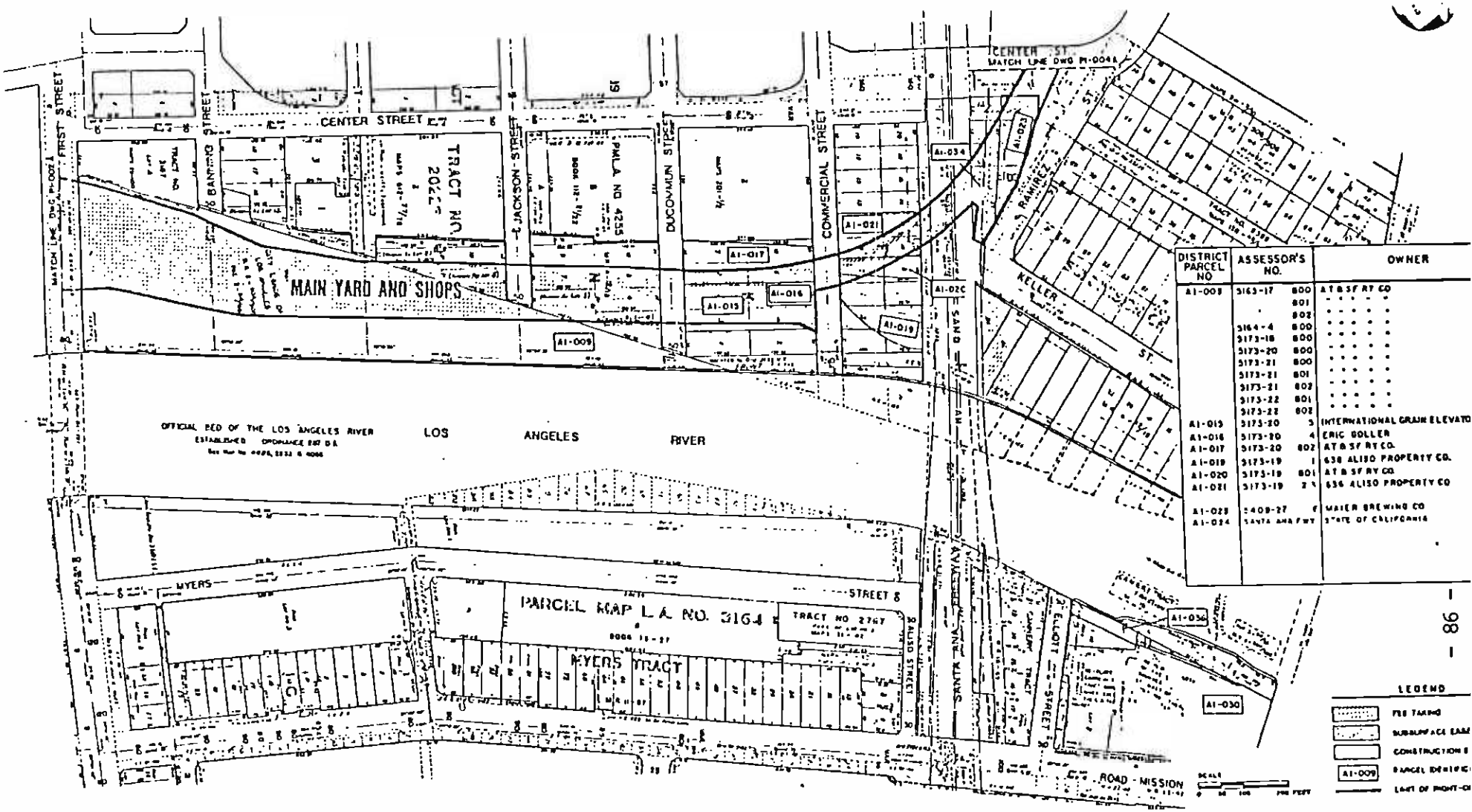
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT

RTD

CBD TO NORTH HOLLYWOOD LINE
PROPERTY IDENTIFICATION PLAN

SANTA FE AVE. & FIRST ST. TO
SANTA FE AVE. & FOURTH ST.

- 85 -



DISTRICT PARCEL NO	ASSESSOR'S NO.		OWNER
A1-009	5163-17	800	AT & SF RY CO
		801	" " " "
		802	" " " "
	5164-4	800	" " " "
	5173-18	800	" " " "
	5173-20	800	" " " "
	5173-21	800	" " " "
	5173-21	801	" " " "
	5173-21	802	" " " "
	5173-22	801	" " " "
	5173-22	802	" " " "
A1-015	5173-20	5	INTERNATIONAL GRAIN ELEVATO
A1-016	5173-20	4	ERIC BOLLER
A1-017	5173-20	802	AT & SF RY CO.
A1-019	5173-19	1	636 ALISO PROPERTY CO.
A1-020	5173-19	801	AT & SF RY CO
A1-021	5173-19	2 \	636 ALISO PROPERTY CO
A1-023	5409-27	6	MAIER BREWING CO
A1-024	SANTA ANA FWY		STATE OF CALIFORNIA

- 86 -

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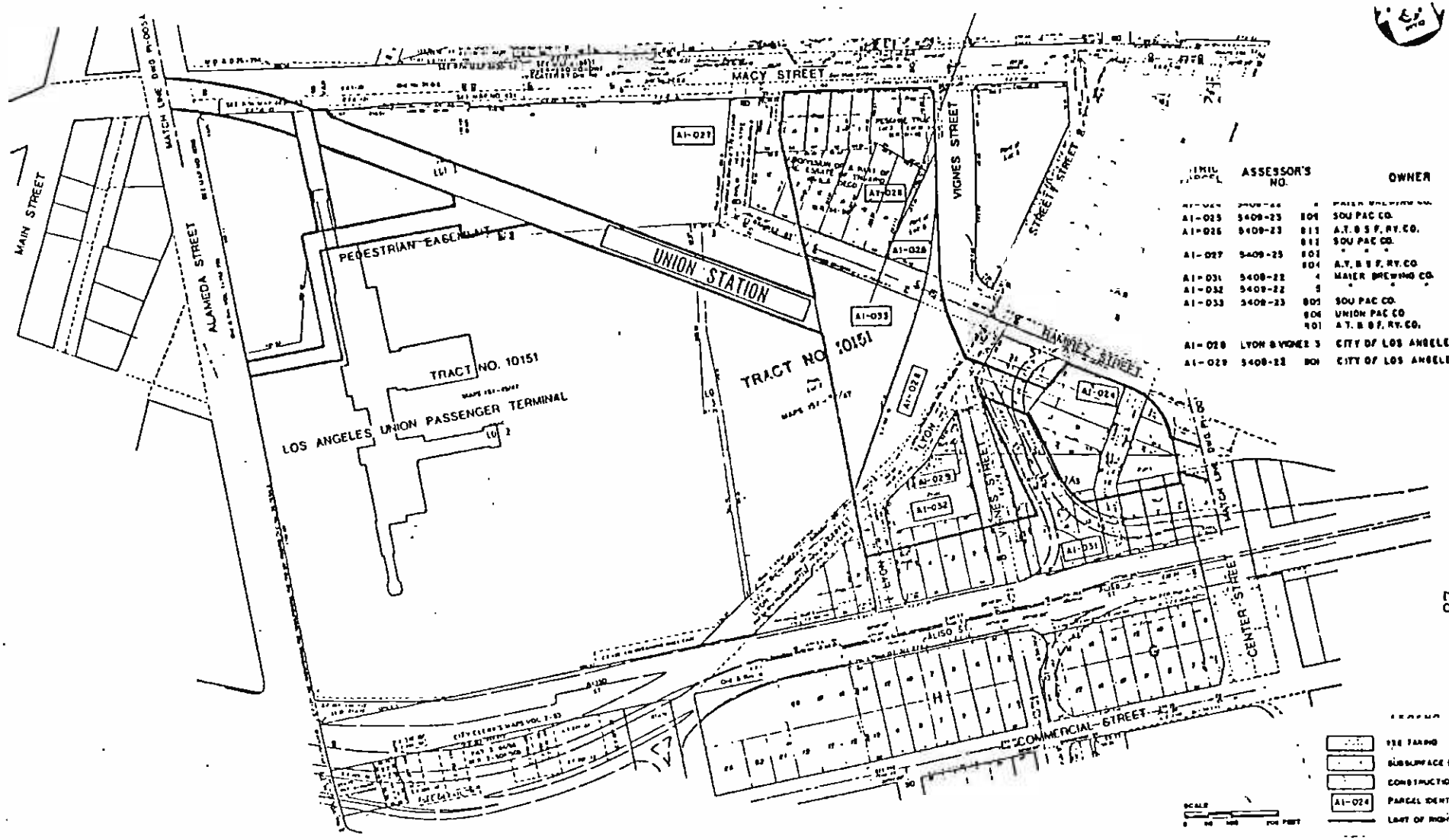
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT

RTD

CBD TO NORTH HOLLYWOOD LINE
PROPERTY IDENTIFICATION PLAN

SANTA FE AVE. & FIRST ST. TO
CENTER ST. & SANTA ANA FRWY.



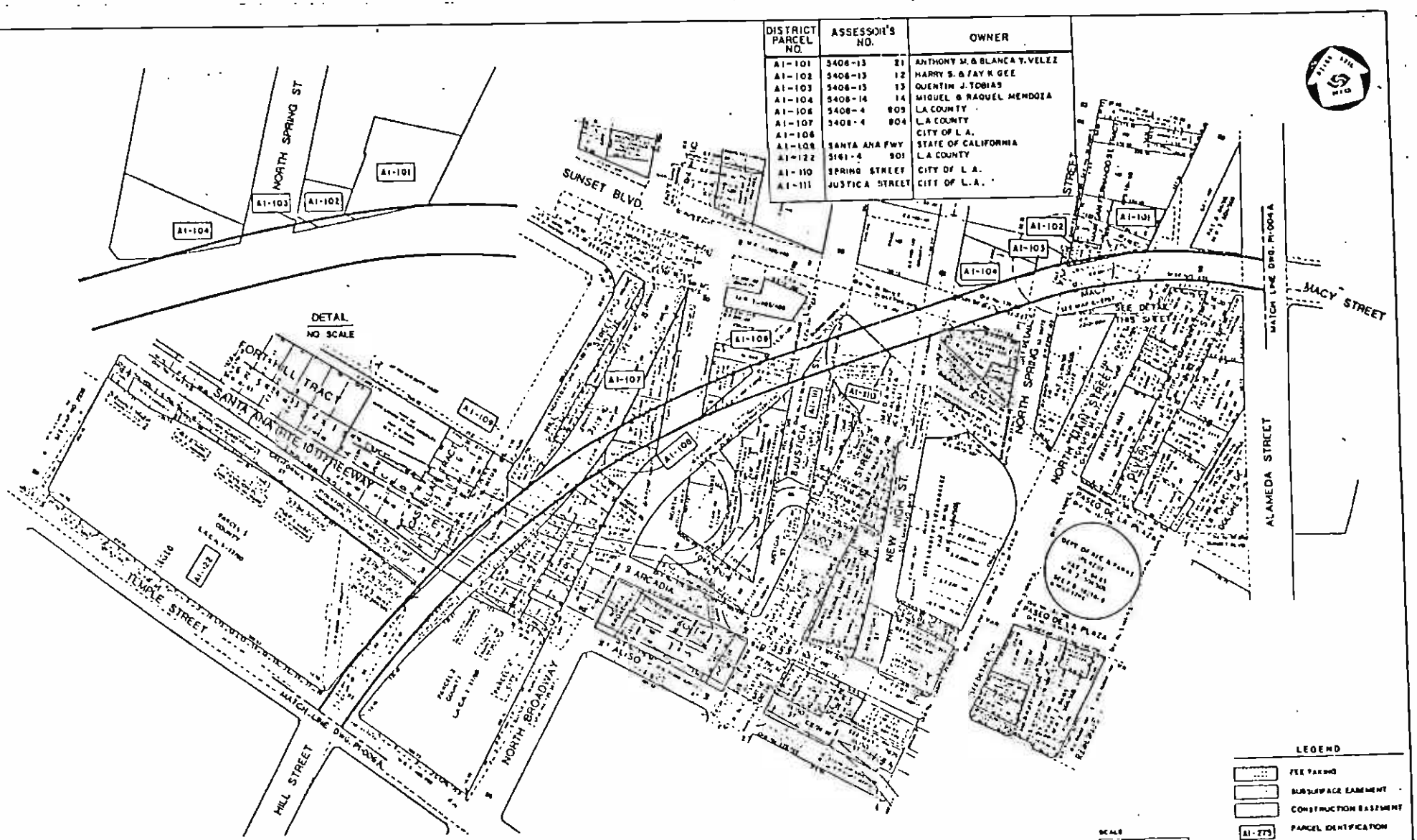
DMJM/PBQD

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT

RTD

CBD TO NORTH HOLLYWOOD LINE
PROPERTY IDENTIFICATION PLAN

CENTER ST. & SANTA ANA FRWY. TO
ALAMEDA ST. & MACY ST.



DISTRICT PARCEL NO.	ASSESSOR'S NO.	OWNER
A1-101	5408-13 21	ANTHONY M. & BLANCA Y. VELEZ
A1-102	5408-13 12	HARRY S. & FAY R. GEE
A1-103	5408-13 13	QUENTIN J. TOBIAS
A1-104	5408-14 14	MIGUEL & RAQUEL MENDOZA
A1-106	5408-4 809	L.A. COUNTY
A1-107	5408-4 804	L.A. COUNTY
A1-108		CITY OF L.A.
A1-109	SANTA ANA FWY	STATE OF CALIFORNIA
A1-122	5161-4 901	L.A. COUNTY
A1-110	SPRING STREET	CITY OF L.A.
A1-111	JUSTICIA STREET	CITY OF L.A.

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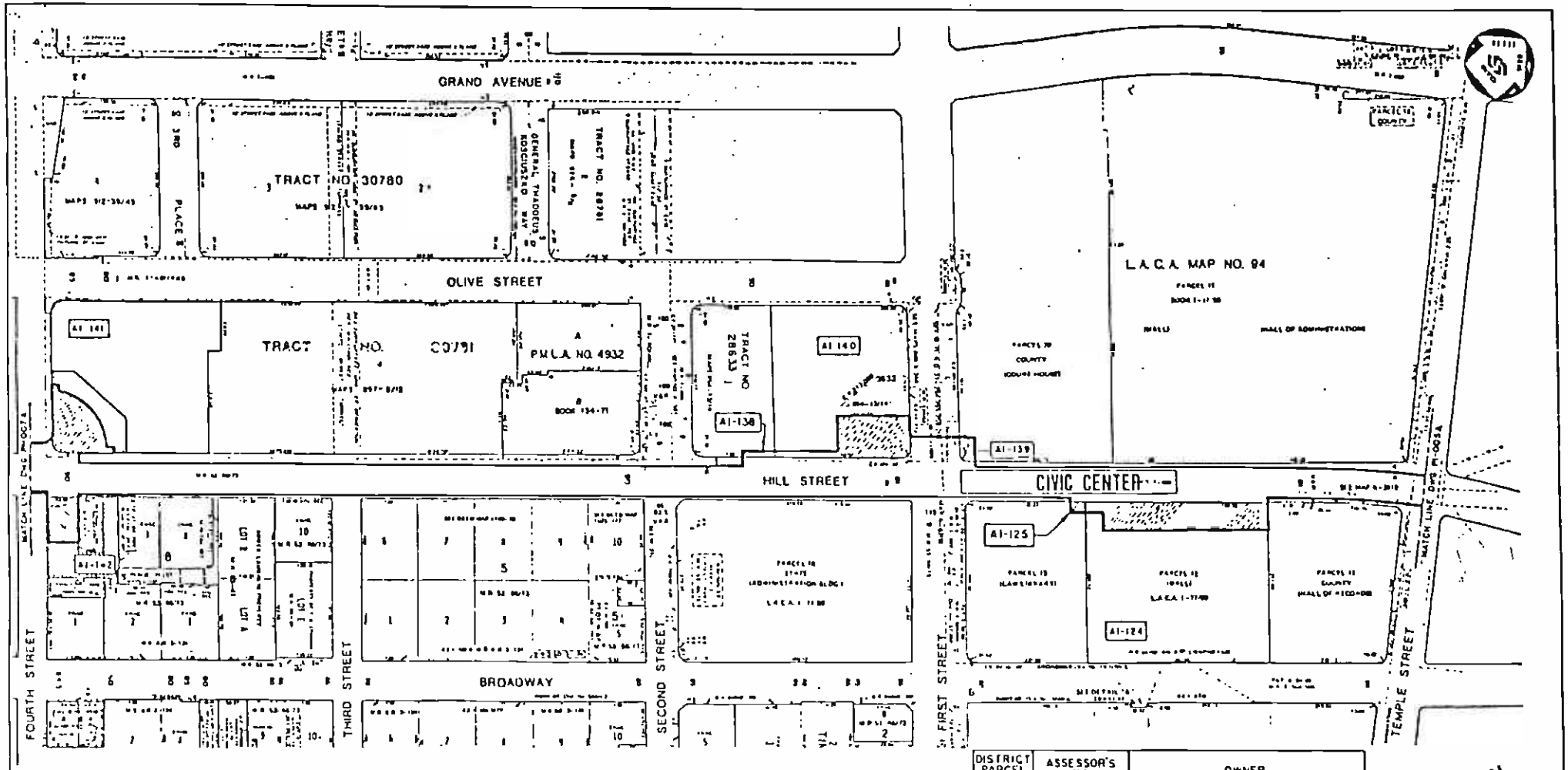
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

CBD TO NORTH HOLLYWOOD LINE
PROPERTY IDENTIFICATION

A 140



DISTRICT PARCEL NO	ASSESSOR'S NO		OWNER
A1-124	5181-5	911	BD OF RETIREMENT OF THE RETIREE
A1-140	5149-1	906	L.A. COUNTY
A1-141	5149-10	920	COMMUNITY REDEVELOPMENT AGENCY
A1-142	5149-15	1,2,4	SYSTEM AUTO PARKS INC & PHILIP DULLEN
A1-138	5149-3	9	TIMES MIRROR CO.
A1-139	5149-4	906	L.A. COUNTY
A1-125	5181-6	911	L.A. COUNTY

AUG 14 1984

LEGEND

PERMANENT AREA

SUBSURFACE EASEMENT

CONSTRUCTION EASEMENT

A1-273 PARCEL IDENTIFICATION

LINE OF RIGHT-OF-WAY

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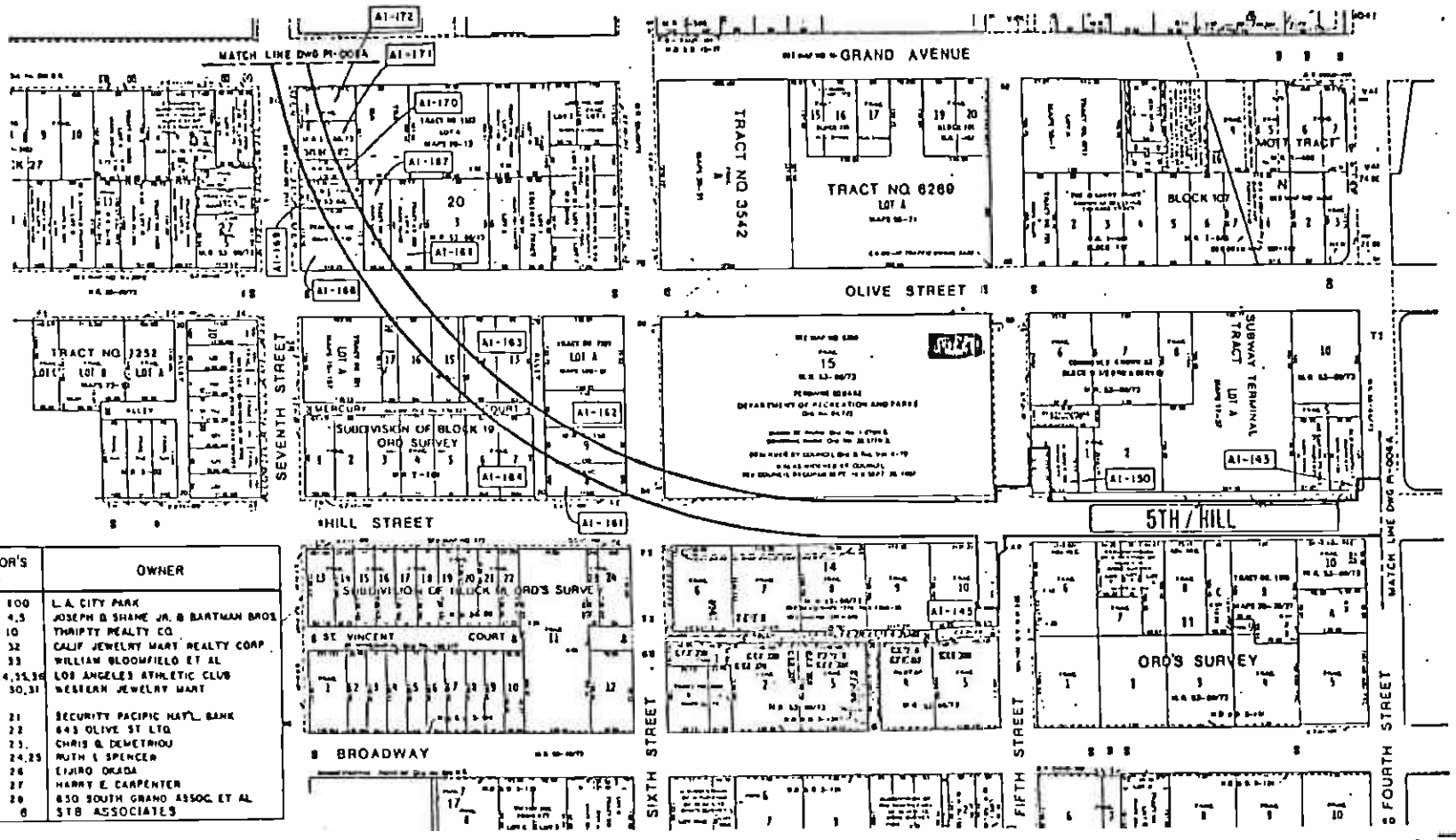
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

CBD TO NORTH HOLLYWOOD



DISTRICT PARCEL NO	ASSESSOR'S NO.	OWNER
A1-144	5149-3 100	L.A. CITY PARK
A1-145	5149-32 4,5	JOSEPH D SHANE JR. & BARTMAN BROS
A1-150	5149-28 10	THRIFTY REALTY CO.
A1-161	5144-3 32	CALIF JEWELRY MART REALTY CORP.
A1-162	5144-3 33	WILLIAM BLOOMFIELD ET AL
A1-163	5144-3 34,35,36	LOS ANGELES ATHLETIC CLUB
A1-164	5144-3 30,31	WESTERN JEWELRY MART
A1-165	5144-4 21	SECURITY PACIFIC NAT'L BANK
A1-167	5144-4 22	643 OLIVE ST LTD.
A1-168	5144-4 23	CHRIS G. DEMETRIOU
A1-169	5144-4 24,25	RUTH E SPENCER
A1-170	5144-4 26	EIJIRO OKADA
A1-171	5144-4 27	HARRY E. CARPENTER
A1-172	5144-4 28	650 SOUTH GRAND ASSOC. ET AL
A1-143	5149-27 6	STB ASSOCIATES

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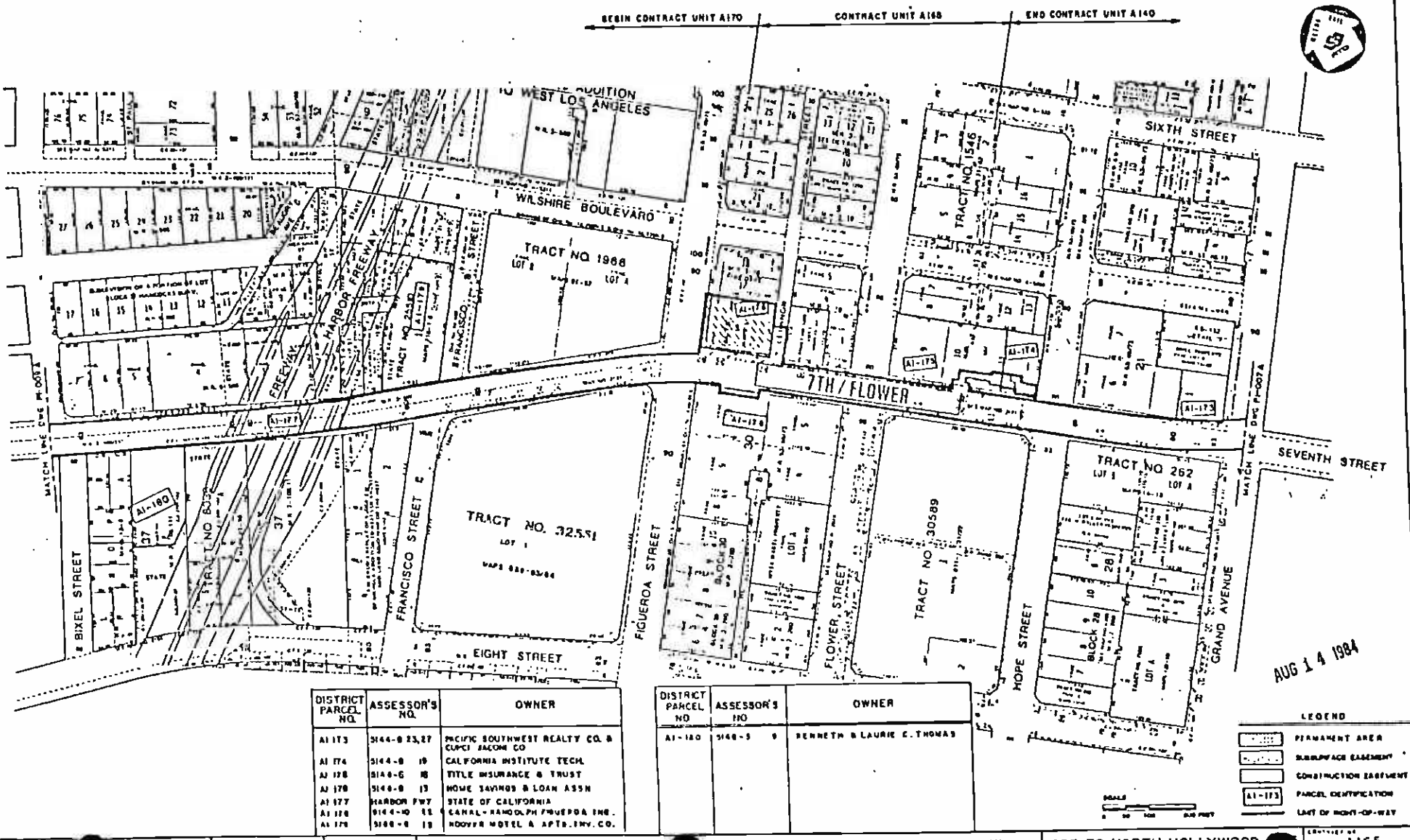
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

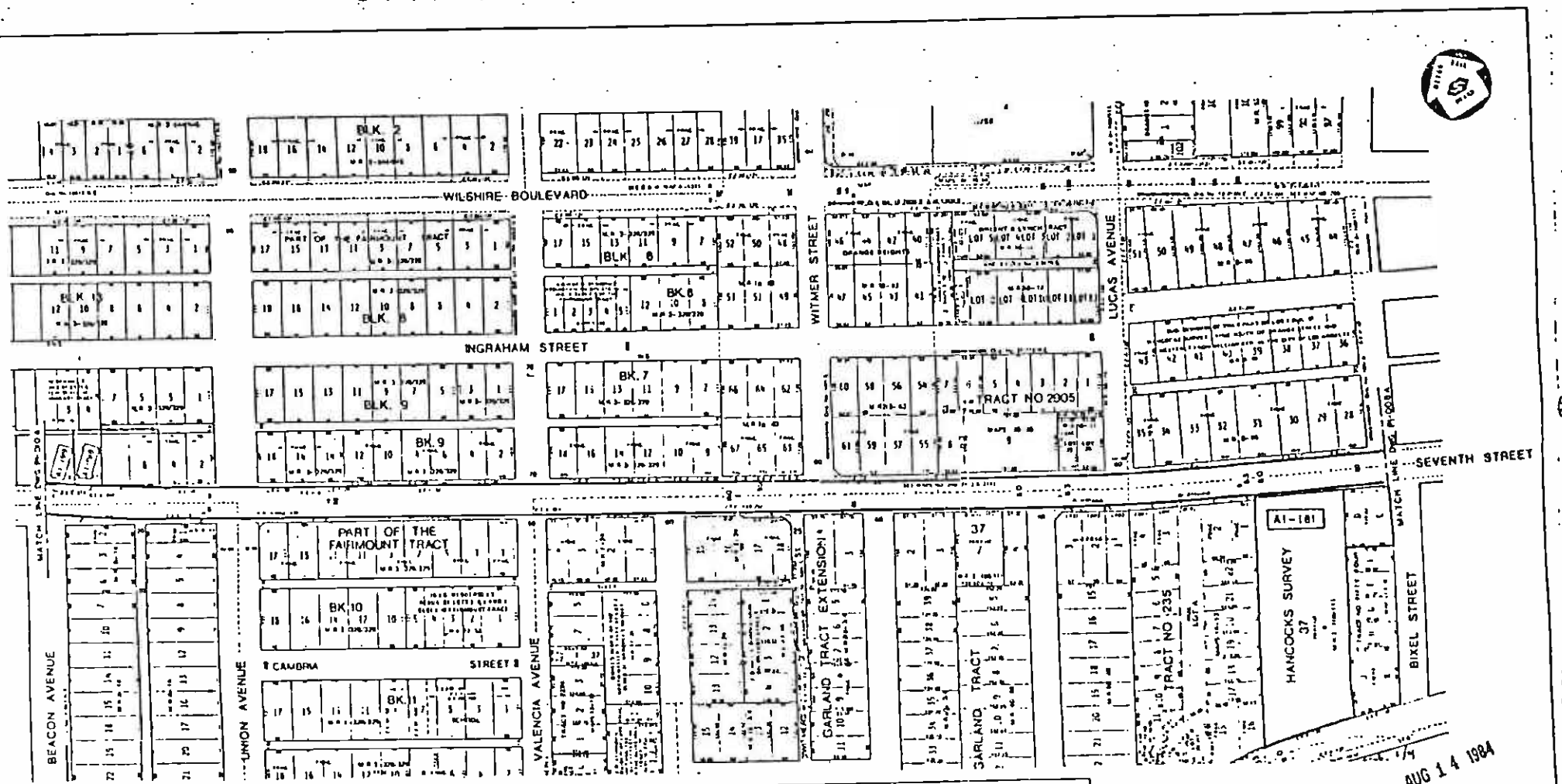
CBD TO NORTH HOLLYWOOD

A 140



DISTRICT PARCEL NO.	ASSESSOR'S NO.	OWNER
A1-173	5144-8 23,27	PACIFIC SOUTHWEST REALTY CO. & CUPCI JACONI CO
A1-174	5144-8 19	CALIFORNIA INSTITUTE TECH.
A1-175	5144-6 18	TITLE INSURANCE & TRUST
A1-176	5144-8 13	HOME SAVINGS & LOAN ASSN
A1-177	HARBOR FWY	STATE OF CALIFORNIA
A1-178	5144-10 11	CANAL-RANDOLPH PUEBLO INC.
A1-179	5166-6 13	HOOVER MOTEL & APTS. INV. CO.

DISTRICT PARCEL NO	ASSESSOR'S NO	OWNER
A1-180	5148-5 9	KENNETH & LAURIE E. THOMAS



DISTRICT PARCEL NO.	ASSESSOR'S NO.	OWNER
A1-198	5142-13 6	DAVID & PATCHARRA BEMO
A1-199	5142-13 7	JERRY STEVENSON & DEAN NELSON
A1-191	5143-6-7	THOMAS INVESTMENTS

LEGEND
PERMANENT AREA
SUBSURFACE EASEMENT
CONSTRUCTION EASEMENT
A1-275 PARCEL IDENTIFICATION
LIMIT OF RIGHT-OF-WAY

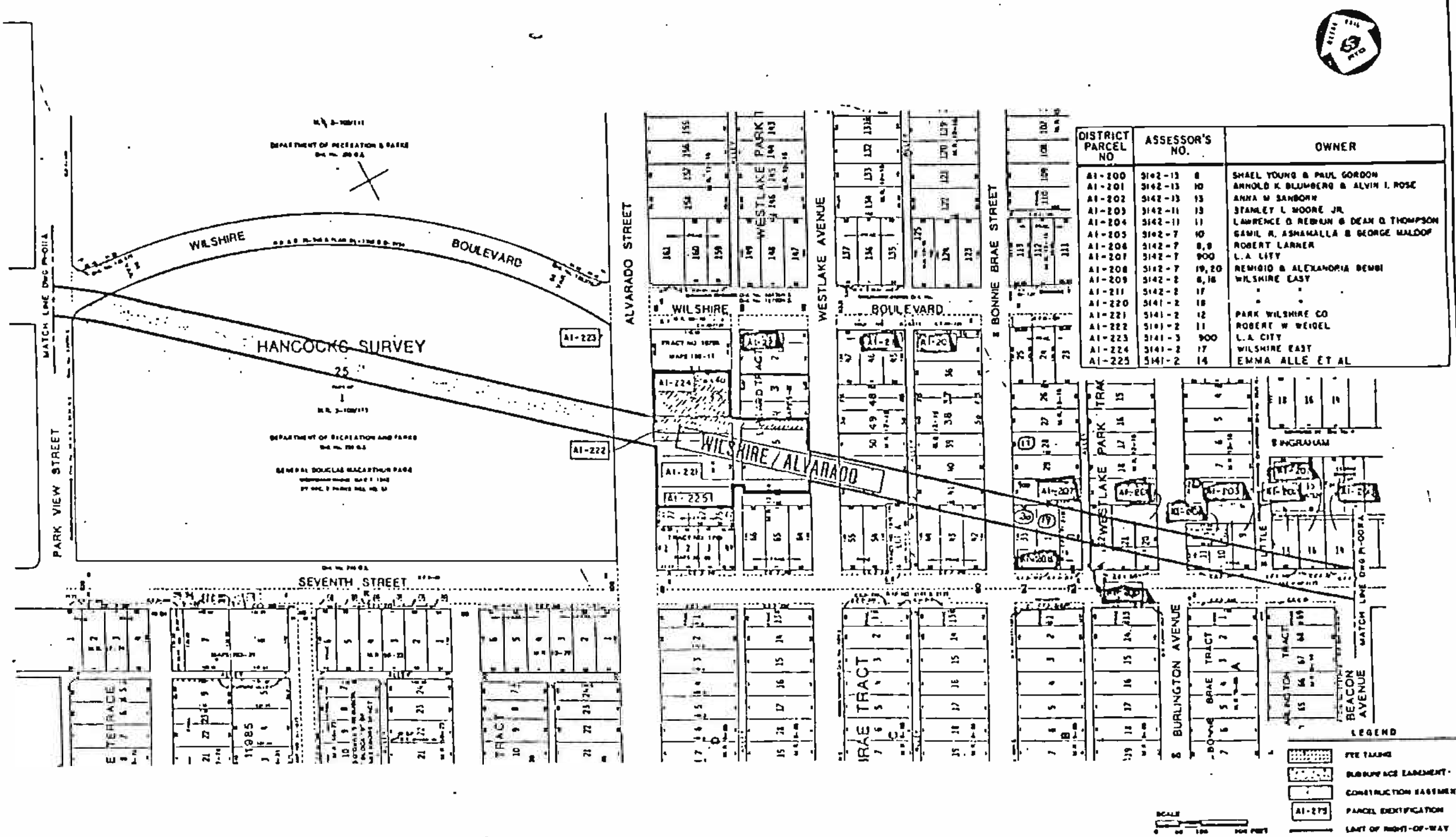
SCALE

DRAWN PROD

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

CBD TO NORTH HOLLYWOOD LINE

A 170



DISTRICT PARCEL NO	ASSESSOR'S NO.		OWNER
A1-200	5142-13	8	SHAEL YOUNG & PAUL GORDON
A1-201	5142-13	10	ARNOLD K BLUMBERG & ALVIN I. ROSE
A1-202	5142-13	13	ANNA M SANBORN
A1-203	5142-11	13	STANLEY L MOORE JR.
A1-204	5142-11	11	LAWRENCE O REBHUN & DEAN O THOMPSON
A1-205	5142-7	10	GAMIL R. ASHAMALLA & GEORGE MALOOF
A1-206	5142-7	8,9	ROBERT LARNER
A1-207	5142-7	900	L.A CITY
A1-208	5142-7	19, 20	REMIGIO & ALEXANDRIA BEMBI
A1-209	5142-2	8, 16	WILSHIRE EAST
A1-211	5142-2	17	" "
A1-220	5141-2	18	" "
A1-221	5141-2	12	PARK WILSHIRE CO
A1-222	5141-2	11	ROBERT W WEIDEL
A1-223	5141-3	900	L.A CITY
A1-224	5141-2	17	WILSHIRE EAST
A1-225	5141-2	14	EMMA ALLE ET AL

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SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

CBD TO NORTH HOLLYWOOD LINE

A 170