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*REVIEW  
OF THE*

## PRELIMINARY CONSTRUCTION COST ESTIMATE

*FOR*

SOUTHERN CALIFORNIA  
RAPID TRANSIT DISTRICT  
METRO RAIL STARTER LINE

25 MARCH 1983

**THE RALPH M. PARSONS COMPANY**

*Worldwide Engineers/Constructors*

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April 1, 1983

Southern California Rapid Transit District  
124 West 4th Street  
Los Angeles, California

ATTENTION of Mr. J. Crawley

SUBJECT Check Estimate of Fixed Facilities for  
the Metro Rail Project

REFERENCE Job 6363-1

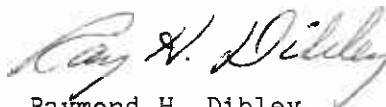
Gentlemen:

Enclosed is our draft report which presents a check estimate for the Metro Rail Project. This report includes a re-estimate of the twin tunnel construction costs as well as an analysis of variances in the stations and other areas. We have presented our findings on possible means to reduce costs in a section on Value Engineering. In addition, we developed data on the use of the various construction crafts on the project. The report is a draft. We would appreciate your comments so that we can issue the report in its final form.

We appreciate this opportunity to support the SCRTD on this important project and look forward to a continuing relationship with the District.

Very truly yours,

THE RALPH M. PARSONS COMPANY



Raymond H. Dibley  
Project Manager

RHD:ja  
Enclosure  
As noted





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## INTRODUCTION

The Southern California Rapid Transit District (SCRTD) has initiated work on the Metro Rail Project. It is a major effort that comprises an 18-1/2-mile rapid transit system that includes 15 miles of tunnel plus 16 stations, crossovers, and pocket track, in cut-and-cover construction. The system will start near Union Station; pass through downtown Los Angeles under Hill Street; proceed west under 7th Street and Wilshire Boulevard, north under Fairfax Avenue, and east under Sunset Boulevard; pass through the Santa Monica Mountains; and terminate at the Lankershim Boulevard/Chandler Boulevard Station in North Hollywood.

At the present time preliminary engineering for the project is in the conceptual stage. Construction plans and supporting pre-preliminary cost estimates have been prepared. SCRTD has determined that it is in the best interest of the project to have the current plans and preliminary estimates reviewed objectively to ensure that:

- The plans reflect the optimum in terms of efficiency, safety, and current construction methods.
- A reliable check estimate is made, structured so that the conceptual cost estimate can be verified.

The Ralph M. Parsons Company has reviewed the current construction planning. Comments on the constructibility of the project as planned have been prepared, along with considerations for changes that would help to incorporate the experience of the review team in the identification of state-of-the-art elements for project execution, economy of resources, system reliability, and safety. Concurrently, the existing preliminary cost estimate was reviewed, and a revised summary of cost was prepared, with backup detail supporting suggested changes.

The personnel who performed the review were thoroughly experienced in tunnel, underground rapid transit system, and passenger station construction. Engineers and estimators who have prepared detailed estimates for this type of construction project, and a fully qualified value management specialist, were participants. They examined the proposed route and reviewed each station area for location, congestion, and potential construction problems. Key personnel who reviewed the estimate have had recent relevant experience in tunneling projects, and both are familiar with local soil, rock, and fault conditions.

The proposed routing and the project schedule are shown on the following pages.



# Southern California Rapid Transit District Metro Rail Project

## DESIGN UNITS

### PHASE 1

- A100 - CENTRAL YARD & SHOPS, INCLUDING YARD LEAD TRACK FROM UNION STATION
- A135 - UNION STATION
- A140 - TUNNEL SEGMENT BETWEEN UNION STATION & 7TH / FLOWER STATION, INCLUDING CIVIC CENTER & 5TH / HILL STATIONS
- A165 - 7TH / FLOWER STATION
- A170 - TUNNEL SEGMENT FROM 7TH / FLOWER TO WILSHIRE / VERMONT, INCLUDING THE STATION AT WILSHIRE / ALVARADO
- A195 - WILSHIRE / VERMONT STATION

### PHASE 2

- A220 - TUNNEL SEGMENT BETWEEN WILSHIRE / VERMONT & WILSHIRE / LA BREA, INCLUDING THE WILSHIRE / NORMANDIE & WILSHIRE / WESTERN STATIONS
- A245 - WILSHIRE / LA BREA STATION AND POCKET TRACK
- A250 - TUNNEL SEGMENT FROM WILSHIRE / LA BREA TO FAIRFAX / BEVERLY, INCLUDING THE WILSHIRE / FAIRFAX STATION
- A275 - FAIRFAX / BEVERLY STATION
- A310 - TUNNEL SEGMENT FROM FAIRFAX / BEVERLY TO HOLLYWOOD / CAHUENGA, INCLUDING THE FAIRFAX / SANTA MONICA & LA BREA / SUNSET STATIONS
- A350 - HOLLYWOOD / CAHUENGA STATION AND POCKET TRACK
- A410 - TUNNEL SEGMENT FROM HOLLYWOOD / CAHUENGA TO UNIVERSAL CITY STATION
- A425 - UNIVERSAL CITY STATION
- A430 - TUNNEL SEGMENT BETWEEN UNIVERSAL CITY STATION & NORTH HOLLYWOOD STATION
- A445 - NORTH HOLLYWOOD STATION & END LINE STORAGE TRACK

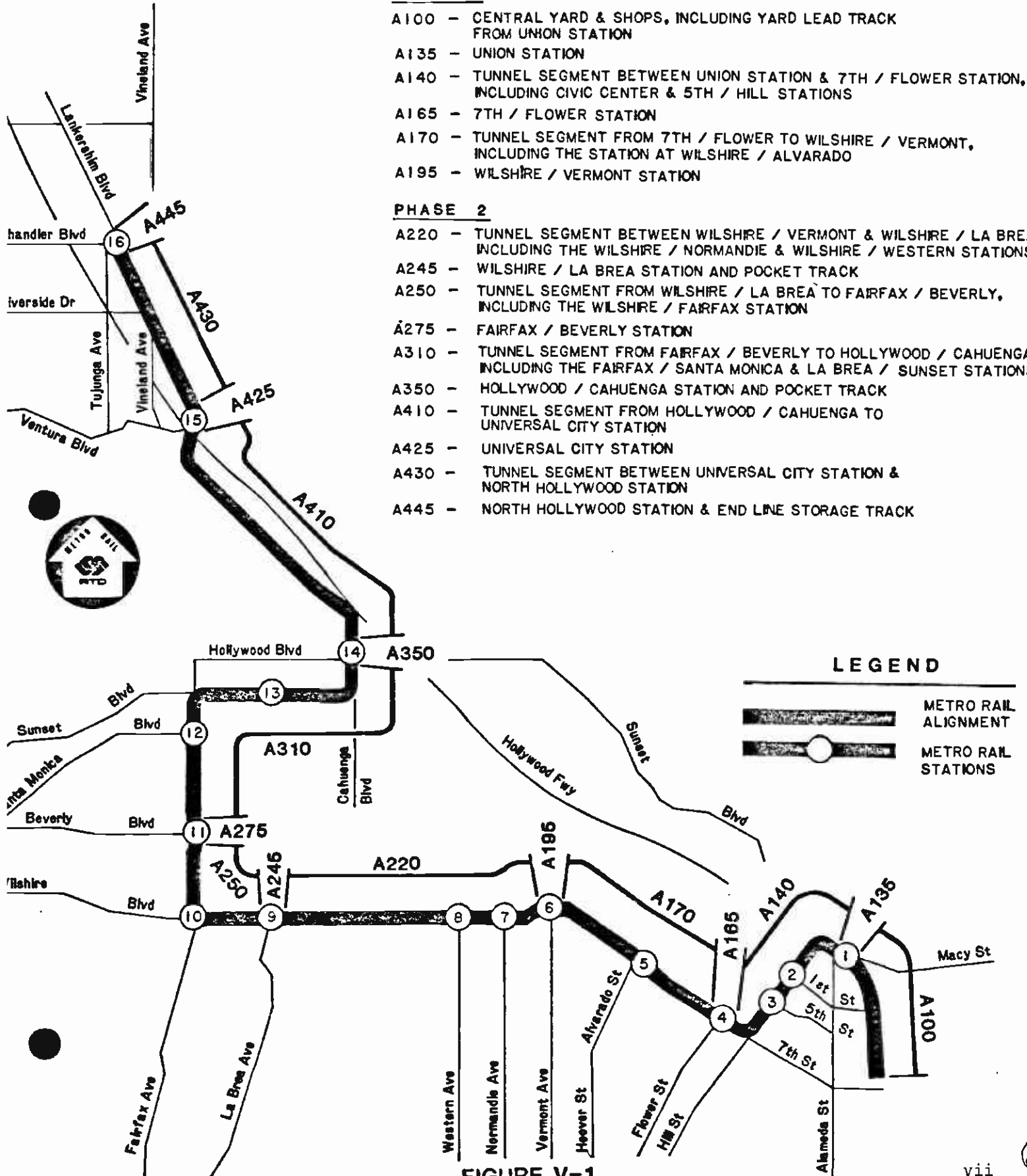
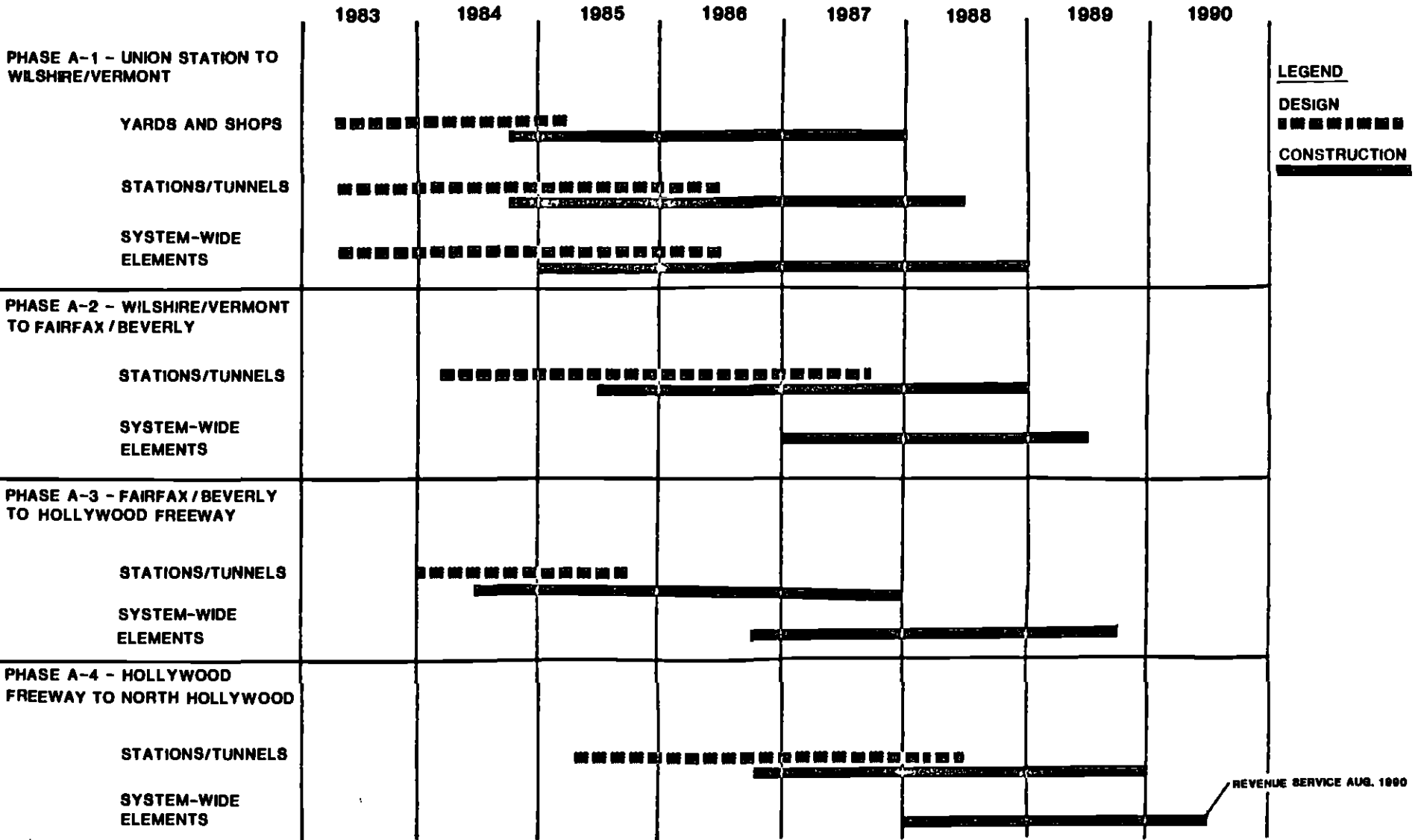


FIGURE V-1

# METRO RAIL PROJECT-IMPLEMENTATION SCHEDULE (NORMAL)



**LEGEND**  
 DESIGN  
 CONSTRUCTION

REVENUE SERVICE AUG. 1990

FIGURE V-2

TITV  
4





SECTION 1  
SCOPE OF WORK

Parsons has reviewed and incorporated suggested changes to the pre-preliminary cost estimates developed by the District's General Engineering Consultant. The effort was limited to construction of the tunnel, the cut-and-cover portion of the line, yards and shops, and stations. The services included were:

- (1) Review of cost, quantity, and manpower estimates.
- (2) Review of contractor's overhead and profit allocations in the estimates.
- (3) Verification that the cost estimates support the required levels of safety, environmental, and quality assurance considerations.
- (4) Identification and resolution of any discrepancies in cost estimates.
- (5) Evaluation of basic constructibility assumptions inherent in the cost estimates.
- (6) Preparation of a written report documenting findings.



SECTION 2

ESTIMATE REVIEW SUMMARY

The Scope of Services To Be Performed as outlined in Section 1 for the estimate review of the major civil and structural elements of SCRTD's Metro Rail Project was performed as follows:

- (1) Quantities were checked and comparisons were made among similar structures.
- (2) Cost data were reviewed and unit prices were checked against reliable published data sources. Labor crews, equipment production, and materials were evaluated to estimate costs for special work.
- (3) Labor and skill estimates were reviewed by using manloaded unit costs to validate manpower requirements.
- (4) Contractor overhead and profit markup was reviewed for the type of construction to be performed. Safety, environmental, and quality assurance were considered to assure that they were incorporated into estimates.
- (5) Discrepancies in the cost estimate were identified and revised costs were developed to reflect corrections.

Table 2-1 is a summary of the results of the estimate review. The basic documents used in the estimate review were:

- (1) SCRTD Metro Rail Project - Summary FIS - Capital Cost Estimate in constant (Fall of 1982) dollars.

Table 2-1 - Summary of Costs

	SCRTD <u>2 January 83</u>	Parsons <u>25 March 83</u>	Difference <u>(+ or -)</u>	
1.0	<u>GUIDEWAYS</u>			
1.1	\$ 1,200,000	\$ 1,200,000	\$ -0-	
1.2	8,300,000	41,925,000	33,625,000	
1.3	384,200,000	590,975,000	206,775,000	
1.4	24,900,000	56,250,000	31,350,000	
1.5	35,500,000	80,500,000	45,000,000	
1.6	2,800,000	3,065,000	265,000	
1.7	8,100,000	9,390,000	1,290,000	
1.8	10,400,000	14,000,000	3,600,000	
1.9	2,200,000	2,410,000	210,000	
1.10	2,800,000	2,800,000	-0-	
1.11	<u>23,400,000</u>	<u>23,400,000</u>	<u>-0-</u>	
	Subtotal	\$503,800,000	\$825,915,000	\$322,115,000
2.0	<u>STATIONS</u>			
2.1	\$361,300,000*	\$475,279,000	\$113,979,000	
2.2	22,300,000	24,415,000	2,115,000	
2.3	10,400,000	11,386,000	986,000	
2.4	18,300,000	-0-	-18,300,000	
	<u>18,600,000*</u>	<u>-0-</u>	<u>-18,600,000</u>	
	Subtotal	\$430,900,000	\$511,080,000	\$ 80,180,000
3.0	<u>PARKING</u>			
3.1	\$ 400,000	\$ 400,000	-0-	
3.2	43,800,000**	20,000,000	-23,800,000	
	Subtotal	\$ 44,200,000	\$ 20,400,000	\$-23,800,000
4.0	<u>TRACK WORK</u>			
4.1	\$ 15,800,000	\$ -	\$ -	
4.2	<u>46,500,000</u>	<u>-</u>	<u>-</u>	
	Subtotal	\$ 62,300,000	\$ 62,300,000	-0-
5.0	<u>YARDS AND SHOPS</u>			
5.1	Demolition			
5.2	Site Preparation			
5.4	Structural			
5.6	Yard Lighting			
5.7	Main Shop Building			
5.8	M of W Building	\$ 46,200,000	\$ 46,200,000	-0-
5.9	Transportation Building			
5.10	Car Cleaners Building			

\*Parking structure deleted from stations

\*\*Includes unidentified parking structure

Table 2-1 - Summary of Costs (Contd)

	<u>SCRTD</u> <u>2 January 83</u>	<u>Parsons</u> <u>25 March 83</u>	<u>Difference</u> <u>(+ or -)</u>
5.0 <u>YARDS AND SHOPS (Contd)</u>			
5.11 Test Building			
5.12 Ext. Car Wash			
5.13 Traction Power Building			
5.14 Fixed Equipment			
5.15 Yard Vehicles			
5.16 Tail Track	<u>23,500,000</u>	<u>28,440,000</u>	<u>4,940,000</u>
Subtotal	<u>\$ 69,700,000</u>	<u>\$ 74,640,000</u>	<u>\$ 4,940,000</u>
	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>TOTAL COST</u>	<u>\$1,110,900,000</u>	<u>\$1,494,335,000</u>	<u>\$383,435,000</u>
	<u>=====</u>	<u>=====</u>	<u>=====</u>

- (2) SCRTD Metro Rail Project - Detailed Cost Estimate - backup data.
- (3) Milestone 3, Route Alignment Alternatives, Recommended Alignment, Plan and Profile Drawings.
- (4) Metro Rail Starter Line Schematic Diagram.
- (5) Geotechnical Investigation Report.
- (6) Station Footprint Drawings, 8-1/2 x 11, Weese, 1982.
- (7) Drawings of Western Station.
- (8) Functional Plan - Yards and Shops.
- (9) Project Schedules.
- (10) Proposed Tunnel Liners Drawings.
- (11) Proposed Cross Passage Drawings.

The review began with the review team's familiarization study of the estimate. They identified the source of costs posted on the summary sheet and at the same time identified the scope of work included in the items of work. Comparison tabulations of quantities and costs of major work elements were made to determine if any one station, structure, etc., was excessive on a per-linear-foot, or other common unit, basis.

Where significant variations were noted, individual items were examined to determine whether there was a logical explanation for the difference. In conducting the comparison studies, the quantities for the major items of work were checked and the unit prices were analyzed.

In conjunction with these activities, Parsons performed a manpower requirement study. Where construction crews were given, such as in the estimate backup for

the tunnel portion, manpower was verified by the classifications that are needed to perform the work. Where costs only were given, detailed unit prices were recomputed, or broken down, to determine the number of personnel that are needed in each classification, together with activity durations for total mandays.

In Section 6 of this report, a tabulation and backup are provided to show the estimated total mandays or manyears of labor, by craft, that are required to construct the major civil and structural elements of the Metro Rail Project.

## 2.1 STATIONS

Our review of the station cost estimates found that there were some major unidentified differences in quantities and costs of some stations. For example, the concrete quantity for the Fairfax/Beverly Station seemed extremely low compared to similar stations, while the Union Station concrete quantities seemed high. The 1st/Hill, 5th/Hill, and Wilshire/Fairfax Stations were analyzed separately because they are larger, over-under or two-level structures. Further review of total costs of individual stations disclosed additional major differences. It was found that the Fairfax/Beverly and Universal City Stations included the costs of parking structures, which were not included in other stations. Initially, it appeared that the Universal City Station was very expensive compared to the other stations. When the parking structure cost was separated from the Universal City Station, the cost seemed reasonable. When the Fairfax/Beverly Station parking structure cost was separated, the station cost appeared low.

The study also indicated lower-than-average costs for the Alvarado, Vermont, and Normandie Stations. A detailed review of these station costs indicated a reduction in cost had been made for a reduction in depth. The reduction in cost was computed in the original estimate at \$460,000/vert ft. Upon investigation, we concluded that the reduction was excessive. In our judgment, only machine and hand excavation, compacted backfill, spoil disposal, soldier piles, and lagging would be significantly affected by the change in structure depth. The \$460,000/vert ft reduction had also been applied to the 1st/Hill and the 5th/Hill Stations. Our revised evaluation of the cost reduction amount for a change in depth is estimated to be an average of \$100,000/vert ft/station, a significant difference from the given estimate.

#### 2.1.1 DEMOLITION

There were no major questions that arose in the review of the demolition section of the estimate.

#### 2.1.2 EARTHWORK

In the earthwork section, the team took exception to the estimate for machine excavation. We determined that the \$3.30/cu yd unit cost does not appear to reflect the added costs of hoisting material from below grade, interference with utilities, shoring struts, and concurrent installation of lagging. Our experience indicates that there will be interferences and disruptions at street level that will affect the excavation costs, which could include removal and replacement of decking and other provisions for traffic. Therefore, the revised estimated cost for machine excavation is \$6.00/cu yd. The estimates for hand excavation costs appear to be adequate.



### 2.1.3 DISPOSAL OF EXCESS SOIL

The team addressed the cost for disposal of the excess soil. A unit cost of \$6.00/cu yd loose seems adequate. However, the check of the quantity to be disposed of appears low. The swell factor is acceptable. The SCRTD estimate indicates a total of approximately 1,550,000 cu yd of excess disposal. This appears to assume that approximately 500,000 cu yd of material will not need to be hauled away from the work sites; presumably, it may be used for backfill. It is our judgment that all material, approximately 2,005,000 cu yd from the open cuts, will have to be hauled away since there appear to be no onsite storage areas. At a later date, either the material will be reloaded or new material will be purchased and hauled to the site for backfill.

### 2.1.4 SOLDIER PILES, LAGGING, AND DECKING

The soldier pile, lagging, and decking quantities and costs appear to be reasonable and acceptable for the preliminary estimate.

### 2.1.5 CONCRETE WORK

The review of the concrete work appears to reflect basic "Means" unit costs for standard construction at ground level. It appears that there was no adjustment made for the Los Angeles area. It was also noted that the estimated costs do not allow for support facilities, crews, and equipment required for handling materials and supplies below grade, and the standby time normally encountered with this type of construction. Moreover, the station construction will generally be performed in restricted work areas. This will require staging areas located at some distance from the work site with redundant crews, and transportation from the staging areas to the stations.

#### 2.1.6 TRAFFIC MAINTENANCE

Our review indicates that the estimate provided for traffic maintenance at the station areas is also low. Generally it provides only chain-link fencing, plus an allowance for miscellaneous items. Adequate allowance should be provided for flagmen, barricades, signal lighting, traffic lane marking and control, lighting, crosswalks, maintenance of safety lanes for emergency vehicles, guard service, weekend maintenance, and pumping, to maintain traffic flow.

#### 2.1.7 OVERHEAD AND PROFIT

In reviewing the SCRTD estimate's overhead and profit factors, it is noted that 10% overhead, 1% bond, and 5% profit, as used, reflect building-type construction in which many of the safety, environmental, and quality assurance considerations, including insurance premiums, are not as great as those associated with underground heavy construction. Moreover, the risks to the general contractor are greater in underground work, as compared to aboveground building where much of the work is subcontracted.

The 10%, 1%, and 5% figures might have been realized in fall 1982 bidding, but we question whether the District should base their planning on a period when prices are severely depressed. If the economy picks up, as it appears to be doing in late March 1983, more normal overhead and profit allowances should be predicted.

As a result, the factors that we have used for overhead have been increased to 15% and risk or profit to 10%, resulting in a total markup of 26.5% on the direct costs.

2.1.8 STATION ESTIMATE ADJUSTMENTS

As a result of the station estimate review, the following adjustments were made:

(1) Machine excavation costs increased \$3.30 to \$6.00/cu yd. Total volume of spoil disposal increased from approximately 1,550,000 to 2,005,000 cu yd	\$ 7,062,000
Total Addition	
(2) Area labor factor adjustment	4,058,000
(3) Additional handling, etc.	2,560,000
(4) Adjustments to labor in restricted areas	6,520,000
(5) Contingency for unforeseen construction difficulties	22,011,000
(6) Traffic maintenance and control	10,879,000
(7) Correction to reduction for depth of stations including overhead and profit, \$3,072,000 vs. \$14,260,000	11,188,000
(8) Overhead and profit at 15% and 10%, 26.5% vs. SCRTD 15.5%	36,976,000
Total station shell increase	101,254,000
(9) Overhead and profit on station finish at 15% and 10%, 26.5% vs. SCRTD 15.5%	\$ 12,725,000
Total station increase	\$113,979,000

2.2 GUIDEWAYS

The review of the guideway estimate was made in two parts: the dual-track twin-tube tunnels and all other work.

2.2.1 DUAL TRACK AT GRADE

The dual track at grade was not clearly defined and, since it was a small item, was accepted without further study.

2.2.2 CROSSOVERS, POCKET TRACK, AND CUT-AND-COVER ITEMS

A detailed study was made of the crossovers, pocket track, and cut-and-cover items. It was noted that a unit price of \$4,930/lin ft was used for the cut-and-cover section and \$11,000/lin ft for both the pocket track and crossovers. We did not find any detail backup supporting the unit costs. However, in the previous study that had been completed on the stations, a detailed breakdown of costs had been developed for the following major items of work on a per-linear-ft basis, which we utilized as appropriate:

- |                       |                               |
|-----------------------|-------------------------------|
| ● Site restoration    | ● Demolition                  |
| ● Traffic maintenance | ● Machine and hand excavation |
| ● Utilities support   | ● Soldier pile and lagging    |
| ● Mobilization        | ● Decking                     |
| ● Underpinning        | ● Concrete (forms, etc.)      |

The total unit costs for all of the above, based on 10,618 lin ft of station construction at a direct-cost level, amounted to approximately \$20,000/lin ft.

For our analysis, we determined that the work associated with the dual track, cut and cover, pocket track, crossovers, and tail track would be related to and would be much the same as for stations, and that all the above work items would be required. We recognized that the only significant difference in cost between

stations and the guideway items would probably be in concrete work, where the cut-and-cover sections may not have platforms, rooms, entryways, and detail finish. The other items of work and cost would be similar to those for stations.

To estimate the cost of the crossovers, pocket track, and cut-and-cover items we applied unit costs from the aforementioned station studies to the individual elements. With 26.5% overhead and profit, our estimated unit cost is \$25,000/lin ft for the cut-and-cover items.

### 2.2.3 VENT STRUCTURES AND SHAFTS

Vent structures in the city were reviewed, using the SCRTD estimates, in a manner similar to the cut-and-cover study. Adjustments in costs were made for machine excavation, spoil disposal, and overhead and profit.

For the vent shafts in the mountains, it was determined that the estimate was for a raise-drilled shaft, and a unit cost for drilling had been developed. We found that the units for earthwork and drilling had not been extended, and that the resulting cost of the shaft excavation was not included in the SCRTD estimate.

Our estimate of raise-drilling was then developed, based on the following four-step operation:

- (1) Pilot hole @ 10 ft/hr
- (2) First slash cut @ 4 ft/hr
- (3) Second slash cut @ 3 ft/hr
- (4) Third slash cut @ 2 ft/hr

A total of 75 work shifts was estimated for the shaft excavation with a 12-man drilling and support crew. Drill rig rental and operation costs were estimated at \$720/hr, cutter costs at \$20/cu yd. These items, together with normal support equipment, indicated that the SCRTD estimated costs per linear foot were adequate or reasonable.

The SCRTD estimate was adjusted to incorporate the omissions. Noting that shaft drilling is a high-risk operation, a 15% overhead factor was added, plus 1% for bond and 17% for risk and profit. The 17% factor reflects a 30% factor on labor.

#### 2.2.4 OTHER GUIDEWAY ITEMS

The remaining items in the guideway section, except the dual-track twin-tube tunnel noted below, were accepted as estimated by SCRTD at direct cost; however, a 26.5% overhead and profit factor was included.

#### 2.2.5 DUAL-TRACK TWIN-TUBE TUNNEL

We reestimated the construction cost of the twin-tube tunnel. Our estimate was based upon normal competitive conditions, with labor and material costs that existed in the fall of 1982. It further considered demonstrated performance with tunnel boring machines (TBMs) rather than optimistic projections of substantial improvements. Following this estimate, which we consider most likely, we discuss the impact on costs of possible higher advance rates, construction methods that deviate from earlier methods but that might be used by contractors to cut their costs, and lower overhead and profit margins.

The analysis we made of tunnel driving progress confirmed the SCRTD rate of 25 ft/day in alluvium and up to 40 ft/day in the Fernando Formations and rock. A

detailed analysis of the tunneling cycle is included in Section 5. Analysis of the tunnel driving manpower was then performed. This led to a determination that 72 men/day (30 on day shift, and 21 men each on swing and graveyard shifts) would be required at the portal for support and service to the TBM driving. The heading crew for each TBM was estimated at 11 men per heading per shift for a total of 66 men/day. A transportation (underground muck handling) crew for an average of two trains per heading, per shift, was determined for a total of 24 men/day in two tunnels. A bull gang of 9 men/day per heading was estimated to be required for handling utilities and associated work, for a total of 18 men. The crew thus developed totaled 180 men/day, the same number as was used in the SCRTD estimate.

Once production rates and crew size were validated, the number of questionable areas was reduced. A difference in tunnel driving time was found in Reach 2 and Reach 8, where there are over-under stations. Our analysis showed that since concurrent headings would occur, tunnel driving times through the areas of the 1st/Hill, 5th/Hill, and Wilshire/Fairfax Stations would be greater than the time allowed for skidding through the station. It is our judgment that excavation of the three over-under stations cannot be accomplished conveniently until the tunneling is completed. Therefore, we conclude that the tunnels will have to be driven through the stations.

#### A. Construction Plant

The construction plant and the TBMs were reviewed. The estimated costs for the TBMs and ancillary equipment seem reasonable at this time, particularly since the type of equipment has not been finalized or selected to meet the ground

conditions. A thorough study could not be made of the ground types, so the SCRTD analysis was accepted.

The other tunnel construction plant was then reviewed. Our evaluation indicates the average cost of \$2 million per reach is extremely low. We estimate that costly 25-ton locomotives would be required to operate on and negotiate the maximum 4% grades. There will also be a high cost for ventilation equipment, rails, utility lines, and support equipment. The resultant plant cost for seven reaches exceeded the SCRTD estimate by \$18 million.

B. Consumables

A detailed review was made of consumables, including electric power, fuel, equipment operations, small tools, and TBM cutters. The total far exceeded the SCRTD estimate of \$4,000/week and resulted in an increased cost of \$22 million (see details in Section 5).

C. Precast Tunnel Liners

Our review and estimate for fabricating the concrete tunnel liners indicated costs of \$600/lin ft and \$800/lin ft of tunnel bore would be encountered for the two major types of liners, ungasketed and gasketed. The resultant increase in liner cost is \$34 million.

D. Muck Disposal

The muck disposal unit cost of \$6.00/cu yd in the SCRTD estimate seemed reasonable. However, as we see the necessity of excavating through over-under stations, it imposed an added cost of approximately \$1 million.



#### E. Cross Passages

Estimates were then prepared for excavation and concrete lining of the cross passages. It was assumed that this work would not be performed until the tunnel excavation was complete, to avoid interference. It was determined that crews would be excavating and concreting in two cross passages at a time, thus tying up the tunnels. Removal of segments would be required, and excavation and support of cross passages would be a hand operation requiring liner plate and ribs for support. There were no details given for the SCRTD estimated costs of the cross passages. We estimated that the SCRTD costs were low for the support and services at the portal and for consumables and equipment operation required to perform the cross-passage work. Our estimate therefore indicates an increase of approximately \$20 million in the SCRTD estimate for cross-passage construction.

#### F. Tunnel Finish

We performed a similar review and estimate for tunnel finish. It was based on the assumptions that 1.25 cu yd of concrete per foot of tunnel = 2.5 cu yd and that handrails could be installed at a rate of 200 lin ft of finish per day. The resultant cost of tunnel finish amounted to an increase of \$24 million, a total cost of nearly \$400/lin ft compared to the SCRTD estimate of \$100/lin ft. It is our judgment that just the concrete and handrail purchase cost exceeds \$100/lin ft. We feel that support, services, consumables, and equipment operation costs were too low.

#### G. Steel Liner in Tunnel

The steel liner for gaseous areas was analyzed. The SCRTD quantities, reaches, and production rate were accepted. However, our estimate exceeded the SCRTD

estimate by \$5 million. We suspect this to be a result of support, services, consumables, electric power, and equipment operation costs, as was noted in the estimate for tunnel finishes.

#### H. Tunnel Cleanup

We estimated tunnel cleanup costs, based upon an assumed 500 lin ft of tunnel per day for a total of \$5 million. The SCRTD estimate did not have a cost for this item.

#### I. General Expenses

The review of general expenses was predicated on agreement that supervisory, engineering, accounting, and clerical labor of 30 people per day was required. The SCRTD estimated markup of 15% for both overhead and profit on direct costs for the tunnel in our judgment is not adequate. Our experience indicates that the total contractor overhead, including supervision labor, should be 15%. Insurance, taxes, permits, fees, parking fees, rental of property, and other items will amount to a significant sum. In addition, surveying, ground control monitoring, offsite storage, and staging areas requiring considerable added transportation costs will be needed, and traffic control at the surface around muck handling and material handling areas will result in costly overhead.

From our current and recent experience with contractors, it is estimated that the risk and profit markup will be approximately 17%, based on variable factors ranging from possibly 30% to 35% of labor, down to 5% of plant and equipment.

In view of this reanalysis of the overhead and profit, the increased cost developed for these two items amounts to \$40 million for overhead and \$36 million for risk and profit, for the seven reaches of tunnel.

J. Guideway Cost Summary

Total cost developed for the dual-track tunnel is \$590,975,000, for an average cost of \$7,315/lin ft, as compared to the SCRTD estimate of \$384.0 million or \$4,752/lin ft. The resulting increase is \$206 million. Our estimated cost per foot of tunnel is very similar to the actual cost realized on the Baltimore Rapid Transit subway project.

Tunnel costs, as reestimated, ranged from a low of \$6,228/lin ft for Reach 12 to a high of \$10,509/lin ft for Reach 8.

ADDITIONAL CONSIDERATIONS

While our analysis mentioned above as well as the actual experience of contractors on the Baltimore Rapid Transit project confirmed the 25 and 40 ft/day advance rates, recent experience with TBMs gives some credence to possibly higher rates of advance. While we could not recommend such increases without substantial analysis, we did evaluate the impact on tunnel construction cost if advance rates were to average 40 ft/day in alluvial soil and 60 ft/day in rock. This single factor would reduce the tunnel cost by \$63.9 million and save several months of schedule. Details of this reduction are included in Section 5 of this report.

In our basic estimate, we have assumed that the cross-passage construction, tunnel cleanup, and tunnel finishing operations will be conducted in series. If a contractor were to develop methods to perform these tasks as the tunnel boring progresses, substantial savings could be realized in Service and Support at the portal (again with savings in time as well). Our estimate is that this method could yield savings of \$23 million (\$8.5 million for the cross passages, \$3.0 million for cleanup, \$6.3 million for tunnel finish, and \$5.1 million for general expense). Details of these reductions are included also at the end of Section 5. These savings are enough to justify considerable attention during the design and construction planning effort to allow concurrent operations.

Another item we considered with regard to possible lower bids was the allowance the contractors will make for overhead and risk/profit. The rates we have assumed are consistent with actual bids on WMATA and Baltimore, but may be higher than contractors are presently bidding. Numerous examples are reported where contractors are bidding much tighter on these key controllable factors. For that reason, we computed the impact on total cost if the contractors were to bid at 8% overhead with 50% of labor for risk/profit. This assumption reduces cost another \$27 million. Again, we reiterate that this reduced margin is a condition that may pertain today but did not two years ago and may not two years from now. We do not recommend for or against using lower overhead and risk/profit figures but simply point them out as relevant under today's environment.

The sum of the above potential reductions is \$114 million. If all these savings could be achieved, the total estimated cost for the tunnel construction would be \$477 million. Thus, we would conclude that the sum of bid amounts for the

tunnels, if the work had been bid in late 1982, would be somewhere in the range of \$477 to \$590 million.

In addition to the above, we believe that savings could be made by using steel liner plate or steel-lined precast concrete liners in the gaseous sections of the tunnel. Possibly, modifying the lining in the rock section and eliminating precast liners could also result in lower costs. A more thorough study of the geology must be made to confirm this procedure.

### 2.3 OTHER WORK

Cost elements that were included in other work are:

- Item 3.0 - Parking
- Item 4.0 - Track Work
- Item 5.0 - Yards and Shops

Item 3.0 of the basic SCRTD estimate, Parking, was reviewed, and the costs appeared to be reasonable. The overhead and profit factors were changed to remain consistent with the factors applied to Item 2.0 (Stations) and for comparison purposes, except for parking at grade.

There are unidentified costs for structures in the SCRTD summary amounting to \$26,639,000. We could not obtain the necessary backup for identifications. Therefore, these costs have been excluded in the Parsons comparison estimate.

Parsons estimate review of Item 4.0, Track Work, found the costs reasonable; no adjustments were made.

The comparison review of Item 5.0, Yards and Shops, found the costs reasonable except for the tail track, which Parsons has designated as 5.16.

SCRTD had prepared an estimate for the tail track of 900 lin ft. This estimate was reviewed, and minor changes were made to the earthwork and other areas. It was found that the tail track, except for architectural and mechanical items included, had a unit cost consistent with that for the cut and cover, pocket track, and crossovers. The adjustment to the item increased the cost approximately \$5 million, of which approximately \$1.4 million was due to an error in addition of reinforcing steel and \$0.7 million to earthwork. The remainder was due to the adjustment in overhead and profit.



SECTION 3  
CONSTRUCTIBILITY REVIEW

In conjunction with the preparation of the tunnel estimate, a preliminary Tunnel Construction Logic Schedule has been prepared (see Appendix C). Contract award dates were taken from the SCRTD Project Schedule (Appendix E) for each of the 14 major reaches of the Metro Rail Project.

The major open-cut and tunneling construction operations have been laid out on a time vs. distance or location scale. From this logic schedule it can be seen when work areas will be available and when and where the tunneling contractors will be working. It should be noted that the durations shown are in agreement with the durations used in the SCRTD estimate. Portals or work areas are also in accordance with the SCRTD estimate, and the direction of tunnel driving is as shown in the SCRTD Starter Line Schematic Diagram (Appendix D). Unless some features have detailed data of which we are unaware, our short study indicates that the schedule should be thoroughly reviewed. It is noted that in many instances Stage II station construction awards are scheduled prior to completion of tunneling, which would delay Stage I unless joint occupancy is specified.

A more thorough study of the logic was not permitted due to the limited time for the reviews. Reference is made to possible savings in costs in Section 2, where it is suggested that fabricated-steel gasketed tunnel liner could be used in the areas of gas and/or oil. This substitution appears to reduce the labor requirements and shorten the construction durations for these reaches. In



addition, welding in gaseous areas could possibly be eliminated. If required, a cast-in-place concrete tunnel lining could be installed within the liner. Another option might be steel-faced concrete liners; however, the welding of joints would not be eliminated. No matter which method of prefabricated tunnel liners is used, tapered sections will be required on curves, thus requiring rigid control to avoid construction or erection problems.

The rock section through the mountain should be reviewed to determine the need for precast concrete liners for both temporary and final support. The numerous faults will present problems to a TBM. However, if there appears to be enough competent material to permit use of a gripper-type TBM, it is estimated that the progress could be improved significantly by omitting precast liner installation. If the tunnel then requires a lining, cast-in-place lining could be placed in conjunction with the tunnel finish operation.

Throughout the tunnel, extreme caution will be required to avoid contaminated air or explosions due to gas. Constant monitoring will be required and pilot or feeler holes should be drilled ahead of the excavation to determine both ground conditions and the presence of gas and oil.

Investigations should be made in the area of the Fairfax/Wilshire Station to determine if slurry walls should be used in lieu of standard soldier beams and lagging for shoring. There may be other areas of high groundwater that would benefit by the use of slurry walls, with concrete placed prior to excavation.

While our constructibility review indicated that the schedule is reasonable, it does not have any contingency or "float" time, which could be used if and when unforeseen events occur. The interdependence of all separate contracts invites sympathetic delays in other activities when a casualty or breakdown occurs that affects a critical path activity.

The project's success will depend on adequate monitoring, timely and appropriate responses to problems, and the management organization's ability to act in advance of potential delays and when the unforeseen is encountered.



SECTION 4  
VALUE MANAGEMENT STUDY

4.1 BACKGROUND

During the evaluation of estimates for construction of the Metro Rail Project, key Parsons staff personnel called on their project-related experience to develop a value management approach that would contribute to the following objectives:

- Overall economies
- Reducing the risk of delays
- Minimizing the potential for changes and impacts on interfacing contracts
- Improvement of management control over costs and schedules

At this point in the project, the discipline of value engineering, that is, the traditional review of detailed design for cost reductions or savings, would be premature. Even as the design work progresses from its present conceptual/preliminary stage, a value engineering effort on separate design units could create a degree of complexity and invite delays when differing opinions must be adjudicated before a change is fully acceptable.

Applying the principles of value management to the structure of the project today discloses a number of opportunities that would coincide with the objectives stated above. Drawing from past and recent transportation projects, the staff addressed the most significant problems encountered. They have been translated

into specific recommendations that SCRTD should consider. The implementation of a value engineering program, in the form of contract clauses with incentives for participant contractors as well as SCRTD, would be most beneficial. The value engineering conditions should be formulated in the construction and supporting contractor documents.

#### 4.2 DISCUSSION

Taking the design units, the implementation schedule, and the cost elements into consideration, the key to achieving the objectives lies in the approach taken to avoid the usual problems encountered in this type of project. It goes without saying that the most difficult phase of underground construction is excavation. The Metro Rail Project has large excavations in three categories:

- Hard rock tunneling - more than 16,450 linear feet
- Soft ground - 66,600 linear feet
- Open cut - 16,700 linear feet

The problems arise when the obstacles that are unforeseen by design are encountered during construction. The "unknowns" will cause delay and impact costs. Once alignment is established, the design will be used to estimate progress on a repetitive and continuous basis, so any obstacle that affects the predicted progress rate will probably have an impact on the activities that follow.

To provide for cost or delay avoidance, the authority can provide management decisions. One action to be considered is an early start for tunneling in hard rock or soft ground and, where appropriate, early start for the placement of

piles for support of open cut and underpinning. Early start for open cut excavation is not without inconvenience. The risk of, and expense for, additional shoring and dewatering may not make early start attractive for this type of excavation. This alternative also requires excavation to proceed prior to completed segment designs, which results in separate and interfacing contracts. Certainly, a tradeoff study should be made to weigh advantages and disadvantages.

In subsequent phases such as station construction, auxiliary facilities, and systemwide elements, the District can provide a value management approach that should be helpful in attainment of the aforementioned objectives. The elements include, but are not limited to:

- Simplification of station structures and the means by which components are formed or emplaced on a (as nearly as possible) repetitive basis.
- Standardization of design of modular elements, which would permit the use of precast components delivered from a central fabrication site if the contractors elect to use this construction method.
- If utility company and trade union agreements permit, use of prefabricated cable trays, vaults, and utility tunnels for permanent and/or temporary service lines.

In retrospect, experience shows a multitude of problems arising during construction activities that were not specifically foreseen by designers and engineers. Left to their own devices, the construction contractors must resolve these problems with corrective activities in the manner and at the time best suited to

the characteristics of their labor force, equipment, and scheduled operations. The problems that characterize this type of project are generally associated with:

- Moving materials to or from the jobsite.
- Maneuvering equipment, powering, and/or servicing on the jobsite above and below ground.
- Maintaining an orderly flow of vehicular and pedestrian traffic.
- Providing the means for reliable continuity of utility services (water, power, sewage, and telephone).

With a history of problems and these general experience factors in mind, specific value management recommendations have been identified in the section that follows.

#### 4.3 SPECIFIC RECOMMENDATIONS

Under the headings below, candidate items for value judgment are offered.

##### 4.3.1 HARD ROCK TUNNELING

We concur with the District's plan to award a single construction contract for design unit A410 through the mountains, but recommend that this unit be included in the first phase, on the basis of dealing with obstacles or unknowns that could create delays. Since this is the only major area of hard rock, only one contractor would mobilize for hard rock tunnel driving. The length of this section is adequate to permit full use of materials and equipment for the most economical performance. We recommend that all of the pocket track at

Hollywood/Cahuenga be included with the tunnel to provide the tunnel contractor with a dedicated laydown area and access to the tunnel, thus eliminating schedule, dual-responsibility, and joint-occupancy problems.

#### 4.3.2 SOFT GROUND TUNNELING

SCRTD envisions six contracts for this work. We concur with this concept; however, additional studies should be made of a possible restructuring of the contract reaches to permit the greatest amount of work with a minimal amount of equipment. In addition, the open-cut excavation and support, particularly at the stations, should be studied for incorporation into the tunneling contracts. This restructuring may provide better and more timely access to the tunnels, with the elimination of dual responsibility, joint occupancy, and interference between contractors.

#### 4.3.3 STATION EXCAVATION

As noted in the preceding paragraph, it may be desirable to perform some station excavation as part of the tunnel construction, in order to provide timely access for the tunnel contractor and avoid dual responsibility (maintenance, dewatering, etc.), joint occupancy, and other interferences. The station shell construction should be reviewed to determine if it should be the tunnel contractor's responsibility or a follow-on contract. All ground support, soldier piles and lagging, slurry walls, and decking must be approved. Excavated areas must be adequate for construction of the station within the area.



#### 4.3.4 GROUTING FROM THE SURFACE

When changed conditions occur in tunneling, fast response by a grouting contractor can get the work back on schedule and minimize costs. It is recommended that a single contract be let for grouting from the surface, either ahead of or with the tunneling, to provide grouting for stabilization of loose material. This on-call contractor has to coordinate his work to meet the needs of the package contractors, again with proper incentives for quality, quantity, and timing.

#### 4.3.5 SUPPORT OF UTILITIES

It is well known that extraordinary coordination for utilities is necessary. The benefit of one or more contractors assigned exclusively to this activity should be considered so that continuity and single-point management of the work and its consistency is maintained. Alternately, if each area or segment contractor handles temporary, relocation, and permanent utility installations in his area, special considerations incorporated into construction documents can include:

- Use of fiberglass tubes or ducting instead of heavy concrete pipe. If permanent concrete pipe must be emplaced, it may be practical to form around the tube, which then becomes a liner. This may be particularly desirable if interruptions are to be avoided.
  
- Prefabricated power sections of varying length with disconnects can be procured and used by contractors where temporary services are required.

These have the advantage of reuse for the life of the project and beyond, with careful handling.

#### 4.3.6 DESIGN

Incorporation of the excavation support along with the structural walls of the station or vent shafts is recommended. Slurry walls or secant piles can be used to reinstall permanent streets across major intersections as soon as the slurry walls are completed and utilities are emplaced and supported. The deck, as a concrete bridge, would be used rather than wood decking. When the station construction is complete, the entire street can be bridged, with the area between the station roof and the street serving as a utility duct.

In order to minimize the repetitious expense of custom-made forms, the designers should review the use of precast units for walls, roofs, platforms, and other common structures. It is estimated that potential savings may be realized in the areas of forming and placing concrete for these facilities if a standard design is employed.

#### 4.4 VALUE MANAGEMENT/ENGINEERING

SCRTD should have value engineering clauses prepared for inclusion in construction specifications. It is also important that post-design contracts awarded to the architect-engineers make provisions for the evaluation of the value engineering proposals during construction that apply to their designs. Unless they are given some incentive for this participation, there is a risk that they would disagree with any proposal to modify their design, however beneficial. Their participation on a formal contractual basis avoids an adversary situation.

#### 4.5 CONSTRUCTIBILITY GUIDANCE FOR A/Es

Experience with similar underground mining and transportation systems indicates areas of concern with regard to construction that the segment designers sometimes overlook. These oversights frequently affect:

- Safety of construction personnel and the general public
- Maintenance of excavation progress

A brief discussion of the construction aspects of each area is provided. Careful attention by the General Engineering Consultant when initiating and administering segment design contracts can minimize these problems.

##### 4.5.1 SAFETY

Construction personnel face hazards at times that are associated with the following activities:

1. Tunneling
  - Cave-ins
  - Rock falls
  - Water intrusion
  - Natural gas
  - Gas leakage from utility lines
  - Falling construction materials
  - Damage to equipment
  - Slips and falls
  - Electric shock

- Fire
- Inadequate ventilation
- 2. Open-cut excavating
  - Injury by moving equipment
  - Injury by moving public and contractor vehicles
  - Cave-ins or slides during wet conditions
  - Electric shock
  - Falls into deep excavation
  - Injury by falling objects from above
  - Fire
- 3. General construction
  - Slips and falls
  - Falling construction materials
  - Moving equipment
  - Public vehicles
  - Support of excavation or decking failure
  - Utility support failure

The general public at street level faces hazards that require protection from:

- Contractor's operating equipment
- Materials being lifted
- Failed or inadequate decking
- Slips and falls on temporary deck surfaces

#### 4.5.2 MAINTENANCE OF EXCAVATION PROGRESS

The most difficult time for the construction contractors to control progress is during support of utilities (unidentified structures) and during the installation of soldier piles. The remaining portion of the excavation has the advantage of having a large open area where heavy equipment can gain access and can be used. When delays occur, other work areas are available for excavation crews.

The open cut construction process usually starts at one end of the site for the placing of soldier piles. They are placed, in order, down one line to develop a work area and to minimize equipment moving time. If an obstacle is encountered during augering, the need for a different construction technique, such as use of rock drills or breakers, causes a shift in the sequence of placing pile. This change in sequence appears simple, since the soldier piles are close together. However, the change could cause extra equipment movement, possible rerouting of traffic, and delay to the start of the next step in the excavation process. Excavation in a congested urban area restricts the contractor because he does not have the benefit of a variety of work areas until he is underground and is not causing hazards to the public or traffic interference. Attention to such common problems during design can minimize schedule delays and disruption to utilities and traffic.

#### 4.5.3 IMPROVEMENTS IN DEEP EXCAVATION CONSTRUCTION

As more tunneling is undertaken and completed, many variations of tunneling methods and equipment are taking place. More large contractors have become proficient in this type of work. It is recommended that the plans and

specifications for tunneling and deep open cut allow a degree of freedom to competent contractors and encourage maximum use of their experience in underground work.



SUMMARY

PROJECT: SCRTD METRO RAIL PROJECT

PROJECT NO. \_\_\_\_\_

LOCATION: LOS ANGELES, CA.

SHEET NO. T

WORK: ITEM 1-0 GUIDEWAYS

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMPCo		SCRTD	
					AMOUNT	AMOUNT	AMOUNT	AMOUNT
1.1	Dual Track at Grade				1,200,000		1,200,000	
1.2	Dual Track Cut & Cover				41,925,000		8,300,000	
1.3	Dual Track Twin Tunnel				590,975,000		384,200,000	
1.4	Pocket Track				56,250,000		24,900,000	
1.5	Crossover				80,500,000		35,500,000	
1.6	Line Vent Mechanical				3,065,000		2,800,000	
1.7	Line Vent Struct. City				9,390,000		8,100,000	
1.8	Line Vent. Struct. Mtn.				14,000,000		10,400,000	
1.9	Crossover Vent Sys. Mech.				2,410,000		2,200,000	
1.10	Underpinning				2,800,000		2,800,000	
1.11	Miscellaneous				23,400,000		23,400,000	
	TOTAL GUIDEWAY				825,915,000		503,800,000	





PROJECT: SCRTD PROJECT NO. \_\_\_\_\_  
 LOCATION: METRO RAIL PROJECT SHEET NO. T  
 WORK: ITEM 1.2 DUAL TRACK CUT&COVER PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: [Signature] DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMP3 AMOUNT	SCRTD AMOUNT
<u>DUAL TRACK CUT&amp;COVER</u>	1677		4930		8267610
RMP - ESTIM BASED ON AVERAGE QUANTITY OF COSTS DEVELOPED FOR SIMILAR WORK - FROM STATIST.					
<u>DEMOLITION EARTHWORK</u>	1677	LF	171.02	286800	
<u>EXCAV</u>	1677	YF	104.42	1752200	
<u>MUCK DISPOSAL</u>	-		1133.10	1900200	
<u>COMPACT BACKFILL</u>	-		762.62	1279000	
				5831400	
<u>SHOULDER DECKINGS EIL</u>	1677	YF			
<u>SOLDIER PILE &amp; LAG</u>	-		4800.00	8051000	
<u>LOCKING</u>	-		761.48	1277000	
<u>UNDERPINNING</u>	-		381.23	640000	
				9990000	
<u>CONCRETE</u>	1677	LF			
<u>FORMS</u>	-		2568.72	4307000	
<u>CONCRETE</u>	-		2246.87	3765000	
<u>REBAR</u>	-		3314.25	5553000	
<u>CURING</u>	-		24.45	41000	
<u>FINISHING</u>	-		254.62	427000	
<u>WATERPROOFING</u>	-		215.86	362000	
				14,463,000	
<u>SITE RESTORATION</u>	1677	LF	461.54	776000	
<u>TRAFFIC MAINT.</u>	-		99.99	57000	
<u>UTILITIES SUPPORT</u>	-		791.29	1327000	
<u>MOBILIZATION</u>	-		737.63	1237000	
				3,395,000	
<u>TOTAL DIR. COST</u>				53,166,200	
<u>O'HD &amp; PROFIT</u>			26.5%	8,789,000	
<u>TOTAL RMP</u>	1677	YF SAY	25017.00 25000	41,955,000 41,925,000	
<u>USE →</u>				41,925,000	8,300,000

SCRTD METRO TUNNEL  
TUNNEL CONSTRUCTION  
SUMMARY ANALYSIS

	REACH 2		REACH 3		REACH 4		REACH 5		REACH 10		REACH 12		REACH 14		TOTAL		"A"	
	SCRTD	RMP	SCRTD	RMP	SCRTD	RMP	SCRTD	RMP	SCRTD	RMP	SCRTD	RMP	SCRTD	RMP	SCRTD	RMP		
PCANT																		
TBM	5,000,000	5,000,000	4,400,000	4,400,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	33,400,000	33,400,000		
OTHEL	2,000,000	5,034,000	2,200,000	6,084,000	2,000,000	5,064,000	2,200,000	5,034,000	2,000,000	7,014,000	2,000,000	6,609,000	2,000,000	5,349,000	14,400,000	40,798,000		+ 18,300,000
		(1,034,000)		(1,084,000)		(1,064,000)		(1,034,000)		(1,224,000)		(1,609,000)		(1,049,000)		(8,098,000)		
LABOR - TUNNEL	13,176,000		15,763,000		13,176,000		15,763,000		20,952,000		19,224,000		11,448,000		108,804,000	112,752,000		+ 3,988,000
		14,040,000		15,763,000		13,176,000		16,849,000		20,954,000		19,224,000		12,744,000		112,752,000		
GEN'L EXPENSE																		
LABOR	2,768,500		3,822,000		2,768,500		3,577,000		3,895,500		3,699,500		2,817,500		23,349,000	23,349,000		
EQUIPMENT	226,000		372,000		226,000		465,000		318,000		850,230		302,000		1,960,000	42,560,000		+ 40,654,000
		4,331,500		7,111,130		4,656,000		5,286,910		9,508,230		7,793,230		4,372,530		42,560,000		
LINER MATERIAL	7,530,000		10,675,000		13,000,000		13,104,000		14,389,000		21,081,000		13,694,000		10,545,000	119,620,000		+ 33,435,000
		18,437,600		15,246,000		13,104,000		14,389,000		28,220,000		20,790,000		15,504,000		119,620,000		
CONSUMABLES	244,000		292,000		244,000		237,000		388,000		388,000		356,000		2,016,000	10,844,000		
		625,500		1,479,500		1,231,000		1,473,000		1,977,000		2,249,000		1,186,500		12,919,000		+ 2,147,000
		1,408,750		1,804,750		1,509,750		1,939,000		2,460,750		2,205,750		1,460,250		12,919,000		
TRUCK DISPOSAL	1,519,000		2,460,000		2,106,000		2,121,600		1,539,000		3,463,000		3,314,000		16,173,000	17,047,000		+ 874,000
		1,809,500		2,608,400		2,121,600		1,836,000		3,408,000		3,346,000		1,978,800		17,047,000		
Geo Water Control	500,000														500,000			
Cleanup																		
		1,475,500		829,750		63,800		497,800		1,161,650		1,441,650		663,800		5,476,000		+ 4,970,000
Cross Passages	1,400,000		2,200,000		2,000,000		1,200,000		3,200,000		3,200,000		1,900,000		15,100,000	34,580,000		+ 19,480,000
		3,644,750		5,255,000		4,037,300		2,977,200		7,024,250		7,024,250		4,541,000		34,580,000		
Finish Tunnel	70,000		1,210,000		1,040,000		4,000,500		760,000		3,078,000		1,700,000		8,080,000	32,042,000		+ 23,962,000
		3,064,000		4,734,000		4,000,500		760,000		3,078,000		6,688,250		6,600,250		32,042,000		
Fuel Line			12,466,000				3,237,000								17,931,000			
			15,911,450				7,054,780								22,985,000			+ 5,033,000
Subtotal	35,133,000	54,449,000	41,501,000	83,826,000	41,501,000	56,924,000	41,501,000	67,744,000	61,896,000	95,093,000	82,111,000	37,334,000	53,900,000	332,964,500	505,313,000			172,349,000
Cost of Tunnel	5,270,000		6,234,000		6,234,000		6,726,000		9,500,000		9,284,000		8,446,000		40,904,000	85,657,000		+ 35,193,000
		9,538,000		14,831,000		9,500,000		11,900,000		14,907,000		14,654,000		9,769,000		85,657,000		
Subtotal	4,340,000	1,322,000	6,449,000	9,232,000	4,775,000	6,449,000	5,533,000	7,712,000	7,121,000	11,000,000	6,449,000	12,277,000	4,900,000	19,707,000	3,270,000	179,970,000		202,062,000

BY G.H.E. THE RALPH M. PARSONS COMPANY

DATE 20.11.65.83

SUBJECT SCOTD METRO RAIL PROJECT

JOB NO 6363-1

PROGRESS-DURATIONS

		# 2	# 5	# 6	# 8	# 10	# 12	# 14	Total	
Track Length	LF	9500	14600	12500	9500	19000	17000	11500	93500	
Tunnel Length	LF	7500	12100	10250	7600	17000	16500	9700	80200	
Tunnel Bore	LF	3800	12100	10400	9000	17000	16500	9700	83500	✓
Alignment	LF	4460			9000			1500	14960	
Days 25' City		180			360			60		
Concrete	LF	4400	12100	10400		17000		8000	52100	
Days 25'		110	303	260		425		205		
Lock	LF						16600		16600	
Days to Day							413			
Days Tunneling		290	303	260	360	425	413	265	2511	
Monday TBH		5								✓
Total Day Hearing		295	303	260	360	425	413	265	2374	
Weeks Tunneling		59	61	52	72	85	83	63	465	35 <sup>1/2</sup> weeks
SPIN THROUGH STATIONS		0	203	6	3	0	203	6	0	15
TOTAL HEARING WEEKS		59	67	55	72	91	83	63	430	34 <sup>1/2</sup> weeks
ARRANGE TBH		4	4	4	4	4	4	4	29	
REMOVE TBH		2	2	2	2	2	2	2	14	
TOTAL WEEKS EXAM		65	73	61	76	97	89	59	522	weeks
Cross Streets	Weeks	14	22	20	12	37	32	19	151	
STEEL LINING	Weeks	10	14	12	8	18	18	12	92	
CLEARING	Weeks	4	31	4	4	17	16500	9700	83500	45
Excavation	Weeks	4	5	4	4	7	7	4	35	
Excavation	Weeks	8	14	11	3	17	17	10	83	
TOTAL WEEKS		87	135	88	112	134	131	85	777	
ARRANGE TBH		32	32	32	32	32	32	32	224	
TOTAL TIME		119	167	118	144	171	163	117	1001	

AT

TITLE SCRIP METRO RAIL PROJECT SHEET NO. 1 OF 3  
 JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 3-20-03

REV.	CHECKER	DATE	REV.	CHECKER	DATE	REV.	CHECKER	DATE

## TUNNEL EXCAVATION

OD = 19'8" = 303.88 sf = 11<sup>1/2</sup> cy/cf

Bolted Concr. Liner 8" Wall OD = 19'4"  
 2" Grout void, ID = 18'0"

LINER  $\pi \left( \frac{19^{33} - 18^{33}}{4} \right) = 38^{32} \text{ sf} = 14^{1/2} \text{ cy/cf}$

GROUT  $\pi \left( \frac{19^{62} - 19^{33}}{4} \right) = 10^{41} \text{ sf} = 0^{32} \text{ cy/cf}$

ASSUME ALLUVIUM @ \$42.00 Say 127.103 cy @ 1<sup>30</sup> /cy  
 @ \$5.230 Say 2<sup>0</sup> /cy @ 1<sup>35</sup> /cy  
 BASALT @ \$52.11 Say 2<sup>23</sup> /cy @ 1<sup>35</sup> /cy

ASSUME Tunnel liners  
 → 5 piece Segm. 4 ft long  
 Fernando/Puñic Formation  
 Tot @ Bolts per Ring  
 Grout 42 cf.  
 → 7 piece Segm. 3'3" long  
 Accuvia Soils  
 TOTAL 88 Bolts per Ring  
 Grout 34 cf.  
 6 piece Segm 4 ft long  
 Rock Formation  
 TOTAL 9 Bolts  
 Grout 42 cf.

TITLE SCRTD SHEET NO. 2 OF 3

JOB NO. 632-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 3-20-93

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE
<u>ESTIM. PROGRESS RATE</u>			<u>ALLOWANCE</u>			<u>Fernando Puente</u>		
			<u>3.25'</u>			<u>4'</u>		
Assume Penetration @ 1" / min Push & EXCOU.			39 min			48 min		
Allow For Charge trains			8 min			5 min		
Install Segments @ 5 min / piece			35			25		
Bolt up Segment Allow 3 min / bolt / 4 men			21			15		
Grout Segments @ 5 min / min			7 min			9 min		
Sub-total theo. progress per push -			107 min			102 min		
Add TRUCK & Extend utility @ 60 min / 30 ft. Average pushing			7 min			8 min		
Change over Power Cable To JEM 4 ft / 100 ft.			1 min			1 min		
Allow For GEAR SWITCH Mov. 4 ft / 50 ft			2 min			2 min		
<b>TOTAL</b>			<b>117</b>			<b>113</b>		
Dist Plot Hole for investigation and Gas is included above								



TITLE SECRET SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 3-21-53

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Progress Rates as used in pre-preliminary ESTIMATE appear to be reasonable.

Note in rock if segments could be eliminated and a rock gripper machine were used instead of pushing on segments the rock cycle might be reduced to 103 - 30 = SAY 73 min

then progress in rock =  $100 \div 73 = 13.77$  push @ 4

Note Progress in 1<sup>st</sup> TBH Excavated rock Tunnel at WMAA averaged 56 ft per day after crews were trained. 55 ft/day



TITLE SECRET SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GFE DATE 3-21-53

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

MUCK HANDLING

ASSUME MAXIMUM PROGRESS CYCLE  $74 \text{ min} / 3.25 \text{ ft} = 23 \text{ ft}^3$   
 $78 \text{ min} / 49 \text{ ft} = 30 \text{ ft}^3$

MUST BE EQUIPPED TO HANDLE 3 R/H.

Say 4 to push at 11<sup>th</sup> Bay = 45 Bay = 70 Lay  
 = 95 Tons

FOR PURPOSE OF ESTIMATE ASSUME 180ay  
 MUCK CARS @ 5 TON TARE  
 TRY 15 TON DIESEL LOCOMOTIVE  
 Say 250 hp.

Union Station to 7<sup>th</sup> of Flower = MAX 9500 LF  
 Ave. 4800 LF

Grades -4% to +4%

NOTE MUST START ON 4% GRADE

Rolling Resistance	20 <sup>#</sup> /TON
Grade Resistance Ave	80 <sup>#</sup> TON
ALLOW FOR ACCELERATE	20 <sup>#</sup> T
TOTAL	120 <sup>#</sup> /TON

15 TON LOCOMOTIVE 30,000<sup>#</sup> @ 0.70 = 6000<sup>#</sup>

LOCOMOTIVE 15 TON @ 120<sup>#</sup>  $\frac{1800<sup>#</sup>}{4200<sup>#</sup>}$

$4200<sup>#</sup> / 120 = 35 \text{ TONS}$

Say 8 cars @ 5 TON = 40 TON Empty  
 8 cars @ = 91 TON Load  
 $\frac{135 \text{ TON}}$

Would be 4 ✓  
 Not Practical

TITLE 5017 SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO.		DEPARTMENT		AUTHOR		DATE		
REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Key: 4 Cars per train @ 5 = 20 Tons  
 4 Cars ldr 40y @ 135 = 54  
74 Tons

74 Tons @ 120' = 8880 # Trailing ldr.

8880 + Loco T x 120 = Loco T x 2000 x 0.20

8880 = Loco T (400 - 120)

Loco T = 31.7

Assume 0.2' traction =  $\frac{8880}{(500-120)} = 23.37$

Ok say for this stretch use 25 Ton loco  
 950 hp. - 57000 cfm unit req'd.  
 length N width 63" ht. 80"  
 30000 cfm  
 100% fuel 140 14/61 16 gallon =  
 50000 #

Cycle

Load Train 1/2 push @ 48 min = 24 min  
 Move out ✓  
 Dump 4 @ 5 = 20  
 Switch etc. 6  
50 min

Travel one 4800 ldr @ 800 = 6

Return one = 6

$\frac{12}{67 \text{ min}}$

Two trains to mid point

Maxim 9500 CF = 11

Return = 11

$\frac{22}{77 \text{ min}}$

Ok Two trains — Full Reach ✓

TITLE SCRD SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 7-21-83

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

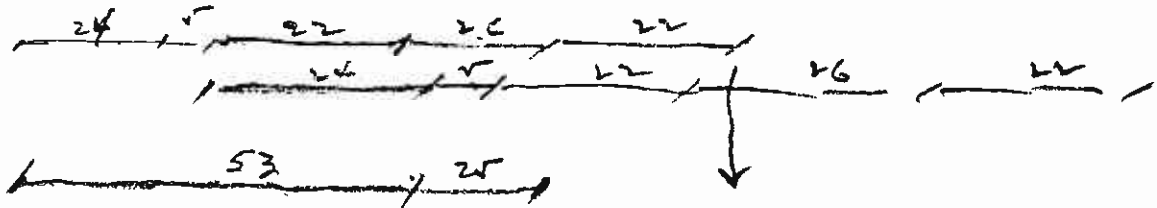
Reach 10 Trucks to Coburn max = 19,000 LF  
 Ave = 9,500  
 GRADE + 3% to -3%  
 Resistance Max = 100 lb/ton

OK use Same Train Makeup

Fixed Time = 55 min

Travel Ave (9500 x 2) : 880 =  $\frac{22}{77 \text{ min}}$  OK 2 Train

Maximum (19000 x 2) : 880 = 44 = 99 min



NOTE Could require a third train for maximum haul - however since cycle is based on 10x min and trucks are being down concurrently - say two train are adequate

Provide 60 lb rail  
 Ties say 6x8 x 60" 20 ft @ 500 = 1000 @ 2 ft  
 switches etc

TITLE SCKTD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR SHE DATE 3-21-83

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

VENTILATION

Provide Ventilation for 2-locomotives  
 Use 230 hp loc w/ Deutz Engines @ 30,000 cfm  
 Say Total Ventilation for Tunnel = 50,000 cfm  
 Provide 1- 75 hp fan / 1000 ft. each tunnel  
 Provide 48"  $\phi$  18 ga. 30' LF

Estimate Fan incl Starter @ \$12,500 ea  
 Estimate Fan incl cpl @ 2000/ea

Reach	2	9500
	5	14500
	8	9500
	10	19000
	12	17000
	14	11500
		<hr/>

Reach 6 81000 IF one ~~12500~~ LF  
 Reach 6 12500 Ave 19500  
 Ventilation 95500

1 fan min 13 fan max Ave 7 fans operating

Oper Cost less electricity = 155/yr  
 Elect 75 x 0.88 = 66 @ 50 = 330/yr.



SUBJECT TUNNEL VENTILATION

CALCULATIONS (Cont'd.):

VENTILATION BLOWERS:

ITEM	UNIT	TRIAL NUMBER		
		1	2	3
NOMINAL DIAMETER	IN		48	
NOMINAL SIZE	HP			
BLADE SETTING (if any)				
BLOWER CHARACTERISTICS AT A FLOW OF	CFM		50280	
STATIC PRESSURE	IN W G		6.54	
OUTPUT	HP		66	
SPACING	FT		1000	
NO. REQUIRED	EA		Use 10	

48-26-1800

COMPARATIVE COSTS:

GENERAL

COST OF ELECTRICAL ENERGY PER KW-HR \$ \_\_\_\_\_  
 NO. OF WORKING HOURS PER WORKING DAY \_\_\_\_\_ HR  
 NO. OF WORKING DAYS FOR TUNNEL EXCAVATION \_\_\_\_\_ DA  
 TOTAL OPERATING HOURS \_\_\_\_\_ HR

ITEM	UNIT	TRIAL NUMBER		
		1	2	3
<b>BLOWER OPERATION AND MAINTENANCE</b>				
OUTPUT PER BLOWER	HP	Use	75	
KW-HR PER HOUR (x 0.88)	KW-HR		66	
<b>HOURLY OPERATING COST</b>				
ENERGY	\$			
OTHER				
<b>TOTAL</b>	<b>\$</b>			
<b>QUANTITIES AND UNIT COSTS</b>				
PIPE	LENGTH	FT	10000	
	UNIT COST	\$		
BLOWER	NO. REQUIRED	EA	10	
	UNIT COST	\$	10,250	
	DUTY FACTOR	%		
	OPERATING HOURS	HR		
<b>COMPARATIVE COSTS</b>				
PIPE	\$		\$	\$
BLOWERS				
OPERATION & MAINTENANCE				
<b>TOTAL</b>	<b>\$</b>		<b>\$</b>	<b>\$</b>

SELECTION:

VENTILATION PIPE

DIAMETER \_\_\_\_\_ IN  
 THICKNESS \_\_\_\_\_ GA  
 LENGTH \_\_\_\_\_ FT

VENTILATION BLOWERS

NOMINAL SIZE \_\_\_\_\_ HP  
 NO. REQUIRED \_\_\_\_\_ EA

TITLE SECTO METALRIC SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR \_\_\_\_\_ DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Raise Drill	Pilot	24"	10 2/4	30 1/2
	Slash	14'	4	75
	Slash	19	3	100
	Slash	24	7	<u>150</u>

355 1/2 @ 60 =

Allow For Setup	5
Change out	5
Disman't	<u>5</u>
	75.5

Raise Drill Cost  $720 \frac{20}{4} \times 355 = 255,600$   
 CUTTER COSTS  
 Excav. For 17 1/2' @  $20 \frac{20}{4} \times 300 = 102,000$

DRILL FOREMAN	1	@ 35 = 35
DRILL OPER	1	@ 30 = 30
DRILL HEAVY	4	@ 25 = 100
MACHINING	2	@ 25 = 50
TRK DRIVER	2	@ 25 = 50
LABOR	✓	@ 20 = 40

$305 \frac{20}{4} \times 8 \times 75 = 183,000$

Pickup	10x8 = 80
1st Drive	45x4 = 180
TRK	25x4 = 100
Mech. Trk	30x4 = 120
Con't	27x4 = 108
	<u>600</u>

45,000  
525,600

653,500

THE RALPH M. PARSONS COMPANY

BY GHC

DATE 3-9-23

SUBJECT SCRIPPO-MERCO RAIL  
MAN. POWER  
TUNNEL CONSTRUCTION

JOB NO. 6363-1  
157  
MANEAY

REACH No	Length	Wall	Soakaway	Circular	TUNNEL	LABOR	PAK	ELECT	CARP.	THE	SPRINK	TERRAZZO	PAINT	CONCRETE	FINISH	HOLIDAY	TOTAL
<u>TUNNEL DRIVE No. 110/111/112</u>																	
2	61	7500	305		(77)	(8)	(78)	(19)	(1)			(1)	(1)				(180)
5	73	12101	365														
6	61	10400	305														
8	70	7600	350														
10	97	17000	465														
12	89	16500	465														
14	57	8700	295														
		<u>82,800</u>	<u>2550</u>														<u>157,000 H.C.</u>
<u>GENERAL EXPENSE</u>																	
✓	113		565		(12)	(14)											
5	134		780														
6	113		561														
8	146		730														
10	159		795														
14	151		755														
16	121		605														
			<u>4795</u>				<u>7195</u>	<u>7195</u>									<u>105,200</u>
<u>CROSS PASSAGES Man, Power</u>																	
✓	10	1000	40		(10)	(250)	(90)	(114)	(10)	(135)	(70)	(5)	(5)				
5	14	1000	70														
6	12	1000	60														
8	8	1200	40														
10	12	1200	90														
14	12	1200	90														
16	11	1200	60														
			<u>420</u>				<u>1510</u>	<u>3780</u>	<u>13590</u>	<u>17365</u>	<u>2765</u>	<u>20385</u>		<u>11325</u>	<u>755</u>	<u>755</u>	<u>105,700</u>
<u>Steel Lining</u>																	
5	8100	12100	155		(3)	(5)	(5)	(45)	(1)	(50)	(1)	(1)					
8	1200	5280	70														
			<u>225</u>				<u>675</u>	<u>13,275</u>	<u>900</u>	<u>10,600</u>	<u>3375</u>	<u>225</u>		<u>6400</u>	<u>225</u>	<u>225</u>	<u>36,900</u>

59



THE RALPH M. PARSONS COMPANY

BY GHE

DATE 3-10-83

SUBJECT SCPTD METRO INC  
NIAGARA POWER TUNNEL CONSTRUCTION

JOB NO. 6363-1  
2873

Reach No	Length	No Days	Super Survey	Classif	Form/Labels	Labels	Equip Engg	Excav	Curt	Test Equip	Steel Workers	Formwork	Pipe ETRC	Concret Finest	MANPOWER
															Total
<u>CHRONOL</u>															
2	10	2100			(2)	(4)	(30)	(1)	(1)			(1)	(1)		(15)
5	10	12100													
6	10 wk	10400													
8	11 wk	7600													
10	10	17000													
12	10	16500													
14	10	9700													
<u>Total</u>			<u>165 days</u>	<u>495</u>	<u>10321</u>	<u>660</u>	<u>5940</u>	<u>1155</u>	<u>165</u>			<u>165</u>	<u>165</u>		<u>19140</u>
<u>Muck Disposal &amp; Man Days/eq</u>															
2	eq	853161	240												
5	eq	429133	305												2535
6	eq	351016	260												4035
8	eq	22,536	305												3510
10	eq	573832	425												2565
12	eq	552263	415												5740
14	eq	310372	265												5525
<u>Total</u>		<u>2,670,577</u>	<u>2215 days</u>												3000
<u>Plant R. us (EAB 50/100) Per 33 eq</u>															
2	4000 eq	240	170			(21)	(14)		(20)		(25)	(10)		(1)	(100)
5	6000 eq	305	200												
6	6500 eq	260	250												
8	4200 eq	305	150												
10	12500 eq	425	240												
12	8000 eq	415	200												
14	6000 eq	265	230												
<u>Total</u>		<u>46400 eq</u>	<u>2215</u>			<u>38926</u>	<u>25924</u>		<u>41400</u>		<u>41400</u>	<u>1860</u>		<u>9280</u>	<u>18700</u>
<u>Av. use 21/day</u>															
<u>Eq. 21/day</u>															

BY GHE THE RALPH M. PARSONS COMPANY

DATE 3-10-83

SUBJECT SCTD. Marco Cir  
HIGH POWER  
Capacity 100000

JOB NO 6363-1  
297

HANDY

Reach No	Length	No Days	Equip Salary	Control	Trans Labor	Line Labor	Opnl Labor	ELECT	CRG	Ins Equip	Tool Mater	Travel	Per Equip	General Equip	Guards	Total	
<u>Summer Work Contd</u>																	
4	5000																
5																	
6																	
8																	
10																	
12																	
14																	
<u>Final Totals Handy/Residual</u>																	
2	100	26000	58														
5	100	121000	60														
6	100	105000	52														
8		76000	38														
10		170000	85														
12		165000	82														
14		270000	47														
		85833	404														
				1212		15786	1616	16228	2828	7676		9684	404	404	3232	5772	
<u>Weekend &amp; Holiday Maint.</u>																	
2		408	172					12	3								
5		675	234														
6		427	184														
8		513	216														
10		625	242														
12		652	274														
14		424	178														
		3934	1600														
				4300				17200	4800								
<u>TOTAL HIGH CAP Trans Equip</u>																	
				88267	71925	223576	65942	89697	52673	77461		72221	49569	4099	12512	9000	107529
<u>July Aug 242 wk days</u>																	
				370	300	1140	270	1240	220	320		310	210	20	50	40	4500
<u>NYC York</u>																	

# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Race Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY G.E. DATE \_\_\_\_\_

QUANTITY Tunnel Drilling TBM 26.144 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	PAYROLL	ELEVATION	DISTRIBUTION				
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	<del>SERVICE PERSONNEL</del>												
2	WALKER	1	1	1	3	3.							
3	CRANE OPER	2	2	2	6								
4	CRANE OPER	1	1	1	3								
5	TOP MAN	1	1	1	3								
6	BOTTOM MAN	1	1	1	3								
7	CHANGE HOUSING	1	1	1	3								
8	COMPRESSOR OPER	1	1	1	3								
9	MECH FOREMAN	1			1								
10	MECHANIC	4	4	4	12								
11	ELECT. FOREMAN	1			1								
12	ELECTRICIAN	2	2	2	6								
13	PUMP OPER	1	1	1	3								
14	MISER	4	4	4	12								
15	LOCO OPER		1	1	2								
16	BRAKEMEN		1	1	2								
17	TRUCK DRIVER	1			1								
18	CARPENTER	1			1								
19	LEADER	4			4								
20	INSPECTOR	1			1								
21													
22	TOTAL	30	21	21	72	3	37	21	4	9	1	1	1
23													
24	<u>Handing Crew (2)</u>												
25	SHIFTER	2	2	2	6			6					
26	TBM OPER	2	2	2	6								
27	TRAIL OPER	2	2	2	6								
28	MECHANIC	2	2	2	6								
29	ELECTRICIAN	2	2	2	6								
30	MISER	8	8	8	24			24					
31	CHUCK TENDER	4	4	4	12								
32													
33	TOTAL	22	22	22	66		18	47		6			
34													
35	<u>Loco Handing Crew (2)</u>												
36	LOCOMOTIVE OPER	4	4	4	12								
37	BRAKEMAN	4	4	4	12								
38													
39	TOTAL	8	8	8	24			24					
40													
41	<u>Bull Gang (2)</u>												
42	BULL GANG FORE	2			2								
43	BULL GANG LAB.	8	2	2	12								
44	LOCO OPER	2			2								
45	LOCO OPER	2			2								
46	TOTAL	14	2	2	18			12					
47													
48	TOTAL	74	5	53	180	3	78	77	4	15	1	1	1

# LABOR COSTS

ESTIMATE 6363-1

FOR SECTO GROUP SHEET NO L

WORK SINGLE HEADS WORK ITEM NO.

LOCATION Los Angeles PREPARED BY SHR DATE

QUANTITY Travel During TBM Sep. 1947 CHECKED BY DATE

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION		
		SHIFT NO 1	SHIFT NO 2	SHIFT NO 3	TOTAL					
1	<u>SERVICE SUPPORT</u>									
2										
3	<u>WALKER</u>	1	1	1	3					
4	<u>CRANE OPER</u>	1	1	1	3					
5	<u>CRANE CYCLER</u>	1	1	1	3					
6	<u>TOP-MAN</u>	1	1	1	3					
7	<u>BOTTOM MAN</u>	1	1	1	3					
8	<u>CHANGEOVER ATTEND</u>	1			1					
9	<u>CONDUCTOR OF ST</u>	1	1	1	3					
10	<u>MECH FOREMAN</u>	1			1					
11	<u>Mechanic</u>	2	2	2	6					
12	<u>ELECT FOREMAN</u>	1			1					
13	<u>ELECTRICIAN</u>	2	2	2	6					
14	<u>TOUR OPER</u>	1	1	1	3					
15	<u>MINER</u>	4	4	4	12					
16	<u>LOCO OPER</u>		1	1	2					
17	<u>BRICKMAN</u>		1	1	2					
18	<u>TRUCK DRIVER</u>	1			1					
19	<u>Operator</u>	1			1					
20	<u>LABOR</u>	2			2					
21	<u>HEADING CREW</u>									
22	<u>SHIFTER</u>	1	1	1	3					
23	<u>TEAM OPER</u>	1	1	1	3					
24	<u>TEAM DRIVER</u>	1	1	1	3					
25	<u>MECHANIC</u>	1	1	1	3					
26	<u>ELECTRICIAN</u>	1	1	1	3					
27	<u>MINER</u>	4	4	4	12					
28	<u>CARTRIDGE TENDER</u>	2	2	2	6					
29		11			11					
30										
31										
32	<u>Mechanics Crew</u>									
33	<u>LOCOMOTIVE OPER</u>	2	2	2	6					
34	<u>BRICKMAN</u>	2	2	2	6					
35		4			4					
36										
37										
38										
39	<u>Bull Guns</u>									
40	<u>BULL GUNS FORE</u>	1			1					
41	<u>BULL GUNS LABOR</u>	4	1	1	6					
42	<u>LOCO OPER</u>	1			1					
43	<u>BRICKMAN</u>	1			1					
44		7			7					
45										
46										
47										
48										
					110					

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY CROSS PASSAGES - EXC. CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION			
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Supv	Oper	Team	Lead	Exec	Cost	Iron	Water	Material
1	<u>Support &amp; Service</u>														
2															
3															
4	<u>Walker</u>	1	1	1	3	3									
5	<u>Crane Oper</u>	1	1	1	3		3								
6	<u>Crane Oiler</u>	1			1		1								
7	<u>Topman</u>	1			1			1							
8	<u>Topman</u>	1	1	1	3			3							
9	<u>Charge Hand</u>	1			1			1							
10	<u>Compr. Oper</u>	1	1	1	3		3								
11	<u>Mech. foreman</u>	1			1		1								
12	<u>Mechanic</u>	2	2	2	6		6								
13	<u>Elect. foreman</u>	1			1		1								
14	<u>Electrician</u>	2	1	1	4					1					
15	<u>Paint. Oper</u>	1			1		1								
16	<u>Painter</u>	4	4	4	12			12							
17	<u>Loco Oper</u>		1	1	2			2							
18	<u>Loco man</u>		1	1	2			2							
19	<u>Truck Driver</u>	1			1		1								
20	<u>Equip. center</u>	1			1		1								
21	<u>Equip. center</u>	4			4					4					
22	<u>Pipe fitter</u>	1			1		1								
23	<u>2 cranes - m/fly</u>				5	3	15	17	4	5	1			1	1
24	<u>14 wk/22</u>														
25															
26															
27	<u>Crossing leading &amp; crew</u>														
28	<u>Shiller</u>	2	2	2	6										
29	<u>Mixer</u>	8	8	8	24										
30	<u>Chick Tender</u>	4	4	4	12										
31	<u>Puffer</u>	2	2	2	6										
32	<u>Mucker (2)</u>	2	2	2	6										
33		18	18	18	54		6	48							
34															
35	<u>Mock handle</u>														
36	<u>Loco Oper</u>	2	2	2	6										
37	<u>Brake man</u>	2	2	2	6										
38															
39															
40	<u>Roll Gang</u>														
41	<u>Foreman</u>	1			1										
42	<u>Roll Gang</u>	4			4										
43															
44															
45															
46	<u>Total Excess 2 Cranes</u>				12										
47	<u>1 Cranes</u>				6										
48	<u>Below from 5 days</u>														

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Large lot PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Class Passage - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	HOURS	PAYROLL	Etc	DISTRIBUTION				
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL					Day	Week	Month	Year	
1														
2	Support & Service													
3	Concrete Crew													
4														
5														
6	Shifter	1	1	1	3		5							
7	Concrete Foreman	1	1	1	3									
8	Union Foreman	1	1	1	3									
9	Concrete	6	6	6	18		6							
10	Concrete	4	4	4	12									
11	Iron workers	4	4	4	12			17						
12	Operator - Saw	4	4	4	12									
13														
14	TOTAL Crews =				54		17					21	17	
15														
16	2 Drivers													
17														
18														
19														
20														
21														
22														
23														
24	TOTAL MEN =													
25	Note Aug 22 Crossover													
26														
27														
28														
29	Support & Service crew = 14 wk @ 51				714		264	238	56	70	14	14	14	
30	Excav				594		46	528						
31	Transport				168		168							
32	Reel Spool				70			70						
33	Concrete Lab.				1512			252	836	588	336			
34														
35														
36	TOTAL Man wk Pay				3058		530	1022	372	70	60	332	14	14
37														
38	Avg per Concrete Man wk				140	139	2	23	56	19	3	27	15	1
39														
40	Avg Man Day/Project				700	10	115	210	90	15	135	75	5	5
41														
42														
43														
44														
45														
46														
47														
48														



TITLE SECRET METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6823-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cross Passages  
Tunnels 42'-8" E to E  
Sky passages 25' long.

ACCUMULATED

Excav. Neat =  $9' \times 12' = 108' \text{ of } 4' \text{ of } 10' = 110'$   
Excav w/BERA =  $11' \times 14' = 154' \text{ of } 5' \text{ of } 10' = 148'$

Concrete 276  
Neat  $118' - (5' \times 3') = 78' \text{ of } 2' \text{ of } 10' = 72'$   
w/BERA  $154' - 46' = 108' \text{ of } 4' \text{ of } 10' = 108'$   
TRUCKS w/BERA  $11 \times 2' \times 25' = 280'$   
Walls & Arch 830'  
108'

Soft Rock  
Excav. Neat



# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP SHEET NO. L  
 WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION Los Angeles PREPARED BY GHE DATE \_\_\_\_\_  
 QUANTITY Tunnel Drilling From 101st to 102nd CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
INSTALL S&P LINER

NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE	50%	OPER	TUNNEL	DRILL	ELECT	CAMP	DISTRIBUTION	TEAM
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL									
1	<del>SERVICE SUPERVISOR</del>													
2	WALKER	1	1	1	3	3.								
3	CRANE OPER.	2	2	2	6									
4	CRANE OPER.	1	1	1	3									
5	TOP MAN	1	1	1	3									
6	BOTTOM MAN	1	1	1	3									
7	CHANGE HOUSE ATT.	1	1	1	3									
8	COMPRESSOR OPER.	1	1	1	3	3								
9	MECH. FOREMAN	1	1	1	3	1								
10	MECHANIC	4	4	4	12	8.17								
11	ELECT. FOREMAN	1	1	1	3									
12	ELECTRICIAN	2	2	2	6									
13	PUMP OPER.	1	1	1	3	3								
14	MINER	4	4	4	12									
15	LOCO OPER.		1	1	2									
16	BRAKEMAN		1	1	2									
17	TRUCK DRIVER	1			1									
18	CARPENTER	1			1									
19	LABOR	4			4									
20	PIPE FITTER	1			1									
21														
22	TOTAL	30	21	21	72	3	21	4	9	1	1	1	1	
23			19	19	58									
24	HEADING CREW (✓)													
25	SHIFTER	2	2	2	6									
26	T.B.M. OPER. IN WAGON	4	4	4	12									
27	T.B.M. OPER. IN WAGON	2	2	2	6									
28	MECHANIC IN WAGON	2	2	2	6									
29	ELECTRICIAN	2	2	2	6									
30	MINER	8	8	8	24									
31	CHUCK TENDER	4	4	4	12									
32														
33	TOTAL	28	20	20	68	18								
34		18	18	18	54									
35	MOCK HANDLING CREW (✓)													
36	LOCOMOTIVE OPER.	4	4	4	12									
37	BRAKEMAN	4	4	4	12									
38														
39	TOTAL	8	8	8	24	24								
40														
41	BULL GANG (✓)													
42	BULL GANG FORE.	2			2									
43	BULL GANG LAB.	8	2		10									
44	LOCO OPER.	2			2									
45	LOCO OPER.	2			2									
46	TOTAL	14	2		16	4								
47														
48	TOTAL	74	53	53	180	3	78	27	4	15	1	1	1	
		70	47	47	164		59	4	15	1	1	1	1	

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Tunnel Cleanup CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

NR	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	<u>Service Report</u>												
4	Walker	1	1	1	3	3							
5	CRANE OPER	2	1	1	4		4						
6	CRANE OPER	1			1		1						
7	TOP MAN	1			1			1					
8	BOTTOM MAN	1	1	1	3			3					
9	CHARGE ELEC ATT	1			1			1					
10	CONTR. OPER	1	1	1	3		3						
11	MECH. FOREMAN	1			1		1						
12	MECHANIC	2	1	1	4		4						
13	ELEC. FOREMAN	1			1				1				
14	ELEC.	4	1	1	6					6			
15	PUMP OPER	1	1	1	3		3						
16	MINE	2	2	2	6			6					
17	LOCO OPER		1	1	2			2					
18	BRAKEMAN		1	1	2			2					
19	TRUCK DRIVER	1			1								1
20	COPPER	1			1								1
21	LABOR	4			4				4				
22	PIPE FITTER	1			1								1
23					48	3	20	11	4	7	1	1	1
24	<u>Cleanup Crew (2 hrs)</u>												
25	SHIFTER	2	2	2	6			6					
26	MINE	4	4	4	12			12					
27	TUNNEL LABOR	8	8	8	24			24					
28					42			42					
29													
30													
31													
32	<u>Transport</u>												
33	LOCO OPER	2	2	2	6		6						
34	BRKEMAN	2	2	2	6		6						
35					12		12						
36													
37													
38	<u>PIPE GANG</u>												
39													
40	FOREMAN	2			2			2					
41	BULL GANG LABOR	8			8			8					
42	LOCO OPER	2			2			2					
43	BRKEMAN	2			2			2					
44					4			4					
45					14			14					
46													
47	<u>Total Per Day</u>				116	3	36	13	7	7	1	1	1

# LABOR COSTS

12

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PENNER WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Muck Disposal CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	Estimated at 6 <sup>00</sup> /day							
2	less O&P exp. = 5 <sup>00</sup> /day							
3								
4	Say want in 20 days							
5	T. Cook, Trailer Wagon							
6	Trailer Hole Cost - 10 <sup>00</sup>							
7	Large Heavy Parts - 32 <sup>00</sup>							
8								
9								
10								
11								
12	Driver							
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								

# LABOR COSTS

ESTIMATE

FOR SCFD GROUP SHEET NO. L  
 WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_  
 LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 QUANTITY Precast Line Pipes CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	TOTAL \$6500 King by 1/4							
2	Avg 21 Rows per day							
3	Maximum 25 rows per day							
4	Assume Each Row has 100 ft							
5	Total Prod. 21 x 25 x 7 = 3675 sets forms							
6	Sly by 18" ID x 19" OD x 4'							
7	Volume Concrete = 580 cu yd							
8	Form Area (18" + 19") x 4' = 419 sq yd							
9	Sly 5000 in 60'							
10	Prof. Conf. 2400.00							
11	less 0.11% 400							
12	2000.00							
13	less 60% = 400.00							
14	less P.O. & Hduc - 100.00							
15	less Rest of 6000 x 0.5 = 3000							
16	less Forms							
17	350 sets @ 500 = 175000							
18	@ 500/set = 875000							
19	= 46400 = 153 1/2 day - 200							
20	\$1000							
21	25 x 1000 = \$25,000/day							
22	Allow Equip. 5000							
23	Lab \$20,000							
24	20000 ÷ (8 x 25) = 100 men							
25	Concrete 6 x 25 = 150 cu yd							

# LABOR COSTS

10

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP SHEET NO. L

WORK METRO RAIL PAVEMENT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Precast liner rings CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION		
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			Material	Subcontract	Overhead
1										
2										
3	Batch Plant									
4	Oper. Eng.	3			3					
5	Label	2			2					
6										
7										
8										
9	Set & Strip Form									
10	5x25 = 125									
11	Carpenter Form Section	2			2					
12	Oper. 67.00	5			5					
13										
14	Clean & Oil									
15	Label	10			10					
16										
17										
18	Iron Workers									
19	6 @ 200 = 1200	25			25					
20	Oper.	5			5					
21										
22										
23	Place Concrete									
24	Oper.	1			1					
25	Labor	4			4					
26	Cement Finisher	5			5					
27										
28										
29	Cure Labor	5			5					
30										
31										
32	Transport Form									
33		10			10					
34										
35										
36	per 25 rings	100			14	21	5	25	25	10
37										
38										
39										
40										
41										
42										
43										
44										
45										
46										
47										
48										

# LABOR COSTS

2

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP SHEET NO. L

WORK METRO RAIL PAVEMENT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

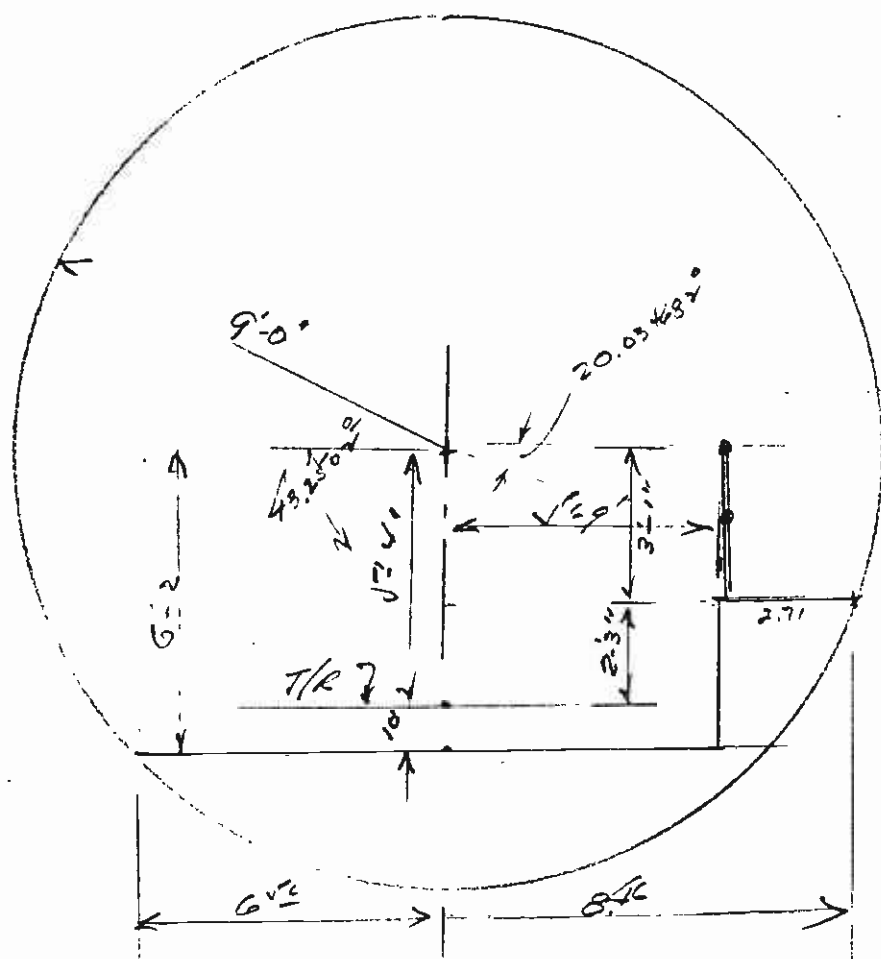
NR	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	adjust Handrail				10 <sup>00</sup> /hr			
3								
4	Place Concrete 50 <sup>00</sup> /cy @ 12				60 <sup>00</sup> /hr			
5								
6								
7	Inst. Hand rail w/ TW @ 3 <sup>00</sup> /hr/100 LF =					0.16 m.k./hr	8 m.k./100	
8								
9								
10	Loco Oper & Breakers				10 m.k./hr	0.08 m.k./hr	4 m.k./100	
11								
12								
13	PLACE Concrete							
14	add LF/dog = 234cy							
15								
16	Shift Key	1			1			
17	Conc Labor	4			4			
18	Carp Foreman		1		1			
19	Carpenter		1	1	2			
20	Labo		1	1	2			
21	Iron worker	1		1	2			
22	Conc Foreman			1	1			
23	Conc Labor			1	1			
24	Pump Oper Conc			1	1			
25	Labo Oper	1	1	1	3			
26	Plate	1	1	1	3			
27	Cement Finish			1	1			
28								
29	Service & Support				44	9.14	83 m.k./100	
30	Use Pump Crew							
31	As for Tunnel Clean up				43/83			
32								
33								
34								
35								
36								
37	Place Concrete				83	18.28	8	18.14
38	Service Support				43	20.14	7	1
39	Install Handrail				12			8
40								
41								
42								
43	Total Per 100 LF				143	52.39	48.7	19.24
44								
45								
46								
47								
48								

TITLE SCRTD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6307-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE \_\_\_\_\_

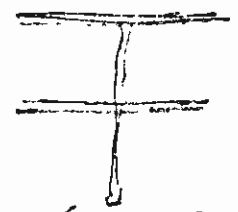
REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

# FINISH TUNNEL



MEANS  
 Handrail Mat'l  
 Painted 20' LF  
 1 IWB install  
 3 IW } 200 LF  
 32 MBR

1 1/2" pipe @ 27' LF



4 LF @ 27' = 108 LF  
 = 76 LF  
 5th 102 LF

### Concrete Vol.

$$\frac{116.7151 \pi 9'^2}{360} = 82.50 \text{ sf}$$

$$\text{less } \frac{1}{2} 8'4" \times 3.03 = - 13.93$$

$$\text{less } 5' \times 3.03 = - 17.2$$

$$\text{less } \frac{1}{2} 6'2" \times 6'5" = - 20.24$$

$$\underline{31.53 \text{ sf}} = 120 \text{ LF}$$

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PERIOD WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>WEEKEND MAINTENANCE</u>							
4	<u>7 Holidays</u>							
5	<u>Drive Tunnel 2550 Days</u>							
6	<u>Coastal Crew 400</u>							
7	<u>Inst. Steel Lining 225</u>							
8	<u>Clean up Tunnel 165</u>							
9	<u>Finish Tunnel 400</u>							
10								
11	<u>3804 Days</u>							
12								
13	<u>4795 - (32 wks x 5 x 7) = 3675</u>							
14								
15	<u>3804 ÷ 5 = 760 wks</u>							
16	<u>- 7 = 110 wks/week</u>							
17								
18	<u>Day Total = 800 wks</u>							
19								
20	<u>@ 2 days/week = 1600 man/days</u>							
21								
22								
23	<u>Walker</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>			
24	<u>Temp man</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>6</u>			
25	<u>Electrician</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>			
26	<u>Mechanic</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>			
27	<u>Loco Oper</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>			
28								
29	<u>GUARDS</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>6</u>			
30								
31								
32					<u>24</u>			
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								



# SUMMARY OF COSTS

FOR: 56KT 2 METRO RAIL GROUP: \_\_\_\_\_

ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION

SHEET NO. S

REACH No. 2

WORK ITEM NO. \_\_\_\_\_

PREPARED BY: GHE DATE: 3-14-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## WORK SCHEDULE

DESCRIPTION	QUANTITY	UNIT	LABOR	PERM. MATERIALS	SUPPLIES	CONSTR FEANT	EOPT. OPERATION	EOPT.	TOTAL
TOTAL DIRECT COSTS Gross FWD			18,557,200	13,992,600	3,854,440	9,000,000	1,942,250		47,346,490
GENERAL EXPENSE									
SCRIP -			2,768,500		226,000				
Add					4,105,500				
TOTAL GEN EXP.	15%		2,768,500		4,331,500				7,100,000
TOTAL COSTS			21,325,700	13,992,600	8,185,940	9,000,000	1,942,250		54,446,490
RISK OF PROFIT									
%			4	10	12	5	15		
AMT									9,357,510
TOTAL COST									63,804,000
Unit	7500	LF							8507

# SUMMARY COSTS

FOR: SCRTD GROUP: \_\_\_\_\_ ESTIMATE NO. 6353-1  
 WORK: NIETRO RAIL PROJECT SHEET NO. S  
TUNNEL CONST. (DUAL TRACK TURN TUNNEL  
REACH NO 2 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

OR IF NO.	WORK SCHEDULE			LABOR		PERM. MATERIALS		SUPPLIES		EQPT. OPERATION		EQPT. RENTALS		TOTAL			
	DESCRIPTION	QUANTITY	UNIT														
	<u>TUNNEL EXCAV.</u>																
-2	EXCAV. & Support Labor			14	040	000											
E1	SUC & Support Equip Oper										926	250					
E2	EXCAV. Equip Oper										682	500					
1	MUCK DISPOSAL							1	808	050							
M-4	Misc Small Tools								552	500							
2	ELECTRIC POWER								487	500							
-3	CUTTER COST								212	500							
4	TUNNEL LINES						12	437	600								
				14	040	000	12	437	600	3	060	550		1	608	750	
															31	146	900
	<u>CROSS PASSAGE</u>																
4-3	SUPPORT & Svc. LABOR				612	000											
3-3	EXCAV. LABOR				453	600											
3-3	LOCO. TRANS				144	000											
3-3	PILE GANG				60	000											
3-3	CONCRETE LABOR				1	296	000										
3-3	SUC. & Support Eq. Oper										73	000					
M-5	Muck Disposal								17	640							
M-6	ELECTRIC POWER								62	500							
E-4	TRANSF. EQUI OPER										100	000					
M-7	CONCRETE <del>LABOR</del> <sup>QUANTITY</sup>						280	000	84	000							
M-9	<del>CONCRETE LABOR</del> <sup>EXCAV. SUPPORTS</sup>								350	000							
5	Misc Small Tools								110	000							
				2	565	600	280	000	624	140		173	000		3,	642,	740.
	<u>TUNNEL CLEANUP</u>																
E-4	LABOR				417	600											
E-5	SUC & Support Equip Oper										15	000					
M-8	UNRELOC. EQUI OPER										26	500					
M-10	ELECTRIC POWER								18	750							
	Misc Small Tools								21	000							
				4	17	600			39	750		40	500		497,	850.	
				\$	17,023,200		\$	12,717,600	\$	3,724,446		\$	7,822,250		\$	35,287,490	

# SUMMARY C. COSTS

FOR: SCT 2 METRO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO: S

REACH No. 2 WORK ITEM NO: \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-1-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FM OR P. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONST. PRANT	EQPT. OPERATION	EQPT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>INSTALL STEEL LINER</u>									
-5	TOTAL LABOR									
-6	SUG Support Equip Op.									
-7	Inst Equip Oper									
4-11	ELECTRIC POWER									
4-12	STEEL LINER									
1-12	Small Tools & Soft G.									
	<u>FINISH TUNNELS</u>									
	LABOR			1,536,000						
L-6	SUG & Support Equip							40,000		
E8	Underground Equipment							80,000		
E9	ELECT. POWER					50,000				
4-13	PERM. MAT'L				1,275,000					
4-14	SMALL TOOLS ETC					80,000				
1-14				1,536,000	1,275,000	130,000		120,000		\$3,061,000
	<u>WEEKEND MAINT</u>									
	INCL elsewhere									
	<u>CONST PRANT</u>									
	TBM'S						5,000,000			
	OTHER PRANT						503,400			
	SALVAGE (-)						1,034,000			
							900,000			\$9,000,000
	page total			1,536,000	1,275,000	130,000	9,000,000	120,000		\$12,061,000
	TOTAL DIRECT COSTS			17,023,200	12,717,600	3,724,440	-	1,822,250		\$35,287,490
				18,559,200	13,992,600	3,854,440	9,000,000	1,942,250		\$47,348,490

# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP SHEET NO. L-1

WORK Metro Race Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GIE DATE \_\_\_\_\_

QUANTITY Tunnel Driving TBM DBL. #2 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	PAYROLL	EVENING	DISTRIBUTION				
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	Service Crew (1)												
2	WALKER	1	1	1	3	3.							
3	CRANE OPER	2	2	2	6								
4	CRANE OPER	1	1	1	3								
5	TOP MAN	1	1	1	3								
6	BOTTOM MAN	1	1	1	3								
7	CHANGE HOUSE ATT.	1	1	1	3								
8	COMPRESSOR OPER	1	1	1	3								
9	MECH. FOREMAN	1	1	1	3								
10	MECHANIC	4	4	4	12								
11	ELECT. FOREMAN	1	1	1	3								
12	ELECTRICIAN	2	2	2	6								
13	PUMP OPER	1	1	1	3								
14	MINER	4	4	4	12								
15	LOCO OPER	1	1	1	3								
16	BRAKEMEN	1	1	1	3								
17	TRUCK DRIVER	1	1	1	3								
18	CARPENTER	1	1	1	3								
19	LEADER	4	4	4	12								
20	SHEETER	1	1	1	3								
21													
22	TOTAL	30	21	21	72	3	32	21	4	9	1	1	1
23													
24	HEADING CREW (2)												
25	SHIFTER	2	2	2	6								
26	TBM OPER	2	2	2	6								
27	TRAIL OPER	2	2	2	6								
28	MECHANIC	2	2	2	6								
29	ELECTRICIAN	2	2	2	6								
30	MINER	8	8	8	24								
31	CHUCK TENDER	4	4	4	12								
32													
33	TOTAL	22	22	22	66	18	42	6					
34													
35	Muck Handling Crew (2)												
36	LOCOMOTIVE OPER	4	4	4	12								
37	BRAKEMAN	4	4	4	12								
38													
39	TOTAL	8	8	8	24	24							
40													
41	BULL GANS (2)												
42	BULL GANS FEED	2	2	2	6								
43	BULL GANS LAB.	2	2	2	6								
44	LOCO OPER	2	2	2	6								
45	LOCO OPER	2	2	2	6								
46	TOTAL	4	4	4	12	4	12						
47													
48	TOTAL	74	53	53	180	3	78	77	4	15	1	1	1

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFTD GROUP SHEET NO. L 2

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHC DATE 3-22-82

QUANTITY REACH No 2 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
3	<u>SERVICE &amp; Support</u>	<u>30</u>	<u>21</u>	<u>21</u>	<u>72</u>	<u>30</u>	<u>2100</u>	
4	Cost per Day						<u>17</u>	
5	Cost Weeks						<u>86</u>	
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30</u>	<u>1980</u>	
11	Cost per Day						<u>15240</u>	
12	Cost Weeks						<u>79200</u>	
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRAINS</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
19	Cost per Day						<u>5760</u>	
20	Cost Weeks						<u>28800</u>	
25	<u>BULL CREW</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>30</u>	<u>540</u>	
26	Cost per Day						<u>4320</u>	
27	Cost Weeks						<u>21600</u>	
33	<b>TOTAL Cost/week</b>						<u>216000</u>	
34	<b>LABOR</b>							
35	<b>TOTAL COST 45 weeks</b>							<u>\$ 4,920,000</u>
39	<u>Excavate Tunnels</u>							
40	<u>through Op. Stations</u>							
41	<u>Before Station Excav.</u>							
42	<u>Total Tunnel =</u>							

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. C363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E 1

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Leach No 2

PREPARED BY: GHE DATE: 3-27-83

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & DEP.	
		No.	UNITS	EA	TOTAL	TOTAL
<u>SERVICE &amp; Support</u>						
	18 Ton Hydraulic Crane (500 lbs)	1	EA	10 hr		350 -
	70 Ton TLE Crane 1 sh. 8 hr (2 sh @ 4 hr)	1		15 hr	100.00	1,500 -
	F.E. Loco. (1 sh. 15 hr)	1		15 hr	46.00	690 -
	Flat bed Truck 2 sh.	1		7 hr	18.00	130 -
	<u>COST PER DAY</u>					<u>2,670</u>
	1200 cfm Elec Comp @ 3 hr per shift	1		9	5.00	45 -
	40 hp Diesel Pump @ 24 hr/day	1		24	0.80	20 -
	2.5 hp - 30" x 300" Conveyor	1		7 hr	5.00	35 -
	15 hp Loco. Switching 2 sh @ 4 hr	1		4	18.00	80 -
	<u>Cost per Day</u>					<u>180 -</u>
	<u>TOTAL COST PER DAY</u>					<u>2,850</u>
	<u>COST PER WEEK</u>					<u>14,250</u>
	<u>TOTAL COST 6.5 Weeks</u>					<u>\$926,250</u>
	A. Oper & Dep. B. Repairs only					

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 2

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. P  
OR QTY

## WORK INFORMATION

*NOTE: For BM ATTNE Cost & Econ on separate page  
75<sup>00</sup> repairs only  
Locomotion: Cost for repairs, service & fuel*

REF. P  
OR QTY

DESCRIPTION

	UES		TOTAL	TOTAL Oper & Rep.	
	178	24			
<u>TUNNEL</u> : cautions 14 opp's & se Operate 48 min/cycle 10 opp's/day = 4.80 min	2	6	12 Hr	75 <sup>00</sup>	900
<u>LOCOMOTIVES &amp; CARS</u> Ave 30 min per train per push or cycle 10 cycles = 300 min 4 trains in 2 hrs Add 2 hr/train for misc					
25 Ton loco	4	8 hr	32 hr	25 <sup>00</sup>	800
Bull Grng loco 5 hr/day 2 ea 1 ton loco	2	4 hr	8 hr	15 <sup>00</sup>	150
Muck Cars	16 ea	8 hr	128 hr	150	200
Other Cars	8 ea	8 hr	64 hr	0 <sup>25</sup>	50
<b>TOTAL Cost Per Day</b>				<b>2100</b>	<b>2100</b>
<b>Cost Per Week</b>				<b>10500</b>	<b>10500</b>
<b>Cost 65 wks</b>					<b>682500</b>

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD

GROUP: \_\_\_\_\_

SHEET No. M-1

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

QUANTITY: REACH No 2

CHECKED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

REF. No. OR QTY. WORK INFORMATION

Assume Tunnel Muck Loaded on truck hauled to disposal site at 5<sup>00</sup>/hour  
 1 LF = 11<sup>25</sup> Bay x 1.50 = Say 17<sup>00</sup> LF. @ 6<sup>00</sup> = 102<sup>00</sup>/4  
Reach

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>Muck Disposal</u> Total 65 weeks	<u>8863 LF</u>	<u>204 202<sup>00</sup></u>	<u>1808 052</u>
	<u>Misc Small Tools &amp; Supplies</u> Estimate misc small tools supplies and consumables @ 4% labor 216,000 Say \$ 8,500/week			
	<u>TOTAL week</u>	<u>65 wk</u>	<u>8500</u>	<u>552,500</u>
	<u>TOTAL</u>			<u>\$</u>



# MATERIAL COSTS

FOR: SCR TO METCO RAIL GROUP

ESTIMATE No. 6363-1

WORK: \_\_\_\_\_

SHEET No. M ✓

LOCATION: \_\_\_\_\_

WORK ITEM No. \_\_\_\_\_

QUANTITY: REACH No

PREPARED BY: GHE DATE: 3-22-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.

WORK INFORMATION

ELECTRIC POWER CONSUMPTION  
TOTAL Tunnel Reacher = 93,000 LE ÷ 7 = 13,300 Ave 7 Tunnel  
2 headings

REF. NO. OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

ELECTRIC POWER

1- 1200 Comp. 4 1/2 hr @ 9 hr/day	4050		
1- 40 hr pump @ 24 hr/day	960		
1- 25 hr Borepore @ 8 hr/day	200		
2- 1000 hp TBM (400 min)	12000 hp hr		
2- 100 hp Borepore (300 min/day)	1000 hp hr		
1- 75 hp Vent Fan (ave) @ 24 hr/day =	25200 hr		
2- Grout pumps (90 min/hr) 2- 16 @ 15	30 hp hr		

ALLOW MISC 560

TOTAL ELEC MOTORS 44,000 hp hr

@ 0.74¢ @ 80% = 27,000 kWh

Lighting

Forth 20 kW @ 24 hr	480		
Headings 2 @ 10 kW @ 24 hr	480		
Line 7000 = 40 @ 125 @ 0.1 @ 24 hr	420		
MISC ALLOW	120		
OFFICE & HOURS	500		
	<u>2000</u>		

TOTAL ELEC Per Day 29,000 kWh 0.25 1450.00

Add for weekend prep work 2500 kWh / 7 days = 357 kWh 0.05 500.00

Cost Per Day 1500.00

Cost Per Week 7500.00

TOTAL COST 65 weeks \$ 487,500

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M 3

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No. 7

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*Estimate Cutler Costs*  
 Say 45 cutters @ 1500<sup>00</sup>/pc = 67500  
 1 2 cutters @ 33500 = 33500  
 \$ 101,000  
 Say 600 hr are life in Alloys & Ferranite = 170<sup>00</sup> x 6 = 1020 = 4 = 25<sup>00</sup>/hr  
 300 hr are life in Basalt = 335<sup>00</sup>/hr x 6 = 2010 = 40 = 50<sup>00</sup>/hr

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT	Total
	Reach 7 (7th Sta)	8500 LF	25		212500
	5	12100	25		
	6	10400	25		
	8 thru Sta	9000 LF	25		
	10	17000	25		
	12	16500	30 <sup>00</sup>		
	14	9700	25		

# MATERIAL COSTS

ESTIMATE No. 63637  
 SHEET No. M-4  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-22-87  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCR7D GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: Reach No 2

REF. NO.  
OR QTY.

## WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LC to transport and deliver non-gasketed liners, 8200<sup>00</sup>/LC to gasketed liners per LF Tunnel  
 Grout Behind Liner = 0.39 cu/yd at 75<sup>00</sup>/yd = 30<sup>00</sup>/LC  
 @ Tunnels = 60<sup>00</sup>/LC per lin. Mat.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

USE SCR7D Breakdown

2 x 4000  
2 x 3600

8000  
7000

\$ 600  
800

4800 000  
5600 000

Thermostat 2 x 1260

2520

600

1512 000

Grout Behind Liner

17520

30<sup>00</sup>

525 600

TOTAL LINERS

12437 600

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L-3

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GJK DATE 3-22-83

QUANTITY REACH No 2 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
1	<u>OP 15 PASSENGER CONST</u>								
2									
3	<u>SUPPORT &amp; SERVICE</u>	25	13	13	51	30	1530		
4	Cost Per Day						12240		
5	Cost Per Week						61200		
6									
7	<u>14 EA CROSSOVER</u>								
8	TOTAL 10 Weeks								612 000
9									
10	<u>CROSSLASSING W/OP EXCISE</u>								
11	2 CREWS	18	18	18	54	30	1620		
12	Cost Per Day						12960		
13	Cost Per Week						64800		
14	TOTAL 7 Weeks								453 600
15									
16	<u>TRAPPORT &amp; Muck Handle</u>	4	4	4	12	30	360		
17	Cost Per Day						2880		
18	Cost Per Week						14400		
19	TOTAL 10 Weeks								144 000
20									
21	<u>BULL GANG</u>	5			5	30	150		
22	Cost Per Day						1200		
23	Cost Per Week						6000		
24	TOTAL 10 Weeks								60 000
25									
26	<u>CONCRETE CREW</u>	36	36	36	108	30	3240		
27	2 CREWS						25920		
28	Cost Per Day						129600		
29	Cost Per Week								
30	TOTAL 10 Weeks								1 296 000
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									

EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-3

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: OHC DATE: 3-23-82

QUANTITY: REACH No 2

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. #  
OR QTY

WORK INFORMATION

CROSS PASSAGE CONSTRUCTION

REF. #  
OR QTY

DESCRIPTION	QTY	HOURS		TOTAL	Operating Cost	
		5hr	TOTAL			
18 Ton Hyd. Crane 2 sh @ 4hr	1	8			3500	280 -
70 Ton Hyd. Crane 1 sh @ 6	1	6			10000	600 -
FE Ldr. (46)	1	4			4600	184 -
LAT BED TRUCK 5t	1	5			1800	108 -
						1172 -
300 cfm. Comp. 1 3 sh @ 7 hr	1	21			500	105 -
HP. Pump	1	24			080	19 -
85 hp. Comp. 1	1	4			500	20 -
NTN 4000 Sw. 1 sh 2 sh @ 4	1	8			1800	144 -
						288 -
TOTAL Cost Per Day						1460 -
COST Per week						7300 -
TOTAL COST 10 days						73000

# MATERIAL COSTS

ESTIMATE NO. 6353-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M 5

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHC DATE: 3-26-82

QUANTITY: REACH No 2

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

*Cross Passage Excav. 40 By/ea x 15 = 210 CCy  
 Much Disposal @ 6<sup>00</sup>/CCy = \$1260 per passage*

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

*No Cross Passage*

*14*

*1260*

*17,640*

*Misc Small Tools  
 & Supplies  
 @ 47¢ Labor 27,800/ea  
 No weeks 10*

*\$11,000*

*\$110,000*

# MATERIAL COSTS

ESTIMATE No. 6353-1

FOR: SCLTD GROUP: \_\_\_\_\_

SHEET No. M-6

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: BHR DATE: 3-22-83

QUANTITY: REACH No

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. NO  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Comp  
21 hr./day

9450 hp hr

1 40 hp Pump @ 24

960 hp hr

1- 25 hp Conveyor @ 4

100 hp hr

1 75 hp Concr. Pump @

600 hp hr

14- 75 hp Vent Fans  
@ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37005 hp hr

@ .746 @ 80%

22,000 kWh

Lighting

POTENTIAL 20 kw @ 24

480

Wires 405 kw @ 24

480

LINE 350 @ 0.11 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekends 500

24500 kWh

25,000 kWh

COST per Day

COST per Week

COST 10 Weeks

0.21

1250

1250

6250

62500

90

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passages - Excess CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL				DISTRIBUTION			
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Suppl	Mat	Wages	EXEC	Cont	Insur	Welfare	Other
1														
2	<u>Support &amp; Service</u>													
3														
4	<u>Walker</u>	1	1	1	3	3								
5	<u>Cone Oper</u>	1	1	1	3		3							
6	<u>Cone Oper</u>	1			1		1							
7	<u>Topman</u>	1			1			1						
8	<u>Topman</u>	1	1	1	3			3						
9	<u>Charge Op</u>	1			1			1						
10	<u>Compr. Oper</u>	1	1	1	3		3							
11	<u>Mech. Foreman</u>	1			1		1							
12	<u>Mechanic</u>	2	2	2	6		6							
13	<u>Fleet Foreman</u>	1			1									
14	<u>Electrician</u>	2	1	1	4									
15	<u>Paint. Op</u>	1			1		1							
16	<u>Miner</u>	4	4	4	12									
17	<u>Lead Op</u>		1	1	2			2						
18	<u>Tractor man</u>		1	1	2			2						
19	<u>Truck Driver</u>	1			1									
20	<u>Carpenter</u>	1			1									
21	<u>Welder</u>	4			4			4						
22	<u>Pipe Fitter</u>	1			1									
23	<u>2 Crossovers - mainline</u>		13	13	51	3	17	17	4	5	1	1	1	1
24	<u>14 wks/yr</u>													
25														
26														
27	<u>Crossing Heading &amp; Crows</u>													
28	<u>Shifter</u>	2	2	2	6			6						
29	<u>Miner</u>	8	8	8	24			24						
30	<u>Chuck Tender</u>	4	4	4	12			12						
31	<u>Ripper</u>	2	2	2	6			6						
32	<u>Mucker (C30)</u>	2	2	2	6			6						
33		18	18	18	54		6	48						
34														
35	<u>Muck handle</u>													
36	<u>Loam Op</u>	2	2	2	6		6							
37	<u>Brake man</u>	2	2	2	6		6							
38														
39														
40	<u>Publ Gang</u>													
41	<u>Foreman</u>	1			1									
42	<u>Bull Gang</u>	4			4									
43														
44														
45														
46	<u>TOTAL EXCESS</u>				122									
47	<u>2 Crossovers</u>													
48	<u>1 Crossover</u>				61									
	<u>ALLOW EXCESS 5 DAYS</u>													



# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L

WORK METRO RAIL PERMIT WORK ITEM NO. \_\_\_\_\_

LOCATION Lockridge Ave PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Class Passage - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

NR	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	HRS	PAYROLL	ELEC	DISTRIBUTION		
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL					NO	SI	LOCATION
1												
2	Support & Service											
3	Concrete work crew											
4												
5	Concrete Crew											
6												
7	Shifter	1	1	1	3			5				
8	Concrete Foreman	1	1	1	3							
9	Helpers	6	6	6	18			6				
10	Carriers	6	6	6	18							
11	Labors	4	4	4	12							
12	Iron workers	4	4	4	12							
13	Operator - for Survey											
14												
15												
16	TOTAL Crew =				54			9	12		21	12
17												
18	2 Drivers - 1 unit											
19												
20												
21												
22												
23												
24	TOTAL MEN =											
25	Note for 22 Crossmen											
26												
27												
28												
29	Support & Service crew = 14 wk @ 51				714	42	264	238	56	70	14	14
30	Excav				594	46	528					
31	Transport				168		168					
32	Bus/Gar				70			70				
33	Concretelab				1512			252	836	588	536	
34												
35												
36	TOTAL Man-wk for crew				3083	42	500	1033	392	70	204	333
37												
38	Avg. for Concrete Man-wk				140	23	50	18	3	22	15	1
39												
40	Avg. for Imp/Assist				700	10	115	230	90	15	135	75
41												
42												
43												
44												
45												
46												
47												
48												



TITLE SCRTD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6213-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHC DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cross Passages  
 Tunnels 42'-8"  $\pm$  to  $\pm$   
 Bay Passages 25' long

ACCOUNTS

Excav. Neat =  $9\frac{1}{2} \times 12\frac{1}{2} = 118\frac{1}{4}$  ft  $4\frac{1}{2}$  g/cu = 110  
 Excav w/BERA =  $11 \times 14 = 154$  ft  $5\frac{1}{2}$  g/cu = 148 g

Concrete 27 cu ft  
 Neat  $118\frac{1}{4} - (5\frac{1}{2} \times 3\frac{1}{2}) = 72$  cu ft =  $2\frac{1}{2}$  g/cu  $\times 27 = 72$  g  
 w/BERA  $154 - 45\frac{1}{2} = 108\frac{1}{2}$  cu ft =  $4\frac{1}{2}$  g/cu  $\times 27 = 108$  g  
 TUNNELS w/BERA  $11 \times 2\frac{1}{2} \times 25 = 289$   
 Wall & Arch 83 g  
 108 g

Soft Rock  
 Excav. Neat

MATERIAL COSTS

63637  
17-8

ESTIMATE NO. \_\_\_\_\_

FOR: SCLTD GROUP: \_\_\_\_\_

SHEET NO. M

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: Reach No 2

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.

WORK INFORMATION

PASSAGE Support - Provide Lintel Frame  
 Opening 9' x 14' = 38 SF/CF x 25' = 950 SF = 40000 \$  
 Steel Hls 6" dia = 38 CF x 550 \$ = 190 CF = 5000 \$  
 Total Support/Passage = 45000 \$  
 Purchase @ 0.55/lb = 5000 \$

REF. NO. OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

Cross Passage  
Steel Support  
No Passage

14

25000

350000

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M-7

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHL DATE: 3-22-83

QUANTITY: REACH NO 2

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## CROSS PASSAGE WORK INFORMATION

### CONCRETE MATERIALS

Concrete 110 cu/ per passage @ 60.00 \$ 6600  
 ReSteel 110 cu @ 260# = 27000# @ 0.63 \$ 13,200  
 Opng 5' x 8' = 22' sq ft 5sq \$ 20,000 / passage  
 82' x 2' = 560 SF.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PERMANENT MATERIAL  
NO CROSS PASSAGE

14

\$ 20000

280000

FORMS - SUPPLIES  
Provide 3 sets Reel  
FORMS @ 1600 SF  
1201 SUPPLIES

1680 SF

50%

\$ 84000

84000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJ WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 7 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

CROSS PASSAGE CONSTR.

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL	Total Oper & Def.	
		No	UNITS	FA			

Cross-Pass Excav

	Eimco 630	2	EA	20	40	2600	1040
	Air Spade Drills etc	8		20	160	100	160

Loco & CARS

	25 TD Loco @ 8 hr	2		8	16	2500	400
	in 3 sh. hr						
	Muck Cars	4		4	16	15	30
	Other Cars	8		4	32	100	30

CONCRETE

	Concrete Pump	1		8	8	1500	120
	Concr. Agitator Cars	4		8	32	500	160
	VIBRATORS Misc	4		8	32	200	60

	Cost Per Day						\$ 2000	
	Cost Per Week						12,000	
	Cost 10 Weeks							100,000

# LABOR COSTS

11

ESTIMATE \_\_\_\_\_

FOR SCFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Lockridge PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Final Group - ✓ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
By Joe R. ...

NR	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	<u>Service &amp; Report</u>												
4	<u>Walker</u>	1	1	1	3	3							
5	<u>Crane Oper</u>	2	1	1	4		✓						
6	<u>Crane Oper</u>	1			1		1						
7	<u>Top Alarm</u>	1			1			1					
8	<u>Bot. Op. Insp.</u>	1	1	1	3			3					
9	<u>Charge Hdr. Att.</u>	1			1			1					
10	<u>Comp. Op.</u>	1	1	1	3		3						
11	<u>Mech. Foreman</u>	1			1		1						
12	<u>Mechanic</u>	2	1	1	4		4						
13	<u>Exec. Foreman</u>	1			1				1				
14	<u>Exec.</u>	4	1	1	6					1			
15	<u>Prog. Oper</u>	1	1	1	3		3						
16	<u>Mine</u>	2	2	2	6			6					
17	<u>Loco Oper</u>		1	1	2			2					
18	<u>Engineer</u>		1	1	2			2					
19	<u>Track Maint.</u>	1			1						1		
20	<u>Conductor</u>	1			1							1	
21	<u>Lab.</u>	1			1				4				
22	<u>Pipe Fitter</u>	1			1					1			
23					48	3	20	11	4	7	1	1	1
24													
25	<u>Cleanup Crew (2 hrs)</u>												
26	<u>Sh. Per</u>	2	2	2	6			6					
27	<u>Misc.</u>	4	4	4	12			12					
28	<u>Tunnel Labor</u>	8	8	8	24			24					
29					42			42					
30													
31													
32	<u>Transport</u>												
33	<u>Loco Op.</u>	2	2	2	6		6						
34	<u>Station</u>	2	2	2	6		6						
35					12		12						
36													
37													
38	<u>Public Works</u>												
39													
40	<u>Foreman</u>	2			2			2					
41	<u>Public Works</u>	8			8			8					
42	<u>Loco Oper</u>	2			2		2						
43	<u>Public</u>	2			2		2						
44					14		4	10					
45													
46													
47	<u>Total Per Day</u>				116	3	36	43	7	7	1	1	1
48													

# LABOR COSTS

ESTIMATE 6363-1

FOR SOFT GROUP SHEET NO. L-4

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - Tunnel PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY REACH No 2 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
3	<u>Sup &amp; Support</u>	10	11	11	43				
12	<u>CLEANUP CREWS</u>	14	14	14	42				
21	<u>TRANSPORT CREW</u>	4	4	4	12				
29	<u>BULL GANG</u>	14			14				
38	<u>TOTAL</u>				116	3	5480		
41	<u>COST PER DAY</u>						27840		
43	<u>COST PER WEEK</u>						139200		
46	<u>TOTAL 3 Week</u>								417600



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHC DATE: 3-23-8

QUANTITY: REACT No 2

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			OPERATING COST	
		No. UNIT	HRS/UNIT	TOTAL	Hourly	Cost
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane</u> <u>3 sh @ 4 hr</u>	1	12		35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane</u> <u>1 sh @ 4</u>	1	4		100 <sup>00</sup>	400 -
	<u>FE Ldri (966)</u>	1	4		46 <sup>00</sup>	184 -
	<u>FLAT BED TRUCK 5TN</u>	1	5		18 <sup>00</sup>	90 -
						710
	<u>1800 cfm. Comp.</u> <u>3 sh @ 7 hr</u>	1	21		5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24		0 <sup>80</sup>	19 -
	<u>85 hp. Comp.</u>	1	4		5 <sup>00</sup>	20 -
	<u>5TN 4000 Switch</u> <u>2 sh @ 4</u>	1	8		18 <sup>00</sup>	144 -
						293
	<u>TOTAL COST per Day</u>					1000
	<u>COST per week</u>					7000
	<u>TOTAL COST 3 weeks</u>					15000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 63631

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-5

WORK: WATER LINE PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION: CLEANUP PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 2 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

Cleanup at 500 ft per day

REF. NO. OR QTY.	DESCRIPTION	HOURS			Total Op. & Inf.	
		No.	UNITS	EA.	TOTAL	TOTAL
	<u>Various Equip.</u>					
	<u>Eimco 630</u>	2	hr	20	48	2600
	<u>MISC</u>					60
	<u>Locost Cars</u>					
	<u>25 Ton V.</u>	2		10	20	500
	<u>Muck Cart</u>	4		10	40	60
	<u>Office Cart</u>	4		10	40	40
	<u>TOTAL Per Day</u>					1700
	<u>Total Per Week</u>					8500
	<u>TOTAL 3 weeks</u>					25500

Various Equip.

Eimco 630

MISC

Locost Cars

25 Ton V.

Muck Cart

Office Cart

TOTAL Per Day

Total Per Week

TOTAL 3 weeks

# MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 2

ESTIMATE No. 6353-1  
 SHEET No. M-8  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GAC DATE: 3-22-53  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Comp. @ 21 hr./day	9450 hp hr		
1- 40 hp Pump @ 24	960 hp hr		
1- 25 hp Conveyor @ 4	100 hp hr		
1- 607 Hi. pr. Pump	600 hp hr		
14- 75 hp Vent Fans @ 24 hr/day	25200 hp hr		
Allow Misc	690		
<u>TOTAL Elec</u>	<u>37000 hp hr</u>		
@ .746 @ 80%	22,000 kWh		
<u>Lighting</u>			
Power 20 kw @ 24	480		
Wds 4 @ 5 kw @ 24	480		
LINE 3500 0.1 x 24	840		
OFFICE SHOP	500		
MISC	700		
	<u>2500</u>		
<u>TOTAL Elec per Day</u>	<u>24500 kWh</u>		
Add for weekends 5%	500		
	<u>25,000 kWh</u>		
Cost per Day		0.25	1250
Cost per Week			1250
Cost 3 Weeks			6250
			18750



# LABOR COSTS

N

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel ✓ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	Handcar Operator			12	12			
3								
4	Place Concrete				60			
5								
6								
7	Inst. Handcar							3 m/hrs
8								
9								
10	Loco Oper. & Handcar			10	10		0.03 m/hrs	4 m/hrs
11								
12								
13	Place Concrete							
14	600 LF @ 234¢							
15								
16	Shift op	1			1			
17	Loco Labor	4			4			
18	Carp Foreman		1		1			
19	Carpenter		1	2	2			
20	Labor		2		2			
21	Iron. worked	1		2	3			
22	Loco Foreman			1	1			
23	Loco Labor			1	1			
24	Handcar Oper. & Loc			1	1			
25	Handcar	1	1	2	4			
26	Place concrete	1	1	2	4			
27	Gen. Fresh			1	1			
28					4			
29	SERVICE & Support					9.14		
30	Joe Sings Crew					2 Tunnels		
31	As for Tunnel Clean up							
32					40			
33								
34								
35								
36								
37	Place Concrete				83	13.75	8	15 14
38	Service Support				43	3	20 14	7 1 1 1
39	Inst. Handcar				14			
40								
41								
42								
43	Total for 200 LF				143	3	52 39 45 7	19 24 1 1
44								
45								
46								
47								
48								



# LABOR COSTS

ESTIMATE 6367-1

FOR SCFD GROUP SHEET NO. L-6

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel Line No 2 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				49	35		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSPORT-</u>				14			
13								
14								
15								
16								
17								
18								
19	<u>Place CURBITE</u>							
20	<u>&amp; Tunnel</u>				83			
21								
22								
23								
24								
25	<u>INSTALL MONORAIL</u>				14			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	<u>TOTAL</u>				160	30	4800	
36	<u>TOTAL Per Day</u>						38400	
37								
38	<u>TOTAL Per Week</u>						192000	
39								
40								
41								
42								
43								
44	<u>TOTAL 8 Week</u>							1536000
45								
46								
47								
48								

# EQUIPMENT OPERATING COSTS

FOR: SCRIPT GROUP: \_\_\_\_\_ ESTIMATE NO. \_\_\_\_\_  
 WORK: METRO RAIL SHEET NO. E-8  
 LOCATION: \_\_\_\_\_ WORK ITEM NO. \_\_\_\_\_  
 QUANTITY: Reach 2 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost		
		No UNIT	HRS/HR	TOTAL			
	<u>SERVICE &amp; SUPPLY</u>						
	<u>Use Cost Period</u>						<u>5000</u>
	<u>TOTAL 8 weeks</u>						<u>40000</u>



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET NO. E-49  
 WORK: METRO RAIL PROJ WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 2 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL		Total Opn & Exp.	
		No	UNITS	FA	TOTAL			
	ALLOW	2	EA	20	40	2000	1040	
	Air Spdr. Drills etc	8		20	160	100	160	
	<u>LOCO &amp; CARS</u>							
	25 TD Loco @ 8 hr	2		8	16	2500	400	
	in 3 sh. hr							
	Muck Cars	4		4	16	150	30	
	Other Cars	8		4	32	100	30	
	<u>CONCRETE</u>							
	Concrete Pump	1		8	8	1500	120	
	Concr. Agitator Cars	4		8	32	500	160	
	VIBRATORS Misc	4		8	32	200	60	
	Cost Per Day						2000	
	Cost Per Week						12,000	
	Cost 4 Weeks							80,000

# MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 2

ESTIMATE No. 6363-1  
 SHEET No. M-13  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GHR DATE: 3-22-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Compr.  
21 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Compressor @ 4

100 hp hr

1- 600 Hi pr. Pump

600 hp hr

14- 75 hp Vent Fans  
@ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37005 hp hr

@ .746 @ 20%

22,000 kWh

Lighting

10174 @ 20 kw @ 24

480

4 hrs @ 5 kw @ 24

480

LINE 350 @ 0.1 @ 24

840

OFFICE SUPPL

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekends 500

24500 kWh

25,000 kWh

Cost per Day

Cost per Week

Cost of Weeks

1250

1250

6250

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SECT D GROUP: \_\_\_\_\_

SHEET No. M-14

WORK: META RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: FINISH TUNNEL

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 2

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PURCHASE HANDRAIL  
2 Tunnels

2.0

1.00

20

POUR CONCRETE  
2 @ 1.17 =

2.50 cy

60.00

150.00

COST OF MAT'L

1 LF

170.00

PERM MAT'L

Reach 2  
5  
6  
8  
10  
12  
14

7500 LF  
7200 LF  
10,500 LF  
7000 LF  
17,000 LF  
10,500 LF  
9,700 LF

170.00  
1  
1  
1  
1  
1  
1

1275.00

Misc Small Tools  
and Supplies

Use 5% Labor 19,200  
5M 10,000

No Weeks

8

\$10000

80000

PLANT & EQUIPMENT DETAIL

SCRIPD METRO CIVIL PROJECT

ESTIMATE NO. 6363-1

SHEET NO.

PREPARED BY: GAF

DATE: 3-21-83

CHECKED BY:

DATE:

Reach 2 9500 LF

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	BALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & Ancill:			5 000 000		10	500 000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1 540 000								
	MISC UNDERGROUND			125 000								
	RAIL TRACKAGE			551 250								
	VENTILATION SYSTEM			651 000								
	CONCRETE EQUIPMENT			262 000								
	COMMUNICATIONS EQUIP			9 750								
	ALIGNMENT CONTROL			15 000								
	ELECTRICAL EQUIPMENT			689 500								
	AIR WATER DEWATER			382 500								
	OTHER PLANT			308 000								
				<u>5 034 000</u>		10	534 000					
				<u>10 034 000</u>			(1034000)					

111

PLANT & EQUIPMENT DETAIL

SCHLID METRO RAIL PROJECT

LEACH & SCOLE

ESTIMATE NO. 6363-1  
 SHEET NO.  
 PREPARED BY: GHE DATE: 3-21-82  
 CHECKED BY: DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE %	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			UNIT	TOTAL			
<u>TUNNEL EQUIP.</u>											
2 EA	TBM incl Trailing Gear, - conveyor - dust suppression for 300T @ 1000 hp		2500000				300	600			
							100	100			
				5000000			400				
<u>Locomotives &amp; Cars</u>											
4	25 TN Diesel loco. Muck		200000	800000			25				
2	15 TN - Bullgan		120000	240000			15				
12	10cy Muck Car 5TN		16000	192000			5				
8	Flat Car 8whl		12000	96000			4				
2	Man Cars 2whl		6500	13000			2				
2	Fan Line Cars		20000	40000			8				
1	Car Dumper		80000	80000			8				
2	Grout Car & Pump		40000	80000			30				
	<u>TOTAL loco &amp; Cars</u>			1540000							
<u>Misc UNDERGROUND</u>											
4	SINKER DRILLS		2000	8000			0				
4	STEEL DRILLS		2500	10000			0				
4	HYDRA DRILLS		2500	10000			0				
2	1/2" Drift for Pilot		14000	28000			0				
2	Drift Room & St. Dr		14000	28000			0				
2	Tipper carts		5000	10000			0				
2	Air Wrenches		500	4000			0				
2	oxy Acet Outoff		1000	4000			0				
1	Elec Welder 300amp		2000	8000			0				
1	1/2" SIZES		1000	8000			0				
1	Chipping sups. A.R		250	1000			0				
1	Misc Conc, Steel Bol's		500	2000			0				
	<u>TOTAL Misc Equip</u>			125000							

1/2

PLANT & EQUIPMENT DETAIL

SKETCH METRO RAIL PROJECT

Reach 2 9.500LF

ESTIMATE NO. 63634

SHEET NO.

PREPARED BY: [Signature]

DATE: 3-4-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			%	AMOUNT			
<b>RAIL TRACKING</b>											
40 Ton	4000 LF 60# Rail		580	20000							
2500 lb	Spikes		0	625							
6000 lb	ANGLE BARS ROSS ct		2 1/2	1500							
5000	5X3" X 5' Ties 500		9 1/2	450							
1 Lot	MISC			875							
	<b>COST PER 1000 LF (2 TUNNELS)</b>			<b>27500</b>							
								443			
95	LF TUNNELS		27500	261,250				443			
8	TURNOUTS Frog Switches		5000	40000				20			
1	CALIFORNIA SWITCH		125000	250000				500			
	<b>TOTAL RAIL TRACK COST</b>			551,250							
<b>VENTILATION SYSTEM</b>											
FOR 2 TUNNELS @ 1000 LF											
2	7 1/2" Air Vane Fans w/ Switch		12500	25000				50			
2000	LF 48" 13ga Venti Pipe w/ caps		2000	40000							
2000	LF Hangers & Hardware		0.50	1000							
	<b>COST PER 1000 LF</b>			66000				40			
95	LF TUNNELS		66000	627,000				40			
2 EA	ELBOW		2000	4000				20			
2 EA	INLET & Silencer		10000	20000				50			
	<b>TOTAL COST VENTIL.</b>			651,000							

# PLANT & EQUIPMENT DETAIL

SECRET

Reach 2 - 9,500 LF

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-21-67  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	BALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>CONCRETE Equip</u>											
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Press Grout Pump/Car		30000	30000								
1 EA	Shotcrete Outfit		45000	45000								
1 EA	SAND BLAST Outfit		3000	3000								
4 EA	Gen. Concr. Agitator Cars		25000	100000								
1 Lot	VALVES & Misc		4000	4000								
200 LF	SPICK LINE		1000	2000								
1 EA	Swing Spring Rig		3000	3000								
	<u>TOTAL CONCR &amp; GROUT EQUIP</u>			<u>262000</u>								
	<u>Communications Equip.</u>											
	SWITCH BOARD & Hookup			5000								
	Cost Per 1000 LF (2 tunnels)											
2000 LF	Telephone line		0.20	400								
75	Telephones		50.00	3750								
	Cost Per 1000 LF			500								
95	LF Tunnel (Reach)		50.00	4750								
	<u>TOTAL COMMUN</u>			<u>9750</u>								
	<u>ALIGNMENT CONTROL</u>											
2 EA	LAZER GUIDANCE System		5000	10000								
1 Lot	FOUR SURVEY EQUIP.		5000	5000								
				<u>15000</u>								

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PLANT & EQUIPMENT DETAIL

SCR 2A METRO TUNNEL

ESTIMATE NO. 5363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 7-21-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Reach 2 9500 LF

QUAN.	DESCRIPTION	SOURCE	COST		USE	BALVAGE		WEIGHT IN TONS		P.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<b>ELECTRICAL EQUIPMENT</b>												
1	Sub-station - Hoop		5000	5000								
3 Ea	1000 KVA Transformer		30000	150000								
1 Ea	300 KW Standby Generator		75000	75000								
1 Lot	SWITCH GEAR		25000	25000								
	<b>TOTAL Electric Plant</b>			<b>300000</b>								
<b>ELECTRICAL Tunnel Plant</b>												
<b>FOR 2 Tunnels @ 1000 LF</b>												
2000 LF	POWER CABLE		10 <sup>00</sup>	20000								
2 Ea	100KVA 4Tg Vent Transformer		9000	18000								
3000	LIGHTING LINE		10 <sup>00</sup>	1000								
50	LIGHT DISTANCE		5 <sup>00</sup>	250								
	MISC OUTLET			75								
2000	MISC GAS, Lighting & Lines		0 <sup>50</sup>	1000								
	<b>TOTAL Elec. for 2 Tunnels</b>			<b>41000</b>								
9500 LF	TUNNEL		6 <sup>4000</sup>	389500								
	<b>TOTAL ELECTRICAL</b>			<b>689500</b>								
<b>Air Water Dewater</b>												
<b>FOR 2 TUNNEL @ 1000 LF</b>												
2000 LF	4" Water Line		4 <sup>00</sup>	8000								
80 Ea	Glover & Cap		25 <sup>00</sup>	2000								
4000 LF	6" Air Line		8	16000								
80 Ea	Glover & Couplings		50 <sup>00</sup>	4000								
2000 LF	10" Dewater Line		15 <sup>00</sup>	30000								
80 Ea	Glover & Cap		100 <sup>00</sup>	8000								
	Allow for Misc. Values & Frig			2000								
2 Ea	Air Pumps		2500	5000								
	<b>COST for 1000 LF Tunnel</b>			<b>75000</b>								

75



PLANT & EQUIPMENT DETAIL

SCRIPPS METRO TUNNEL

ESTIMATE NO. 6363-1

Reach 2 9500 LF

SHEET NO.

PREPARED BY: *JR*

DATE: 3-21-52

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	BALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	AIR, WATER, DEWATER 9500 LF TUNNEL (2 TUNNELS)		75000	712500								
	<u>PLANT</u>											
1 EA	1200 cfm Elec Comp		80000	80000								
1 EA	600 cfm Diesel Comp		60000	60000								
2 EA	Air Receivers		1000	2000								
2 EA	Water Pumps 10 HP. 17.5'		2000	4000								
2 EA	Disch. Pumps 50 HP. 17.5'		5000	10000								
	Misc. Manifolds etc			14000								
	TOTAL PLANT			170000								
	TOT AIR WATER Disch.			88250								
	<u>Other Plant &amp; Equipment</u>											
1 Lot	Repair Shop Equipment		25000	25000								
1 Lot	Electric Shop Equipment		15000	15000								
1 Lot	Construction Shop Equipment		10000	10000								
7 EA	INSURANCE		10000	10000								
2 EA	OFFICE TRAILER 12x60		25000	50000								
1 EA	Warehouse 1000 sq			10000								
2 EA	Change house & Noo			60000								
1 EA	Shed Van			5000								
1 EA	First Aid Trailer			10000								
	ALIMAK MAN ELEVATOR			3000								
	36" x 300' Muck Conveyor 2 Hrs.			100000								
	500 cfm Muck Hoist			10000								
	TOTAL Other			338000								



# SUMMARY OF COSTS

FOR: SCRTD METRO RAIL GROUP: \_\_\_\_\_

ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION

SHEET NO: S

REACH No. 5

WORK ITEM NO: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-12-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQT. OPERATION	EQT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>TOTAL DIRECT COSTS</u>			<u>28 535 400</u>	<u>26 467 100</u>	<u>5 507 120</u>	<u>9 400 000</u>	<u>2 897 250</u>		<u>72 371 970</u>
	<u>Bro FWD</u>									
	<u>GENERAL EXPENSE</u>									
	<u>SCRTD -</u>			<u>3 822 000</u>		<u>3 172 000</u>				
	<u>Add</u>					<u>6 799 130</u>				
	<u>TOTAL GEN EXP.</u>			<u>3 822 000</u>		<u>7 111 130</u>				<u>10 933 130</u>
	<u>TOTAL COSTS</u>			<u>32 360 400</u>	<u>26 467 100</u>	<u>12 718 250</u>	<u>9 400 000</u>	<u>2 897 250</u>		<u>83 825 000</u>
	<u>RISK OF PROFIT</u>									
	<u>7%</u>			<u>2</u>	<u>10</u>	<u>10</u>	<u>6</u>	<u>15</u>		
	<u>AMT</u>									<u>14 551 500</u>
	<u>TOTAL COST</u>									<u>98 376 500</u>
		<u>12/00</u>	<u>LF</u>							<u>81 280</u>





# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP SHEET NO. L  
 WORK Metko Race Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION Los Angeles PREPARED BY GIE DATE \_\_\_\_\_  
 QUANTITY Tunnel Driving, TBM, D.M., #5 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	TUNNEL	DRILL	ELEV.	DISTRIBUTION	TBM
	SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL						
<del>ENGINEER</del>										
WALKER	1	1	1	3	3					
CRANE OPER	2	2	2	6		6				
CRANE OPER	1	1	1	3						
TOP MAN	1	1	1	3						
BOTTOM MAN	1	1	1	3						
CHANGE ROUSE LTT.	1	1	1	3						
COMPRESSOR OPER	1	1	1	3	3					
MECH. FOREMAN	1	1	1	3	1					
MECHANIC	4	4	4	12	12					
ELECT. FOREMAN	1	1	1	3						
ELECTRICIAN	3	2	2	7						
PUMP OPER	1	1	1	3	3					
MINER	4	4	4	12		12				
LOCO. OPER		1	1	2	2					
BRAKEMAN		1	1	2	2					
TRUCK DRIVER	1			1						1
CARPENTER	1			1					1	
Welder	4			4				4		
WELDER	1			1						1
<b>TOTAL</b>	<b>30</b>	<b>21</b>	<b>21</b>	<b>72</b>	<b>3</b>	<b>37</b>	<b>21</b>	<b>4</b>	<b>9</b>	<b>1</b>
<b>LOADING CREW (✓)</b>										
SHIFTER	2	2	2	6		6				
T.B.M. OPER	2	2	2	6						
T.B.M. OPER	2	2	2	6						
MECHANIC	2	2	2	6						
ELECTRICIAN	2	2	2	6						
MINER	8	8	8	24			24			
CHUCK TENDER	4	4	4	12						
<b>TOTAL</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>66</b>	<b>18</b>	<b>12</b>	<b>24</b>	<b>6</b>		
<b>TRUCK HANDLING CREW (✓)</b>										
LOCOMOTIVE OPER	4	4	4	12	12					
BRAKEMAN	4	4	4	12	12					
<b>TOTAL</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>24</b>	<b>24</b>					
<b>BULL GEN'S (✓)</b>										
BULL GEN'S FULL	2			2			2			
BULL GEN'S LAB.	8	2	2	12						
LOCO OPER	2			2	2					
LOCO OPER	2			2	2					
<b>TOTAL</b>	<b>14</b>	<b>2</b>	<b>2</b>	<b>18</b>	<b>4</b>	<b>12</b>				
<b>TOTAL</b>	<b>74</b>	<b>53</b>	<b>53</b>	<b>180</b>	<b>3</b>	<b>78</b>	<b>77</b>	<b>4</b>	<b>15</b>	<b>1</b>

# LABOR COSTS

ESTIMATE 6363-1

FOR SOFT GROUP

SHEET NO. L 1

WORK METRO RAIL PENIST

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles

PREPARED BY SHC DATE 3.22.88

QUANTITY REACH No 5

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
3	<u>SERVICE &amp; Support</u>	<u>30</u>	<u>21</u>	<u>21</u>	<u>72</u>	<u>30<sup>00</sup></u>	<u>2160</u>	
4	<u>Cost per Day</u>						<u>17280</u>	
5	<u>Cost</u>						<u>86400</u>	
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30<sup>00</sup></u>	<u>1980</u>	
11	<u>Cost per Day</u>						<u>15840</u>	
12	<u>Cost</u>						<u>79200</u>	
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRAMP</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
19	<u>Cost per Day</u>						<u>5760</u>	
20	<u>Cost</u>						<u>28800</u>	
25	<u>BULL GANG</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>30</u>	<u>540</u>	
26	<u>Cost per Day</u>						<u>420</u>	
27	<u>Cost</u>						<u>21600</u>	
34	<u>TOTAL Cost/week</u>						<u>216000</u>	
35	<u>LABOR</u>							
36	<u>TOTAL COST 73 weeks</u>							<u>15,768,000</u>

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. L363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E 1

WORK: Metro Rail Project

WORK ITEM NO. \_\_\_\_\_

LOCATION: Leach No 5

PREPARED BY: GHE DATE: 3-22-83

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & REP.	
		No.	UNITS	EA	TOTAL	A
<b>SERVICE &amp; Support</b>						
	78 Ton Hydraulic Crane (5ay 50%)	1	EA	10 hr		350 -
	70 Ton Tree Crane 1 sh. 8 hr (2 sh @ 4 hr)	1		15 hr	100.00	1500 -
	F.E. Loader (ld. work) 1 @ 8 20 ft	1		15 hr	46.00	690 -
	Flat bed Truck 5tn.	1		7 hr	18.00	130 -
	<u>COST PER DAY</u>					<u>2670</u>
	1200 cfm Elec Comp @ 3 hr per shift	1		9	5.00	45 -
	40 hp Gravity Pump @ 24 hr/day	1		24	0.82	20 -
	2.5 hp - 30' x 300' Conveyor	1		7 hr	5.00	35 -
	15 hp Loco. Switching @ 4 hr	1		4	18.00	80 -
	<u>Cost for Day</u>					<u>180 -</u>
	<b>TOTAL COST PER DAY</b>					<b>2850</b>
	<b>COST PER WEEK</b>					<b>14250</b>
	<b>TOTAL COST 73 Weeks</b>					<b>1040250</b>
	A. Oper & Maint. B. Repairs only					



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 5

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*NOTE: For TBM ATTEN COST & FUEL on Separate Page  
75% Repairs only  
Locomotion: Cost for repairs, service & fuel*

REF. # OR QTY.	DESCRIPTION	HOURS			Total Oper & Rep.	
		1/2	FA	TOTAL		
	<i>TUNNEL CAUTION</i>					
	<i>TBM repair &amp; op Operate 48 min/cycle 10 cycles/day = 480 min</i>	2	6	12 Hr	75 <sup>00</sup>	900
	<i>LOCOMOTIVES &amp; CARS</i>					
	<i>Ave 30 min pit time per push or cycle 10 cycles = 300 min 4 hours in 2 hrs Add 2 hr/train for misc 25 Ton loco</i>	4	8 hr	32 hr	25 <sup>00</sup>	800
	<i>Rolling Stock loco 5 hr 4 hr/day 2 ea 7 ton loco</i>	2	4 hr	8 hr	18 <sup>00</sup>	150
	<i>Muck Cars</i>	16 Ea	8 hr	128 hr	150	200
	<i>Other Cars</i>	8 Ea	8 hr	64 hr	0 <sup>25</sup>	50
	<b>TOTAL COST PER DAY</b>					<b>2100</b>
	<b>COST PER WEEK</b>					<b>10500</b>
	<b>COST 73 WEEK</b>					<b>766,500</b>

# MATERIAL COSTS

ESTIMATE No. 6363-1  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET No. M  
 WORK: METRO RAIL PROJECT WORK ITEM No. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 5 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No. OR QTY. WORK INFORMATION

Assume Tunnel Muck Loaded on truck hauled  
 to disposal site at 5<sup>00</sup>/hour  
 $1 \text{ LF} \cdot 11 \frac{1}{2} \text{ Bay} \times 1.50 = \text{Say } 17 \text{ LF} \cdot 2600 = 10200$   
 $\times 2 \text{ Tunnels} = 20400$   
 $10200 - 10200 = 0$   
 Reach

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>Muck Disposal</u>	<u>12,100 LF</u>	<u>10200</u> <u>20400</u>	<u>2,468,400</u>
	<u>Misc Small Tools &amp; Supplies</u>			
	<u>Estimate misc small tools, supplies and consumables @ 4% labor 216,000 say \$ 8500/week</u>			
	<u>TOTAL 13 weeks</u>	<u>12,100 LF</u>	<u>8500</u>	<u>620,500</u>

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SORTO METCO RAIL GROUP

SHEET No. M

WORK: \_\_\_\_\_

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GAE DATE: 3-22-83

QUANTITY: REACH No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.

WORK INFORMATION

ELECTRIC POWER CONSUMPTION  
TOTAL TUNNEL REACH = 93,100 LF ÷ 7 = 13,300 Ave 7 Tunnels  
2 headings

REF. NO. OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

ELECTRIC POWER

- 1- 1200 Comp. 460 hr @ 9 hr/day
- 1- 40 hp pump @ 24 hr/day
- 1- 25 hp conveyor @ 8 hr/day

4050  
960  
200

- 2- 1000 hp TBM (490 min)
- 2- 100 hp brkt (300 min/day)

12000 hp hr  
1000 hp hr

- 1- 75 hp Vent Fan (ave)
- @ 24 hr/day =

25,200 hp hr

- 2- Grout pump (90 min/day)
- 2- 150 hp

30 hp hr

Allow Misc

560

TOTAL ELEC MOTORS

44,000 hp hr

@ 0.74¢ @ 80% =

27,000 kWh

Lighting

- FOR TBM 20 kW @ 24 hr
- Headings 2 @ 10 kW @ 24 hr
- Line 7000 ÷ 40 = 175 @ 0.1 @ 24 hr
- Misc Allow
- OFFICE & HOUS

480  
480  
420  
120  
500  
2000

TOTAL Elec Per Day

29,500 kWh

Add. to weekend peaking  
2500 kWh / 7 days =

1000

Cost Per Day

1450<sup>00</sup>

Cost Per Week

7500

TOTAL COST 73 weeks

547,500

# MATERIAL COSTS

ESTIMATE No. 6363-1  
 SHEET No. M  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No. 5

REF. NO. OR QTY. WORK INFORMATION

*Estimate Cutter Costs*  
 Say 45 cutters @ 1500<sup>00</sup>/pc = 67500  
 2 builders @ 16750 = 33500  
 101,000  
 Say 600 hr are life in Allow & Finance @ 170<sup>00</sup> x 6 = 1020 = 6 = 25<sup>00</sup>/hr  
 300 hr are life in Result = 375<sup>00</sup>/hr x 6 = 2010 = 40 = 50<sup>00</sup>/hr

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	Reach 7 (Trans Sta)	8500 LF	25	
	5	12100 -	25	
	6	10400 -	25	
	8 Thin Sta	8000 LF	25	
	10	17000	25	
	12	16500	50 <sup>00</sup>	
	14	9700	25	
				302500

# MATERIAL COSTS

ESTIMATE No. 63637

FOR: SCR7D GROUP: \_\_\_\_\_

SHEET No. M-4

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-22-87

QUANTITY: Reach No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LF to figure and deliver non-gasketed liners, 500<sup>00</sup>/LF to gasketed liners per LF Tunnel.  
 Grout Behind Liner = 0.39 cu/LF at 75<sup>00</sup>/cu = 30<sup>00</sup>/LF  
 @ Tunnels = 60<sup>00</sup>/LF Perm Mat.

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	SCR7D MARZ C <sub>2</sub> S <sub>2</sub>			
	LX 12,100	24,200	\$ 600	14,520,000
	RX		500	
	Grout Behind Liner	24,200	30 <sup>00</sup>	726,000
	<b>Total LINERS</b>			<b>15,246,000</b>

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFTD GROUP SHEET NO. L-3

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHE DATE 3-22-83

QUANTITY REACH No 5 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	<u>CROSS PASSAGE CONST</u>							
2								
3	<u>Support &amp; Service</u>	25	13	13	51	30 <sup>00</sup>	1530	
4	Cost Per Day						12940	
5	Cost Per week						61200	
6								
7								
8								
9								
10	<u>26 TA CROSSOVER</u>							
11	TOTAL 14 Weeks							856 800
12								
13	<u>CROSS PASSAGE Wdg. BRW</u>							
14	2 crews	18	18	18	54	30 <sup>00</sup>	1620	
15	Cost Per Day						12960	
16	Cost Per week						64800	
17								
18								
19								
20	TOTAL 11 Weeks							712 800
21								
22								
23								
24	<u>TRASPOT + Muck haul</u>	4	4	4	12	30 <sup>00</sup>	360	
25	Cost Per day						2880	
26	Cost Per week						14400	
27								
28								
29								
30	TOTAL 14 Weeks							201 600
31								
32								
33	<u>BULL GANG</u>	5			5	30 <sup>00</sup>	150	
34	Cost Per day						1200	
35	Cost Per week						6000	
36								
37								
38	TOTAL 14 Weeks							84 000
39								
40								
41	<u>CONCRETE CREW</u>							
42	2 crews	36	36	36	108	30 <sup>00</sup>	3240	
43	Cost Per Day						25920	
44	Cost Per week						129600	
45								
46								
47	TOTAL 14 Weeks							1 814 400
48								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6353-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: OHC DATE: 3-23-8

QUANTITY: REAC4 No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<u>CROSS PASSAGE CONSTRUCTION</u>

REF. NO. OR QTY.	DESCRIPTION	HOURS		Operating Cost		
		No. UNIT	HRS/HR	TOTAL	Hourly	Cost
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane 2 sh @ 4 hr</u>	1	8		35 <sup>00</sup>	280 -
	<u>70 Ton Hyd. Crane 1 sh @ 6</u>	1	6		100 <sup>00</sup>	600 -
	<u>FE Ldr (946)</u>	1	4		46 <sup>00</sup>	184 -
	<u>FLAT BED TRUCK 5TN</u>	1	6		18 <sup>00</sup>	108 -
						1172 -
	<u>1800 cfm Comp</u>	1	21		5 <sup>10</sup>	105 -
	<u>3 sh @ 7 hr</u>				0 <sup>30</sup>	19 -
	<u>40 hp. Pump</u>	1	24			
	<u>85 hp. Compressor</u>	1	4		5 <sup>00</sup>	20 -
	<u>5TN 4000 Switch</u>	1	8		18 <sup>00</sup>	144 -
						288 -
	<u>TOTAL Cost per Day</u>					1460 -
	<u>COST Per week</u>					7300 -
	<u>TOTAL Cost 14 weeks</u>					102200

# MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_ ESTIMATE NO. 6313-1  
 WORK: METRO RAIL PROJECT SHEET NO. M 5  
 LOCATION: \_\_\_\_\_ WORK ITEM NO. \_\_\_\_\_  
 QUANTITY: REACH NO 5 PREPARED BY: GHC DATE: 3-26-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

Cross Passage Excav.  $40 \text{ Bay/ft} \times 15' = 210 \text{ CC}$   
 Much Disposal @  $6^{00}/\text{CC} = \$1260/\text{cross passage}$

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

No Cross Passage

22

1260

27720

MISC. SMALL TOOLS  
+ SUPPLIES

@ 40% Labor \$275,800/wk  
16 weeks

14

\$11,000

154000



# MATERIAL COSTS

ESTIMATE No. 6363-1  
 SHEET No. M-6  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GHK DATE: 3-22-53  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 5

REF. No.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

	1 - 1200 cfm 450 hp Comp. 21 hr/day	9450 hp hr			
	1 - 40 hp Pump @ 24	960 hp hr			
	1 - 25 hp Compressor @ 4	100 hp hr			
	1 - 75 hp Concrete Pump @	600 hp hr			
	14 - 75 hp Vent Fans @ 24 hr/day	25200 hp hr			
	Allow Misc	690			
	<b>TOTAL Elec</b>	<b>37005 hp hr</b>			
	@ .746 c/kwh				22,000 kwh
	Lighting				
	Partial 20 kw @ 24	480			
	Ads 405 kw @ 24	480			
	LINE 350 @ 0.1 x 24	840			
	OFFICE SHOP	500			
	MISC	700			
		<u>2500</u>			
	<b>TOTAL Elec per Day</b>	<b>24500 kwh</b>			
	Add for weekend 1 day	500			
		<u>25,000 kwh</u>			0.25
	Cost per Day				1250
	Cost per Week				8750
	Cost 14 weeks				122500

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passages - Exca. CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION				
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Suppl	Op	Wks	Exc	Cost	Wks	Exc	Cost		
1																
2	<u>Support &amp; Service</u>															
3																
4	<u>Walker</u>	1	1	1	3	3										
5	<u>Crane Oper</u>	1	1	1	3		3									
6	<u>Crane Oper</u>	1			1		1									
7	<u>Topman</u>	1			1			1								
8	<u>Topman boy</u>	1	1	1	3			3								
9	<u>Charge Hand</u>	1			1			1								
10	<u>Compr. Oper</u>	1	1	1	3		3									
11	<u>Mech. Foreman</u>	1			1		1									
12	<u>Mechanic</u>	2	2	2	6		6									
13	<u>Fleet Foreman</u>	1			1											
14	<u>Electrician</u>	2	1	1	4				4							
15	<u>Paint. Oper</u>	1			1		1									
16	<u>Miner</u>	4	4	4	12			12								
17	<u>Loos Oper</u>		1	1	2			2								
18	<u>Tractor man</u>		1	1	2			2								
19	<u>Truck Driver</u>	1			1											
20	<u>Carpenter</u>	1			1											
21	<u>Labo</u>	4			4				4							
22	<u>Pipe Fitter</u>	1			1											
23	<u>2 crossovers - me/day</u>				5	3		17	17	4	5	1		1	1	
24	<u>14 wks/22</u>															
25																
26																
27	<u>Crossing Heating &amp; Crows</u>															
28	<u>Shiller</u>	2	2	2	6				6							
29	<u>Miner</u>	8	8	8	24				24							
30	<u>Chuck Tester</u>	4	4	4	12				12							
31	<u>Ripper</u>	2	2	2	6				6							
32	<u>Mucker (20)</u>	2	2	2	6				6							
33		18	18	18	54		6		48							
34																
35	<u>Muck handle</u>															
36	<u>Loos Oper</u>	2	2	2	6				6							
37	<u>Blade man</u>	2	2	2	6				6							
38									12							
39																
40	<u>Roll Gang</u>															
41	<u>Foreman</u>	1			1				1							
42	<u>Roll Gang</u>	4			4				4							
43																
44																
45																
46	<u>Total Exca. 2 Crows</u>				122											
47																
48	<u>1 Crossover</u>				61											
	<u>Allow Exca. 5 days</u>															

# LABOR COSTS

ESTIMATE 6363-1

FOR SOFTO GROUP \_\_\_\_\_ SHEET NO. L  
 WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION backstage PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 QUANTITY Class Passage - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	PAYROLL				DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		W	W	W	W	W	W	W	W		
1																
2	Support & Service															
3	Concrete work crew															
4																
5	Concrete Crew															
6	Shutter	1	1	1	3											
7	Concrete Formwork	1	1	1	3											
8	Shutter	1	1	1	3											
9	Concrete Formwork	1	1	1	3											
10	Shutter	1	1	1	3											
11	Concrete Formwork	1	1	1	3											
12	Shutter	1	1	1	3											
13	Concrete Formwork	1	1	1	3											
14	Shutter	1	1	1	3											
15	Concrete Formwork	1	1	1	3											
16	TOTAL Crews =				54											
17																
18	2 Crews															
19																
20																
21																
22																
23																
24	TOTAL MEN =															
25	Note Aug 22 Crossover															
26																
27																
28																
29	Support & Service crew = 14 wk @ 51				714											
30	Excav = 11 wk @ 54				594											
31	Transport = 14 wk @ 12				168											
32	Backstage = 14 wk @ 5				70											
33	Concrete Lab. = 14 wk @ 108				1512											
34																
35																
36	TOTAL Man-works for				3003											
37																
38	Rev. for Concrete Man-works				140											
39																
40	Rev. for Support/Excav				700											
41																
42																
43																
44																
45																
46																
47																
48																



TITLE SCRIPD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6913-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHC DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

CROSS PASSAGES  
Tunnels 42'-8"  $\phi$  to  $\phi$   
Sewer Passages 25' dia.

Excavate Soil

Excav. Neat =  $9^5 \times 12^5 = 118^5$  cu ft  $4^5$  cu ft = 110  
Excav w/BER =  $11^5 \times 14^5 = 154^5$  cu ft =  $5^5$  cu ft = 148

Concrete 27 cu yds  $46^5$   
Neat  $118^5 - (5^5 \times 3^5) = 74^5$  cu ft =  $2^5$  cu yds  $\times 27 = 72^5$   
w/BER  $154^5 - 46^5 = 108^5$  cu ft =  $4^5$  cu yds  $\times 27 = 108^5$   
TRUCKS w/BER  $11 \times 2^5 \times 27 = 28^5$   
Wall & Arch  $83^5$   
108^5

Soft Rock  
Excav. Neat



# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRIP GROUP: \_\_\_\_\_

SHEET No. M-7

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHL DATE: 3-22-83

QUANTITY: REACH NO 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

## CROSS PASSAGE WORK INFORMATION CONCRETE MATERIALS

Concrete 110 cu/ per passage @ 60.00 \$ 6600  
 Rebar 1109 @ 250' = 27000' @ 0.60 \$ 13,200  
 Form 5' x 8' = 22' x 2' = 44 SF  
 8' x 2' = 16 SF  
 Total 60 SF @ 300.00 / passage = \$ 20,000

REF. No.  
OR QTY.

DESCRIPTION	QUANTITY	UNIT COST	AMOUNT			
PERMANENT MATERIAL NO CROSS PASSAGE	22	\$ 20000	440000			
FORMS - Sill Piles Provide 3 sets Red FORMS @ 560 SF 1201 54110'	1680 SF	50.00	\$ 84000	84000		

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCHTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJ

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

CROSS PASSAGE CONSTR

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNITS EA TOTAL

Total Op. & Ref.

Cross-Pass Excav

Einco 630 2 EA 20 40 2000 1040  
Air Spade Drills etc 8 20 160 160

Loco & CARS

25 Tn Loco @ 84 2 8 16 2500 400  
in 3 shifts

Huck Cars 4 4 16 160 30  
Other Cars 8 4 32 100 30

CONCRETE

Concrete Pump 1 8 8 1500 120

Concr. Agitator Cars 4 8 32 500 160

VIBRATORS Misc 4 8 32 200 60

Cost Per Day \$ 2000

Cost Per Week 10,000

Cost 14 Weeks 140,000



# LABOR COSTS

11

ESTIMATE \_\_\_\_\_

FOR SOFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Turnout Cleanup - 500 ft. section CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	ELECT	DISTRIBUTION	MATERIAL
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL					
1	<u>Service &amp; Repair</u>									
2										
3										
4	<u>Walker</u>	1	1	1	3	3				
5	<u>CRANE OPER</u>	2	1	1	4					
6	<u>CRANE DRIVER</u>	1			1					
7	<u>TOP MAN</u>	1			1					
8	<u>BOTTOM MAN</u>	1	1	1	3		3			
9	<u>CHARGE H&amp;S ATTN</u>	1			1					
10	<u>CONTR. OPER</u>	1	1	1	3		3			
11	<u>MECH. FOREMAN</u>	1			1					
12	<u>MECHANIC</u>	2	1	1	4		4			
13	<u>ELEC. FOREMAN</u>	1			1					
14	<u>ELEC.</u>	4	1	1	6				6	
15	<u>PROP. OPER</u>	1	1	1	3		3			
16	<u>MINE</u>	2	2	2	6		6			
17	<u>LOCO OPER</u>		1	1	2		2			
18	<u>PROP. OPER</u>		1	1	2		2			
19	<u>TRUCK DRIVER</u>	1			1					
20	<u>CARPENTER</u>	1			1					1
21	<u>LABOR</u>	4			4		4			
22	<u>PIPE FITTER</u>	1			1					1
23										
24					48	3	20	11	4	7
25	<u>Cleanup Crew (2.67)</u>									
26	<u>SHIFTER</u>	2	2	2	6		6			
27	<u>MINE</u>	4	4	4	12		12			
28	<u>TURNOUT LABOR</u>	8	8	8	24		24			
29										
30					47		47			
31										
32	<u>Transport</u>									
33	<u>LOCO OPER</u>	2	2	2	6		6			
34	<u>MATERIAL</u>	2	2	2	6		6			
35					12		12			
36										
37										
38	<u>Blue Prints</u>									
39										
40	<u>Foreman</u>	2			2		2			
41	<u>Blue Print Labor</u>	8			8		8			
42	<u>Loco Oper</u>	2			2		2			
43	<u>Material</u>	2			2		2			
44					14		4	10		
45										
46										
47	<u>Total Per Day</u>				116	3	36	63	4	7
48										

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L-4

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - Tunnel PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY REACH No 5 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>Sec &amp; Support</u>							
4		<u>26</u>	<u>11</u>	<u>11</u>	<u>48</u>			
5								
6								
7								
8								
9								
10								
11								
12	<u>CLEANUP CREWS</u>							
13		<u>14</u>	<u>14</u>	<u>14</u>	<u>42</u>			
14								
15								
16								
17								
18								
19								
20								
21	<u>TRANSPORT CREW</u>							
22		<u>4</u>	<u>4</u>	<u>4</u>	<u>12</u>			
23								
24								
25								
26								
27								
28								
29	<u>BULL GANG</u>							
30		<u>14</u>			<u>14</u>			
31								
32								
33								
34								
35								
36								
37								
38	<u>TOTAL</u>				<u>116</u>	<u>30</u>	<u>3480</u>	
39								
40	<u>COST PER DAY</u>						<u>27840</u>	
41								
42	<u>COST PER WEEK</u>						<u>139200</u>	
43								
44								
45								
46	<u>TOTAL 5 Weeks</u>							<u>696 000</u>
47								
48								

190

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: JHE DATE: 3-23-82

QUANTITY: REAC4 No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.      WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost	
		No. UNITS	Hrs/Unit	TOTAL		
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane</u> <u>3 sh @ 4 hr</u>	1	12		35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane</u> <u>1 sh @ 4</u>	1	4		100 <sup>00</sup>	400 -
	<u>FE Ldr (940)</u>	1	4		46 <sup>00</sup>	184 -
	<u>FLAT BED TRUCK STN</u>	1	5		15 <sup>00</sup>	75 -
						710 -
	<u>1800 cfm. Comp.</u> <u>3 sh @ 7 hr</u>	1	21		5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24		0 <sup>80</sup>	19 -
	<u>65 hp. Crane</u>	1	4		5 <sup>00</sup>	20 -
	<u>15 TN 4000 Sw. Lch.</u> <u>2 sh @ 4</u>	1	8		18 <sup>00</sup>	144 -
						293
	<u>TOTAL Cost Per Day</u>					1000
	<u>Cost Per week</u>					5000 -
	<u>TOTAL Cost 5 weeks</u>					25 000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 63631  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET NO. E-5  
 WORK: NETS RICE PROJECT WORK ITEM NO. \_\_\_\_\_  
 LOCATION: CLEANUP PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 5 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

Cleanup at 500 ft per day

REF. NO. OR QTY.	DESCRIPTION	HOURS			Total Opn & Rep.				
		No	UNITS	FA	TOTAL				
	<u>Under Equip.</u>								
	<u>Emco 630</u>	2	10	20	40	26 <sup>00</sup>	10 <sup>00</sup>		
	<u>MISC</u>						60		
	<u>Loco &amp; Cars</u>								
	<u>25 Ton v.</u>	2		10	20	25	5 <sup>00</sup>		
	<u>Muck Cars</u>	4		10	40	1 <sup>00</sup>	60		
	<u>Office Cars</u>	4		10	40	1 <sup>00</sup>	40		
	<u>TOTAL Per Day</u>						17 <sup>00</sup>		
	<u>Total Per Week</u>						8 <sup>50</sup>		
	<u>TOTAL 5 weeks</u>								42500

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M-8

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GLK DATE: 3-22-53

QUANTITY: REACH No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No. OR QTY. WORK INFORMATION

ELECTRIC POWER

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1- 1200 cfm 450 hp Comp. @ 21 hr/day	9450 hp hr		
	1- 40 hp Pump @ 24	960 hp hr		
	1- 25 hp Conveyor @ 4	100 hp hr		
	1- 407 Hi Pl. Pump	600 hp hr		
	14- 75 hp Vent Fans @ 24 hr/day	25200 hp hr		
	Allow Misc	690		
	<u>TOTAL Elec</u>	<u>37000 hp hr</u>		
	@ .74¢ @ 80%	22,000 kWh.		
	<u>Lighting</u>			
	Potential 20 kw @ 24	480		
	Wiring 20 kw @ 24	480		
	LINE 350 @ 0.1 x 24	840		
	OFFICE SHOP	500		
	MISC	700		
		<u>2500</u>		
	<u>TOTAL Elec per Day</u>	<u>24500 kWh.</u>		
	Add for weekends 5%	500		
		<u>25,000 kWh.</u>		
	Cost per Day			1250
	Cost per Week			8750
	Cost 5 weeks			43750

31 250 143

# MATERIAL COSTS

ESTIMATE NO. 6365-1  
 SHEET NO. M-10  
 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PARROT  
 LOCATION: Clean up  
 QUANTITY: REACH N<sup>o</sup> 5

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

MISC Small Tools  
& Supplies

AT 5% Lab'l 139200  
 Say 7000<sup>00</sup>/wk

No Weeks

5

7000

35000



# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY RUE DATE 3-27-83

QUANTITY INSTALL STEEL LINER CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	REACH No 5							
2	SCFD Time of Assume 78 H/Day							
3	SERVICE & Support							
4	①	30	19	19	68	30 <sup>00</sup>	2040	
5	Cost Per Day						16320	
6	Cost Per Week						81600	
7	Cost _____ weeks							
12	LINER HANDING CREW							
13	①	18	18	18	54	30 <sup>00</sup>	1620	
14	Cost Per Day						12960	
15	Cost Per Week						64800	
16	Cost _____ weeks							
21	MAT'L TRANSFER CREW							
22	①	8	8	8	24	30	720	
23	Cost Per Day						5760	
24	Cost Per Week						28800	
25	Cost _____ weeks							
30	PULL GANG							
31	①	4	4	4	12		540	
32	Cost Per Day						4320	
33	Cost Per Week						21600	
34	Cost _____ weeks							
40	TOTAL Cost Per Week						196800	
45	TOTAL 31 Weeks							6,100,800



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-6

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHE DATE: 3-23-82

QUANTITY: REACH No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS		Operating Cost	
		No UNIT	HRS	Per Unit	Total
	<u>SERVICE &amp; SUPPORT</u>				
	<u>18 Ton Hyd. Crane</u> <u>3 sh @ 4 hr</u>	1	12	35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane</u> <u>3 sh @ 4</u>	1	12	100 <sup>00</sup>	1200 -
	<u>FE Ldr. (946)</u>	1	4	46 <sup>00</sup>	184 -
	<u>FLAT BED TRUCK 5TN</u>	1	6	18 <sup>00</sup>	108 -
					1910
	<u>1800 cu. Comp.</u> <u>3 sh @ 7 hr</u>	1	21	5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24	0 <sup>80</sup>	19 -
	<u>85 hp. Comp.</u>	1	4	5 <sup>00</sup>	20 -
	<u>5TN 4000 Sw. ch.</u> <u>2 sh @ 4</u>	1	8	18 <sup>00</sup>	144 -
					270
	<u>TOTAL Cost per Day</u>				2200
	<u>COST Per week</u>				11000 -
	<u>TOTAL COST 35 weeks</u>				341000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRIPT GROUP: \_\_\_\_\_

SHEET NO. E-7

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 5-23-83

QUANTITY: REACH NO 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<u>INSTALL STEEL LINER - Details taking into SCRTD life</u>

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost		
		No.	UNIT	TOTAL			
	Allow for welding jacks, tuggis etc 30 hrs @ 5 hr x 4	2	Lot	15	30 hr.	1500	450
	Locos. + Cars						
	25 to loco @ 10 hrs each	4		10	40 hr	2500	1000
	Cars	8		10	80	1000	800
	CRUIT pump.	2		5	10	300	300
	Cost per Day						1560
	Cost per Week						7500
	Cost 31 weeks						241800

# MATERIAL COSTS

ESTIMATE No. 6363-1  
 SHEET No. M-11  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GHR DATE: 3-22-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 5

REF. NO. OR QTY. WORK INFORMATION

ELECTRIC POWER

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1- 1200 cfm 450 hp Comp. @ 21 hr/day	9450 hp hr		
	1- 40 hp Pump @ 24	960 hp hr		
	1- 25 hp Compressor @ 4	100 hp hr		
	1- LOT WELDERS	600 hp hr		
	14- 75 hp Vent Fans @ 24 hr/day	25200 hp hr		
	ALLOW MISC	690		
	<u>TOTAL PERC</u>	<u>37055 hp hr</u>		
	@ .746 x 25%	22,000 kWh		
	<u>Lighting</u>			
	Potential 20 kw @ 24	480		
	Watts 405 kw @ 24	480		
	LINE 350 @ 0.1 x 24	840		
	OFFICE SHOP	500		
	MISC	700		
		<u>2500</u>		
	<u>TOTAL PERC PER DAY</u>	<u>24500 kWh</u>		
	Add for weekend day	500		
		<u>25,000 kWh</u>		
	COST Per Day			1250
	COST Per Week			8750
	COST 31 Weeks			271250

# MATERIAL COSTS

ESTIMATE No. 63631

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-12

WORK: METRO RARC Project

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

No. of bits given SCRTD Allow  $1135 \text{ lps} @ 60 \text{ lps} = 631^{\text{st}}$   
 Reach 5 = Grant at  $10 \text{ lps} @ 400 = 40$   
 8 = Total  $671$   
 OK to use for estimate

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PEELY MAT'L  
 Reach 5  
 Reach 8

12100 LF

74<sup>00</sup>

~~8724100~~  
 8724100

5250 LF

74<sup>00</sup>

Small Tools & Supplies  
 Use 5% labor  $192809 / \text{wk} =$   
 = Say \$10000

No Weeks

31

10000

310000

# LABOR COSTS

N

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel 5 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	Finish Handout			12	12			
3								
4	Finish Concrete 50% @ 15			60	60			
5								
6								
7	Iron Reinforcement							8 m/ps
8								
9								
10	Local Operator					0.05 m/ps		4 m/ps
11								
12								
13	Place Concrete							
14	600 LF @ 0.234							
15								
16	Shift 1	1			1			
17	Local Labor	4			4			
18	Conf. Personnel		1		1			
19	Conf. Personnel		2		2			
20	Labor		2		2			
21	Iron worked	6		2	8			
22	Local Labor			1	1			
23	Conf. Personnel			1	1			
24	Local Labor			1	1			
25	Local Labor	1	1	2	4			
26	Local Labor	1	1	2	4			
27	Cement Finish			1	1			
28					4			
29	Service & Support				4			
30					4			
31	Use Proprietary							
32	As for Tunnel Clearance				4			
33								
34								
35								
36								
37	Place Concrete				83	13.23	8	15 14
38	Service Support				43	3	20 14	7 1 1 1
39								
40								
41	Iron Handout				12			
42								
43	Total Personnel				143		37 13	7 17 24 1 1
44								
45								
46								
47								
48								



# LABOR COSTS

ESTIMATE 6367-1

FOR SCFTD GROUP \_\_\_\_\_ SHEET NO. L 46

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel Length No 5 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				<u>49</u>	<u>30</u>		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSPORT</u>				<u>14</u>			
13								
14								
15								
16								
17								
18								
19	<u>PLACE CONCRETE</u>							
20	<u>4" Tunnel</u>				<u>83</u>			
21								
22								
23								
24								
25	<u>INSTALL HORIZONTAL</u>				<u>14</u>			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	<u>TOTAL</u>				<u>160</u>	<u>30</u>	<u>4800</u>	
36	<u>TOTAL Per Day</u>						<u>39000</u>	
37								
38	<u>TOTAL Per Week</u>						<u>190000</u>	
39								
40								
41								
42								
43								
44	<u>TOTAL 12 Week</u>							<u>2,304,000</u>
45								
46								
47								

# EQUIPMENT OPERATING COSTS

FOR: SCRIPT GROUP: \_\_\_\_\_ ESTIMATE NO. \_\_\_\_\_  
 WORK: METRO RAIL SHEET NO. E-8  
 LOCATION: \_\_\_\_\_ WORK ITEM NO. \_\_\_\_\_  
 QUANTITY: Reach No. 5 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost		
		No	UNIT	TOTAL	Per Unit	Total	Total
	<u>SERVICE &amp; SUPPLY</u> <u>Use Cost Per Week</u>  <u>TOTAL 12 weeks</u>					<u>500</u>	<u>60000</u>



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1  
 FOR: SCTD GROUP: \_\_\_\_\_ SHEET NO. E-29  
 WORK: METRO RAIL PROJ WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 5 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	DESCRIPTION	HOURS			Total Opn & Exp.	
		No. Units	EA	TOTAL		
	Allow	2 EA	20	40	2600	1040
	Air Spade Drills etc	8	20	160	100	160
	<u>LOCO &amp; CARS</u>					
	25 TD Loco @ 8 hr in 3 shifts	2	8	16	2500	400
	Muck Cars	4	4	16	150	30
	Other Cars	8	4	32	100	30
	<u>CONCRETE</u>					
	Concrete Pump	1	8	8	1500	120
	Concr. Agitator Cars	4	8	32	500	160
	VIBRATORS Misc	4	8	32	200	60
	Cost Per Day				\$ 2000	
	Cost Per Week				12,000	
	Cost 12 weeks					120,000

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M-13

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GLK DATE: 3-22-33

QUANTITY: REACH No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

ELECTRIC POWER

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1- 1200 cfm 450 hp Comp.	9450 hp hr		
	21 hr/day			
	1 40 hp Pump @ 24	960 hp hr		
	1- 25 hp Conveyor @ F	100 hp hr		
	1- Lot Hi fl. Pump	600 hp hr		
	1/4- 75 hp Vent Fans @ 24 hr/day	25200 hp hr		
	Allow Misc	690		
	<u>TOTAL Elec</u>	<u>37000 hp hr</u>		
	@ .746 @ 80%	22,000 kWh.		
	<u>Lighting</u>			
	Pot. 4 @ 20 kw @ 24	480		
	Wks 4 @ 5 kw @ 24	480		
	LINE 350 @ 0.1 x 24	840		
	OFFICE SHOP	500		
	MISC	700		
		<u>2500</u>		
	<u>TOTAL Elec per Day</u>	<u>24500 kWh</u>		
	Add for weekends 5%	<u>500</u>		
		<u>25,000 kWh.</u>		
	Cost per Day		0.25	125
	Cost per Week			125
	Cost 12 Weeks			6250
				75000 156

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SECT D GROUP: \_\_\_\_\_

SHEET No. M-14

WORK: META RAIL RAILING

WORK ITEM No. \_\_\_\_\_

LOCATION: FINISH TUNNEL

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACT No 5

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PURCHASE HANDRAIL  
2 Tonnels

2.0

10.00

20

POUR CONCRETE  
2 @ 1.17 =

2.50 cy

60.00

150.00

COST OF MAT'L

1 LF

170.00

PERM MAT'L

Reach 2  
5  
6  
10  
12  
14

7500 LF  
12100 LF  
12500 LF  
7000 LF  
17000 LF  
10500 LF  
19700 LF

170.00  
1  
1  
1  
1  
1  
1

2057.000

Misc Small Tools  
and Supplies

Use 510 LAGIR 192,000  
5M 10,000

No Weeks

12

10000

120.000

PLANT & EQUIPMENT DETAIL

SCRIPD METRO RAIL PROJECT

ESTIMATE NO. 6363-1

Reach 5 14,500 LF Total (12,100)

SHEET NO.

PREPARED BY: GAF

DATE: 3-21-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & ANKILL:			4,400,000		10	1,100,000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1,540,000								
	MISC UNDERGROUND			1,250,000								
	RAIL TRACKAGE			688,750								
	VENTILATION SYSTEM			981,000								
	CONCRETE EQUIPMENT			262,000								
	COMMUNICATIONS EQUIP			12,250								
	ALIGNMENT CONTROL			15,000								
	ELECTRICAL EQUIPMENT			894,500								
	AIR WATER DEWATER			1,357,500								
	OTHER PLANT			308,000								
				6,084,000		10	1,446,000					
				10,484,000			1,084,000					

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PLANT & EQUIPMENT DETAIL

SCHT'D METRO RAIL PROJECT

ESTIMATE NO. 6363-1

LEACH 5 14,500 LF TOTAL (12,100)

SHEET NO.

PREPARED BY: GHC

DATE: 3-21-82

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	BALVAGE %	WEIGHT IN TONS		P.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			UNIT	TOTAL			
<u>TUNNEL EXCAV.</u>											
2 EA	TBM incl Trailing Gear, - conveyor - dust suppression for 300TN @ 1000 hp		2200000				300	600			
							100	200			
				4400000			400				
<u>Locomotives &amp; Cars</u>											
4	25 TN Diesel loco, Muck		200,000	800000			25				
2	15 TN Bullgan		120000	240000			15				
12	10 cu Muck Car 5TN		16000	192000			5				
8	Flat Car 8whl		12000	96000			4				
2	Man Cars 4whl		6000	12000			2				
2	Fan Line Cars		20000	40000			8				
1	Coal Dumper		80000	80000			30				
2	Grout Car & Pump		40000	80000			30				
	<u>TOTAL loco &amp; Cars</u>			1546000							
<u>Misc UNDERGROUND</u>											
4	SINKER DRILLS		4000	8000			0				
4	STRIKER DRILLS		2500	10000			0				
4	AXLES DRILLS		2500	10000			0				
2	4" Drift for Plot		16000	32000			0				
2	Drift Boom & Side		14000	28000			1				
2	Turner hoists		5000	10000			1				
2	Air Wrenches		500	4000			0				
4	Oxy Acet. Outfit		1000	4000			0				
1	Elec Welder 300amp		2000	8000			0				
1	PERTO JACKS		1000	8000			0				
1	Chipping gun, A.R		250	1000			0				
1	Misc Conc, Steel Drills		500	2000			0				
	<u>TOTAL Misc Equip</u>			125000							

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PLANT & EQUIPMENT DETAIL

SECT D METRO Rail Project

REACT 5

ESTIMATE NO. 6367  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-2-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<b>RAIL TRACKING</b>												
40 Ton	4000 LF 60" x 48" Rail		500	20000								
2500 lb	Spikes		0	625								
6000 LF	ANGLE BARS RAILS ok		0	1500								
500 LF	5" x 3" x 5" Ties @ 500		9	450								
1 Lot	MISC			875								
	<b>COST Per 1000 LF (2 TUNNELS)</b>			<b>27500</b>					<b>443</b>			
14 1/2	LF TUNNELS		27500	398750					443			
8 EA	TURNOUTS, Frog Switches		5000	40000					20			
7 EA	CALIFORNIA SWITCH		125000	250000					500			
	<b>TOTAL RAIL TRACK COST</b>			<b>688,750</b>								
<b>VENTILATION SYSTEM</b>												
FOR 2 TUNNELS @ 1000 LF												
2	7' x 10' Air Vane Fans w/ Switch		12500	25000					30			
2000 LF	48" x 18" Gal. Ducting w/ Sple.		2000	40000								
2000 LF	Hangers & Hardware		0	1000								
	<b>COST Per 1000 LF</b>			<b>66000</b>					<b>40</b>			
14 1/2	LF TUNNELS		66000	957000					40			
2 EA	ELBOW		2000	4000					20			
2 EA	INLET & Silencer		10000	20000					50			
	<b>TOTAL COST VENTIL.</b>			<b>981,000</b>								

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PLANT & EQUIPMENT DETAIL

SECRET

REACH 3

ESTIMATE NO. 6303-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: Jan DATE: 3-21-87  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>CONCRETE Equip</u>											
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Post Concrete Pump/Car		30000	30000								
1 EA	Shotcrete Outfit		45000	45000								
1 EA	SAND BLAST OUTFIT		3000	3000								
4 EA	6 in. Concrete Agitator Cars		25000	100000								
1 LOT	VALATORS & MISC		4000	4000								
200 LF	SPICK LINE		1000	2000								
1 EA	Swing Spring Key		3000	3000								
	TOTAL CONCR & GROUT EQUIP			260000								
				262000								
	<u>Communications Equip.</u>											
	SWITCH BOARD & Hookup			500								
	Cost Per 1000 A (2 turn in)											
1000 LF	Telephone line		0.20	400								
75	Telephones		50.00	100								
	Cost Per 1000 LF			500								
14.5	LF Tunnel (reach)		500.00	7250								
	TOTAL COMMUN			12750								
	<u>ALIGNMENT CONTROL</u>											
2 EA	LASER GUIDANCE SYSTEM		5000	10000								
1 LOT	ENGR SURVEY EQUIP.		5000	5000								
				15000								

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# PLANT & EQUIPMENT DETAIL

SCR 70 METRO TUNNEL

REACH

ESTIMATE NO. 2353-1

SHEET NO. \_\_\_\_\_

PREPARED BY: [Signature]

DATE: 7-21-83

CHECKED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>ELECTRICAL EQUIPMENT</u>												
1	Sub-station - Hook up			5000								
3 EA	1000 KVA Transformer			30000								
1 EA	300 KW Standby Generator			75000								
1 LOT	SWITCH GEAR			25000								
	<u>TOTAL ELECTRIC PLANT</u>											
	<u>ELECTRICAL Tunnel Plant</u>											
	<u>FOR 2 TUNNEL @ 1000 LF</u>											
2000	LF POWER CABLE			10 <sup>00</sup>	20000							
2 EA	100KVA 27.5kV Transformer			9000	18000							
3000	LIGHTING LINE			0 <sup>50</sup>	1500							
50	LIGHT DISTANCE			5 <sup>00</sup>	250							
	MISC OUTLET				750							
2000	MISC GAS, Lighting etc Lines			0 <sup>50</sup>	1000							
	<u>TOTAL Elec for 2 Tunnel</u>				41000							
145	LF TUNNEL			41000	594500							
	<u>TOTAL ELECTRICAL</u>				894500							
	<u>AIR WATER Dewater</u>											
	<u>FOR 2 TUNNEL @ 1000 LF</u>											
2000	LF 4" Water Line			4 <sup>00</sup>	8000							
80 EA	Ground Clips			25 <sup>00</sup>	2000							
4000	LF 6" AIR LINE			8	16000							
80 EA	Ground & Clamps			50 <sup>00</sup>	4000							
2000	LF 10" Dewater Line			15 <sup>00</sup>	30000							
80 EA	Ground & Clips			100 <sup>00</sup>	8000							
2 EA	Allow for Misc. Valves & Fittings				2000							
	Air Pumps			2500	5000							
	<u>COST per 1000 LF TUNNELS</u>				75000							

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PLANT & EQUIPMENT DETAIL

SECRET METRO Tunnel

Raccoon J

ESTIMATE NO. 1363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-21-52  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE %	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			UNIT	TOTAL			
	<u>Air Water Dewater</u>										
	145' LF TUNNEL (2 Tunnels)		75300	1,087,500							
	<u>PLANT</u>										
1 EA	1200 cfm Elec Comp		80000	80000							
1 EA	600 cfm Diesel Comp		60000	60000							
2 EA	Air Receivers		1000	2000							
2 EA	Water Pump 10 Hp. 114'		2000	4000							
2 EA	Disch. Pump 50 Hp 114'		5000	10000							
	Misc. Manifolds etc			14000							
	<u>TOTAL PLANT</u>			677000							
	<u>Tot Air Water Disch.</u>			1,257,500							
	<u>Other Plant &amp; Equipment</u>										
1 Lot	Repair Shop Equipment		25000	25000							
1 Lot	Elec Shop Equipment		14000	14000							
1 Lot	Carpenter Shop Equipment		10000	10000							
7 EA	Auto Insurance		10000	10000							
2 EA	Office Trailer 12x60		25000	50000							
1 EA	Warehouse 1000sq'			10000							
2 EA	Change house @ Noo			60000							
1 EA	Steel Van			5000							
1 EA	First Aid Trailer			10000							
	ALIMAK MAN ELEVATOR			3000							
	36" x 300' Muck Conveyor 25hp.			100000							
	500' Muck Hoop			10000							
	<u>Total Other</u>			358000							

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# SUMMARY OF COSTS

FOR: SCRTD METRO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO. S

REACH No. 6 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-2-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

ITEM OR LP. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR FRONT	EQPT. OPERATION	EQPT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>TOTAL DIRECT COSTS</u>			<u>18,316,800</u>	<u>15,272,000</u>	<u>4,389,300</u>	<u>9,600,000</u>	<u>1,921,350</u>		<u>49,499,450</u>
	<u>Profit Fund</u>									
	<u>GENERAL EXPENSE</u>									
	<u>SCRTD -</u>			<u>2,768,500</u>		<u>276,000</u>				
	<u>Add</u>					<u>4,430,850</u>				
	<u>TOTAL GEN EXP.</u>			<u>2,768,500</u>		<u>4,656,850</u>				<u>7,424,350</u>
	<u>TOTAL COSTS</u>			<u>21,085,300</u>	<u>15,272,000</u>	<u>9,045,350</u>	<u>9,600,000</u>	<u>1,921,350</u>		<u>56,924,000</u>
	<u>RISK OF PROFIT</u>									
	<u>7%</u>			<u>30</u>	<u>12</u>	<u>12</u>	<u>0</u>	<u>15</u>		<u>9,526,000</u>
	<u>AMT</u>									
	<u>TOTAL COST</u>									<u>66,450,000</u>
										<u>6387</u>
	<u>10400</u>									

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# SUMMARY OF COSTS

FOR: SOFT D METRO RAIL GROUP: \_\_\_\_\_

ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION

SHEET NO. S

REACH No. 6

WORK ITEM NO. \_\_\_\_\_

PREPARED BY: GHE DATE: 3-2-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

4 OR NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQPT. OPERATION	EQPT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>INSTALL STEEL LINER</u>									
	TOTAL LABOR									
	SUC Support Equip Co.									
	Inst Equip Oper									
	ELECTRIC POWER									
	STEEL LINER									
	Small Tools & Suppl.									
	<u>FINISH TUNNELS</u>									
	LABOR			1,920,000						
	SUC & Support Equip							50,000		
	Underground Equipment							100,000		
	Elec. Power					62,500				
	PERM. MAT'L				1,768,000					
	SMALL TOOLS ETC					100,000				
				1,920,000	1,768,000	162,500		150,000		4,000,500
	<u>WEEKEND MAINT</u>									
	Incl elsewhere									
	<u>CONSTR PLANT</u>						5,000,000			
	TBM'S						5,664,000			
	OTHER PLANT						(1,064,000)			
	SALVAGE									9,600,000
	<u>Page total</u>			1,920,000	1,768,000	162,500	9,600,000	150,000		13,600,500
	<u>TOTAL DIRECT COSTS</u>			16,396,800	13,504,000	4,226,800	-	1,771,350		35,898,950
				18,316,800	15,272,000	4,389,300	9,600,000	1,921,350		49,499,450

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GIE DATE \_\_\_\_\_

QUANTITY Tunnel Driving TBM DBL. #6 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	SUPERVISOR	PATROL	ELECTRICIAN	DISTRIBUTION	OTHER
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL						
1	<del>SERVICE PERSONNEL</del>										
2	WALKER	1	1	1	3	3.					
3	CRANE OPER	2	2	2	6						
4	CRANE OPER	1	1	1	3						
5	TOP MAN	1	1	1	3						
6	BOTTOM MAN	1	1	1	3						
7	CHANGE HOUSE LTR.	1	1	1	3						
8	COMPRESSOR OPER	1	1	1	3						
9	MECH. FOREMAN	1	1	1	3						
10	MECHANIC	2	2	4	12						
11	ELECT. FOREMAN	1	1	1	3						
12	ELECTRICIAN	2	2	2	6						
13	PUMP OPER	1	1	1	3						
14	MINEL	4	4	4	12						
15	LOCO OPER		1	1	2						
16	BRAKEMAN		1	1	2						
17	TRUCK DRIVER	1			1						
18	CARPENTER	1			1						
19	LABOR	4			4						
20	WRECKER	1			1						
21											
22	TOTAL	30	21	21	72	3	32	21	4	9	1
23											
24	<u>HEADING CREW (2)</u>										
25	SHIFTER	2	2	2	6						
26	TBM OPER	2	2	2	6						
27	TBM OPER	2	2	2	6						
28	MECHANIC	2	2	2	6						
29	ELECTRICIAN	2	2	2	6						
30	MINEL	8	8	8	24						
31	CHUCK TENDER	4	4	4	12						
32											
33	TOTAL	22	22	22	66	18	12	6			
34											
35	<u>TRUCK HEADING CREW (2)</u>										
36	LOCOMOTIVE OPER	4	4	4	12						
37	BRAKEMAN	4	4	4	12						
38											
39	TOTAL	8	8	8	24	24					
40											
41	<u>BULL GENS CREW (2)</u>										
42	BULL GENS FULL	2			2						
43	BULL GENS LAB.	8	2	2	12						
44	LOCO OPER	2			2						
45	LOCO OPER	2			2						
46											
47	TOTAL	2	2	2	12	12					
48	TOTAL	7	13	53	180	78	77	15	1	1	1

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCHTD GROUP SHEET NO. L 1

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHC DATE 3-22-83

QUANTITY REACH No 6 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
3	<u>SERVICE &amp; Support</u>	<u>30</u>	<u>21</u>	<u>21</u>	<u>72</u>	<u>30<sup>00</sup></u>	<u>2160</u>	
5	<u>Cost Per Day</u>						<u>17280</u>	
7	<u>Cost Weeks</u>						<u>86400</u>	
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30<sup>00</sup></u>	<u>1980</u>	
12	<u>Cost Per Day</u>						<u>15840</u>	
14	<u>Cost Weeks</u>						<u>79200</u>	
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRAMP</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
20	<u>Cost Per Day</u>						<u>5760</u>	
22	<u>Cost Weeks</u>						<u>28800</u>	
25	<u>BULL GRAB</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>30</u>	<u>540</u>	
27	<u>Cost Per Day</u>						<u>4320</u>	
29	<u>Cost Weeks</u>						<u>21600</u>	
34	<u>TOTAL Cost/week</u>						<u>216000</u>	
37	<u>LABOR TOTAL Cost 61 weeks</u>							<u>1317600</u>
40	<u>at 66</u>							





# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: JCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 6

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

*Note: For TBM Actual Cost & Elec on Separate Page  
7<sup>1/2</sup> repairs only  
Locomotive: Cost of repairs, Service & fuel*

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No. UNITS EA TOTAL

Total Oper & Exp.

TUNNEL Excavation  
TBM Repair 2500  
Operate 48 mi/cycle  
10 cycles/day = 480 mi

2

6

12 Hr

75<sup>00</sup>

900

Locomotive & Cars  
Ave 30 min per train  
per Push or cycle  
10 cycles = 300 min  
4 trains in 2 hrs  
Add 2 1/2 hr train  
for misc  
25 Ton loco.

4

8 hr

32 hr

25<sup>00</sup>

800

Push Grng. Loco  
5 hr 4 hr/day 2 ea  
7 1/2 ton loco

2

4 hr

8 hr

18<sup>00</sup>

150

Muck Cars  
Other Cars

16 ea

8 hr

128 hr

150

200

8 ea

8 hr

64 hr

0<sup>75</sup>

50

TOTAL Cost Per Day

2100

Cost Per Week

14700

Cost 61 weeks

640,500

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*Assume Tunnel Muck loaded on truck hauled to disposal site at 5¢/cusec  
 1 LF = 11<sup>2</sup> Bag x 1.50 = Say 17<sup>0</sup> LF @ 60¢ = 102<sup>00</sup>/<sub>100</sub>  
 X 2 Trucks = 204<sup>00</sup>/<sub>100</sub>  
 Reach*

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<i>Muck Disposal</i>	<i>10400 LF</i>	<i>20.7 500.00</i>	<i>2121.600</i>
	<i>Misc Small Tools &amp; Supplies</i>			
	<i>Estimate misc small tools supplies and consumables @ 4 operators 216,000 say \$8500/week</i>			
	<i>TOTAL week 61</i>	<i>WB</i>	<i>8500</i>	<i>518500</i>

# MATERIAL COSTS

FOR: SOFTO METCO RAIL GROUP

WORK: \_\_\_\_\_

LOCATION: \_\_\_\_\_

QUANTITY: REACH No 6

ESTIMATE No. 6363-1

SHEET No. M

WORK ITEM No. \_\_\_\_\_

PREPARED BY: GFE DATE: 3-11-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<u>ELECTRIC POWER CONSUMPTION</u>
	<u>TOTAL Tunnel Reacher = 93,600 kwh ÷ 7 = 13,350 Ave 7 Tunnel</u>
	<u>2 headings</u>

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>ELECTRIC POWER</u>	<u>hp-hr</u>		
	<u>1- 1200 Comp. 450 kw @ 9 hr/day</u>	<u>4050</u>		
	<u>1- 40 hp pump @ 24 hr/day</u>	<u>960</u>		
	<u>1- 25 hp conveyor @ 8 hr/day</u>	<u>200</u>		
	<u>2- 1000 hp TBM (400 min)</u>	<u>12000 hp-hr</u>		
	<u>2- 100 hp brush (300 min/day)</u>	<u>1000 hp-hr</u>		
	<u>1- 75 hp Vent Fan (900)</u>			
	<u>@ 24 hr/day =</u>	<u>25,200 hp-hr</u>		
	<u>2- Grout pumps (90 min/hr)</u>			
	<u>2- 16 @ 15</u>	<u>30 hp-hr</u>		
	<u>Allow Misc</u>	<u>560</u>		
	<u>TOTAL ELEC MOTORS</u>	<u>44,000 hp-hr</u>		
	<u>@ 0.74¢ @ 80% =</u>	<u>27,000 kWh</u>		
	<u>Lighting</u>			
	<u>Forth 90 kW @ 24 hr</u>	<u>480</u>		
	<u>Head disc 2 @ 10 kW @ 24 hr</u>	<u>480</u>		
	<u>Line Tool = 40 @ 125 @ 0.1 @ 24 hr</u>	<u>420</u>		
	<u>Misc Allow</u>	<u>120</u>		
	<u>OFFICE &amp; HOUS</u>	<u>500</u>		
		<u>2000</u>		
	<u>TOTAL Elec Per Day</u>	<u>29,500 kWh</u>	<u>0.05</u>	<u>1450.00</u>
	<u>Add for weekend peaking</u>		<u>0.05</u>	<u>50.00</u>
	<u>2500 x 1/7 Sun</u>	<u>1000</u>		
	<u>Cost Per Day</u>			<u>1500.00</u>
	<u>Cost Per Week</u>			<u>7500</u>
	<u>TOTAL COST 61 Weeks</u>			<u>457,500</u>

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No. 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

*Estimate Cutter Costs*  
 Say 45 cutters @ 1500<sup>00</sup>/pc = 67500  
 2 rebuilds @ 33500  
 101,000  
 Say 600 hr are life in Allow + Renewal = 170<sup>00</sup> x 6 = 1020 = 25<sup>00</sup>/hr  
 300 hr are life in Basalt = 335<sup>00</sup>/hr x 6 = 2010 = 50<sup>00</sup>/hr

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	Reach 7 (Thin Sta)	8500 LF	25	
	5	12100 -	25	
	6	10400 -	25	
	8 Thin Sta	4000 LF	25	260,000
	10	17000	25	
	12	16500	50 <sup>00</sup>	
	14	9700	25	

# MATERIAL COSTS

ESTIMATE NO. 63637  
 SHEET NO. M-4  
 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-22-87  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCR7D GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: Reach No 4

REF. NO.  
OR QTY.

WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LC to precast  
 and deliver non-gasketed liners, 800<sup>00</sup>/LC for gasketed  
 Liners per LF Tunnel  
 Grout Behind Liner = 0.39 cu/LC at 75<sup>00</sup>/cu = 30<sup>00</sup>/LC  
 @ Tunnels = 60<sup>00</sup>/LC per lin. Mat.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

SCR7D MAT'L COAST

2x 10,400  
2x

20,800

\$ 600  
500

12,480,000

Grout Behind Liner

20,800

30<sup>00</sup>

624,000

TOTAL LINERS

13,104,000

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L-3

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHE DATE 3-22-83

QUANTITY REACH No 6 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	<u>OPERS PASSAGE CONST</u>							
2								
3	<u>SUPPORT &amp; SERVICE</u>	25	13	13	51	30 <sup>00</sup>	1530	
4	Cost Per Day						12240	
5	Cost Per Week						61200	
6								
7	<u>NO FA Crossover</u>							
8	<u>TOTAL 14 Weeks</u>							734,400
9								
10	<u>CROSS PASSAGE HOP FROM</u>							
11	<u>2 CREWS</u>	18	18	13	54	30 <sup>00</sup>	1620	
12	Cost Per Day						12960	
13	Cost Per Week						64800	
14	<u>TOTAL 10 Weeks</u>							129,600
15								
16	<u>TRASPORT &amp; Muck Handle</u>	4	4	4	12	30 <sup>00</sup>	360	
17	Cost Per Day						2880	
18	Cost Per Week						14400	
19	<u>TOTAL 14 Weeks</u>							172,800
20								
21	<u>BULL GANG</u>	5			5	30 <sup>00</sup>	150	
22	Cost Per Day						1200	
23	Cost Per Week						6000	
24	<u>TOTAL 14 Weeks</u>							72,000
25								
26	<u>CONCRETE CREW</u>	36	36	36	108	30 <sup>00</sup>	3240	
27	<u>8 CREWS</u>						25920	
28	Cost Per Day						109600	
29	Cost Per Week							
30	<u>TOTAL 14 Weeks</u>							1,555,200
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-3

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: OHC DATE: 3-23-8

QUANTITY: REAC4 No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

CROSS PASSAGE CONSTRUCTION

REF. NO. OR QTY. DESCRIPTION FLOORS OPERATING COST

SERVICE & SUPPORT

18 Ton Hyd. Crane  
2 sh @ 4 hr

1 8

3500 280 -

70 Ton Hyd. Crane  
1 sh @ 6

1 6

1000 600 -

FE Ldr (946)

1 4

4600 184 -

FLAT BED TRUCK STN

1 6

1800 108 -

1172 -

1800 cfm Comp.  
3 sh @ 7 hr

1 21

510 105 -

40 hp. Pump

1 24

080 19 -

85 hp. Compressor

1 4

500 20 -

15 TN 1000 Sw. sh.  
2 sh @ 4

1 8

1800 144 -

288 -

TOTAL COST per Day

1460 -

COST Per week

7300 -

TOTAL COST 12 weeks

\$ 87600

# MATERIAL COSTS

ESTIMATE NO. 6353-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M 5

WORK: MEFLO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHC DATE: 3-22-82

QUANTITY: REACH No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<p><i>Cross Passage Excav. 40 By/ea x 15' = 210 Ccy</i>  <i>Much Disposal @ 6<sup>00</sup>/Ccy = \$1260 per passage</i></p>

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<i>No Cross Passage</i>	<i>20</i>	<i>1260</i>	<i>25200</i>
	<p><i>MISC SMALL TOOLS &amp; SUPPLIES</i>  <i>@ 40% Labor \$25,800 sub</i>  <i>No Works</i></p>	<i>12</i>	<i>\$11000</i>	<i>132000</i>



# MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 6

ESTIMATE NO. G353-1  
 SHEET NO. M-6  
 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-22-38  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*ELECTRIC POWER*

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1- 1200 cfm 450 hp Comp. 21 hr./day	9450 hp hr		
	1 40 hp Pump @ 24	960 hp hr		
	1- 25 hp Conveyor @ 4	100 hp hr		
	1 75 hp Concr. Pump @	600 hp hr		
	14- 75 hp Vent Fans @ 24 hr/day	25200 hp hr		
	Allow Misc	690		
	<b>TOTAL LINE</b>	<b>37005 hp hr</b>		
	@ .746 c. 80%	22,000 kWh.		
	<b>Lighting</b>			
	Power 20 kw @ 24	480		
	Wdgs 405 kw @ 24	430		
	Line 3500 0.1 x 24	840		
	Office Shop	500		
	MISC	700		
		<b>2500</b>		
	<b>TOTAL FEES PER DAY</b>	<b>24500 kWh</b>		
	Add for weekend day	500		
		<b>25,000 kWh.</b>		
	Cost per Day		005	1250
	Cost per Week			210
	Cost 12 weeks			6270

75,000 178

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR 50KTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY CRAN TRACKS - EXCAV CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		4/10/11	4/11/11	4/12/11	4/13/11	4/14/11	4/15/11	4/16/11	4/17/11	4/18/11		
1																	
2	<u>Support &amp; Service</u>																
3																	
4	<u>Walker</u>	1	1	1	3	3											
5	<u>Crane Oper</u>	1	1	1	3		3										
6	<u>Crane Oper</u>	1			1		1										
7	<u>Tapman</u>	1			1			1									
8	<u>Boorman</u>	1	1	1	3			3									
9	<u>Charge Hand</u>	1			1			1									
10	<u>Control Oper</u>	1	1	1	3		3										
11	<u>Weld Foreman</u>	1			1		1										
12	<u>Mechanic</u>	2	2	2	6		6										
13	<u>Elect Foreman</u>	1			1												
14	<u>Electrician</u>	2	1	1	4												
15	<u>Power Oper</u>	1			1		1										
16	<u>Mines</u>	4	4	4	12			12									
17	<u>Load Oper</u>		1	1	2			2									
18	<u>Tractor man</u>		1	1	2			2									
19	<u>Truck Driver</u>	1			1												
20	<u>Carpenter</u>	1			1												
21	<u>Lab</u>	4			4												
22	<u>Pipe fitter</u>				1												
23	<u>2 Crossovers - men/day</u>				51	3	17	17	4	5	1						
24	<u>14 wks/yr</u>																
25																	
26																	
27	<u>Crossing Heating &amp; Crows</u>																
28	<u>Shifter</u>	2	2	2	6			6									
29	<u>Mixer</u>	8	8	8	24			24									
30	<u>Chuck Tender</u>	4	4	4	12			12									
31	<u>Nipper</u>	2	2	2	6			6									
32	<u>Mucker (20)</u>	2	2	2	6			6									
33		18	18	18	54		6	48									
34																	
35	<u>Muck handle</u>																
36	<u>Loco Oper</u>	2	2	2	6		6										
37	<u>Blade man</u>	2	2	2	6		6										
38					12		12										
39																	
40	<u>Publ Gang</u>																
41	<u>Foreman</u>	1			1												
42	<u>Bull Gang</u>	4			4												
43					5												
44																	
45																	
46	<u>Total Ex cav. 2 Crossovers</u>				122												
47	<u>1 Crossover</u>				61												
48	<u>Allow Ex cav 5 days</u>																

# LABOR COSTS

7

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L  
 WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION Washington PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 QUANTITY Class Passengers - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	HOURS	PAYROLL	DISTRIBUTION				
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				11	10	9	8	
1													
2	Support & Service												
3	Concrete Crew												
4													
5													
6	Concrete Crew												
7													
8	Shutter	1	1	1	3			3					
9	Concrete Form	1	1	1	3								
10	Manual	1	1	1	3			6					
11	Concrete	6	6	6	18							18	
12	Workers	4	4	4	12				12				
13	Iron workers	4	4	4	12								12
14	Operator - for												
15													
16	TOTAL Crews				54			9	12			21	12
17													
18	2 Drivers												
19													
20													
21													
22													
23													
24	TOTAL MEN =												
25	Note Aug 22 Cross-section												
26													
27													
28													
29	Support & Service 20 crews = 14 wk @ 51				714	42	266	238	56	70	14	14	14
30	Excav				594	46	528						
31	Transport				168		168						
32	Rail Spore				70		70						
33	Concrete Lab.				1512		252	336		252	336		
34													
35													
36	TOTAL Man-wk for				3008	42	500	1023	372	70	204	336	14
37													
38	Rev. per Concrete Man-wk				140	23	50	18	3	27	25	1	1
39													
40	Rev. per Day/Person				700	10	115	23	90	15	135	75	5
41													
42													
43													
44													
45													
46													
47													
48													

Man Wages

29	Support & Service 20 crews = 14 wk @ 51	714	42	266	238	56	70	14	14	14
30	Excav	594	46	528						
31	Transport	168		168						
32	Rail Spore	70		70						
33	Concrete Lab.	1512		252	336		252	336		
36	TOTAL Man-wk for	3008	42	500	1023	372	70	204	336	14
38	Rev. per Concrete Man-wk	140	23	50	18	3	27	25	1	1
40	Rev. per Day/Person	700	10	115	23	90	15	135	75	5

RJP

THE RALPH M. PARSONS COMPANY

Crew Passage

SCHEDULING AND REPORTING SHEET

PREPARED BY

JOB NUMBER CLIENT

LOCATION

DATE

APPROVED BY

DESCRIPTION	1981		1982				1983				1984				1985				1986				1987				1988				1989				1990																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
33	Support & Service												51 men				73 wks				=				1173				= 5300 mdy																						
32	Excan												54 men				11 wks				=				574				= 2970 mdy																						
31	Transport												23 men				23 wks				=				276				= 100 mdy																						
30	Bulk Star												23 men				23 wks				=				115				= 500 mdy																						
29	Camp & Cabin												54 men				73 wks				=				1242				= 6210																						
28																									3400				17000 mdy																						
27																																																			
26																																																			
25																																																			
24																													by 20 mdy/yr																						
23																																																			
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5																																																			
4																																																			
3																																																			
2																																																			
1																																																			
0																																																			

Support of Service 51 x 73 = 3723  
 Excan 54 x 11 = 594  
 Transport 23 x 23 = 529  
 Bulk Star 23 x 23 = 529  
 Camp & Cabin 54 x 73 = 3942

3038 x 17000 mdy  
 = 51646000 mdy

101

TITLE SKRTD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6213-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cross Passage  
 Tunnels 42'-8"  $\phi$  to  $\phi$   
 Bay passages 25' long.

Excavation

Excav. Neat =  $9\frac{1}{2} \times 12\frac{1}{2} = 118\frac{1}{4}$  cu ft  $4\frac{1}{2}$  cu yds = 110 cu yds  
 Excav w/obst =  $11\frac{1}{2} \times 14\frac{1}{2} = 164\frac{1}{4}$  cu ft =  $5\frac{1}{2}$  cu yds = 148 cu yds

Concrete 27 cu yds  $4\frac{1}{2}$  cu yds  
 Neat  $118\frac{1}{4} - (5\frac{1}{2} \times 8\frac{1}{2}) = 74\frac{1}{4}$  cu ft =  $2\frac{1}{2}$  cu yds  $\times 27 = 72$  cu yds  
 w/obst  $164\frac{1}{4} - 45\frac{1}{2} = 108\frac{1}{4}$  cu ft =  $4\frac{1}{2}$  cu yds  $\times 27 = 108$  cu yds  
 Truck w/obst  $11 \times 2\frac{1}{2} \times 25 = 289$   
 Wall & Arch 83 cu yds  
 108 cu yds

Soft Rock  
 Excav. Neat

# MATERIAL COSTS

ESTIMATE No. 17-9

FOR: SERTO GROUP: \_\_\_\_\_

SHEET No. M

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<p><u>PASSAGE Support - Provide LAVOR PLATE</u>                      Opening <math>9' \times 14' = 38 \text{ SF} \times 65 = 950 \text{ SF} = 4000 \text{ \#}</math>                      Steel Hbs <math>6'' \times 5 \text{ \#} = 38 \text{ LF} \times 5 \text{ \#} = 190 \text{ LF} = 5000 \text{ \#}</math>                      Total Support/Passage <math>4000 \text{ \#}</math>                      Purchase @ <math>0.55/\text{lb}</math> <math>5000 \times 0.55 = 27500</math></p>

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>Cross Passage Steel Support No Passage</u>	<u>20</u>	<u>25000</u>	<u>500000</u>



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJ WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 6 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

CROSS PASSAGE CONSTR.

REF. NO.  
OR QTY.

DESCRIPTION

Hours  
No Units EA TOTAL

Total Oper. & Ref.

Cross-Pass Equip.

Einco 630  
Air Spade Drills etc

2 EA		20	40
8		20	160

2000	1040
100	160

Loco & CARS

25 TN Loco @ 8 hr  
in 3 shifts

2		8	16
---	--	---	----

2500	400
------	-----

Muck Cars  
Other Cars

4		4	16
8		4	32

150	30
100	30

CONCRETE

Concrete Pump

1		8	8
---	--	---	---

1500	120
------	-----

Concr. Agitator Cars

4		8	32
---	--	---	----

500	160
-----	-----

VIBRATORS Misc

4		8	32
---	--	---	----

200	60
-----	----

Cost per Day

\$ 2000

Cost per week

12,000

Cost 12 weeks

120,000



# LABOR COSTS

11

ESTIMATE \_\_\_\_\_

FOR SOFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Lockridge Ave PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Total Cleanup - 6 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
500 lbs for 6 weeks

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
1	<u>Services &amp; Report</u>								
2									
3									
4	<u>Water</u>	1	1	1	3	3			
5	<u>CRANE OPER</u>	2	1	1	4				
6	<u>CRANE DRIVER</u>	1			1				
7	<u>TOP ALARM</u>	1			1		1		
8	<u>RESTOR. MATH</u>	1	1	1	3		3		
9	<u>CHARGE HEE ATT.</u>	1			1		1		
10	<u>CONSTR. OPER</u>	1	1	1	3	3			
11	<u>MECH. FOREMAN</u>	1			1		1		
12	<u>MECHANIC</u>	2	1	1	4		4		
13	<u>EXEC. FOREMAN</u>	1			1			1	
14	<u>ELEC</u>	4	1	1	6			6	
15	<u>PUMP OPER</u>	1	1	1	3	3			
16	<u>MINE</u>	2	2	2	6		6		
17	<u>LECO OPER</u>		1	1	2		2		
18	<u>ROCKMAN</u>		1	1	2		2		
19	<u>TRUCK DRIVER</u>	1			1			1	
20	<u>CARPENTER</u>	1			1			1	
21	<u>LABOR</u>	4			4		4		
22	<u>PIPE FITTER</u>	1			1			1	
23					48	3	20	11	4
24								7	1
25	<u>Cleanup Crew (2 hrs)</u>								
26	<u>SHIFTER</u>	2	2	2	6		6		
27	<u>MINE</u>	4	4	4	12		12		
28	<u>TURBO LATER</u>	8	8	8	24		24		
29									
30					47		47		
31									
32	<u>Transport</u>								
33	<u>LECO OPER</u>	2	2	2	6	6			
34	<u>PLATE</u>	2	2	2	6		6		
35					12		12		
36									
37									
38	<u>PIPE REPAIR</u>								
39									
40	<u>FOREMAN</u>	2			2		2		
41	<u>PIPE GRIND BACK</u>	8			8		8		
42	<u>LECO OPER</u>	2			2	2			
43	<u>PIPE</u>	2			2		2		
44					14	4	10		
45									
46									
47	<u>Total Per Day</u>				116	3	36	43	4
48								7	1

186

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L-4

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - Tunnel (CA 113) PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY REACH No 6 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>Sec Support</u>	<u>26</u>	<u>11</u>	<u>11</u>	<u>48</u>			
4								
5								
6								
7								
8								
9								
10								
11								
12	<u>CLEANUP CREWS</u>	<u>14</u>	<u>14</u>	<u>14</u>	<u>42</u>			
13								
14								
15								
16								
17								
18								
19								
20								
21	<u>TRANSPORT CREW</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>12</u>			
22								
23								
24								
25								
26								
27								
28								
29	<u>BULL GANG</u>	<u>14</u>			<u>14</u>			
30								
31								
32								
33								
34								
35								
36								
37								
38	<u>TOTAL</u>				<u>116</u>	<u>30</u>	<u>3480</u>	
39								
40	<u>COST PER DAY</u>						<u>27845</u>	
41								
42	<u>COST PER WEEK</u>						<u>139200</u>	
43								
44								
45	<u>TOTAL 4 Weeks</u>							<u>556800</u>
46								
47								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: DHC DATE: 3-23-8

QUANTITY: REAC 4 No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost	
		No Unit	Hrs/Unit	TOTAL		
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane</u> <u>3 sh @ 4 hr</u>	1	12		35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane</u> <u>1 sh @ 4</u>	1	4		100 <sup>00</sup>	400 -
	<u>FE Ldri (946)</u>	1	4		46 <sup>00</sup>	180 -
	<u>FLAT BED TRUCK 5TN</u>	1	5		18 <sup>00</sup>	90 -
						710
	<u>1800 cfm. Comp.</u> <u>3 sh @ 7 hr</u>	1	21		5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24		0 <sup>80</sup>	19 -
	<u>85 hp. Compressor</u>	1	4		5 <sup>00</sup>	20 -
	<u>5TN 6000 Switch</u> <u>2 sh @ 4</u>	1	8		18 <sup>00</sup>	144 -
						898
	<u>TOTAL COST per Day</u>					1080
	<u>COST per week</u>					5000 -
	<u>TOTAL COST 4 weeks</u>					20000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 63631  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET NO. E-5  
 WORK: NETS RAIL PROJECT WORK ITEM NO. \_\_\_\_\_  
 LOCATION: CLEANUP PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 6 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

Cleanup at 500 ft per day

REF. NO. OR QTY.	DESCRIPTION	HOURS			Total Oper. Exp.				
		No	UNITS	EA	TOTAL				
	<u>Under Equip.</u>								
	<u>Finco 630</u>	2	EA	20	40	26 <sup>00</sup>	1040		
	<u>MISC</u>						60		
	<u>Loco &amp; Cars</u>								
	<u>25 Ton V.</u>	2		10	20	25	500		
	<u>Muck Cars</u>	4		10	40	10	60		
	<u>Office Cars</u>	4		10	40	10	40		
	<u>TOTAL Per Day</u>						1700		
	<u>Trk Per Week</u>						8500		
	<u>TOTAL 4 weeks</u>								34000

# MATERIAL COSTS

ESTIMATE No. G363-1  
 SHEET No. M-8  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GFK DATE: 3-22-53  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 6

## WORK INFORMATION

ELECTRIC POWER

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1 - 1200 cfm 450 hp Comp. 21 hr./day	9450 hp hr		
	1 - 40 hp Pump @ 24	960 hp hr		
	1 - 25 hp Conveyor @ 24	100 hp hr		
	1 - 607 Hi fl. Pump	600 hp hr		
	14 - 75 hp Vent Fans @ 24 hr/day	25200 hp hr		
	Allow Misc	690		
	<u>TOTAL Elec</u>	<u>37005 hp hr</u>		
	@ .746 = 27%	22,000 kWh		
	<u>Lighting</u>			
	Power 20 kw @ 24	480		
	Watts 405 kw @ 24	480		
	LINE 350 @ 0.1224	840		
	OFFICE SHOP	500		
	MISC	700		
		<u>2500</u>		
	<u>TOTAL Elec per Day</u>	<u>24500 kWh</u>		
	Add for weekends 500	500		
		<u>25,000 kWh</u>		
	Cost per Day		0.24	1250
	Cost per Week			1250
	Cost 4 weeks			6250
				25,000



# LABOR COSTS

41

ESTIMATE \_\_\_\_\_

FOR 50 FT D GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel 6 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION						
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL									
1														
2	Reinforce Handrail			12	12									
3														
4	Place Concrete 50' @ 15'			60	60									
5														
6														
7	Install Handrail													300' per
8														
9														
10	Loco Oper. 1/2 hr			16	16		0.03							480' per
11														
12														
13	Place Concrete													
14	600 LF @ 0.23													
15														
16	Shift Lead	1			1									
17	Loco Labor	1			1									
18	Conf. Foreman		1		1									
19	Conf. Labor		1	1	2									
20	Labor		1	1	2									
21	Trans. worker	1			1									
22	Loco Foreman			1	1									
23	Loco Labor			1	1									
24	Loco Oper. 1/2 hr			1	1									
25	Loco Oper	1	1	1	3									
26	Loco Oper	1	1	1	3									
27	Concrete Finish													
28	Service & Support				4									
29	Use Project Crew													
30	AS for Tunnel Clear up				4									
31														
32														
33														
34														
35														
36														
37	Place Concrete				83		13.75	8						
38	Service Support				43	3	20.14	7						
39	Install Handrail				12									
40														
41	Total for 600 LF				143	3	5.29	7.5						





# LABOR COSTS

ESTIMATE 63671

FOR SCFD GROUP

SHEET NO. L-6

WORK METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles -

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel Head No 6

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				49	30		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSPORT</u>				14			
13								
14								
15								
16								
17								
18								
19	<u>Place Concrete</u>							
20	<u>&amp; Tunnels</u>				83			
21								
22								
23								
24								
25	<u>INSTALL HANDRAIL</u>				14			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	<u>TOTAL</u>				160	30	4800	
36	<u>TOTAL Per Day</u>						59400	
37								
38	<u>TOTAL Per Week</u>						192000	
39								
40								
41								
42								
43								
44	<u>TOTAL 10 Weeks</u>							1920000
45								
46								
47								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. \_\_\_\_\_

FOR: SCRIPT GROUP: \_\_\_\_\_ SHEET NO. E 46

WORK: METRO RAIL WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: Reach No. 6 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## WORK INFORMATION

REF. NO.  
OR QTY.

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNIT HRS/UNIT TOTAL

Operating Cost

SERVICE & SUPPORT  
Use Cost Record

TOTAL 10 weeks

5000

50000

195

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4-9

WORK: METRO RAIL PROJ

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

	No. Units		Hours		TOTAL	Total Op & Exp.	
			EA				
<u>Access</u>	2	EA	20		40	2000	1040
<u>Air Spade Drills etc</u>	8		20		160	100	160
<u>Loco &amp; CARS</u>							
<u>25 TD Loco @ 8 hr</u>	2		8		16	2500	400
<u>in 3 shifts</u>							
<u>Muck Cars</u>	4		4		16	100	30
<u>Other Cars</u>	8		4		32	100	30
<u>CONCRETE</u>							
<u>Concrete Pump</u>	1		8		8	1500	120
<u>Concr Agitator Cars</u>	4		8		32	500	160
<u>Vibrators Misc</u>	4		8		32	200	60
<u>Cost Per Day</u>						\$ 2000	
<u>Cost Per Week</u>						10,000	
<u>Cost 10 Weeks</u>							100,000

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-13

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: ELR DATE: 3-22-33

QUANTITY: REACH No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm. 450 hp Comp. 21 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Comp. @ 4

100 hp hr

1- 607 Hi fl. Pump

600 hp hr

14- 75 hp Vent Fans @ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37005 hp hr

@ .746 @ 80%

22,000 kWh

Lighting

FOOT CANDLE 20 kw @ 24

480

Halls 105 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day

24500 kWh

Add for weekends 500

25,000 kWh

Cost per Day

Cost per Week

Cost 10 weeks

0.25	1250
	250
	6250

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SECT D GROUP: \_\_\_\_\_

SHEET No. M

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: FINDEN TUNNEL

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 6

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No. OR QTY.	WORK INFORMATION

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	PURCHASE HANDRAIL 2 Tunnels	2.0	10.00	20
	POURING CONCRETE 2 @ 1.17 =	2.50 cy	60.00	150.00
	COST OF MAT'L	1 LF		170.00
	PERM MAT'L			
	Reach 2	<del>7500 LF</del>	170.00	
	5	<del>4200 LF</del>	170.00	
	6	10400 LF	170.00	
	8	<del>7100 LF</del>	170.00	
	10	<del>7000 LF</del>	170.00	
	12	16500 LF	170.00	
	14	9000 LF	170.00	
	Misc Small Tools and Supplies			
	Use 5% Labor 17,000			
	5% 10,000			
	No Weeks	10	\$10000	100,000
				1,768,000

PLANT & EQUIPMENT DETAIL

SCRIPD METRO RAIL PROJECT

ESTIMATE NO. 6363-1

Reach 6 12500 LF (10,400)

SHEET NO.

PREPARED BY: GAF

DATE: 3-21-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & Ancill:			5000000		10	500000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1540000								
	MISC UNDER GROUND			125000								
	RAIL TRACKAGE			633750								
	VENTILATION SYSTEM			849000								
	CONCRETE EQUIPMENT			262000								
	COMMUNICATIONS EQUIP			11250								
	ALIGNMENT CONTROL			15000								
	ELECTRICAL EQUIPMENT			812500								
	AIR WATER DEWATER			1107500								
	OTHER PLANT			308000								
				<u>5664000</u>		10	<u>564000</u>					
				<u>10664000 ✓</u>			<u>1064000</u>					

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PLANT & EQUIPMENT DETAIL

SCHTD METRO RAIL PROJECT

ESTIMATE NO. 6363-1  
 SHEET NO.  
 PREPARED BY: GHE DATE: 3-21-82  
 CHECKED BY: DATE:

REVENUE 12500 LE (10400)

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>TUNNEL EXC.</u>												
2 Ea	TBM incl Trailing Gear, - conveyor - dust suppression Fan 300TN @ 1000 hp		2500000					300	600			
								100	100			
				5000000				400				
<u>Locomotives &amp; Cars</u>												
4	25 TN Diesel loco. Muck		200,000	800,000				25				
2	15 TN Bullgan		120,000	240,000				15				
12	10cu Muck Car 5TN		16,000	192,000				5				
8	Flat Car 8whl		12,000	96,000				42				
2	MAN CARS 2whl		6,000	12,000				20				
2	Fan Line Cars		20,000	40,000				80				
1	CAL DUMPER		80,000	80,000				300				
2	GROUT CAR & PUMP		40,000	80,000								
	<u>TOTAL loco &amp; Cars</u>			1548000								
<u>Misc UNDERGROUND</u>												
4	SINKER DRILLS		2000	8000				0				
4	STOPPER DRILLS		2500	10000				0				
4	AXLES DRILLS		2500	10000				0				
7	4" Driller for Pilot		16,000	52000				0				
2	Drill Boom & St. Dr		12,500	25000				10				
2	Timmer haints		5000	10000				10				
2	AIR Wrenches		500	4000				0				
4	oxy Acet Oult's		1000	4000				0				
4	Elec Welder 300amp		2000	8000				0				
4	Pinto Jacks		1000	4000				0				
4	Chipping saws Air		250	1000				0				
4	Misc Cond, Steel Drills		500	2000				0				
	<u>TOTAL Misc Equip</u>			125000								

000

PLANT & EQUIPMENT DETAIL

SECRET METRO RAIL PROJECT

REACH 6

ESTIMATE NO. 63634

SHEET NO.

PREPARED BY: [Signature]

DATE: 3-4-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<b>RAIL TRACKING</b>												
40 Ton	4000 LF 60 <sup>3</sup> / <sub>4</sub> Rail		500	20000								
2500 lb	Spikes		0	625								
6000 lb	ANGLE BARS BOLTS etc		0	1500								
5000	5x8"x5" Ties @ 500		9	4500								
1 Lot	MISC			875								
	<b>COST PER 1000 LF (2 TUNNELS)</b>			<b>27500</b>								
12 <sup>1</sup> / <sub>4</sub> LF	TUNNELS		27500	343750					443			
8 EA	TURNOUTS Frog Switches		5000	40000					20			
YEA	CALIFORNIA SWITCH		125000	250000					500			
	<b>TOTAL RAIL TRACK COST</b>			<b>633750</b>								
<b>VENTILATION SYSTEM</b>												
FOR 2 TUNNELS @ 1000 LF												
2	7 HP Air Wng. Fans w/ Starters		12500	25000					50			
2000 LF	48" 18ga Vnltg w/ caps.		2000	40000								
2000 LF	Hangers & Hardware		050	1000								
	<b>COST PER 1000 LF</b>			<b>66000</b>					40			
12 <sup>1</sup> / <sub>4</sub> LF	TUNNELS		66000	825000					40			
2 EA	ELBOW		2000	4000					20			
2 EA	INLET & Silencer		10000	20000					50			
	<b>TOTAL COST VENTIL.</b>			<b>849000</b>								

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PLANT & EQUIPMENT DETAIL

SECRET

Reach 6

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: JA DATE: 3-21-70  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>CONCRETE Equip</u>												
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Press Grout Pump/Car		30000	30000								
1 EA	SPACERITE OUTFIT		45000	45000								
1 EA	SAND BLAST OUTFIT		3000	3000								
4 EA	6 by Conc. Agitate. Cars		25000	100000								
1 LOT	VIBRATORS & MISC		4000	4000								
200 LF	SEWER LINE		1000	2000								
1 EA	Swing Spring Rig		3000	3000								
	TOTAL CONCR & GROUT EQUIP			260000								
				262000								
<u>Communications Equip.</u>												
	SWITCH BOARD & Hookup			5000								
	Cost Per 1000 A (2 turn in)											
2000 LF	Telephone line		0.20	400								
7 E	Telephones		50.00	350								
	Cost Per 1000 LF			500								
12 5/4 LF	Tunnel (Reach)		500.00	6250								
	TOTAL COMMUN			11250								
<u>ALIGNMENT CONTROL</u>												
2 EA	LAZER GUIDANCE System		5000	10000								
1 LOT	ENG. SURVEY EQUIP.		5000	5000								
				15000								

202



PLANT & EQUIPMENT DETAIL

SECRET METRO TUNNEL

Reach 6

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-21-52  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE %	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			UNIT	TOTAL			
	<u>Air, Water, Dewater</u>										
	12 1/2' LF TUNNEL (2 Tunnels)		75000	937500							
	<u>PLANT</u>										
1 EA	1200 cfm Elec Comp		80000	80000							
1 EA	600 cfm Diesel Comp		60000	60000							
2 EA	Air Receivers		1000	2000							
2 EA	Water Pump 10 Hp. Mf.		2000	4000							
2 EA	Disch. Pump 50 Hp. Mf.		5000	10000							
	Misc. Manifolds etc			14000							
	<u>TOTAL PLANT</u>			170000							
	<u>707 Air Water Disch.</u>			1107500							
	<u>Other Plant &amp; Equipment</u>										
1 Lot	Repair Shop Equipment		25000	25000							
1 Lot	Electric Shop Equipment		11000	11000							
1 Lot	Compressor Shop Equipment		10000	10000							
7 EA	ASTM WHEELS		10000	10000							
2 EA	OFFICE TRAILER 12x60		25000	50000							
1 EA	Warehouse 1000sq			10000							
2 EA	Change house @ Noo			60000							
1 EA	Shed Van			5000							
1 EA	First Aid Trailer			10000							
	ALIMAK MAN ELEVATOR			3000							
	36" x 300' Muck Conveyor 2 Sh.			100000							
	500' Muck Hoop			10000							
	<u>Tools &amp; Other</u>			308000							



# SUMMARY OF COSTS

FOR: SCRTD METRO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO. S

REACH No. 8 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-1-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM NO.

WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQUIP. OPERATION	EQUIP.	TOTAL
DESCRIPTION	QUANTITY	UNIT							
TOTAL DIRECT COSTS Prof FWD			23,635,200	19,718,880	4,243,370	9,000,000	2,492,600		59,070,050
GENERAL EXPENSE									
SCRTD - Add			3,577,000		292,900				
					499,490				
TOTAL GEN EXP.			3,577,000		528,620				8,863,900
TOTAL COSTS			27,212,200	19,718,880	9,530,370	9,000,000	2,492,600		67,954,050
RISK OF PROFIT									
%			30	10	10	5	15		
AMT									11,912,000
TOTAL COST									79,866,050
									105,240

205

# SUMMARY OF COSTS

FOR: SCRIP GROUP: \_\_\_\_\_ ESTIMATE NO. 6353-1

WORK: NIETKO RAIL PROJECT SHEET NO: S

TUNNEL CONST. (DUAL TRACK TURN TUNNEL) WORK ITEM NO. \_\_\_\_\_

REACH No 8 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	EQPT. OPERATION	EQPT. RENTALS	TOTAL
	DESCRIPTION	QUANTITY	UNIT						
	<u>TUNNEL EXCAV.</u>								
-2	EXCAV. & Support LABOR			16,848,000					
E-1	SUC & Support Equip Oper						-1,111,500		
-2	EXCAV. Equip Oper						-819,000		
-11	MUCK DISPOSAL					1,836,000			
-1-4	Misc Small Tools					663,000			
-2	ELECTRIC POWER					585,000			
-1-3	CUTTER COST					225,000			
-4	TUNNEL LINERS				14,380,000				36,467,500
				16,848,000	14,380,000	3,309,000	1,930,500		
	<u>CROSS PASSAGE</u>								
-3	SUPPORT & SUC. LABOR			489,600					
-3	EXCAV. LABOR			388,800					
-3	Loco. TRANS			115,200					
-3	PILE GANG			48,000					
-3	CONCRETE LABOR			1,036,800					
-3	SUC. & Support Equip Oper						58,400		
-5	Muck Disposal					15,120			
-6	ELECTRIC POWER					50,000			
-4	TRANS. Equip Oper						80,000		
-7	CONCRETE <del>Equip Oper</del> Mults.				240,000	84,000			
-9	<del>CONCRETE</del> Elev. Supports					300,000			
-5	Misc Small Tools etc					88,000			
				2,078,400	240,000	537,120	138,400		2,993,920
	<u>TUNNEL CLEANUP</u>								
-4	LABOR			417,600					
E-4	SUC & Support Equip Oper						15,000		
E-5	UNREGR. Equip Oper						25,500		
M-8	ELECTRIC POWER					18,750			
M-10	Misc Small Tools etc					21,000			
				417,600	240,000	39,750	40,500		497,850
				19,344,000	14,620,000	3,885,870	2,109,400		39,959,270

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# SUMMARY COSTS

FOR: SOFT 2 METRO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO: 5

REACH No. 8 WORK ITEM NO: \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3.11.83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQT. OPERATION	EQT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>INSTALL STEEL LINER</u>									
-5	TOTAL LABOR			2 755 200						2 755 200
-6	SUC Support Equip Op.							154 000		154 000
-7	Inst Equip Oper							109 200		109 200
1-11	ELECTRIC POWER					87 500				87 500
1-12	STEEL LINER				3 806 880					3 806 880
1-12	Small Tools & Suppl.					140 000				140 000
				2 755 200	3 806 880	227 500		263 200		7 052 780
	<u>FINISH TUNNELS</u>									
-6	LABOR			1 536 000						1 536 000
-7	SUC & Support Equip							40 000		40 000
-9	Underground Equipment							80 000		80 000
1-13	Elev. Tower					50 000				50 000
1-14	PERM. MAT'L				1 292 000					1 292 000
1-14	Small Tools Etc					90 000				90 000
				1 536 000	1 292 000	130 000		120 000		3 078 000
	<u>WEEKEND MAINT</u>									
	INCL elsewhere									
	<u>CONSTR PLANT</u>									
	T B M S						500 000			500 000
	OTHER PLANT						503 000			503 000
	SALVAGE						920 000			920 000
	<u>Page Total</u>			4 291 200	5 098 880	357 500	9 000 000	283 200		19 130 780
	<u>TOTAL DIRECT COSTS</u>			23 635 200	19 718 880	4 243 370	9 000 000	2 449 200		59 046 650

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP SHEET NO. L

WORK Metro Race Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GIE DATE \_\_\_\_\_

QUANTITY Tunnel Driving TBM - 78 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	OPER	TUNNEL	PYROCL	ELECT	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL							
1	<del>Service Foreman</del>											
2	WALKER	1	1	1	3	3						
3	CRANE OPER	2	2	2	6							
4	CRANE OPER	1	1	1	3							
5	TOP MAN	1	1	1	3							
6	BOTTOM MAN	1	1	1	3							
7	CHANGE RUSH LTD.	1	1	1	3							
8	COMPRESSOR OPER	1	1	1	3	3						
9	MECH FOREMAN	1			1	1						
10	MECHANIC	4	2	4	10	10						
11	ELECT. FOREMAN	1			1							
12	ELECTRICIAN	2	2	2	6							
13	PUMP OPER	1	1	1	3	3						
14	MINER	4	4	4	12							
15	LOCO OPER		1	1	2	2						
16	BRAKEMAN		1	1	2	2						
17	TRUCK DRIVER	1			1							
18	CARPENTER	1			1							
19	LABOR	4			4							
20	WRECKER	1			1							
21												
22	TOTAL	30	21	21	72	3	32	21	4	9	1	1
23												
24	HEADING CREW (v)											
25	SHIFTER	2	2	2	6							
26	TBM OPER	2	2	2	6							
27	TBM OPER	2	2	2	6							
28	MECHANIC	2	2	2	6							
29	ELECTRICIAN	2	2	2	6							
30	MINER	8	8	8	24							
31	CHUCK TENDER	4	4	4	12							
32												
33	TOTAL	22	22	22	66	18	12					
34												
35	TRUCK HEADING CREW (v)											
36	LOCOMOTIVE OPER	4	4	4	12	12						
37	BRAKEMAN	4	4	4	12	12						
38												
39	TOTAL	8	8	8	24	24						
40												
41	PILE CREW (v)											
42	PILE GANG FULL	2			2							
43	PILE GANG LAB.	8	2	2	12							
44	LOCO OPER	2			2	2						
45	LOCO OPER	2			2	2						
46	TOTAL	14	2	2	18	4	12					
47												
48	TOTAL	74	53	53	180	3	78	77	4	15	1	1



# LABOR COSTS

ESTIMATE 6363-1

FOR SOFT GROUP SHEET NO. L 1

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHC DATE 3-22-82

QUANTITY REACH NO 8 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>SERVICE &amp; Support</u>	<u>30</u>	<u>21</u>	<u>21</u>	<u>72</u>	<u>30<sup>00</sup></u>	<u>2160</u>	
4	<u>Cost Per Day</u>						<u>17280</u>	
5	<u>Cost Weeks</u>						<u>86400</u>	
6								
7								
8								
9								
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30<sup>00</sup></u>	<u>1980</u>	
11	<u>Cost Per Day</u>						<u>15840</u>	
12	<u>Cost Weeks</u>						<u>79200</u>	
13								
14								
15								
16								
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRAMP</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
19	<u>Cost Per Day</u>						<u>5760</u>	
20	<u>Cost Weeks</u>						<u>28800</u>	
21								
22								
23								
24								
25	<u>BULL DRAG</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>30</u>	<u>540</u>	
26	<u>Cost Per Day</u>						<u>4320</u>	
27	<u>Cost Weeks</u>						<u>21600</u>	
28								
29								
30								
31								
32								
33								
34	<u>TOTAL Cost/week</u>						<u>216000</u>	
35	<u>Labor</u>							
36	<u>TOTAL Cost 78 weeks</u>							<u>16848000</u>
37								
38								
39								
40	<u>Excavate Tunnels</u>							
41	<u>Through Old Stations</u>							
42	<u>Before Station and</u>							
43	<u>Crossings excavated</u>							
44								
45	<u>TOTAL LF Tunnel = 9000 LF</u>							
46								
47								
48								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E 1

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Leach No 9

PREPARED BY: GHE DATE: 3-22-83

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & REP.		
		No.	UNITS	FA	TOTAL	A	B
<b>SERVICE &amp; SUPPORT</b>							
	18 Ton Hydraulic Crane (5ay solo)	1	Ea	10 hr		A 350 <sup>00</sup>	350 -
	70 Ton Tilt Crane 15h. 8hr (2 sh @ 4 hr)	1		15 hr		A 100 <sup>00</sup>	1500 -
	F.E. Load'rs (1d. <sup>922</sup> 11000)	1		15 hr		A 46 <sup>00</sup>	690 -
	1 @ 8' 2 @ 4'						
	Flat bed Truck 5 tr.	1		7 hr		A 18 <sup>00</sup>	130 -
	<u>COST PER DAY</u>						<u>2670</u>
	1200 cfm. Elec. Comp. @ 3 hr per shift	1		9	9	B 5 <sup>00</sup>	45 -
	40 hp. Sewage Pump @ 24 hr / day	1		24	24	0 <sup>00</sup>	20 -
	25 hp. - 30' x 300' Conveyor	1		7 hr	7	5 <sup>00</sup>	35 -
	15 hp. Load. - Switching @ 5h @ 4 hr	1		4	4	18 <sup>00</sup>	80 -
	<u>COST PER DAY</u>						<u>180</u>
	<u>TOTAL COST PER DAY</u>						<u>2850</u>
	<u>COST PER WEEK</u>						<u>14250</u>
	<u>TOTAL COST 78 Weeks</u>						<u>1111500</u>
	A. Oper & Maint. B. Repairs only						

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO Rail Project

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 8

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

NOTE: For TBM Actual Cost & base on separate page  
 71.00 repairs only  
 Locomotive: Cost of repairs service & fuel

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & REP.	
		No. UNITS	EA	TOTAL		

TUNNEL Excavation  
 TBM Repair & Serv  
 Operate 48 mi/cycle  
 100 ft/day = 480 min

2		6		12 Hr	75.00	900
---	--	---	--	-------	-------	-----

LOCOMOTIVES & CARS  
 Ave 30 min full train  
 per push or cycle  
 100 cycles = 300 min  
 4 trains in 2 hrs  
 Add 2 hr full train  
 for misc  
 25 Tons loco

4		8 hr		32 hr	25.00	800
---	--	------	--	-------	-------	-----

Bull Crank Loco  
 Say 4 hr/day 2 ea  
 1 ton loco

2		4 hr		8 hr	18.00	150
---	--	------	--	------	-------	-----

Muck Cars  
Other Cars

16	EA	8 hr		128 hr	1.50	200
8	EA	8 hr		64 hr	0.75	50

TOTAL Cost Per Day

2100

Cost Per Week

14700

Cost 78 weeks

819000

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## WORK INFORMATION

Assume Tunnel Muck Loaded on truck hauled  
to disposal site at 5<sup>00</sup>/hour  
1 LF. 11<sup>00</sup> Bag x 1.50 = Say 17<sup>00</sup> LF. @ 60<sup>00</sup> = 102<sup>00</sup>/hr  
2 Tunnels 204<sup>00</sup>  
Reach

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>Muck Disposal</u>	<u>9000 LF</u>	<u>204<sup>00</sup></u> <u>102<sup>00</sup></u>	<u>1836000</u>
	<u>Tunnel through Gate and Cross-over</u>			
	<u>Misc Small Tools &amp; Supplies</u>			
	<u>Estimate misc small tools, supplies and consumables @ 4.92 labor, 216,000 Say \$ 8500/week</u>			
	<u>TOTAL 8 weeks</u>	<u>WA</u>	<u>8500</u>	<u>663,000</u>

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCR TO METEO RAIL GROUP

SHEET No. M

WORK: \_\_\_\_\_

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-11-83

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

ELECTRIC POWER CONSUMPTION  
TOTAL Tunnel Reaches = 93,100 CE ÷ 7 = 13,300 Ave 7 Tunnels  
2 headings

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>ELECTRIC POWER</u>	<u>hp-hr</u>		
	<u>1-1200 Comp. 4 1/2 hr @ 9 hr/day</u>	<u>4050</u>		
	<u>1-40 hp pump @ 2 1/2 hr/day</u>	<u>960</u>		
	<u>1-25 hp conveyor @ 8 hr/day</u>	<u>200</u>		
	<u>2-1000 hp TM (400 min)</u>	<u>12000 hp-hr</u>		
	<u>2-100 hp Grant (300 min/day)</u>	<u>1000 hp-hr</u>		
	<u>A-75 hp Vent Fan (ave)</u>			
	<u>@ 2 1/2 hr / day =</u>	<u>25,200 hp-hr</u>		
	<u>2-Grant pump (90 min/hr)</u>			
	<u>2-150 hp</u>	<u>30 hp-hr</u>		
	<u>ALLOW MISC</u>	<u>560</u>		
	<u>TOTAL ELEC MOTORS</u>	<u>44,000 hp-hr</u>		
	<u>@ 0.74¢ @ 80% =</u>	<u>27,000 kWh</u>		
	<u>Lighting</u>			
	<u>PORTAL 20 kW @ 2 1/2 hr</u>	<u>480</u>		
	<u>Headset 2 @ 10 kW @ 2 1/2 hr</u>	<u>480</u>		
	<u>Line 7000 = 40 = 175 @ 0.1 @ 2 1/2 hr</u>	<u>420</u>		
	<u>MISC ALLOW</u>	<u>120</u>		
	<u>OFFICE &amp; HOURS</u>	<u>500</u>		
		<u>2000</u>		
	<u>TOTAL Elec Per Day</u>	<u>29,500</u>		
	<u>Add for weekend peaking</u>			
	<u>2500 x 2 / 7 = 500</u>	<u>1000</u>		
	<u>Cost Per Day</u>			<u>1450.00</u>
	<u>Cost Per Week</u>			<u>7500.00</u>
	<u>TOTAL Cost 78 Weeks</u>			<u>585000</u>

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No. 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. 7

## WORK INFORMATION

*Estimate Copper Costs*  
 Say 45 outers @ 1500<sup>00</sup>/pc = 67500  
 7 2 cables @ 500<sup>00</sup> = 3500  
 101000  
 Say 600 hr are life in Allow + Reserve = 170<sup>00</sup> x 6 = 1020 = 25<sup>00</sup>/hr  
 300 hr are life in Basalt = 335<sup>00</sup>/hr x 6 = 2010 = 50<sup>00</sup>/hr

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	Reach 2 (Thru Sta)	8500 LF	25	
	5	12100	25	
	6	10400	25	
	8 Thru Sta	9000 LF	25	
	10	17000	25	
	12	16500	50 <sup>00</sup>	
	14	9700	25	
				225,000

# MATERIAL COSTS

ESTIMATE NO. 63657  
 SHEET NO. M-4  
 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-22-87  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: Reach No 8

REF. NO.  
OR QTY.

WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LC to project  
 and deliver non-grouted liners, 800<sup>00</sup>/LC to grouted  
 Liners per LF Tunnel  
 Grout Behind Liner = 0.39 cy/LC at 75<sup>00</sup>/cy = 30<sup>00</sup>/LC  
 @ Tunnels = 60<sup>00</sup>/LC Perm Mat.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

SCRTD MAT'L CLASS

2x 7600

15700

600  
500

12 160 000

Through S. 2x 1400

2800

600

1 680 000

Grout Behind Liner

18000

30<sup>00</sup>

540 000

TOTAL LINERS

14 380 000

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP \_\_\_\_\_

SHEET NO. L-3

WORK METRO RAIL PAVEMENT

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles

PREPARED BY GKE DATE 3-22-93

QUANTITY REACH No 8

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
1	<u>WAS PAVEMENT CONSTR</u>								
2									
3									
4	<u>SUPPORT &amp; SERVICE</u>	25	13	13	51	30 <sup>00</sup>	1530		
5	Cost per day						12840		
6	Cost per week						61200		
7									
8									
9									
10	<u>12 EA CROSSOVER</u>								489600
11	TOTAL 8 Weeks								
12									
13									
14	<u>CROSSOVER 1/2 Hr. Crew</u>	18	18	18	54	30 <sup>00</sup>	1620		
15	2 crews						12960		
16	Cost per day						64800		388800
17	Cost per week								
18									
19									
20									
21	TOTAL 4 Weeks								
22									
23									
24	<u>TRASPORT &amp; Mch Handle</u>	4	4	4	12	30	360		
25							2880		
26	Cost per day						14400		
27	Cost per week								115200
28									
29									
30									
31	TOTAL 8 Weeks								
32									
33									
34	<u>BULL GANG</u>	5			5	30	150		
35							1200		
36	Cost per day						6000		
37	Cost per week								48000
38									
39									
40	TOTAL 8 Weeks								
41									
42	<u>CONCRETE CREW</u>	36	36	36	108	30 <sup>00</sup>	3240		
43	3 crews						25920		
44	Cost per day						109600		
45	Cost per week								1036800
46									
47	TOTAL 8 Weeks								
48									



EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-3

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: OHC DATE: 3-23-8

QUANTITY: LEACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<u>CROSS PASSAGE CONSTRUCTION</u>

REF. NO. OR QTY.	DESCRIPTION	HOURS		OPERATING COST	
		No. UNIT	Hrs/Unit	TOTAL	PER UNIT
	<u>SERVICE &amp; SUPPORT</u>				
	<u>18 Ton Hyd. Crane 2 sh @ 4 hr</u>	1	8	3500	280 -
	<u>70 Ton Hyd. Crane 1 sh @ 6</u>	1	6	10000	600 -
	<u>FE Ldr. (946)</u>	1	4	4600	184 -
	<u>FLAT BED TRUCK STN</u>	1	5	1800	108 -
					1172 -
	<u>1800 cfm. Comp.</u>				
	<u>3 sh @ 7 hr</u>	1	21	500	105 -
	<u>40 hp. Pump</u>	1	24	600	19 -
	<u>85 hp. Compressor</u>	1	4	500	20 -
	<u>STN. 6000 Switch 2 sh @ 4</u>	1	8	1800	144 -
					288 -
	<u>TOTAL COST per Day</u>				1460 -
	<u>COST per week</u>				7300 -
	<u>TOTAL COST 8 weeks</u>				58400

# MATERIAL COSTS

ESTIMATE No. 6353-1  
 SHEET No. M 5  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GAC DATE: 3-26-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 8

## WORK INFORMATION

Cross Passage Excav. 40 By/ea x 1' = 210 Ccy  
 Much Disposal @ 6<sup>00</sup>/Ccy = \$1260 per passage

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	No Cross Passage	12	1260	15120
	MISC. SMALL TOOLS + SUPPLIES @ 4% Labor \$275,800 No Wks	8	\$11,000	88000

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCLTD GROUP: \_\_\_\_\_

SHEET No. M-6

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-22-53

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Comp  
21 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Conveyor @ 24

100 hp hr

1- 75 hp Concr. Pump @ 8

600 hp hr

14- 75 hp Vent Fans  
@ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37000 hp hr

@ .746 @ 80%

22,000 kWh

Lighting

Partial 20 kw @ 24

480

400 @ 5 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SUPS

500

MISC

700

2500

TOTAL Elec per Day

24500 kWh

Add for weekends 500

25,000 kWh

Cost per Day

Cost per Week

Cost @ weeks

1250

1250

6250

50000

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SOFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passages - Excess CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION		
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Superv	Off	Tools	W. M.	Exp	Cost	W. M.	Exp
1														
2	<u>Support &amp; Service</u>													
3														
4	Walker	1	1	1	3	3								
5	Crane Oper	1	1	1	3		3							
6	Crane Oiler	1			1		1							
7	Tap man	1			1				1					
8	Hoisting man	1	1	1	3				3					
9	Charge Hand	1			1				1					
10	Compr. Oper	1	1	1	3		3							
11	Mech. Foreman	1			1		1							
12	Mechanic	2	2	2	6		6							
13	Elect. Foreman	1			1									
14	Electrician	2	1	1	4					14				
15	Pump Oper	1			1		1							
16	Miner	4	4	4	12				12					
17	Loco Oper		1	1	2		2							
18	Brake man		1	1	2		2							
19	Truck Driver	1			1									
20	Carpenter	1			1									
21	Welder	4			4				4					
22	Pipe Fitter	1			1									
23	2 Crossings - men/day				51	3	17	17	4	5	1		1	1
24	14 hrs/24													
25														
26														
27	<u>Crossing Working 2 Cross</u>													
28	Spitter	2	2	2	6		6							
29	Miner	8	8	8	24		24							
30	Chuck Tender	4	4	4	12		12							
31	Picker	2	2	2	6		6							
32	Mucker (2)	2	2	2	6		6							
33		18	18	18	54		6	48						
34														
35	<u>Mock Handle</u>													
36	Loco Oper	2	2	2	6		6							
37	Brake man	2	2	2	6		6							
38					12		12							
39														
40	<u>Bull Gang</u>													
41	Foreman	1			1									
42	Bull Gang	4			4									
43					5									
44														
45														
46	<u>TOTAL EXCESS 2 CROSSINGS</u>				122									
47	<u>1 Crossing</u>				61									
48	<u>ALLOW EXCESS 5 DAYS</u>													

# LABOR COSTS

ESTIMATE 6363-1

7

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L  
 WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 QUANTITY Class Passengers - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			1	2	3	4		
1													
2	Support & Service												
3	Concrete Crew												
4													
5													
6													
7													
8	Shifter	1	1	1	3								
9	Concrete Finisher	1	1	1	3								
10	Helpers	1	1	1	3								
11	Concrete	6	6	6	18								
12	Helpers	4	4	4	12								
13	Iron workers	4	4	4	12								
14	Operator - for concrete												
15													
16	Total crew =				34		9.14			21		12	
17													
18	2 Crews												
19													
20													
21													
22													
23													
24	TOTAL MEN =												
25	Note Aug 22 Crossover												
26													
27													
28													
29	Support & Service 24 crews = 14 wk @ 51				714	42	236	238	56	70	14	14	14
30	Excav				594		46	528					
31	Transport				168		168						
32	Back Goo				70		70						
33	Concrete Lab				1512		54	336		588	336		
34													
35													
36	TOTAL Man-wk for 24				3053	42	500	1023/332	70	204	336	14	14
37													
38	Rev. for Concrete Man-wk				140	23	23	50	19	3	27	15	11
39													
40	Ass. for Equip/Passenger				720	10	115	26	90	15	135	75	5
41													
42													
43													
44													
45													
46													
47													
48													



TITLE SCRIPD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6213-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHC DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

CROSS PASSAGES  
 Tunnels 42'-8"  $\pm$  to  $\pm$   
 Bay Passages 25' long.

ACCOUNTS

Excav. Neat =  $9\frac{1}{2} \times 12\frac{1}{2} = 118\frac{1}{4}$  cu ft  $4\frac{1}{2}$  cu yds = 110  
 Excav w/over =  $11\frac{1}{2} \times 14\frac{1}{2} = 164\frac{1}{2}$  cu ft =  $5\frac{1}{2}$  cu yds = 148 cu

Concrete 27 cu yds  $46\frac{1}{2}$   
 Neat  $118\frac{1}{4} - (5\frac{1}{2} \times 25\frac{1}{2}) = 77\frac{1}{4}$  cu ft =  $2\frac{6}{8}$  cu yds  $\times 27 = 72\frac{1}{2}$   
 w/over  $164\frac{1}{2} - 46\frac{1}{2} = 108\frac{1}{2}$  cu ft =  $4\frac{1}{8}$  cu yds  $\times 27 = 108\frac{1}{2}$   
 TRUCKS w/over  $11 \times 25\frac{1}{2} \times 25 = 299\frac{1}{2}$   
 wall & curb 83 cu yds  
 108 cu yds

Soft Rock  
 Excav. Neat





# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-7

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHC DATE: 3-21-83

QUANTITY: REACH NO 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## CROSS PASSAGE WORK INFORMATION

### CONCRETE MATERIALS

Concrete 110 cu/ per passage @ 60.00 \$ 6600  
 Rebar 1109 @ 260' = 22000' @ 0.60 \$ 13,200  
 Opog 5'-5" x 8' = 22'-5" SF  
 8'2" x 25' = 560 SF  
 May \$ 29,000 / passage

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PERMANENT MATERIAL  
NO CROSS PASSAGE

12

\$ 20000

240000

FORMS - Silt Bas  
Provide 3 sets of  
FORMS @ 160 SF  
1201 Silt Bas

1680 SF

50.00

\$ 84000

84000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCHTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJ WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 8 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

CROSS PASSAGE CONSTR

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNITS EA TOTAL

TOTAL OPER & DEF.

Cross-Pass Excav

Eimco 630 2 EA 20 40  
Air Spade Drills etc 8 20 160

2600 1040  
100 160

Loco & CARS

25 TD Loco @ 8 hr 2 8 16  
in 3 sh. hr

2500 400

Muck Cars 4 4 16  
Other Cars 8 4 32

150 30  
100 30

CONCRETE

Concrete Pump 1 8 8

1500 120

Concr. Agitator Cars 4 8 32

500 160

Vibrators Misc 4 8 32

200 60

Cost Per Day

\$ 2000

Cost Per Week

12,000

Cost 8 Weeks

80,000

# LABOR COSTS

11

ESTIMATE \_\_\_\_\_

FOR SCFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Total 1 Group - 8  
500 sq ft track CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	<u>Service &amp; Report</u>												
2													
3													
4	<u>Water</u>	1	1	1	3	3							
5	<u>CRANE Oper</u>	2	1	1	4		4						
6	<u>Crane Driver</u>	1			1		1						
7	<u>Top Alarm</u>	1			1			1					
8	<u>Bottom Alarm</u>	1	1	1	3			3					
9	<u>Charge Rec. Att.</u>	1			1			1					
10	<u>Control Oper</u>	1	1	1	3		3						
11	<u>Mech. Foreman</u>	1			1		1						
12	<u>Mechanic</u>	2	1	1	4		4						
13	<u>Elec. Foreman</u>	1			1								
14	<u>Elec.</u>	4	1	1	6					1			
15	<u>Pump Oper</u>	1	1	1	3		3						
16	<u>Pipe</u>	2	2	2	6		6						
17	<u>Loco Oper</u>		1	1	2		2						
18	<u>Brake Man</u>		1	1	2		2						
19	<u>Track Driver</u>	1			1								1
20	<u>Carpenter</u>	1			1								1
21	<u>Hand</u>	4			4			4					
22	<u>Pipe Fitter</u>	1			1					1			
23					48	3	20	11	4	7	1	1	1
24													
25	<u>Cleanup Crew (2 hrs)</u>												
26	<u>Shifter</u>	2	2	2	6		6						
27	<u>Miner</u>	4	4	4	12		12						
28	<u>Tunnel Labor</u>	8	8	8	24		24						
29													
30					48								
31													
32	<u>Transport</u>												
33	<u>Loco Oper</u>	2	2	2	6		6						
34	<u>Station</u>	2	2	2	6		6						
35					12		12						
36													
37													
38	<u>Blue Birds</u>												
39													
40	<u>Foreman</u>	2			2								
41	<u>Blue Birds back</u>	8			8								
42	<u>Loco Oper</u>	2			2		2						
43	<u>Boiler</u>	2			2		2						
44					14		4	10					
45													
46													
47	<u>Total Per Day</u>				116	3	36	63	7	7	1	1	1
48													



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHE DATE: 3-23-8

QUANTITY: REAC4 No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			OPERATING COST	
		No. UNIT	Hrs/Unit	TOTAL	Rate	Total
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane</u> <u>3 sh @ 4 hr</u>	1	12		35.00	420 -
	<u>70 Ton Hyd. Crane</u> <u>1 sh @ 4 hr</u>	1	4		100.00	400 -
	<u>FE Ldr (946)</u>	1	4		46.00	180 -
	<u>FLAT BED TRUCK STN</u>	1	6		18.00	110 -
						710
	<u>1800 cfm. Comp. 11</u> <u>3 sh @ 7 hr</u>	1	21		5.00	105 -
	<u>40 hp. Pump</u>	1	24		0.80	19 -
	<u>65 hp. Compressor</u>	1	4		5.00	20 -
	<u>NTN 4000 Switch</u> <u>2 sh @ 4 hr</u>	1	8		18.00	144 -
						293
	<u>TOTAL COST per Day</u>					1000
	<u>COST per week</u>					5000 -
	<u>TOTAL COST 3 weeks</u>					15000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 63631

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-5

WORK: Water Line Project

WORK ITEM NO. \_\_\_\_\_

LOCATION: CLEANUP

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: Reach No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

Cleanup at 5.00 \$ per day

REF. NO. OR QTY.	DESCRIPTION	HOURS				Total Oper. & Rep.	
		No.	Un.	EA	TOTAL		
	<u>Various Equip.</u>						
	Finco 630	2	EA	20	40	26.00	1040
	MISC						60
	<u>LOCOMOTIVES</u>						
	25 Ton V.	2		10	20	25	500
	Muck Call	4		10	40	1.50	60
	Office Call	4		10	40	1.00	40
	 TOTAL Per Day						1700
	Totals Per Week						8500
	 TOTAL 3 weeks						25500

# MATERIAL COSTS

ESTIMATE No. 6353-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-8

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHC DATE: 3-22-53

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Comp. @ 24 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Conveyor @ 4

100 hp hr

1- 600 Hi. Pl. Pump

600 hp hr

14- 75 hp. Vent Fans @ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37000 hp hr

@ .546 @ 24

22,000 kWh

Lighting

POTENTIAL 20 kw @ 24

480

Wks 405 kw @ 24

430

LINE 350 @ 0.11 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per day  
Add for weekend day

24500 kWh

500

25,000 kWh

0.05

1250

Cost per day

1250

Cost per Week

6250

Cost 3 weeks

18,750

231

# MATERIAL COSTS

ESTIMATE No. 6365-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-10

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: Clearing

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No. 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

MISC Small Tools  
& Supplies

AT 5 1/2 Labs 129200  
Say 7000/wk

No Weeks

3

700

21000



# LABOR COSTS

ESTIMATE 6363-1

FOR SOFTO GROUP SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles final #8 PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Tunnel Driving Install Steel Liner CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION						
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Open	Tunnel	Latent	Elect	Cap	Structure	PHO	Filler	Teal			
1	Service + Support (1)																	
2	Walker	1	1	1	3	3												
3	Crane Oper	2	2	2	6	30												
4	Crane Oiler	1	1	1	3	30												
5	Top-man	1	1	1	3													
6	Bottom Man	1	1	1	3													
7	Change House att.	1	1	1	3													
8	Compressor Oper.	1	1	1	3	3												
9	Mech. Foreman	1			1	80												
10	Mechanic	4	2	2	8													
11	Elect. Foreman	1			1													
12	Electrician	4	2	2	8													
13	Pump Oiler	1	1	1	3	3												
14	Mixer	4	4	4	12													
15	Loco Oper		1	1	2	20												
16	Brakeman		1	1	2													
17	Truck Driver	1			1													
18	Carpenter	1			1													
19	Labor	4			4													
20	Pipe Fitter	1			1													
21																		
22	<b>Total</b>	<b>30</b>	<b>19</b>	<b>19</b>	<b>68</b>	<b>3</b>	<b>28</b>	<b>21</b>	<b>4</b>	<b>9</b>	<b>1</b>							
23																		
24	<u>Heading Crew (2)</u>																	
25	Shifter	2	2	2	6													
26	Iron Worker - Welder	4	4	4	12													
27	Iron Worker - Rigger	2	2	2	6													
28	Iron Worker - Helper	2	2	2	6													
29	Electrician	2	2	2	6													
30	Miner	4	4	4	12													
31	Chuck Tender	2	2	2	6													
32																		
33	<b>Total</b>	<b>18</b>	<b>18</b>	<b>18</b>	<b>54</b>													
34																		
35	<u>MATL TRANSFER Crew (2)</u>																	
36	Locomotive Oper	4	4	4	12													
37	Brakeman	4	4	4	12													
38																		
39	<b>Total</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>24</b>													
40																		
41	<u>Bull Gang (2)</u>																	
42	Bull Gang Foreman	2			2													
43	Bull Gang Laborer	2	2	2	6													
44	Loco Oper	2			2													
45	Loco Oiler	2			2													
46	<b>Total</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>8</b>													
47																		
48	<b>TOTAL</b>	<b>70</b>	<b>47</b>	<b>47</b>	<b>164</b>	<b>3</b>	<b>56</b>	<b>59</b>	<b>4</b>	<b>15</b>	<b>1</b>	<b>24</b>	<b>1</b>	<b>1</b>				

233

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFTD GROUP SHEET NO. L-5

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY PLC DATE 3-27-83

QUANTITY INSTALL STEEL LINER CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	<u>REACH No 8</u>							
2	<u>SCFTD Time of Assure</u>							
3	<u>SERVICE &amp; Support</u>							
4		30	19	19	68	30 <sup>00</sup>	2070	
5	Cost Per Day						16320	
6	Cost Per Week						81600	
7	Cost _____ weeks							
12	<u>LINER HANGING CREWS</u>							
13		13	13	13	54	30 <sup>00</sup>	1620	
14	Cost Per Day						12960	
15	Cost Per Week						64800	
16	Cost _____ weeks							
21	<u>MAT'L TRANSFER CREW</u>							
22		8	8	8	24	30	720	
23	Cost Per Day						5760	
24	Cost Per Week						23300	
25	Cost _____ weeks							
30	<u>PULL CREWS</u>							
31		4	4	4	18		540	
32	Cost Per Day						4320	
33	Cost Per Week						21600	
34	Cost _____ weeks							
40	<u>TOTAL COST PER WEEK</u>						196800	
44	<u>TOTAL COST PER WEEK</u>							275500

EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-6

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHE DATE: 3-23-82

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

REF. NO. OR QTY. DESCRIPTION No UNIT Hours Hours TOTAL Operating Cost

SERVICE & SUPPORT

18 Ton Hyd. Crane  
3 sh @ 4 hr

1

12

3500

420

70 Ton Hyd. Crane  
3 sh @ 4

1

12

10000

1200

FE Ldr. (940)

1

4

4600

180

FLAT BED TRUCK STN

1

5

1800

110

1910

1800 cfm Comp. Air  
3 sh @ 7 hr

1

21

500

105

40 hp. Pump

1

24

080

19

85 hp. Generator

1

4

500

20

15 TN 6000 Sw. ch.  
2 sh @ 4

1

8

1800

144

290

TOTAL Cost Per Day

2200

Cost Per week

11000

TOTAL COST 14 weeks

154000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1  
 FOR: SCRP GROUP: \_\_\_\_\_ SHEET NO. E-7  
 WORK: METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: GHE DATE: 3-23-83  
 QUANTITY: REACH No 8 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<u>INSTALL STEEL LINER - Details taking into SCRP's late</u>

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost		
		No	UNIT	TOTAL			
	Allow for welder jacks, tugs etc 30 hrs @ 5 hr x ✓	2	hr	15	30 hr	1500	450
	<u>Locos. + Cars</u>						
	25 to loco @ 4 hrs each	4		10	40 hr	25	1000
	Cars	8		10	80	100	80
	Clout pump.	2		5	10	3	30
							1560
	Cost per Day						7800
	Cost per Week						
	Cost 14 week						109200

# MATERIAL COSTS

ESTIMATE No. 6363-1  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET No. M-11  
 WORK: METRO RAIL PROJECT WORK ITEM No. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: BHR DATE: 3-22-83  
 QUANTITY: REACH No 3 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Compr.  
21 hr/day

9450 hp hr

1 40 hp Pump @ 24

960 hp hr

1- 25 hp Compressor @ 24

1000 hp hr

1- Lot WELDERS

600 hp hr

14- 75 hp Vent Fans  
@ 24 hr/day

25200 hp hr

ALLOW MISC

690

TOTAL Elec

37005 hp hr

@ .746 @ 85%

22,000 kWh

Lighting

POTAL 20 kw @ 24

480

Hds 405 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekend Day

24500 kWh

500

25,000 kWh

02

125

COST per Day

COST per Week

125

625

COST 14 weeks

87500

237

# MATERIAL COSTS

ESTIMATE No. 63631

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-12

WORK: METRO RARE PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

## WORK INFORMATION

No details given SCRTD Allow 1135 1/4" @ 60 c/ft = 681.12  
 Reach 5: Grout at 10 c/ft @ 400 = 40  
 Reach 8: \_\_\_\_\_  
 TOTAL 5.721  
 OK to use for estimate

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>PEEL MARK</u>			
	<u>Reach 5</u>	<u>72100</u>	<u>74</u>	
	<u>Reach 8</u>	<u>5280</u>	<u>721</u>	<u>3806880</u>
	<u>Small Tools &amp; Supplies</u>			
	<u>Use 5 Pa Labor 17600/wk</u>			
	<u>= Pay \$10000</u>			
	<u>No Weeks</u>	<u>14</u>	<u>10000</u>	<u>140000</u>

# LABOR COSTS

N

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel 8 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	Package Handling			12	12			
3								
4	Trench Concrete 50% @ 1.50			60	60			
5								
6								
7	Truck Driver			3	3			3 m/hrs
8								
9								
10	Loco Op & Ass't			10	10	0.05 m/hrs		4 m/hrs
11								
12								
13	Place Concrete							
14	612 LF @ 234¢							
15								
16	Shift Op	1			1			
17	Loco Labor	4			4			
18	Carp Foreman		1		1			
19	Carp Labor		2		2			
20	Labor		2		2			
21	Iron Worker	1			1			
22	Iron Foreman			1	1			
23	Carp Labor		1		1			
24	Loco Op & Ass't			1	1			
25	Loco Op	1	1	2	4			
26	Place & Finish	1	1	2	4			
27	Cement Finish			2	4			
28					4			
29	SERVICE & Support					9.14		
30	Use Pump Crew					2		
31	As for Tunnel Clear up							
32								
33								
34								
35								
36								
37	Place Concrete				83	13.25		15 14
38	Service Support				43	3		1 1 1
39	Install Handrail				14			
40								
41								
42								
43	Total for 100 LF				143	5		19 24 1 1
44								
45								
46								
47								
48								





# LABOR COSTS

ESTIMATE 6367-1

FOR SCFD GROUP

SHEET NO. L-6

WORK METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Trench Fence No 8

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				<u>43</u>	<u>30</u>		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSIT</u>				<u>14</u>			
13								
14								
15								
16								
17								
18								
19	<u>Place Curbside</u>							
20	<u>&amp; Trench</u>				<u>83</u>			
21								
22								
23								
24								
25	<u>INSTALL HORIZONTAL</u>				<u>14</u>			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	<u>TOTAL</u>				<u>160</u>	<u>30</u>	<u>4800</u>	
36	<u>TOTAL Per Day</u>						<u>59000</u>	
37								
38	<u>TOTAL Per Week</u>						<u>190000</u>	
39								
40								
41								
42								
43	<u>TOTAL 8 Week</u>							<u>1536000</u>
44								
45								
46								
47								

# EQUIPMENT OPERATING COSTS

FOR: SCRTD GROUP: \_\_\_\_\_ ESTIMATE NO. \_\_\_\_\_  
 WORK: METRO RAIL SHEET NO. E 8  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: Reach No 8. CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			Operating Cost		
		No	UNIT	HRS/EA	TOTAL		
	<u>Service &amp; Support</u>						
	<u>Use Cost Per Hr</u>						<u>500</u>
	<u>TOTAL of work</u>						<u>40 000</u>

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCTD GROUP: \_\_\_\_\_

SHEET NO. E-49

WORK: METRO RAIL PROJ

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 8

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNITS EA TOTAL

Total Oper. Exp.

ALLOW  
AIR Spdr. Drills etc

2 EA 20 40  
8 20 160

2000 1040  
100 160

LOCO & CARS

25 TD Loco @ 8 hr.  
in 3 shifts

2 8 16

3500 400

Muck Cars  
Other Cars

4 4 16  
8 4 32

150 30  
100 30

CONCRETE

Concrete Pump

1 8 8

1500 120

Concr. Agitator Cars

4 8 32

500 160

VIBRATORS MISC

4 8 32

200 60

Cost Per Day

\$ 2000

Cost Per Week

12,000

Cost 6 weeks

80,000

# MATERIAL COSTS

FOR: SCLTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 8

ESTIMATE No. 6363-1  
 SHEET No. M-13  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: ELR DATE: 3-22-33  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Comp. @ 21 hr./day

9450 hph

1- 40 hp Pump @ 24

960 hph

1- 25 hp Compressor @ 24

100 hph

1- 507 Hi. pr. Pump

600 hph

14- 75 hp Vent Fans @ 24 hr/day

25200 hph

Allow misc

690

TOTAL Elec

37005 hph

@ .74¢ @ 20%

22,000 kWh

Lighting

Power 20 kw @ 24

480

Wds 505 kw @ 24

480

Line 3500 0.1 x 24

840

Office Supp

500

MISC

700

2500

TOTAL FEES PER DAY  
Add for weekends Day

24500 kWh

500

25,000 kWh

Cost per Day

Cost per Week

Cost 8 Weeks

0.25

1250

210

6270

50 000

244

# MATERIAL COSTS

ESTIMATE No. 63637  
 SHEET No. M-14  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SECT D GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: FINISH TUNNEL  
 QUANTITY: REACT No 8

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	PURCHASE HANDRAIL 2 Tunnels	20	1.00	20
	PURCHASE CONCRETE 2 @ 1.17 =	2.50 cy	60.00	150.00
	COST OF MAT'L	1 LF		170.00
	PERM MAT'L			
	Reach 2	7500 LF	170.00	
	3	6500 LF	170.00	
	6	10500 LF	170.00	
	10	7600 LF	170.00	
	14	17000 LF	170.00	
	14	15500 LF	170.00	
	14	9700 LF	170.00	
	Misc Small Tools and Supplies			
	Use 50 Lags @ 19.00			
	5m @ 10.00			
	No Weeks	8	51000	80.00

PLANT & EQUIPMENT DETAIL

SCRIPD METRO RAIL PROJECT

ESTIMATE NO. 6363-1

Reach 8 9,500 LF (1600 LF)

SHEET NO.

PREPARED BY: GPF

DATE: 3-21-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & ANKILL:			5000000		10	500000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1540000								
	MISC UNDER GROUND			125000								
	RAIL TRACKAGE			551250								
	VENTILATION SYSTEM			651000								
	CONCRETE EQUIPMENT			262000								
	COMMUNICATIONS EQUIP			9750								
	ALIGNMENT CONTROL			15000								
	ELECTRICAL EQUIPMENT			689500								
	AIR WATER DEWATER			882500								
	OTHER PLANT			308000								
				5034000		10	534000					
				10034000			1034000					

9776

PLANT & EQUIPMENT DETAIL

SCHLTD METRO RAIL PROJECT

ESTIMATE NO. 6363-1

REACH 8 9500 LF (7600 LF)

SHEET NO.

PREPARED BY: GHE

DATE: 3-21-82

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE %	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			UNIT	TOTAL			
<u>TUNNEL EQUIP.</u>											
2 EA	TBM incl Trailing Gear - conveyor - dust suppression Qty 300 TN @ 1000 hp		2500	000			300	600			
							100	200			
				5000	000		400				
<u>Locomotives &amp; Cars</u>											
4	25 TN Diesel loco. Muck		200,000	800,000			25				
2	15 TN Bullgan		120,000	240,000			15				
12	10 cu Muck Car 5 TN		16,000	192,000			5				
8	Flat Car 8 whl		12,000	96,000			42				
2	Man Cars 4 whl		6,000	12,000			20				
2	Eng Line Cars		20,000	40,000			80				
1	Coal Dumper		80,000	80,000			300				
2	SCOUT CAR & PUMP		4,000	8,000							
	<u>TOTAL loco &amp; Cars</u>			<u>1,548,000</u>							
<u>MISC UNDERGROUND</u>											
4	SINKER DRILLS		2000	8000			0				
4	STOPEE DRILLS		2500	10000			0				
4	AXLES DRILLS		2500	10000			0				
2	4" Driftel for Pilot		16,000	32,000			10				
2	Ditch Boom & Slide		14,000	28,000			10				
2	Tigger hoists		5,000	10,000			10				
2	AIR Wrenches		500	4,000			0				
4	Oxy Acet Outfit		1,000	4,000			0				
4	Elec Welder 300 amp		2,000	8,000			0				
4	Photo Scales		1,000	8,000			0				
4	Chipping sups. Air		250	1,000			0				
1	Misc Conc, Steel Drills		500	2,000			0				
	<u>TOTAL MISC Equip</u>			<u>125,000</u>							

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PLANT & EQUIPMENT DETAIL

SECT 8 METRO RAIL PROJECT

Reach 8

ESTIMATE NO. 63634  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: *[Signature]* DATE: 3-4-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			%	AMOUNT			
<b>RAIL &amp; Trackage</b>											
40 tons	FOR 2 Tunnels 1000'										
2500 lb	4000 LF 60# Rail		500	20000							
6000 lb	Spikes		0	625							
5000 lb	ANGLE BARS RAILS etc		0	1500							
1 lot	5x8"x5' TRUCK JOBS		9	450							
	MISC			375							
	<b>COST Per 1000 LF (2 TUNNELS)</b>			<b>27500</b>							
9 1/2	MLF TUNNELS		27500	261250					443		
8	TURNOUTS, frogs, switches		5000	40000					20		
YEA	CALIFORNIA SWITCH		125000	250000					500		
	<b>TOTAL RAIL TRACK COST</b>			<b>551250</b>							
<b>VENTILATION SYSTEM</b>											
FOR 2 TUNNELS @ 1000 LF											
2	W/HP Air Vary Fans w/struts		12500	25000					50		
2000 LF	48" Dia Ducting w/caps		2000	40000							
2000 LF	Hangers & hardware		650	1000							
	<b>COST Per 1000 LF</b>			<b>66000</b>					40		
9 1/2	MLF TUNNELS		66000	627000					40		
2 EA	ELBOW		2000	4000					20		
2 EA	INLET & Silencer		10000	20000					50		
	<b>TOTAL COST VENTIL.</b>			<b>651000</b>							

248



PLANT & EQUIPMENT DETAIL

SECRET

Reach 8

ESTIMATE NO.

6363-1

SHEET NO.

PREPARED BY:

*[Signature]*

DATE: 3-21-87

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>CONCRETE Equip</u>											
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Press Grout Pump/Car		38000	38000								
1 EA	Shotcrete Outfit		45000	45000								
1 EA	SAND BLAST Outfit		3000	3000								
4 EA	6 cu Yards Concrete Vibr		25000	100000								
1 LOT	VIBRATORS & MISC		4000	4000								
200 LF	SPICK LINE		10 <sup>00</sup>	2000								
1 EA	Sealing Spring Rig		3000	3000								
	TOTAL CONCR & GROUT Equip			262000								
				262000								
	<u>Communications Equip.</u>											
	SWITCH BOARD & Hookup			5000								
	(Cost Per 1000 A (2 turn))											
2000 LF	Telephone line		0 <sup>20</sup>	400								
7 E	Telephones		50 <sup>00</sup>	100								
	Cost Per 1000 LF			500								
9 <sup>1</sup> LF	Tunnel (Reach)		500 <sup>00</sup>	4750								
	TOTAL COMMUN			9750								
	<u>ALIGNMENT CONTROL</u>											
2 EA	LAZER GUIDANCE System		5000	10000								
1 LOT	FIELD SURVEY Equip.		5000	5000								
				15000								

247

PLANT & EQUIPMENT DETAIL

SCR 70 METRO TUNNEL

Reach 8

ESTIMATE NO. 5367-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-21-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>ELECTRICAL EQUIPMENT</u>												
1	Sub-station - Hook up		5000	5000								
3 Ea	1000 KVA Transformer		30000	15000								
1 Ea	300 KW Standby Generator		75000	75000								
1 Lot	SWITCH GEAR		25000	25000								
	<u>TOTAL ELECTRIC PLANT</u>			<u>300000</u>								
<u>ELECTRICAL Tunnel Plant</u>												
<u>FOR 2 TUNNEL @ 1000 LF</u>												
2000	LF POWER CABLE		10 <sup>00</sup>	20000								
2 Ea	100KVA 4Tg Vent Transformer		9000	18000								
3000	LIGHTING LINE		0 <sup>30</sup>	1000								
50	LIGHT DISTANCE		5 <sup>00</sup>	250								
	MISC OUTLET			750								
2000	MISC GAS, LIGHTING etc Lines		0 <sup>50</sup>	1000								
	<u>TOTAL Elec for 2 Tun</u>			<u>41000</u>								
	<u>9" LF TUNNEL</u>		<u>\$41000</u>	<u>389500</u>								
	<u>TOTAL ELECTRICAL</u>			<u>689500</u>								
<u>Air Water Dewater</u>												
<u>FOR 2 TUNNEL @ 1000 LF</u>												
2000	LF 4" Water line		4 <sup>00</sup>	8000								
80 Ea	Gloves & Caps		25 <sup>00</sup>	2000								
1000	LF 6" Air Line		8	16000								
80 Ea	Gloves & Caps		50 <sup>00</sup>	4000								
2000	LF 10" Dewater Line		15 <sup>00</sup>	30000								
80 Ea	Gloves & Caps		100 <sup>00</sup>	8000								
	Allow for Misc Valves & Fittings			2000								
2 Ea	Air Pumps		2500	5000								
	<u>COST per 1000 LF Tunnel</u>			<u>75000</u>								

250

PLANT & EQUIPMENT DETAIL

SECRET METRO TUNNEL

Reach 8

ESTIMATE NO.

6363-1

SHEET NO.

PREPARED BY:

*[Signature]*

DATE: 2-21-52

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	AIR, WATER, DEWATER											
	9-1/2 LF TUNNEL (2 TUNNELS)		75000	712500								
	<u>PLANT</u>											
1 EA	1200 cfm Elec Comp		80000	80000								
1 EA	600 cfm Diesel Comp Standby		60000	60000								
2 EA	Air Receivers		1000	2000								
2 EA	Water Pump 10 Hp. 110'		2000	4000								
2 EA	Disch. Pump 50 Hp. 110'		5000	10000								
	MISC. Manifolds etc			14000								
	TOTAL PLANT			170000								
	Tot Air Water Disch.			882500								
	<u>Other Plants &amp; Equipment</u>											
1 Lot	Repair Shop Equipment		25000	25000								
1 Lot	Electric Shop Equipment		15000	15000								
1 Lot	Carpenter Shop Equipment		10000	10000								
7 EA	AMBUVANCE		10000	10000								
2 EA	OFFICE TRAILER 12x60		25000	50000								
1 EA	Warehouse 1000 sq			10000								
2 EA	Change house 6x100			60000								
1 EA	Shop Van			5000								
1 EA	First Aid Trailer			10000								
	ALIMAK MAN ELEVATOR			3000								
	36' x 300' Muck Conveyor 24hp.			100000								
	500 sq Muck Hopper			10000								
	TOTAL & Other			358000								

251





# SUMMARY COSTS

FOR: SECRET GROUP: \_\_\_\_\_ ESTIMATE NO. 6383-1

WORK: NIETKO RAIL PROJECT SHEET NO: 5

TUNNEL COSTS. (DUAL TRACE TWIN TUNNEL)  
REACH No 10

WORK ITEM NO: \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

JOB OR I.F. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	EQUIP. OPERATION	EQUIP. RENTALS	TOTAL
	DESCRIPTION	QUANTITY	UNIT						
	<u>TUNNEL EXCAV.</u>								
2	EXCAV. & Support Labor			20 952 000					
E1	Sub & Support Equip Oper						-1 382 250		
E2	EXCAV. Equip Oper						-1 018 500		
1	MUCK DISPOSAL					3 468 000			
M-4	Misc Small Tools					824 500			
2	ELECTRIC POWER					727 500			
3	CUTTING COST					425 000			
4	TUNNEL LINERS								
					28 220 000				
				20 952 000	28 220 000	5 445 000	2 400 750		\$ 57 017 750
	<u>CROSS-PASSAGE</u>								
	SUPPORT & Sub. LABOR			1 101 600					
	EXCAV. LABOR			1 036 800					
	LOCO-TRANS			257 200					
	BULL GANG			108 000					
	CONCRETE LABOR			2 332 800					
	Sub. & Support Equip Oper						131 400		
	MUCK DISPOSAL					40 320			
	ELECTRIC POWER					112 500			
	TRANSF. EQUIP OPER						180 000		
	CONCRETE Equip Oper				640 000	84 000			
	GRADING MACH					800 000			
	Misc Small Tools etc					198 000			
				4 832 400	640 000	1 234 820	311 400		\$ 7 024 620
	<u>TUNNEL CLEANUP</u>								
	LABOR			474 400					
	Sub & Support Equip Oper						35 000		
	WELDER Equip Oper						59 500		
	ELECTRIC POWER					42 750			
	Misc Small Tools etc					49 000			
				974 400		92 750	94 500		\$ 1 161 650
				\$26,764,800	\$28,860,000	\$6,772,570	\$2,806,650		\$65,204,020

E-1  
 E-2  
 E-3  
 E-4  
 E-5  
 M-1  
 M-2  
 M-3  
 M-4  
 M-5  
 M-6  
 M-7  
 M-8  
 M-9  
 M-10

Matt. Equip Supports

253

# SUMMARY OF COSTS

FOR: SECT 2 NIETO RAN GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO. S

REACH No 10

WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-1-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQUIP. OPERATION	EQUIP.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>INSTALL STEEL LINER</u>									
	TOTAL LABOR									
-5	SUG Support Equip									
-6	Inst Equip Oper									
-7	ELECTRIC POWER									
-11	STEEL LINER									
-12	SMALL TOOLS & SUPPLIES									
-17										
	<u>FINISH TUNNELS</u>									
	LABOR			3,264,000						
-6	SUG & Support Equip							250,000		
-8	Leased Equipment							170,000		
-9	Electric Power					106,250				
-13	PERM. MAT'L				2,890,000					
-14	SMALL TOOLS ETC					170,000				
-17				3,264,000	2,890,000	276,250		255,000		6,685,250
	<u>WEERED MAINT</u>									
	INCL elsewhere									
	<u>CONSTR PLANT</u>									
	TBM'S						500,000			
	OTHER PLANT						700,000			
	SALVAGE						1,224,000			
							10,800,000			10,800,000
	<u>Page TOTAL</u>			3,264,000	2,890,000	276,250	10,800,000	255,000		17,485,250
				26,764,800	28,860,000	6,772,570		2,806,650		65,204,020
	<u>TOTAL DIRECT COSTS</u>			30,028,800	31,750,000	7,048,820	10,800,000	3,061,650		\$ 82,689,270

254





# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP

SHEET NO. L 1

WORK METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles

PREPARED BY GHC DATE 3-22-88

QUANTITY REACH No 10

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
3	<u>SERVICE &amp; Support</u>	<u>30</u>	<u>21</u>	<u>21</u>	<u>72</u>	<u>30<sup>00</sup></u>	<u>2160</u>	
4	<u>Cost Per Day</u>						<u>17280</u>	
7	<u>Cost Weeks</u>						<u>86400</u>	
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30<sup>00</sup></u>	<u>1980</u>	
11	<u>Cost Per Day</u>						<u>15840</u>	
14	<u>Cost Weeks</u>						<u>79200</u>	
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRAMP</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
19	<u>Cost Per Day</u>						<u>5760</u>	
22	<u>Cost Weeks</u>						<u>28800</u>	
25	<u>BULL GRAB</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>30</u>	<u>540</u>	
26	<u>Cost Per Day</u>						<u>540</u>	
28	<u>Cost Weeks</u>						<u>21600</u>	
34	<u>TOTAL Cost/week</u>						<u>216000</u>	
37	<u>TOTAL Cost 97 weeks</u>							<u>20952000</u>

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. L363-1  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET NO. E 1  
 WORK: Metro Rail Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION: Leach No 10 PREPARED BY GHE DATE: 3-22-83  
 QUANTITY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. COST	
		No.	UNITS	EA	TOTAL	TOTAL OPER. COST
<b>SERVICE &amp; Support</b>						
	18 Ton Hydraulic Crane (5 day solo)	1	EA	10 hr		350 -
	70 Ton TLE Crane 15h. 8 hr (25h @ 4 hr)	1		15 hr	100.00	1500 -
	F.E. Loader (1st. 965) 1 @ 8' 2 @ 4'	1		15 hr	46.00	690 -
	Flatbed Truck 5 tr.	1		7 hr	18.00	130 -
	<u>COST PER DAY</u>					<u>2670</u>
	1200 cfm. Elec. Compressor @ 3 hr per shift	1		9	9	45 -
	40 hp. Sewage Pump @ 24 hr/day	1		24	24	20 -
	25 hp. - 30' x 300' Conveyer	1		7 hr	7	35 -
	15 hp. Load. Switching @ 5h @ 4 hr	1		4	4	80 -
	<u>Cost per day</u>					<u>130 -</u>
	<b>TOTAL COST PER DAY</b>					<b>2850</b>
	<b>COST PER WEEK</b>					<b>14250</b>
	<b>TOTAL COST 97 Weeks</b>					<b>1,382,250</b>
	A. Oper & Maint. B. Repairs only					

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 10

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*Note: For TBM Actual Cost & Base on separate page  
7 1/2 days only  
Locomotive: Cost to repair service & fuel*

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & DEF.	
		No. UNITS	EA	TOTAL		
	<u>TUNNEL Excavation</u>					
	TBM Repair & Survey Operate 48 mi/cycle 100 hrs/day = 480 min	2	6	12 Hr	75 <sup>00</sup>	900
	<u>Locomotive &amp; Cars</u>					
	Ave 30 min per train per pusher cycle 10 cycles = 300 min 4 trains in 2 hrs Add 2 1/2 hr train for misc					
	25 Ton loco	4	8 hr	32 hr	25 <sup>00</sup>	800
	Bull Head loco 5 hr 4 hr/day 2 ea 15 ton loco	2	4 hr	8 hr	18 <sup>00</sup>	150
	Muck Cars	16	8 hr	128 hr	150	200
	Other Cars	8	3 hr	24 hr	0 <sup>75</sup>	50
	<u>TOTAL Cost Per Day</u>					2100
	<u>Cost Per Week</u>					10500
	<u>Cost 97 weeks</u>					1018500

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*Assume Tunnel Muck Loaded on truck hauled to disposal site at 5¢/ton*  
*1 LF = 11<sup>25</sup> Bag x 1.50 = Say 17<sup>00</sup> LF @ 60¢ = 102<sup>00</sup>/<sub>4</sub>  
 Reach 10 # Trucks: 204<sup>00</sup>*

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>Muck Disposal</u>	<u>17000 LF</u>	<u>204<sup>00</sup> 182<sup>00</sup></u>	<u>3468<sup>00</sup></u>
	<u>Misc Small Tools &amp; Supplies</u>			
	<i>Estimate misc small tools, supplies and consumables @ 4¢/LF or 216,000 Say \$8500/week</i>			
	<u>TOTAL Weeks</u>	<u>W.B.</u>	<u>8500</u>	<u>824<sup>500</sup></u>

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SORTO METCO RAIL GROUP

SHEET No. M

WORK: \_\_\_\_\_

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-11-83

QUANTITY: REACH No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.

WORK INFORMATION

ELECTRIC POWER CONSUMPTION  
TOTAL Tunnel Reaches = 93,103 LE ÷ 7 = 13,300 Ave 7 Tunnels  
2 headings

REF. NO. OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

ELECTRIC POWER  
hp-hr  
 1- 1200 Comp. m. 4/6 hr @ 9 hr/day 4050  
 1- 40 hp pump @ 24 hr/day 960  
 1- 25 hp conveyor @ 8 hr/day 200

2- 1000 hp TBM (400 mi/hr) 12000 hp-hr  
 2- 100 hp brack (300 mi/hr) 1000 hp-hr

4- 75 hp Vent Fan (Ave) @ 24 hr/day = 25,200 hp-hr

2- Grout pump (90 mi/hr) 2- 16 @ hr 32 hp-hr

ALLOW Misc 560

TOTAL ELEC MOTORS 44,000 hp-hr

@ 0.74¢ @ 80% = 27,000 kWh

Lighting  
 Forthl 20 kW @ 24hr 480  
 Headings 2 @ 10 kW @ 24 hr 480  
 Line 7000 = 40 = 175 @ 0.1 @ 24 hr 420  
 Misc Allow 120  
 OFFICE & HALL 500  
2000

TOTAL Elec Per Day 29,000 kWh 0.05 1450.00

Add for weekend pumping 2500 x 2/7 Sun 1000 0.05 50.00

Cost Per Day 1500.00

Cost Per Week 7500

TOTAL Cost 97 weeks 727,500

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No. 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

Estimate Cutler Costs  
 Say 4.5' cutler @ 1500<sup>00</sup>/sec. \$ 67500  
 2 rebuilds @ 50% 33500

Say 600 hr. ave. life in Allow. & Renewal = 170<sup>00</sup> X 6 = 1020 = 4 = 25<sup>00</sup>/hr  
 300 hr. ave. life in Renewal = 335<sup>00</sup> X 6 = 2010 = 4 = 50<sup>00</sup>/hr

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

Reach 2 (Thru Sta)  
 5  
 6  
 8 Thru Sta  
 10  
 12  
 14

8500 LF  
 12100 -  
 10400 -  
 9000 LF  
 17000  
 16500  
 9700

25  
 25  
 25  
 25  
 25  
 50<sup>00</sup>  
 25

425,000

# MATERIAL COSTS

ESTIMATE No. 63637  
 SHEET No. M-4  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-22-87  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: Reach No 10

## WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LC to proposed  
 and deliver non-gasketed liners, 800<sup>00</sup>/LC to gasketed  
 Liners per LF Tunnel  
 Grout Behind Liner = 0.39 cy/LC at 75<sup>00</sup>/cy = 30<sup>00</sup>/LC  
 8 Tunnels = 60<sup>00</sup>/LC per Met.

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	SCRTD MATL CLASS			
	2 X 2 X 17,000	34,000	\$ 600 800	27 200 000
	Grout Behind Liner	34,000	30 <sup>00</sup>	1 020 000
	TOTAL LINERS			28 220 000

# LABOR COSTS

ESTIMATE 6363-1

FOR SC-10 GROUP \_\_\_\_\_ SHEET NO. L-3

WORK METRO RAIL PAVING WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHE DATE 3-22-93

QUANTITY REACH No 10 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	<u>CROSS PASSAGE CONST</u>							
2								
3								
4	<u>SUPPORT &amp; SERVICE</u>	25	13	13	51	30 <sup>00</sup>	1530	
5	Cost per day						12540	
6	Cost per week						61200	
7								
8								
9								
10	<u>3/1A CROSSOVER</u>							
11	TOTAL 18 Weeks							1101600
12								
13								
14	<u>CROSS PASSAGE 1/2 Crew</u>	18	18	18	54	30 <sup>00</sup>	1620	
15	2 crews						12960	
16	Cost per day						12960	
17	Cost per week						64800	
18								
19								
20								
21	TOTAL 16 Weeks							1036800
22								
23								
24	<u>TRASPORT &amp; Muck Handle</u>	4	4	4	12	30	360	
25							2880	
26	Cost per day						14400	
27	Cost per week							
28								
29								
30								
31	TOTAL 18 Weeks							259200
32								
33								
34	<u>BULL GANG</u>	5			5	30	150	
35							1200	
36	Cost per day						6000	
37	Cost per week							
38								
39								
40	TOTAL 18 Weeks							108000
41								
42	<u>CONCRETE CREW</u>	36	36	36	108	30 <sup>00</sup>	3240	
43	2 crews						25920	
44	Cost per Day						129600	
45	Cost per week							
46								
47	TOTAL 18 Weeks							2332800
48								



EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-3

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHC DATE: 3-23-8

QUANTITY: LEACH No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

CROSS PASSAGE CONSTRUCTION

REF. NO. OR QTY. DESCRIPTION FLOORS OPERATING COST

REF. NO. OR QTY.	DESCRIPTION	FLOORS			OPERATING COST	
		No	UNIT	HEIGHT	TOTAL	PER DAY
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane 2 sh @ 4 hr</u>	1		8	3500	280 -
	<u>70 Ton Hyd. Crane 1 sh @ 6</u>	1		6	10000	600 -
	<u>FE Ldr. (940)</u>	1		4	4600	184 -
	<u>FLAT BED TRUCK STN</u>	1		5	1800	108 -
						1172 -
	<u>1800 cfm Comp. II 3 sh @ 7 hr</u>	1		21	500	105 -
	<u>40 hp. Pump</u>	1		24	080	19 -
	<u>85 hp. Compressor</u>	1		4	500	20 -
	<u>1570 4000 Sw. Lch. 2 sh @ 4</u>	1		8	1800	144 -
						288 -
	<u>TOTAL COST Per Day</u>					1460 -
	<u>COST Per week</u>					7300 -
	<u>TOTAL COST 18 weeks</u>					131400

# MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 10

ESTIMATE No. 6363-1  
 SHEET No. M 5  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GAC DATE: 3-22-82  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No. OR QTY. WORK INFORMATION

*Cross Passage Excav. 40 By/ft x 15' = 210 Cy  
 Much Disposal @ 6<sup>00</sup>/Cy = \$1260 per passage*

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	No Cross Passage	32	1260	40320
	MISC. SMALL TOOLS + SUPPLIES @ 40% Labor \$275,800 each			
	No work	18	11000	\$198000

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-6

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHR DATE: 3-22-53

QUANTITY: REACH No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1 - 1200 cfm. 450 hp Comp. @ 21 hr/day

9450 hp hr

1 - 40 hp Pump @ 24

960 hp hr

1 - 25 hp Conveyor @ 4

100 hp hr

1 - 75 hp Concr. Pump @

600 hp hr

14 - 75 hp Vent Fans @ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37005 hp hr

@ 24 hr @ 20%

22,000 kWh

Lighting

POTAL 20 kw @ 24

480

4 hrs @ 5 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekends 500

24500 kWh

25,000 kWh

COST per Day

COST per Week

COST 18 weeks

005

1250

1250

6250

112,500

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passages - Excess CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Suppl	Dr	Tools	Mater	Equip	Cont	Inc
1													
2	<u>Support &amp; Service</u>												
3													
4	Walker	1	1	1	3	3							
5	Crane Oper	1	1	1	3		3						
6	Crane Aider	1			1		1						
7	Tappan	1			1			1					
8	Boysman	1	1	1	3			3					
9	Charge Hand	1			1			1					
10	Comp. Oper	1	1	1	3		3						
11	Mech Foreman	1			1		1						
12	Mechanic	2	2	2	6		6						
13	Fleet Foreman	1			1								
14	Electrician	2	1	1	4								
15	Paint. Oper	1			1		1						
16	Miner	4	4	4	12			12					
17	Loco Oper		1	1	2		2						
18	Tractor man		1	1	2		2						
19	Truck Driver	1			1								
20	Engineer	1			1								
21	Welder	4			4			4					
22	Pipe fitter	1			1								
23	9.00000000 - men/day				51	3	17	17	4	5	1	1	1
24	14 wks/yr												
25													
26													
27	<u>Crossing Handling &amp; Crews</u>												
28	Shifter	2	2	2	6			6					
29	Miner	8	8	8	24			24					
30	Chuck Tender	4	4	4	12			12					
31	Dipper	2	2	2	6			6					
32	Mucker (Crew)	2	2	2	6		6						
33		18	18	18	54		6	48					
34													
35	<u>Muck Handle</u>												
36	Loco Oper	2	2	2	6		6						
37	Brake man	2	2	2	6		6						
38					12		12						
39													
40	<u>Roll Grinding</u>												
41	Foreman	1			1								
42	Roll Grnd	4			4								
43					5								
44													
45													
46	Total Excess 2 Crossings				122								
47	1 Crossing				61								
48	Allow Excess 5 days												

# LABOR COSTS

ESTIMATE 6363-1

FOR SOFT GROUP SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Las Vegas PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Class Passengers - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	ELCC	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				1	2	3	4		
1														
2	Support & Service													
3	Concrete crew													
4														
5														
6	Concrete crew													
7														
8	Shifter	1	1	1	3		15							
9	Concrete Foreman	1	1	1	3									
10	Shifter	1	1	1	3		6							
11	Concrete crew	6	6	6	18									
12	Concrete crew	2	2	2	6									
13	Iron workers	4	4	4	12		17							
14	Operator - for concrete													
15														
16	TOTAL crew =				54		7	17				21	17	
17														
18	2 crews													
19														
20														
21														
22														
23														
24	TOTAL MEN =													
25	Note Aug 22 Crossmen													
26														
27														
28														
29	Support & Service 22 crews = 14 wk @ 51				714	42	234	238	56	70		14	14	14
30	Excavator 11 wk @ 54				594		24	538						
31	Transport 14 wk @ 12				168		168							
32	Reel Guard 14 wk @ 10				140			75						
33	Concrete Lab. 14 wk @ 108				1512			257	336		500	336		
34														
35														
36	TOTAL 14-wk for 22				3053	42	500	1003	370	70	604	336	14	14
37														
38	Rev. for Concrete Mark				140	23	50	18	3	27	15	1	1	
39														
40	Rev. for Sup/Assist				700	10	115	250	90	15	135	75	5	5
41														
42														
43														
44														
45														
46														
47														
48														



TITLE SKRTD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6213-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHC DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cross Passages  
Tunnels 42'-8"  $\pm$  to  $\pm$   
Bay Passages 25' long.

Excavation

Excav. Neat =  $9' \times 12' = 108' \text{ of } 4' \text{ of } 10' = 110'$   
Excav w/over =  $11' \times 14' = 154' \text{ of } 5' \text{ of } 10' = 148'$

Concrete 27 cu  
Neat  $118' - (2' \times 12') = 74' \text{ of } 2' \text{ of } 10' = 72'$   
w/over  $154' - 46' = 108' \text{ of } 4' \text{ of } 10' = 108'$   
TRUCKS w/over  $11 \times 2' \times 25' = 250'$   
Walt & Arch 830'  
108'

Soft Rock

Excav. Neat





# MATERIAL COSTS

ESTIMATE No. 6367-1

FOR: SCRIP

GROUP: \_\_\_\_\_

SHEET No. M-7

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-22-83

QUANTITY: REACH No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## CROSS PASSAGE WORK INFORMATION

### CONCRETE MATERIALS

Concrete 110 cu/ft per passage @ 60.00 \$ 6600  
 Rebar 1109 @ 250¢ = 27000¢ @ 0.60 \$ 13200  
 Opog 5' x 8' = 22' 3" L. 5' W. \$ 20,000 / passage  
 82' x 25' = 560 sq. ft.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PERMANENT MATERIAL No Cross Passage	37	\$ 20000	640000
--	----	----------	--------

FORMS - 3 sets Reel FORMS @ 120' 5" x 110'	1680 sq	50.00	84000
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# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1  
 FOR: SCTD GROUP: \_\_\_\_\_ SHEET NO. E-4  
 WORK: METRO RAIL PROJ WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 10 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

CROSS PASSAGE CONSTR.

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & DEF.	
		No.	UNITS	EA	TOTAL	
	<u>Cross-Pass Equip.</u>					
	Eimco 630	2	EA	20	40	2600
	Air Spdr. Drills etc	8		20	160	100
	<u>Loco &amp; CARS</u>					
	25 TD Loco @ 8 hr	2		8	16	3500
	in 3 sh. hr					400
	Muck Cars	4		4	16	150
	Other Car	8		4	32	100
	<u>CONCRETE</u>					
	Concrete Pump	1		8	8	1500
	Concr. Agitator Cars	4		8	32	500
	VIBRATORS Misc	4		8	32	200
	Cost Per Day					\$ 2000
	Cost Per Week					10,000
	Cost 10 Weeks					180,000

# LABOR COSTS

11

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metrol Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Total Group - 10 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

5 by 500 ft

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
1	<u>Service &amp; Report</u>								
2									
3									
4	<u>Water</u>	1	1	1	3	3			
5	<u>CRANE Oper</u>	2	1	1	4		4		
6	<u>Crane Driver</u>	1			1		1		
7	<u>Top Alarm</u>	1			1		1		
8	<u>Botom Alarm</u>	1	1	1	3		3		
9	<u>Change the Att</u>	1			1		1		
10	<u>Comp. Op</u>	1	1	1	3		3		
11	<u>Mech. Foreman</u>	1			1		1		
12	<u>Mechanic</u>	2	1	1	4		4		
13	<u>Loc. Foreman</u>	1			1		1		
14	<u>Eng</u>	4	1	1	6		6		
15	<u>Eng Op</u>	1	1	1	3		3		
16	<u>Mine</u>	2	2	2	6		6		
17	<u>Loco Oper</u>		1	1	2		2		
18	<u>Breakman</u>		1	1	2		2		
19	<u>Truck Driver</u>	1			1		1		
20	<u>Carpenter</u>	1			1		1		
21	<u>Lab</u>	4			4		4		
22	<u>Pipe Fitter</u>	1			1		1		
23					48	3	20	11	4
24								7	1
25	<u>Clearup Crew (2 hrs)</u>								
26	<u>Shifter</u>	2	2	2	6		6		
27	<u>Spicer</u>	4	4	4	12		12		
28	<u>Tower Lab</u>	8	8	8	24		24		
29									
30					48		48		
31									
32	<u>Transport</u>								
33	<u>Loco Op</u>	2	2	2	6		6		
34	<u>Platman</u>	2	2	2	6		6		
35					12		12		
36									
37									
38	<u>Build Bars</u>								
39									
40	<u>Foreman</u>	2			2		2		
41	<u>Build Bars</u>	8			8		8		
42	<u>Loco Op</u>	2			2		2		
43	<u>Boiler</u>	2			2		2		
44					14		4	10	
45									
46									
47	<u>Total Per Day</u>				116	3	36	43	7
48								7	1

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L-4

WORK METRO RAIL PENNIST WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - Tunnel Clean PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY REACH No 10 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>SEA &amp; SUPPORT</u>							
4		10	11	11	43			
5								
6								
7								
8								
9								
10								
11								
12	<u>CLEANUP CREWS</u>							
13		14	14	14	42			
14								
15								
16								
17								
18								
19								
20								
21	<u>TRANSPORT CREW</u>							
22		4	4	4	12			
23								
24								
25								
26								
27								
28								
29	<u>PULL GANG</u>							
30		14			14			
31								
32								
33								
34								
35								
36								
37								
38	<u>TOTAL</u>				116	30	3480	
39								
40								
41	<u>COST PER DAY</u>						27840	
42								
43	<u>COST PER WEEK</u>						139200	
44								
45								
46	<u>TOTAL 7 Weeks</u>						974400	
47								
48								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHE DATE: 3-23-8

QUANTITY: LEAC4 No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			OPERATING COST	
		No. UNIT	HRS/HR	TOTAL		
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane</u>					
	<u>3 sh @ 4 hr</u>	1	12		35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane</u>					
	<u>1 sh @ 4 hr</u>	1	4		100 <sup>00</sup>	400 -
	<u>FE Ldr. (946)</u>	1	4		46 <sup>00</sup>	180 -
	<u>FLAT BED TRUCK STN</u>	1	5		15 <sup>00</sup>	75 -
						710
	<u>1800 cfm. Comp.</u>					
	<u>3 sh @ 7 hr</u>	1	21		5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24		0 <sup>80</sup>	19 -
	<u>85 hp. Compressor</u>	1	4		5 <sup>00</sup>	20 -
	<u>15 TN 4000 Switch</u>	1	8		18 <sup>00</sup>	144 -
						290
	<u>TOTAL COST Per Day</u>					
	<u>COST Per week</u>					500
	<u>TOTAL COST 7 weeks</u>					35 000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 63631  
 SHEET NO. E-5  
 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: Water Line Project  
 LOCATION: CLEANUP  
 QUANTITY: Reach No 10

REF. NO.  
OR QTY.

WORK INFORMATION

Cleanup at 500 ft per Day

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNITS EA TOTAL

Total Op. Exp.

Various Equip.

Emco 630  
MISC

2 EA

20

48

2622

1040  
60

Loco & Cars

25 Ton +

1

10

30

25

500

Muck Car  
Office Car

1

10

40

100

60

1

10

40

100

40

TOTAL Per Day

1702

Trk Per Week

8500

TOTAL 7 weeks

59500

MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_ ESTIMATE No. 6363-1  
 WORK: METRO RAIL PROJECT SHEET No. M-8  
 LOCATION: \_\_\_\_\_ WORK ITEM No. \_\_\_\_\_  
 QUANTITY: REACH No 10 PREPARED BY: GHE DATE: 3-22-33  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No. OR QTY.	WORK INFORMATION
	<u>ELECTRIC POWER</u>

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1- 1200 cfm 450 hp Comp. @ 24 hr./day	9450 hp hr		
	1- 40 hp Pump @ 24	960 hp hr		
	1- 25 hp Comp. @ 4	100 hp hr		
	1- 607 Hi pr. Pump	600 hp hr		
	14- 75 hp Vent Fans @ 24 hr./day	25200 hp hr		
	Allow Misc	690		
	<u>TOTAL Elec</u>	<u>37005 hp hr</u>		
	@ .74¢ @ 20%	22,000 kWh.		
	<u>Lighting</u>			
	Motor 20 kw @ 24	480		
	Wds 405 kw @ 24	430		
	Line 350 @ 0.1 x 24	840		
	Office Shop	500		
	MISC	200		
		<u>2500</u>		
	<u>TOTAL Elec per Day</u>	<u>24500 kWh</u>		
	Add for weekends Day	500		
		<u>25,000 kWh.</u>		
	Cost per Day		0.25	1250
	Cost per Week			1250
	Cost 7 weeks			6250
				43,750





# LABOR COSTS

41

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel 10 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	Highway Handout			12	12			
3								
4	Track Concrete 50% @ 15			60	60			
5								
6								
7	Track concrete 50% @ 15			60	60			30000
8								
9								
10	Loco Op. & Helpers			10	10	0.03	0.30	30000
11								
12								
13	Place Concrete							
14	602 LF @ 0.25 = 234.00							
15								
16	Shift 1st	1			1			
17	Unsk. Labor	1			1			
18	Craft Foreman		1		1			
19	Craft Helper		1	1	2			
20	Labor		1	1	2			
21	Iron. work	1			1			
22	Unsk. Labor		1		1			
23	Craft Labor		1		1			
24	Temp. Op. & Conv.		1		1			
25	Unsk. Labor	1	1	1	3			
26	Unsk. Labor	1	1	1	3			
27	Cement Finish			1	1			
28					1			
29	SERVICE & Support					2	2	
30	Use Project Crew							
31	AS for Tunnel Clean up							
32								
33								
34								
35								
36								
37	Place Concrete				33	12.25	404.25	15
38	Service Support				43	3	129	1
39	Install Handout				12			1
40								
41								
42								
43	Total for 100 LF				145			17
44								24
45								1
46								1
47								
48								



# LABOR COSTS

ESTIMATE 6367-1

FOR SCFD GROUP

SHEET NO. L-6

WORK Metro Rail Project

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles -

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel Length No 10

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				49	30		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSPORT -</u>				14			
13								
14								
15								
16								
17								
18								
19	<u>PLACE CONCRETE</u>							
20	<u>4' Tunnel</u>				83			
21								
22								
23								
24								
25	<u>INSTALL HORIZONTAL</u>				14			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	TOTAL				160	30	4800	
36	TOTAL Per Day						38400	
37								
38	TOTAL Per Week						192000	
39								
40								
41								
42								
43								
44	TOTAL 17 Week							3 264 000
45								
46								
47								
48								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. \_\_\_\_\_

FOR: SCRIPT GROUP: \_\_\_\_\_ SHEET NO. E-6

WORK: METRO RAIL WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: Resin No. 10 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNIT HRS/HR TOTAL

Operating Cost

SERVICE & Support  
Use Cost Period

500

TOTAL 17 weeks

85,000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-49

WORK: METRO RAIL PROJ

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH NO 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

	No. UNITS		Hours		TOTAL	Total Oper & Exp.	
		EA		EA			
	2	EA	20		40	2000	1040
Air Spade Drills etc	8		20		160	100	160
<u>Loco &amp; CARS</u>							
25 TD Loco @ 8 hr	2		8		16	2500	400
in 3 shifts							
Muck Cars	4		4		16	100	30
Other Cars	8		4		32	100	30
<u>CONCRETE</u>							
Concrete Pump	1		8		8	1500	120
Concr Agitator Cars	4		8		32	500	160
VIBRATOR Misc	4		8		32	200	60
Cost Per Day						\$ 2000	
Cost Per Week						14,000	
Cost 17 Weeks							170,000

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-13

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: BKR DATE: 3-22-53

QUANTITY: REACH No 10

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm. 450 hp Comp.  
21 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Conveyor @ 4

100 hp hr

1- 607 Hi. pl. Pump

600 hp hr

14- 75 hp Vent Fans  
@ 24 hr/day

25200 hp hr

ALLOW MISC

690

TOTAL Elec

37000 hp hr

@ .746 @ 80%

22,000 kWh

Lighting

POLE 20 kw @ 24

480

405 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekend Day

24500 kWh

500

25,000 kWh

COST per Day

COST per Week

COST 17 weeks

0.25

1250

1250

6250

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SECT D GROUP: \_\_\_\_\_ SHEET No. M-14

WORK: METRO RAIL PROJECT WORK ITEM No. \_\_\_\_\_

LOCATION: FINDEN TUNNEL PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACT No 10 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

## WORK INFORMATION

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PURCHASE HANDRAIL

2 Tunnels

20

10<sup>00</sup>

20

POUR CONC. @ 1.17 =

2500 y

60<sup>00</sup>

150<sup>00</sup>

COST OF MAT'L

1 LF

170<sup>00</sup>

PERM MAT'L

Reach 2

7500 LF

170<sup>00</sup>

3

1500 LF

1

6

10500 LF

1

8

7500 LF

1

10

17000 LF

1

12

7500 LF

1

14

9700 LF

1

2890000

Misc Small Tools and Supplies

Use 50' Laser \$19,000  
5m \$10,000

No Weeks

17

\$10000

170000

PLANT & EQUIPMENT DETAIL

SCRIPD METRO RAIL PROJECT

ESTIMATE NO. 6363-1

March 10 19,000 LF (17,000 LF)

SHEET NO.

PREPARED BY: GPF

DATE: 3-21-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & AXILL:			5000000		10	500000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1540000								
	MISC UNDERGROUND			125000								
	RAIL TRACKAGE			812500								
	VENTILATION SYSTEM			1278000								
	CONCRETE EQUIPMENT			262000								
	COMMUNICATIONS EQUIP			9500								
	ALIGNMENT CONTROL			15000								
	ELECTRICAL EQUIPMENT			1079000								
	AIR WATER DEWATER			1515000								
	OTHER PLANT			308000								
				7024000		10	724000					
				12024000 ✓			1224000					



PLANT & EQUIPMENT DETAIL

SCHT'D METRO RAIL PROJECT

REACH 10 19,000 LF (17000 LF)

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-21-82  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>TUNNEL EXCOV.</u>												
2 EA	TBM incl Trailing Gear, - conveyor - dust suppression In 300TN @ 1000 hp.			2,500,000					300	600		
								100	100	700		
				5,000,000				400				
<u>Locomotives &amp; Cars</u>												
4	25 TN Diesel loco. Muck		200,000	800,000					25			
2	15 TN Bullgan		120,000	240,000					15			
12	100 Muck Car 5TN		16,000	192,000					5			
8	Flat Car 8 w/ht.		12,000	96,000					42			
2	MAN CARS 2 w/ht		6,000	12,000					20			
2	Fan Line Cars		20,000	40,000					80			
1	CAR DUMPER		80,000	80,000					300			
2	GROUT CAR & PUMP.		40,000	80,000								
	<u>TOTAL loco &amp; Cars</u>			1,548,000								
<u>MISC UNDERGROUND</u>												
4	SINKER DRILLS		2,000	8,000					0	1		
4	STOPER DRILLS		2,500	10,000					0	1		
4	AIRLES DRILLS		2,500	10,000					0	1		
2	2" Drift for Blast		16,000	32,000					1	10		
2	Drifts Boom & Slide		14,000	28,000					1	10		
1	Truss hoists		5,000	10,000					1	10		
2	AIR Wrenches		500	4,000					0	1		
4	oxy Acet Oults		1,000	4,000					0	1		
1	ESL Welder 300amp		2,000	2,000					0	1		
1	PORT JACES		1,000	5,000					0	1		
1	Chipping sys. AIR		250	1,000					0	1		
1	Misc Conc, Steel Drills		500	2,000					0	1		
	<u>TOTAL MISC Equip</u>			125,000								

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PLANT & EQUIPMENT DETAIL

SECRET METRO Rail Project

Reach 10

ESTIMATE NO. 6363-1  
 SHEET NO. 1  
 PREPARED BY: [Signature]  
 CHECKED BY: [Signature]  
 DATE: 3-24-83

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			%	AMOUNT			
<b>RAIL TRACKING</b>											
40 Ton	FOR 2 Tunnels 1000'										
2500 lb	4000 LF 60 <sup>th</sup> Rail		580	20000							
6000 lb	Spikes		0	625							
500 lb	ANGLE BARS BOLTS etc		0	1500							
1 Lot	5x8" x 5' Ties @ 500		9	4500							
	MISC			875							
	<b>COST Per 1000 LF (2 TUNNELS)</b>			<b>27500</b>							
19 <sup>th</sup> LF TUNNELS			27500	522500						443	
8 EA	TURNOUTS Frog Switches		5000	40000						20	
7 EA	CALIFORNIA SWITCH		125000	250000						500	
	<b>TOTAL RAIL TRACK COST</b>			<b>812,500</b>							
<b>VENTILATION SYSTEM</b>											
FOR 2 TUNNELS @ 1000 LF											
2	7 <sup>th</sup> Air Vary Fans w/switch		12500	25000						50	
2000 LF	48" Dia Vauling w/air		2000	40000							
2000 LF	Hangers & Hardware		0.50	1000							
	<b>COST Per 1000 LF</b>			<b>66000</b>							
19 <sup>th</sup> LF TUNNELS			66000	1,254,000						404	
2 EA	ELBOW		2000	4000						20	
2 EA	INLET & Silencer		10000	20000						50	
	<b>TOTAL COST VENTIL.</b>			<b>1,278,000</b>							

PLANT & EQUIPMENT DETAIL

SECRET

Reach 10

ESTIMATE NO.

6363-1

SHEET NO.

PREPARED BY:

*[Signature]*

DATE: 3-21-57

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>CONCRETE Equip</u>											
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Press Grout Pump/Car		30000	30000								
1 EA	SHARCRETE Outfit		45000	45000								
1 EA	SAND BEAST Outfit		3000	3000								
4 EA	Gen. Equip. Agitate. Unit		25000	100000								
1 Lot	VALVES & MISC		4000	4000								
200 LF	SEICK LINE		1000	2000								
1 EA	Surging Spring Rig		3000	3000								
	TOTAL CONCR & GROUT EQUIP			260000								
				260000								
	<u>Communications Equip.</u>											
	SWITCH BOARD & Hookup			5000								
	Cost Per 1000 A (2 turn. W)											
2000 LF	Telephone line		0.20	400								
75	Telephones		50.00	100								
	Cost Per 1000 LF			500								
1900 LF	Tunnel (Reach)		500.00	9500								
	TOTAL COMMUN			14500								
	<u>ALIGNMENT CONTROL</u>											
2 EA	LAZER GUIDANCE SYSTEM		5000	10000								
1 Lot	TRIP SURVEY EQUIP.		5000	5000								
				15000								

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PLANT & EQUIPMENT DETAIL

SECRET METRO Tunnel

ESTIMATE NO. 6363-1

Reach 10

SHEET NO. \_\_\_\_\_  
 PREPARED BY: *[Signature]* DATE: 3-21-52  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	Air, Water, Dewater											
	19" LF TUNNEL (2 Tunnels)		75000	1425000								
	<u>PLANT</u>											
1 EA	1200 cfm Elec Comp		80000	80000								
1 EA	600 cfm Diesel Comp		60000	60000								
2 EA	Air Receivers		1000	2000								
2 EA	Water Pumps 10 Hp. each		2000	4000								
2 EA	Disch. Pumps 50 Hp. each		5000	10000								
	Misc. Manifolds etc			14000								
	TOTAL PLANT			670000								
	Tot. Air Water Disch.			1595000								
	<u>Other Plants &amp; Equipment</u>											
1 Lot	Repair Shop Equipment		25000	25000								
1 Lot	Electric Shop Equipment		15000	15000								
1 Lot	Compressor Shop Equipment		10000	10000								
7 EA	AMBULANCE		10000	10000								
12 EA	OFFICE TRAILER 12x60		25000	50000								
1 EA	Warehouse 10000 sq			10000								
2 EA	Change house @ 3000			60000								
1 EA	Shop Van			5000								
1 EA	First Aid Trailer			10000								
	ALIMAK MAN ELEVATOR			3000								
	36" x 300' Muck Conveyor 2 1/2 hp.			100000								
	500 c Muck Hoop			10000								
	Totals & Other			358000								



# SUMMARY OF COSTS

FOR: SCRIPPS METRO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO: S

REACH No. 12 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3.14.83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

EM OR IF. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR FRONT	EQPT. OPERATION	EQPT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>TOTAL DIRECT COSTS</u>			28,300,800	24,235,000	7,218,820	14,000,000	2,863,650		76,618,270
	<u>PROFIT</u>									
	<u>GENERAL EXPENSE</u>									
	<u>SCRIPPS -</u>			3,699,500		302,700				
	<u>Add</u>					7,491,230				
	<u>TOTAL GEN EXP.</u>			3,699,500		7,793,230				11,492,730
	<u>TOTAL COSTS</u>			32,000,300	24,235,000	15,012,050	14,000,000	2,863,650		88,111,000
	<u>RISK OR PROFIT</u>									
	<u>7%</u>			30	10	10	5	15		
	<u>AMT</u>									14,654,000
	<u>TOTAL COST</u>									102,765,000
	<u>16500</u>									62250

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# SUMMARY OF COSTS

FOR: SKRTD GROUP: \_\_\_\_\_ ESTIMATE NO. 6353-1

WORK: NIETKO RAIL PROJECT SHEET NO. S

TUNNEL CONST. (DUAL TRACE TWIN TUNNEL) WORK ITEM NO. \_\_\_\_\_

REACH No 12 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	EQUIT. OPERATION	EQUIT. RENTALS	TOTAL
	DESCRIPTION	QUANTITY	UNIT						
	<u>TUNNEL EXCAV.</u>								
-2	EXCAV. & Support LABOR			19 224 000					
E1	SUB & Support Equip Oper						-1 268 250		
E2	EXCAV. Equip Oper						- 934 500		
41	MUCK DISPOSAL					3 366 000			
42	MISC SMALL TOOL					756 500			
43	ELECTRIC POWER					667 500			
44	CUTTER COST					825 000			
45	TUNNEL LINERS				20 790 000				
				19 224 000	20 790 000	5 615 000	2 202 750		\$ 47 831 750
	<u>CROSS-PASSAGE</u>								
L-3	SUPPORT & Via. LABOR			1 101 600					
L-3	EXCAV. LABOR			1 036 800					
L-3	LOCO-TRANS			259 200					
L-3	PILE GANG			108 000					
L-3	CONCRETE LABOR			2 332 800					
E3	SUB. & Support Equip Oper						131 400		
M-5	MUCK DISPOSAL					40 320			
M-6	ELECTRIC POWER					112 500			
E-4	TRANSF. EQUI. OPER.						180 000		
M-7	CONCRETE EQUI. OPER.				640 000	84 000			
M-9	CONCRETE MISC					800 000			
M-5	MISC SMALL TOOL					198 000			
				4 838 400	640 000	1 234 820	311 400		\$ 7 024 620
	<u>TUNNEL CLEANUP</u>								
L-4	LABOR			974 400					
E-4	SUB & Support Equip Oper						35 000		
L-2	DRIVE GEAR Equip Oper						59 500		
M-8	ELECTRIC POWER					43 750			
M-10	MISC SMALL TOOL					147 000			
				974 400		92 750	94 500		\$ 1 161 650
				\$ 25,036,800	\$ 21,430,000	\$ 6,942,570	\$ 2,608,650		\$ 56,018,020

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# SUMMARY OF COSTS

FOR: SECRET 2 NITRO RAY GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO. S

REACH No. 12 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-1-53  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

MOR. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQPT. OPERATION	EQPT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>INSTALL STEEL LINER</u>									
5	TOTAL LABOR									
26	SUC Support Equip									
27	Inst Equip Oper									
1-11	ELECTRIC POWER									
1-12	STEEL LINER									
1-17	Small Tools & Suppl									
	<u>FINISH TUNNELS</u>									
	LABOR			3 264 000						3 264 000
	SUC & Support Equip							85000		85000
	Underground Equipment							170000		170000
	Egpt. Power					106 250				106 250
	PERM. MAT'L				2 805 000					2 805 000
	SMALL TOOLS ETC					170 000				170 000
				3 264 000	2 805 000	276 250		255 000		6 600 250
	<u>WEEKEND MAINT</u>									
	INCL elsewhere									
	<u>CONSTR PLANT</u>									
	TBM'S						900 000			900 000
	OTHER PLANT						6 609 000			6 609 000
	SALVAGE						7 609 000			7 609 000
	Page Total			3 264 000	2 805 000	276 250	14 000 000	255 000		14 000 250
	<u>TOTAL DIRECT COSTS</u>			28,300,800	24,235,000	7,218,870	14,000,000	2,863,650		76,618,270

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP SHEET NO. L

WORK Metko Race Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GIE DATE \_\_\_\_\_

QUANTITY Panel Driving TBM D.M.C. #12 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	DR	TSM	PAYROLL	EVEN	CITY	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL							
1	<del>SENIOR FOREMAN</del>											
2	WALKER	1	1	1	3	3.						
3	CRANE OPER.	2	2	2	6							
4	CRANE OPER.	1	1	1	3							
5	TOP-MAN	1	1	1	3							
6	BOTTOM MAN	1	1	1	3							
7	CHANGE HOUSE LTD.	1	1	1	3							
8	COMPRESSOR OPER.	1	1	1	3							
9	MECH. FOREMAN	1	1	1	3							
10	MECHANIC	4	4	4	12							
11	ELECT. FOREMAN	1	1	1	3							
12	ELECTRICIAN	2	2	2	6							
13	PUMP OPER.	1	1	1	3							
14	MINEL	4	4	4	12							
15	LOCO OPER.	1	1	1	3							
16	BRAKEMAN	1	1	1	3							
17	TRUCK DRIVER	1	1	1	3							
18	CARPENTER	1	1	1	3							
19	LABOR	4	4	4	12							
20	FILLER	1	1	1	3							
21												
22	TOTAL	30	21	21	72	3	32	21	4	9	1	1
23												
24	<u>HEADINGS CREW (2)</u>											
25	SHIFTER	2	2	2	6							
26	TBM OPER.	2	2	2	6							
27	TBM OPER.	2	2	2	6							
28	MECHANIC	2	2	2	6							
29	ELECTRICIAN	2	2	2	6							
30	MINEL	8	8	8	24							
31	CHUCK TENDER	6	6	6	12							
32												
33	TOTAL	22	20	20	66	18	12	6				
34												
35	<u>Rock Handling Crew (2)</u>											
36	LOCOMOTIVE OPER.	4	4	4	12							
37	BRAKEMAN	4	4	4	12							
38												
39	TOTAL	8	8	8	24	24						
40												
41	<u>PILE GANG (2)</u>											
42	PILE GANG FEEL	2	2	2	6							
43	PILE GANG LAB.	8	8	8	24							
44	LOCO OPER.	2	2	2	6							
45	LOCO OPER.	2	2	2	6							
46												
47	TOTAL	14	14	14	42	4	12					
48												
	TOTAL	74	53	53	180	3	78	77	4	15	1	1

# LABOR COSTS

ESTIMATE 6363-1

FOR SOFTD GROUP

SHEET NO. L 1

WORK METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles

PREPARED BY GHC DATE 3-22-82

QUANTITY REACH No 12

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>SERVICE &amp; Support</u>	<u>35</u>	<u>21</u>	<u>21</u>	<u>77</u>	<u>50<sup>00</sup></u>	<u>2160</u>	
4	Cost Per Day						<u>17280</u>	
5	Cost Weeks						<u>86400</u>	
6								
7								
8								
9								
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30<sup>00</sup></u>	<u>1980</u>	
11	Cost Per Day						<u>15840</u>	
12	Cost Weeks						<u>79200</u>	
13								
14								
15								
16								
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRENCH</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
19	Cost Per Day						<u>5760</u>	
20	Cost Weeks						<u>28800</u>	
21								
22								
23								
24								
25	<u>BULL GANG</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>30</u>	<u>540</u>	
26	Cost Per Day						<u>4320</u>	
27	Cost Weeks						<u>21600</u>	
28								
29								
30								
31								
32								
33								
34	<u>TOTAL Cost/week</u>						<u>216000</u>	
35								
36	<u>TOTAL Labor Cost 89 weeks</u>							<u>19224000</u>
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 12

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*Note: For TBM Actual Cost & Esc on Separate Page  
75<sup>00</sup> repairs only  
Locomotive: Cost to repair service & fuel*

REF. NO. OR QTY. HOURS TOTAL TOTAL OPER. & FUEL

DESCRIPTION	HOURS		TOTAL	TOTAL OPER. & FUEL	
	No. UNITS	EA			
<u>TUNNEL Excavation</u> TBM Repair 2500 Operate 48 mi/cycle 10 cycles/day = 480 mi	2	6	12 hr	75 <sup>00</sup>	900-
<u>Locomotives &amp; Cars</u> Ave 30 min position per push or cycle 10 cycles = 300 min 4 trains in 2 hrs Add 2 1/2 train for misc 25 Ton loco	4	8 hr	32 hr	25 <sup>00</sup>	800-
<u>Bull Grub loco</u> 50 4 hr/day 2 ea 1 1/2 ton loco	2	4 hr	8 hr	18 <sup>00</sup>	150-
<u>Muck Cars</u>	16 EA	8 hr	128 hr	15 <sup>00</sup>	200-
<u>Other Cars</u>	8 EA	8 hr	64 hr	0 <sup>25</sup>	50-
<u>TOTAL Cost Per Day</u>					2100-
<u>Cost Per Week</u>					10500-

Cost 89 weeks

934,500

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No. OR QTY. WORK INFORMATION

Assume Tunnel Muck Loaded on truck hauled to disposal site at 5<sup>00</sup>/hour  
 1 LP = 11<sup>25</sup> Bay x 1.50 = Say 17<sup>00</sup> Lcy. @ 6<sup>00</sup> = 102<sup>00</sup>/<sub>4</sub>  
 # TUNNELS = 204<sup>00</sup>  
 Reach

REF. No. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	Muck Disposal	16500 LF	204 <sup>00</sup> 102 <sup>00</sup>	3 366 000
	Misc Small Tools & Supplies			
	Estimate misc small tools supplies and consumables @ 4.92 labor = 716,000 say \$ 8500/week			
	TOTAL 89 weeks	WB	8500	756,500

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SORTD METCO RAIL GROUP

SHEET No. M

WORK: \_\_\_\_\_

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-11-83

QUANTITY: REACH No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

ELECTRIC POWER CONSUMPTION  
TOTAL Tunnel Reacher = 93,600 kWh ÷ 7 = 13,350 Ave 7 Tunnel  
2 headings

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>ELECTRIC POWER</u>	<u>hp-hr</u>		
	<u>1- 1200 Comp. 440 line 9 hr/day</u>	<u>4050</u>		
	<u>1- 40 hp pump @ 2 1/2 hr/day</u>	<u>960</u>		
	<u>1- 25 hp conveyor @ 8 hr/day</u>	<u>200</u>		
	<u>2- 1000 hp TBM (400 min)</u>	<u>12000 hp-hr</u>		
	<u>2- 100 hp track (300 min/day)</u>	<u>1000 hp-hr</u>		
	<u>A- 75 hp Vent Fan (ave)</u>			
	<u>@ 2 1/2 hr/day =</u>	<u>25,200 hp-hr</u>		
	<u>2- Grout pump (90 min/hr)</u>			
	<u>2- 160 hp</u>	<u>30 hp-hr</u>		
	<u>ALLOW Misc</u>	<u>560</u>		
	<u>TOTAL ELEC MOTORS</u>	<u>44,000 hp-hr</u>		
	<u>@ 0.74¢ @ 80% =</u>	<u>27,000 kWh</u>		
	<u>Lighting</u>			
	<u>For 20 kW @ 2 1/2 hr</u>	<u>480</u>		
	<u>Headings 2 @ 10 kW @ 2 1/2 hr</u>	<u>480</u>		
	<u>Line 7000 = 40 = 175 @ 0.16 2 1/2 hr</u>	<u>420</u>		
	<u>Misc Allow</u>	<u>120</u>		
	<u>OFFICE 4-HRS</u>	<u>500</u>		
		<u>2000</u>		
	<u>TOTAL ELEC Per Day</u>	<u>29,000 kWh</u>	<u>0.05</u>	<u>1450.00</u>
	<u>Add for weekend pumping</u>		<u>0.05</u>	
	<u>2500 kWh @ 50¢ =</u>	<u>1000</u>		<u>500.00</u>
	<u>Cost Per Day</u>			<u>1900.00</u>
	<u>Cost Per Week</u>			<u>7500</u>
	<u>TOTAL Cost 69 work</u>			<u>667500</u>

# MATERIAL COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No. 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.

## WORK INFORMATION

*Estimate Copper Costs*

*Say 45 authors @ 1500¢/pc = 67500  
 2 @ build @ 25¢ = 33500*

*Say 600 hr. are life in Allow. & Finance = 170<sup>00</sup> x 6 = 1020 = 25<sup>00</sup>/¢  
 300 hr. are life in Result = 33<sup>50</sup> x 6 = 2010 = 50<sup>00</sup>/¢*

REF. NO. OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

*Reach 7 (Thin Sta)*

*5  
6  
8 Thin Sta  
10  
12  
14*

*8500 LF  
12100 -  
10400 -  
8000 LF  
17000  
16500  
9700*

*25  
25  
25  
25  
25  
50.00  
25.00*

*825000*



# MATERIAL COSTS

ESTIMATE NO. 63657

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-22-87

QUANTITY: Reach No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LC to proposed  
and deliver non-gasketed liners, 800<sup>00</sup>/LC for gasketed  
Liners per LF Tunnel  
Grout Behind Liner = 0.39 cy/LC at 75<sup>00</sup>/cy = 30<sup>00</sup>/LC  
@ Tunnels = 60<sup>00</sup>/LC Per Met.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

Ax 16500  
Rx

33000

\$ 600  
500

19 800 000

Grout Behind Liner

33000

30<sup>00</sup>

990 000

TOTAL LINERS

20 790 000

# LABOR COSTS

ESTIMATE 6363-1

FOR SOFT GROUP SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHE DATE 3-22-83

QUANTITY REACH No 12 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
1	<u>CROSS PASSAGE CONST</u>								
2									
3	<u>SUPPORT &amp; SERVICE</u>	25	13	13	51	30 <sup>00</sup>	1530		
4	Cost Per Day						7240		
5	Cost Per Week						61200		
6									
7	<u>3rd LA CROSSOVER</u>								
8	TOTAL 13 Weeks								1101 600
9									
10	<u>CROSS PASSAGE 1st &amp; 2nd CREWS</u>	18	18	18	54	30 <sup>00</sup>	1620		
11	Cost Per Day						12960		
12	Cost Per Week						64800		
13	TOTAL 16 Weeks								1036 800
14									
15	<u>TRANSPORT &amp; MACH HANDLE</u>	4	4	4	12	30	360		
16	Cost Per Day						2880		
17	Cost Per Week						14400		
18	TOTAL 18 Weeks								259 200
19									
20	<u>BULL GANG</u>	5			5	30	150		
21	Cost Per Day						1200		
22	Cost Per Week						6000		
23	TOTAL 12 Weeks								108 000
24									
25	<u>CONCRETE CREW</u>	36	36	36	108	30 <sup>00</sup>	3240		
26	Cost Per Day						25920		
27	Cost Per Week						129600		
28	TOTAL 18 Weeks								2332 800
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									

# EQUIPMENT OPERATING COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. E

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: OHC DATE: 3-23-8

QUANTITY: REACH No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

CROSS PASSAGE CONSTRUCTION

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNIT HRS/HR TOTAL

Operating Cost

SERVICE & SUPPORT

18 Ton Hyd. Crane  
2 sh @ 4 hr

1

8

35<sup>00</sup>

280 -

70 Ton Hyd. Crane  
1 sh @ 6

1

6

100<sup>00</sup>

600 -

FE Ldr. (44)

1

4

46<sup>00</sup>

184 -

FLAT BED TRUCK STN

1

5

18<sup>00</sup>

108 -

1172 -

1800 cfm Comp. Air  
3 sh @ 7 hr

1

21

5<sup>00</sup>

105 -

40 hp. Pump

1

24

08<sup>00</sup>

19 -

85 hp. Compressor

1

4

5<sup>00</sup>

20 -

15 TN 4000 Sw. lch.  
2 sh @ 4

1

8

18<sup>00</sup>

144 -

288 -

TOTAL Cost per Day

1460 -

Cost Per week

7300 -

TOTAL Cost 18 weeks

131,400

# MATERIAL COSTS

ESTIMATE NO. 6313-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M 5

WORK: MEFLO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: EAC DATE: 3-22-82

QUANTITY: REACH No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

Cross Passage Excav. 40 By/ea x 1' = 210 CG  
Much Disposal @ 6<sup>00</sup>/CG = \$1260/cross passage

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

No Cross Passage

32

1260

40320

11150 SMALL TOOLS  
 & SUPPLIES  
 @ 40% labor \$275,800 cost  
 110 work

18

\$11,000

198,000

# MATERIAL COSTS

FOR: SCLTD GROUP: \_\_\_\_\_ ESTIMATE No. 6363-1  
 WORK: METRO RAIL PROJECT SHEET No. M-6  
 LOCATION: \_\_\_\_\_ WORK ITEM No. \_\_\_\_\_  
 QUANTITY: REACH No 12 PREPARED BY: GHR DATE: 3-22-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm 450 hp Comp. 21 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Conveyor @ 4

100 hp hr

1- 75 hp Concr. Pump @

600 hp hr

14- 75 hp Vent Fans @ 24 hr/day

25200 hp hr

Alloca Misc

690

TOTAL Elec

37005 hp hr

@ .746 c. @ 24

22,000 kWh

Lighting

POTENTIAL 20 kw @ 24

480

Wires 4 @ 5 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SUPPL

500

MISC

700

2500

TOTAL Elec PER DAY  
Add for weekends 500

24500 kWh

25,000 kWh

COST Per Day

COST Per Week

COST 18 Weeks

005

1250

1250

6250

112,500 307

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFTD GROUP SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION LAKEVIEW PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY CRAN TESTS - EXC CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Suppl	Off	10hr	12hr	Even	Cost	10hr	12hr	10hr		
1																	
2	<u>Support &amp; Service</u>																
3																	
4	<u>Walker</u>	1	1	1	3	3											
5	<u>Crane Oper</u>	1	1	1	3	3											
6	<u>Crane Oiler</u>	1			1	1											
7	<u>Tappan</u>	1			1	1											
8	<u>Hoisting man</u>	1	1	1	3	3											
9	<u>Charge Electric</u>	1			1	1											
10	<u>Compr. Oper</u>	1	1	1	3	3											
11	<u>Mech Foreman</u>	1			1	1											
12	<u>Mechanic</u>	2	2	2	6	6											
13	<u>Fleet Foreman</u>	1			1	1											
14	<u>Electrician</u>	2	1	1	4	4											
15	<u>Pump Oper</u>	1			1	1											
16	<u>Miner</u>	4	4	4	12	12											
17	<u>Load Oper</u>		1	1	2	2											
18	<u>Tractor man</u>		1	1	2	2											
19	<u>Truck Driver</u>	1			1	1											
20	<u>Carpenter</u>	1			1	1											
21	<u>Welder</u>	4			4	4											
22	<u>Pipe Fitter</u>	1			1	1											
23																	
24	<u>2 Cranes - men/day</u>				5	5	2	17	17	4	5	1					
25	<u>14 wks/yr</u>																
26																	
27	<u>Crossing Heating &amp; Crows</u>																
28	<u>Shifter</u>	2	2	2	6	6											
29	<u>Hooper</u>	8	8	8	24	24											
30	<u>Chuck Tender</u>	4	4	4	12	12											
31	<u>Nipper</u>	2	2	2	6	6											
32	<u>Mucker (2)</u>	2	2	2	6	6											
33		18	18	18	54	54		6	48								
34																	
35	<u>Muck handle</u>																
36	<u>Loco Oper</u>	2	2	2	6	6											
37	<u>Brake man</u>	2	2	2	6	6											
38																	
39																	
40	<u>Rock Gang</u>																
41	<u>Foreman</u>	1			1	1											
42	<u>Rock Gang</u>	4			4	4											
43																	
44																	
45																	
46	<u>Total Excl. 2 Cranes</u>				122	122											
47																	
48	<u>Also Excl 5 days</u>				61	61											

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFTD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passage - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			1	2	3	4		
1													
2	<i>Support &amp; Service</i>												
3	<i>Concrete Crew</i>												
4													
5													
6													
7													
8	<i>Shifter</i>	1	1	1	3								
9	<i>Concrete Foreman</i>	1	1	1	3								
10	<i>Helpers</i>	1	1	1	3								
11	<i>Carriers</i>	6	6	6	18								
12	<i>Laborers</i>	4	4	4	12								
13	<i>Iron workers</i>	4	4	4	12								
14	<i>Operator - for</i>												
15													
16	<i>TOTAL Crew =</i>				<u>54</u>								
17													
18	<i>2 Drivers</i>												
19													
20													
21													
22													
23													
24	<i>TOTAL MEN =</i>												
25	<i>Note Aug 22 Crossover</i>												
26													
27													
28													
29	<i>Support &amp; Service 22 crews = 14 wk @ 51</i>				714	42	264	238	56	70	14	14	14
30	<i>Excav 11 wk @ 54</i>				594		26	528					
31	<i>Transport 14 wk @ 12</i>				168		168						
32	<i>Bull Guard 14 wk @ 5</i>				70			70					
33	<i>Concrete Lab 14 wk @ 108</i>				1512			54	336	588	336		
34													
35													
36	<i>TOTAL Man-wk for 22</i>				<u>3053</u>	42	500	1033	370	70	204	333	14
37													
38	<i>Rate per Concrete Man-wk</i>				<u>140.137</u>	2	23	65	13	3	27	45	1
39													
40	<i>Rate for Support/Service</i>				<u>750</u>	10	115	230	90	15	135	75	5
41													
42													
43													
44													
45													
46													
47													
48													





TITLE SCRIPD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6813-1 DEPARTMENT \_\_\_\_\_ AUTHDR GHE DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

CROSS PASSAGES  
Tunnels 42'-8"  $\phi$  to  $\phi$   
- Bay Passages 25' long.

Excavation

Excav. Neat =  $9\frac{1}{2} \times 12\frac{1}{2} = 118\frac{1}{4}$  cf  $4\frac{1}{2}$  yds = 110  
Excav w/BER =  $11\frac{1}{2} \times 14\frac{1}{2} = 164$  cf =  $5\frac{1}{2}$  yds = 148 y

Concrete 27 d. 42"  
Neat  $118\frac{1}{4} - (5\frac{1}{2} \times 3\frac{1}{2}) = 74$  cf =  $2\frac{1}{2}$  yds = 72 y  
w/BER  $164 - 45\frac{1}{2} = 118\frac{1}{2}$  cf =  $4\frac{1}{2}$  yds = 108 y  
TRUCK w/BER  $11 \times 2\frac{1}{2} \times 25 = 289$   
Wall & Arch 83 y  
108 y

Soft Rock  
Excav. Neat



# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRIP GROUP: \_\_\_\_\_

SHEET No. M-7

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-22-83

QUANTITY: REACH NO 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. CROSS PASSAGE WORK INFORMATION

CONCRETE MATERIALS

Concrete 110 cu/ft per passage @ 60.00 \$ 6600  
 Rebar 110 cu @ 200# = 22000# @ 0.60 \$ 13,200  
 Opng 5'-5" x 8' = 22' x 3' 6" 5 cu \$ 20,000 / passage  
 BRK X 25 = 560 SF.

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>PERMANENT MATERIAL</u> <u>NO CROSS PASSAGE</u>	<u>32</u>	<u>\$20000</u>	<u>640000</u>
	<u>FORMS - 3 sets</u> <u>Provide 3 sets steel</u> <u>FORMS @ 560 SF</u> <u>incl 5410'</u>	<u>1680 SF</u>	<u>50.00</u>	<u>\$84000</u> <u>84000</u>

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1  
 FOR: SCTD GROUP: \_\_\_\_\_ SHEET NO. E-4  
 WORK: METRO RAIL Proj WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 12 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

CROSS PASSAGE CONSTR

REF. NO.  
OR QTY.

DESCRIPTION

	No	Units	Hours		TOTAL	Total Opn & Exp.	
			EA				
<u>Cross-Pass Excav</u>							
Eimco 630	2	EA	20		40	2600	1040
Air Spade Drills etc	8		20		160	100	160
<u>Loco &amp; CARS</u>							
25 TD Loco @ 8 hr	2		8		16	2500	400
in 3 shifts							
Muck Cars	4		4		16	150	30
Other Cars	8		4		32	100	30
<u>CONCRETE</u>							
Concrete Pump	1		8		8	1500	120
Concr. Agitator Cars	4		8		32	500	160
VIBRATORS Misc	4		8		32	200	60
Cost Per Day						\$ 2000	
Cost Per Week						12,000	
Cost 18 Weeks							180,000



# LABOR COSTS

ESTIMATE 6363-1

FOR SOFT GROUP SHEET NO. L-4

WORK METRO RAIL PENNIST WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - Tunnel Cleaning PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY REACH No 12 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>Sec &amp; Support</u>							
4		26	11	11	48			
5								
6								
7								
8								
9								
10								
11								
12	<u>CLEANUP CREWS</u>							
13		14	14	14	42			
14								
15								
16								
17								
18								
19								
20								
21	<u>TRANSPORT CREW</u>							
22		4	4	4	12			
23								
24								
25								
26								
27								
28								
29	<u>BULL GANG</u>							
30		14			14			
31								
32								
33								
34								
35								
36								
37								
38	<u>TOTAL</u>				116	30	3480	
39								
40	<u>COST PER DAY</u>						2784	
41								
42	<u>COST PER WEEK</u>						139200	
43								
44								
45								
46	<u>TOTAL 7 Weeks</u>						974400	
47								
48								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: OHE DATE: 3-23-8

QUANTITY: REACT No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS		TOTAL	OPERATING COST	
		No UNIT	HRS		PER UNIT	TOTAL
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane 3 sh @ 4 hr</u>	1	12		35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane 1 sh @ 4</u>	1	4		100 <sup>00</sup>	400 -
	<u>FE Ldr. (946)</u>	1	4		46 <sup>00</sup>	180 -
	<u>FLAT BED TRUCK STN</u>	1	5		18 <sup>00</sup>	90 -
						710
	<u>1800 cfm. Comp. 1 3 sh @ 7 hr</u>	1	21		5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24		0 <sup>80</sup>	19 -
	<u>85 hp. Comp. 1</u>	1	4		5 <sup>00</sup>	20 -
	<u>15 TN 4000 Sw. t. h. 2 sh @ 4</u>	1	8		18 <sup>00</sup>	144 -
						290
	<u>TOTAL COST per Day</u>					1000
	<u>COST per week</u>					5000
	<u>TOTAL COST 7 weeks</u>					35000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 63631

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-5

WORK: WATER LINE PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: CLEANUP

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<i>Cleanup at 5.00 P per day</i>

REF. NO. OR QTY.	DESCRIPTION	HOURS			Total Opn & Inf.		
		No	UNITS	FA	TOTAL		
	<u>Various Equip.</u>						
	<u>Excav 630</u>	2	EA	20	48	26.00	1040
	<u>MISC</u>						50
	<u>Loco &amp; Cars</u>						
	<u>25 Ton V.</u>	2		10	20	25	500
	<u>Muck Car</u>	4		10	40	1.50	60
	<u>Office Car</u>	4		10	40	1.00	40
	<u>Total Per Day</u>						1700
	<u>Total Per Week</u>						8150
	<u>TOTAL 7 weeks</u>						59500



# MATERIAL COSTS

ESTIMATE NO. G363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. M-8

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: BRK DATE: 3-22-33

QUANTITY: REACH No 18

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

*ELECTRIC POWER*

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	1 - 1200 cfm 450 hp Compr. 21 hr./day	9450 hphr		
	1 - 40 hp Pump @ 24	960 hphr		
	1 - 25 hp Conveyor @ 4	100 hphr		
	1 - 600 Hi Pl. Pump	600 hphr		
	14 - 75 hp Vent Fans @ 24 hr/day	25200 hphr		
	Allow Misc	690		
	<u>TOTAL Elec</u>	<u>37005 hphr</u>		
	@ .546¢ @ 24			22,000 kWh
	<u>Lighting</u>			
	1 Pole 20 kw @ 24	480		
	Wires 505kw @ 24	480		
	LINE 350 @ 0.1x24	840		
	OFFICE SHOP	500		
	MISC	700		
		<u>2500</u>		
	<u>TOTAL Elec per Day</u>	<u>24500 kWh</u>		
	Add for weekends 500			
		<u>25,000 kWh</u>		
	Cost per Day			1250
	Cost per Week			8750
	Cost 7 weeks			43750

# MATERIAL COSTS

ESTIMATE No. 6365-1

FOR: SCRIPT GROUP: \_\_\_\_\_

SHEET No. M-10

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: Class 1

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: RECH N. 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

WORK INFORMATION

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

MISC Small Tools  
& Supplies

AT 5% Labor 129200  
Say 7000 / wk

No Weeks

7

7000

49,000

# LABOR COSTS

N

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Lockridge PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel 12 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION						
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL									
1														
2	Reinforce Handrail				12									
3														
4	Place Concrete Slab				60									
5														
6														
7	Install Handrail													
8														
9														
10	Loco Operator				10		0.03							
11														
12														
13	Place Concrete													
14	600 LF @ 23¢/LF													
15														
16	Shift	1			1									
17	Loco Labor	4			4									
18	Carp Foreman		1		1									
19	Carp		2		2									
20	Labor		2		2									
21	Iron Worker	6		2	8									
22	Carp Foreman			1	1									
23	Carp Labor			4	4									
24	Iron Worker			1	1		1.44							
25	Loco Op	1	1	2	4									
26	Electrician	1	1	2	4									
27	Cement Finish			2	2									
28					4		9.14							
29	SERVICE & Support						2							
30	Use Pump Crew													
31	AS for Tunnel Clean up													
32					49									
33														
34														
35														
36														
37	Place Concrete				83		13.25	8						
38	Service Support				43	3	20.14	7	1					
39	Install Handrail				12									
40														
41	Total for 100 LF				143	3	52.39	15	7	17	24	1	1	



# LABOR COSTS

ESTIMATE 6367-1

FOR SCFTD GROUP L SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel Length No 12 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				<u>48</u>	<u>30</u>		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSACT -</u>				<u>12</u>			
13								
14								
15								
16								
17								
18	<u>Place Concrete</u>							
19	<u>of Tunnel</u>				<u>83</u>			
20								
21								
22								
23								
24								
25	<u>INSTALL HORIZONTAL</u>				<u>12</u>			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	<u>TOTAL</u>				<u>160</u>	<u>30</u>	<u>4800</u>	
36	<u>TOTAL Per Day</u>						<u>58000</u>	
37								
38	<u>TOTAL Per Week</u>						<u>192000</u>	
39								
40								
41								
42								
43								
44	<u>TOTAL 17 Weeks</u>							<u>3264000</u>
45								
46								
47								

# EQUIPMENT OPERATING COSTS

FOR: SCRIPT GROUP: \_\_\_\_\_ ESTIMATE No. \_\_\_\_\_  
 WORK: METRO RAIL SHEET No. E-8  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: Reels No 17 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

No UNIT      Hours  
                  HRS/WRK      TOTAL

Operating Cost

SERVICE & Support  
Use Cost Reels

500

TOTAL 17 weeks

85000

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-20

WORK: METRO RAIL PROJ

WORK ITEM NO \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH NO 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## WORK INFORMATION

REF. NO.  
OR QTY.

REF. NO.  
OR QTY.

DESCRIPTION

No	UNITS	HOURS		TOTAL	Total Opn & Exp.	
		EA				
	2 EA		20	40	2000	1040
	8		20	160	100	160
<u>Loco &amp; CARS</u>						
	2		8	16	2500	400
	11		3 sh. hr.			
	4		4	16	100	30
	8		4	32	100	30
<u>CONCRETE</u>						
	1		8	8	1500	120
	4		8	32	500	160
	4		8	32	200	60
					\$ 2000	
					19,000	
						170,000

# MATERIAL COSTS

ESTIMATE NO. 6363-1  
 FOR: SOFTD GROUP: \_\_\_\_\_ SHEET NO. M-13  
 WORK: METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: BUR DATE: 3-22-53  
 QUANTITY: REACH No 12 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm. 450 hp Comp. @ 21 hr./day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Compressor @ 4

100 hp hr

1- 607 Hi. pl. Pump

600 hp hr

14- 75 hp. Vent Fans @ 24 hr/day

25200 hp hr

Alcom Misc

690

TOTAL Elec

37005 hp hr

@ .746 c. 80%

22,000 kWh.

Lighting

Power 20 kw @ 24

480

Misc 505 kw @ 24

480

Line 350 @ 0.1 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekends Day

24500 kWh

500

25,000 kWh.

0.25

1250

Cost per Day

250

Cost per Week

625

Cost 17 weeks



# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SECT D GROUP: \_\_\_\_\_

SHEET No. M-14

WORK: METHS RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: FINISH TUNNEL

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 12

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

WORK INFORMATION

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PURCHASE HANDRAIL  
2 Tonnels

20

1.00

20

PURCHASE CONCRETE  
2 @ 1.17 =

2.50 cy

60.00

150.00

COST OF MAT'L

1 LF

170.00

PERM MAT'L

Reach 2  
5  
6  
10  
12  
14

~~7500 LF~~  
~~7500 LF~~  
~~10500 LF~~  
~~7500 LF~~  
~~17500 LF~~  
~~15500 LF~~  
~~7500 LF~~

170.00

2305.00

Misc Small Tools  
and Supplies

Use Sp. Lark \$19,000  
SA \$10,000

No Weeks

17

\$10000

170.000

PLANT & EQUIPMENT DETAIL

SCRIPD METRO CIVIL PROJECT

ESTIMATE NO. 6363-1

Book 12 17,000 LF (No. 500 LF)

SHEET NO.

PREPARED BY: GAF

DATE: 3-21-83

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & AXILL:			9000000		10	900000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1540000								
	MISC WOOD GROUND			125000								
	RAIL TRACKAGE			757500								
	VENTILATION SYSTEM			1146000								
	CONCRETE EQUIPMENT			262000								
	COMMUNICATIONS EQUIP			13500								
	ALIGNMENT CONTROL			15000								
	ELECTRICAL EQUIPMENT			997000								
	AIR WATER DEWATER			1445000								
	OTHER PLANT			308000								
				6609000		10	709000					
				15609000 ✓			1609000					

14000

PLANT & EQUIPMENT DETAIL

SCHLID METRO RAIL PROJECT

REACH 12 17000 (16500 LF)

ESTIMATE NO. 6363-1  
 SHEET NO.  
 PREPARED BY: GAC DATE: 3-21-82  
 CHECKED BY: DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>TUNNEL EXCAV.</u>												
2 EA	TBM incl Trailing Gear, - conveyor - dust suppression for 300 TN @ 1000 hp			4500000					300	600		
								100	100	700		
				900000				400	400			
<u>Locomotives &amp; Cars</u>												
4	25 TN Diesel loco. Huck		200,000	800000					25			
2	15 TN Bullgun		120000	240000					15			
12	1000 Huck Car 5 TN		16000	192000					5			
8	Hall'car 8 sub.		12000	96000					42			
2	Man Cars 4 sub		6000	12000					20			
2	Eng Line Cars		20000	40000					80			
1	Car Dumper		80000	80000					300			
2	Grout Car & Pump		40000	80000								
	<u>TOTAL loco &amp; Cars</u>			1540000								
<u>MISC UNDERGROUND</u>												
4	SINKER DRILLS		2000	8000					0	11		
4	STAKE DRILLS		2500	10000					0	11		
4	AXLES DRILLS		2500	10000					0	11		
4	4" Drift for test		14,750	57,000					1	10		
4	Drifts Boom & Side		14000	28000					1	10		
4	Taper bits		5000	10000					1	10		
4	AIR Wrenches		500	4000					0	11		
4	oxy Acet. Oulf		1000	4000					0	11		
4	Elec Welder 300 hp		2000	8000					0	11		
4	CRACK JACKS		1000	8000					0	11		
4	Chipping sup. Air		250	1000					0	11		
4	Misc Cone, Steel Drills		500	2000					0	11		
	<u>TOTAL MISC Equip</u>			125000								

623

PLANT & EQUIPMENT DETAIL

SECT 2 METRO RAIL PROJECT

ESTIMATE NO. 63694  
 SHEET NO.  
 PREPARED BY: [Signature] DATE: 3-2-83  
 CHECKED BY: DATE:

Reach 12

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			%	AMOUNT			
<u>RAIL TRACKING</u>											
40 Ton	FOR 2 TUNNELS 1000'										
2500 lb	4000 LF 60# Rail		500	20000							
6000 lb	5 spikes		0	625							
500 lb	ANGLE BARS BOLTS etc		0	1500							
1 Lot	5x8" X 5' TRUSS 500'		9	2500							
	MISC			875							
	<u>COST PER 1000 LF (2 TUNNELS)</u>			<u>27500</u>							
								143			
17' 0" LF	TUNNELS		27500	467500				143			
8 EA	TURNOUTS Frog Switches		5000	40000				20			
7 EA	CALIFORNIA SWITCH		125000	250000				500			
	<u>TOTAL RAIL TRACK COST</u>			<u>757500</u>							
<u>VENTILATION SYSTEM</u>											
FOR 2 TUNNELS @ 1000 LF											
2	7 1/2 HP Air Vary Fans w/ starter		12500	25000				50			
2000 LF	48" Dia Venti w/ caps		2000	40000							
2000 LF	Hangers & hardware		650	1000							
	<u>COST PER 1000 LF</u>			<u>66000</u>				<u>40</u>			
17' 0" LF	TUNNELS		66000	1122000				40			
2 EA	ELBOW		2000	4000				20			
2 EA	INLET & Silencer		10000	20000				50			
	<u>TOTAL COST VENTIL.</u>			<u>1146000</u>							

530

# PLANT & EQUIPMENT DETAIL

SECRET

Reach 12

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: JA DATE: 3-21-77  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>CONCRETE Equip</u>												
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Press Grout Pump/Car		30000	30000								
1 EA	Shotcrete Outfit		45000	45000								
1 EA	SAND BLAST OUTFIT		3000	3000								
4 EA	Gen. Equip. Hydraulic Cams		25000	100000								
1 LOT	VALVES & MISC		4000	4000								
200 LB	SPICK LINE		1000	2000								
1 EA	Swing Spring Rig		3000	3000								
	TOTAL CONCR & GROUT EQUIP			262000								
<u>Communications Equip.</u>												
	SWITCH BOARD & Hookup			5000								
	Cost per 1000 ft (2 tunnels)											
2000 LF	Telephone line		0.20	400								
7 EA	Telephones		50.00	350								
	Cost per 1000 LF			500								
1700 LF	Tunnel (Reach)		500.00	8500								
	TOTAL COMMUN			13500								
<u>ALIGNMENT CONTROL</u>												
2 EA	LAZER GUIDANCE SYSTEM		5000	10000								
1 LOT	TRIP SURVEY EQUIP.		5000	5000								
				15000								

12/1

PLANT & EQUIPMENT DETAIL

SCR 78 METRO TUNNEL

Reach 12

ESTIMATE NO. 2363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-21-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
<u>ELECTRICAL EQUIPMENT</u>												
1	Sub-station - Hook up		5000	5000								
3 Ea	1000 KVA Transformer		30000	150000								
1 Ea	200 kW Standby Generator		75000	75000								
1 Lot	Switch Gear		25000	25000								
	<u>TOTAL ELECTRICAL PLANT</u>			<u>300000</u>								
<u>ELECTRICAL TUNNEL PLANT</u>												
<u>FOR 2 TUNNEL @ 1000 LF</u>												
2000 LF	POWER CABLE		10 <sup>00</sup>	20000								
2 Ea	100KVA Ltg. Vent. Transformer		9000	18000								
3000	LIGHTNING LINE		0 <sup>30</sup>	1000								
50	LIGHT FIXTURES		5 <sup>00</sup>	250								
	MISC OUTLET			750								
2000	MISC GAS, LIGHTING, etc. Lines		0 <sup>50</sup>	1000								
	<u>TOTAL ELEC. FOR 2 TUNNEL</u>			<u>41000</u>								
77 <sup>1</sup> / <sub>2</sub> LF	TUNNEL		6 <sup>4000</sup>	697000								
	<u>TOTAL ELECTRICAL</u>			<u>997000</u>								
<u>AIR WATER Dewater</u>												
<u>FOR 2 TUNNEL @ 1000 LF</u>												
2000 LF	4" Water Line		4 <sup>00</sup>	8000								
80 Ea	Ground Clips		25 <sup>00</sup>	2000								
4000 LF	6" Air Line		8	16000								
80 Ea	Ground & Grounding		50 <sup>00</sup>	4000								
2000 LF	10" Dewater Line		15 <sup>00</sup>	30000								
80 Ea	Ground & Clips		100 <sup>00</sup>	8000								
	Allow for Misc. Valves & Fittings			2000								
2 Ea	Air Pumps		2500	5000								
	<u>COST FOR 1000 LF TUNNELS</u>			<u>75000</u>								

3312

PLANT & EQUIPMENT DETAIL

SECRET METRO Tunnel

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 2-21-52  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Block 12

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	Air, Water, Dewater											
	17' dia TUNNEL (2 tunnels)		75300	1275000								
	<u>PLANT</u>											
1 EA	1200 cfm Elec Comp		80000	80000								
1 EA	600 cfm Diesel Comp		60000	60000								
2 EA	Air Receivers		1000	2000								
2 EA	Water Pumps 10 Hp. 114"		2000	4000								
2 EA	Disch. Pumps 50 Hp 120"		5000	10000								
	Misc. Manifolds etc			14000								
	TOTAL PLANT			870000								
	Tot Air Water Disch.			1445000								
	<u>Other Plant &amp; Equipment</u>											
1 Lot	Repair Shop Equipment		25000	25000								
1 Lot	Electric Shop Equipment		15000	15000								
1 Lot	Compressor Shop Equipment		10000	10000								
7 EA	AMBUVANCE		10000	10000								
2 EA	OFFICE TRACES 12x60		25000	50000								
1 EA	Warehouse 10000 sq			10000								
2 EA	Change house @ Noo			60000								
1 EA	Said Van			5000								
1 EA	First Aid Tracer			10000								
	ALIMAK MAN ELEVATOR			3000								
	36' x 300' Muck Conveyor 25 hp.			100000								
	500 g Muck Hoop			10000								
	TOTAL Other			358000								

333





# SUMMARY OF COSTS

FOR: SCRTD METRO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO. S

REACH No. 14 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3.11.83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

WORK SCHEDULE

DESCRIPTION	QUANTITY		UNIT	LABOR		PERM. MATERIALS		SUPPLIES		CONSTR	EQPT. OPERATION		EQPT.	TOTAL													
										PLANT																	
TOTAL DIRECT COSTS BIO F FWD				18	403	200	17	531	000	4	161	920	9	300	000	1	871	850			51	267	970				
GENERAL EXPENSE SCRTD - Add				28	17	500					23	000	46	42	530												
TOTAL GEN EXP.				28	17	500				4	972	530											75	720	230		
TOTAL COSTS				21	220	700	17	531	000	9	034	450	9	300	000	1	871	850					51	267	970		
RISK OF PROFIT % AMT				30			10			10			5			15									9	769	000
TOTAL COST																									68	727	600
																									9	700	LE

334

# SUMMARY OF COSTS

FOR: SKRTD GROUP: \_\_\_\_\_ ESTIMATE NO. 6353-1

WORK: NIETRO RAIL PROJECT SHEET NO. S

TUNNEL CONST. (DUAL TRACK TWIN TUNNEL) WORK ITEM NO. \_\_\_\_\_

REACH No 14 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

ITEM OR NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	EQPT. OPERATION	EQPT. RENTALS	TOTAL
	DESCRIPTION	QUANTITY	UNIT						
	<u>TUNNEL EXCAV.</u>								
-2	EXCAV. & Support LABOR			12744000					
E1	SUC & Support Equip Oper						840750		
11	EXCAV. Equip Oper						619500		
11	MUCK DISPOSAL					1778800			
1-4	Misc Small Tools					501500			
1-2	ELECTRIC POWER					442500			
1-3	CUTTING COST					242500			
1-4	TUNNEL LINERS								
				12744000	75502000	3165300	1440250		\$37,871,550
	<u>CROSS PASSAGE</u>								
	SUPPORT & Lab. LABOR			734400					
	EXCAV. LABOR			648000					
	LOCO. TRANS			172200					
	PILE GANG			72000					
	CONCRETE LABOR			1555200					
	SUC. & Support Eq. Oper						87600		
	MUCK DISPOSAL					15120			
	ELECTRIC POWER					75000			
	TRANSF. EQUI. OPER.						120000		
	CONCRETE EQUI. OPER.				380000	84000			
	CONCRETE MIXTL					475000			
	MISC SMALL TOOLS					132000			
				3182400	380000	781120	207600		\$4,551,120
	<u>TUNNEL CLEANUP</u>								
	LABOR			556800					
	SUC & Support Equip Oper						20000		
	EXCAV. Equip Oper						34000		
	ELECTRIC POWER					25000			
	Misc Small Tools etc					18000			
				556800	380000	53000	54000		\$663,800
				16,483,200	15,882,000	3,999,420	1,721,850		\$38,086,470

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# SUMMARY OF COSTS

FOR: SCT D NIETO RAIL GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: TUNNEL CONSTRUCTION SHEET NO: S

REACH No. 14 WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GHE DATE: 3-1-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	CONSTR PLANT	EQT. OPERATION	EQT.	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>INSTALL STEEL LINER</u>									
-5	TOTAL LABOR									
-6	SUC Support Equip									
-7	Inst Equip Oppl									
-11	ELECTRIC POWER									
-12	STEEL LINER									
-12	Small Tools & Suppl									
	<u>FINISH TUNNELS</u>									
	LABOR			1 920 000						1 920 000
	SUC & Support Equip							50 000		50 000
	Underground Equipment							100 000		100 000
	Elec. Power					62 500				62 500
	PERM. MAT'L				1 649 000					1 649 000
	SMALL TOOLS ETC					100 000				100 000
				1 920 000	1 649 000	162 500		150 000		3 881 500
	<u>WEEKEND MAINT</u>									
	Incl elsewhere									
	<u>CONSTR PLANT</u>									
	TBM'S						5 000 000			
	OTHER PLANT						534 900			
	SALVAGE						(104 900)			
							9 300 000			9 300 000
	Page Total			1 920 000	1 649 000	162 500	9 300 000	150 000		13 181 500
	<u>TOTAL DIRECT COSTS</u>			18,403,200	17,531,000	4,161,920	9,320,000	187,1850		51,267,970

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP \_\_\_\_\_ SHEET NO. L

WORK Metrol Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GIR DATE \_\_\_\_\_

QUANTITY Tunnel Drilling TBM - DUBBY #14 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER HOUR	DRILL	TUNNEL	VHS	ELECT	CABLE	DISTRIBUTION	OTHER
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	<del>SENSEMAN</del>												
2	WALKER	1	1	1	3	3							
3	CRANE OPER	2	2	2	6								
4	CRANE OPER	1	1	1	3								
5	TOP MAN	1	1	1	3								
6	BOTTOM MAN	1	1	1	3								
7	CHANGE ROVER LTT.	1	1	1	3								
8	COMPRESSOR OPER	1	1	1	3	3							
9	MECH. FOREMAN	1	1	1	3	1							
10	MECHANIC	4	4	4	12	12							
11	ELECT. FOREMAN	1	1	1	3								
12	ELECTRICIAN	2	2	2	6								
13	PUMP OPER	1	1	1	3	3							
14	MINER	4	4	4	12	12							
15	LOCO OPER		1	1	2	2							
16	BRAKEMAN		1	1	2	2							
17	TRUCK DRIVER	1			1								
18	CARPENTER	1			1								
19	LEADER	4			4								
20	WELDER	1			1								
21	TOTAL	30	21	21	72	3	32	21	4	9	1	1	1
22													
23													
24	<u>HAULING CREW (v)</u>												
25	SHIFTER	2	2	2	6								
26	TBM OPER	2	2	2	6								
27	TBM OPER	2	2	2	6								
28	MECHANIC	2	2	2	6								
29	ELECTRICIAN	2	2	2	6								
30	MINER	8	8	8	24								
31	CHUCK TENDER	5	5	5	15								
32	TOTAL	22	22	22	66	18	42	6					
33													
34													
35	<u>Track Handling Crew (v)</u>												
36	LOCOMOTIVE OPER	4	4	4	12	12							
37	BRAKEMAN	4	4	4	12	12							
38	TOTAL	8	8	8	24	24							
39													
40													
41	<u>Bill Gens (v)</u>												
42	TRAIL GENS FEED	2			2								
43	TRAIL GENS LAB.	8	2	2	12								
44	LOCO OPER	2			2	2							
45	LOCO OPER	2			2	2							
46	TOTAL	14	2	2	18	4	12						
47													
48	TOTAL	74	53	53	180	3	78	77	4	15	1	1	1

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# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L 1

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY GHC DATE 3.22.82

QUANTITY REACH No 1A CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
3	<u>SERVICE &amp; Support</u>	<u>30</u>	<u>21</u>	<u>21</u>	<u>72</u>	<u>30</u>	<u>2160</u>	
4	<u>Cost per Day</u>						<u>17250</u>	
5	<u>Cost Weeks</u>						<u>86400</u>	
10	<u>HEADING CREWS</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>66</u>	<u>30</u>	<u>1980</u>	
11	<u>Cost per Day</u>						<u>15870</u>	
12	<u>Cost Weeks</u>						<u>79200</u>	
17	<u>MUCK HANDLING</u>							
18	<u>UNDERGROUND TRAMP</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>24</u>	<u>30</u>	<u>720</u>	
19	<u>Cost per Day</u>						<u>5760</u>	
20	<u>Cost Weeks</u>						<u>28800</u>	
25	<u>BULL GRIND</u>	<u>14</u>	<u>2</u>	<u>2</u>	<u>18</u>	<u>3</u>	<u>540</u>	
26	<u>Cost per Day</u>						<u>420</u>	
27	<u>Cost Weeks</u>						<u>21600</u>	
34	<u>TOTAL Cost/week</u>						<u>216000</u>	
35	<u>LABOR</u>							
36	<u>TOTAL Cost 59 weeks</u>							<u>12,744,000</u>



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E ✓

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: Reach No 14

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.

## WORK INFORMATION

*Note: For TBH Article Cost & Base on separate page  
 No repairs only  
 Locomotive: Cost to repair service & fuel*

REF. NO. OR QTY.

DESCRIPTION

No. UNITS

HOURS EA

TOTAL

Total Oper. Exp.

TUNNEL Excavation  
 TBH Repair & Serv  
 Operate 40 mi/cycle  
 10 cycles/day = 400 mi

2

6

12 Hr

75<sup>00</sup>

900-

Locomotives & Cars  
 Ave 30 mi per train  
 per push or cycle  
 10 cycles = 300 mi  
 4 trains in 2 hrs  
 Add 2 1/2 train  
 for misc  
 25 Ton loco

4

8 hr

32 hr

25<sup>00</sup>

800-

Bull Crane Loco  
 5 hr 4 hr/day 2 ea  
 1 1/2 ton loco

2

4 hr

8 hr

15<sup>00</sup>

150-

Muck Cars  
 Other Cars

16 EA

8 hr

128 hr

150

200-

8 EA

8 hr

64 hr

0.75

50-

TOTAL Cost Per Day

2100-

Cost Per Week

10500-

Cost 59 weeks

619,500

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 14

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

## WORK INFORMATION

Assume Tunnel Muck Loaded on truck hauled  
to disposal site at 5<sup>th</sup> / 60000 yd  
1 LF = 11<sup>25</sup> Bag x 1.50 = \$17<sup>00</sup> LF @ 600 = 10200  
2 Tons = 20400  
Reach

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

Muck Disposal

9700 LF

204<sup>00</sup>  
102<sup>00</sup>

1978.800

Misc Small Tools & Supplies

Estimate misc small  
tools supplies  
and consumables @  
4 sp labor 216,000  
500 # 8500 / week

TOTAL 59 weeks

WR

8500

501,500



# MATERIAL COSTS

FOR: SOFTO METCO RAIL GROUP

WORK: \_\_\_\_\_

LOCATION: \_\_\_\_\_

QUANTITY: REACH No 14

ESTIMATE NO. 6363-1

SHEET NO. M

WORK ITEM NO. \_\_\_\_\_

PREPARED BY: GHE DATE: 3-21-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY. WORK INFORMATION

ELECTRIC POWER CONSUMPTION  
TOTAL TUNNEL REACH = 93,600 LF = 7 : 13,350 Ave 7 Tunnels  
2 headings

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	<u>ELECTRIC POWER</u>	<u>hp-hr</u>		
	<u>1-1200 Comp. 4/6 line 9 hr/dy</u>	<u>4050</u>		
	<u>1-40 hp pump @ 24 hr/dy</u>	<u>960</u>		
	<u>1-25 hp conveyor @ 8 hr/dy</u>	<u>200</u>		
	<u>2-1000 hp TBM (490 min)</u>	<u>12000 hp hr</u>		
	<u>2-100 hp front (300 r.m/d)</u>	<u>1000 hp hr</u>		
	<u>1-75 hp Vent Fan (ave)</u>			
	<u>@ 24 hr/day =</u>	<u>25,200 hp hr</u>		
	<u>2-Grout pump (90 min/hr)</u>			
	<u>2-16 @ 15</u>	<u>30 hp hr</u>		
	<u>ALLOW MISC</u>	<u>560</u>		
	<u>TOTAL ELEC MOTORS</u>	<u>44,000 hp hr</u>		
	<u>@ 0.74¢ @ 80% =</u>	<u>27,000 kWh</u>		
	<u>Lighting</u>			
	<u>Header 20 kW @ 24 hr</u>	<u>480</u>		
	<u>Header 2 @ 10 kW @ 24 hr</u>	<u>480</u>		
	<u>Line 7000 = 40 = 125 @ 0.16 @ 24 hr</u>	<u>420</u>		
	<u>MISC ALLOW</u>	<u>120</u>		
	<u>OFFICE &amp; HALL</u>	<u>500</u>		
		<u>2000</u>		
	<u>TOTAL ELEC Per Day</u>	<u>29,500 kWh</u>	<u>005</u>	<u>1475.00</u>
	<u>Add for weekend parking</u>		<u>005</u>	<u>50.00</u>
	<u>2500 x 1/2 50%</u>	<u>1000</u>		
	<u>Cost Per Day</u>			<u>1500.00</u>
	<u>Cost Per Week</u>			<u>7500</u>
	<u>TOTAL COST 59 weeks</u>			<u>442,500</u>

# MATERIAL COSTS

ESTIMATE No. 6363-1  
 SHEET No. M  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No. 14

REF. NO. OR QTY. WORK INFORMATION

*Estimate Copper Costs*  
 Say 45 authors @ 1500/pc = 67500  
 2 rebuilds @ 35% = 33500  
 \$ 101,000  
 Say 600 hr. are life in Allow. & Finance = 178<sup>00</sup> x 6 = 1068 = 48 = 25<sup>00</sup>/hr  
 300 hr. are life in Result = 335<sup>00</sup>/hr. x 6 = 2010 = 40 = 50<sup>00</sup>/hr

REF. NO. OR QTY.	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT
	Reach 7 (Thin Sta)	8500 LF	25	
	5	12100 -	25	
	6	10400 -	25	
	8 Thin Sta	9000 LF	25	
	10	17000	25	
	12	16500	50 <sup>00</sup>	
	14	9700	25 <sup>00</sup>	
				242,500

# MATERIAL COSTS

ESTIMATE No. 63637

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-4

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: GHE DATE: 3-22-83

QUANTITY: Reach No 14

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

A review of liners would indicate 600<sup>00</sup>/LC to figure and deliver non-gasketed liners, 500<sup>00</sup>/LC for gasketed liners per Lt. Tunnel  
 Grout Behind liner = 0.39 cu/LC at 75<sup>00</sup>/cu = 30<sup>00</sup>/LC  
 @ Tunnels = 60<sup>00</sup>/LC per Mt.

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

2 X 1500  
2 X 8200

3000  
16400

\* 600  
500

1800 000  
13120 000

Grout Behind liner

19400

30<sup>00</sup>

582000

TOTAL LINERS

15502000



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-3

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHC DATE: 3-23-8

QUANTITY: REACD NO

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.      WORK INFORMATION

CROSS PASSAGE CONSTRUCTION

REF. NO. OR QTY.	DESCRIPTION	FLOORS			OPERATING COST		
		No	UNIT	HRS	TOTAL	PER DAY	PER WEEK
	<u>SERVICE &amp; SUPPORT</u>						
	<u>18 Ton Hyd. Crane 2 sh @ 4 hr</u>	1		8	3500	280	-
	<u>70 Ton Hyd. Crane 1 sh @ 6</u>	1		6	10000	600	-
	<u>FE Ldr (946)</u>	1		4	4600	184	-
	<u>FLAT BED TRUCK STN</u>	1		5	1800	108	-
						1172	-
	<u>1200 cfm. Comp.</u>	1		21	500	105	-
	<u>3 sh @ 7 hr</u>						
	<u>40 hp. Pump</u>	1		24	080	19	-
	<u>85 hp. Compressor</u>	1		4	500	20	-
	<u>STN 4000 Sw. 1 sh</u>	1		8	1800	144	-
	<u>2 sh @ 4</u>						
	<u>TOTAL COST per Day</u>					288	-
	<u>COST per week</u>					1460	-
	<u>TOTAL COST 12 weeks</u>					7300	-
							87600

# MATERIAL COSTS

ESTIMATE No. 6353-1  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET No. M 5  
 WORK: METRO RAIL PROJECT WORK ITEM No. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: GAC DATE: 3-21-83  
 QUANTITY: REACH No 14 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

Cross Passage Excav. 40 By/ft x 15' = 210 CCY  
 Much Disposal @ 6<sup>00</sup>/CCY = \$1260 per passage

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

No Cross Passage

19

1260

15120

MISC SMALL TOOLS  
 + Supplies  
 @ 40% Labor \$275,000/wk  
 17/6 weeks

12

\$11,000

132,000

MATERIAL COSTS

FOR: SCRTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 14

ESTIMATE No. 6363-1  
 SHEET No. M-6  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: GHK DATE: 3-22-33  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1 - 1200 cfm 450 hp Comp.	9450 hp hr		
21 hr./day			
1 - 40 hp Pump @ 24	960 hp hr		
1 - 25 hp Comp. @ 4	100 hp hr		
1 - 75 hp Comp. Pump @	600 hp hr		
14 - 75 hp Vent Fans	25200 hp hr		
@ 24 hr/day			
Allow Misc	690		
<u>TOTAL Elec</u>	<u>37005 hp hr</u>		
@ .746 c. 80%	22,000 kWh.		
Lighting			
Power 20 kw @ 24	480		
Wds 405 kw @ 24	430		
LINE 350 @ 0.1 x 24	840		
OFFICE SHOP	500		
MISC	700		
	<u>2500</u>		
<u>TOTAL Elec per Day</u>	<u>24500 kWh</u>		
Add for weekends 500	500		
	<u>25,000 kWh.</u>		
Cost per Day		0.25	1250
Cost per Week			1250
Cost 12 Weeks			6250

75 000

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passages - Excess CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL				DISTRIBUTION			
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Suppl	DP	W/P	ELEC	ESC	W/O	W/O	W/O
1														
2	<u>Support &amp; Service</u>													
3														
4	Walker	1	1	1	3	3								
5	Crane Oper	1	1	1	3		3							
6	Crane Oper	1			1		1							
7	Tie man	1			1			1						
8	Hoist man	1	1	1	3			3						
9	Charge Hand	1			1			1						
10	Comp. Oper	1	1	1	3		3							
11	Mech Foreman	1			1		1							
12	Mechanic	2	2	2	6		6							
13	Fleet Foreman	1			1									
14	Electrician	2	1	1	4				1					
15	Pump Oper	1			1		1							
16	Misc	4	4	4	12			12						
17	Loos Oper		1	1	2		2							
18	Tie man		1	1	2		2							
19	Truck Driver	1			1									1
20	Carpenter	1			1									1
21	Welder	4			4				4					
22	Pipe Fitter	1			1									
23	2 Crossovers - men/day				5	2	10	10	4	5	1			1
24	14 wks/22													1
25														
26														
27	<u>Crossing Heating 2 Crows</u>													
28	Shifter	2	2	2	6									
29	Misc	8	8	8	24			24						
30	Chuck Tester	4	4	4	12			12						
31	Welder	2	2	2	6			6						
32	Mucker (CRO)	2	2	2	6		6							
33		18	18	18	54		6	48						
34														
35	<u>Mock handle</u>													
36	Loos Oper	2	2	2	6		6							
37	Brake man	2	2	2	6		6							
38					12		12							
39														
40	<u>Roller Gang</u>													
41	Foreman	1			1									
42	Roller Gang	4			4									
43					5									
44														
45														
46	<u>Total Excess 2 Crows</u>				122									
47														
48	<u>Allow Excess 1 Cross</u>				61									
	<u>Allow Excess 5 Crows</u>													



# LABOR COSTS

ESTIMATE 6313-1

FOR SOFT GROUP

SHEET NO. L

WORK Metro Rail Project

WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Clear Passage - Concrete

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	ELC	DISTRIBUTION		
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				10	11	11
1											
2	Support & Service										
3	Concrete work crew										
4											
5											
6	Concrete Crew										
7											
8	Shiller	1	1	1	3						
9	Concrete Foreman	1	1	1	3						
10	Chimney	1	1	1	6		6				
11	Concrete	6	6	6	18					18	
12	Workers	4	4	4	12		12				
13	Iron workers	4	4	4	12						12
14	Operator - for										
15											
16	TOTAL crew =				54		12			21	12
17											
18	2 Drivers										
19											
20											
21											
22											
23											
24	TOTAL MEN =										
25	Note Aug 22 Crossmen										
26											
27											
28											
29	Support & Service crew = 14 wk @ 51				714	42	238	56	70	14	14
30	Excav				594	46	528				
31	Transport				128	168					
32	Rock Guard				70		70				
33	Concrete lab.				1512		252	336	588	336	
34											
35											
36	TOTAL Man-wk for				3083	42	500	1021	372	70	204
37											
38	Rev. for Concrete Man-wk				140	23	50	19	3	27	15
39											
40	Rev. for Imp/Assist				720	10	115	250	90	15	135
41											
42											
43											
44											
45											
46											
47											
48											

R/P

THE RALPH M. PARSONS COMPANY

Crow Passage

SCHEDULING AND REPORTING SHEET

PREPARED BY \_\_\_\_\_

JOB NUMBER \_\_\_\_\_ CLIENT \_\_\_\_\_

LOCATION \_\_\_\_\_

DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_

DESCRIPTION	1981		1982		1983		1984		1985		1986		1987		1988		1989		1990																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
33	Support & Service														51	1000	73	Wkr	=	1173	=	524	ndy																												
32	Excav														51	m	11	Wkr	=	574	=	2970	ndy																												
31	Transport														13	m	23	Wkr	=	276	=	183	ndy																												
30	Bull Spas														5	m	73	Wkr	=	115	=	575	ndy																												
29	Camp & Cabins														51	m	77	Wkr	=	1247	=	6210	ndy																												
28																					3400		17000		ndy																										
27																																																			
26																																																			
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6																																																			
5																																																			
4																																																			
3																																																			
2																																																			
1																																																			
0																																																			

Support of Service 31 x 1000  
 Excav 51 x 1000  
 Transport 13 x 1000  
 Bull Spas 5 x 1000  
 Camp & Cabins 51 x 1000

3033 x 1000  
 6210 ndy

351

CON 8 (2/78)

TITLE SCRTD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6213-1 DEPARTMENT \_\_\_\_\_ AUTHOR GNE DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cross Passages  
Tunnels 42'-8"  $\pm$  to  $\pm$   
- Sky Passages 25' long.

Excavation Soil

Excav. Neat =  $9\frac{1}{2}' \times 12\frac{1}{2}' = 118\frac{1}{4}\text{sf}$   $4\frac{1}{2}' \text{ depth} = 110\text{cy}$   
Excav w/over =  $11\frac{1}{2}' \times 14\frac{1}{2}' = 164\text{sf}$   $5\frac{1}{2}' \text{ depth} = 148\text{cy}$

Concrete 27c  $4\frac{1}{2}'$   
Neat  $118\frac{1}{4}\text{sf} - (5\frac{1}{2}' \times 13\frac{1}{2}') = 74\text{sf}$   $2\frac{1}{2}' \text{ depth} = 27\text{cy}$   
w/over  $164\text{sf} - 45\frac{1}{2}\text{sf} = 108\text{sf}$   $4\frac{1}{2}' \text{ depth} \times 27 = 108\text{cy}$   
Trucks w/over  $11 \times 2\frac{1}{2}' \times 25 = 28\text{cy}$   
Walls & Arch  $\frac{83\text{cy}}{108\text{cy}}$

Soft Rock  
Excav. Neat





# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJ

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH NO

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION
	<u>CROSS PASSAGE CONSTR</u>

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & DEF.	
		No. UNITS	EA	TOTAL		
	<u>Cross-Pass Excav</u>					
	Finco G30	2	EA	20	40	2500
	Air Spade Drills etc	8		20	160	100
	<u>Loco &amp; CARS</u>					
	25 TD Loco @ 84	2		8	16	2500
	in 3 shifts					400
	Huck Cars	4		4	16	100
	Other Cars	8		4	32	100
	<u>CONCRETE</u>					
	Concrete Pump	1		8	8	1500
	Concr. Agitator Cars	4		8	32	500
	VIBRATORS Misc	4		8	32	200
	Cost Per Day					\$ 2000
	Cost Per Week					12,000
	Cost 17 Weeks					170,000

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP SHEET NO. L

WORK Metrol Pac Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Turn 1 Cleanup - 14 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION					
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL								
1	<u>Revers of Road</u>												
2													
3													
4	<u>Water</u>	1	1	1	3	3							
5	<u>CRANE Oper</u>	2	1	1	4								
6	<u>Engine Driver</u>	1			1		1						
7	<u>Trip Alarm</u>	1			1			1					
8	<u>Section Man</u>	1	1	1	3			3					
9	<u>Charge Hoo. Att.</u>	1			1				1				
10	<u>Condr. Oper</u>	1	1	1	3		3						
11	<u>Mech. Foreman</u>	1			1		1						
12	<u>Mechanic</u>	2	1	1	4		4						
13	<u>Exec. Foreman</u>	1			1								
14	<u>Eyes</u>	4	1	1	6						1		
15	<u>Pump Oper</u>	1	1	1	3		3						
16	<u>Mine</u>	2	2	2	6		6						
17	<u>Loco Oper</u>		1	1	2		2						
18	<u>Bagman</u>		1	1	2		2						
19	<u>Track Driver</u>	1			1								1
20	<u>Carpenter</u>	1			1								1
21	<u>Labr</u>	4			4				4				
22	<u>Pipe Fitter</u>	1			1								1
23					48	3	20	11	4	7	1	1	1
24													
25	<u>Cleanup Crew (2 hrs)</u>												
26	<u>Shifter</u>	2	2	2	6		6						
27	<u>Driver</u>	4	4	4	12		12						
28	<u>Tunnel Labor</u>	8	8	8	24		24						
29													
30					47								
31													
32	<u>Transport</u>												
33	<u>Loco Oper</u>	2	2	2	6		6						
34	<u>Blatman</u>	2	2	2	6		6						
35					12		12						
36													
37													
38	<u>Blind Rivets</u>												
39													
40	<u>Foreman</u>	2			2								
41	<u>Bill Gate Hook</u>	8			8				8				
42	<u>Loco Oper</u>	2			2		2						
43	<u>Blade</u>	2			2		2						
44					14		4		10				
45													
46													
47	<u>Turn Per Day</u>				116	3	36	43	7	7	1	1	1
48													

# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L-4

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - Tunnel (East) PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY REACH No 14 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3	<u>Self Support</u>							
4		10	11	11	32			
5								
6								
7								
8								
9								
10								
11								
12	<u>CLEANUP CREWS</u>							
13		14	14	14	42			
14								
15								
16								
17								
18								
19								
20								
21	<u>TRANSPORT CREW</u>	4	4	4	12			
22								
23								
24								
25								
26								
27								
28								
29	<u>BULL GANG</u>	14			14			
30								
31								
32								
33								
34								
35								
36								
37								
38	<u>TOTAL</u>				116	30	3480	
39								
40								
41	<u>COST Per Day</u>						29840	
42								
43	<u>COST Per Week</u>						139000	
44								
45								
46	<u>TOTAL of Weeks</u>						556800	
47								
48								



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET NO. E-4

WORK: METRO RAIL PROJECT

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: SHE DATE: 3-23-8

QUANTITY: LEASE NO 14

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	Hours		Operating Cost		
		No. Units	Hrs/Unit	TOTAL	Hourly	Total
	<u>SERVICE &amp; SUPPORT</u>					
	<u>18 Ton Hyd. Crane 3 sh @ 4 hr</u>	1	12		35 <sup>00</sup>	420 -
	<u>70 Ton Hyd. Crane 1 sh @ 4</u>	1	4		100 <sup>00</sup>	400 -
	<u>FE Ldr (946)</u>	1	4		46 <sup>00</sup>	184 -
	<u>FLAT BED TRUCK STN</u>	1	5		15 <sup>00</sup>	75 -
						710
	<u>1800 cfm Comp. 3 sh @ 7 hr</u>	1	21		5 <sup>00</sup>	105 -
	<u>40 hp. Pump</u>	1	24		0 <sup>80</sup>	19 -
	<u>85 hp. Compressor</u>	1	4		5 <sup>00</sup>	20 -
	<u>15 TN 6000 Switch 2 sh @ 4</u>	1	8		18 <sup>00</sup>	144 -
						290
	<u>TOTAL COST Per Day</u>					1000
	<u>COST Per week</u>					7000
	<u>TOTAL COST 4 weeks</u>					28000

# EQUIPMENT OPERATING COSTS

ESTIMATE No. 65631

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. E-5

WORK: WATER LINE PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: CLEANUP

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 14

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO  
OR QTY.

## WORK INFORMATION

Cleanup at 5.00 \$ per Day

REF. NO  
OR QTY.

DESCRIPTION

HOURS  
No UNITS FA TOTAL

Total Oper. Exp.

Various Equip.

Finco 630  
MISC

2 LE 20 48

26.00 1040  
50

Loco & Cars

25 Ton V.

✓ 10 30

25 500

Mock Call  
Office Call

✓ 10 40  
4 10 40

1.50 60  
1.00 40

TOTAL Per Day

1700

Total Per Week

8500

TOTAL 4 weeks

34000

# MATERIAL COSTS

FOR: SCLTD GROUP: \_\_\_\_\_  
 WORK: METRO RAIL PROJECT  
 LOCATION: \_\_\_\_\_  
 QUANTITY: REACH No 14

ESTIMATE No. 6363-1  
 SHEET No. M-6  
 WORK ITEM No. \_\_\_\_\_  
 PREPARED BY: BAK DATE: 7-22-53  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

ELECTRIC POWER

REF. NO.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm. 45 hp Comp. @ 21 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Conveyor @ 4

100 hp hr

1- 607 Hi Pr. Pump

600 hp hr

14- 75 hp Vent Fans @ 24 hr/day

25200 hp hr

Alloca Misc

690

TOTAL Elec

37000 hp hr

@ .746 c. kWh

27,500 kWh

Lighting  
 42 20 kw @ 24

480

40 5 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SUPPL

500

MISC

700

2500

TOTAL Elec per Day  
 Add for weekends 800

24500 kWh

500

25,000 kWh

COST per Day  
 COST per Week

0.25 1250  
 210  
 6300

COST 4 weeks

25000 360



# LABOR COSTS

N'

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel 14 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	Purchase Material			12	12			
3								
4	Lunch Concrete 50 ft @ 15			60	60			
5								
6								
7	Truck haul material @ 200 ft @ 200 ft							800 ft
8								
9								
10	Loco Oper. 1 hr @ 100			10	10		0.03	300 ft
11								
12								
13	Place Concrete							
14	600 LF @ 23/4							
15								
16	Shift pay	1			1			
17	Unsk. Labor	4			4			
18	Carp. Foreman		1		1			
19	Carpenter		2		2			
20	Labor		2		2			
21	Iron worker	4		2	6			
22	Unsk. Labor			1	1			
23	Carp. Labor			1	1			
24	Unsk. Labor			1	1			
25	Loco Oper.	1	1	2	4			
26	Truck			2	2			
27	Cement Finish			2	2			
28								
29	SERVICE & Support					9.14		
30	Use Project Crew							
31	AS for Tunnel Clean up							
32								
33								
34								
35								
36								
37	Place Concrete				93	13.28		1250
38	Service Support				43	20.14		870
39	Install Material				12			144
40								
41								
42								
43	Total for 200 LF				143	71.52		10284
44								
45								
46								
47								
48								



# LABOR COSTS

ESTIMATE 6367-1

FOR SCFD GROUP SHEET NO. L-6

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles - PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel Length No 14 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2								
3								
4	<u>Service &amp; Support</u>				<u>43</u>	<u>30</u>		
5								
6								
7								
8								
9								
10								
11								
12	<u>TRANSPORT</u>				<u>14</u>			
13								
14								
15								
16								
17								
18								
19	<u>Place Concrete</u>							
20	<u>in Tunnel</u>				<u>83</u>			
21								
22								
23								
24								
25	<u>INSTALL HANDBILL</u>				<u>14</u>			
26								
27								
28								
29								
30								
31								
32								
33								
34								
35	<u>TOTAL</u>				<u>160</u>	<u>30</u>	<u>4800</u>	
36	<u>TOTAL Per Day</u>						<u>38400</u>	
37								
38	<u>TOTAL Per Week</u>						<u>192000</u>	
39								
40								
41								
42								
43								
44	<u>TOTAL 10 Week</u>							<u>1920000</u>
45								
46								
47								

# EQUIPMENT OPERATING COSTS

ESTIMATE NO. \_\_\_\_\_

FOR: SCRIPT GROUP: \_\_\_\_\_

SHEET NO. E-9

WORK: METRO RAIL

WORK ITEM NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: Perch 46.14

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO.  
OR QTY.

WORK INFORMATION

REF. NO.  
OR QTY.

DESCRIPTION

HOURS  
No UNIT HRS PER TOTAL

Operating Cost

SERVICE & SUPPLY  
USE COST PER

500

TOTAL 10 weeks

50 000



# EQUIPMENT OPERATING COSTS

ESTIMATE NO. 6363-1  
 FOR: SCRTD GROUP: \_\_\_\_\_ SHEET NO. E-89  
 WORK: METRO RAIL Proj WORK ITEM NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUANTITY: REACH No 14 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. NO. OR QTY.	WORK INFORMATION

REF. NO. OR QTY.	DESCRIPTION	HOURS			TOTAL OPER. & REP.		
		No	UNITS	FA	TOTAL		
	<u>ALLOWS</u>	2	EA	20	40	2000	1040
	<u>Air pads drills etc</u>	8		20	160	100	160
	<u>LOCO &amp; CARS</u>						
	<u>25 TD Loco @ 8 hr</u>	2		8	16	500	400
	<u>in 3 shifts</u>						
	<u>Muck Cars</u>	4		4	16	150	30
	<u>Other Cars</u>	8		4	32	100	30
	<u>CONCRETE</u>						
	<u>Concrete Pump</u>	1		8	8	1500	120
	<u>Concr Agitator Cars</u>	4		8	32	500	160
	<u>VIBRATORS MISC</u>	4		8	32	200	60
	<u>COST PER DAY</u>					\$ 2000	
	<u>COST PER WEEK</u>					12,000	
	<u>COST 10 Weeks</u>						100,000

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SCRTD GROUP: \_\_\_\_\_

SHEET No. M-13

WORK: METRO RAIL PROJECT

WORK ITEM No. \_\_\_\_\_

LOCATION: \_\_\_\_\_

PREPARED BY: BAK DATE: 3-22-53

QUANTITY: REACH No 14

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

## WORK INFORMATION

ELECTRIC POWER

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

1- 1200 cfm. 450 hp Comp. @ 24 hr/day

9450 hp hr

1- 40 hp Pump @ 24

960 hp hr

1- 25 hp Compressor @ 4

100 hp hr

1- 600 Hi. Pl. Pump

600 hp hr

14- 75 hp Vent Fans @ 24 hr/day

25200 hp hr

Allow Misc

690

TOTAL Elec

37000 hp hr

@ 74.6 c/kwh

27500 kwh

Lighting

TOTAL 20 kw @ 24

480

405 kw @ 24

480

LINE 350 @ 0.1 x 24

840

OFFICE SHOP

500

MISC

700

2500

TOTAL Elec per Day  
Add for weekend 500

24500 kwh

25000 kwh

Cost per Day  
Cost per Week

1250

1250

6250

Cost 10 weeks

62500 367

# MATERIAL COSTS

ESTIMATE No. 6363-1

FOR: SECT D GROUP: \_\_\_\_\_ SHEET No. M

WORK: METRO RAIL PROJECT WORK ITEM No. \_\_\_\_\_

LOCATION: FINDEN TUNNEL PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUANTITY: REACH No 14 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REF. No.  
OR QTY.

WORK INFORMATION

REF. No.  
OR QTY.

DESCRIPTION

QUANTITY

UNIT COST

AMOUNT

PURCHASE HANDRAIL  
2 Tunnels

20

1.000

20

PURCHASE CONCRETE  
2 @ 1.17 =

2.500

60.00

150.00

COST OF MAT'L

1 LF

170.00

PERM MAT'L

Reach 2  
5  
6  
8  
10  
12  
14

7500 LF  
12200 LF  
10450 LF  
7400 LF  
17000 LF  
16500 LF  
9700 LF

170.00

1

1

1

1

1

1

1649000

Misc Small Tools  
and Supplies

Use 50 Lags @ 19,000  
50 @ 10,000

No Weeks

10

10000

100000

PLANT & EQUIPMENT DETAIL

SCRIPD METRO ENG PROJECT

REACH 14 11,000 LF 9700

ESTIMATE NO. 6363-1

SHEET NO.

PREPARED BY: GFF

DATE: 3-21-72

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		P.O.B. POINT	FREIGHT	DATE REQUI
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	<u>SUMMARY</u>											
	TUNNEL TBMS & ANCHORS			500000		10	500000					
	<u>OTHER MAJOR PLANT</u>											
	LOCOMOTIVES & CARS			1540000								
	MISC UNDER GROUND			125000								
	RAIL TRACKAGE			592500								
	VENTILATION SYSTEM			750000								
	CONCRETE EQUIPMENT			262500								
	COMMUNICATIONS EQUIP			10500								
	ALIGNMENT CONTROL			15000								
	ELECTRICAL EQUIPMENT			751000								
	AIR WATER DEWATER			995000								
	OTHER PLANT			308000								
	TOTAL OTHER MAJOR EQUIP.			5349000		10	549000					
				10349000 ✓			1049000					

PLANT & EQUIPMENT DETAIL

3CHTD METRO RAIL PROJECT

REACH 14 (14,000 cu) 5700

ESTIMATE NO. 6363-1

SHEET NO.

PREPARED BY: GHE

DATE: 3-21-88

CHECKED BY:

DATE:

QUAN.	DESCRIPTION	SOURCE	COST		USE	SALVAGE	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			%	AMOUNT			
<u>TUNNEL EXCAV.</u>											
2 Ea	TBM incl Trailing Gear, - conveyor - dust suppression		2500	200				300		600	
	For 300TN @ 1000 hp.							100		100	
				5000	000			400			
<u>Locomotives &amp; Cars</u>											
4	25 TN Diesel loco. Muck		200,000	800,000				25			
2	15 TN Bullgan		120,000	240,000				15			
12	1000 Muck Car 5TN		16,000	192,000				5			
8	Flat Car 8whl		12,000	96,000				42			
2	Man Cars 4whl		6,000	12,000				20			
2	Eng Line Cars		20,000	40,000				80			
1	CAR JUMPER		80,000	80,000				300			
2	GRIST CAR & PUMP		4,000	8,000							
	<u>TOTAL loco &amp; Cars</u>			1,540,000							
<u>MISC UNDERGROUND</u>											
4	SINKER DRILLS		2,000	8,000							
4	STRIKER DRILLS		2,500	10,000							
4	AXLES DRILLS		2,500	10,000							
7	4" Drift for Post		16,000	52,000							
7	Drift Boom & Slide		14,000	28,000							
2	Trimmer Hauler		5,000	10,000							
2	AIR Wrenches		500	4,000							
4	Oxy Acet Outfit		1,000	4,000							
4	ELC Welder 300amp		2,000	8,000							
4	PLATE JACKS		1,000	4,000							
4	Chipping mas. A.R		250	1,000							
4	Misc Cond, Steel Drills		500	2,000							
	<u>TOTAL MISC Equip</u>			125,000							

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PLANT & EQUIPMENT DETAIL

SECRET METRO RAIL PROJECT

ESTIMATE NO. 63634  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-4-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Reach 14

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE %	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT			UNIT	TOTAL			
<b>RAIL &amp; TRACKING</b>											
40 Ton	FOR 2 Tunnels 1000'										
2500 lb	4000 LF 60# Rail		500	20000							
6000 lb	Spikes		0.25	625							
5300 lb	ANGLE BARS BOLTS etc		0.25	1325							
1600	5X8" X 5' TUNNEL Sigs		9.00	14400							
	MISC			875							
	<b>COST PER 1000 LF (2 TUNNELS)</b>			<b>27500</b>				<b>44.3</b>			
112 LF	TUNNELS		27500	308500				44.3			
82	TURNINGS Frog Switches		5000	40000				2.0			
1/2	CALIFORNIA SWITCH		125000	250000				500			
	<b>TOTAL RAIL TRACK COST</b>			<b>592500</b>							
<b>VENTILATION SYSTEM</b>											
FOR 2 TUNNELS @ 1000 LF											
2	7 1/2 HP Air Vary Fans w/ starter		12500	25000				50			
2000 LF	48" 18ga Vending w/ start		2000	40000							
2000 LF	Hangers & hardware		0.50	1000							
	<b>COST PER 1000 LF</b>			<b>66000</b>				<b>40.5</b>			
112 LF	TUNNELS		66000	726000				40.5			
2 EA	ELBOW		2000	4000				2.0			
2 EA	INLET & Silencer		10000	20000				50			
	<b>TOTAL COST VENTIL.</b>			<b>750000</b>							

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PLANT & EQUIPMENT DETAIL

SECRET

Reach 14

ESTIMATE NO. 6363-1  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: [Signature] DATE: 3-21-83  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE %	AMOUNT	WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT				UNIT	TOTAL			
<u>CONCRETE Equip</u>												
1 EA	CONCRETE Pump/Car		75000	75000								
1 EA	H. Press Grout Pump/Car		30000	30000								
1 EA	Shotcrete Outfit		45000	45000								
1 EA	SAND BLAST Outfit		3000	3000								
4 EA	6 in. Conc. Agitator Cars		25000	100000								
1 Lot	VALATORS & Misc		4000	4000								
200 LF	SLICK LINE		10 <sup>13</sup>	2000								
1 EA	Swing Spring Key		3000	3000								
	<u>Total Conc &amp; Grout Equip</u>			<u>260000</u>								
				<u>262000</u>								
<u>Communications Equip.</u>												
	SWITCH BOARD & Hookup			5000								
	(Cost Per 1000 A (at time))											
2000 LF	Telephone line		0 <sup>25</sup>	400								
75	Telephones		50 <sup>20</sup>	100								
	Cost Per 1000 LF			500								
11 <sup>2</sup>	LF Tunnel (reach)		500 <sup>22</sup>	5500								
	<u>TOTAL COMMUN</u>			<u>10500</u>								
<u>ALIGNMENT CONTROL</u>												
2 EA	LAZER GUIDANCE System		5000	10000								
1 Lot	TRIP SURVEY Equip.		5000	5000								
				<u>15000</u>								

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PLANT & EQUIPMENT DETAIL

SCRIPPS METRO TUNNEL

6363-1

Reach 11

ESTIMATE NO. \_\_\_\_\_  
 SHEET NO. \_\_\_\_\_  
 PREPARED BY: *APR* DATE: 3-21-52  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

QUAN.	DESCRIPTION	SOURCE	COST		USE IN	SALVAGE		WEIGHT IN TONS		F.O.B. POINT	FREIGHT	DATE REQUIRED
			UNIT	AMOUNT		%	AMOUNT	UNIT	TOTAL			
	AIR, WATER, DEWATER											
	11 1/2 LF TUNNEL (2 Tunnels)		75300	825000								
	<u>PLANT</u>											
1 EA	1200 cfm Elec Comp		80000	80000								
1 EA	600 cfm Elec Comp		60000	60000								
2 EA	Air Receivers		1000	2000								
2 EA	Water Pumps 10 Hp. 11 1/2"		2000	4000								
2 EA	Disch. Pumps 50 Hp 11 1/2"		5000	10000								
	Misc. Manifolds etc			14000								
	TOTAL PLANT			870000								
	TOT AIR WATER Disch.			995000								
	<u>Other Plant &amp; Equipment</u>											
1 Lot	Repair Shop Equipment		25000	25000								
1 Lot	Electric Shop Equipment		15000	15000								
1 Lot	Construction Shop Equipment		10000	10000								
7 EA	AMBULANCE		10000	10000								
12 EA	OFFICE TRAILER 12x60		25000	30000								
1 EA	Warehouse 1000 sq			10000								
2 EA	Change house 6'x60'			60000								
1 EA	Shed Van			5000								
1 EA	First Aid Trailer			10000								
	ALIMAK MAN ELEVATOR			3000								
	36'x 300' Muck Conveyor 2 1/2"			100000								
	500 c/m Muck Hoist			10000								
	TOTAL OTHER			308000								

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# SUMMARY OF COSTS

FOR: 5 CRTD METRO RAIL CO GROUP

ESTIMATE NO. 6363-1

WORK: DOAL TRACK TWIN TUNNEL

SHEET NO. 5

ADJUSTMENT IN ESTIMATE FOR INCREASED

WORK ITEM NO. \_\_\_\_\_

DRIVING RATE 40 vs 25 & 50 vs 40

PREPARED BY: \_\_\_\_\_ DATE: 4-83

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

ITEM OR REF. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	SUB-CONTRACTS	EQT. OPERATION	EQT. RENTALS	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	TUNNEL EXCAV AS EST	80800	LF	112752000	119680000	10840000	17048000	12919000	71100000	344340000
	REDUCTION -			(3450000)		(1836000)	-0-	(2218000)	-0-	(38614000)
	REV ADJUST EXC TOTAL			78192000	119680000	9008000	17048000	10701000	71100000	305729000
	CROSS PASSAGES AS EST	151	EA	23837000	3020000	5941000	190000	1592000	-	34590000
	REDUCTION			(3,672000)	-	(123000)	-	(330000)	-	(4125000)
	REV ADJUST CROSS PAS			20165000	3020000	5518000	190000	1262000	-	30155000
	CLEANUP AS EST			4594000		437000		44000		5476000
	INSTALL STEEL LINING			8356000	12531000	731000		84000		22964000
	FINISH TUNNEL AS EST			15744000	13736000	1332000		1230000		32042000
	SUB-TOTAL DIRECT COST			127551000	148969000	17026000	17238000	14484000	71100000	376366000
	GEN EXPENSE AS EST			23349000		4256000				25719000
	REDUCTION			(3920000)		(2534000)				(6456000)
	SUB-TOTAL GEN EXPENSE			19429000	-	10024000				59453000
	TOTAL COST			146980000	148969000	57050000	17238000	14484000	71100000	455319500
	MARKUP									71285000
	TOTAL EST. COST									\$ 526604500
	REDUCTINAL									\$ 63,271,000

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# SUMMARY OF COSTS

FOR: SCRTD METRO RAIL PLAN GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1  
 WORK: DUAL TRACK TWIN TUNNEL SHEET NO. S  
ADJUSTMENT IN ESTIMATE, IF CROSS- WORK ITEM NO. \_\_\_\_\_  
PHASES, CLEANUP & FINISH CONCURRENT W/ EXCAV PREPARED BY: GHE DATE: 1 APR 93  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

ITEM OR REF. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	SUB-CONTRACTS	EQPT. OPERATION	EQPT. RENTALS	TOTAL	
	DESCRIPTION	QUANTITY	UNIT								
	<b>REDUCTIONS</b>										
	<u>CROSS PHASES 92 wks</u>										
	ELIMINATE -										
	SUP & SUPP. LABOR	92 wks	61200	5630400							
	TRANS. (LIC & GAS)	72 wks	14400	1324800							
	BULL GANG	92 wks	6000	552000							
	Red. SUP & SUPP. EQPT. 50%	92 wk	3650			294400		395800			
	MISC. Small Tools 5% Lab	92 wk	3200			56800					
	Red. ELECT. Power - 70%	92	4400								
	Reduction To Cross Phs			7507200		699200		335800			8542200
	<u>CLEANUP 35 wks</u>										
	ELIMINATE										
	SUP & SUPP. LABOR	35 wks	57600	2016000							
	50% TRANSPORT LABOR	35 wks	7200	252000							
	50% BULL GANG LABOR	35 wks	8400	294000							
	Red. SUP & SUPP. EQPT. 80%	35 wk	4000					140000			
	MISC. Small Tools 20%	35 wks	3660			128100					
	Red. ELECT. Power 70%	35 wks	4400			154000					
	Reduction To Cleanup			2562000		282100		140000			2984100
	<u>FINISH TUNNEL 83 wks</u>										
	ELIMINATE										
	SUP & SUPP. LABOR	83 wks	57600	4780000							
	50% TRANSPORT	83 wks	7200	597600							
	Red. SUP & SUPP. EQPT. 80%	83 wk	4000					332000			
	ELECT. Power 70%	83 wk	4400			315200					
	Red. Small Tools 20%	83	3240			268900					
	Reduction To Finish			5377600		634100		332000			6343700
	Tot. Dir. Cost Reduction										\$1787000

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# SUMMARY OF COSTS

FOR: SCTO METAL PIPE PROJECT GROUP: \_\_\_\_\_

ESTIMATE NO. 623-1

WORK: DUAL TRACK TWIN TUNNEL

SHEET NO. S

Adjustment in Estimate if Cross Passes

WORK ITEM NO. \_\_\_\_\_  
PREPARED BY: GHC DATE: 1 Apr 05

CLEANUP & FINISH TUNNEL CONCURRENT W/ EXCAV

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

ITEM OR REF. NO.	WORK SCHEDULE			LABOR	PERM. MATERIALS	SUPPLIES	SUB-CONTRACTS	EQUIP. OPERATION	EQUIP. RENTALS	TOTAL
	DESCRIPTION	QUANTITY	UNIT							
	<u>REDUCTIONS</u>									
	<u>GENERAL EXCAVATION</u>									
	<u>EP: 94, CO 95, FN 83</u>									
		<u>210 Wks</u>	<u>24500</u>	<u>5145000</u>						<u>5145000</u>
	<u>TOTAL REDUCTION FOR CONCURRENT OPER.</u>									<u>\$ 23,015000</u>

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PROJECT: SCRTD

PROJECT NO. \_\_\_\_\_

LOCATION: METRO RAIL PROJECT

SHEET NO. T

WORK: ITEM 1.4 POCKET TRACK

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMP co. AMOUNT	SCRTD AMOUNT
<u>POCKET TRACK</u>	2260	LF	*11,000 <sup>00</sup>		*24,860,000 <sup>-</sup>
RMP-ESTIM. BASED ON AVERAGE QTY & COST DEVELOPED FOR SIMILAR WORK FROM STATIONS.					
<u>DEMOLITION</u> S/T	2260	LF	170 <sup>27</sup>	384,600	
<u>EARTHWORK</u>	2260	LF			
EXCAV.		✓	1100 <sup>18</sup>	2,486,400	
MUCK DISPOSAL		✓	1127 <sup>88</sup>	2,549,000	
COMPACT BACK FILL		✓	765 <sup>93</sup>	1,731,000	
S/T				6,766,400	
<u>SHORING DECKING</u>	2260	LF			
SOLDIER PILE & LAGG.		✓	4781 <sup>86</sup>	10,807,000	
DECKING		✓	771 <sup>24</sup>	1,743,000	
UNDERPINNING		✓	382 <sup>30</sup>	864,000	
S/T				13,414,000	
<u>CONCRETE</u>	2260	LF			
FORMS		✓	2556 <sup>64</sup>	5,778,000	
CONCRETE		✓	2236 <sup>73</sup>	5,055,000	
REBAR		✓	3300 <sup>06</sup>	7,458,000	
CURING		✓	24 <sup>34</sup>	55,000	
FINISHING		✓	253 <sup>54</sup>	573,000	
WATERPROOFING		✓	214 <sup>60</sup>	485,000	
S/T				19,404,000	
<u>SITE RESTORATION</u>	2260	LF	462 <sup>39</sup>	1,045,000	
TRAFFIC MAINT.		LF	34 <sup>07</sup>	77,000	
UTILITIES SUPPORT		LF	792 <sup>48</sup>	1,791,000	
MOBILIZATION		LF	734 <sup>51</sup>	1,660,000	
S/T				4,573,000	
<u>TOTAL DIRECT COST</u>				44,542,200	
<u>OVERHEAD &amp; PROFIT</u>			26.5%	11,803,000	
<u>TOTAL RMP co.</u>	2260	LF	24,931 <sup>50</sup>	56,345,200	
<u>USE</u>			SAY *24,890 <sup>-</sup>	*56,250,000 <sup>-</sup>	*24,900,000 <sup>-</sup>

PROJECT: SCRTD

PROJECT NO. \_\_\_\_\_

LOCATION: METRO RAIL PROJECT

SHEET NO. T

WORK: ITEM 1.5 CROSS OVER

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMP Co AMOUNT	SCRTD AMOUNT
<u>CROSS OVER</u>	3220	LF	11000. <sup>60</sup>		35420000 <sup>-</sup>
RMP-ESTIM. BASED ON AVERAGE QTY & COST DEVELOPED FOR SIMILAR WORK FROM STATIONS					
<u>DEMOLITION</u>	3220	LF	170 <sup>81</sup>	550000	
<u>EARTHWORK</u>	3220	LF			
EXCAV.		✓	1103 <sup>11</sup>	3552000	
MUCK DISPOSAL		✓	1130 <sup>43</sup>	3640000	
COMPACT BACKFILL		✓	768 <sup>01</sup>	2473000	
				9665000	
<u>SHORING DECKING</u>	3220	LF			
SOLDIER PILE & LAGG.		✓	4801 <sup>86</sup>	15462000	
DECKING		✓	774 <sup>53</sup>	2494000	
UNDERPINNING		✓	385 <sup>89</sup>	1240000	
				19196000	
<u>CONCRETE</u>	3220	LF			
FORMS		✓	2568 <sup>32</sup>	8270000	
CONCRETE		✓	2246 <sup>35</sup>	7235000	
REBAR		✓	3314 <sup>25</sup>	10672000	
CURING		✓	24 <sup>53</sup>	79000	
FINISHING		✓	254 <sup>65</sup>	820000	
WATERPROOFING		✓	215 <sup>59</sup>	694000	
				27770000	
<u>SITE RESTORATION</u>	3220	LF	464 <sup>29</sup>	1495000	
<u>TRAFFIC MAINT.</u>		LF	34 <sup>76</sup>	110000	
<u>UTILITIES SUPPORT</u>		LF	796 <sup>27</sup>	2564000	
<u>MOBILIZATION</u>		LF	737 <sup>58</sup>	2375000	
				6544000	
<u>TOTAL DIRECT COST</u>				63725000	
<u>OVERHEAD &amp; PROFIT</u>			26.5%	16887000	
<u>TOTAL RMP Co.</u>	3220	LF	25034 <sup>78</sup>	80612000	
<u>USE</u>			SAY *25000 <sup>-</sup>	*80500000	*35500000



PROJECT: SCRTN  
 LOCATION: NETLO RAIL PROJECT  
 WORK: ITEM 1-6-LINE VENT MECHANICAL

PROJECT NO. \_\_\_\_\_  
 SHEET NO. T  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	AMOUNT
				RMPCO	SCRTC
ESTIMATE REVIEWED ACCEPT SCRTD DIRECT UPSTE ADJUST OMB & LIFT					
USE SCRTD EST				2,423,000	2,423,000
O H E F R M F 26.5%				642,000	
SCRTD 15.54%					377,000
TOTAL				3,065,000	2,800,000

PROJECT: SCRTD  
 LOCATION: METRO RAIL PROJECT  
 WORK: ITEM 1.7 LINE VENT STRUCT. CITY

PROJECT NO. \_\_\_\_\_  
 SHEET NO. T  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMP Co AMOUNT	SCRTD AMOUNT
<u>LINE VENT STRUCT. CITY</u>	<u>3</u>	<u>EA</u>	<u>\$2,700,000</u>		<u>\$8,100,000</u>
RMP-ESTIM. BASED ON AVERAGE QTY & COST DEVELOPED FOR SIMILAR WORK - FROM STATIONS					
<u>3 Structures SCRTD</u>	<u>3</u>	<u>EA</u>	<u>Estim. Adjusted</u>		
<u>DEMOLITION</u>				150,000	
<u>EARTHWORK</u>		<u>LF</u>			
EXCAV.	<u>3</u>	<u>✓</u>		242,400	
MUCK DISPOSAL	<u>3</u>	<u>✓</u>		117,000	
COMPACT BACK FILL	<u>3</u>	<u>✓</u>		154,800	
<u>SHORING DECKING</u>		<u>LF</u>		514,200	
SOLDIER PILE & LAGG.		<u>✓</u>		201,000	
DECKING		<u>✓</u>		177,000	
UNDERPINNING		<u>✓</u>			
<u>CONCRETE</u>		<u>LF</u>		378,000	
FORMS		<u>✓</u>		414,000	
CONCRETE		<u>✓</u>		516,000	
REBAR		<u>✓</u>		630,000	
CURING		<u>✓</u>		84,000	
FINISHING		<u>✓</u>		84,000	
WATERPROOFING		<u>✓</u>			
<u>SITE RESTORATION</u>		<u>LF</u>		1,728,000	
<u>TRAFFIC MAINT.</u>		<u>LF</u>		129,000	
<u>UTILITIES SUPPORT</u>		<u>LF</u>		36,000	
<u>MOBILIZATION</u>		<u>LF</u>		840,000	
		<u>LF</u>		282,000	
<u>ARCH., MECH., &amp; ELECT.</u>		<u>LF</u>		1,287,000	
<u>TOTAL DIRECT COST</u>				3,366,000	
				7,423,200	
<u>OVERHEAD &amp; PROFIT</u>			26.5%	1,967,100	
<u>TOTAL RMP Co.</u>		<u>LF</u>		9,390,300	
<u>USE</u>		<u>SAY</u>		<u>\$9,390,000</u>	<u>\$8,100,000</u>

PROJECT: SCRTD

PROJECT NO. \_\_\_\_\_

LOCATION: METRO RAIL PROJECT

SHEET NO. T

WORK: ITEM 1.8 LINE VENT STRUCT. MTN.

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMP Co. AMOUNT	SCRTD AMOUNT
LINE VENT STRUCT. MTN.	2	EA	\$5,200,000		\$10,400,000
RMP-ESTIM. BASED ON AVERAGE QTY & COST DEVELOPED FOR SIMILAR WORK - 2200 STATIONS SEE ATTACHED SCRD Adjusted					
SITE CLEAR & GRUB	2	EA		500,000	
<u>EARTHWORK</u>					
EXCAV.		LF		18,000	
MUCK DISPOSAL		LF		26,000	
COMPACT BACK FILL		LF		17,000	
SHAFT EXC. & RAISE DRILL ROCK BOLTS ETC.		LF		61,000	
HOIST & HEAD GEAR CONST. VENT. SYSTEM.		LF		307,000	
		LF		200,000	
		LF		600,000	
		LF		800,000	
		LF		3,907,000	
<u>CONCRETE</u>					
FORMS		LF		1,030,000	
CONCRETE		LF		2,114,000	
REBAR		LF		132,000	
CURING		LF		92,000	
FINISHING		LF		108,000	
STRUCT. STEEL		LF		3,476,000	
<u>SITE RESTORATION</u>					
TRAFFIC MAINT.		LF			
UTILITIES SUPPORT		LF			
MOBILIZATION		LF			
<u>MECH. ELEC. &amp; ARCH.</u>					
TOTAL DIRECT COST				2,374,000	
				10,318,000	
OVERHEAD & PROFIT (SEE ATTACHED)		35.7%		3,684,000	
TOTAL RMP Co.		LF		14,002,000	
USE		SAY *		* 14,000,000	* 10,400,000

# DMJM/PBQD

-S of 12/2/82 @ 2:00PM

FORM - 2

## CONSTRUCTION COST ESTIMATE

We have 4 of these complexes.

Note: Rock Excavation & Shaft wall pour using Dinorwic equipment

VUZ

DATE 1 Dec 1982

NAME METRO RAIL PROJECT LOCATION Los Angeles  
 SUBJECT SPECIAL ANALYSIS - Vent Shaft complex in mountains  
 JOB NO. WBS-14 PHASE Conceptual PAGE 1 OF

Item	Description	Quantity	Unit	Unit Cost	Estimated Cost	Totals
	One 20' dia Vent Shaft 300LF deep drilled through hard rock - Surface equipment building (x x h) with all related Mech & Elect equipment.					
I	Site work	Allow	L.S.			250000-
	Allow. inc. Clear, grub, access roads, set up Landscaping					
II	Earth work (Dinorwic sus)					
	300' Shaft 24' dia (rock)	5624	cy	116.20	653500	684000
	Build basement (dirt) back fill	1620	cy	52	84240	
	Disposal excess soil	540	cy	152	82080	
		1080	cy	125	135000	
III	Shoring - (shaft only)					
	Rock bolting	Allow	L.S.		50000-	
	Bracing & Lagging	Allow	L.S.		50000-	
						100000-
IV	Concrete work					
	Form work					
	Shaft - (Slip Form)	18840	SF	15.60	294000-	
	Shaft Partition wall	12000	SF	12.50	150000-	
	Side Tunnels	2112	SF	8.50	18000-	
	Bldg Bas. Ex. Walls (2-sides)	8000	SF	4.20	34000-	
	Bldg. Partition wall (Side)	2496	SF	4.20	10000-	
	Removable Slab Roof	1040	SF	8.50	9000-	
					515000-	
	Amounts Forwarded				515000-	250000-

1,034,000 383

## CONSTRUCTION COST ESTIMATE

NAME METRO RAIL PROJECT LOCATION Los Angeles DATE Dec 1982  
 SUBJECT SPECIAL ANALYSIS - ... Complex in mountain  
 JOB NO. UPC-12 PHASE Conceptual PAGE 2 OF     

Item	Description	Quantity	Unit	Unit Cost	Estimated Cost	Totals
					5,500.00-	3,500.00-
<b>IV</b>	<b>Concrete Work (continued)</b>					
	<b>Concrete</b>					
	Shaft walls	1400	CY	568-	795000-	
	Shaft Part wall	222	CY	498-	111000-	
	Side Tunnel w Fl.	186	CY	545-	101000-	
	Slab on Grade	27	CY	82-	2000-	
	Bldg Bas walls	298	CY	102-	30000-	
	Bldg Part. walls	93	CY	112-	10000-	
	Roof	77	CY	100-	8000-	
	<b>Rebar</b>	2303	cy	488/cy	1057000-	
	Shaft walls	None				
	Shaft Part. wall (120#/cy)	2640	LB	058	15000-	
	Side Tunnel w Floors	None				
	Bldg Bas walls (200#/cy)	59600	LB	048	29000-	
	Bldg Part walls (120#/cy)	1160	LB	054	6000-	
	Rem. Roof Slab (150#/cy)	11550	LB	058	7000-	
	Slab on Grade (105/cy)	2700	LB	045	1000-	
	Hoisting	Allow			8000-	
	<b>Finish/Cure</b>	11236			16000-	
	Shaft walls	18240	SF	120	23000-	
	Shaft part walls	12000	SF	120	14000-	
	Side tunnel walls & Fl.	2540	SF	074	2000-	
	Bld Bas floor	360	SF	051	0-	
	Bld Bas Ext & Int walls	10496	SF	058	6000-	
	Roof Slab	1040	SF	050	1000-	
		45228			46000-	11684000-
<b>V</b>	<b>Struct Steel &amp; Misc Iron</b>					
	Access Ladders w Landings	300	LF	125-	38000-	
	Fan Supports steel	1500	LB	110	2000-	
	Mech Fan Rm fl. grate	912	SF	155	14000-	
						54000-
<b>VI</b>	<b>Special Hoist, Handenv &amp; Etc</b>	Allow	L.S.			800000-
<b>VII</b>	<b>Const Vent System</b>	Allow	L.S.			400000-
	<b>Amounts Forwarded</b>					3,2880.00-

3,977,000 384

## CONSTRUCTION COST ESTIMATE

NAME METRO RAIL PROJECT LOCATION Los Angeles DATE 1 Dec 1983  
 SUBJECT SPECIAL ANALYSIS - Vent Shaft Complex in mountains  
 JOB NO. WBS-14 PHASE Conceptual PAGE 3 OF 3

Item	Description	Quantity	Unit	Unit Cost	Estimated Cost	Totals
						<del>3,912,000</del>
						<del>3,282,000 -</del>
VIII	Mech. System	Allow	L.S.			672,000 -
	(by J. Guinan)					
X	Electrical	Allow	L.S.			504,000 -
XI	Bldg Finisher	912 SF		12 -		111,000 -
	Direct Cost - sub Total					<del>4,473,000 -</del>
						5,157,000
	General Conditions		ⓐ	4.0%		174,000 -
	Bonding		ⓐ	1.0%		47,000 -
	G.C. - art & Profit		ⓑ	100%		47,000 -
	Total					5,171,000 -
	Overhead & GE.			15%		774,000
	BOND			1%		59,000
	Risk & PROFIT			17%		1,000,000
	One Shaft					\$ 700,000
	Two Shafts Reg					1,400,000
	Amounts Forwarded					

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. **T**

WORK: ITEM 1-9 - CROSSOVER VENT SYS MECH

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	ROOF CO AMOUNT	SCRTD AMOUNT
<i>ESTIMATE REVIEWED ACCEPT SCRTD DIRECT COSTS, ADJUST O.H. &amp; PROFIT</i>					
<i>USE SCRTD EST</i>				<i>1 904 000</i>	<i>1 904 000</i>
<i>O.H. &amp; F RMFCO 26.5%</i>				<i>505 000</i>	
<i>SCRTD 15.54%</i>					<i>296 000</i>
<i>TOTAL</i>				<i>2 409 000</i>	<i>2 200 000</i>
<i>Use</i>				<i>2 409 000</i>	

# TABULATION OF COSTS

PROJECT: \_\_\_\_\_ PROJECT NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ SHEET NO. **T** \_\_\_\_\_  
 WORK: ITEM 1-10 - UNDERPINNING PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMPC. AMOUNT	SCRD AMOUNT
<u>UNDERPINNING</u>					
No DETAILS - APPEARS ACCEPTABLE ACCEPT SCRTD ESTIMATE					
VERMONT				20 000	
W - FAIRFAX				420 000	
BEV - FAIRFAX				780 000	
LA BREA				675 000	
H' WOOD - CAHU..				160 000	
NO. H' WOOD.				550 000	
LA BREA - SUN.				150 000	
TOTAL				2 815 000	
USE				* 2 800 000	2 800 000





SCR TD METRO RAIL PROJECT

SUMMARY

PROJECT: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_  
 WORK: ITEM 2.0 - STATIONS

PROJECT NO. \_\_\_\_\_  
 SHEET NO. T \_\_\_\_\_  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMPCo AMOUNT	SCR TD AMOUNT
2.1	Stations				475,279,000	361,339,000
2.2	S.L. Line Vent Mech.				24,415,000	22,300,000
2.3	O/U Line Vent Mech.				11,386,000	10,400,000
2.4	Underpinning				-0-	18,300,000
	Underpinning costs are included with the station earthwork in RMPCo estimate.					
	TOTAL				511,080,000	412,339,000
	NOTE: The parking structures have been removed from the SCR TD estimates, so similar costs can be compared. Parking structures now reside in Item 3.0.					
	SCR TD Parking Structure Cost in Estimate.					18,561,000
	TOTAL					430,900,000

CENTRAL REVIEW

PROJECT: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_  
 WORK: ITEM 2.1 - STATIONS

PROJECT NO. \_\_\_\_\_  
 SHEET NO. T  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: P.P. DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMPG AMOUNT	SCRTD AMOUNT
EST. ST. FULL DEVELOPMENT				1 964 000	1 964 000
EARTHWORK				95 014 000	87 952 000
CONCRETE WORK				132 046 000	96 917 000
SITE RESTORATION				5 010 000	5 000 000
TRAFFIC MAINTENANCE				11 250 000	571 000
UTILITIES SUPPORT				8 570 000	8 570 000
MECELRIZATION				7 950 000	7 950 000
<b>SUB-TOTAL</b>				<b>261 824 000</b>	<b>208 734 000</b>
O.H & P RMP 26.5%				69 383 000	
SCRTD 15.54%					32 446 000
<b>TOTAL</b>				<b>331 207 000</b>	<b>241 180 000</b>
STATION REDUCTION FOR V.F. CHANGE				< 3 012 000 >	< 14 260 000 >
<b>TOTAL STATION FOUR FINISH</b>				<b>328 135 000</b>	<b>226 920 000</b>
STATION FINISH				116 319 000	116 319 000
O.H & P RMP USE 26.5				30 825 000	
SCRTD 15.54					18 100 000
<b>TOTAL FINISH</b>				<b>147 144 000</b>	<b>134 419 000</b>
<b>TOTAL EST. COST OF STATION W/ FINISH</b>				<b>475 279 000</b>	<b>361 339 000</b>

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE				SHEET		OF		
JOB NO.: 6363-1		CLIENT: SCRTO		MARCH - 1983				CHECKED BY: T.P.J.				
UNIT/AREA		QUAN-TITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LABS		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
EXCAVATION & STRUCTURAL												
DEMOLITION USE ESTIMATE												1964000
EARTHWORK IN ESTIMATE												
ADDITIONAL EXCAV. & SPOIL COST												
SUB-TOTAL												95014000
CONCRETE IN ESTIMATE												
ADD "MEANS" LABOR ADJUSTMENT												
ADDITIONAL HANDLING & STANDBY												
ADJUSTMENT TO LABOR RESTRICTED												
WORK AREAS												
CONTINGENCY - FOR UNFORESEEN												
CONSTRUCTION DIFFICULTIES												
SUB-TOTAL												130066000
TRAFFIC MAINTENANCE												
IN ESTIMATE												
ADD FOR FLAGMEN, BARRICADES, SIGNAL												
LIGHTING, LANE MARKING, LIGHTING, CROSS-												
WALKS, MAINTENANCE OF SAFETY LANES FOR												
EMERGENCY VEHICLES ETC.												
SUB-TOTAL												11250000
UTILITIES SUPPORT USE ESTIMATE												8570000
MOBILIZATION USE ESTIMATE												7950000
SUB-TOTAL												256814000
							FWD					

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ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE				SHEET		OF					
JOB NO.: 6363-1		CLIENT: SCRTO		MARCH - 1983				CHECKED BY: [Signature]							
UNIT/AREA	DESCRIPTION	CAPACITY	QUAN-TITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
					MATL	M/H	LABS	M/HR\$	DOLLARS	M/HR\$	DOLLARS				
ACCNT	EXCAVATION & STRUCTURAL														
	SUB-TOTAL														
															256,814,000
	SITE RESTORATION USE ESTIMATE														
	SUB-TOTAL														
															5,010,000
	STATION REDUCTION DUE TO CHANGE IN VERTICAL FT:														
			8	VF	80.5	K									644,000
			7	VF	93.9	K									657,300
			6	VF	60.0	K									360,000
			2	VF	67.1	K									134,200
			8	VF	79.1	K									632,800
			TOTAL REDUCTION FOR STATIONS											< 2,428,300	
															USE < 2,428,000
	SUB-TOTAL														
															259,396,000
	GENERAL CONTRACTORS OVERHEAD & PROFIT USE 15% & 10%														
															68,740,000
	TOTAL STATION Cost EXCLUDING FINISH														
															328,136,000

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ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE MARCH 1993				SHEET		OF				
JOB NO. 6363-1		CLIENT: LARTO		TYPE OF ESTIMATE CONCEPTUAL				CHECKED BY		D.H.C.				
UNIT/AREA	DESCRIPTION	CAPACITY	QUAN-TITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS
					MATL	M/H	LABS	M/HR\$	DOLLARS	M/HR\$	DOLLARS			
ACCNT	CONCRETE WORK IN STATIONS													
	FORMS		4,35,500	SF	1.77	.164	4.12	8,204,800			760,222	19,073,700		
	CONCRETE		424,500	CY	52.00	.567	18.29	22,074,000			240,697	7,762,000		
	REINFORCING STEEL		42,815	TAN	373.00	12.12	39.10	16,008,000			519,100	16,861,000		
	CURLING		5,189,300	SF	0.0178	.0156	0.2302	103,000			8,100	156,100		
	FINISHING		6,494,600	SF	0.10	.02306	0.5075	649,500			149,800	3,296,000		
	WALL PROOF - BENTONITE		1,856,100	SF	0.6055	.010577	0.2365	1,124,000			19,633	476,100		
	- WATERSTOP & PACKING		188,900	LF	5.415	.02220	0.5416	1,023,000			4,200	102,300		
	SUB-TOTAL/CY COST IN EST.		424,500	CY	115.87	4.01	112.44	49,186,300			1,701,741	47,730,800		76,717,100
	LABOR ADJUSTMENT ADD 8.5% (MEANS AREA LOCATION)					.34	9.56				144,648	4,058,200		
	ADD TO REBAR LABOR } 14% HANDLING & STANDBY					.186	6.92				78,850	2,559,700		
	ADJUSTMENT TO LABOR FOR } 12% RESTRICTED WORK AREAS					.544	15.36				239,928	6,520,300		
	TOTAL		424,500	CY	115.87	5.08	143.39	49,186,340			2,156,170	60,869,000		110,055,300
	CONTINGENCY - FOR UNFORESEEN CONSTRUCTION DIFFICULTIES 20%													22,011,100
	TOTAL													132,066,400
	12,438/LF													

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ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE MARCH 1983				SHEET OF					
JOB NO.:		CLIENT: SCRTD		TYPE OF ESTIMATE CONCEPTUAL				CHECKED BY [Signature]					
UNIT/AREA	DESCRIPTION	QUAN-TITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS
				MATL	M/H	LABS	M/HR	DOLLARS	M/HR	DOLLARS			
ACCNT	STATIONS												
	STATION FINISH												
	FINISH USE ESTIMATE												116,319.00
	GENERAL CONTRACTORS OVERHEAD & PROFIT USE 15% & 10%												30,825.00
	TOTAL FINISHING COST												147,144.00

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OK: *[Signature]*

	UNION <u>29,192 Cy</u>	1ST <u>31,311 Cy</u>	5TH <u>43,582 Cy</u>	7TH <u>25,843 Cy</u>	KALVREDDO <u>15,964 Cy</u>	VERMONT <u>20,843 Cy</u>
FORMS	\$ 54.84	\$ 74.85	\$ 72.44	\$ 57.88	\$ 36.97	\$ 45.13
LABOR	17.52	18.95	18.71	18.35	15.88	17.06
CONCRETE	52.00	52.00	52.00	52.00	52.00	52.00
REBAR	<u>76.00</u>	<u>79.80</u>	<u>80.09</u>	<u>76.00</u>	<u>76.00</u>	<u>75.57</u>
SUB-TOTAL	\$ 200.36	\$ 225.60	\$ 223.24	\$ 204.23	\$ 180.85	\$ 189.76
CURE & FINISH	<u>10.06</u>	<u>9.61</u>	<u>10.21</u>	<u>3.69</u>	<u>4.11</u>	<u>5.47</u>
SUB-TOTAL	\$ 210.42	\$ 235.21	\$ 233.45	\$ 207.92	\$ 184.96	\$ 195.23
WATERPROOF	<u>2.92</u>	<u>9.09</u>	<u>6.42</u>	<u>7.21</u>	<u>4.39</u>	<u>6.07</u>
TOTAL / Cy	\$ 213.34	\$ 244.30	\$ 239.87	\$ 215.13	\$ 189.35	\$ 201.30

	NORMADIE <u>23,559 Cy</u>	WESTERN WILSHIRE <u>24,331 Cy</u>	LA BREA WILSHIRE <u>25,819 Cy</u>	FAIRFAX WILSHIRE <u>48,280 Cy</u>	BEVERLY FAIRFAX <u>16,136 Cy</u>	SANTA MONICA <u>23,479 Cy</u>
FORMS	\$ 69.75	\$ 72.28	\$ 63.05	\$ 59.92	\$ 67.37	\$ 71.35
LABOR	18.22	18.48	18.28	19.23	18.59	18.00
CONCRETE	52.00	52.00	52.00	52.00	52.00	52.00
REBAR	<u>76.02</u>	<u>75.01</u>	<u>76.00</u>	<u>76.00</u>	<u>76.00</u>	<u>76.00</u>
SUB-TOTAL	\$ 215.99	\$ 217.77	\$ 209.33	\$ 207.15	\$ 213.96	\$ 217.35
CURE & FINISH	<u>13.50</u>	<u>8.24</u>	<u>12.52</u>	<u>10.42</u>	<u>15.93</u>	<u>9.90</u>
SUB-TOTAL	\$ 229.49	\$ 226.01	\$ 221.85	\$ 217.57	\$ 229.89	\$ 227.25
WATERPROOF	<u>7.53</u>	<u>5.79</u>	<u>6.69</u>	<u>3.89</u>	<u>7.23</u>	<u>7.57</u>
TOTAL / Cy	\$ 237.02	\$ 231.80	\$ 228.54	\$ 221.46	\$ 237.12	\$ 234.82



CD: D.K.

SUNSET  
LA BELLA

HOLLYWOOD  
CAHILLINGA

UNIVERSAL  
CITY

LAUKERSHIM

23072 Cy

22411 Cy

22150 Cy

23559 Cy

FORMS

\$ 65.04

\$ 67.34

\$ 65.38

\$ 69.75

LABOR

18.20

18.23

18.22

18.22

CONCRETE

52.00

52.00

52.00

52.00

REBAR

76.00

76.00

76.00

90.00

SUB-TOTAL

\$ 211.24

\$ 213.57

\$ 211.60

\$ 229.97

210.75

CURE & FINISH

13.54

13.62

2.30

13.50

SUB-TOTAL

\$ 224.78

\$ 227.19

\$ 213.90

\$ 243.47

WATERPROOF

7.32

7.42

7.45

7.53

TOTAL/Cy

\$ 232.10

\$ 234.61

\$ 221.35

\$ 251.00



TRAFFIC CONTROL

MARCH - 1983

	RMP	COUNT	DIFF.
UNION STATION	20,000	15,000	+ 5,000
CIVIC CENTER	1,000,000	41,650	+ 958,350
5 <sup>th</sup> & HILL	1,000,000	49,000	+ 951,000
7 <sup>th</sup> & FLOWER	1,000,000	53,600	+ 946,400
ALVARADO	300,000	11,000	+ 289,000
VERMONT	300,000	15,000	+ 285,000
NORMANDIE	1,000,000	15,400	+ 984,600
WESTERN	1,000,000	17,000	+ 983,000
LA BREA / WILSHIRE	800,000	15,600	+ 784,400
FAIRFAX	800,000	21,700	+ 778,300
BEVERLY	800,000	16,100	+ 783,900
SANTA MONICA	800,000	16,600	+ 783,400
LA BREA / SUNSET	900,000	19,100	+ 880,900
HOLLYWOOD	500,000	19,000	+ 481,000
UNIVERSITY CITY	30,000	30,000	0
N. HOLLYWOOD	1,000,000	15,400	+ 984,600
	17,250,000	371,150	+ 16,878,850

Ord: *D. J. J.*

MARCH 1983

REDUCTION / VERICAL F. OF STATION

	<u>1ST &amp; HILL</u>	<u>5TH &amp; HILL</u>	<u>ALVARADO</u>	<u>VERMONT</u>	<u>NORMANDIE</u>
MACH. EXCAV.	\$ 370.5 <sup>K</sup>	\$ 540.9 <sup>K</sup>	\$ 193.1 <sup>K</sup>	\$ 206.9 <sup>K</sup>	\$ 328.0 <sup>K</sup>
HAND. EXCAV.	141.9	208.6	74.0	80.9	129.6
COMPACT. E.F.	263.0	957.3	643.4	50.4	750.5
SPOIL	696.8	813.0	184.1	423.8	493.5
SOLDIER F. & L	3,539.4	4,386.5	1,904.0	2,313.7	3,207.6
SOLDIER STAIRWELL	365.6	1,217.8	-0-	-0-	120.0
TOTAL	\$ 5,377.2 <sup>K</sup>	\$ 8,124.1 <sup>K</sup>	\$ 2,998.6 <sup>K</sup>	\$ 3,075.7 <sup>K</sup>	\$ 5,029.2 <sup>K</sup>
DIVIDE BY VF	<u>66.3333'</u>	<u>86.5'</u>	<u>50'</u>	<u>45.8333</u>	<u>63.5833</u>
REDUCTION/VF	80.5 <sup>K</sup>	93.9	60.0 <sup>K</sup>	67.1 <sup>K</sup>	79.1 <sup>K</sup>
MULTIPLY BY	<u>8 VF</u>	<u>7 VF</u>	<u>6 VF</u>	<u>2 VF</u>	<u>8 VF</u>
TOTAL REDUCTION PER STATION	\$ 644.0 <sup>K</sup> w/OUT MARK-UP	\$ 657.3 <sup>K</sup>	\$ 360 <sup>K</sup>	\$ 134.2 <sup>K</sup>	\$ 632.8 <sup>K</sup> (RMP)
REDUCTION SHOWN IN CLIENTS EST.	3,185.0 <sup>K</sup> w/OUT MARK-UP	2,787.0 <sup>K</sup>	2,389.0 <sup>K</sup>	796.0 <sup>K</sup>	3,185.0 <sup>K</sup>
ESTIMATED COST SHOULD BE INCREASED	\$ 2541.0 <sup>K</sup> <u>MARK-UP</u>	\$ 2,129.7 <sup>K</sup>	\$ 2,029.0 <sup>K</sup>	\$ 661.8 <sup>K</sup>	\$ 2,557.2 <sup>K</sup>

INCREASE TO THE TOTAL ESTIMATED COST \$ 9913.7<sup>K</sup>  
WITH OUT MARK-UP (SCRTD)

INCREASE WITH MARK-UP (SCRTD) \$ 11,455<sup>K</sup>  
(BASE X 10% X 1% X 4% = 15.54%)

MARCH 1983

TYPE OF STATION

UNION STATION	"B"	ONE LEVEL
* 1 <sup>ST</sup> & HILL	"E"	OVER/UNDER
* 5 <sup>TH</sup> & HILL	"E"	OVER/UNDER
7 <sup>TH</sup> & FLOWER	"A"	ONE LEVEL
* ALVARADO & WILSHIRE	"B"	ONE LEVEL
* VERMONT & WILSHIRE	"C"	ONE LEVEL
* NORMANDIE & WILSHIRE	"C"	ONE LEVEL
WESTERN & WILSHIRE	"C"	ONE LEVEL
LA BREA & WILSHIRE	"C"	ONE LEVEL
FAIRFAX & WILSHIRE	"E"	OVER/UNDER
BEVERLY & FAIRFAX	"B"	ONE LEVEL
SANTA MONICA	"C"	ONE LEVEL
LA BREA & SUNSET		
HOLLYWOOD & CAHUENGA		
UNIVERSAL CITY		
LANKERSHIM	"C"	ONE LEVEL

\* STATION COST REDUCED TO COMPENSATE FOR A REDUCTION IN DEPTH OF EXCAVATION

THE FOLLOWING ITEMS ARE AFFECTED BY REDUCTION IN DEPTH OF THE STATIONS.

1. MACHINE EXCAVATION
2. HAND EXCAVATION
3. COMPACTED BACKFILL
4. SPOIL
5. SOLDIER PILES & LAGGING
6. SOLDIER STAIRWELLS
7. CONCRETE IN STAIRWELLS, ELEVATOR } OMIT FROM REDUCTION  
SHAFTS & VENT SHAFTS } AT THIS TIME

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. **T** \_\_\_\_\_

WORK: **ITEM 2.2-S.L. LINE VENT MECH**

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: *[Signature]* DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
				RMPCO	SCRTD
S.L. VENT MECH. USE SCRTD EST				19 300 000	19 300 000
OR & P RMPCO 26.5%				5 115 000	
SCRTD 15.54%					3 000 000
<b>TOTAL</b>				<b>24 415 000</b>	<b>22 300 000</b>

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. T

WORK: ITEM 2.3 - O/U LINE VENT MECH

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: [Signature] DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
				RMPCO	SCRTO
O/U VENT MECH. USE SCRTO EST.				9,001,000	9,001,000
O.H & P RMPCO      26.5%				2,385,000	
SCRTO      15.54%					1,399,000
<b>TOTAL</b>				<b>11,386,000</b>	<b>10,400,000</b>

# TABULATION OF COSTS

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. **T** \_\_\_\_\_

WORK: LINE VENT MECHANICAL (STATION AREA)

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: HP DATE: \_\_\_\_\_

	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	Estimated AMOUNT RMP	Total AMOUNT SCRTO
	<u>ITEMS</u>					
2.2	B.L. VENT MECH.				19 300 000	19 300 000
	O.H. & P.					
	RMP 26.5				5 115 000	
	SCRTO 15.54					3 000 000
	<u>TOTAL</u>				24 415 000	22 300 000
2.3	O/U VENT MECH				9 001 000	9 001 000
	O.H. & P					
	RMP 26.5%				2 385 000	
	SCRTO 15.54%					1 399 000
	<u>TOTAL</u>				11 386 000	10 400 000





TITLE SCRIP SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 3-11-53

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Excav for Stations, Cross-over etc  
Machine

Use Cat 977 + D-7 in hole

Dore to Clanshall

Use 75T Trk Crane w/2 cy clamshell bucket  
Say 1.5 Ecy.

Assume 1 1/2 min cycle = 40 swings per hr = 60  
Say 600cy/hr

- 1 Foreman 30.00
- 1 Crane Oper 25.00
- 1 Crane Oper 20.00
- 2 Operator Trks 50.00
  
- 1 Trk Crane 100.00
- 1 977 40.00
- 1 D-7 60.00
- Pickup 10.00

\$341.00/hr.

@ 8  
\$2730.00/day

7 1/2 hr

450 cy/day

602 Say \$600/day

Dore and loader will experience interference and delay with utilities, storming shaft and installation of lagging

Crane (clamshell) similarly will be delayed on surface

TITLE SECRET SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6367-1 DEPARTMENT \_\_\_\_\_ AUTHOR G.F.E. DATE 3-15-52

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Station - Hand Excavation  
 AT 5% of Machine Excav.  
 Trench walls etc.  
 400 cu/shift at 5% = 20<sup>cu</sup>/shift

Excavation 150 cu/shift  
 Say 65 ft wide x 10' (between Siding) = 24 cu/vf  
 150 ÷ 24 = Say 19 vf/shift  
 2 x 19 x 10 = 380 sf/shift ave 160 ft/min

Labor Foreman 25  
 2 Labor @ 20 = 40  
 1 Comp. Oper 25 =  
 Air Spuds 200<sup>hr</sup> 100  
 Compr. 1500

\$1000

Say \$850/day ÷ 24 = \$37.50

850 ÷ 24 = 35<sup>cu</sup>/day

Say 5 hr/day  
 To Hand EXCAV \$500

TITLE SCRTO - METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GJR DATE 3-11-87

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Neck Disposal 2,005,000 Cy  
 Total 3250 Day = 620 cy/Day.  
 Trks. (see tunnel) Say 20 cy @ 5 trips/Day = 100 cy/Trk.  
 Req - 620 ÷ 100 = 6 Trks  
 Hourly cost Sub at 6<sup>00</sup>/cy less 0.40 = 5<sup>60</sup>/cy.

Compacted Backfill  
 TOTAL 518,970 cy.  
 Length = 10518 ÷ 16 ave 64 x 16 = 431.25 ft  
 1600 cy/ft  
 stat - or  
 518,970 cy ÷ 16 = 32,435 cy/1600 ft ÷ 1600 = 20<sup>27</sup> ft  
 Say 1000 cy/shift @ 1000 cy/shift

Crew  
 Oper. Foreman 1 - 30<sup>00</sup>  
 1 Compactor Oper. 1 - 25<sup>00</sup>  
 3 Hand Comp. Labor 160  
 2 Labor Hire 40  
 2 - Oper 977-D-7 50  
 1 dump man 20  
 1 Cost party Labor 10325

TITLE SCRIP SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6367-1 DEPARTMENT \_\_\_\_\_ AUTHOR GRF DATE 3-1-68

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Back Fill  
 Labor Cost \$ 325/hr = 2400<sup>00</sup>/day

Equipment  
 1 Cr 25 30  
 8 Hand Vics. = 32  
 1 977 Ldr 46  
 1 D-7 60  
 170  
 + 1360<sup>00</sup>

Ld Trk  
 1 Oper 25<sup>00</sup>  
 1 980 50<sup>00</sup>  
 75<sup>00</sup>  
 600<sup>00</sup>

\$ 4560<sup>00</sup> 45

Haul To Site  
 1 Cy = 1.15cy = 145 Lcy.  
 200 Trk 1.45 = 14 Ccy/ld.  
 Haul 5 ld/day = 70 Ccy/day

Driver 25<sup>00</sup> @ 8 = 290<sup>00</sup>  
 Trk 67<sup>00</sup> @ 6 = 402  
 636<sup>00</sup>/day 90

1000cy @ 75 = 15 Trks/day

TITLE SOLDIER SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6763-1 DEPARTMENT \_\_\_\_\_ AUTHOR \_\_\_\_\_ DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

SOLDIER PILE & LAGGING 1,390,100 SF  
@ 10 P.C. = 139,010 LF SOLDIER PILE

TOTAL EXCEL = 1,536,445 LF  
length 106'8" width 6' = 639,170 SF or 25,564' ÷ 16 = 1600 LF  
depth Ave = 60 LF

Say Soldier 139,010 ÷ 60 = 2320 ea  
Add 10 ft for toe = 70' 162,400 LF Soldier Pile

Use Means For crew & Mat'l (30<sup>00</sup>/sf.)  
Use 34<sup>00</sup>

B. 50' @ \$3831<sup>75</sup>/day = 14<sup>00</sup>/sq ave 274 SF/day

Allow Mat'l @ = @ 20<sup>00</sup>/sf

Estimate = @ 34<sup>00</sup>/sf

1390,100 SF ÷ 274 = 5070 shifts

- |       |                    |                 |            |
|-------|--------------------|-----------------|------------|
|       | <u>SOLDIERS</u>    | <u>Lagging</u>  |            |
| B. 19 | 1 Pic Bull Foreman | 1 Pic Bull Fore | 2 Buckets  |
|       | 4 Pic Batts        | 2 Pic Batt      | 6 Pic Batt |
|       | 2 Equip Oper       |                 | 2 Oper     |
|       | 1 Oiler            |                 | 1 Oiler    |
|       |                    | 3 LABOR         | 3 Labor    |
| 9     |                    |                 |            |
| 8     |                    |                 | 14 men     |

14 x 5070 = 70980 man

TITLE SCRIP

SHEET NO. \_\_\_\_\_ DF \_\_\_\_\_

JOB NO. 6360-1

DEPARTMENT \_\_\_\_\_

AUTHOR GHE

DATE 3-10-55

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

SOLIDIER Pile & Lagging Shallow 155070 sf.

B-50 @ \$3831<sup>2</sup>/dy 8<sup>00</sup>/50 = 480 sf/dy

MATL 12<sup>00</sup>/515

ESTIMATE & MEAS 20

155070 sf ÷ 480 = 323 Say 330

14 x 330 = 4620 mat

TOTAL

5070	Shallow	Deep
330		
<hr/>		
5400	shifts	÷ 16 Ave 338 sf/shift

Note Excess occur

3250	÷ 16	Ave 203
------	------	---------

2150	÷ 16	Ave 134
------	------	---------

5400 x 14 75600 shifts

TITLE SOFTD SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6743-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHR DATE 3-1-57

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Decking  
 TRAFFIC 524,005 sf @ 13<sup>00</sup>

Say 12" Fir @ 12 bf Say 600<sup>00</sup>/4 = 7<sup>20</sup>

Install 12x12x12' = 12 sf  
 @ 8/4 = 100 sf/4 = 600 sf/4

- 1 Pile Butt Foreman 30<sup>00</sup>
- 1 Crane Oper 25<sup>00</sup>
- 1 Crane Oper 20<sup>00</sup>
- 6 Pile Butts 150
- & Labor 40
- 1 Trk Driver 25
- 1 Comp. Oper 20
- 13 310 x 8 = \$ 2450

- 1 70 T Crane 100
- 1 Comp. 600 15<sup>00</sup>
- 1 Trk 30
- Air Tool 5
- 150 x 8 = 1200

\$ 3650  
 = 6<sup>00</sup>

At 600 sf/shift  
 = 7200 flm/shift  
 13x8 ave 70 flm/mb. TOTAL 830 sf

Walkway 172,250 sf @ 6<sup>00</sup>  
 Say 4" Fir @ 4 bf @ 500<sup>00</sup>/4 = 2<sup>00</sup>

Use Horse Crew @ 900 sf/sh. ft. 4<sup>00</sup>  
200  
 1030 sf



TITLE SECRET SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6317-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHC DATE 3-15-57

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

STATION CHICKENNING

47N @ 800' = 3,772,000  
 62N pile = 314,750

4,086,750' = 545,000

Means \$815/ly.

Crew B-52 2300 cy/day = 2220 shifts

MAT'Ls } 12500 / ly = 547 \$300/day  
 LABOR } 675 / ly = 1557 / day  
 Equip. }

1 Chief Foreman	-	(2220 in day	4440
1 Corp. Foreman	=	2220	-
3 Labor	=	6660	5540
1 Cement Finish	=	2220	2220
0.5 Iron worker	=	1110	1110
0.5 Equip Oper	=	1110	1110
<u>7</u>		<u>15540</u>	Team 1110
0.5 T.E. Loader			

SUMMARY

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. **T** \_\_\_\_\_

WORK: **ITEM 3.0 - PARKING**

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMPCo AMOUNT	SCRTD AMOUNT
3.1	At Grade				400,000	400,000
3.2	Structure				20,000,000	17,161,000
	TOTAL				20,400,000	17,561,000
	Structure not Identified and not in RMPCo Estimate					26,639,000
	TOTAL				20,400,000	44,200,000

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. **T** \_\_\_\_\_

WORK: ITEM 3.1 PARKING

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

AT GRADE

CHECKED BY: AL DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	AMOUNT
<p>C USE SCRTD ESTIMATE</p>				<p>400,000</p>	<p>400,000</p>

# TABULATION OF COSTS

PROJECT: \_\_\_\_\_ PROJECT NO. \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ SHEET NO. **T** \_\_\_\_\_  
 WORK: ITEM 3.2 - PARKING PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
PARKING STRUCTURES CHECKED BY: [Signature] DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	Estimated AMOUNT RMP	Total AMOUNT SCRID
Beverly 650 CARS				4 108 000	4 108 000
UNIVERSAL City 1700 CARS				10 744 000	10 744 000
<b>SUB-TOTAL</b>				<b>14 852 000</b>	<b>14 852 000</b>
O.H & P. RMP 26.5%				3 936 000	
SCRID 15.54%					2 309 000
<b>TOTAL</b>				<b>18 788 000</b>	<b>17 161 000</b>
STRUCTURES NOT IDENTIFIED AND POSSIBLE DUPLICATION					264390.00
<b>USE</b>				<b>20000 000</b>	<b>43 800 000</b>



SUMMARY

PROJECT: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

LOCATION: \_\_\_\_\_

SHEET NO. **T** \_\_\_\_\_

WORK: ITEM 5.0 - YARDS & SHOPS

PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	RMPCo AMOUNT	SCRTD AMOUNT
5.1					46,200,000	46,200,000
5.16	Tail Track				28,440,000	23,500,000
	TOTAL				74,640,000	69,700,000

PROJECT: SCRTD  
 LOCATION: METRO RAIL PROJECT  
 WORK: ITEM 5.16 TAIL TRACK

PROJECT NO. \_\_\_\_\_  
 SHEET NO. T  
 PREPARED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	AMOUNT
MP-ESTIM. BASED ✓ AVERAGE QTY & COST DEVELOPED FOR SIMILAR WORK- FROM STATIONS	900	LF	-		23 505 000
<u>DEMOLITION</u>	900	LF	47 78	43 000	
<u>EARTHWORK</u>	900	LF			
EXCAV.		✓	1324 44	1 192 000	
MUCK DISPOSAL		✓	1233 33	1 110 000	
COMPACT BACK FILL		✓	842 22	758 000	
				3 060 000	
<u>SHORING DECKING</u>	900	LF			
SOLDIER PILE & LAGG.		✓	4692 22	4 223 000	
DECKING		✓	933 33	840 000	
UNDERPINNING		✓	-	- 000	
				5 063 000	
<u>CONCRETE</u>	900	LF			
FORMS		✓	2935 56	2 642 000	
CONCRETE		✓	2246 67	2 022 000	
REBAR		✓	3314 44	2 983 000	
CURING		✓	197 78	178 000	
FINISHING		✓	254 44	229 000	
WATERPROOFING		✓	215 56	194 000	
				8 248 000	
<u>SITE RESTORATION</u>	900	LF	195 56	176 000	
<u>TRAFFIC MAINT.</u>		LF	24 44	22 000	
<u>UTILITIES SUPPORT</u>		LF	666 67	600 000	
<u>MOBILIZATION</u>		LF	555 56	500 000	
ARCHITECTURAL etc.	900	LF	5291 11	4 762 000	
<u>TOTAL DIRECT COST</u>				22 474 000	
<u>OVERHEAD &amp; PROFIT</u>			26.5%	5 956 000	
<u>TOTAL RMP Co.</u>	900	LF	31 588 89	28 430 000	
USE			SAY * 31 600 -	* 28 440 000	* 23 505 000





MANPOWER REQUIREMENT  
(CIVIL AND STRUCTURAL ONLY)  
MAN YEARS - TOTAL

<u>CRAFT</u>	<u>MAN DAYS</u>	<u>MAN YRS.</u>
Supervision	173,000	720
Clerical	156,000	650
General Foreman	62,600	260
Tunnel Labor	278,000	1160
Labor	359,400	1500
Oper. Engr.	448,200	1870
Teamster	126,500	530
Carpenter	315,300	1310
Pile Butts	96,400	400
Electrician	162,900	680
Ironworkers	236,700	990
Pipe Fitter	83,100	350
Cement Finisher	61,500	260
Roofers	4,200	20
Specialty Craft	<u>78,800</u>	<u>330</u>
TOTAL	2,642,600	11030

NOTES:

1. One man year - 240 man days
2. Specialty craft includes: mosaic & terrazzo, glaziers, tile layer, lathers, plasterers, ornamental metal, painters, roofers, marble setters, HVAC.

CBTD - METRO RAIL PROJECT  
MAN POWER REQUIREMENT  
6363-1  
7-9-83

MAN DAYS

LINE NO.	DESCRIPTION	SUIKER	CIVIL	FOREMAN	QUALS	TERRAZ LATH	LABOR	OILL ENGR	ELECTR	CARR	FRAS POSTS	STEEL WORKER	TEAMER	WELDER	GENERAL FINISH	ROOFER	SPECIALTY CRAFTS	MISC DAYS
1.0	GATEWAY																	
1.1	DUAL TRACK AT GRADE	150					13200	10370	2060	12870	8560	9550	5250	1440	1380	350		65760
1.2	DUAL TRACK CUT COVER	88670	71930		9600	273530	65940	296460	52670	77400		72720	49570	4100	13510			1075300
1.3	DUAL TRACK TWIN TUNNEL						17830	13930	2960	17300	11490	12820	7040	1940	1840	460		87210
1.4	CROSS-OVER	200					25520	19930	4230	24760	16460	12350	10090	2770	2650	660		165640
1.5	CROSS-OVER	290					680	140	530								1140	2700
1.6	LINE VENT MECHAN			210			2310	1830	2580	1320	1410	720	690	3180	160	50	1340	15630
1.7	LINE VENT STRUCTURAL	30					1020	2540	1860	2580		800	560	1700	1000		60	16660
1.8	LINE VENT MOUNT						450	90	360								750	1800
1.9	CROSS-OVER VENT SYSTEMS			150														
1.10	LABEL PANNING						25340	7050		28070		7050	7050		14120			90180
1.11	MISCELLANEOUS																	49720
	CONTRACTOR SUPERVISION ADJ	24860	124860															1539160
	TOTAL GATEWAY	113800	96790	360	9600	278530	162350	352840	67250	164530	37820	122070	80250	75130	33660	1520	3290	
2.0	STATIONS			23300														
2.1	STATION			1150			101290	65510	79510	66030	54240	54260	39460	59880	10460	2450	63540	633930
2.2	ST. LINE VENT MECH			520			3600	710	2860								6030	14350
2.3	ST. LINE VENT MECH						590	310	1260								2660	6340
2.4	UNDERPINNING						25060	5010		20040		5010	5010		10030			70160
	CONTRACTOR SUPERVISION	43500	43500															87000
	TOTAL STATIONS	43500	43500	40970			131540	71540	83630	86070	54240	59070	38470	59880	20490	2450	72230	511780
3.0	PARKING																	
3.1	ET GRADE																	
3.2	STRUCTURE			14640			17260	4710	4190	32010		23370		2310	4860			103350
	CONTRACTOR SUPERVISION	6200	6200															12800
	TOTAL PARKING	6200	6200	14640			17260	4710	4190	32010		23370		2310	4860			115750
4.0	TRACK WORK																	
4.1	GALLIESTED AT GRADE			790			3160	790				3160						7900
4.2	DIRECT FIXATION			1860			9320	1860				9320						22360
	CONTRACTOR SUPERVISION	1800	1800															3600
	TOTAL TRACK WORK	1800	1800	2650			12480	2650				12480						33860
5.0	YARDS & SHOPS																	
5.1	NORTH TAIL TRACK	60					7150	5290	4220	7290	3800	5100	2910	4700	720	190	3250	44680
5.2	YARD WORK						18990	11140	3610	23040	460	14390	4210	1100	1710			81650
	CONTRACTOR SUPERVISION	7600	7600															15140
	TOTAL	7600	7600				26140	16430	7830	32730	4260	19290	7120	5800	2430	190	3250	141970
	TOTAL	172900	153890	66670	9600	278070	349770	448170	162900	315340	96420	236700	126460	83200	61440	4160	78770	TOTAL 2662310 420



THE RALPH M. PARSONS COMPANY

BY GHE

DATE 3-12-83

SUBJECT SCRTD METEORIC  
MAIN POWER TUNNEL CONCR.

JOB NO. 6363-1  
2877

Reach No	Length	No Days	Super Salary	General	General Labor	Labor	Equip. Engk	Engk	CAR	Flt. Pkts	Steel Worker	Transfer	Pip. FT/SEC	Concr. Fin. Sd	MONEY TOTAL
<u>Checkup</u>			<u>3</u>		<u>(63)</u>	<u>4</u>	<u>(36)</u>	<u>1</u>	<u>1</u>			<u>1</u>	<u>1</u>		<u>(16)</u>
2	10	7600													
5	10	12100													
6	10 wk	10400													
8	10 wk	7600													
10	10	17000													
12	10	16500													
14	10	9700													
<u>Total</u>		<u>165 day</u>	<u>495</u>		<u>1038</u>	<u>660</u>	<u>8940</u>	<u>1155</u>	<u>165</u>			<u>165</u>	<u>165</u>		<u>19140</u>
<u>Muck Disposal @ Man Days/eq.</u>															
2	eq	253,161													<u>2535</u>
5	eq	627,433													<u>4035</u>
6	eq	351,016													<u>3510</u>
8	eq	257,536													<u>2565</u>
10	eq	573,932													<u>5740</u>
12	eq	552,263													<u>5525</u>
14	eq	320,272													<u>3000</u>
		<u>2,689,577</u>													<u>26910</u>
<u>Reinst. R. eq. (FAR) 50% (1.1) @ 25% eq.</u>															
2	4000 km	240					<u>(21)</u>	<u>(14)</u>	<u>(25)</u>			<u>(25)</u>	<u>(10)</u>	<u>(5)</u>	<u>(100)</u>
5	6000 km	305													
6	6000 km	260													
8	4700 km	305													
10	12500 km	425													
12	8000 km	415													
14	6100 km	265													
	<u>46400 km</u>	<u>2211</u>					<u>38976</u>	<u>25984</u>	<u>46400</u>		<u>46400</u>	<u>18600</u>	<u>7280</u>		<u>18700</u>
<u>Avg use 21/day</u>															
<u>Fahr 25/day</u>															

APP

FORM RMP 310

BY GHE THE RALPH M. PARSONS COMPANY

DATE 3-10-83

SUBJECT SKRTD. MARCO RAIL  
MPH. POWER  
TUNNEL ROUTE

JOB NO. 6367-1  
3877

Reach No	Length	No Days	Super Salary	Overhead	Tenure LABOR	LABOR	Overhead ENG'G	ELCT	CRAN	Misc Equip	Tool Material	Transfer	Per. Profit	Contract Firms	GUARDS	MANPOWER TOTAL	
<u>Power Work Control</u>																	
4																	
5																	
6																	
8																	
10																	
12																	
14																	
<u>Finish Tunnel Monday/Road End</u>																	
2	100'	2600	58		(39)	(1)	(1)	(1)	(1)		(2)	(1)	(1)	(1)		(1)	
5	100'	12145	60														
6	100'	10400	57														
8		26000	38														
10		17000	85														
12		16000	82														
14		27000	49														
		89,837	404	1212		15756	1616	1628	2828	7676	9896	404	404	3232		59772	
<u>Weekend &amp; Holiday Maint</u>																	
4		408	172	3			(12)	3								(6)	
5		675	284														
6		437	184														
8		573	216														
10		625	247														
12		652	274														
14		424	178														
		3834 = 1600		4800			17200	4800								9600	35400
<u>TOTAL Man Day Tunnel Const</u>																	
			88267	71925	27356	68940	296957	52673	77461		72221	49569	4079	12512	9600	1075,252	
<u>Job Av. 240 wk days/year</u>																	
			370	300	1140	270	1240	220	320		310	210	20	50	10	4500	
<u>MAN YEARS</u>																	

423

# LABOR COSTS

ESTIMATE 6363-1

FOR SCLTP GROUP \_\_\_\_\_ SHEET NO. L  
 WORK Metro Race Project WORK ITEM NO. \_\_\_\_\_  
 LOCATION Los Angeles PREPARED BY GHE DATE \_\_\_\_\_  
 QUANTITY 3 2 1 1 1 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT			TOTAL	UN	D	PYRO	ELEV	C	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3							
1	<del>SECURITY GUARD</del>										
2	WALKER	1	1	1	3						
3	CRANE OPER	2	2	2	6						
4	CRANE OILER	1	1	1	3						
5	TOP MAN	1	1	1	3						
6	BOTTOM MAN	1	1	1	3						
7	CHANGE HOUSE ATT.	1	1	1	3						
8	COMPRESSOR OPER	1	1	1	3						
9	MECH. FOREMAN	1			1						
10	MECHANIC	4	4	4	12						
11	ELECT. FOREMAN	1			1						
12	ELECTRICIAN	2	2	2	6						
13	PUMP OPER	1	1	1	3						
14	MINER	4	4	4	12						
15	LOCO OPER		1	1	2						
16	BRAKEMAN		1	1	2						
17	TRUCK DRIVER	1			1						
18	CARPENTER	1			1						
19	LABOR	4			4						
20	FIREFIGHTER	1			1						
21											
22	TOTAL	0	21	21	72	3	32	21	4	9	1
23											
24	<u>HAULING CREW (v)</u>										
25	SHIFTER	2	2	2	6			6			
26	T.B.M. OPER	2	2	2	6						
27	TRAIL OPER	2	2	2	6						
28	MECHANIC	2	2	2	6						
29	ELECTRICIAN	2	2	2	6						
30	MINER	8	8	8	24			24			
31	CHUCK TENDER	4	4	4	12			12			
32											
33	TOTAL	22	22	22	66	18	42	6			
34											
35	<u>Mech Hauling Crew</u>										
36	LOCOMOTIVE OPER	4	4	4	12						
37	BRAKEMAN	4	4	4	12						
38											
39	TOTAL	8	8	8	24	24					
40											
41	<u>BULL GANG (v)</u>										
42	BULL GANG FULL	2			2			2			
43	BULL GANG LAB.	8	2	2	12						
44	LOCO OPER	2			2						
45	LOCO OILER	2			2						
46			2	2	4						
47	TOTAL	14	2	2	18	12					
48											
49	TOTAL	7	13	53	180	78	7	15	1	1	424



# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Cross Passages - Excav CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL					DISTRIBUTION			
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL		Sup	OP	Totals	Wages	EXC	Cost	100% Wages	100% Cost	
1	<u>Support &amp; Service</u>														
4	<u>Walker</u>	1	1	1	3	3									
5	<u>Crane Oper</u>	1	1	1	3	3									
6	<u>Crane Oiler</u>	1			1	1									
7	<u>Top man</u>	1			1				1						
8	<u>Bottom man</u>	1	1	1	3				3						
9	<u>Charge Hand</u>	1			1				1						
10	<u>Compr. Oper</u>	1	1	1	3	3									
11	<u>Mech Foreman</u>	1			1	1									
12	<u>Mechanic</u>	1	1	1	3	3									
13	<u>Elect. Foreman</u>	1			1	1									
14	<u>Electrician</u>	1	1	1	3	3									
15	<u>Pump Oper</u>	1			1	1									
16	<u>Miner</u>	4	4	4	12				12						
17	<u>Load Oper</u>		1	1	2				2						
18	<u>Brake man</u>		1	1	2				2						
19	<u>Truck Driver</u>	1			1										
20	<u>Carpenter</u>	1			1										
21	<u>Welder</u>	4			4				4						
22	<u>Pipe fitter</u>	1			1										
23	<u>2 Crossovers - men/day</u>				5	3	17	17	4	5	1	1	1	1	1
24	<u>14 wks/22</u>														
26	<u>Cross Over Handling 2 Crows</u>														
28	<u>Shiller</u>	2	2	2	6				6						
29	<u>Miner</u>	8	8	8	24				24						
30	<u>Chuck Tender</u>	4	4	4	12				12						
31	<u>Picker</u>	2	2	2	6				6						
32	<u>Mucker (2)</u>	2	2	2	6				6						
33					54		6	48							
35	<u>Muck Handle</u>														
36	<u>Load Oper</u>	2	2	2	6				6						
37	<u>Brake man</u>	2	2	2	6				6						
38					12		12								
40	<u>Bull Gang</u>														
41	<u>Foreman</u>	1			1				1						
42	<u>Bull Gang</u>	4			4				4						
43					5				5						
45	<u>Total Ex cav. 2 Crossovers</u>				122										
46	<u>1 Crossover</u>				6				6						
47	<u>Below excav 5 crows</u>														



# LABOR COSTS

ESTIMATE 6363-1

FOR SCFD GROUP SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Class Passage - Concrete CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	HOURS	PAYROLL	Etc	DISTRIBUTION				
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL					1	2	3	4	
1														
2	Support & Service													
3	Concurrent with track													
4														
5	Concrete Crew													
6	Shiller	1	1	1	3			3						
7	Concrete Foreman	1	1	1	3									
8	Shiller	1	1	1	3			6						
9	Concrete Foreman	1	1	1	3									
10	Shiller	6	6	6	18									
11	Concrete Foreman	6	6	6	18									
12	Shiller	4	4	4	12			17						
13	Concrete Foreman	4	4	4	12									
14	Shiller	4	4	4	12									
15	Concrete Foreman	4	4	4	12									
16	Total Crews				54			9	17			21	17	
17														
18	2 Crews - 11 hrs													
19														
20														
21														
22														
23														
24	TOTAL MEN =													
25	Note Aug 22 Crossover													
26														
27														
28														
29	Support & Service crew = 14 wk @ 51				714	42	246	238	56	70	14	14	14	
30	Excav				594	46	528							
31	Transport				168	168								
32	Reel Case				70		70							
33	Concrete Lab				1512		252	336	588	336				
34														
35														
36	TOTAL Man wk for				3083	42	500	1000	372	70	264	336	144	144
37														
38	Av. per Concrete Man wk				140	2	23	50	18	3	27	15	1	1
39														
40	Av. Man Imp/Access				700	10	115	230	90	15	135	75	5	5
41														
42														
43														
44														
45														
46														
47														
48														



TITLE SCRIPD METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

JOB NO. 6213-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cross Passages for  
Tunnels 42'-8" E to E  
Stay Passages 25' long.

ACCOUNTS

Excav. Neat =  $9\frac{1}{2} \times 12\frac{1}{2} = 118\frac{1}{4}$  sq ft  $4\frac{1}{2}$  g/cu = 110 c  
Excav w/blk =  $11 \times 14 = 154$  sq ft =  $5\frac{1}{2}$  g/cu = 148 c

Concrete 27 cu  
Neat  $118\frac{1}{4} - (5\frac{1}{2} \times 3\frac{1}{2}) = 74\frac{1}{4}$  cu ft =  $2\frac{1}{2}$  g/cu x 27 = 72 c  
w/blk 154 -  $4\frac{1}{2}$  cu ft = 108 cu ft =  $4\frac{1}{2}$  g/cu x 27 = 108 c  
INVERT w/blk 11 x 22' x 25' = 28 c  
Wall & Arch 83 c

SOFT ROCK  
Excav. Neat



# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Tunnel Cleanup - CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
5th St to 6th St

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	ELECT	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL				
1	<u>Service &amp; Repair</u>								
2									
3									
4	<u>Walker</u>	1	1	1	3	3			
5	<u>Crane Oper</u>	2	1	1	4	7			
6	<u>Crane Opwrk</u>	1			1	1			
7	<u>Top Man</u>	1			1		1		
8	<u>Bottom Man</u>	1	1	1	3		3		
9	<u>Charge Hse Att.</u>	1			1		1		
10	<u>Crane Oper</u>	1	1	1	3	3			
11	<u>Mech Foreman</u>	1			1	1			
12	<u>Mechanic</u>	2	1	1	4	4			
13	<u>Elec Foreman</u>	1			1			1	
14	<u>Elec</u>	4	1	1	6			6	
15	<u>Pump Oper</u>	1	1	1	3	3			
16	<u>Mine</u>	2	2	2	6		6		
17	<u>Loco Oper</u>		1	1	2	2			
18	<u>Brakeman</u>		1	1	2	2			
19	<u>Track Driver</u>	1			1			1	
20	<u>Carpenter</u>	1			1			1	
21	<u>Labels</u>	4			4		4		
22	<u>Pipe Fitter</u>	1			1			1	
23					48	20	11	4	
24							7	1	
25	<u>Cleanup Crew (2 hrs)</u>								
26	<u>Shifter</u>	2	2	2	6	6			
27	<u>Miner</u>	4	4	4	12	12			
28	<u>Tunnel Label</u>	8	8	8	24	24			
29									
30					48	48			
31									
32	<u>Transport</u>								
33	<u>Loco Oper</u>	2	2	2	6	6			
34	<u>Brakeman</u>	2	2	2	6	6			
35					12	12			
36									
37									
38	<u>Blue Gang</u>								
39									
40	<u>Foreman</u>	2			2	2			
41	<u>Blue Gang Labor</u>	8			8	8			
42	<u>Loco Oper</u>	2			2	2			
43	<u>Brake</u>	2			2	2			
44					4	4			
45					14	10			
46									
47	<u>TOTAL Per Day</u>				116	36	13	4	
48							7	1	

# LABOR COSTS

12

ESTIMATE \_\_\_\_\_

FOR SOFT GROUP SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Muck Disposal CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1	Estimated at 6 <sup>00</sup> /day							
2	less O.H. & profit = 5 <sup>00</sup> /day							
3								
4	Day haul in 20 cu							
5	Truck Trailer W/ty's							
6	Trailer Mile Cost = 10 <sup>00</sup>							
7	Time thru parts							
8								
9								
10								
11								
12								
13	Driver							
14								
15								
16								
17	20 cu @ 5 <sup>00</sup> = 100 <sup>00</sup> /day							
18	Ok day Trucks make & tips per day = 100 <sup>00</sup>							
19								
20								
21	Trailer							
22	Labor @ 25 <sup>00</sup> /hr x 8 = 200 <sup>00</sup>							
23								
24								
25	0.01 manday/day							
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								

# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Freest Line Rings CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			
1								
2	TOTAL \$6400 King 12 1/2" Sq 60/ft = 20400 = 1/100							
3								
4	Due 21 Class prodn							
5	Maximum 25 King prodn							
6								
7	Assume each bench has plant							
8	reg'd production							
9	8' x 25' x 7' = 350 sets forms							
10								
11	Sq 18" ID x 19" OP. x 4' =							
12								
13	Volume Concrete = 580 cu/ft Sq 60/ft							
14								
15	Form Area							
16	(18" x 19") x 4' = 469 sq/ft Sq 500 ft in 60.							
17								
18								
19								
20	Quops Cost 2400.00							
21	less diff. 400							
22								
23	2000.00							
24	less Conc 6 @ 65 = 400.00							
25								
26	Test. Pol. of Hdue - 100.00							
27								
28	less Test 6 @ 200 x 0.25 = 300							
29								
30	less Forms							
31	350 sets @ 500 = 175000.00							
32	@ 50% of 175000 = 87500.00							
33	= 46400 = 123.50 Sq - 200							
34								
35	\$1000							
36								
37	25 x 1000 = \$25,000/day							
38								
39	Allow Equip 5000							
40								
41	Lab 20,000							
42								
43	20000 ÷ (8 x 25) = 100 men							
44								
45	Concrete 6 x 25 = 150 cu/ft							
46								
47								
48								

# LABOR COSTS

1.4

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP SHEET NO. L

WORK Metro Rail Project WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Precast Liner Rings CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL	DISTRIBUTION		
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL			PERCENT	AMOUNT	
3	Batch Plant Op. Eng.	3			3					
4	Label	2								
9	Self Stig Form 5x25 = 125									
11	Computer Form Labor	2			5			25		
12	Operator	5								
14	Clean & Oil Labor	10				10				
18	Iron Working 6 @ 200 = 1200	25			5				75	
20	Oper.	5								
23	Place Concrete Oper.	1			1					
25	Labor	1				4				
26	Cement Finisher	5					5			
29	Cure Labor	5				5				
32	Transport Concrete	10							10	
36	per 25 rings	100			14	21	5	25	25	10

Checked by \_\_\_\_\_  
 Date \_\_\_\_\_  
 Distribution by \_\_\_\_\_  
 100%



# LABOR COSTS

N

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY Finish Tunnel CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

LINE NO.	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL		DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL					
1	Purchase Material				12 <sup>00</sup> /hr					
2										
3	Purch Concrete 50 <sup>00</sup> /cy @ 12				60 <sup>00</sup> /hr					
4										
5										
6										
7	Inst Hand rail w/ tw @ 3 <sup>00</sup> /hr				12 <sup>00</sup> /hr		0.12 m.t./hr			8 m.t./100
8										
9										
10	Loco Oper & Brokers				10 m.t./hr		0.08 m.t./hr			4 m.t./100
11										
12										
13	Place Concrete									
14	200 LF/dy = 23 1/2 cy									
15										
16	Shifter	1			1		1			
17	Conc Labor	4			4		4			
18	Cmp Foreman		1		1					
19	Chiffonier		2	2	2					
20	Label		2	2	2					
21	From worker	4		2	6					8
22	Conc Foreman			1	1					
23	Conc Labor			6	6					
24	Pump Op & Conc			1	1					
25	Loco Op	1	1	2	4		4			
26	Plate	1	1	2	4		4			
27	Cement Finish			4	4					
28					44		9 1/4			9 1/4
29	SERVICE & Support						2 Tunnel			8 m.t./100
30	Use Pump Crew									
31	As for Tunnel Clean up				49/8					
32										
33										
34										
35										
36										
37	Place Concrete				88		18 3/8	8		18 1/4
38	Service Support				48	3	20	14	7	1 - 1 - 1
39										
40	Install Handrail				12		5			5
41										
42										
43	Total per 100 LF				148	3	42	39 4/8	7	19 24 1 1
44										
45										
46										
47										
48										



# LABOR COSTS

ESTIMATE \_\_\_\_\_

FOR SCFD GROUP \_\_\_\_\_ SHEET NO. L

WORK METRO RAIL PROJECT WORK ITEM NO. \_\_\_\_\_

LOCATION Los Angeles PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

QUANTITY \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

	LABOR CLASSIFICATION	NUMBER OF MEN ON SHIFT				UNIT RATE PER	PAYROLL		DISTRIBUTION	
		SHIFT NO. 1	SHIFT NO. 2	SHIFT NO. 3	TOTAL					
1										
2										
3	<u>WEEKEND MAINTENANCE</u>									
4	<u>of Holidays</u>									
5	<u>Drive Tunnel 2530 Dg</u>									
6	<u>Coast. Crac. Pipe 420</u>									
7	<u>Inst. Steel Lining 228</u>									
8	<u>Clean up Tunnel 165</u>									
9	<u>Finish Tunnel 404</u>									
10										
11	<u>380</u>									
12										
13	<u>4795 - (32 wks x 5 x 7) = 31</u>									
14										
15	<u>3804 ÷ 5 = 760 wks</u>									
16	<u>- 7 = 110 wks / break</u>									
17										
18	<u>Day Total = 800 wks</u>									
19										
20	<u>@ 2 day/week = 1600 man/days</u>									
21										
22										
23	<u>Walker</u>	1	1	1						
24	<u>Pumpman</u>	2	2	2						
25	<u>Electrician</u>	1	1	1						
26	<u>Mechanic</u>	1	1	1						
27	<u>Loco Oper</u>	1	1	1						
28										
29	<u>GUARDS</u>	2	2	2	6					
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
41										
42										
43										
44										
45										
46										
47										
48										

117  
 SCLTD METRO RAIL PROJECT  
 MANHATTAN - CITY  
 LINE VENT STRUCTURE - CITY  
 MANHATTAN 6363-1

QUANTITY & UNIT	DEMOLITION	TRAFFIC PAINT	SITE RESTORE	IRON WORK		SCAFFOLD		CONCRETE				WATER PROOF	OTEC SUPPORT	ARIEL FINISH	MEAN	ELECT.	MEAS.	TOTAL M.C.S. 1 STRUCT	MANHATTAN 3 STRUCT
				EXCAV.	EMBAR.	EXCESS	PILE & LAGERS	SECTION	FOURTH COURSE	RESTEEL	FINISH CURE								
	\$5000	1200 ft	4000 ft	6370 ft	2430 ft	1800 ft	15300 ft	2378 ft	1593 ft	1670 ft	11567 ft	23000	\$280000	\$200000	62400	37000	96000		
SUPER.																	10	10	30
OPER ENGR	55		15	85	10	180	20	20	20				115				90	610	7830
LABOR	50	75	30	45	30	180	15	80	60	5			165				35	770	2310
TEAMSTER	25				40	70	60	10									25	230	690
LABOR	5								410								25	245	1335
ELEC	5		10										400			435	10	800	2580
PIPEFITTER													265		785		10	1060	2180
IRON WORKER	5		5															240	720
CEMENT FINISH			5							35	15							55	165
PILE PUTTS							420	50										470	1410
ROOFERS												15						15	45
SPECIALTY														485				445	1335
TOTAL	145	25	65	130	80	70	840	95	490	115	250	20	745	445	735	435	205	5210	15630

SECRET METRO RAIL PROJECT  
MADRID  
1.8 VERTICAL SHAFT IN MOUNTAINS

	SITE NO.	SITE EXCAVATION	FOUNDATION	SHAFT RISE	RAIL TIES ETC	FORMS	CONCRETE	REINFORC	COAT & FIN	STEEL SHEET PILING	HAIR & HANGING	CRUISE UNIT SUPPLY	MAN SPECIAL	ELECT	ARCE	TOTAL ONE SHAFT	TOTAL TWO SHAFTS
		1400	500	2100	3000		44000	200	5600	30000							
	050000	2000	500	1300	6000	10000	51000	105000	6000	1000	8000	1000	1000	5000	1100		
											B						
OPER ENGR	230	20	5		600		200	200		10						1270	2540
LABOR	345	10	5		150											510	1020
TREASURER	115		5	5	150											270	540
TUNNEL LABOR						210	480	1300		60						2270	4540
ELECT							100	100						720		930	1860
IRONWORKER								100	200		100					400	800
CEMENT FINISH								400	100							500	1000
CONCRETE							1300									1290	2580
PIPE FITTER													850			850	1700
SPECIALTY CLAS														25		30	60
TOTAL	690	30	15	5	900	210	2000	2400	200	160	110		850	780	25	8330	16660



# DMJM/PBQD

4-67

LCRTD

JOB No. 15-02

SHEET No. 4

DESIGNED BY C. Lee

DATE 11-17-8

APPROVED

Handwritten notes: "Mark in mini" and "in mini cost"

- 1) UNION STATION - 0 -
- 2) 1ST 3/4 HILL X \$1,000,000
- 3) 5TH 3/4 HILL X \$7,580,000
- 4) 7TH 3/4 FLOWER \$3,230,000
- 5) ALVARADO - WILSHIRE \$120,000
- 6) VERMONT - WILSHIRE - 0 -
- 7) NORMANDIE - WILSHIRE ✓ \$2,725,000
- 8) WESTERN - WILSHIRE ✓ \$1,050,000
- 9) LA BREA - WILSHIRE ✓ \$500,000
- 10) FAIRFAX - WILSHIRE ✓ \$900,000
- 11) BEVERLY - FAIRFAX X - 0 -
- 12) SANTA MONICA - FAIRFAX \$510,000
- 13) LA BREA - SUNSET \$10,000
- 14) CAHUENGA - HOLLYWOOD \$315,000
- 15) LA BREA - HOLLYWOOD - 0 -
- 16) UNIVERSAL - 0 -
- 17) LANKERSHIM - 0 -

DMJM/PBQD

9-68

22

SCRTD

JOB No. 3111

SHEET No.

Cut & Over Cross Over

DESIGNED BY S. Uy

DATE 11-19-82

Underpinning Estimate Cost

APPROVED

Cross Over Underpinning Cost.

UNION STATION

- 0 -

ALVARADO

- 0 -

NORMANDIE

\$ 700,000

LA BREA -

\$ 675,000

10

FAIRFAX

1,200,000

\$ 420,000

8

BEVERLY

\$ 280,000

CAHUENGA

✓

\$ 169,000

12

LINKERSHIM

✓

\$ 550,000

14

(N.H. w/ TRAIL TRACK)

\* VERMONT - WILSHIRE

✓

\$ 20,000

5

\* LA BREA - SUDLET

\$ 150,000

\* ADD'D 1-4-83

RECEIVED

JAN 4 1983

DMJM-PROB  
COST CONTROL



3 CRTD  
MANROWEL - MANDARY  
YARDS & SHOP

	DEVELOPMENT	SITE PREP & EXCAV	SURFACE PREP & CONCRETE	STRUCTURAL CONCRETE	LOADS PAVE	FIXING	YARD LIGHTING	BUILDING	FIXED EQUIP	YARD VEHICLE	TOTAL								
61 Hrs S.I.T	6,500,000	700,000	600,000	3,700,000	1,200,000	300,000	600,000	2,500,000	7,700,000	3,400,000									
Oper Equip	7150	600	200	370	440		100	2200	0	0	11140								
Laborer	6342	300	200	1260	570	1340	200	8230			13790								
Iron Worker	820			2300	10			11200			14390								
Electrician	610						1000	2000			3610								
TEAMSTEEL	2950	500	40	100			200	1000			4810								
PILE BOTT			460								460								
CARPENTER				350				2030			2380								
CEM FIN				380	10			1320			1710								
PIPE FITTER								1100			1100								
SPECIALTY																			
	17720	1400	920	7460	1030	1840	1500	48570			81650								

THE RALPH M. PARSONS COMPANY

DATE 3-15-83

BY \_\_\_\_\_  
 SUBJECT SCRTD-METRO RAIL  
MAN POWER

JOB NO. 4363-1

STATION CONSTRUCTION

MAN HOURS

TOTAL

	FOREMEN	CLERICAL	TUNNEL LABOR	LABOR	OPER. ENGR.	ELECT.	CARR.	FILE BOYS	STEEL WALKER	TEAMST	PIPE FITTER MACH.	CEMENT FINISH	ROOFER	SPECIALTY CRANES	TOTAL		
															MAN-HOURS	MAN-DAYS	
DEMOLITION				15000	17000	1400			2100	7000						42500	5,313
EARTHWORK				310,300	359,100			439,900		266,300						1,378,600	167,825
CONCRETE WORK formwork	126,800			126,800			507,100									760,700	95,088
CONCRETE WORK in-place	35,300			94,700	39,800							80,200				250,000	31,250
REBAR	51,400				37,800				427,900							519,100	64,888
CURING				8,100												8,100	1,012
FINISHING	76,500			140,200	21,000	515,200					399,700			508,304		1,660,904	207,612
WATERPROOFING							4,200						19,600			23,800	2,975
SITE RESTORATION	7,300			31,300	9,200	7,100	500		2,096		2,300	3,496				63,292	7,913
TRASS. MAINT.	3,200			16,100												19,300	2,412
UTILITIES SUPPORT	29,500			43,200		104,200					68,800					245,700	30,712
MOBILIZATION	16,400			24,604	49,196	8,196	16,400			14,404	8,200					139,404	17,425
PARKING STRUCTURE & AREA U.C.	28,100			31,100	2,100	8,000	61,400		44,800		4,400	9,300				198,800	24,775
<b>TOTAL MANHOURS</b>	<b>346,400</b>			<b>810,304</b>	<b>524,096</b>	<b>636,096</b>	<b>528,200</b>	<b>433,904</b>	<b>434,096</b>	<b>267,704</b>	<b>477,000</b>	<b>83,696</b>	<b>19,600</b>	<b>508,304</b>		<b>5,071,400</b>	<b>631,105</b>
<b>TOTAL MANDAYS</b>	<b>43,300</b>			<b>101,290</b>	<b>65,310</b>	<b>79,510</b>	<b>66,050</b>	<b>54,240</b>	<b>54,260</b>	<b>33,460</b>	<b>59,880</b>	<b>10,460</b>	<b>2,450</b>	<b>63,540</b>			<b>633,930</b>

MAN

THE RALPH M. PARSONS COMPANY

DATE 3-15-83

BY \_\_\_\_\_

JOB NO. 6363-1

SUBJECT SCRTD - METRO RAIL  
MAN POWER  
PARKING STRUCTURES

	FOREMAN	LABOR	OPER. ENGR.	ELECT	CARP	IRON WORKER	PIPE FITTER	CEMENT FINISH	TOTAL	
									MAN- HOURS	MAN- DAYS
UNION STATION	29,800	35,100	9,600	8,500	65,100	47,500	4,700	9,900	210,200	26,275
WILSHIRE FAIRFAX	13,200	15,600	4,200	3,800	28,900	21,100	2,100	4,400	93,300	11,663
FAIRFAX BEVERLY	13,200	15,600	4,200	3,800	28,900	21,100	2,100	4,400	93,300	11,663
UNIVERSAL CITY	28,100	33,100	9,100	8,000	61,400	44,800	4,400	9,300	198,200	24,775
NORTH HOLLYWOOD	32,800	38,700	10,600	9,400	71,800	52,400	5,200	10,900	231,800	28,975
TOTAL MANHOURS	117,100	138,100	37,700	33,500	256,100	186,900	18,500	38,900	826,800	
TOTAL MANDAYS	14,640	17,260	4,710	4,190	32,010	23,370	2,310	4,860		103,950

SELECTED METRO RAIL PROJECT  
6365-1

STATIONS - MAIN POWER 3-11-93

	No 1 UNION STATION	No 2 15th Ave St. Home	No 3 7th & Grand	No 4 Hunters	No 5 Vanderbilt Mountain	No 6 WESTERN	No 7 VICTIMS Lafayette	No 8 WHEELS East	No 9 FANTAS Bassett	No 10 FANTAS SOUTH	No 11 SUNSET Lafayette	No 12 Lafayette Humboldt	No 13 Mountain Dale	No 14 Mountain Humboldt	Sub- Total	TOTAL AMT
1	LENSA	640	631	745	290	27	67	600	660	935	85	600				1061947.50
2	LENSA															
3																
4																
5	LENSA - 11.000	63300														63300
6	Remove R.R. Power	160000														160000
7	Remove R.R. Power	48000														48000
8	Remove R.R. Power	13350	6600	8500	7500	4950	8500	63000	3500	10000	13150	13350	14000			911150
9	Remove R.R. Power		22,100	20,000	23,500	500	13250	2300	5000	2000	9200	4000	4500			143200
10	Remove R.R. Power		10500	15000	16000	500	3000	11000	2000	1000	3000	1800	2300			183200
11	Remove R.R. Power		5500	3000	10000		1000	3000	1000							30000
12	Remove R.R. Power		1000	500	250		500	500	500							5000
13	Remove R.R. Power		2000	3000	1000		2000	500	1000							10000
14	Remove R.R. Power		500	200	1000		500	1000								5000
15	Remove R.R. Power		200	300	1000		200	500								5000
16	Remove R.R. Power		200	300	1000		200	500								5000
17	Remove R.R. Power		200	300	1000		200	500								5000
18	Remove R.R. Power	10000	6000	7000	10000	2000	1000	1500	1000	2000	19000	20000	12000	5000		140750
19	Remove R.R. Power	10000	6000	7000	10000	2000	1000	1500	1000	2000	19000	20000	12000	5000		140750
20	Remove R.R. Power	10000	6000	7000	10000	2000	1000	1500	1000	2000	19000	20000	12000	5000		140750
21	TOTAL	300000	2000	4000	10000	20000	36700	37700	15000	11000	13100	6000	3000			192685
22																
23																
24		Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	Task 9	Task 10	Task 11	Task 12	Task 13	Task 14	Task 15
25	1 9000	13000	1 200	24000	1 200	5000	1 200	9000								
26	2 400	2000	1 200	2000												
27	1 200	1500	1 200	2000												
28	1 100	1200	1 100	2000												
29	1 200	1000	1 200	2000												
30	1 200	1000	1 200	2000												
31	1 200	1000	1 200	2000												
32	1 600	5000	4 200	350	1 300	1000	1 200	1800	1 200		1800					
33	1 600	5000	4 200	350	1 300	1000	1 200	1800	1 200		1800					
34	1 200	1000	1 200	2000	1 200	5000	1 200	9000	1 200		6000	1 200	3000			
35	1 200	1000	1 200	2000	1 200	5000	1 200	9000	1 200		6000	1 200	3000			
36	1 400	1000	1 400	2000	1 400	5000	1 400	9000	1 400		6000	1 400	3000			
37	1 300	1000	1 300	2000	1 300	5000	1 300	9000	1 300		6000	1 300	3000			
38	1 200	1000	1 200	2000	1 200	5000	1 200	9000	1 200		6000	1 200	3000			
39	1 200	1000	1 200	2000	1 200	5000	1 200	9000	1 200		6000	1 200	3000			
40	1 200	1000	1 200	2000	1 200	5000	1 200	9000	1 200		6000	1 200	3000			

SCRTD METRO RAIL PROJECT  
STATIONS

6363-1  
3-11-83

		No. 1 UNION STATION	No. 2 1ST HILL 5TH HILL	No. 3 PINEBROOK	No. 4 ALVAH	No. 5 VERMONT 100th AVE	No. 6 WESTERN	No. 7 WILMARE LA BEE	No. 8 VALENTINE HARRIS	No. 9 3RD ST 35th ST	No. 10 STANLEY 17th ST	No. 11 HUNTER CITY	No. 12 NORTH H'WY	No. 13 THICK	No. 14 THICK	Quant	AMT	
Length		645	631	631	740	490	527	627	620	660	935	685	680	670	635	620	612	10618
Exc. & WORK MACHINE EXCAV	CY \$/CY AMT	5180 40 207,200	112,770 330 370,500	163,600 330 546,900	78000 330 289,600	58,600 330 193,000	62,700 330 206,900	97,700 330 323,000	93,800 330 309,500	86,200 330 286,450	177,130 330 584,500	63,770 330 210,400	70,235 330 231,000	86,800 330 286,400	79,900 330 263,700	77,300 330 261,700	94,000 330 328,000	1458,250 7750
HAND EXCAV	CY \$/CY AMT	272 24 6540	5910 24 14180	8690 24 20850	4140 24 9750	3080 24 7320	3370 24 8270	5400 24 12960	4900 24 11360	4500 24 10800	930 24 2230	3360 24 8250	3705 24 8880	460 24 590	450 24 540	4200 24 10080	5400 24 12960	7750
Comp Backfill	CY \$/CY AMT	11280 152 17770	16700 152 26360	6780 152 95700	32300 152 53700	4880 152 64340	3200 152 50400	4760 152 75350	2980 152 49200	2480 152 37600	19770 152 297200	30940 152 47700	-	18870 152 287200	17400 152 274100	17400 152 274000	4960 152 75000	58970
Exc. Disp'n	CY \$/CY AMT	27300 144 39200	12500 144 18000	14500 144 20900	67100 144 97300	33000 144 48600	76080 144 110000	38000 144 54700	95700 144 138000	94000 144 135600	24370 144 35100	56330 144 81100	98000 144 141000	9900 144 13660	9700 144 13980	91200 144 131700	8800 144 12480	1553100
Soil & Paving	\$/CY \$/CY AMT	4300 34 146200	10400 34 353600	12700 34 432600	9820 34 334600	56000 34 1904000	6800 34 2313700	94340 34 3207500	7900 34 2687000	8387 34 2834700	168000 34 5710000	62790 34 2134800	67400 34 2292000	83050 34 2823700	77000 34 2618000	76500 34 2609000	94540 34 3227600	1490100
walkway	\$/CY \$/CY AMT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decking	\$/CY \$/CY AMT	-	4530 132 59700	5730 132 75700	43700 132 57700	460 132 5260	5000 132 6600	43680 132 57700	4900 132 63600	4900 132 63600	6070 132 79900	4900 132 63600	4200 132 54600	4480 132 58200	500 132 6600	4360 132 56600	4360 132 56600	52400
walkway	\$/CY \$/CY AMT	4250 6 25500	500 6 3000	600 6 3600	590 6 3540	-	-	410 6 2460	300 6 1800	490 6 2940	1020 6 6120	8000 6 48000	8000 6 48000	14200 6 85200	14200 6 85200	14200 6 85200	14200 6 85200	17220
Dewatering	\$/CY \$/CY AMT	16 2650 42400	16 2650 42400	16 2650 42400	16 2650 42400	13 2650 34450	16 2650 42400	22 2650 58300	13 2650 34450	21 2650 55650	27 2650 71550	19 2650 50350	19 2650 50350	4 2650 10600	18 2650 47700	19 2650 50350	24 2650 63600	311
Chipping	\$/CY \$/CY AMT	-	12609 31470 39689000	6284 31470 39689000	27709 31470 39689000	-	-	2559 31470 39689000	-	-	-	-	-	-	-	-	-	-
		27640	623370	93450	76940	399600	318370	571100	517400	50625	118310	390120	489050	509300	423100	3834100	571100	82910



TITLE SCRTD SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6363-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 5-11-62

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Excu for Stations, Cross-over etc  
Machine

Use Cat 977 + D-7 in hole

Dore to Clanshell

Use 75T Trk Crane w/2 cy Clanshell bucket  
 say 1.5 E cy.

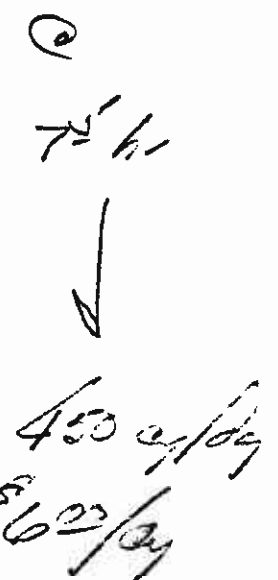
Assume 12 min cycle + 40 swings per hr = 60  
 say 6000/hr

- 1 Foreman 30<sup>00</sup>
- 1 Crane Oper 25<sup>00</sup>
- 1 Crane Oiler 20<sup>00</sup>
- 2 Operator Tractor 50<sup>00</sup>
  
- 1 Trk Crane 100<sup>00</sup>
- 1 977 46<sup>00</sup>
- 1 D-7 60<sup>00</sup>
- Pickup 10<sup>00</sup>

34100/hr.

@ 8  
 \$ 2730<sup>00</sup>/day

6<sup>00</sup> say 6<sup>00</sup>/day



Dore and loader will experience interference and delay with utilities, stringing stoff and installation of logging

Crane (clanshell) similarly will be delayed on surface

TITLE 5 CRTD SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6-67-1 DEPARTMENT \_\_\_\_\_ AUTHOR GJE DATE 7-15-82

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Station - Hand Excavation  
 AT 5% of Machine Excav.  
 Trench walls etc.  
 400 cu/shift at 5% = 200 cu/shift

Excavation 150 cu/shift  
 SAY 65 ft wide x 10' (between Sides) = 24 cu/ft  
 450 ÷ 24 = Say 19 ft/shift  
 2 x 19 x 10 = 380 sq/shift ave 160 ft/min

Labor Foreman 25  
 2 Labor 40  
 1 Comp. Oper 25  
 Air Spas 200<sup>00</sup> 100  
 Compr. 15<sup>00</sup>

\$100<sup>00</sup>

Say \$850/day ÷ 24 = \$37<sup>50</sup>

850 ÷ 24 = 35<sup>40</sup> cu/day

Say 5 cu/day  
 To Hand EXCAV \$530



TITLE SCRTO - METRO RAIL SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6353-1 DEPARTMENT \_\_\_\_\_ AUTHOR GJR DATE 2-11-87

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Must Dig out 2,005,000 cy

Total 3750 day = 670 cy/day.

Trks. (see tunnel) Say 20 cy @ 5 trk/shift = 100 cy/trk.

Ry - 670 ÷ 100 = 6 Trks

New cost sub at 6% less 000 = 5%.

Compacted Backfill

Total 518,970 cy.

Length = 10618 ÷ 16 ave cut x 6' = 431,950  
 1600 cy/ft  
 station

518,970 cy ÷ 12 = 32,435 cy/sta ÷ 1600 = 20.27 ft

Say 1000 cy/shift @ 1000 cy/shift

Crew

- Operator 1 - 30.00
- 1 Compactor Oper - 1.75.00
- 8 Hand Comp. Labor 160
- 2 Labor Fore 40.
- 2- Oper 977-0.7 50.
- 1 dump man 20
- 1 Cost party Labor 15325

TITLE SCRIP SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6367-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHE DATE 3-15-83

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Back Fill  
 Labor Cost  $\$325/\text{hr} = 2600 \text{ hr/day}$

Equipment  
 1 CR 25 30  
 8 Hand Vics. 32  
 1 977 Ldr 46  
 1 D-7 60  
170  $+ 1360 =$

LD Tkr  
 1 Oper 25  
 1 980 50  
75  $600 =$

$\$4560 =$  45

Went To Site  
 1 Cy = 1.15 Cy = 145 Ld.  
 200 Tkr 1.45 = 14 Cyl/dy.  
 Hand 5 ldr/dy = 70 Cyl/dy

Driver 25 @ 8 = 200  
 Tkr 67 @ 6 = 402

$636 \text{ hr/day}$  90

$10000 \text{ hr} : 70 = 15 \text{ Tkr/dy}$

TITLE 5 CRTD SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6763-1 DEPARTMENT \_\_\_\_\_ AUTHOR \_\_\_\_\_ DATE \_\_\_\_\_

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

SOLDIER PILE & LAGGING 1,390,100 SF  
 @ 10 P.C.C. = 139,010 LF SOLDIER PILE

Total Excess = 1,536,445 ft<sup>2</sup> +16 95,000 sq ft  
 length 106'8" x width 65' = 693,170 SF or 25,562 ÷ 16 = 1600 ft<sup>2</sup>  
 depth Ave = 60 LF

Say Soldier 139,010 ÷ 60 = 2320 ea  
 Add 10 ft for toe = 70' 162,400 LF Soldier pile

Use Means For crews & Mat'l (30<sup>00</sup>/sf.)  
 Use 34<sup>00</sup>

B. 50' @ \$3837<sup>00</sup>/day = 1700<sup>00</sup>/sq ave 277 SF/day

Allow Mat'l @ = @ 20<sup>00</sup>/sf

Estimate = @ 34<sup>00</sup>/sf

1390,100 SF ÷ 274 = 5070 sh. ft

- |      |                     |                  |                    |
|------|---------------------|------------------|--------------------|
|      | <u>SOLDIERS</u>     | <u>Lagging</u>   |                    |
| B-19 | 1 Pil. Butt Foreman | 1 Pil. Butt Fore | - 2 Pil. Butt Fore |
|      | 4 Pil. Butts        | 2 Pil. Butt      | 6 Pil. Butt        |
|      | 2 Equip Oper        |                  | 2 Oper             |
|      | 1 Order             |                  | 1 Order            |
|      |                     | 3 LABOR          | 3 Labor            |
| 1    |                     |                  |                    |
| 8    |                     |                  | 14 men             |

14 x 5070 = 70980 man

TITLE SECRET SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6362-1 DEPARTMENT \_\_\_\_\_ AUTHOR GHC DATE 3-15-51

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Solarix line & Logging Shallow = 155070 sf.

B-50 @ 383 1/2' / dg 800 / 50 = 480 sf / dg

Mat'l 1200 / 50 =

ESTIMATE & MERCH 20

155070 sf ÷ 480 = 323 Say 330

14 x 330 = 4620 mfd

TOTAL 5070 Shif. Deep  
 330 Shallow  
 5400 shifts ÷ 16 Ave 338 sf / shift.

Note Excess occur 3250 ÷ 16 Ave 203  
 2150 ÷ 16 Ave 134

5400 x 14 75600 shifts



TITLE SCRTD SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. 6357-1 DEPARTMENT \_\_\_\_\_ AUTHOR RHE DATE 3-11-53

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

STATION CANCELFUNNING

$47N @ 800' = 3,777,000$   
 $62\% \text{ pile} = \underline{314,750}$

$4,086,750' = \text{Avg } 5100\%$

Means \$815/cy.

Crew B-52 2300 cy/day = 2220 shifts

MAT'Ls } 125' / cy = 54 \$300/day  
 LABOR } 675 / cy = 1552 / day  
 Equip. }

1 Craft Foreman	=	2220	in days	4440
1 Carp.	=	2220	"	"
3 Labor	=	6660	"	5520
1 Cement Finish	=	2220	"	2220
0.5 Iron worker	=	1110	"	1110
0.5 Equip Oper	=	1110	"	1110
<u>7</u>		<u>15540</u>		Team 1110
0.5 T.E. Leader				



SCRTD METRO RAIL PROJECT  
STATION SHELL 2 OF 2  
6363-1

		No. 1 UNION STATION	MAIN YARD	No. 2 1ST HILL STATION	No. 3 5TH HILL STATION	No. 4 7TH HILL STATION	No. 5 AVENUE VENUE	No. 6 NORMANDE WEBSTER	No. 7 LA BREA FAIRFAX	No. 8 WILSHIRE FAIRFAX	No. 9 FAIRFAX BERELEY ST.	No. 10 FAIRFAX MCA. LA BREA	No. 11 SUNSET LA BREA	No. 12 H WOOD CANNELG. CITY	No. 13 UNIVERSA CITY	No. 14 NORTH H WOOD	TOTAL		
LENGTH	LF	640 LF		631 LF	631 LF	740 LF	490 LF	567 LF	672 LF	660 LF	660 LF	935 LF	685 LF	80 LF	600 LF	635 LF	630 LF	672 LF	
FRANKED SUB/TOTAL																		\$69,977,000	
CURING																			
QUANTITY	SF	284,190		395,400	228,364	260,800	148,555	219,250	370,200	277,432	322,447	455,500	218,076	35,350	389,110	257,120	153,900	370,700	5,187,300
AMOUNT	\$	\$19,200		\$19,800	\$31,450	\$14,650	\$35,300	\$11,000	\$15,550	\$19,900	\$19,150	\$20,750	\$10,900	\$17,150	\$14,470	\$12,900	\$7,700	\$18,550	\$259,700
FINISHING																			
QUANTITY	SF	482,700		455,030	228,364	175,000	118,230	207,549	427,600	312,578	503,910	718,074	2,302,888	325,815	514,961	474,293	116,120	481,000	6,881,600
AMOUNT	\$	\$278,400		\$37,650	\$12,150	\$15,450	\$58,250	\$102,700	\$291,550	\$185,500	\$224,000	\$48,350	\$246,150	\$210,700	\$219,750	\$22,200	\$4,300	\$277,500	\$2,345,700
WATERPROOFING																			
5/16 BENTONITE																			
QUANTITY	SF	49,520		264,422	159,250	148,320	47,000	77,574	111,721	109,900	107,835	207,700	85,300	112,750	114,553	105,900	105,113	111,721	1,858,100
SUB-TOT.	\$	\$22,600		\$227,400	\$136,750	\$177,550	\$41,450	\$25,500	\$76,100	\$94,850	\$94,450	\$103,600	\$73,800	\$7,300	\$101,950	\$91,100	\$29,400	\$20,100	\$1,162,200
WATERSTOP																			
JOINT PACKING																			
QUANTITY	LF	7,130		137,688	221,284	9,700	4,940	6,725	13,901	7,750	13,432	14,075	7,162	1,303	14,082	12,982	12,881	13,981	158,900
SUB-TOT.	\$	\$2,520		\$84,600	\$142,700	\$58,750	\$29,600	\$4,100	\$81,200	\$16,050	\$78,150	\$84,200	\$42,800	\$20,450	\$81,650	\$75,200	\$78,100	\$81,200	\$1,124,900
AMOUNT	\$	\$85,100		\$312,000	\$279,450	\$184,300	\$79,050	\$126,600	\$177,300	\$146,900	\$172,600	\$180,000	\$116,600	\$177,650	\$183,600	\$166,300	\$165,100	\$177,300	\$2,725,000
PAGE 2/2																		\$4,959,400	
PAGE 1/2																		\$69,977,000	
TOTAL																		\$69,977,000	



SCRTD METRO RAIL PROJECT  
6862-1

STATIONS FINISHING

ESTIMATED

ESTIMATED

		No. 1 UNION STATION	MAIN YARD	No. 2 1ST & HILL STATION	5TH & HILL STATION	No. 3 7th & RIVER STATION	No. 4 ALVARADO	No. 5 VERMONT	No. 5 NORMANDIE	No. 6 VETERAN	No. 7 LA BREA	No. 8 FARFAX HILLSIDE	No. 9 FARFAX BEVERLY	No. 10 FARFAX TAMPA	SUNSET LA BREA	No. 11 H'WOOD CANNING	No. 13 UNIVERSITY CITY	No. 14 NORTH H'WOOD	TOTAL
LENGTH	4 SF	(640) 30144		(631) 39800	(631) 50800	(740) 36125	(490) 22240	(567) 27840	(612) 22950	(620) 23140	(620) 24024	(735) 61700	(685) 25880	(680) 22550	(690) 24300	(635) 22650	(630) 25200	(672) 25440	104723 SF
ARCHITECTURAL	Amt.	\$1,848,000		\$2,112,000	\$2,684,000	\$2,205,000	\$1,807,000	\$1,743,000	\$1,407,000	\$1,407,000	\$1,470,000	\$3,256,000	\$1,617,000	\$1,326,000	\$1,491,000	\$1,428,000	\$1,575,000	\$1,554,000	\$26,590,000
MECHANICAL	Amt.	\$3,432,000		\$4,032,000	\$5,124,000	\$4,095,000	\$2,613,000	\$3,237,000	\$2,613,000	\$2,613,000	\$2,730,000	\$6,216,000	\$3,003,000	\$2,574,000	\$2,769,000	\$2,952,000	\$2,925,000	\$2,886,000	\$33,514,000
INCLUDES HV/AC, ELEVATORS & ESCALATORS																			
ELECTRICAL	Amt.	\$2,288,000		\$2,112,000	\$2,684,000	\$2,730,000	\$1,742,000	\$2,158,000	\$1,742,000	\$1,742,000	\$1,820,000	\$3,256,000	\$2,002,000	\$1,716,000	\$1,946,000	\$1,768,000	\$1,950,000	\$1,920,000	\$33,480,000
(AUXILIARY SYS.)																			
ELECTRICAL	Amt.	\$704,000		\$864,000	\$1,078,000	\$849,000	\$526,000	\$664,000	\$526,000	\$536,000	\$560,000	\$1,332,000	\$616,000	\$528,000	\$568,000	\$544,000	\$600,000	\$592,000	\$11,118,000
(MOTOR CONTROL CENTER)																			
FIRE PROTECTION	Amt.	\$528,000		\$480,000	\$610,000	\$630,000	\$402,000	\$428,000	\$402,000	\$402,000	\$420,000	\$740,000	\$462,000	\$396,000	\$426,000	\$408,000	\$450,000	\$444,000	\$7,698,000
SYSTEM & PLUMB. SEWAGE.																			
COST PER SF	Amt./SF	\$291		\$240	\$240	\$291	\$299	\$298	\$291	\$291	\$291	\$240	\$291	\$291	\$291	\$300	\$298	\$291	\$277
FINISHING TOTAL	Amt.	\$3,800,940		\$3,600,000	\$12,200,000	\$14,500,000	\$6,700,000	\$8,300,000	\$6,700,000	\$6,700,000	\$7,000,000	\$14,800,000	\$7,700,000	\$6,600,000	\$7,100,000	\$6,800,000	\$7,520,000	\$7,000,000	\$136,000,000

SCSD METRO RAIL PROJECT  
 STATIONS  
 6362-1  
 3-14-83

		No. 1 UNION STATION	No. 2 1 <sup>ST</sup> HILL 5 <sup>TH</sup> HILL	No. 3 7 <sup>TH</sup> HILL	No. 4 PULVERED	No. 5 1 <sup>ST</sup> HILL 1 <sup>ST</sup> HILL	No. 6 PULVERED	No. 7 WILSON LA BEE	No. 8 WILSON FAIRFAY	No. 9 WILSON FAIRFAY	No. 10 WILSON FAIRFAY	No. 11 WILSON FAIRFAY	No. 12 WILSON FAIRFAY	No. 13 UNIVERSITY CITY	No. 14 11 <sup>TH</sup> HILL HILL	TRAIL TRUCK	TOTAL		
SITE RESTORATION	LF	610	631	631	740	470	567	672	660	667	935	635	630	672	900		11518		
ARE GRADING	SF U/Cost AMT	280 128 5075	42210 128 78,700	56550 128 100,650	49800 128 88,650	33150 128 59,000	71300 128 126,950	58600 128 104,300	57260 128 91,250	53330 128 94,950	178,800 128 352,450	86200 128 153,420	93150 128 165,820	62,000 128 110,400	41,300 128 73,500	252,000 128 448,600	58,600 128 104,300	68000 128 121,000	1304250 128 2,328,700
CONCRETE GRADING	SF U/Cost AMT	13360 2 573	13025 121 24350	4325 121 8100	40760 121 76600	7975 121 14950	2050 121 3850	260 2 600	2000 121 3750	250 2 500	63,200 2 128,600			100,000 2 200,000	260 2 520	7200 2 140,000		281405 121 688370	
RR CANOPY	SF U/Cost AMT	18400 25 460,000																	18400 25 460,000
RR TRACKS & BALLAST	LF U/Cost AMT	3590 100 359,000																	3590 100 359,000
SEAL BUILDING WALL	SF U/Cost AMT	1800 20 36,000																	1800 20 36,000
LANDSCAPING	SF U/Cost AMT	5,000 2 10,000								102,700 128 154,050									102,700 128 154,050
MISCELLANEOUS	LS	95500	6100	8400	12100	22650			9000	35,100	17550	8450	16500	6300	10,000				247,650
SIGNS - REINSTALL	EA U/Cost AMT		3 100 300	4 100 400	8 100 800		5 100 500	15 100 1500	5 100 500	7 100 700									74 100 7400
TRAFFIC SIGNALS	EA U/Cost AMT		4 600 2400	8 600 4800	16 600 9600		10 600 6000	8 600 4800	4 600 2400				2 600 1200						64 600 38400
		Sub-TOTAL	1,045,000				131,300						164,300	75,200					460

SCCD METRO RAIL PROJECT  
6363-1  
3/15/83  
STATIONS

	No. 1 UNION STATION	No. 2 1ST & HILL 5TH & HILL	No. 3 7TH & FLOWER	No. 4 ALVARADO	No. 5 VERMONT NOBUNNIE	No. 6 WESTERN	No. 7 WILSHIRE LA BREA	No. 8 WILSHIRE FAIRFAX	No. 9 FAIRFAX BEVERLY SANTA MONICA	No. 10 SUNSET LA BREA	No. 11 LA BREA CANTON	No. 12	No. 13 UNIVERSAL CITY	No. 14 NORTH H WOOD	TAIL TRACK				
<u>SITE RESTORATION (CONT)</u>																			
CONCRETE CURBING	LF U/C AMT	1010 9 <sup>42</sup> 9500	1855 9 <sup>42</sup> 17450	1570 9 <sup>42</sup> 14950	360 9 <sup>42</sup> 3400	2450 9 <sup>42</sup> 23050	1840 9 <sup>42</sup> 17300	1540 9 <sup>42</sup> 14500	1760 9 <sup>42</sup> 13750	6150 9 <sup>42</sup> 57800	2170 9 <sup>42</sup> 20400	250 9 <sup>42</sup> 2350	1560 9 <sup>42</sup> 14700	650 9 <sup>42</sup> 6100	7400 9 <sup>42</sup> 69600	1840 9 <sup>42</sup> 17300	1800 9 <sup>42</sup> 17000	33925 9 <sup>42</sup> 319150	
STREET LIGHTS REINST	EA U/C AMT	11 600 6600	14 600 8400	40 600 24000		6 600 3600	18 600 10,800	14 600 8400	12 600 7200				26 3000 78,000	18 600 10,800	12 600 7200			173 960 164,200	
PARKING METER REINST	EA U/C AMT	3 100 300	10 100 1000	5 100 500		24 100 2400	60 100 6000	11 100 1100	15 100 1500					60 100 6000	70 100 7000			258 100 25,800	
MANHOLES	EA U/C AMT		13 1500 19500	12 1500 18000		4 1500 6000	7 1500 10,500	36 1500 54,000	4 1500 6000					7 1500 10,500	4 1500 6000			87 1500 130,500	
FIRE HYDRANTS	EA U/C AMT		3 1000 3000	4 1000 4000		3 1000 3000	5 1000 5000	6 1000 6000	4 1000 4000		1 1000 1000			5 1000 5000	2 1000 2000			33 1000 33000	
NIGHT STANDARDS	EA U/C AMT		8 600 4800	8 600 4800															16 600 9600
TOTAL		1,045,000	124250	176,500	254,000	100,000	169,350	162,000	184,300	140,600	728,000	191,400	180,000	179,200	101,300	1,413,400	18,190	176,000	5,009,800
														1700 CARS 9000 54 550		10,744,000			(PARKING STRUCTURE)
														26 3000		58,100			(PARKING AREA)
																178,000			(PARKING LIGHTING)
																165,000			(LANDSCAPE)

SCRTO METRO RAIL PROJECT  
6363-1  
STATIONS 3/15/83

	No. 1 UNION STATION	No. 2 1 <sup>ST</sup> & HILL 5 <sup>TH</sup> & HILL	No. 3 7 <sup>TH</sup> & FLOWER	No. 4 ALVARADO	No. 5 VERMONT BERNARDO	No. 6 WESTERN	No. 7 WILSHIRE LA BREA	No. 8 WILSHIRE FAIRFAX	No. 9 FAIRFAX BEVERLY SAN MAR	No. 10 SUNSET LA BREA	No. 11 H'WOOD CAHESNA	No. 12	No. 13 UNIVERSAL CITY	No. 14 NORTH H'WOOD	TRAIN TRACK	TOTAL			
<u>TRAFFIC MAINTENANCE</u>																			
6' C.L. FENCE	LF 1500 6 <sup>00</sup>	1550 5 <sup>42</sup>	1700 5 <sup>25</sup>	1860 5 <sup>25</sup>	1140 5 <sup>25</sup>	2140 5 <sup>25</sup>	1540 6 <sup>-</sup>	1760 5 <sup>25</sup>	1560 6 <sup>-</sup>	2160 6 <sup>-</sup>	1610 6 <sup>-</sup>	1660 6 <sup>-</sup>	2250 6 <sup>-</sup>	2240 6 <sup>-</sup>	-	3700 6 <sup>-</sup>	1540 6 <sup>-</sup>	2277 6 <sup>-</sup>	32187 5 <sup>00</sup>
	AMT 9000	8900	9800	10,700	6600	12,300	9250	10,150	9360	13,000	9650	10,000	13500	13450	-	22,200	9250	14,000	191,100
MISCELLANEOUS ITEMS	LS 6000	32750	39,200	42,900	4400	2700	6150	6850	6240	8700	6450	6,600	5600	5550	-	7800	6150	8000	202040
	TOTAL 15,000	41650	49000	53,600	11,000	15,000	15400	17,000	15,600	21700	16100	16600	19100	19000	-	30,000	15,400	22,000	393,200
<u>UTILITIES SUPPORT</u>																			
	(640)	(631)	(631)	(740)	(400)	(567)	(672)	(660)	(660)	(935)	(685)	(680)	(690)	(635)	-	(630)	(672)	(900)	11518
	LF 5%	5%	5%	5%	60	5%	5%	5%	5%	5%	3%	5%	5%	5%	-	1%	5%	-	1230
	AMT 517,600	773,850	1,003,650	684,250	73,800	379,600	567,500	538,300	562,850	1,186,300	239,500	502,000	564,900	286,400	-	103,000	567,900	600,000	9,171,600
<u>MOBILIZATION</u>																			
	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	-	4%	4%	-	255,000
	AMT 434,800	619,150	807,950	547,400	255,000	318,700	476,950	446,600	492,800	983,850	328,900	446,000	474,500	469,700	-	415,200	476,950	500,000	8,497,400

FORMS 4635,500 SF \$ 27,270,000 MAT'L → \$ 8,134,000

24.50 FOREMAN 126,800 MH. CARPENTER 507,100 MH. LABORER 126,800 MH. POWER TOOLS \$ 439,000 LABOR \$ 18637,000

CONCRETE 424,500 Cy \$ 29,836,000 MAT'L → \$ 19,916,000

22.40 FOREMAN 35,300 MH. FINISHERS 73,000 MH. LABORERS 92,400 MH. EQUIP. OPER. 39,800 MH. EQUIP. \$ 2,483,000 LABOR \$ 7,437,000

REBAR 42,815 Ton \$ 32,871,000 MAT'L → \$ 16,009,000

27.95 FOREMAN 51400 ROOFMEN 429,900 MH. EQUIP. OPER. 37,800 MH. EQUIP. \$ 2,355,000 LABOR \$ 14,509,000

WIRING 5,189,300 SF \$ 259,700 MAT'L → \$ 103,000

19.40 LABORERS 8,100 MH. LABOR \$ 156,700

FINISHING 6,494,600 SF \$ 3,945,700 MAT'L → \$ 41,500

22.00 LABOR 2300 MH. FINISHER 7,200 MH. EQUIP. \$ 28,900 LABOR 209,000

WATERPROOF MAT'L → 1,124,000

24.25 ROOFER 19,600 MH. LABOR 476,200

24.55 CARPENTER 4200 MH. MAT'L 1,023. LABOR 102,500

TOTAL MAT'L 2,147,000 LABOR 578,500

F	L	Q	FIN	EQ	ROD	EL	PL
126.8	126.8	507.1					
35.3	92.4		73.0	39.8			
31.4				37.8	429.9		
							4.457.9
213.5	219.2	507.1	73.0	77.6	429.9		
14.04%	14.42%	33.54%	4.8%	5.1%	28.1%		

5,009.35

16,054.40	301.1
15,789.9	264
264.4	371







# PARKING STRUCTURE, UNIVERSAL CITY

1,700 CARS @ 6,320 = 10,744,000

MAT'L. → \$ 5,362,100

22.25 FOREMEN 19.6 LABORERS 24.85 CARPENT. 23.0 FINISHER, 24.96 EQUIP. OP., 27.96 ROOMMAN, 27.7 ELECT, 27.65 PLUMB

LABOR → 4,801,700

28,100 MH 33,100 61,400 9,300 9,100 44,800 8,000 4,400

EQUIP. → 530,200

STATION FINISHING 484,743 SF \$134,400,000

ARCHITECTURAL (\$28,590,000)

MAT'L \$17,154,000

SPECIALTY CRAFTS

LABOR 11,436,000

MOSAIC & TERRAZZO

GLAZIERS

TILE LAYERS

LATHERS

PLASTERERS

ORNAMENTAL METAL

PAINTERS

ROOFERS

MARBLE SETTERS

508,300 M.H.

MECHANICAL \$53,514,000

MAT'L \$38,530,000

TOTAL MANHOURS

540,900 M.H.

LABOR \$14,984,000

ELECTRICAL \$44,598,000

MAT'L \$30,327,000

TOTAL MANHOURS

515,200 M.H.

LABOR \$14,271,000

POTABLE WATER }  
FIRE PROTECTION } \$7,698,000  
SANITARY SEWERAGE }

MAT'L \$5,000,000

LABOR \$2,698,000

TOTAL MANHOURS

96,500 M.H.

1,660,900 M.H.

# TUNNEL VENT SYSTEM

## STATIONS

O/U STATION	\$10,400,000					MAT'L.	\$ 8,996,000
FOREMEN	LABORERS	EQUIP. OP.	MILLWR.	ELECT.		LABOR	1,404,000
4,100	12,700	2,500	21,300	10,100 MH	50,700 M.H		
520	1,590	310	2,660	1,260	→ 6,340 M.D		

SINGLE LEVEL STATION	\$22,700,000					MAT'L.	\$ 19,522,000
FOREMEN	LABORERS	EQUIP. OP.	MILLWR.	ELECT.		LABOR	3,178,000
9,200 MH	28,700	5,700	48,200	22,900	114,780 M.H		
1,150	3,600	710	6,030	2,860	→ 14,350 M.D		

## GUIDEWAYS

LINE VENT MECH.	\$2,800,000					MAT'L.	\$ 2,800,000
FOREMEN	LABORERS	EQUIP. OP.	MILLWR.	ELECT.		LABOR	600,000
1,700	5,400	1,100	9,100	4,300	21,600 M.H		
210	680	140	1,140	530	2,700 M.D		

LINE VENT STRUCT.	\$18,500,000					MAT'L.	11,100,000
FOREMEN	LABORERS	EQUIP. OP.	MILLWR.	ELECT.	CARP. FINISH. I.W.	LABOR	7,400,000

CROSSOVER VENT MECH.	\$2,200,000					MAT'L.	\$ 1,800,000
FOREMEN	LABORERS	EQUIP. OP.	MILLWR.	ELECT.		LABOR	400,000
1,200	3,600	700	6,000	2,900	10,400 M.H		
150	450	90	750	360	1,800 M.D		

TRACK WORK

BALLASTED AT GRADE \$15,800,000

MAT'L. \$13,746,000

FOREMAN LABORER I.W. Equip. Op

LABOR 1,580,000

6,300 25300 25300 6,300

EQUIP. 474,000

DIRECT FIXATION \$46,500,000

MAT'L \$40,455,000

FOREMAN LABORER I.W. EQUIP. OPER.

LABOR 4,650,000

14,900 74,560 74,560 14,900

EQUIP. 1,395,000

TRACK WORK

					\$ RATE	\$
F	1	@	8	15%	8	247.6
I.W.	4	@	8	40%	32	926.4
L.P.B.	4	@	8	45%	32	620.8
E.O.	1	@	8	10%	8	199.6
					<u>80</u>	<u>1994.4</u>

SMY 24.75 AVR

63,300  
186,400

THE RALPH M. PARSONS COMPANY

BY \_\_\_\_\_

DATE 3-16-83

SUBJECT SCRTD

JOB NO. 6363-1

52

1.2 CUT & COVER 1677 LF

MAN POWER  
MAN HOURS

TOTAL

	\$	SUPERV. SALARY	CLERICAL	TUNNEL LABOR	LABOR	OPER. ENG'R	ELECT.	CARP.	PILE BUTTS	STEEL WORKER	TEAMST.	PIPE FITTER	CEMENT FINISH	ROOFER			MAN-HOURS	MAN-DAYS
DEMOLITION	286,000				2240	2520	224			304	1040						6328	791
E/W exc. + b/f	5231,400				19600	26880					30320						76100	9600
shoring + deck.	9,990,000				28800	27360			60400		8240						132880	16610
CONCRETE WORK																		
formwork	4,307,000				20000			100080									120080	15200
CONCRETE WORK																		
in place	3,768,000				16720	5200						9560					31480	3935
REBAR	5,558,000					5720				75760							81480	10210
CURING	41,000				1280												1280	160
FINISHING	427,000				320								960				1280	160
WATERPROOFING	362,000							600						2800			3400	425
SITE RESTORATION	744,000				4620	2400	1040	80		820		320	520				9200	1150
TRAFFIC MAINT.	57,000				2800												2800	350
UTILITIES SUPPORT	1,327,000				6240	4280	15080					9960					35660	4445
MOBILIZATION	1,237,000	1200			3600	8400	150	2400			2400	1200					19250	2419
s/f	38,766,200																	
+15 1/2%	55,307,000																	
COST per LF @	\$29,843																	
		1200			106120	82960	16490	103160	68480	76380	42000	11480	11040	2800			532180	
		150			13260	10370	2060	12890	8560	9550	5250	1440	1080	350				65260

2/18

THE RALPH M. PARSONS COMPANY

DATE 3-16-83

BY SCRTD

JOB NO. 6363-1

SUBJECT MAN POWER

M A N H O U R S

1.4 POCKET TRACK 2250 LF

TOTAL

		SUPERV. SALARY	CLERICAL	TUNNEL LABOR	LABOR	OPER. ENG'R	ELECT.	CARP.	PILE BUTTS	STEEL WORKERS	TEAMST.	PIPE FITTER	CEMENT FINISH	ROOFER	MAN-HOURS	MAN-DAYS
DEMOLITION	204,800				3000	3312	288			416	1400				8496	1062
E/W exc. & b/f sharing deck.	6766,600				26800	36080					40720				105200	12900
	13,414,000				38680	36760			91920		11000				178260	22295
CONCRETE WORK formwork	5778,000				26880			134320							161200	20150
CONCRETE WORK in-place	5055,000				82440	7000						12800			82160	5280
REBAR	7,458,000					8000				101680					109680	13710
CURING	55,000				1680										1680	210
FINISHING	573,000				400							12800			1680	210
WATERPROOFING	485,000							800						3720	4520	565
SITE RESTORATION	1,045,000				6120	3240	1400	80		400		480	680		18400	1550
TRAFFIC MAINT.	77,000				3800										3800	475
UTILITIES SUPPORT	1,791,000				8440	5760	20360					13440			48000	6000
MOBILIZATION	1,660,000	1600			4800	11200	1600	3200			3200	1600			27200	3400
S/T	44,592,200															
+15% %	51,246,000															
COST PER LF @ \$22,865		1600			142,640	111480	23650	138400	9920	102500	56320	15620	14760	3720	702460	87810
		200			17830	13930	2460	17200	11490	12820	7040	1340	1840	460		

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THE RALPH M. PARSONS COMPANY

DATE 3-16-83

5f

SUBJECT SCRTD - METRO RAIL  
MAN POWER

JOB NO. 6863-1

1.5 CROSS OVER - 3220 LF

MAN HOURS

	*	SUPERV. SALARY	CLERICAL	TUNNEL LABOR	LABOR	OPER. ENGR	ELECT.	CARP.	PILE BUTTS	STEEL WORKER	TEAMST.	PIPE FITTER	CEMENT FINISH	ROOFER	TOTAL	
															MAN-HOURS	MAN-DAYS
DEMOLITION	550,000				4304	4840	416			592	2000				12152	1519
E/W exc. & b/f shoring & deck.	9665,000				37800	61680					58320				147800	18475
	17,196,000				55320	42520			131720		15760				255320	31915
CONCRETE WORK formwork	8,270,000				38400			192200							230600	27825
CONCRETE WORK in place	7,225,000				32120	10000							18360		60480	7560
REBAR	1,672,000					11440				145440					156880	19610
CURING	71,000				2480										2480	310
FINISHING	820,000				600								1840		2440	305
WATERPROOFING	694,000							1120						5320	6440	805
SITE RESTORATION	1,495,000				8760	4600	2000	120		600		640	1000		11720	2215
TRAFFIC MAINT.	110,000				5400										5400	675
UTILITIES SUPPORT	2,504,000				12080	8240	29120					19200			68440	8580
MOBILIZATION	2,375,000	2320			6880	16080	2320	4640			4640	2320			39200	4900
5f	63,725,000															
+15% fee	73,602,000															
COST PER LF @ 322,858																
		2320			204140	159400	33860	191080	131720	146630	80720	22160	4200	5320	1005550	1
		290			35520	19930	4230	24760	16460	18330	10090	2770	2650	660		125690

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THE RALPH M. PARSONS COMPANY

BY \_\_\_\_\_  
 SUBJECT SCRTO - METRO RAIL  
MAN POWER

DATE 3-16-83

JOB NO. 6363-1

M A N H O U R S

55

5.0

TAIL TRACK - 900 LF

TOTAL

	\$	SUPERV. SALARY	CLERICAL	TUNNEL LABOR	LABOR	OPER. ENGR	ELECT.	CARP.	PILE BUTTS	STEEL WORKER	TEAMST.	PIPE FITTER	CEMENT FINISH	ROOFER	SPECIAL CRAFT	MAN. HOURS	MAN. DAYS
DEMOLITION	43,000				336	284	32			48	160					960	120
E/W exc. 1 b/c sharing deck..	9,857,600 5,063,000				12240	17120					17760					47120	5890
					12160	13000			30400		4360					57920	7490
CONCRETE WORK formwork	2,642,000				11400			57000								62000	9550
CONCRETE WORK in place	2,022,000				8960	2800						5120				16880	2110
REBAR	2,983,000					3200				10640						43140	5480
CURING	176,000				5560											5560	690
FINISHING	229,000				160							520				680	85
WATERPROOFING	194,000							320					1480			1800	225
SITE RESTORATION	170,000				1040	560	240	40		80		80	120			2160	270
TRAFFIC MAINT.	22,000				1080											1080	135
UTILITIES SUPPORT	600,000				2840	1920	6840					4480				16080	2010
MOBILIZATION	520,000	480			1440	3360	480	960			960	480				8160	1020
ARCHITECTURAL	4,762,000						26200					32600			2000	84800	10600
5/7	122,473,600																
+15% %	1,355,971,000																
Cost per LF	\$ 20,841.-	480			57220	42840	33790	58320	30400	40770	23240	37640	4760	1480	26000	357640	
6.0	MANDAYS.	60			7150	5290	4220	7290	3800	5100	2910	4700	720	190	3250		44680

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5007: MISTO RAIL PROJECT  
 MAN POWER REQUIREMENT  
 DEMOLITION - MANDAYS

	DEMOLITION		TOTAL TRACK	TOTAL CROSSING	TOTAL CUT & COVER	TOTAL FOOT TRACK	
	Station	Track					
TOTAL Length Sta.	10+84.5	900	11519	930	3220	1677	2250
TOTAL COST	\$1926850	\$43000	196985	\$43000	\$281800		\$384000
UNIT COST	181 <sup>00</sup>	47 <sup>33</sup>	171 <sup>00</sup>				
	MANDAYS						
OPER ENG	2120			50	605	315	465
LABOR	1880			40	540	280	375
IRONWORKER	260			5	75	40	50
ELECTRICIAN	130			5	50	30	35
TELETYPE	275			20	250	130	175
	<u>5315</u>						

SOFT & METAL RAIL  
 RICHMOND  
 FAIRFAX

	STATIONS				TAIL TRACK				TOTAL CROSSING				CUT & BUCK				PACET TRACK			
	TOTAL	MUCK	Compact	TOTAL	TOTAL	Muck	Compact	TOTAL	TOTAL	Muck	Compact	TOTAL	TOTAL	Muck	Compact	TOTAL	TOTAL	Muck	Compact	TOTAL
Length	10613	10613	10613		900				320				1677				2250			
Total Quantity	1458860				142592				224117				225711				225711			
	7750				142022				4222				225711				225711			
	653574	235000	58300		156400	185000	43100		224117	32000	15000		225711	32000	21000		225711	32000	21000	
Ave per LE	14500	12000	4800		17400	16000	5000		14800	13000	4500		14800	13000	4500		14800	13000	4500	
Rise per LF	500		192		64		222		64		222		64		222		64		222	
Ave per LF/UF	28		243		22		209		22		209		22		209		22		209	
AMT. \$	60		150		2400		150		2400		150		2400		150		2400		150	
TOTAL AMT	10615000	12000000	3174000		11715000	11100000	2800000	6,050,600	5500000	3640000	2473000	9,665,000	1,250,000	1,900,000	1,270,000	5,130,000	2,450,000	2,500,000	1,770,000	6,720,000
OPEN ENGR	1250		2600		1200		260	2140	1200		260	2140	1200		260	2140	1200		260	2140
LAROL	970		6240		970		6240	1530	970		6240	1530	970		6240	1530	970		6240	1530
TEAR STEEL		16250	7800			16250	7800	2220		16250	7800	2220		16250	7800	2220		16250	7800	2220
	29250	15250	15250		2850	1500	1540	5890	2850	1500	1540	5890	2850	1500	1540	5890	2850	1500	1540	5890
QUANT.	SPECIAL PILE	DEAN'S PILE	CHANCE PILE	TOTAL	SPECIAL PILE	DEAN'S PILE	CHANCE PILE	TOTAL	SPECIAL PILE	DEAN'S PILE	CHANCE PILE	TOTAL	SPECIAL PILE	DEAN'S PILE	CHANCE PILE	TOTAL	SPECIAL PILE	DEAN'S PILE	CHANCE PILE	TOTAL
Long - Tail	150000	60000			124000	50000			124000	50000			244000	110000	800		327500	147000	1200	
Short - Tail	130000	17000			124000	20000			124000	20000			124000	20000			124000	20000		
TOTAL	150000	60000	5000		124000	70000			124000	70000			244000	110000	800		327500	147000	1200	
	10500	1000	000		13800	7700			13800	7700			13800	7700	000		13800	7700	000	
AMT. \$	3400	1000	5000		3400	1000			3400	1000			3400	1000	5000		3400	1000	5000	
TOTAL AMT	10615000	12000000	4000000		12230000	8000000		13063000	15000000	9000000	12000000	19,000,000	3,050,000	1,270,000	600,000	9,990,000	11,000,000	1,770,000	5,130,000	13,000,000
OPEN ENGR	1250	3200	2000		1300	500		1625	1300	500		1625	1300	500	3420	3420	600	470	4595	
LAROL	13000	2140	4440		13000	2140	4440	1520	13000	2140	4440	1520	13000	2140	4440	1520	13000	2140	4440	1520
TEAR STEEL	5400	1200			435	110		545	435	110		545	435	110	1970	1970	350	230	1375	
PILE BUTT	37300	7600	8330		38450	7600		3800	11470	2295	2700	16965	3975	11470	1395	8560	3010	1600	1390	11470
	7600	14000	15500		6075	145		7490	2890	4260	4725	3915	11950	2215	2445	16610	16025	2800	3290	22295



STATION FINISHING 484,743 SF \$134,400,000

ARCHITECTURAL (\$28,590,000) MAT'L \$17,154,000  
 SPECIALTY CRAFTS LABOR 11,436,000  
 MOSAIC & TERRAZZO  
 GLAZIERS  
 TILE LAYERS  
 LATHERS  
 PLASTERERS } 508,300 M.H.  
 ORNAMENTAL METAL } 63540 M.H. =  
 PAINTERS } 450 M.H.  
 ROOFERS  
 MARBLE SETTERS

MECHANICAL \$53,514,000 MAT'L \$38,530,000  
 TOTAL MANHOURS 540,900 LABOR 14,984,000  
 FOREMEN STEAM

ELECTRICAL \$44,598,000 MAT'L \$30,327,000  
 TOTAL MANHOURS 515,200 LABOR 14,271,000

POTABLE WATER  
 FIRE PROTECTION } \$7,698,000 MAT'L 5,000,000  
 SANITARY SEWERAGE } LABOR 2,698,000  
 TOTAL MANHOURS 96,500

TOTAL SPECIALTY 1,669,900 M.H. = 207,600 M.D.  
 = 647 2/3 \$/M.O.A

ARCHITECTURAL FOR NORTH TAIL TRACE \$4,762,000  
 @ 40% = LABOR of 215 = 10600 M.DAYS

Specialty Craft 3240 = 2092 m.b.  
 PIPE FITTER 4070 = 34600  
 ELECTRICAL 3790 = 26200  
 10600 = 84800 m.b.

Done!

# SUMMARY OF COSTS

FOR: SCRTD GROUP: \_\_\_\_\_ ESTIMATE NO. 6363-1

WORK: MOBILIZATION SHEET NO. 5

WORK ITEM NO. \_\_\_\_\_  
 PREPARED BY: GUR DATE: 5-16-57  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

*Labor*

ITEM OR REF NO	WORK SCHEDULE DESCRIPTION	QUANTITY	UNIT	\$/HR	MEX	FREIGHT	EQUIP	OPER	TOTAL
1	SUPER			40					
1	OPER ENGR FORE			35					
1	CIAAC CHIEF			25					
1	PIPING OILER			20					
4	MECHANICS			100					
1	LABOR FORE			15					
2	LABOR			50					
2	CARPENTER			60					
1	ELECT			30					
1	PIPE FITTER			30					
2	TRE DRIVER			40					
				450					
17	MAN DAY (136 hrs)			3640					
	Ave Per Man			26.5					
	ALLOW R. 5 mhr/Ton Equip move in								
	136 ÷ 25 = 5.44			55					
	EST FRT IN @ 50¢/hr × 55								
	Misc Mat'l & Supplies								
	TOTAL Cost/day			3640	710	2750	1200	8300	9300
	TOTAL Mobilization Stations								
	No Shifts								

*Picks*  
 10  
 10  
 15  
 27  
 30  
 10

*20 Ton Load  
 3 TN Filled*  
 4000  
 1800  
 2000  
 6600  
 1200/day

5,174.00  
 324  
 1625  
 69

SCRTD  
MANPOWER - MAN DAYS

	STATIONS				TAIL TRAIL				CROSS-DIEM				CUT & COVER				POST-YEAR			
	Site RESTOR	TRAFFIC MOUNT	UTIL MOUNT	MOBL	Site RESTOR	TRAFFIC MOUNT	UTIL MOUNT	MOBL	Site RESTOR	TRAFFIC MOUNT	UTIL MOUNT	MOBL	Site RESTOR	TRAFFIC MOUNT	UTIL MOUNT	MOBL	Site RESTOR	TRAFFIC MOUNT	UTIL MOUNT	MOBL
TOTAL AMT.	\$5,347,000	\$3,931,500	\$9,171,600	\$8,477,400	\$116,000	\$22,000	\$60,000	\$500,000	\$1,495,000	\$110,000	2,524,000	2,375,000	\$774,000	57,000	1,327,000	1,237,000	1,045,000	77,000	1,791,000	1,657,000
UNIT FILE	4642	3412	7762	7372	1952	2412	6212	5552	4642	3412	7762	7372	4642	3412	7762	7372	4642	3412	7762	7372
SUPERV.				1025				60				290				150				200
EQUIP. ERECTION	910		3690	1025	30		240	60	255		1030	290	130		535	150	180		720	200
EQUIP. OPER.	1150			6150	40		360	360	320		1720	1720	170		900	900	225		1700	1700
LABOR. AND FORMS	3910	2410	5400	3075	130	136	355	180	1095	675	1510	860	525	350	780	450	765	475	1055	600
ELECT.	870		13025	1025	30		855	60	240		3640	290	130		1885	150	175		2545	200
IRON WORKS	260				10				25				4				58			
CEMENT FINISH	45				15				125				65				85			
CONCRETE	60			2050	5		120	40	15			580	10		300	10	10		400	400
PIPE FITTING	290		8600	1025	10		540	40	80		2400	280	40		1245	130	60		1680	200
TRAILER				2050			120					580			200					460
				17425																

REFERENCE DATA

RECEIVED FROM SCR TD

1. Capital Cost Estimate - Dated December 3, 1982  
Revised January 7, 1983
2. Functional Plan - Yards and Shops 12-14-82
3. Project Schedule
  - a. Phase A1 Union Station to Wilshire/Vermont  
Station Facilities Sheet 1 of 5
  - b. Phase A1 Union Station to Wilshire/Vermont  
Station Systemwide Sheet 2 of 5
  - c. Phase A2 Wilshire/Vermont to Fairfax/Beverly  
Facilities and Systemwide Sheet 3 of 5
  - d. Phase A3 Fairfax/Beverly Station to  
Hollywood/Cahuenga Station  
Facilities and Systemside Sheet 4 of 5
  - e. Phase A4 Hollywood/Cahuenga Station  
to North Hollywood Station  
Facilities and Systemwide Sheet 5 of 5
4. Proposed Liners for the Rod Tunnels  
Alternate A - P.C.C. Segments  
Alternate B - Cast-in-place concrete Dwg. No. AC-16AAA-C-003
5. Proposed Tunnel Liner for the Fernando/  
Puente Foundations -  
MK II Version without bolt pockets Dwg. No. AC 16AAA-006
6. Proposed Tunnel Liner for the Alluvial Soils  
A1, A2, A3, A4, and San Pedro Sand  
MK II Version without bolt pockets Dwg. No. 16AAA-C-005
7. Proposed Internal Oil and Gas-Proof  
Steel Liner Dwg. No. 16AAA-C-004
8. Cross Passage Between Tunnels Alluvial  
Soils (sheet 1) Dwg. No. 16AAA-C-012
9. Cross Passage Between Tunnels  
Alluvial Soils Dwg. No. 16AAA-C-014
10. Preliminary Draft Report for Development  
of Milestone 10 Fixed Facilities February 1983

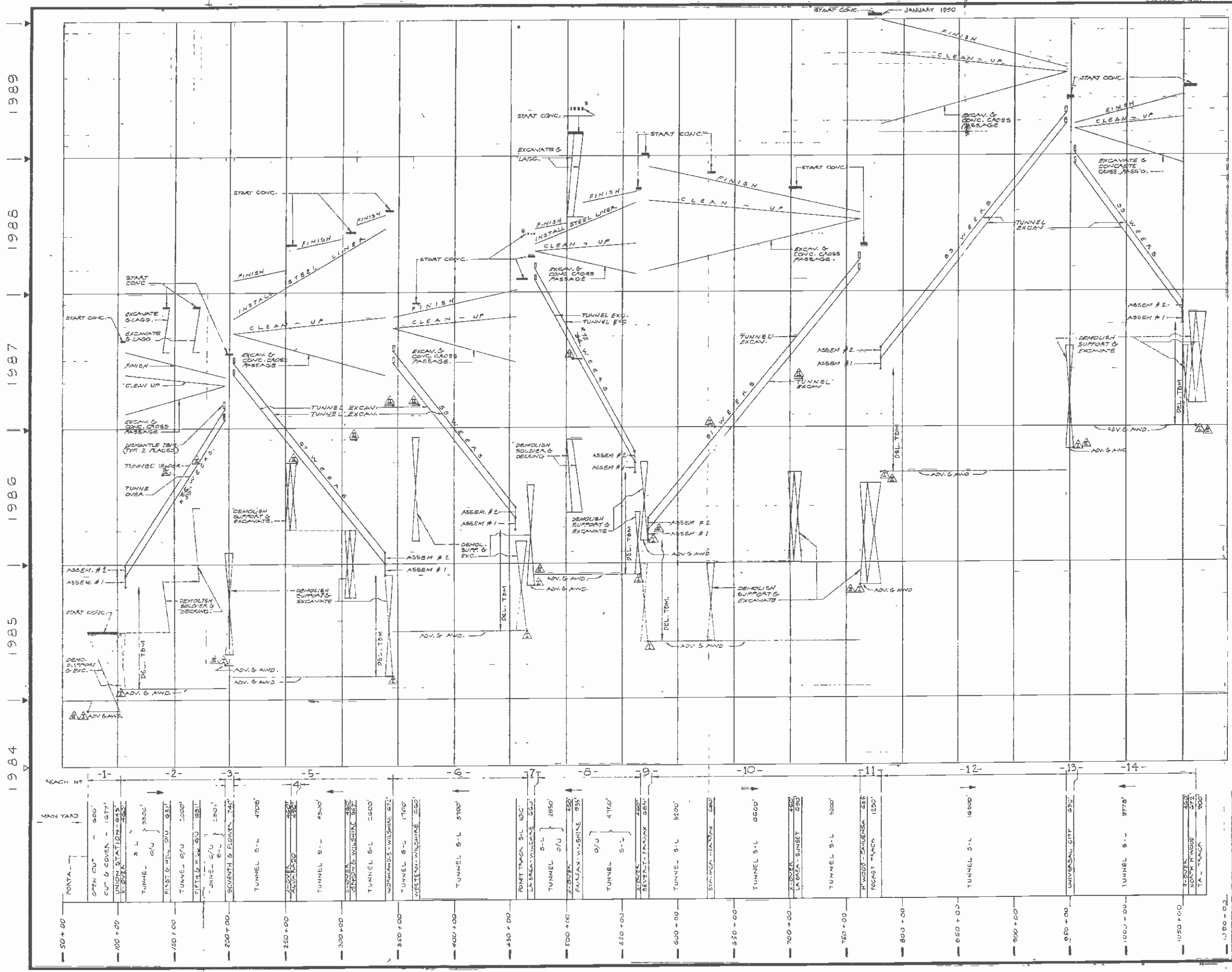






APPENDIX C

1



- NOTES & LEGEND:**
- ▲ ADVERTISE AND AWARD - STAGE I CONSTRUCTION  
DATE OF AWARD INDICATED ON B.C.P.T.D.  
PROJECT SCHEDULE, JANUARY 1983.
  - ▲ STAGE II CONSTRUCTION - DATE OF AWARD IN-  
DATED ON B.C.P.T.D. PROJECT SCHEDULE  
JANUARY 1983.
  - ∇ DEMOLITION, INSTALLATION OF SOLDIER FILES  
AND STREET DECKING.
  - Z OPEN CUT EXCAVATION & LAGGING.
  - △ DEMOLITION, INSTALLATION OF SOLDIER FILES,  
STREET DECKING, EXCAVATION & LAGGING.
  - ▲ ASSEMBLY OF TBM #2  
▲ ASSEMBLY OF TBM #1
  - DISMANTLE OF TBM #2  
□ DISMANTLE OF TBM #1
  - ← DIRECTION OF TUNNELING.

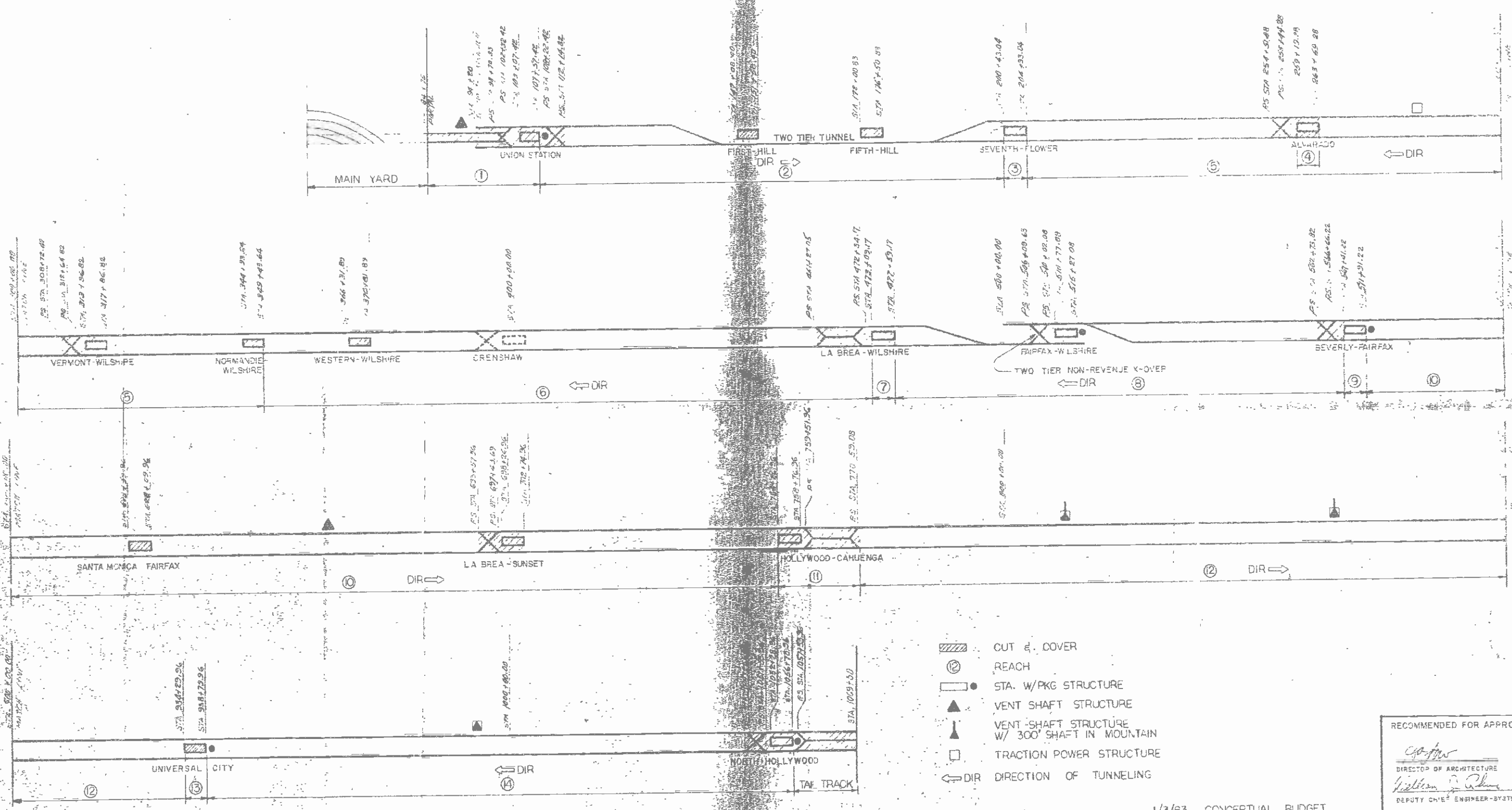
METRO RAIL PROJECT - SCRT D  
R.M. PARSONS CO.  
PRELIMINARY - TUNNEL  
CONSTRUCTION LOGIC  
SCHEDULE

ENGR: G.H. EIDE	3/24/83	SHEET
DESIGN: P.A. PERAZ	3/24/83	1 of 1
SCALE: 1" = 3000'-0"		



1.1	LOCATION/REACH	MAIN YARD	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7	NO. 8	NO. 9	NO. 10	NO. 11	NO. 12	NO. 13	NO. 14	NORTH TAIL TRACK	SYSTEM WIDE FACILITIES	TOTAL FALL 1982 COST	REMARKS
	LENGTH (FT.)		2,922	9,323	740	490	14,257	12,070	660	9,455	685	18,830	1,885	16,500	630	10,910				
1.0	GUIDEWAYS																			
1.1	DUAL TRACK AT GRADE																		11.2	
1.2	DUAL TRACK CUT AND COVER																		42.0	
1.3	DUAL TRACK TWIN TUNNEL																		531.0	
1.4	POCKET TRACK																		56.2	
1.5	CROSSOVER																		80.5	
1.6	LINE VENT MECHANICAL																		2.1	
1.7	LINE VENT STRUCT. CITY																		2.4	
1.8	LINE VENT STRUCT. MOUNT.																		11.0	
1.9	CROSSOVER VENT SYST. MECH.																		2.4	
1.10	UNDERPINNING																		2.8	
1.11	MISCELLANEOUS																		73.4	
																			826.0	97
2.0	STATIONS																			
2.1	STATIONS																		475.3	
2.2	S.L. LINE VENT MECH.																		28.4	
2.3	O/U LINE VENT MECH.																		111.9	
2.4	UNDERPINNING																			
																			INC. IN 2.1	
																			151.1	97
3.0	PARKING																			
3.1	AT GRADE																		0.4	
3.2	STRUCTURE																		20.3	
																			20.4	97
4.0	TRACK WORK																			
4.1	BALLAST'D AT GRADE																		15.8	
4.2	DIRECT FIXATION																		46.5	
																			62.3	97
5.0	YARDS AND SHOPS																			
5.1	DEMOLITION																		6.5	
5.2	SITE PREPARATION																		1.3	
5.3	STRUCTURAL																		3.7	
5.4	ROADS AND PAVEMENT																		1.2	
5.5	ELECTRIC																		0.5	
5.6	YARD LIGHTING																		0.6	
5.7	MAIN SHOP BUILDING																		1.4	
5.8	M. OF W. BUILDING																		3.0	
5.9	TRANSPORTATION BUILDING																		1.7	
5.10	CAR CLEANERS BUILDING																		0.4	
5.11	TEST BUILDING																		0.9	
5.12	EXT. CAR WASH																		0.6	
5.13	TRACTION POWER BUILDING																		0.5	
5.14	FIXED EQUIPMENT																		7.7	
5.15	YARD VEHICLES																		3.4	
	TAIL TRACK																		28.4	
																			74.4	97
	TOTAL COSTS																		1434.4	
6.0	CENTRAL CONTROL FACILITY																			
7.0	UTILITY RELOCATION																			
8.0	TRAIN CONTROL																			
9.0	COMMUNICATIONS																			
10.0	TRACTION POWER SYSTEM																			
10.1	TRACTION POWER																			
10.2	TRACTION POWER STRUCTURE																			
11.0	FARE COLLECTION																			
12.0	VEHICLES																			
	CAPITAL COST SUBTOTAL																			
	NOTE: NO CONTINGENCY																			
	NOTE: THIS ESTIMATE DOES NOT INCLUDE R.O.W. ACQUISITION, DESIGN & CONST. CONTINGENCY, DESIGN AND CONSULTING FEES, CONSTRUCTION MANAGEMENT AGENCY COSTS, & NEAP-UP INSURANCE																			
	DESIGN CONTINGENCY																			
	RIGHT OF WAY																			
	ENG. DESIGN & C M																			
	AGENCY COST																			
	INSURANCE COST																			
	CUMULATIVE TOTAL																			

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- CUT & COVER
- REACH
- STA. W/PKG STRUCTURE
- VENT SHAFT STRUCTURE
- VENT SHAFT STRUCTURE W/ 300' SHAFT IN MOUNTAIN
- TRACTION POWER STRUCTURE
- DIR DIRECTION OF TUNNELING

1/3/83 CONCEPTUAL BUDGET

RECOMMENDED FOR APPROVAL  
*[Signature]*  
 DIRECTOR OF ARCHITECTURE  
*[Signature]*  
 DEPUTY CHIEF ENGINEER-SYSTEMS

DESIGNED BY	KARAT	DATE	1/17/82	
DRAWN BY	MACIS/CASTILLO	DATE	1/17/82	
CHECKED BY	STANSKE	DATE	1/17/82	
REV.	DATE	BY	APP.	DESCRIPTION
1	1/17/82	D.L.		CRENSHAW STATION & CROSS OVER
2	1/17/82	D.L.		GENERAL REVISIONS

**DMJM/PBQD**  
 General Engineering  
 Consultant - Ways and Structures  
 SUBMITTED BY:  
*[Signature]*  
 PROJECT MANAGER

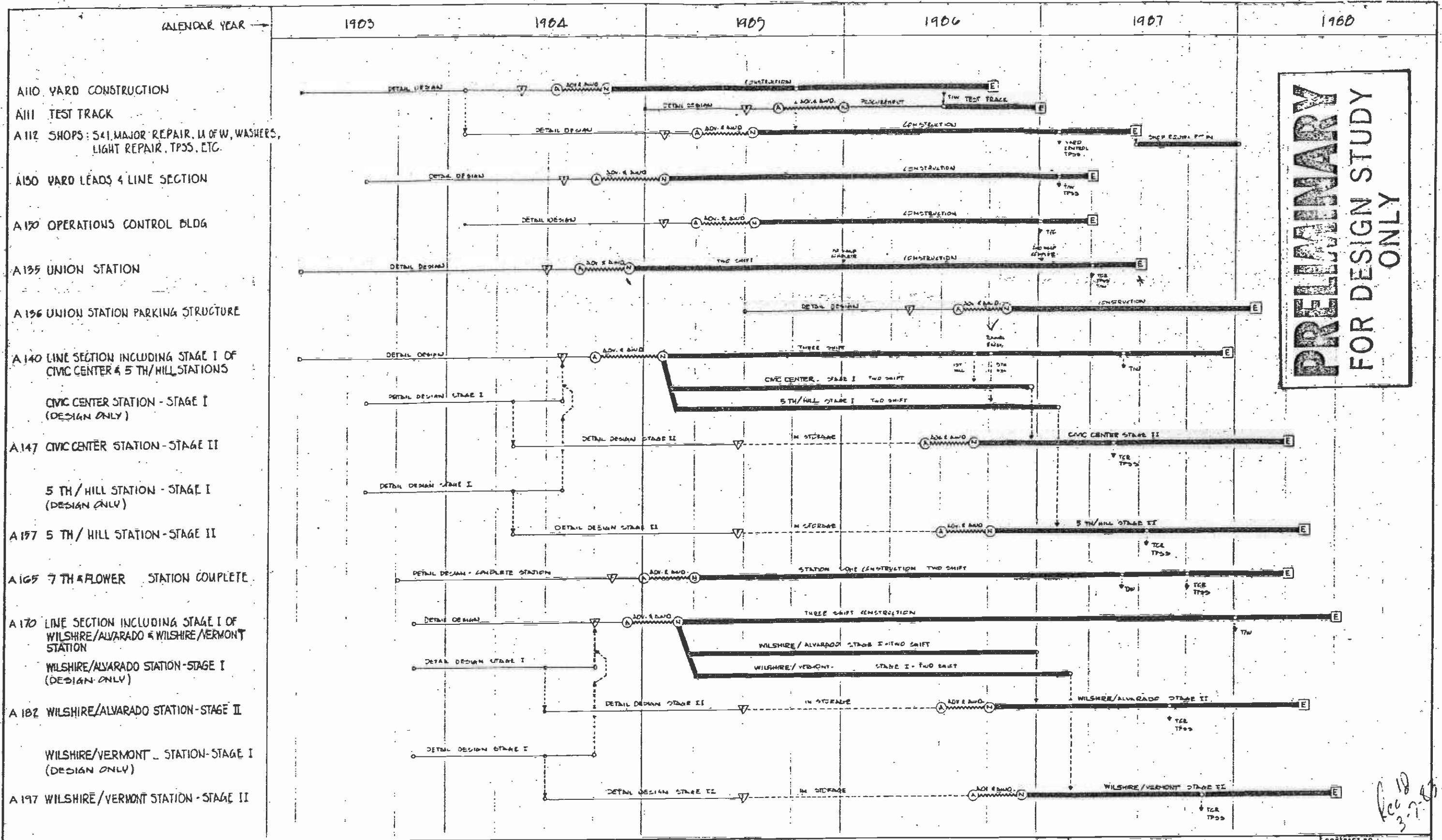
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
**METRO RAIL PROJECT**  
 APPROVAL: RECOMMENDED  
*[Signature]*  
 SENIOR ENGINEER  
 WAYS & STRUCTURES  
 Reg. No. 24376  
 APPROVED  
*[Signature]*  
 MANAGER / CHIEF ENGINEER  
 Reg. No. 6561

**METRO RAIL  
 STARTER LINE  
 SCHEMATIC DIAGRAM**

CONTRACT NO.	
DRAWING NO.	AP-14 2A4-C-03
SCALE	1" = 100'
A-EFT NO.	







REV.	DATE	BY	APP.	DESCRIPTION
2	11/28/83	RS		UPDATE
1	11/28/83	R.D.		UPDATE

DESIGNED BY: Date: AM '83  
 R.M. CHAN  
 DRAWN BY: Date: \_\_\_\_\_  
 CHECKED BY: Date: \_\_\_\_\_

**DMJM/PBQD**  
 General Engineering Consultant - Ways and Structures  
 SUBMITTED BY: \_\_\_\_\_  
 PROJECT MANAGER

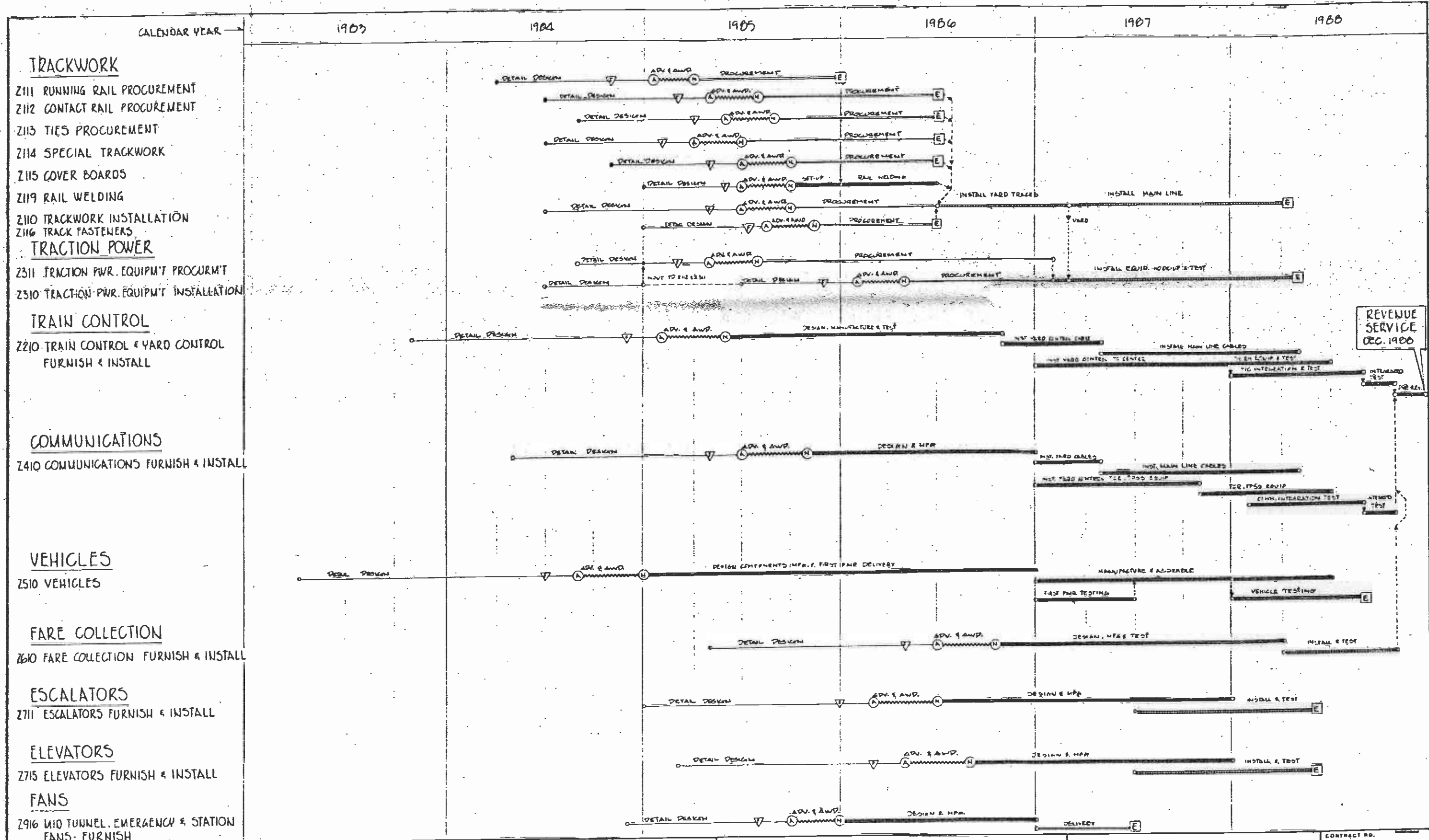
**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**  
**METRO RAIL PROJECT**  
 APPROVAL RECOMMENDED: \_\_\_\_\_ Date: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_ Date: \_\_\_\_\_  
 MANAGER / CHIEF ENGINEER

**PHASE A1**  
**UNION STATION TO WILSHIRE/VERMONT STATION**  
**PROJECT SCHEDULE**  
**FACILITIES**  
**NDNAL SCHEDULE**

CONTRACT NO. \_\_\_\_\_  
 DRAWING NO. \_\_\_\_\_  
 SCALE: N.T.S.  
 SHEET NO. 1 OF 5

**PRELIMINARY**  
**FOR DESIGN STUDY ONLY**

Rec 18  
 3-7-83



REV.	DATE	BY	APP.	DESCRIPTION
2	1-18-65	J.S.		UPDATE
1	1-6-65	J.B.		UPDATE

DESIGNED BY  
RAJ CHAN  
Date: 11-21-63

DRAWN BY  
Date: \_\_\_\_\_

CHECKED BY  
Date: \_\_\_\_\_

**DMJM/PBQD**  
General Engineering Consultant - Ways and Structures

SUBMITTED BY:  
PROJECT MANAGER

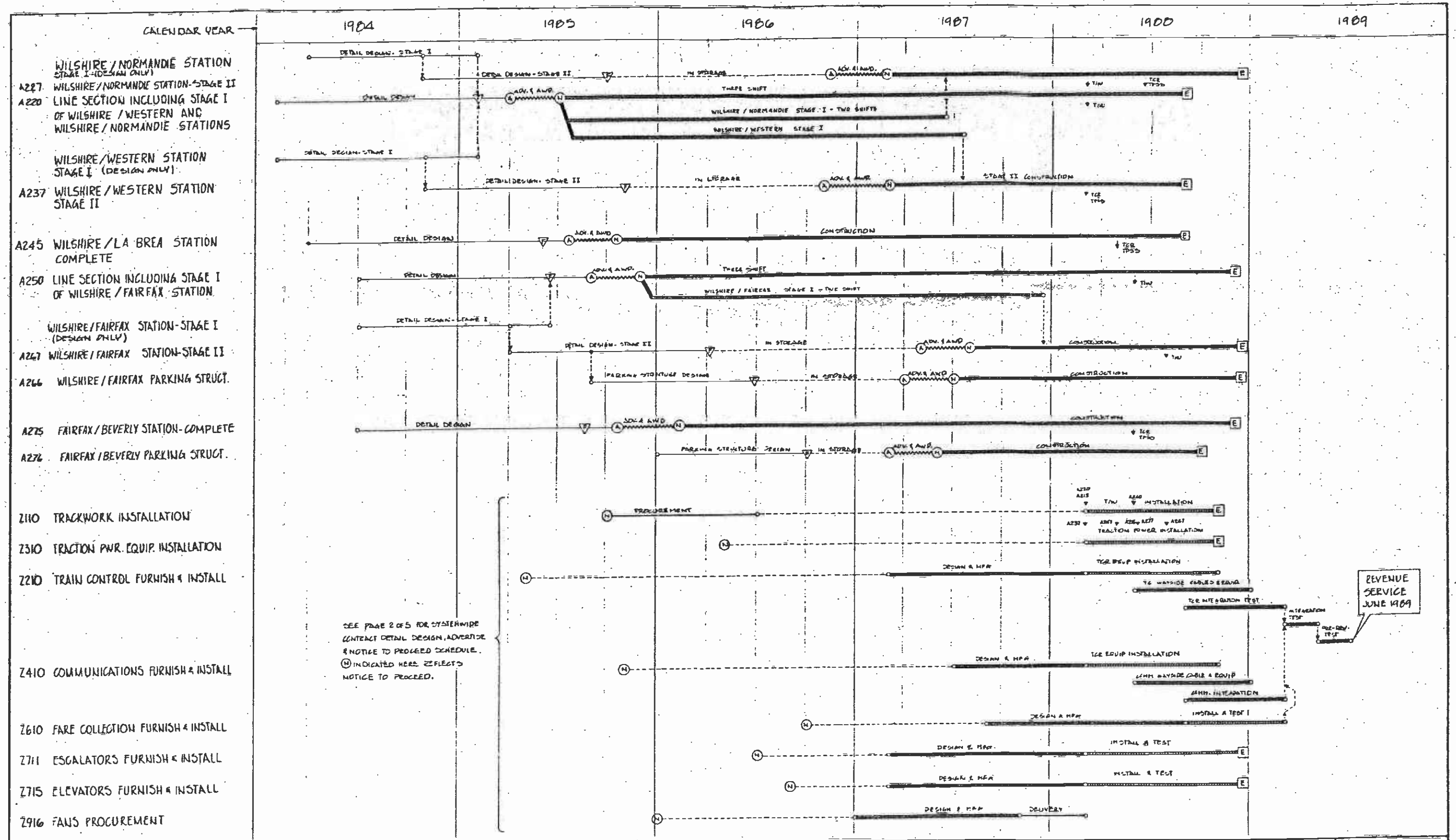
**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**  
**METRO RAIL PROJECT**

APPROVAL RECOMMENDED: \_\_\_\_\_ Date: \_\_\_\_\_

APPROVED: \_\_\_\_\_ Date: \_\_\_\_\_  
MANAGER / CHIEF ENGINEER

PHASE A1  
UNION STATION TO WILSHIRE/VERMONT STATION  
PROJECT SCHEDULE  
SYSTEMWIDE  
NORMAL SCHEDULE

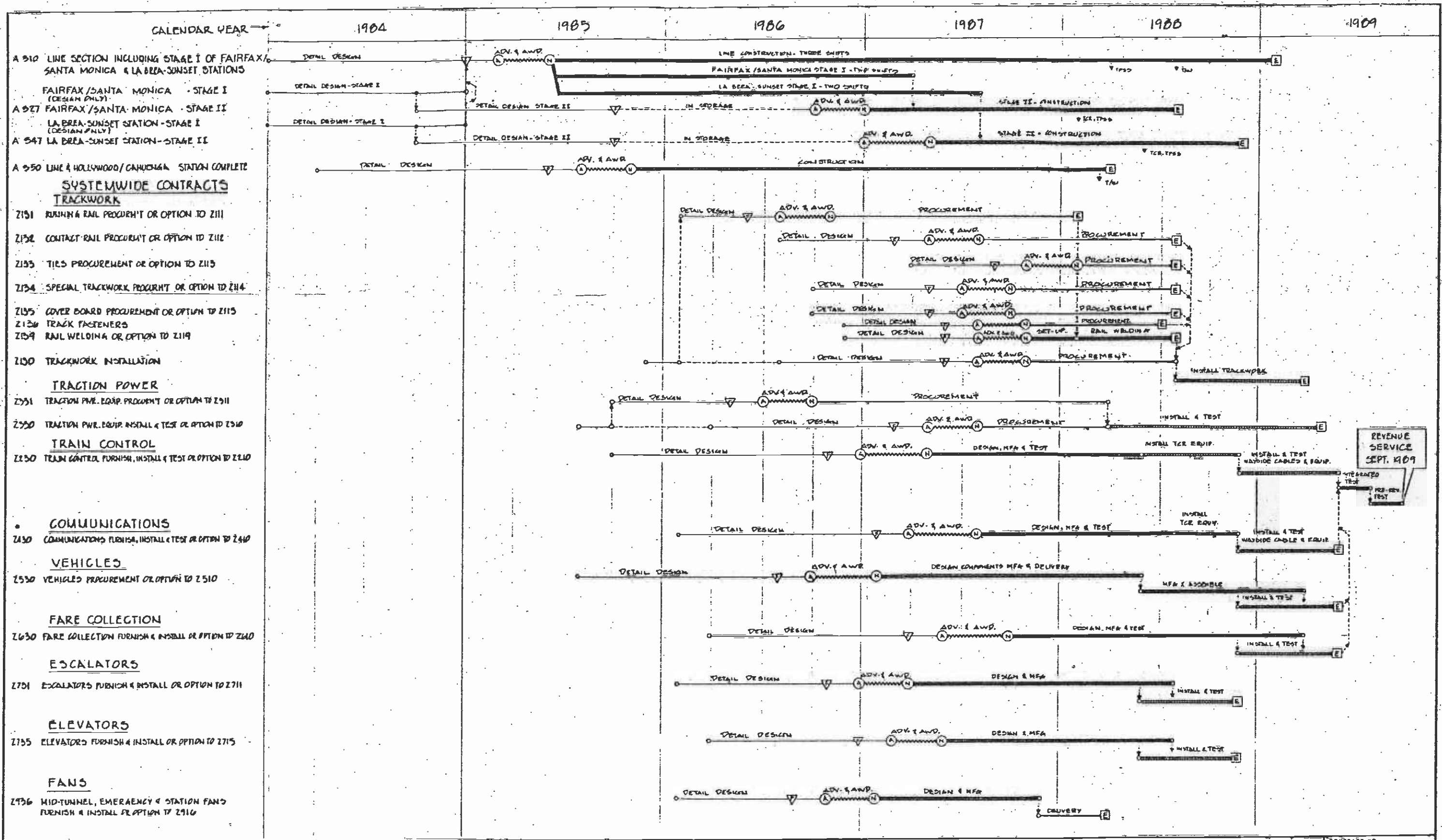
CONTRACT NO. \_\_\_\_\_  
DRAWING NO. \_\_\_\_\_  
SCALE: 1/4" = 1'-0"  
SHEET NO. 2 OF 5



SEE PAGE 2 OF 5 FOR SYSTEMWIDE CONTRACT DETAIL DESIGN, ADVERTISE & NOTICE TO PROCEED SCHEDULE. (N) INDICATED HERE REFLECTS NOTICE TO PROCEED.

REVENUE SERVICE JUNE 1989

DESIGNED BY: <u>RAJ SHAM</u> DRAWN BY: <u>DATE</u> CHECKED BY: <u>DATE</u>		<b>DMJM/PBQD</b> General Engineering Consultant - Ways and Structures SUBMITTED BY: _____ PROJECT MANAGER: _____		SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT <b>METRO RAIL PROJECT</b> APPROVAL RECOMMENDED: _____ APPROVED: _____ MANAGER / CHIEF ENGINEER		PHASE A2 WILSHIRE/VERMONT TO FAIRFAX/BEVERLY PROJECT SCHEDULE FACILITIES AND SYSTEMWIDE NORMAL SCHEDULE		CONTRACT NO. _____ DRAWING NO. _____ SCALE: N.T.S. SHEET NO. <u>3 of 5</u>
REV.	DATE	BY	APP.	DESCRIPTION				
2	12-88	R.S.	UPDATE					
1	1-89	J.D.	UPDATE					



REV. DATE	BY	APP.	DESCRIPTION
2	10-23	R.S.	UPDATE
1	7-6-83	J.S.	UPDATE

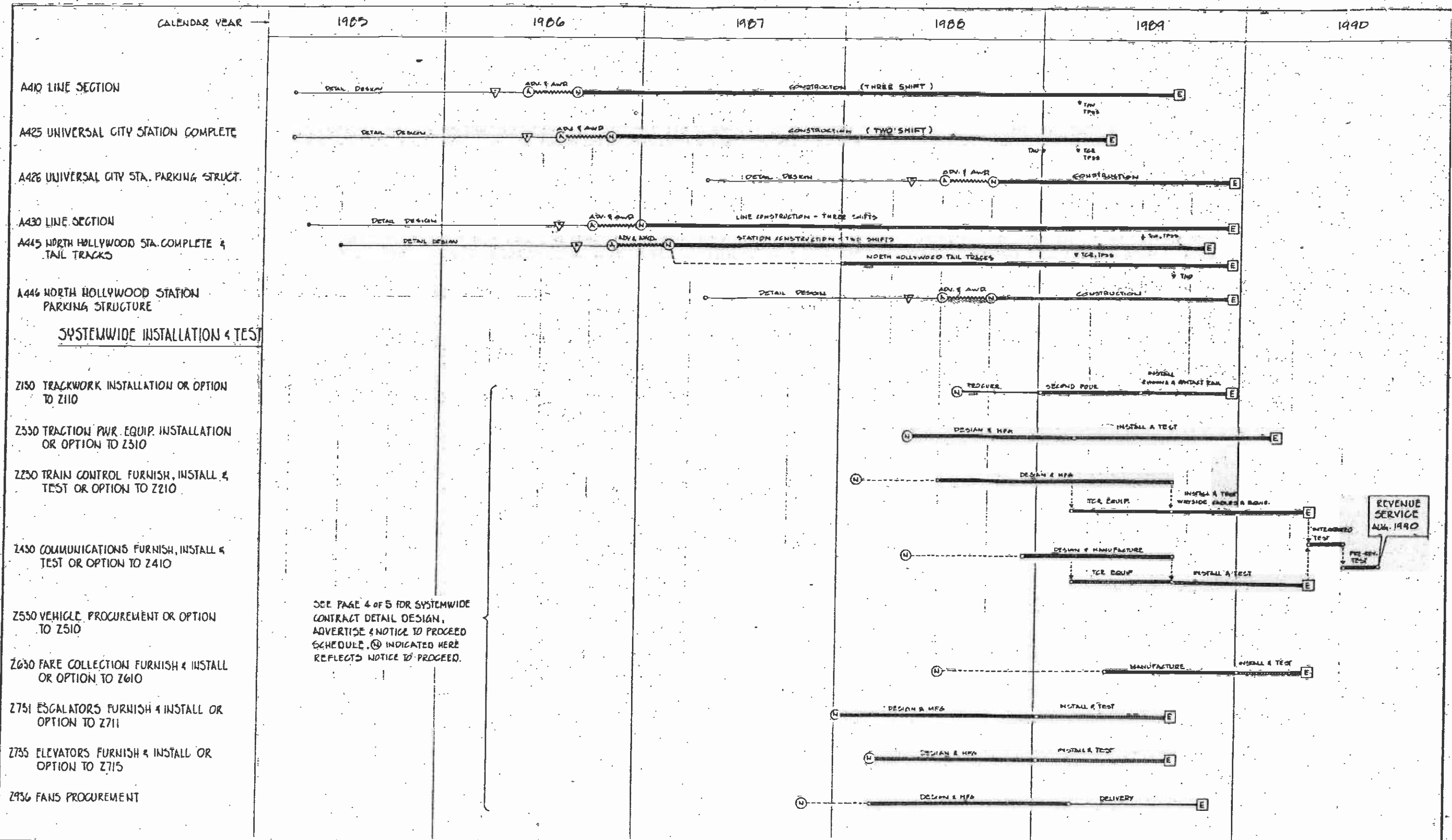
DESIGNED BY: DATE: 10/23/83  
 RAJ SHAM  
 DRAWN BY: DATE:  
 CHECKED BY: DATE:

**DMJM/PBQD**  
 General Engineering Consultant - Ways and Structures  
 SUBMITTED BY:  
 PROJECT MANAGER

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**  
**METRO RAIL PROJECT**  
 APPROVAL RECOMMENDED: DATE:  
 APPROVED: DATE:  
 MANAGER / CHIEF ENGINEER

**PHASE A 5**  
**FAIRFAX/BEVERLY STATION TO HOLLYWOOD/CAHUENGA STATION**  
**PROJECT SCHEDULE FACILITIES AND SYSTEMWIDE NORMAL SCHEDULE**

CONTRACT NO.  
 DRAWING NO.  
 SCALE  
 SHEET NO. 4 OF 5



REV.	DATE	BY	APP.	DESCRIPTION
2	1-2-85	R.S.		UPDATE
1	1-6-85	J.B.	R.S.	UPDATE

DESIGNED BY	Date: JAN. '85
DRAWN BY	Date:
CHECKED BY	Date:

**DMJM/PBQD**  
General Engineering Consultant - Ways and Structures

SUBMITTED BY

PROJECT MANAGER

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
**METRO RAIL PROJECT**

APPROVAL RECOMMENDED

APPROVED

MANAGER / CHIEF ENGINEER

PHASE A4  
HOLLYWOOD/CAHUENGA STATION  
TO NORTH HOLLYWOOD STATION  
PROJECT SCHEDULE  
FACILITIES AND SYSTEMWIDE  
NORMAL SCHEDULE

CONTRACT NO.
DRAWING NO.
SCALE N.T.S.
SHEET NO. 5 OF 5