

INTERMEDIATE SIZE BUS SPECIFICATIONS

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SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

NOTICE INVITING BIDS

FOR

HEAVY-DUTY AIR-CONDITIONED INTERMEDIATE SIZE BUSES

FOR THE

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

SPECIFICATIONS #CA-03-0132 (M)

All bids must be submitted on form furnished by the District and must be filed in the Office of the Secretary, 2nd Floor, Southern California Rapid Transit District, at 425 So. Main St., Los Angeles, California 90013 on or before 10:30 A.M., March 20, 1979 to furnish and deliver 50 Heavy-Duty Air-Conditioned Intermediate size Buses for the Southern California Rapid Transit District, in accordance with specifications therefor.

Bids will be opened and publicly read at that time on the 2nd floor of the Transit Building, 425 So. Main, Los Angeles, California 90013.

Copies of the specifications may be obtained at the office of the District Purchasing Agent, 361 East 55th Street, Los Angeles, California 90011.

Refer to the specifications for complete details and bid requirements. Specifications and this notice shall be considered a part of any contract made pursuant thereto.

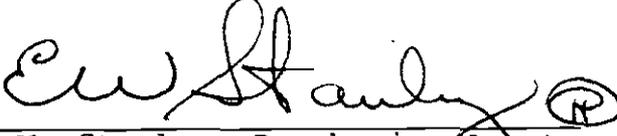
All bidders will be required to certify that they are not on the Comptroller General's list of ineligible contractors.

The District hereby notifies all bidders that it will affirmatively insure that in regard to any contract entered into pursuant to this advertisement, minority business enterprise will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

The contract to be let is subject to a financial assistance contract between the District and the United States Department of Transportation. Bidders and the Contractor shall show UMTA's project number, "CA-03-0132", on all correspondence with the District and UMTA.

Full compliance with all applicable safety and health standards, and Equal Opportunity laws and regulations will be required of the successful bidder.

Date: January 19, 1979


E. W. Stanley, Purchasing Agent
SOUTHERN CALIFORNIA RAPID
TRANSIT DISTRICT

SCOPE OF WORK

The work herein proposed consists of furnishing and delivery of 50 HEAVY-DUTY AIR-CONDITIONED INTERMEDIATE SIZE buses in accordance with the specifications.

It is the intent of these specifications to describe a vehicle constructed and equipped so as to provide optimum performance in regard to safety, environmental features, comfort, reliability, attractiveness and public acceptance. It is recognized that certain of the performance requirements or other features may differ from those of a bidder's standard design. All bids must, therefore, be accompanied by complete technical information concerning the bus bid upon. Technical information shall be submitted on the forms provided by the District and shall contain all information requested thereon. This data must be supplemented by charts and engineering drawings reproducible by the Ozalid method and renderings as deemed necessary and desirable to fully describe the vehicle which the Contractor intends to supply.

INSTRUCTIONS TO BIDDERS

1. General

Copies of these specifications may be obtained at no charge at the offices of the Southern California Rapid Transit District, 361 East 55th Street, Los Angeles. One complete copy shall be returned intact with the bid.

2. Discrepancies

If a bidder becomes aware of any discrepancy, ambiguity, error or omission, it shall be reported immediately to the Purchasing Agent, who will determine the necessity for clarification.

3. Addenda

Clarification or any other notice of a change in the Contract Document shall be issued only by the District's Purchasing Agent and only in the form of written addenda mailed or otherwise delivered to the address of record of each bidder. Each addendum shall be numbered, dated, and identified. Under extreme circumstances, an addendum may be in the form of a telegram. Oral statements or any instructions in any form, other than addenda as described above shall have no consideration.

Each addendum received during the bidding period shall be acknowledged in the designated space in the Proposal Form with the information therein requested. If none are received, the words, "no addenda received" shall be written in the said space.

4. Form of bids

Bids shall be submitted only on one copy of the bid form furnished to bidders herewith. Bids submitted in any other form shall be considered non-responsive and will be rejected. The only acceptable method for modifying a bid is by notarized letter, which shall be received by the person assigned to open the bids prior to the time set for opening of the bids.

Bid forms shall be carefully and completely filled out with ink or typewriter only. All signatures shall be in longhand.

EVERY designated space on the Bid Form SHALL be filled in or otherwise marked to show the bidder's intention clearly. Interlineations, alterations, erasures or any other change must be clearly initialed by the bidder. All amounts shall be stated in figures. The Bid Form is to be submitted along with the documents and specifications attached hereto.

Conditional bids, or those which take exception to the specifications, shall be considered non-responsive and shall be rejected.

5. Qualification of Bidders

A bidder shall be either the manufacturer of the bus bid on or the authorized agent of such manufacturer. The manufacturer shall certify that the bus offered in his bid has been designed, manufactured, assembled and tested for transit purposes. Buses shall be acceptable only if they are manufactured by a person, firm or corporation which:

- o Has adequate experience in the manufacture and advertised sales of intermediate size buses.
- o Has in operation a manufacturing plant adequate to assure delivery of all buses within the time specified under the contract.
- o Has adequate engineering and service personnel to satisfy any engineering or service problems during the warranty period.
- o Has the necessary facilities and financial resources to complete the contract in a satisfactory manner, within the required time.
- o Has available an adequate supply of spare parts for the buses bid on and will maintain said supply for a minimum of 15 years.

Supporting data covering the above qualifications shall be submitted with the bid.

6. Bidder's Specifications

Each bidder shall attach to his proposal, and make a part thereof, Specifications which shall be designated as "Contractor's Specifications" which shall contain drawings including overall dimensions, photographs or cuts of the equipment and all appurtenances which the bidder proposes to furnish, and the materials which shall be used in construction of same. The "Contractor's Specifications" shall also include a "List of Materials" or parts catalog and sufficient data, which may be a Maintenance Manual, to fully describe all equipment and appurtenances that he intends to provide.

The general conditions and technical provisions of these specifications, and the proposal and data sheet, shall control if there is any conflict between these and any printed brochures, manuals, and other similar documents which may be submitted by bidders. These documents will not be used in the evaluation of the bid.

7. Clarification of Ambiguities

If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the specifications or finds discrepancies in or omissions from said specifications, he shall submit to the District Purchasing Agent a written request for an interpretation or correction thereof. Any interpretation, or change, or correction of said specifications will be made by addenda only, duly issued by the District Purchasing Agent. Copies of such addenda will be mailed or delivered to each firm receiving a set of said specifications. All verbal modifications of these conditions or specifications are void and ineffective.

8. Signatures

- A. Bids signed for a corporation shall bear the signature of the President or other authorized officer, written in longhand below the corporation name and following the word "BY" (signature). If such a bid is signed by an individual other than the President, a certified copy of a resolution of the Board of Directors of the corporation, evidencing the authority of that individual to sign, shall be attached to the Bid Form. Such bids shall also bear the attesting signature of the Secretary and the impression of the corporate seal.

9. Appeals Procedures

- A. Prime contractors and subcontractors may make appointments to discuss these specifications. This, however, does not relieve them from the written documented requests required by Paragraphs B and D below.
- B. Requests for approved equals, clarification of specifications, and protest of specifications must be received by the District, in writing, not less than 28 full days before the date of scheduled bid opening. Any request for an approved equal or protest of the specifications must be fully supported with technical data, test results, or other pertinent information as evidence that the substitute offered is equal to or better than the specification requirement. In addition, any test requirements in the specifications that pertain to an item under consideration for approved equal must be submitted with the request for approved equal. Such requests shall be addressed to the District Purchasing Agent.
- C. The District's replies to requests under Paragraph B above will be postmarked at least 17 full days before the date scheduled for bid opening.

9. (continued)

- D. Appeal from the decision of the District by a prime contractor or an adversely affected subcontractor must be in writing and received by UMTA not less than 7 full days before bid opening. Appeals received less than 7 full days before bid opening will not be considered. The District must receive a concurrent notice, indicating the nature of the appeal. The District will furnish UMTA a copy of all previous correspondence pertaining to the subjects covered by the appeal. In deciding appeals, UMTA will consider only the documentation developed during negotiations between the District and the supplier and the information obtained through specific requests for such to the District, Contractor, or other third party.
- E. Upon receipt of a notice that an appeal has been submitted to UMTA, the District will immediately contact the appropriate UMTA official to determine if bid opening should be postponed. If bid opening is postponed, the District will telegraph all prime contractors and subcontractors who have been furnished a copy of the specifications that an appeal has been filed and that bid opening is postponed until UMTA has issued its decision. Appropriate addendums will be issued rescheduling bid opening.
- F. Any appeal to UMTA may be withdrawn at any time before UMTA has issued its decision.
- G. UMTA's decision on any appeal under Paragraph D will be final. No further appeals will be considered by UMTA.
- H. District reserves the right to postpone bid opening for its own convenience.

10. Unit Prices

When unit prices are called for in the Bid Form, complete all blank spaces using amounts that include all costs for the items to be delivered with overhead, profits and all other costs covered. As the District is exempt from the payment of Federal Excise and Transportation tax, the District shall furnish the Contractor with a Federal Excise Tax Exemption Certificate. Such taxes must not be included in the proposed prices.

10. Unit Prices (Continued)

This quotation is subject to state and local sales taxes, and import duties, if any, which will be shown separately, but are part of the contract price.

Bottom line prices (See page 13) for the buses are to be inclusive of all charges required to accomplish delivery to the District's Division 14 at 5413 South Avalon Street, Los Angeles, California 90011. Delivery charges will be used as an item of price evaluation, but are not subject to California Sales Tax, and, therefore, must be shown as a separate item.

Bidder shall state bid price based on payment terms of net 20 days after acceptance of each bus. Bidder shall also state bid price for payments made 21 or more days after acceptance. This is referred to as "Extended Price".

11. Marking and Delivery of Bids

Each bid shall be securely sealed in a suitable envelope and marked:

HEAVY-DUTY AIR-CONDITIONED INTERMEDIATE SIZE BUSES
Specification #CA-03-0132 (M)
CAPITAL GRANT PROJECT NO. CA-03-0132

in capital letters on front and back of the envelope.

The envelope shall also include the following:

Name and address of bidder

Name and address for delivery as follows:

The District Secretary
Southern California Rapid Transit District
2nd Floor, 425 South Main Street
Los Angeles, California 90013

12. Receiving Bids

Bids received shall be kept unopened until the time fixed for the bid opening. The person whose duty it is to open the bids shall determine when the time stated above has arrived and no bid received thereafter will be considered. All bids shall be opened in public at

12. Receiving Bids (Continued)

the bid opening. At that time, any person present shall have the right to have any part of the bids read aloud. The District may postpone bid opening for its convenience.

13. Withdrawal of Bids

Bids may be withdrawn only by signature of bidder, provided the request is received by the person whose duty it is to open bids prior to the time for bid opening. Each bid opened shall be considered a valid offer and may not be withdrawn for a period of sixty consecutive calendar days following the opening of bids, unless the bidder is given written notice that this bid is unacceptable.

14. Bidders Interested in More Than One Bid

If more than one bid is offered by any one person or group of persons, or in the name of his or their agent, clerk, partner or any other person, all bids submitted by that person or group shall be rejected. A person who has quoted prices to a bidder who has been rejected is not hereby disqualified from quoting prices to other bidders or from submitting a general contract bid directly.

15. Award or Rejection of Bids

The award of the contract will be made within sixty days of the bid opening to the lowest responsible bidder for fifty intermediate size buses. The District reserves the right to accept or reject any and all bids or any item or part thereof; or to waive any informality or irregularity in bids.

Total price rather than extended price will be used for bid evaluation purposes.

Evaluation of bids shall be based upon a minimum of 31 seats.

Any bid conditioned in whole or in part on the revision or omission of any requirement or provision in the Contract Documents or based on any substitution for an item specified therein, or on the inclusion of an escalation clause or any other requirement or provision not contained in the bidding or Contract Documents shall be rejected.

16. "Form" Provisions Prohibited

The bid documents are considered to be the complete submission. The general conditions and technical provisions of these specifications, and the proposal and data sheet, shall control if there is any conflict between these and any printed brochures, manual, and other similar documents which may be submitted by the bidder.

17. Approved Equal

Whenever brand, manufacturer or product names are indicated in these specifications, they are included for the purpose of establishing identification and a general description of the item. Wherever such names appear, the term "or approved equal" is considered to follow.

18. Bid Package

The following items shall be included in the bid package and shall be submitted in English:

1. Identification of Bidder
2. Warehouse Location
3. Bus Manufacturer's Certification
4. Bid Proposal
5. Signed Certification Form pertaining to ineligible contractors.
6. Technical Submission
7. Successful Bidder's Specifications
8. Drawings indicating the grab rail and handle arrangements for front entrance area.
9. A Milestone Bar Chart plotting the estimated schedule in regard to design, manufacturing, testing and delivery of the buses. The successful bidder shall update on a monthly basis the Bar Chart to reflect actual progress.
10. Those items identified on Page 6 of this specification under Item 6 of the "Instructions to Bidders".

BID PACKAGE

- o It is the District's intention to award a contract on only one of the two bid proposals described. Bidder must submit bids on both proposals.
- o Bidder must complete all forms included in this bid package. If any required information is not applicable, the appropriate block should be filled in with "none" or "not applicable".
- o Identification of Bidders
Bidder:

_____ (Company Name)
_____ (Full Mailing Address)
_____ (Telephone No.)
_____ (Legal Nature of Business Entity)

BY: _____ (Signature of Authorized Individual)
_____ (Typed Name of Authorized Individual)
_____ (Title)

- o Bidder shall state location of warehouse in or near Los Angeles from which full line of replacement parts for the vehicles offered may be secured. This factor will not be considered in determining the award of bid. State full street address of warehouse:

o Bus Manufacturer's Certification

The _____ (Name of Manufacturer)

hereby certifies that the bus offered in this bid has been designed, manufactured, assembled and tested for transit purposes and is suitable for extended suburban and interurban service.

I-B Basic Spare Parts Package "A":

- 1 Power Plant assembly with all accessories mounted on a cradle ready for installation.
- 1 Transmission ready for installation.
- 1 Freon Compressor

Package "A" Price	_____
Sales Tax	_____
Duty	_____
Delivery Charge	_____
TOTAL	_____

I-C Basic Spare Parts Package "B":

- 1 1st Axle (steering) assembly complete with hubs, brakes, etc.
- 1 2nd Axle (drive) assembly complete with differential assembly, hubs, brakes, etc.

- 1 Wheelchair Level Changing Device complete with controls
- 1 Drive Line assembly with universal joints.
- 1 Radiator
- 1 Turbo-Charger (if used)
- 2 Alternators
- 2 Starters
- 1 Evaporator
- 2 Blower Motors and Fan Assemblies
- 2 Condensers, fan motors and fan assemblies

Package "B" Price	_____
Sales Tax	_____
Duty	_____
Delivery Charge	_____
TOTAL	_____

The undersigned understands that any condition stated in the proposal, clarification made to the proposal or information submitted on or with this form -- other than that requested will render the bid unresponsive and it will be rejected; and further agrees that this bid may not be withdrawn for a period of 60 days after the date set for the opening of the bids.

ADDENDA RECEIVED (If none received, write "none received")

Addendum No. _____ Date Received: _____

By: _____

Title: _____

* Total price is based on payment terms of net 20 days after acceptance of each bus.

** Extended bid price is for payments made 21 or more days after acceptance.

I-B Basic Spare Parts Package "A":

- 1 Power Plant assembly with all accessories mounted on a cradle ready for installation.
- 1 Transmission ready for installation.
- 1 Freon Compressor

Package "A" Price _____
Sales Tax _____
Duty _____
Delivery Charge _____
TOTAL _____

I-C Basic Spare Parts Package "B":

- 1 1st Axle (steering) assembly complete with hubs, brakes, etc.
- 1 2nd Axle (drive) assembly complete with differential assembly, hubs, brakes, etc.

- 1 Drive Line assembly with universal joints.
- 1 Radiator
- 1 Turbo-Charger (if used)
- 2 Alternators
- 2 Starters
- 1 Evaporator
- 2 Blower Motors and Fan Assemblies
- 2 Condensers, fan motors and fan assemblies

Package "B" Price _____
Sales Tax _____
Duty _____
Delivery Charge _____
TOTAL _____

The undersigned understands that any condition stated in the proposal, clarification made to the proposal or information submitted on or with this form -- other than that requested will render the bid unresponsive and it will be rejected; and further agrees that this bid may not be withdrawn for a period of 60 days after the date set for the opening of the bids.

ADDENDA RECEIVED (If none received, write "none received")

Addendum No. _____ Date Received: _____

By: _____

Title: _____

- * Total price is based on payment terms of net 20 days after acceptance of each bus.
- ** Extended bid price is for payments made 21 or more days after acceptance.

BIDDER'S CERTIFICATION
REGARDING
INELIGIBLE CONTRACTORS

The _____
hereby certifies that it IS NOT included on the U. S.
Comptroller General's Consolidated List of persons or
firms currently debarred for violations of various public
contracts incorporating Labor Standards Provisions.

BY: _____

TITLE: _____

DATE: _____

TECHNICAL SUBMISSION

I. GENERAL

Contractor _____
proposes to furnish buses under Bid.No. CA-03-0132 (M)
which shall conform to the specifications herein set
forth within normal engineering and manufacturing
tolerances.

A. Bus Model Number _____

B. General Dimensions

1. Overall Length _____ Ft. _____ In.

2. Overall Width _____ In.
Over Body _____ In.

3. Overall Height, Front _____ In.

4. Overall Height, Rear _____ In.

5. Wheelbase _____ In.

6. Overhang, Center Line of
Axle Over Bumper _____ In.

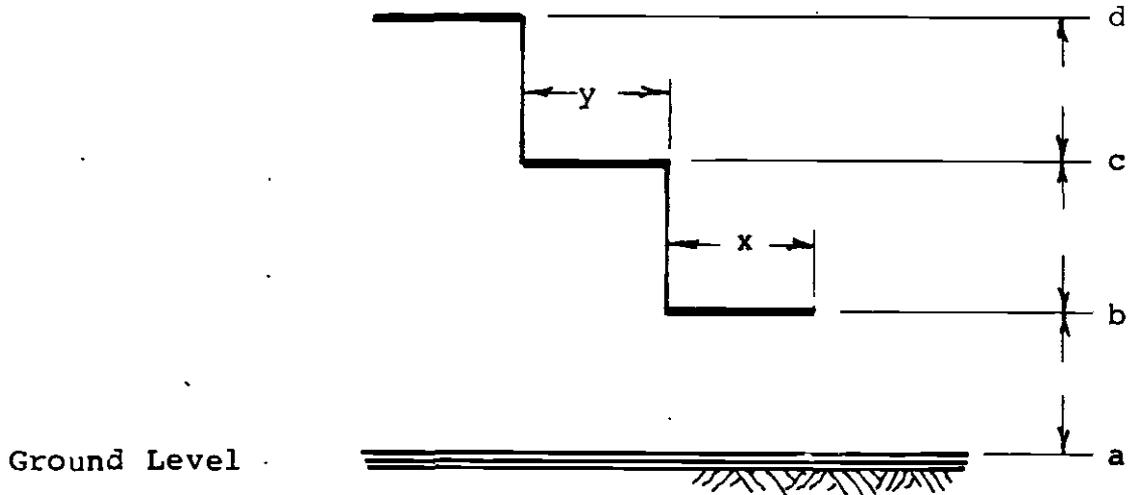
7. Turning Radius
Right _____ Ft. _____ In.
Left _____ Ft. _____ In.

8. Body Turning Radius
Right _____ Ft. _____ In.
Left _____ Ft. _____ In.

9. Height, Floor to Ceiling
Front of Bus _____ In.
Center of Bus _____ In.
Rear of Bus _____ In.

I.B (continued)

10. Minimum Road Clearances
 1st Axle _____ In.
 2nd Axle _____ In.
11. Road Clearance at Lowest Point
 1st Axle _____ In.
 2nd Axle _____ In.
12. Angle
 Approach _____ Degree
 Departure _____ Degree
 Breakover _____ Degree
13. Step Height from Ground, Step
 Riser Heights, and Step Depths



Front Steps Empty

a-b In. _____
 b-c In. _____
 c-d In. _____
 a-d In. _____
 x In. _____
 y In. _____

Rear Steps, Empty

a-b In. _____
 b-c In. _____
 c-d In. _____
 a-d In. _____
 x In. _____
 y In. _____

I-C,

C. Weight of Bus, Complete with Full
Complement of Fuel, Oil and Water,
Minus Fare Box and Driver

1. On 1st Axle _____

2. On 2nd Axle _____

Total _____

D. Engine

1. Manufacturer _____

2. Type _____

3. Model Number _____

4. Bore _____ In.

5. Stroke _____ In.

6. Displacement _____ Cu. In.

7. Compression Ratio _____

8. Injector Type and Size _____

9. Brake Horsepower _____ Hp.
At _____ RPM

10. Torque _____ Ft. Lb.
_____ RPM

E. Transmission

1. Manufacturer _____
2. Type _____
3. Model Number _____
4. Gears _____
5. Ratio _____

F. Retarder

1. Manufacturer _____
2. Type _____
3. Model Number _____

G. Maximum Warranted Speeds

1. Propulsion Engine
Load RPM _____
No Load RPM _____
2. Alternator RPM _____
3. Freon Compressor RPM _____
4. A/C Alternator RPM _____

5. Bidder shall furnish gradeability, engine speed versus vehicle speed in direct drive, and time versus vehicle speed curves for the engine he proposes to furnish.

H. Energy Absorption Bumper, Front

1. Manufacturer _____
2. Model _____
3. Number of Sections _____
4. Capacity _____ Gal. or cu. in.

I. 1st Axle

- 1. Manufacturer _____
- 2. Model _____

J. 2nd Axle

Drive

Tag (if used)

- 1. Manufacturer _____
- 2. Model _____

K. Drive Ratios

- 1. Transmission Output _____
- 2. Rear Axle _____
- 3. Final Gear Ratio _____

L. Brakes

- 1. Brake Chambers
Vendor's Size and Part No.
1st Axle _____
2nd Axle _____

- 2. Slack Adjusters
Vendor's Type and Part No.
1st Axle right _____
1st Axle left _____
2nd Axle right _____
2nd Axle left _____

Length

- 1st Axle _____ In.
- 2nd Axle _____ In.

3.	Brake Drums	1st Axle	2nd Axle	
	Manufacturer	_____	_____	
	Part Number	_____	_____	
	Diameter	_____	_____	
4.	Brake Block Manufacturer		_____	
5.	Brake Block Identification			
	1st Axle			
	Forward		_____	
	Reverse		_____	
	2nd Axle			
	Forward		_____	
	Reverse		_____	
6.	Brake Blocks Per Shoe			
	1st Axle		_____	
	2nd Axle		_____	
7.	Brake Block Widths			
	1st Axle		_____	In.
	2nd Axle		_____	In.
8.	Brake Block Lengths			
	1st Axle		_____	In.
	2nd Axle		_____	In.
9.	Brake Block Thickness		_____	In.
10.	Brake Block Area Per Drum			
	1st Axle		_____	Sq. In.
	2nd Axle		_____	Sq. In.
M.	<u>Air Reservoir Capacity</u>			
	1. No. 1 Reservoir		_____	Cu. In.
	2. No. 2 Reservoir		_____	Cu. In.
	3. No. 3 Reservoir		_____	Cu. In.
	4. Other		_____	Cu. In.
N.	<u>Total Coolant Capacity</u>			
	Cooling and Heating System		_____	Gal.

O. Air Conditioning Equipment

1. Engine Manufacturer (If used) _____
Model _____
Bore, Stroke _____ In.
Displacement _____ Cu.In.
Compression Ratio _____
Brake Horse Power _____

2. Compressor
Manufacturer _____
Model _____
No. of Cylinders _____
Drive Ratio (to Diesel Engine) _____
Oil Capacity - Dry _____ Pt.
Wet _____ Pt.
Refrigerant _____

3. Condenser
Manufacturer _____
Model _____
No. of Rows _____
No. of Fins/In. _____
O.D. of Tube _____ In.
Fin Size _____ In.

4. Condenser Fan
Manufacturer _____
Model _____
Fan Diameter _____ In.
Speed Maximum _____ RPM
Flow Rate (maximum) _____ CFM

5. Receiver
Manufacturer _____
Model _____
Refrigerant Capacity _____ Lbs.

6. Condenser Fan Drive
 - a. Alternator
Manufacturer _____
Model _____
(Max.) Rating _____ Amp.

 - b. Motor
Manufacturer _____
Model _____

- 7. Evaporator
Manufacturer _____
Model _____
No. of Rows _____
No. of Fins/In _____
O.D. of Tubes _____
Fin Size _____

- 8. Expansion Valve
Manufacturer _____
Model _____

- 9. Filter-Drier
Manufacturer _____
Model _____

- 10. Wheelchair Level Changing
Device Manufacturer _____
Model _____

GENERAL PROVISIONS

SECTION A
DEFINITIONS

The following definitions are used in these documents:

Government	Federal Government
District	Southern California Rapid Transit District
Purchasing Agent	Purchasing Agent for the Southern California Rapid Transit District
DOT	U. S. Department of Transportation
UMTA	Urban Mass Transportation Administration
EEO	Equal Employment Opportunity
OSHA	Federal Occupational Safety Health Act
FMVSS	Federal Motor Vehicle Safety Standards
Bidder or Contractor	Person, firm or corporation with whom the contract is made by the District, or the agent or legal representative who may be appointed to represent such person, firm or corporation in the execution of the Contract.

SECTION B

INDEMNITY

- B.1. Contractor shall indemnify and hold the District, its officers and employees harmless from and against all claims, losses, actions and expenses (including attorney's fees), on account of bodily injury to or death of any person (including employees of District) or for damage to or loss of use of property (including property of District) arising out of or in any way connected with the work and services to be performed under the agreement, unless caused solely by the negligence of the District, its officers or employees. This indemnity shall be in effect until buses are delivered to the District.

SECTION C

LAW OF CALIFORNIA

The Contract hereunder shall be governed by the laws of the State of California.

SECTION D

EQUAL EMPLOYMENT OPPORTUNITY

- D.1 In connection with the execution of this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during their employment, without regard to their race, religion, color, sex or national origin. Such actions shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff, or termination; rates of pay, or other forms of compensation; and selection for training, including apprenticeship.

SECTION E

WARRANTY

- E.1 The Contractor warrants each bus including all equipment and accessories thereon (except extended warranty on components indicated below) to be free from defects in design, material and workmanship for a period of one year or until the accumulation of 50,000 miles, whichever occurs first, after each such vehicle is placed in revenue operation and shall, at his own cost and expense, promptly furnish and replace all parts including tires of the bus that fail on account of defective design, material or workmanship. The Contractor and the District may, at the District's option, arrange for the performance of such necessary work by the District at the expense of the Contractor, at the rate of actual labor cost plus 75% overhead and actual material cost plus 25%.
- E.2 Contractor further warrants the engine and its major components installed in any bus furnished under this contract to be free from defects in material, design and workmanship for a period of two years or 200,000 miles, whichever occurs first, after vehicle is placed in revenue operation and shall at his own cost and expense promptly furnish to the District in Los Angeles, all parts necessary for the repair or replacement of the defective parts. Contractor shall also reimburse the District for necessary labor to effect the repair or replacement of any defective engine part (100% of labor costs up to 100,000 miles, 50% of labor costs between 100,000 and 200,000 miles or two years whichever occurs first). Costs for such work shall be based upon the District's actual labor cost plus 75% overhead and actual material cost plus 25%.
- E.3 Contractor warrants the transmission installed in any bus furnished under this contract to be free from defects in material, design and workmanship for a period of one year or 100,000 miles, whichever occurs first after vehicle is placed in revenue operation and shall at his own cost and expense promptly furnish to the District in Los Angeles, all parts necessary for the repair or replacement of the defective parts. Contractor shall also reimburse the District for necessary labor to effect the repair or replacement of any defective transmission parts. Costs for such work shall be based upon the District's actual labor cost plus 75% overhead and actual material cost plus 25%.

- E.4 Major components consist of all units required to make the engine operative and include: blower, fan and fan drive, starter, radiator, and turbo charger, if used.
- E.5 Contractor also warrants the Air-Conditioning, heating, and ventilating system installed in any bus furnished under this contract to be free from defects in design, material and workmanship for a period of two years or 2,000 hours, whichever occurs first after vehicle is placed in revenue operation and shall at his own cost and expense promptly furnish and replace all labor and material necessary to replace parts that fail at the rates specified above in paragraph E.1.
- E.6 The Air-Conditioning, heating and ventilating system includes: freon compressor and drive assembly, expansion valve, condensor fan and drive assemblies, alternator and voltage regulator, all necessary controls and relays.
- E.7 In the event of any failure due to defective design, material or workmanship of a unit or assembly under warranty, the Contractor and the District shall mutually consider whether the unit or assembly is to be changed in its entirety or whether the unit or assembly is to be repaired and the defective parts replaced.
- E.8 The decision as to which alternative will be used shall be based upon minimizing down time of the vehicle and as to whether or not the failure of the unit might be detrimental to the life of the assembly. The District may, at its option, arrange for such necessary change or repair by the District at the expense of the Contractor at the rates specified above in paragraph E.1.
- E.9 In the event that, during the warranty period, repairs or modifications necessitated by defective design, material, or workmanship occur to an extent in excess of 17% on the vehicles purchased under this contract, the Contractor shall promptly furnish all necessary labor and material to effect such repairs and modifications for every vehicle delivered under the contract under the terms and conditions outlined in paragraph E.1 of this section.

- E.10 In the event that, during the warranty period, repairs and/or modifications on all or any bus made necessary by defective design, material or workmanship are not completed due to lack of material or inability to provide the proper repair, the delay running beyond the end of the warranty period, such delay shall not be considered in computing the guarantee period, and the same guarantee shall remain in effect as if the repair or modification was still within the guarantee period, said warranty being extended by the period of delay.
- E.11 Any material, parts or components removed under the warranty provisions that the Contractor requests to be returned to him shall be packaged and shipped at the Contractor's expense.

SECTION F
PATENT RIGHTS

F.1 The Contractor agrees to defend and pay the entire cost of defending any claim or suit whenever or wherever made or brought against the District based upon an infringement or alleged infringement of such letters patent, and to indemnify and save harmless the said District from and against any and all liability, damage, loss or injury adjudged or sustained by reason of the equipment to be furnished hereunder constituting an infringement of any letters patent, or adjudged or sustained by reason of inability of said District to use said equipment because of any infringement or alleged infringement of any letter patent.

SECTION G

CONTRACT CHANGES

- G.1 Oral change orders are not permitted. No change in this contract shall be made unless the Purchasing Agent gives his prior written approval therefor.
- G.2 Any requested change order or amendment that alters the contract price shall describe in detail the work to be done, and shall be accompanied by a cost breakdown in material, labor, overhead and profit, which shall be agreed to by the parties prior to executing such change order.
- G.3 Profit for individual changes shall be generally consistent with the profit applicable to the original contract, but in no event shall it exceed the profit applicable to the original contract, or 10% whichever is less.
- G.4 The District maintains the right to audit the Contractor with respect to changes in the contract price pursuant to this clause.
- G.5 A cost adjustment, either up or down, shall be made, in accordance with this section, for changes scheduled to become effective prior to the scheduled delivery date, pursuant to legislation or regulation enacted subsequent to the date of bid opening.

SECTION H

INTEREST OF MEMBERS OF CONGRESS

H.1 No member of or delegate to the Congress of the United States shall be admitted to any share or part of this contract or to any benefit arising therefrom.

SECTION I

PROHIBITED INTEREST

- I.1 No member, officer or employee of the District, or of a local public body, during his tenure or for one year thereafter shall have any interest direct or indirect, in this contract or the proceeds thereof.

- I.2 To the District's or Contractor's knowledge, no Board member, officer or employee of the District has any interest, whether contractual, non-contractual, financial or otherwise in this transaction, or in the business of the Contractor, and if any such interest comes to the knowledge of either party at any time, a full and complete disclosure of all such information shall be made in writing to the other party, even if such interest would not be considered a conflict under Article 4 of Division 4 (commencing with Section 1090) or Division 4.5 (commencing with Section 3600) of the Government Code of the State of California.

SECTION J
AIR POLLUTION

J.1 The Contractor and suppliers must submit evidence to the District that the governing air pollution criteria will be met. This evidence and related documents will be retained by the District for on-site examination by UMTA.

SECTION K

TERMINATION

- K.1 District may terminate this contract for convenience at any time by giving the Contractor written notice thereof. Upon termination, the District shall pay the Contractor his allowable cost incurred to date of termination, and those costs deemed reasonably necessary by the District to effect such termination, determined in accordance with Part 1-8.705-1 of the Federal Procurement Regulations (41 CFR 1-8) of other applicable portion(s) of said Regulations. In addition, the District shall pay the Contractor a percentage of profit, which relates to contract work accomplished to date of termination. The effective date of termination shall be the date of Notice of Termination.
- K.2 In the event the Contractor breaches the terms or violates the conditions of the contract, and does not within ten days thereafter, cure such breach or violation, the District may immediately terminate the contract for default. Contractor shall be liable for any and all costs incurred by the District as a result of such default.

SECTION L

MOTOR VEHICLE SAFETY AND POLLUTION

- L.1 Contractor shall furnish, in accordance with the requirements of the United States Environmental Protection Agency, the following certification in writing:
- o The horsepower of the vehicle is adequate for the speed range and terrain in which it will be required to operate and also to meet the demands of all auxiliary power equipment.
 - o All gases and vapors emanating from the crankcase of a spark-ignition engine are controlled to minimize their escape into the atmosphere.
 - o Visible emission from the exhaust will not exceed #1 on the Ringlemann Scale when measured 6 inches from the tailpipe with the vehicle in steady operation.
 - o When the vehicle has been idled for three minutes and then accelerated to 80% of rated speed under load, the opacity of the exhaust will not exceed #2 on the Ringlemann Scale for more than five seconds, and not more than #1 on the Ringlemann Scale thereafter.
 - o That the vehicles furnished meet the current Federal and State regulations. Certificate to include the values of the H.C. + NO₂ and CO-grams per BHP-Hr.
- L.2 Vehicles shall comply with the Federal Motor Vehicle Safety Standards as established by the United States Department of Transportation in effect on the date of manufacture.
- L.3 Vehicles shall comply with all requirements of the laws of the State of California, including all regulations set forth by the California Highway Patrol in effect on the date of manufacture.

SECTION M

MINORITY BUSINESS ENTERPRISE

- M.1 In connection with the performance of this contract, the Contractor will cooperate with the District in meeting its commitments and goals with regard to the maximum utilization of Minority Business Enterprises and will use its best effort to insure that Minority Business Enterprises shall have the maximum practicable opportunity to compete for subcontract work under this contract.
- M.2 Minority Person means an individual who is Black, Hispanic, Asian American, American Indian, Alaskan native, or a woman regardless of race or ethnicity.
- M.3 Owned and controlled means a business which is 1) a sole proprietorship legitimately owned by an individual who is a minority person, 2) a partnership or joint venture controlled by minority persons and in which at least 51% of the beneficial ownership interest legitimately are held by minority persons, or 3) a corporation or other entity controlled by minority persons and in which at least 51% of the voting interests and 51% of the beneficial ownership interests legitimately are held by minority persons.
- M.4 Appendix VI regarding Minority Business Enterprise is incorporated into this specification at the request of the Urban Mass Transportation Administration, Office of Civil Rights.

SECTION N

MATERIAL AND WORKMANSHIP

- N.1 All materials, parts and equipment furnished by the Contractor shall be new, high grade, and free from defects. Workmanship shall be in accord with generally accepted standards. The Contractor shall extend to the District's General Superintendent of Maintenance, or his authorized representative, full access to his manufacturing facilities during normal working hours, so that the District can maintain surveillance and monitor the Contractor's compliance with his established quality assurance procedures and the District's specifications.
- N.2 Materials and workmanship not conforming to the requirements of these specifications shall be considered defective and will be subject to rejection.
- N.3 If the Contractor fails to replace any defective or damaged work or material after reasonable notice, the Southern California Rapid Transit District may cause such work or materials to be replaced. The replacement expense shall be deducted from the amount paid to the Contractor.
- N.4 Unless otherwise specifically provided in this Contract, reference to any equipment, material, article or patented process by trade name, make or catalog number shall be regarded as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor may, at his option, use any material, article or process which, in the judgment of the District's Purchasing Agent is equal to that name. The Contractor shall furnish, at his own expense, all information necessary or related thereto as required by the Purchasing Agent. The Purchasing Agent shall be the sole judge as to the comparative quality and suitability of alternative equipment or articles or material and his decision shall be final.
- N.5 It should be understood that specifying a brand name, component or equipment in this specification shall not relieve the supplier from his responsibility to produce the product in accordance with the performance warranty and contractual requirements. The supplier is responsible for notifying the District of any inappropriate brand name, component, or equipment that may be called for in the specifications, and to propose a suitable substitute for consideration.

SECTION N (Cont'd)

- N.6 Contractor shall permit designated representatives of the District to inspect the daily progress of vehicles under fabrication at Contractor's manufacturing facilities to ascertain that fabrication and materials comply with these specifications.

SECTION O

PAYMENT

- O.1 The District shall pay the Contractor or his representative within 20 days after acceptance of each bus. Invoices shall be furnished to the District with, or prior to delivery of each bus.

SECTION P

DELIVERY AND ACCEPTANCE

- P.1 The buses shall be delivered to the District's Division 14, 5413 South Avalon, Los Angeles, California, in first class condition, complete and ready for operation. Contractor shall assume all liability and risk of loss incidental to delivery. Buses, if delivered from overseas shall be shipped below deck for protection from the weather.
- P.2 Time is of the essence on this contract. The Contractor shall prosecute the work continuously and diligently. He shall deliver the buses as follows:
- o Delivery shall commence no later than 12 months after the date of execution of contract, with final delivery to be completed within 18 months after the date of execution of the contract.
 - o Delivery shall occur between the hours of 8:00 a.m. and 3:30 p.m., Mondays through Fridays, exclusive of holidays.
- P.3 Buses shall be delivered at a planned rate not to exceed 7 per day during the delivery period. Contractor shall submit a schedule of his delivery plan.
- P.4 Contractor shall make all arrangements for delivery subject to approval of the District.
- P.5 Delivery drivers shall log and report all incidents and unusual bus performance occurring during the delivery trip. Bus speed and operations enroute shall be controlled so as to prevent damage to any part of the bus. If any delivery trip is interrupted, Contractor shall submit a report to the District describing the nature of the interruption and the service or repair, if any, required to continue the trip.
- P.6 Upon delivery, District will execute an acknowledgment of receipt, which shall not constitute acceptance of the bus. At, or before time of delivery, Contractor will execute all documents necessary for transfer of title and registration of bus to District. Buses shall be registered to Southern California Rapid Transit District, 425 South Main Street, Los Angeles, California 90013.

SECTION P (Cont'd)

- P.7 If after testing and final inspection by responsible employees of the District, it is determined that the buses are in conformance with contract requirements, District shall accept the buses in writing. In no event shall acceptance of a bus occur at a later date than when said bus is placed into revenue service. The District shall notify the Contractor in writing within 15 days after delivery of each bus if it has or has not been accepted. A letter of non-acceptance will furnish details of the deficiencies.

SECTION Q

CARGO PREFERENCE - USE OF UNITED STATES FLAG VESSELS

The Contractor shall:

- Q.1 Utilize privately owned United States-Flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels.
- Q.2 Furnish within 20 days following the date of loading for shipments originating within the United States, or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated "on board" commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (1) above to the UMTA Administrator and grantee (through the prime Contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, D. C. 20230.

SECTION R

LIQUIDATED DAMAGES

- R.1 Contractor agrees that failure to complete the delivery of the buses as scheduled will result in additional costs and other tangible and intangible losses to the District. Therefore, if Contractor fails to complete delivery of a bus as scheduled, he shall pay the District \$50 a day for each day such bus remains undelivered, and such monies shall be paid as liquidated damages, not as a penalty. All liquidated damages shall be deducted from the invoices submitted for the purchase of these buses, or, if monies due or to become due Contractor are insufficient, Contractor or its surety shall pay the amount due.
- R.2 Liquidated damages will not be assessed where the time for completion of delivery has been extended by the District. The time for completion shall be extended for such reasonable time as the District determines under the following conditions:
- A. Where the Contractor is delayed due to a cause beyond his control, including but not limited to strikes, riots, acts of God.
- A delay is beyond the Contractor's control only if the delay:
1. was not reasonably expected to occur in connection with, or during the Contractor's performance; and
 2. it was not caused directly or substantially by Contractor's (or its agents') act, omission, negligency or mistake; and
 3. it was substantial and in fact delayed the total progress of the work (When Contractor is delayed in progress of one area of the contract but can proceed with performance in another area, he must do so); and
 4. it could not adequately have been guarded against by contractual or legal means.

SECTION S

AUDIT AND INSPECTION OF RECORDS

The Contractor shall permit the authorized representatives of the U. S. Department of Transportation and the Comptroller General of the United States to inspect and audit all data and records of the contractor relating to his performance under the contract.

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

1. GENERAL

A. General Description

It is the intent of these specifications to describe a transit bus of the latest design suitable for service under the conditions which prevail on the routes of the District. It is the desire of the District to obtain a vehicle which is innovative in design and at the same time provides proven reliability and maintainability.

B. Dimensions and Miscellaneous Data

Length Overall	30-32 Ft.
Width Overall	102 In. Max.
Width Over Body	96-102 In.
Height Overall	124 In. Max.
Step Height from Street Level to 1st Step - Front	14 In. Max.
Step Height from Street Level to 1st Step - Rear	14 In. Max.
Step Riser Height	10 In. Max.
Head Room Over Aisle	74 In. Min.
Floor Height At Front Entrance	34 In. Max.
At Rear Exit	34 In. Max.
Front door opening, clear between hardware and assists	35 In. Min.
Rear door opening, clear between hardware and assists	26 In. Min.
Seat spacing, hip to knee	28 In. Min.
Seat Width	36 In.
Seat Back Height	36 In.
Aisle Width	17 In. Min.
Body Turning Radius Right	34 Ft. Max.
Left	35 Ft. Max.
Approach Angle	10° Min.
Departure Angle	10° Min.
Breakover Angle	10° Min.
Wheelbase	175-182 In.

Weight Penalty, fifty cents per pound in excess of 21,000.

C. Weight

The wet weight of each bus including a full complement of fuel, oil and water shall be stated by the bidder and shall not exceed 21,000 pounds.

Any weight in excess of the above maximum shall carry a penalty of fifty cents (50 cents) per pound which shall be deducted from the Contractor's invoice by the District. Contractor shall submit a certified weight slip for each bus. Fuel tanks must be full at time of weighing and certifications made thereto. In analyzing the bid prices, the over weight penalty will not be considered.

D. Performance

Vehicles supplied under this contract shall be equipped with the proper combination of engine, transmission and drive axle, of the latest proven design; capable of giving satisfactory life and performance under all conditions which prevail in the District's service. Vehicles shall be capable of a road speed of at least 55 mph at recommended engine governed speed. Acceleration shall be smooth and shall be sufficient to achieve a speed of 30 mph in 20 seconds, and a speed of 50 mph in 57 seconds from a standing start on dry, level pavement.

Sufficient power shall be available to maintain a speed of 40 mph while climbing a 2.5 percent grade. These performance requirements shall be demonstrated with air-conditioning on and with a full seated load of 150 pounds per passenger.

E. Tests

In addition to performance data supplied as part of the bid it shall be the Contractor's responsibility to demonstrate to the District's satisfaction that the vehicles furnished meet all the requirements of these specifications.

Buses to be tested shall be selected at random from the regular production run to be delivered under this contract, as directed by the District. Sufficient tests shall be conducted to make certain that the vehicles comply with these specifications. It will not be necessary to repeat those tests on the remainder of the buses where the items or systems clearly meet the requirements of these specifications.

E. Tests (Continued)

All buses shall be water tested for a minimum of 30 minutes in a manner equalling a sustained driving rain, prior to the installation of the interior paneling in order that leaks may be detected and corrected from the interior

F. Materials and Construction

For economy in maintenance, it is essential that parts and units be arranged so that rapid assembly and disassembly will be possible for all buses proposed to be purchased. The dimensions of all parts, unless particularly specified, will be in accordance with current standards of the Society of Automotive Engineers.

All units or parts not specified shall be Contractor's standard units or parts and shall conform in material, design and workmanship to the best practice known in the automotive industry. All parts shall be new and in no case will be used, reconditioned or obsolete parts be accepted. Any one part used shall be an exact duplicate in manufacture, design and construction in each of the buses. No advantage shall be taken by the Contractor in the omission of any parts or details which go to make the bus complete and ready for service, even though such parts or details are not mentioned in these specifications.

Workmanship throughout shall conform to the highest standard of commercially accepted practice for the class of work and shall result in a neat and finished appearance. All exposed surfaces and edges shall be smooth, free from burrs and other projections, and shall be neatly finished. Exposed metal surfaces, prior to paneling or covering shall be properly prepared and coated with protective material to insure against corrosion or deterioration. It is not necessary to coat or cover aluminum paneling with protective material, except where paneling interfaces with other materials.

All lubrication, unless otherwise specified, shall be by high pressure grease gun operated on fittings of the "Alemite Zerk" hydraulic type. These fittings shall be all of one manufacture and shall be accessible for a grease gun operated without flexible hose connections.

F. Materials and Construction Continued)

Specifications for petroleum and other consumable products currently being used by the District are found in the appendix. Contractor agrees that said products are acceptable unless his bid indicates in writing those products which are not acceptable for use in the vehicles as delivered. In the event Contractor does not find the District's petroleum product specifications acceptable, he shall indicate those areas where his recommended specifications differ from the District's and the reasons for such differences.

G. Publications

1. Language

All publications shall be in the English language. All measurements shall be in feet, inches and pounds.

2. Maintenance Manuals

Two current sets of maintenance manuals shall be provided with each bus and shall be delivered no later than when the 10th bus is delivered. Prior to the delivery of the manuals, the Contractor shall provide preliminary information, as required to support adequate maintenance of the buses. The manuals shall include information covering all optional or special equipment applicable to the bus delivered. Information contained in the maintenance manuals shall include, but shall not be limited to, all adjustments, tolerances, replacement and repair procedures, recommended preventive maintenance cycles and practices, trouble shooting procedures and necessary accompanying photographs or other illustrations of all major bus systems. Provide complete electrical system schematic drawings with each manual.

G. Publications Continued)

3. Parts Catalogs

Thirty current parts catalogs shall be provided at time of delivery of the first bus. All such catalogs shall be assembled prior to delivery with all sections under one cover and shall include information covering all optional or special equipment applicable to the bus delivered.

4. Price Books

Six current price books shall be supplied to the District's Purchasing Department at time of delivery of the first bus. Contractor shall provide up-to-date supplements over the life of the equipment.

5. Drivers' Manuals

100 drivers' manuals shall be supplied at time of delivery of the first bus. Manuals shall be approved by the District prior to final printing.

6. As-Built Drawings

The Contractor shall, prior to commencing production, supply an "as built" 3/16" = 1 ft. scale drawing photographically reproduced on stable base matte finish Mylar film. This drawing shall be similar to drawing B-0000-A in the Appendix and shall have sufficient detail and data to describe all technical features of each bus furnished. Format of drawing shall be approved by the District.

7. Approval of Bus Design

Contractor shall, prior to commencing production, obtain the District's approval on his bus design drawings and/or modifications of his present design done to conform to these specifications. District approval of the design does not relieve the manufacturer of his responsibility to produce a bus designed, manufactured, assembled and tested for use in the District's service area. The District shall approve or reject the drawings and specifications within 10 calendar days after receipt of the drawings from the Contractor.

II. ENGINE & ACCESSORIES

A. Engine

Engine shall be of a proper design produced by a reputable and recognized United States engine manufacturer and shall be of sufficient horse power and torque over the range of engine speeds to give maximum performance in all transmission gear ranges.

Engine shall operate smoothly without noticeable vibration.

Engine shall be of the latest design incorporating all features which will minimize emissions and maximize life of the engine. Engine shall be of sufficient horse power so that in the event it is derated in order to minimize emissions, it will nevertheless meet all the performance requirements stated above. It shall, with normal maintenance, operate with minimum smoke or objectionable odors, using fuels and oils meeting the specifications found in the Appendix.

Engine shall meet all Federal laws and regulations and all laws and regulations of the State of California with regard to air and noise pollution in effect on the date of manufacture of the bus.

Internal noise level generated by the engine, air intake and other vehicle systems shall not exceed 83 dbA under normal operating conditons. Internal noise level shall be measured at a point four feet forward of the rear of the passenger compartment and four feet above the floor. Measurements shall be taken at locations where there are no reflecting or absorbing surfaces to change the sound emitting from the vehicle. Readings shall be taken in sufficient quantity so as to demonstrate that under all normal operating conditions, the noise level shall not exceed 83 dbA.

If air throttle is utilized, provide means for operator to build up air pressure quickly. Accelerator shall be under control of the operator while he is in the driver's seat.

The engine and components shall be arranged and mounted so as to provide convenient access for servicing the engine and all its accessories, arrangement subject to approval of the District. The power plant shall be mounted in the rear of the bus, entirely outside of the passenger compartment, and shall be removable as a single unit, complete with the transmission assembly. Engine air shall be taken from outside of bus.

B. Engine Equipment

Engine temperatures shall be thermostatically controlled to approximately 200 degrees F. by thermostat and shutter combination, or by electric or fluid fan.

The power plant compartment shall be completely sealed so as to prevent smoke and odors from entering passenger compartment, and shall be insulated for both heat and sound.

Exhaust sound level shall be held to a minimum, without increasing muffler back pressure that would be detrimental to the engine performance and engine life expectancy. Sound level shall be below the maximum limits set by the State of California.

Exhaust tail pipe or pipes shall terminate near the left lower rear corner of the bus.

Crankcase shall be adequately ventilated so as to meet all requirements of the State of California. Necessary means shall be provided to approach zero inches of water crankcase pressure at rated engine speed. Oil drain plugs shall be machined with gasket and flange, if available, and shall be magnetic.

Fuel Filters of the "spin-on" type shall be provided. Parker-Hannifin No. 2600 swing type valve shall be installed near inlet of primary fuel filter. Also provide fuel shutoff cock if fuel filter is below top of fuel tank.

Engine air cleaner shall be heavy-duty type.

Fuel and oil lines shall be steel tubing where practical. Flex lines shall be Teflon core with stainless steel braid cover and kept to a minimum in number and length, properly clamped with heavy-duty clamp of material which will not deteriorate with oil, heat or abrasion.

Oil pressure gauge and oil pressure switch shall be mounted on bulkhead in the engine compartment.

A vertical exhaust shall not be used unless absolutely necessary to achieve noise standards contained elsewhere in District's specifications. In the event that vertical exhaust is included, the fourth paragraph of this section, relative to the

B. (Continued)

location of the exhaust pipe may be amended to place this exhaust pipe in a position located near the upper left rear of the vehicle provided it meets the requirements of the California Vehicle Code. If the Venturi Aspirator is provided, steps shall be taken to prevent back pressure and entrance of exhaust into engine compartment.

C. Cooling System

Radiator shall be of latest heavy-duty design, adequate to maintain 200° F operating temperature with 110° F ambient temperature on any route operated by District. Provide tubular type brass core. Top and bottom tanks shall be heavy-duty, removable bolted type. Tanks, inlets and outlets shall be brass. Fittings shall be silver soldered or phosphor copper welded in place, or 95-5% tin antimony solder.

Heaters shall be heavy-duty design, tubular type brass cores. Tanks shall be brass with reinforced attaching brackets.

All fittings in cooling system shall be cast iron or brass.

Water hoses shall be Gates Durion or Hadbar Purosil 70, silicone hose with 4-ply polyester fabric reinforcement. All hoses shall be protected from engine heat which may cause premature failure.

Provide push button pressure relief valve at filler level of surge tank.

All hose clamps shall be stainless steel. All hoses, 2 inches or greater, in diameter, shall have hose clamps, 3/4 inch wide, spring loaded, T-bar type as manufactured by Voss Industries, or by Specialty Products and shall have self-locking nuts.

A low water detector with probe in 4-gallon minimum surge tank and indicator lamp in driver's compartment shall be provided. A sight glass, located at the filler level, shall be provided to determine coolant level adequacy without opening filler.

C. Cooling System Continued)

Contractor shall certify in writing that each Vernatherm valve, if provided, has been checked and properly adjusted to perform in accordance with the specifications. Alarmstat shall be set at 220° - 225° F.

III. TRANSMISSION

A. General

Transmission shall be of U.S. manufacture and shall be a fully automatic, heavy-duty single fluid hydraulic type, of the latest design and materials. Transmission shall be compatible with the engine to give maximum performance in all gear ranges.

Selector shall be easily moved into forward or reverse positions without raking gears. Automatic shifting of gears shall be completed smoothly without jerking the bus. Provide means for operator to downshift without damage to the power plant. Transmission shall be equipped with a starter interlock to prevent starting of engine unless transmission is in neutral. Provisions shall be made for proper circulation, filtration and cooling of the hydraulic fluid. The transmission shall have a minimum of four speeds forward, all of which shall be fairly even spaced. Transmission shall be readily accessible for removal or adjustments. Any frame member or structural unit shall be easily removable to provide complete access to the transmission.

Contractor shall provide in writing as part of his bid the recommended shift speed settings compatible with the power train provided, operating conditions and fuel economy, subject to approval of the District.

B. Retarder

Contractor shall provide hydraulic retarder. Retarder shall be subject to the approval of the District. Bidder shall provide with his bid, information relative to the type of retarder he proposes to furnish, including mounting and retardations characteristics.

IV. RUNNING GEAR

A. Air Suspension

Air suspension system shall maintain constant height of body in relation to axles regardless of load. Source of air shall be a separate tank and a check valve shall protect against air loss from leaks or failure of suspension system.

B. Radius Rods

Radius rods or other suitable devices shall adequately control lateral, longitudinal and torsional movements at each axle.

C. Bumpers

Front bumper shall be of the energy absorption type as manufactured by Firestone, or approved equal. Color shall blend with the exterior paint scheme. Contractor shall submit drawings and specifications at time of bid, for District's approval, if other innovative type energy absorption bumper is proposed.

Rear bumper shall be corrosion-resistant stainless steel channel of 0.130-inch minimum thickness. Energy absorption-type bumper will also be acceptable in the rear at Contractor's option. Color shall blend with the exterior paint scheme. The entire arrangement shall be approved by the District within 10 calendar days after submission of drawings to the District.

D. Fueling System

Fuel tanks shall have a minimum capacity of 125 gallons and shall have properly secured baffles. Tank shall be provided with either an easily removable filler neck or inspection plate near the center of the top of the tank. Location, size, material, construction, and design shall meet California laws. Fueling rate shall not be less than 50 gallons per minute. Fuel tank capacity shall be sufficient to provide a range of 350 miles with air conditioning system in operation. The entire fuel tank and its hardware shall be compatible with the Emco Wheaton Model G-2251 nozzle. Tank shall be complete with pressure relief valve, level control valve, vehicle and anti-spill device.

E. Shock Absorbers

Heavy-duty shock absorbers shall be provided on each side at front and rear.

F. Tow Eyes

Tow eyes or tow eye anchors shall be located above or in the front bumper assembly and shall be properly installed so that bus can be safely towed without damage to the bus.

G. Drive Shaft

Drive shaft shall be heavy-duty and protected by bulkhead or "U" bracket. Universal joints shall be provided with Zerk fittings.

H. Rear Axle

Rear axle assembly shall be heavy-duty with a minimum rating and capacity of 22,000 pounds. Non-bushing type compensating gears are preferred. Load tubes shall be hard chrome-plated or induction-hardened.

I. Front Axle

Front axle shall be heavy-duty with minimum rating and capacity of 12,000 pounds. Spindles shall be hardened to 285-341 Brinell.

J. Final Gear Ratio

Final gear ratio shall provide a cruising speed of not less than 55 mph without exceeding manufacturer's recommended maximum engine speed. Combination of gear ratios shall give optimum performance in each gear range, subject to approval of the District.

K. Steering Mechanism

Power steering mechanism shall be constructed so that bus can be easily steered by operator and shall be such as to make the steering wheel free from road shock and vibration. Steering wheel movement shall be no more than eight complete turns lock to lock. Steering mechanism shall be self-centering, requiring little or no effort for the operator to bring the bus back to a straight-ahead

K. (Continued)

position after turning. Exterior of steering wheel shall be of all plastic or synthetic resin construction. Further, it shall be provided with puller holes in the hub so that a standard or universal puller may be used.

The required pull at the rim shall not exceed 15 pounds to turn the front wheels five degrees right or left. These requirements are for a wet bus empty on a dry concrete floor, clean and free from loose or foreign material with tires aired to the District's Tire Contractor's recommended pressure. The pull at the rim for a wet bus with a full seated load (150 pounds per passenger) shall not exceed 30 pounds under the same conditions.

Provisions shall be made for easy external adjustment of steering gear backlash.

L. Wheels

Wheels shall be 10 hole, ventilated disc type and shall be compatible with radial steel tires. Wheels shall be motor-wheel type mounting.

M. Tires

The tire size and type shall be as proposed by the Contractor. All tires shall be the same size and shall be interchangeable at all wheel positions. Contractor shall utilize tires from the District's Tire Mileage Contractor, The Firestone Tire and Rubber Company, if proper tires are available.

N. Brakes

Contractor shall make certain that the brake spider, cams and hinge pins are in proper relation with the front spindle or rear load tubes. Brake systems shall comply with Federal Motor Vehicle Safety Standard No. 121.

1. Brake Shoes

Minimum width of brake shoes shall be as follows:

Front - 6 inches
Drive - 10 inches

2. Brake Drums

Brake drums shall be 14-1/2 inches minimum inside diameter and free of casting flaws. Drums shall be turned and machined concentric with a maximum run out of .010 inches. Rear drums shall be drilled for a minimum of three squeal dampeners.

3. Brake Lining

Contractor shall apply brake lining which provides optimum life of lining and drums and shall be free of squeal. Bidder shall indicate, on the appropriate submission forms along with his bid, the type of lining and drums which he proposes to furnish.

4. Brake Cams

All brake wearing surfaces shall be hardened to minimum 50-60 Rockwell, "C" scale or hard chrome plated and ground smooth and bearing surfaces not to exceed thirty (30) micro inches. Cams shall be supported by bronze bushings. Brake cams with a forged cam head in lieu of ground cam heads are acceptable so long as other requirements of this section are met.

5. Slack Adjusters

Contractor shall furnish Bendix-Westinghouse, lock type slack adjusters.

6. Diaphragms

Brake diaphragms shall be oil and abrasion resistant.

7. Parking Brakes

Provide Bendix-Westinghouse DD-3 parking brake at each wheel position on rear axle. Operator's parking brake control shall be located to the left of the operator in a convenient position, yet out of reach of passengers. Quick-release clevises shall be utilized.

Bus shall not be capable of being moved until brakes are fully released.

Provide warning lamp for each rear brake to indicate if rear brakes are mechanically on when air or spring is fully released. Provide individual circuits for each lamp. Circuits shall be in series with the engine run switch. Entire system shall be approved by the District.

V. BODY

A. Exterior

1. General

Body structure must be of integrated design and shall be capable of performing satisfactorily under extreme bus use (fully loaded buses, stop and go operations). All rivet lines shall be straight. Rivets shall be of the same basic material as the panels being riveted. Rivet hole to edge of panel distance shall be a minimum of 1-1/2 times the diameter of the hole. Hole to rivet clearance shall be a maximum of .008".

2. Siding

Siding shall be anodized aluminum or steel of sufficient thickness to prevent drumming and provide structural integrity. All body panels shall be treated to prevent corrosion.

3. Radio Compartment

Contractor shall provide waterproof compartment on left side of bus for future installation of radio. Compartment shall be not less than 9-1/2 inches high, 20 inches wide and 28 inches deep. Provide hinged, locked door with water resistant Corbin lock, with No. 4T17153 key. Provide one key for each lock.

4. Finish

Metal surfaces shall be painted and shall be properly cleaned, etched and primed prior to application of paint so as to insure a proper bond. All concealed metal surfaces shall be given a coat of corrosion resistant protective paint. Roof, front, rear, and side surfaces shall be painted with DuPont Imron, Sherwin Williams Polane, or equal to three mil thickness. The interior of the rear passenger doors shall be primed with acid-resistant paint.

5. Color Scheme

Contractor shall provide, with his bid, no less than one artist's water color painting of the bus bid upon, illustrating a proposed color scheme for bus exterior painting. Paint scheme shall be generally in conformance with District's latest design.

Successful bidder shall be prepared to make modifications to the suggested scheme which do not materially change the concept or the cost thereof. The first production bus shall be painted according to the recommended scheme and approved by the District prior to painting the remainder of the buses.

The District's standard colors are: white, yellow, gold champagne, and black. Bowles color drift control panels shall be provided to the successful bidder for color matching.

6. Rear Engine Door

All equipment compartment doors shall be equipped with door latches with handles.

B. Interior

It is the intention of these specifications to provide a functional and pleasant environment for passenger appeal, comfort, convenience and safety. Provisions shall be made to minimize accident hazards by applying door hinge guards, padding on overhead obstructions, etc. as necessary.

1. Ceiling and Window Area

Ceiling panels and wall area around windows shall be laminated plastic, Formica Gemina White 749 (-30) or Consoweld Dura Beauty Antique White Cantina C25T, or equal. Ceiling panels shall be properly sealed and insulated from roof ribs to prevent discoloration.

2. Side Panels

Side panels below windows shall be laminated plastic Formica Windsor Bookmatched 232 (-64), or Consoweld Dura Beauty, Select Walnut W-46-T, or equal. Panels shall be supported so as to prevent buckling, drumming or flexing.

3. Insulation

Thermal and accoustical insulation shall be installed in ceilings, walls, floors and between engine compartment and passenger area.

4. Trim

All trim including internal exposed support structures shall be anodized aluminum, stainless steel, or PVC. Exposed rivets and other fasteners shall be kept to a minimum and where used shall be aluminum or otherwise treated to prevent corrosion.

Trim molding shall be applied at floor covering edges around all wheel houses, driver's platform dash panel, and at all wall joints not otherwise covered by floor heating ducts. Heating duct covers shall be smooth aluminum or stainless steel sheeting.

5. Modesty Panels

Modesty panels shall be of sufficient thickness and manufactured and supported in such a manner to prevent buckling, drumming or flexing. There shall be no pinch or interference between doors and modesty panel.

Modesty panels shall be covered on both sides with laminated plastic. Pattern shall match wall panels. Provide approximately one-inch clearance between panel and the floor at the front and approximately 5 to 6 inches at the rear.

6. Painted Areas

Painted areas in interior shall be held to a minimum. Paint scheme for doors and dash area shall complement the interior and shall be approved by the District.

7. Driver's Barrier

Contractor shall provide a driver's barrier that shall protect the operator from the rear. Barrier shall extend from left side of bus to approximately 2" of the vertical stanchion at rear aisle side of operator's seat. Barrier shall extend from approximately 24" above the bus floor to the bus ceiling. Drivers' barriers shall be made of 1/2" thick 26 percent density coated plastic material such as Swedlow's AcriVue A or approved equal.

An embossed anodized aluminum or stainless steel panel may be used for the lower portion of the driver's barrier to a height of 40 inches above the bus floor.

C. Windows

1. Side Windows

Windows shall be push-out type, hinged from the top. Window glass shall be mounted in rubber retainers or frames. Frames and hardware shall be anodized aluminum of a color matching the paint scheme or of stainless steel. Windows shall be stationary except that the rear window on each side shall have sliding sash. Contractor shall provide anodized exterior lock to match sash or provide other means to allow air to enter bus during the "cyclone" vacuuming of the interior. Lock shall be on rear vertical portion of sash and shall be as low as practical. Arrangement shall be approved by the District.

All messages relative to emergency exits shall be on permanently attached vandal-resistant metal plates.

2. Driver's Window

Driver's window shall be stationary except for forward portion which shall be openable to allow operator to adjust exterior rear-view mirror. Openable portion shall be equipped with manual type lock. Entire assembly shall be hinged from top and shall provide emergency egress and shall comply with FMVSS 217.

3. Windshield

The windshield shall be two-piece with vertical center divider and shall be designed to eliminate reflective glare in the operator's line of sight.

4. Rear Window

Rear window, if provided shall be two-piece with vertical divider.

5. Glass

Glass shall be bronze tint, E-2 Eye Soft Ray, Libby Owens Ford, or equal. Laminated glass in all windows.

Provide single density float glass in:

Windshield
Rear Window
Operator's Side Window
Front Doors

Provide 28% density glazing in side windows.

Provide double density float glass in rear doors.

D. Passenger Doors

Structure of the doors, their attachments, inside and outside trim panels, shall be durable and corrosion-resistant. Door construction shall be of corrosion-resistant metal. Grab handles shall be attached to the interior of the front doors.

Doors shall be controlled from a single horizontal plane lever or by push-buttons mounted on the operator's console. Location of controls subject to the approval of the District.

Meeting edges of doors shall have rubber edges on each door section with a minimum clearance of 4 inches between solid edges.

Doors shall be air operated, but may be electrically controlled providing that circuitry is designed to prevent inadvertent closing of doors when run control switch is moved to "OFF" position. Door control arrangement shall be approved by the District.

D. Passenger Doors (Continued)

A manually operated door bleed-valve, located at operator's left in an accessible position, shall be provided to release air pressure on front door to allow doors to be opened and closed manually.

When opened, the front doors shall leave a clear opening of no less than 76 inches in height and no less than 35 inches in width, including hardware and attachments.

It shall be possible to open and close either or both passenger doors when the bus is loaded to its GVWR with the right side tires touching an 8-inch high curb on a street sloping toward the curb with the left side wheels 5 inches higher than the right side wheels.

The upper section (1/2 door height) of both front and rear door and the lower section of the front doors shall be glazed for no less than one-half the respective door opening area of each section. The edge of a 6 inch high curb shall be visible to the seated driver through the closed front door when the bus is no less than 6 inches from the curb.

The rear doors shall be on the right side of the bus and shall have a clear opening of not less than 76 inches in height and no less than 26 inches in width, including hardware and attachments and shall be:

1. Designed to release the door-closing pressure, and to reopen should a person be caught in them while they are closing.
2. Equipped to transmit a distinctive audible signal and to light a warning lamp on the operator's console should the doors completely close on any part of a person's body.
3. Adjustable to close between 2-1/2 to 3-1/2 seconds.
4. Equipped with air release valve to allow doors to be opened by passengers in the event of an emergency. This valve shall be located behind a single-strength glass and shall be identified by proper sign.
5. Equipped with a brake and accelerator interlock that shall prevent the bus from being moved while the door control is energized and until the door is fully closed.

D. Passenger Doors (Continued)

6. Equipped to energize the stop lamp circuits when rear door opens.
7. Equipped to promptly release the brakes after door closes regardless of street crown.
8. Designed to allow operator to override the system and to open the rear door. Provide by-pass switch in a location convenient to the seated operator, subject to the approval of the District.

E. Steps

Step height from street level	14" Max.
Step riser height	10" Max.
Steps	2 Max.

Step wells shall be stainless steel or molded fiberglass, installed so as to be easily changed and repaired.

Step covering shall fully cover steps or shall be recessed to furnish a flush surface to eliminate tripping hazards.

F. Wheel Wells

Wheel well housings shall be stainless steel.

G. Destination Signs

Destination signs shall be included on the front and on the right side of the bus near the front door. Characters shall be alpha-numeric. The sign system shall post the same readings on both signs simultaneously.

Front sign shall be capable of displaying the maximum number of characters that space will allow in a particular manufacturer's bus. Signs shall be capable of displaying primary destination readings and secondary messages intermittently or secondary messages may be on a separate line. A minimum of 18 characters on a line shall be acceptable.

G. Destination Signs (Continued)

The primary readings on the front sign shall be clearly legible for a distance between 12 and 150 feet, day or night, by persons with 20/20 vision. Primary readings on the side sign and all secondary messages on both signs shall be clearly legible for a distance between 8 and 50 feet.

Reading selections shall be made by the operator by dialing thumb switches.

The system shall be capable of displaying up to 500 primary and/or secondary readings. Selection of these readings shall be made by the operator in less than 30 seconds.

Contractor shall state the time required and the method that the District will use to add, delete or otherwise change the data stored in the destination sign memory.

If special equipment is necessary to make changes to the memory, the Contractor shall state the cost, availability and source of supply of such equipment.

H. Mirrors

The following mirrors shall be provided:

1. 7 inches x 10 inches convex mirror over front stepwell. ACME 1000-78, or approved equal.
2. Right and left hand exterior rear-view mirrors shall be approximately 6 inches x 16 inches and shall be mounted as high as practicable. Mirror shall be flat except for the bottom 4 inches which shall be convex and non-adjustable. Outer edge of mirrors shall not extend more than 10 inches on each side of the bus, except that the maximum bus width shall not exceed 120 inches as a result of the mirrors.
3. 4 inches x 16 inches interior rear-view mirror. Mounting location and arrangement subject to approval of District.
4. 6" diameter and 12" diameter rear door mirror combination. Must have stainless steel backs. ROSCO 363 12" and ROSCO 364 6" mirrors or approved equal.

I. Sun Visor

Sun visor shall be padded type with vinyl plastic cover in color compatible with interior decor. Core shall be #12 gauge aluminum firmly attached to a non-corrosive metal shaft. Mounting brackets shall be sturdy and tamper-proof of satin finish, stainless steel or cast aluminum. Provide large diameter knob for easy and positive adjustment and locking of visor. Visors shall provide adequate eye protection for operator in the forward and left side positions and shall be approximately 7" x 27". Contractor shall furnish sample visor to the District for approval. Sample visor shall become the property of the District.

J. Lights

1. General

All lights and reflectors shall meet California requirements as to specifications and location. Interior lighting systems shall be so designed as to prevent glare to operator on windshield. Lights shall operate with or without engine running. All lamp sockets shall be heavy-duty type and capable of accepting U.S. manufacturer's bulbs.

2. Interior Lighting

- a. An overhead fluorescent lighting system shall provide general illumination in the passenger compartment and shall be controlled by the operator. The system shall provide no less than 15 foot-candles of illumination on a 1 square foot plane at an angle of 45° centered 33 inches above the floor and 24 inches in front of the seat back at each seating position. Floor surface in the vestibule and aisle shall be illuminated to no less than 10 foot-candles. Floor surface illumination in the vestibule may be reduced to no less than 2 foot-candles when the front door is closed. Fluorescent light fixtures shall be located above the side windows at or near the juncture of the coach ceiling and the side wall and may be provided over the rear door. Fluorescent lighting shall not be installed above the forward longitudinal seats. Lamp fixtures

J. Lights (Continued)

and lenses shall be fire-resistant and shall not drip flaming material onto seats or interior trim if burned. Advertising media located in this area shall be illuminated by backlighting, although the interior lighting requirements shall be attained without advertising media installed. The fixtures shall be sealed to prevent accumulation of dust and insects but shall be easily openable on hinges for cleaning and service. The lenses shall be retained in a closed position by tamperproof devices with any fasteners being captive and requiring the same tool to open as other interior access panels. Power supplies shall be enclosed with fireproof material and shall be located at the individual light fixtures. Power supplies shall be inaudible with an operating frequency above 18,000 Hz. Interchangeability of fluorescent lamps, lenses, fixtures, and power supplies shall be maximized.

- b. Provide flush type pre-focused reading lamps over the front longitudinal seats. Lamps shall be preadjusted and locked in position to allow passengers to read newsprint, etc. and to minimize reflection on the windshield to the operator. These lamps shall be controlled by the operator. The transition between the fluorescent fixtures and the pre-focussed lamps shall be neat and symmetrical.
- c. Ceiling light over operator's seat shall be controlled by individual switch.
- d. A stepwell lighting system shall be illuminated when the master switch is in RUN and NITE/RUN, except the front stepwell lamps which shall be extinguished when the doors are closed. The system shall provide no less than 2 foot-candles of illumination on the entry and exit step treads with the doors open. These lights shall be shielded to protect passenger's eyes from glare. Light fixtures shall be totally enclosed, splashproof, designed to provide ease of cleaning as well as lamp and housing removal, and shall not be easily removable by passengers. Stepwell lights shall be protected from damage caused by passengers kicking lenses or fixtures and shall not be a hazard to passengers.

J. Lights (Continued)

- e. Cable shall be provided for future installation of farebox lamp. Cable shall be connected to marker lamp circuit and loose end shall be coiled under dash.

3. Exterior Lighting

Directional lamps shall be provided at front, rear and sides. Side lamps shall be located in standard position near front wheel housing. Contractor shall provide electronic flasher unit. Floor switches for directional lamps shall be completely sealed and protected from moisture. Provide emergency warning flasher switch. All lamps shall conform to California Vehicle Code and California Administrative Code, Title 13.

Dimmer switch shall be sealed and protected from moisture as completely as practical.

The marker and clearance lamps shall be of a type, size and configuration that complements the size and decor of the bus.

The four corner clearance lamps shall delineate the length, width and height of the bus and shall be fitted with dual filament bulbs. The 3 candlepower filament shall be wired for standard clearance and marker lamp use. The 32 candlepower filaments shall be connected with 12-gauge wire to "L" terminal of a silent electronic flasher provided by the Contractor in electrical equipment box in engine compartment. Connect "X" terminal of this flasher with a 12-gauge wire to a Micro Switch No. 13AT3 located 6-1/2 inches above the floor on the front side of the steering column, toggle to the left. Connect this switch in series from the terminal connected to the "X" post of the electronic flasher to a 20-amp circuit breaker. Circuit breaker shall be connected to battery bus bar or equivalent power source.

The 13AT3 switch consists of two sub-miniature micro switches mounted in opposite directions. Switch No. 2 shall be used for this circuit.

J. Exterior Lighting (Continued)

Switch No. 1 will be used in conjunction with radio alarm. The switch shall be mounted with the momentary action of the toggle in the "up" position. The function of this switch is as follows: (1) With the switch in the lower position, the flashing lamps will be off. (2) With the switch in the middle and momentary upper position, the flashing lamps will be on.

Provide 21 candlepower hooded lamps outside front and rear doors to illuminate a 3' x 3' ground area. Lamps shall light only when marker lamps are lighted and doors are open.

Stop lamps shall have removable socket for convenient replacement of bulb.

K. Floor

The floor shall be no higher than 34 inches at the front and rear doors.

The floor may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement. Sheet metal screws shall not be used to retain the floor. Tapping plates used for the floor fasteners shall be no less than the same thickness of a standard nut and all fasteners shall be secured and protected from corrosion for the service life of the bus. The floor shall be reinforced as needed to support passenger loads. No point of the floor shall have an elastic deflection of more than .60 inches when loaded to the GWR.

The floor, as assembled, including sealers, attachments, and covering, shall be waterproof, non-hydroscopic, resistant to wet and dry rot, resistant to mold growth, and impervious to insects. Plywood, if used, shall be no less than 3/4 inches thick, exterior A-C grade and shall be installed with the "A" side up with all edges sealed. Flooring joints shall be installed only over frame members. Plywood shall be sanded after installation and just prior to application of the floor covering.

L. Floor Covering

RCA, or equal, black rubber composition, non-skid type floor covering installed with seams not coinciding with floor joints. Provide properly caulked expansion joints.

L. Floor Covering (Continued)

1. Front Entrance Area

Floor covering shall be 5/16 inch thick ribbed covering with bonded stainless steel binding at entrance nosing and adjoining aisle. Full width integral molded yellow nosing shall be provided at entrance.

2. Center Aisle

Floor covering shall be 3/16 inch ribbed covering running longitudinal, one piece from rear seat to the front entrance area.

3. Under Seat Area

Floor covering shall be 1/8 inch thick smooth covering.

4. Step Treads

Step treads shall be covered with 5/16 inch thick ribbed material bonded to a stainless steel backing with integrally molded yellow molding.

M. Stanchions

Stanchions, overhead grab rails and passenger assists shall be stainless steel clad and shall be between 1-1/4 and 1-1/2 inches in diameter. Grab rails shall permit a full hand grip with no less than 1-1/2 inches for knuckle clearance. Stanchions, grab rails and passenger assists shall be attached with anti-rattle fittings and securely mounted. All mounting brackets, fasteners and other hardware shall be fabricated of corrosion-resistant materials.

Overhead grab rails shall be continuous, except that on the left side one splice, located so that it is invisible and secured to prevent cranking action, shall be permitted. Grab rails shall be securely attached to each carline.

Passenger assists shall be provided along both sides of the front and rear step well areas and shall be positioned to be easily reached from outside the bus. Grab handles shall be located on the interior side of slide-glide type front doors.

M. Stanchions (Continued)

The forward most passenger assists shall extend transversely across the front of the passenger compartment from the front right corner of the dash toward the driver's area so as to come between the farebox assembly and the passenger aisle.

Location of stanchions shall generally conform to District Drawing No. B-1220-A-3.

N. Platform Grab Rails and Fare Box Mounting

Fare box mounting support shall be provided in the platform area in accordance with Drawing No. B-1205-A-15. Platform grab rail arrangement shall generally conform with the Drawing B-1205-A-11. Arrangement subject to approval of the District.

Some deviation from drawings may be necessary to meet the needs of the wheelchair handicapped but grab rails shall afford adequate assists to all passengers and protection from the fare box.

O. Miscellaneous Hardware

1. Take One Box

Contractor shall supply and install two Take One Boxes. Boxes shall be approximately 4-1/2" high x 3-1/2" wide x 1-3/4" deep. Boxes shall have a "U" cut-out of approximately 2-2-1/2" for easy removal of printed material. Boxes may be clear plastic or metal and shall be located near front and rear doors. Location subject to approval of the District.

2. Coat Hook and Strap

Contractor shall supply and install coat hook and strap in accordance with Drawing No. D-1168-A-26.

3. Fire Extinguisher and Bracket

Provide General Model TCP-5J, or Amerex Model 425, 5-pound multi-purpose fire extinguisher, complete with bracket in accordance with District's Drg. No. SK 74-A7. Fire extinguisher shall be equipped with pin and chain and shall have a Fire Marshal's inspection tag showing date of service. Inspection tag shall be wired to fire extinguisher. Extinguisher and bracket shall be located in a convenient place, subject to the approval of District. Bracket shall be attached with through bolts.

4. Emergency Reflector Kit

Emergency reflector kit, Cat's Eye 7500 or KD 610-4645 shall be located in a convenient location out of the way of passengers. Location shall be subject to approval of the District.

5. Run Number Sign

Contractor shall supply and install lighted, three digit, run number sign, Transign No. 1868 in accordance with Drawing No. B-1210-A-10. All digit positions shall have the following readings: 1,2,3,4,5,6,7,8,9,0 and X. Run number sign shall be clearly legible for a distance up to 90 feet, day or night, by persons with 20/20 vision. Sign curtains shall be Mylar. Characters shall be yellow on black background. Run number sign shall be lighted when destination sign is lighted. Face of run number sign shall be painted with non-reflective, black paint. Remainder of run number sign shall be same color as dash panel.

P. Miscellaneous Markings

1. Decals

Contractor shall furnish and apply all decals, location shall be approved by the District. Two manufacturers who have supplied decals to the District are: Hesik Company, Inc., 17466 Damler St., Irvine, California 92705 and Serigraphic Displays, 13721 E. Bora Drive, Santa Fe Springs, California 90670. The Contractor shall certify that the decals, as listed below, are 3-M Scotchcal:

<u>Required</u>	<u>Exterior</u>	<u>Color</u>	<u>3-M Material</u>
1 Set	1-1/2" Digit Numbers	Black	3655
3 Sets	5" Digit Numbers	Black	3655
1 Set	5" Digit Numbers	White	3650
1	3" Bienvenidos	Black	3655
1	2" SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT	White	3650
1	5/8" Exact Fare Please	Clear	3669 Prtd Black
1	3" Welcome Aboard	Black	3655

Decals (Continued)

<u>Required</u>	<u>Exterior</u>	<u>Color</u>	<u>3-M Material</u>
1 Set	5/8" Tenga Pasaje Exacto Por Favor	Clear	3669 Prtd. Black
	<u>Interior</u>		
1	6-1/2" x 13-7/8" (Intl. Sign) PLEASE NO EATING-NO SMOKING-NO RADIO	Clear	3669 Red-Black White
1	1/2" UNNECESSARY CONVERSATION WITH OPERATOR IS FORBIDDEN BY LAW	Clear	3669 Prtd. Black
1	11/16" Bus Drivers Carry No Cash or Tokens	Clear	3669 Prtd.
1	11/16" El Conductor No Tiene Dinero Ni Tokens de Autobus	Clear	3669 Prtd. Black
1	1/2" It is Unlawful For Passengers To Stand In Entrance	Clear	3669 Prtd. Black
1	1" Caution	Clear	3669 Prtd. Black
1	1/2" Door Opens In	Clear	3669 Prtd. Black
4	3/8" These Seats Priority to Elderly and Handicapped Passengers	Clear	3669 Prtd. Black

All "screened" markings shall be coated with 3-M clear coat.

The Contractor shall certify that the following decal is 3-M Scotchlite:

1	1-1/4" Watch Your Step	White	3280 Prtd.
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District shall furnish successful bidder with samples or drawings of all decals listed. Contractor shall furnish any other markings necessary for identification or instructions. Window egress instructions shall be on vandal-resistant plates permanently attached.

V. BODY (Continued)

2. Roof Numbers

Bus numbers shall be painted on exterior of roof in 5-foot numbers in accordance with Drawing No. B-1205-A-16.

Q. Windshield Wipers & Washers

Windshield wipers to be air operated, heavy-duty, Sprague Super-Challenger, or approved equal. Air operated wiper motors shall be piped so air will exhaust below floor. Wiper blades to be heavy-duty refillable type.

Electric or air operated windshield washers to be provided.

R. Under-Carriage & Under-Body

Entire under-carriage and under-body shall be liberally coated with non-flammable resin material such as Pontiac varnish or Ashland Oil Company Tectyl. Miscellaneous fittings, switches, blower motors, etc. are to be protected from undercoat during this process.

S. Operator's Seat

The Operator's seat shall be National Seating Co. Model 195, Deluxe Cush-N-Air, high back, air ride, with heavy-duty shock absorbers, or approved equal. If National seat is used the flanges must be reinforced on supporting stand. Stand shall have removable cover to prevent accumulation of dirt and to provide easy access. All flexible lines shall be arranged to prevent chafing and rubbing in all positions of seat. Driver seats shall conform to all appropriate Federal Motor Vehicle Standards. Seat belts with retractors shall be provided. Bidder may submit with his bid specifications, drawings and pictures for approval by the District of other type air or spring type seats.

T. Passenger Seats

1. Seating arrangement and installation subject to approval of the District on or before award of the contract, generally in accordance with Drawing No. B-1220-A-3. Bidder shall supply

T. Passenger Seats (Continued)

with his bid complete interior layout showing position, dimensions and spacing of all seats, door dimensions and location, aisle width and all pertinent interior dimensions. Minimum spacing from the front of the seat back to the back of the next seat forward shall be 27 inches.

Back panels shall be stainless steel, or approved equal.

Contractor shall provide space and security systems for at least two wheelchairs.

Contractor shall provide a minimum of 31 seats (including those spaces required for 2 wheelchairs, providing "fold down" or other type seating is provided in this area for ambulatory passengers) utilizing the specified spacing.

The 5-passenger rear lounge cushion shall be split into no more than two sections.

Dimensions of seat backs and cushions for longitudinal seats and rear seats to be the same as those for standard transverse seats. The minimum thickness of the seat back at the buttocks level shall not be less than 1.1 inch.

No painted finish is allowed on any portion of the seat.

2. Seats

Seats in buses furnished shall be American No. 6464T or approved equal.

Overall dimensions of seat shall be 34 inches wide and nominal 34 inches high to top of rail if bus is 96 inches wide. If bus is 102 inches wide seats shall be nominally 36 inches by 36 inches. Cushions shall be serpentine spring with 1-inch neoprene foam topper, or approved equal. Backs shall be neoprene foam padded over plywood inner panel.

2. Seats (Continued)

Frame shall be one inch, 16-gauge stainless steel round tubing supported on single stainless steel inverted T-type pedestal with horizontal grab rail above seat back. All surfaces to be jointed shall have a continuous weld.

Vinyl portion of seats including winged seat sides shall be covered with Uniroyal Naugahyde, Ebony Brown, RTD-3978, Doe grain or approved equal. Fabric portion shall be Craftex Pattern K8758N, Color 69411, or approved equal.

3. Tests

The Contractor shall submit a certified test report on the seat components and structural members. The report must show test diagrams, photos of tests and load results on representative seats completely assembled and fastened to a fixture simulating the seat support.

Performance tests must include the following:

o Static Load to Back, Fore and Aft:

This test to consist of horizontal loads of 50, 100, 150, 200 and 300 pounds applied to top of back in forward and rearward directions. Loads to be applied to the center of the top edge of the aisle seat back. At each load application, the amount of deflection and permanent set shall be recorded. The permanent set shall not exceed 1/2 inch at 200 pounds.

o Static Load to Seat Bottom:

This test to consist of downward vertical loads of 100, 200, 300 and 400 pounds applied on the aisle-side seat. Loads to be applied to the center of seat bucket and front edge of seat at center line of aisle seat. At each load application, the amount of deflection and permanent set shall be recorded. The permanent set shall not exceed 1/4 inch.

3. Tests (Continued)

o Swing Impact to Back:

A 40-pound sand bag shall be swung against the back 10,000 times from the front of seat through each of 6, 8, 10 and 12 inch strokes. The unit shall withstand this test without material or weld failure. The pendulum length equals 36 inches. Point of impact shall be the approximate center of aisle seat back.

o Vertical Drop Impact to Seat:

The seat shall be firmly anchored to testing platform and subjected to repeated impacts of a 40-pound sand bag. The center of impact shall be 7-1/2 inches from front edge and 9 inches from aisle side. The seat shall withstand 1,000 impacts with each of 6, 8, 10 and 12 inch drops without cracks, breaks, weld failures or other irregularities that would impair the seat's usefulness.

4. Sample Seats

The successful bidder shall furnish one Operator's seat and one transverse seat to the District, for inspection, test and compliance purposes. Approval shall be obtained prior to installation of seats in any bus under construction. The seats so furnished shall be exact duplicates of the seats proposed for buses under this specification, and when approved, shall become the property of the District. These seats shall be delivered freight prepaid to:

Purchasing Agent
Southern California Rapid
Transit District
361 East 55th Street
Los Angeles, California 90011

U. Passenger Signal

A chime type passenger signal shall be provided, to be operated by vandal-resistant pull cords mounted above side windows and below standee

U. Passenger Signal Continued)

windows on both sides of bus. A switch on driver's panel shall make the chime system inoperative when desired. Any portion of the hardware for this system that is not of bright finished corrosion-resistant metal shall be painted to match adjacent finish of bus. Signal arrangement subject to approval of the District.

V. Provisions for Wheelchair Confined Passengers

Note: The requirements of this section V. pertain only to Bid Proposal One.

1. A system shall be incorporated at the front door to provide ingress and egress by wheelchair confined passengers from the street or sidewalk levels to the floor level of the bus. The loading system shall not compromise the front door opening width, door operation, or other requirements for the door system. When the wheelchair system (lift) is not in use, no portion of the steps or entry shall move and the steps shall be maintained at the proper level and position with mechanical positive locking devices. Operation of the loading system shall not result in hazardous conditions for any passenger, the bus operator or service personnel. The bus shall be prevented from moving during the loading and unloading cycles and until the system is fully stowed, by a throttle and brake interlock system. The system shall be prevented from stowing when in use by a passenger. The system shall be simple to operate by the operator in the normal seated position. The wheelchair loading area shall be no less than 34 inches wide by 50 inches long and shall extend no less than 18 inches outward from the bus. The loading system shall accommodate a minimum load of 600 pounds.

The loading system shall safely accommodate wheelchair confined passengers when bus is stopped on a street with the left side wheels raised 6 inches above the level of the right side wheels and parked alongside a sidewalk (curb) 0 to 10 inches high.

The system shall be designed to protect itself and the bus from damage and persons on the sidewalk or street from injury during the extension and lowering phases of operation. An audible alarm, easily heard by boarding passengers

V. Provisions for Wheelchair Confined Passengers (Contd)

shall sound and a warning lamp, located near the front door shall flash during operation of the wheelchair loading system. A barrier shall prevent the wheelchair from rolling off the platform during the loading and unloading process.

Deployment or storage of the lift shall require no more than 10 seconds and the time required for other phases of the loading or unloading operation shall not exceed 14 seconds. The controls shall require no complex phasing. A manual override system shall permit unloading a wheelchair and stowing the device in the event of a primary power failure. The lift system shall be designed to prevent a sudden fall in the event of a hydraulic line, fitting or component failure. Any component failure on the lift shall result in a "fail-safe" condition.

The entire lift unit shall be protected from the entrance of water, air or dust. The bus interior shall be sealed from the entrance of dust, water and air while the unit is in the driving position.

Steps and risers shall have no exposed screws, rivets, or other irregularities that passengers could trip or slip on. Step and riser coverings shall be replaceable, non-skid material.

Provide assists for both wheelchair confined and ambulatory passengers in the left and step area. A skid plate of sufficient thickness, size and strength shall protect the lift from underside damage in the event the right front corner of the bus strikes a curb or other object.

Wheelchair lift system equipped buses shall have seating arrangements that safely and freely allow wheelchair confined passengers to travel and maneuver to and from their riding stations. Securement and tiedown devices shall be provided to accommodate two wheelchair confined passengers.

W. Kneeling - Provide "kneeling" mechanism

A driver actuated kneeling device shall lower the front of the bus during loading or unloading operations, regardless of load, to a street level to first step height of no more than 9 inches. A brake and throttle interlock shall prevent the bus from movement during the kneeling process. The bus shall be capable of kneeling in a maximum of 4 seconds from the time the control is actuated. An

W. Kneeling (Contd)

audible alarm, easily heard by boarding passengers shall sound during the kneeling process. The kneeling shall take place only after the front door has been opened.

After kneeling, the bus shall rise within 4 seconds to a height permitting the bus to resume normal speed service and shall rise to the correct operating height within 6 seconds. An indicator visible to the driver shall be illuminated during the kneeling operation and shall remain lighted until the bus is raised to a height adequate for safe street travel. The time to kneel and rise shall be independently adjustable, but only with the use of tools. This adjustment shall not be normally accessible to the driver.

If the bus has accommodations for the wheelchair confined handicapped, it shall also be equipped with a semi-automatic transverse leveling device. The body of the bus shall be capable of being lowered on the left side to compensate for high crowned roads. The single control to operate entire kneeling system shall be simple to operate.

VI. AIR SYSTEM

A. Air Compressor

Bendix Westinghouse TU-FLO-600 or equal, minimum of 14.5 cfm, at 1250 rpm with ball-type main bearings and latest design with steel connecting rods.

B. Ping Tank - Provide ping tank fitted with drain cock.

C. Check Valve

Check valves shall be located between No. 1 and No. 2 air tanks, adjacent to No. 2 tank.

C. Air Suspension Reservoir

Provide tank for air suspension system with check valve and regulator set at approximately 67 psi.

E. Drain Cocks

Air tanks shall be equipped with flush type drain cocks, Bendix Westinghouse, McGregor, or equal. Drain cock shall be installed with 6-point wrench and worked back and forth to seat threads properly to prevent distortion of drain cock body.

F. Air Gauge

Provide dual needle air gauge, 150 psi, AC No. 6464121 or approved equal.

G. Air Lines

Air lines shall be copper or brass, except that nylon tubing, qualified under the appropriate FMVSS, shall be permitted in areas not directly connected with the braking system, such as the windshield wiper and washer systems; door engine piping; air throttle piping; suspension and leveling system piping. Flex lines shall have teflon core and stainless steel braid. Provide heavy-duty flexible coupling between compressor and ping tank. All air lines shall be neatly arranged and properly secured to prevent chafing and rubbing. Nylon lines shall be color coded.

H. Safety Valve

Safety valve shall be Bendix Westinghouse and located in the Number 1 air reservoir.

I. Air Governor

Air governor shall be Bendix Westinghouse D-2, or approved equal, mounted on bulkhead or firewall.

J. Switches

Stoplight switch shall be Bendix Westinghouse, or approved equal. Low air alarm shall be Bendix Westinghouse, or approved equal, set at 65-70 psi.

K. Automatic Drain Valve

Contractor shall provide a Graham-White moisture ejector valve installed on the wet tank to operate when rear door opens. Ejector valve shall be installed so as to eject moisture directly onto the pavement and not on any bus part.

VII. ELECTRICAL

A. General

Electrical system shall be 12 or 24 volts. If 24 volts, the entire electrical system shall be 24 volts with the exception of circuits to the radio compartment. Provide 12 volt, 30 ampere capacity circuit to the radio compartment. A master battery cut-out switch shall be provided. Terminals shall be at inboard end of battery.

All wiring shall be properly grouped, numbered and color coded. Installation shall permit ease of replacement. Wiring, including cables shall be adequate in size to carry the electrical load without excessive voltage drop. All wiring,

VII. ELECTRICAL (Continued)

including cables shall be adequate in size to carry the electrical load without excessive voltage drop. All wiring, including cables, shall be soldered at terminals or power machine staked. Identify positive battery with red insulation.

All circuits, except for those involved in propulsion system start up, shall be protected by circuit breakers or fuses. Fuses shall be used only where it can be demonstrated that circuit breakers are not practicable, and they shall be easily accessible for replacement.

Redundant grounds shall be used for all electrical equipment, except where it can be demonstrated that redundant grounds are not feasible or practicable. One ground may be the coach body and framing. Grounds shall not be carried through hinges, bolted joints (except those specifically designed as electrical connectors), or powerplant mountings. Major wiring harnesses shall not be located under the coach floor, and underfloor wiring shall be eliminated to the extent practicable. Wiring and electrical equipment necessarily located under the coach shall be insulated from water, heat, corrosion, and mechanical damage. Provide means of "jumping" the batteries, from a convenient location in the engine compartment.

All relays, controllers, flashers, automatic re-setting circuit breakers, and other electrical components should be mounted in easily accessible junction boxes. The boxes shall be sealed to prevent moisture from normal sources, including engine compartment cleaning, from reaching the electrical components and shall prevent fire that may occur inside the box from propagating outside the box. The components and circuits in each box shall be identified and their locations recorded on a schematic drawing permanently glued or printed on the inside of the box cover or door. The drawing shall be protected from oil, grease, fuel and abrasion. The front junction box shall be completely serviceable from the driver's seat or the vestibule. A rear start and run control box shall be mounted in an accessible location in the engine compartment.

VII. ELECTRICAL (Continued)

Contractor shall provide not less than three spare wires from the Operator's panel to the engine compartment and two spare wires each from the Operator's panel to the front door compartment and from the Operator's panel to the rear door compartment. Ends of all spare wires shall be identified and terminate on terminal boards.

B. Alternator

The alternator shall be heavy-duty type and shall supply a nominal 12 or 24 volts of direct current. The alternator shall be rated sufficiently higher than the total possible electrical load to maintain the charge on the batteries at all operating conditions.

C. All Voltage Regulators

All voltage regulators shall be heavy-duty transistor type with rheostat controls. Vibrating type is not acceptable.

D. Starter

Starter shall be heavy-duty with latest modifications.

E. Batteries

Provide four 12-volt, Delco 1200 maintenance free batteries, or approved equal. Batteries shall be located as close to starter as possible and practical. Batteries shall be installed with the terminals facing inboard, toward the center of each bus. Batteries shall be installed on swing out or pull out trays, properly supported to prevent spillage or damage to batteries when tray is in pulled out position.

F. Speedometer

Speedometer head and sending units shall be of the latest design, A.C. or approved equal, permanent magnet type combination. Adapter body shall be repairable type with Alemite-Zerk grease fitting with relief.

VII. ELECTRICAL (Continued)

G. Hubodometer

Provide hubodometer on right rear wheel. Meter to read in miles and have a capacity of 999,999 miles.

H. Safety Warning Signals

All warning signals and lights shall comply with all applicable Federal Motor Vehicle Safety Standards and California Vehicle Code sections and shall include buzzers and properly identified lamps.

I. Master Switch

Switch panel arrangement and location subject to approval of the District.

Master switch shall have 5 positions as follows:

1st Position to read - ENG STOP - All systems off.

2nd Position to read - DAY PARK - All systems off, except radio.

3rd Position to read - DAY RUN - All systems except lights to be on.

4th Position to read - NITE LIGHT - All systems to be on, no exceptions

5th Position to read - CL ID LPS - All systems to be off except interior marker and tail lights; and radio.

Rear door master switch shall be located in dash compartment near front door.

VII. ELECTRICAL (Continued)

J. Radio Equipment

Bus builder shall install necessary loom, conduit and other radio accessories. Radio shall be furnished and installed by the District. Specific location of radio unit and control head shall be determined by the District after award of contract. A removable panel in dash shall be provided for speaker mounting if feasible. General location of control head is on dash to the right of the driver. The following items shall be included in the equipment furnished and installed by the bus builder:

- o Contractor shall supply and install a low profile unity gain radio antenna which shall be compatible with the District's frequency (475 MHz). Antenna shall be located on bus roof, 2 inches to 4 inches to left of centerline in a level section 3 to 7 feet from front edge. Antenna housing shall be white in color. Antenna shall not be painted by Contractor or baked in oven.
- o Contractor shall supply and install stranded coaxial antenna cable, Belden No. 8219 or 8259, Essex or Alpha X RG58, housed in appropriate loom, connecting antenna with radio compartment. Provide extra 4 feet of cable at radio compartment. Loom installation shall permit future replacement of cable by "pull through" method.
- o Contractor shall provide a 12-volt (negative ground) power supply to the radio compartment from battery with No. 10 stranded wire properly loomed and protected with a 30 amp. circuit breaker, and equipped with on-off switch in driver's compartment.
- o Contractor shall provide and install a one-inch minimum inside diameter conduit from the radio compartment to the radio control head. All exposed conduit shall be metallic.
- o Length of conduit shall be limited to allow use of a standard length control cable with a minimum of 24 inches of cable in the radio box and a minimum of 45 inches of cable above floor level at the front of the bus.

VII. ELECTRICAL (Continued)

K. Public Address System

- o Amplifier shall be solid state of sufficient power and quality, that Operator's voice can be easily heard and understood, during normal operation of the bus. Amplifier shall be located behind a panel and attached with vandal-resistant fasteners.
- o Speakers of sufficient power and quality shall be flush mounted in the ceiling or elsewhere to provide a good distribution of sound throughout the passenger compartment. Speakers shall be covered by a stainless steel bezel and grille and shall be attached with vandal-resistant fasteners..
- o One exterior water-proof, high quality, speaker shall be flush mounted near the front door.
- o Speaker selector switch shall be conveniently mounted to allow Operator to use interior speakers only; exterior speaker only; or all speakers.
- o Spring loaded, normally off, power switch shall be floor mounted. Location shall be approved by the District.
- o Provide gooseneck microphone base and mounting bracket on left window post. Mounting location and arrangement shall be approved by the District.

VIII. HEATING, VENTILATING AND AIR CONDITIONING

A. Automatic Temperature Control System

Provide automatic temperature control system (ATCS) that shall operate at all times when the alternator is charging, except when ATCS master switch is in the off position.

The ATCS shall be capable of maintaining a temperature of 68-70° F when the temperature is between 20° F and 90° F with a fully seated load of passengers plus 50 percent of the seated load in standees. Between 90° F and 105° F the

A. Automatic Temperature Control System (Contd)

the system shall maintain a temperature gradient of 15°F with relative humidities lower than 50%. The average weight of passenger shall be considered as 150 pounds.

Under normal operating conditions, the blower shall circulate air plus approximately 15% outside air. The blowers shall be prevented from coming on until the heating element has warmed sufficiently to assure no less than 60°F air out temperature.

In the event of a failure of the air-conditioning portion of the system, the ventilating blowers shall continue to function. The system shall deliver at least 100 cubic feet per minute of air to the Operator's area. Adjustable nozzles shall permit variable distribution or cutting off air flow by the Operator. The system shall have a separate dash heater with adjustable air distribution louvers to the Operator's feet and legs. Provide a defroster system capable of maintaining the windshield free of frost during all weather conditions encountered in the District's service area.

An ATCS master switch shall be provided on the Operator's electrical panel (not normally accessible to the Operator).

Provide manually operated roof vents to supplement air circulation in the event of air-conditioning failure. Vents shall provide for twelve air changes per hour with bus traveling at 20 miles per hour in still air. Vents may be integrated with emergency escape hatches, if appropriate. Vents, including emergency hatches, shall be hinged and shall be capable of being returned to the locked position without the use of tools.

Condenser fan drive shall be electrical and shall function only when air-conditioning is required.

ATCS hardware:

Provide manual shut-off valves in the refrigerant lines that allow all major components, to be isolated for service. Shut-off valves shall be provided on both sides of filter unless system is designed to lose no greater than five pounds of freon during filter change.

Automatic Temperature Control System (Contd)

Water circulating pump shall be of a design not requiring annual bearing and motor brush replacement and shall be readily accessible for service and inspection. This unit shall have a minimum capacity of 15 gallons per minute for adequate circulation throughout the bus. Brushes shall be replaceable without removing pump motor.

Heater water lines shall be routed through inside of bus, with the exception that lines to the driver's heater may be routed under the driver's platform, provided they are heavily insulated. Use slip fit silver solder, 95-5 tin antimony solder or phosphor copper welded joints at all connections. Cores shall be constructed entirely of copper and brass. Tanks shall be minimum .040-inch brass; core tubes shall be a minimum of .006-inch wall thickness; a minimum of 9 fins per inch shall be provided. Another heater core which is acceptable is fin and tube design with aluminum fins, nine to the inch, and .020-inch wall thickness copper tubing.

A separate dash heater and blower shall be provided for Operator's comfort and for windshield defrosting and demisting. A heater unit of at least 40,000 BTU output at 100 degrees water-air temperature differential is required for this application. Two-speed blower shall have an air volume of 500 cfm minimum with separate switch and manual valve to control water flow.

Main blower motors shall be two-speed, heavy-duty 3/4 hp type with minimum output of 1,500 cfm on heat cycle and 2,800 cfm on air conditioning cycle. Blower motors must be shielded from dust and dirt to prolong commutator and brush life, and clean air is to be routed through motors from plenum chamber to atmosphere for cooling motors.

An hour meter of highquality shall be installed in dash compartment. Hour meter shall function only during air conditioning cycle and shall be visible without removing panels.

If separate engine is employed for ATCS, it must use the same fuel from the same tank as the main power plant. Engine must be isolated from the passenger compartment and insulation must be provided to protect passengers from noise and vibration. Alternator of sufficient capacity to

Automatic Temperature Control System (Contd)

operate entire ATCS must be provided and must be compatible with main alternator or overruled when main alternator is in operation.

Option : Bidder may quote additional cost for providing air conditioning system capable of maintaining standard level of comfort for a period not less than thirty minutes during which the bus propoulsion engine is not in operation.

APPENDIX

I. DIESEL FUEL SPECIFICATIONS

A. General

The materials shall be a petroleum distillate having the following characteristics:

	<u>No. 1</u>	<u>No. 2</u>
Cetane Number, Min. (may be attained by use of additives)	50	45
Pour Point, °F, Max.	-15	-
Flash Point, °F, Min.	125	125
Distillation, °F		
IBP. Min.	320	375
90% Max.	500	-
EP, . Max.	550	650
SUS/100 F	30-40	30-40
Water & Sediment, % Max.	0.05	0.05
Ash Content, % Max.	0.01	0.02
Sulfur, % Max.	0.3	0.5
Corrosion, 3 Hrs./212°F, Max.	Pass 1/	-
Carbon Residue on 10% Residuum, % Max.	0.15*	0.15*
Alkali or Mineral Acid	Neutral	Neutral
Odor	Non-offensive	Non-offensive
Color	Plus 10 Saybolt	ASTM 4, Max.

(1/) The "pass" requirement for corrosion test shall be interpreted as no more than a transparent discoloration on any part of test strip.

(*) Carbon residue requirement applies to the base fuel prior to the incorporation of any additives.

Diesel fuel shall contain Ethyl Corporation diesel additive MPA-D or approved equal in a ratio of 200 parts per million of fuel.

Conformity of product shall be determined by the latest ASTM test methods as follows:

I. B. Characteristics and Test Methods

Cetane Number	ASTM D 613
Pour Point	ASTM D 97
Flash Point	ASTM D 93
Distillation	ASTM D 86
Viscosity	ASTM D 445 and D 2161
Water and Sediment	ASTM D 1796
Ash Content	ASTM D 482
Sulfur	ASTM D 129
Corrosion	ASTM D 130
Carbon Residue	ASTM D 189
Alkali or Mineral Acid	ASTM D 664

II. HEAVY DUTY CRANKCASE OIL SPECIFICATIONS

A. General

The oil supplied for this application shall be SAE 30 and shall conform to the requirements of the Internal Combustion Engine Institute "I.C.E.I." oils described as follows:

These oils must be recommended for all internal combustion engines used in passenger car fleets, diesel engines in City Transit service. Furthermore, the oil supplied shall have a minimum V.I. of 85, and shall have given satisfactory evidence of proven performance in four (4) cycle Cummins and General Motors two (2) cycle diesel engines in City Transit service.

B. Characteristics and Test Methods

It shall have a minimum flash point of 450° F, and a minimum fire point of 500° F.

The product shall render satisfactory service with 6,000 mile change intervals.

Oil supplied must meet the Mil-L-2104B specifications and supplemental oils with following limitations:

II. B. (Cont'd)

- (a) Zinc, as zinc diorganodithiophosphate, between a minimum of 0.07 and a maximum of 0.10 percent by weight.
- (b) Sulfated ash (ASTM D-874) of 1.00 percent maximum by weight, except lubricants that contain only barium detergent-dispersants where 1.50 percent by weight is allowed.

III. TRANSMISSION FLUID

The automatic transmission fluid shall be a type C-3 fluid and shall be compatible with Cities Service Company's "Citgo Torque Converter Fluid 250".

IV. MULTI-SERVICE CHASSIS AND WHEEL BEARING GREASE

A. General

The materials for these applications shall be homogeneous mixtures of mineral oil and lithium soap of a special fatty material, oxidation inhibitor, lead soap and EP additives to provide film strength and wear resistance. The material shall contain no fillers such as asbestos, graphite, kaolin, mica, rosin, rosin oil, talc, wax or other undesirable or deleterious substances. Product must render satisfactory lubrication for all points requiring grease on passenger cars, trucks, and buses with 6,000 mile service intervals. These include ball joints, all chassis points, universal joints, splines, linkages, water pumps, wheel bearings, etc. Contain an oil having a Saybolt Universal Viscosity of 210^o G, between 75-100 seconds. Product shall have performed satisfactorily in an "In-Service" test on wheel bearings in the District's buses for a minimum of 50,000 miles between repacking.

B. Characteristics and Test Methods

Grade, NLGI	2
Soap	Lithium or Lithium-Complex
Soap Content, %	5 min., 15 max., AST, D128
Worked Penetration at 77 ^o F	265-295 ASTM D217
Dropping Point, ^o F	325 min. ASTM D566
Texture	Smooth

IV. B. (Cont'd)

Lead as PbO, % or Moly	0.10 Min., 0.5 Max. ASTM D1262
Insoluble Matter, % Max.	0.5 ASTM D128
Water Content, % Max.	0.5 ASTM D128
Corrosion	Negative FSB 5304
Mineral Oil, %	83 Min., 92 Max. by difference
Wheel Bearing Test	Pass, ASTM D1263
Film Strength Timken EP O.K. Load	40 Min., ASTM D2509

V. General

The materials for this application shall be uncompounded mineral oil SAE 50.

B. Characteristics and Test Methods

Flash Point, Cleveland ° F	410 Min.
Viscosity at 210° F, SSU	85 - 110
Pour Point, ° F Max.	Zero
Color, ASTM	7 Max.
Carbon Residue, %	.25 Max.



THE ADMINISTRATOR

APPENDIX VI
DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

November 13, 1978

Dear UMTA Grantee:

The purpose of this letter is to apprise you of the status of efforts of the Urban Mass Transportation Administration (UMTA) to implement paragraph 8 of UMTA Circular 1165.1, "UMTA Interim Minority Business Enterprise [(MBE)] Policy and Requirements for Grant Recipients," subsection, "UMTA MBE Policy and Requirements." In addition, UMTA is providing you with instructions to be used in preparation of your bid specifications. Paragraph 8 states:

Requirements for Transit Vehicle and Component Manufacturers.
Effective March 1, 1978, each grant recipient shall require that, as a condition for bidding on UMTA-assisted contract [sic], transit vehicle manufacturers must have an UMTA-approved MBE program. Rather than grant recipients seeking individually to encourage MBE programs by transit manufacturers, ... UMTA will work directly with such manufacturers. It will be the objective of this activity to produce the adoption by such manufacturers of MBE programs in connection with the design and production of transit vehicles purchased with Federal funds. (Italics ours.)

To implement Paragraph 8, UMTA has contracted with Triton Corporation, a Washington-based contractor, to collect and to analyze pertinent data, and to recommend guidance to UMTA in drafting MBE manufacturing requirements.

We are now securing appropriate comments from the industry on a draft MBE policy statement prior to promulgation of these requirements. This statement is enclosed.

Transit authorities are requested to require best efforts in the field of MBE by manufacturers of transit vehicles who bid on UMTA-assisted contracts. In addition to your best efforts language in the notice to bidders, you are requested to include a copy of this letter and the UMTA

draft policy statement. This procedure is effective at once and will remain in effect until the industry comments are received and analyzed, the study completed and recommendations submitted, and guidelines promulgated in the appropriate manner.

If you have any questions regarding this matter, please contact Mr. Harold B. Williams, Director of Civil Rights, at (202)426-4018.

Sincerely,


Charles F. Bingham
Deputy

Enclosure



DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

THE ADMINISTRATOR

OCT 31 1978

Dear Transit Vehicle Manufacturers and Suppliers:

The purpose of this letter is to apprise you of efforts of the Urban Mass Transportation Administration (UMTA) to implement Paragraph 8 of UMTA Circular 1165.1, "UMTA Interim Minority Business Enterprise [(MBE)] Policy and Requirement for Grant Recipients," subsection, "UMTA MBE Policy and Requirements." Paragraph 8 states:

Requirements for Transit Vehicle and Component Manufacturers. Effective March 1, 1978, each grant recipient shall require that, as a condition for bidding on UMTA-assisted contract [sic], transit vehicle manufacturers must have an UMTA-approved MBE program. Rather than grant recipients seeking individually to encourage MBE programs by transit manufacturers,... UMTA will work directly with such manufacturers. It will be the objective of this activity to produce the adoption by such manufacturers of MBE programs in connection with the design and production of transit vehicles purchased with Federal funds. (Italics ours.)

We submit to you the following proposed statement of policy and we invite your comments. After receipt of your comments, we will invite you or your designee to meet with us in Washington to review the substance of the final policy to be promulgated in the appropriate manner. Simultaneously, UMTA has contracted with Triton Corporation, a Washington-based contractor, to advise us in this drafting process. UMTA is sure that should you be contacted by this firm in this process, you will continue to cooperate.

POLICY. It is UMTA policy to encourage and increase the participation of businesses owned and controlled by minorities, including women, in all UMTA-funded activities. Economically and socially disadvantaged individuals, including minorities and women, have been traditionally underrepresented as owners and managers of businesses in this country. The executive and legislative branches of the Federal government have long recognized the need to promote the development of businesses owned by the economically and socially disadvantaged to achieve the goal of equal

opportunity. To overcome the traditional underrepresentation of these groups in the business community, the Federal government has used its procurement program and its financial assistance programs to state and local governments as vehicles to assist MBEs. Executive Order 11625 directs the Department of Commerce to provide technical and financial assistance to promote MBE. Executive Order 11625 further requires that Federal executive agencies develop comprehensive plans and programs to encourage minority business enterprise. UMTA Circular 1165.1 furthers that goal and this statement of intended policy, made in pursuance of that Circular, applies the Federal commitment to manufacturers of transit vehicles and major suppliers of components and materials as a condition of participating in UMTA-financed contracting activities.

DEFINITIONS. Minority business enterprise is a business that is owned and controlled by one or more minority persons. For the purposes of this definition:

- a. Minority person means an individual who is Black, Hispanic, Asian American, American Indian, Alaskan native, or a woman regardless of race or ethnicity.
- b. Owned and controlled means a business which is 1) a sole proprietorship legitimately owned by an individual who is a minority person, 2) a partnership or joint venture controlled by minority persons and in which at least 51 percent of the beneficial ownership interests legitimately are held by minority persons, or 3) a corporation or other entity controlled by minority persons, and in which at least 51 percent of the voting interests and 51 percent of the beneficial ownership interest legitimately are held by minority persons.

UNIVERSE AND MONITORING RESPONSIBILITIES. Manufacturers of transit vehicles, such as the producers of rail cars, buses, and ferry boats, are covered by Paragraph 8, as well as the primary manufacturers of components and materials used by major manufacturers such as brake systems, engines, and so on. Monitoring of the compliance activities of major suppliers will be the responsibility of major manufacturers of transit vehicles. UMTA specifically invites comments regarding the threshold requirements to extend coverage to smaller suppliers. For example, which companies should be considered "primary manufacturers" of components and materials?

MAJOR ELEMENTS OF MANUFACTURERS' MBE PROGRAMS. Manufacturers covered by paragraph 8 shall prepare a program of affirmative action in MBE to include at a minimum the following major elements:

- a. A policy statement expressing a commitment to utilize MBEs in all

aspects of procurement to the maximum extent feasible;

- b. The appointment of a liaison officer, as well as such support staff as may be necessary, to administer the program, noting the authority, responsibility, and duties of the liaison officer and support staff;
- c. Percentage goals for the dollar value of work to be awarded to MBEs and reasonable written justification for those goals;
- d. Procedures by which recipients will seek affirmative action on MBE participation from major contractors to the manufacturer;
- e. Where allowable under local law and appropriate to meet MBE goals, procedures by which the manufacturer will carry out an MBE set-aside program, under which consideration of bids or proposals would be limited to those submitted by MBEs in cases where MBEs with capabilities consistent with contract requirements exist in sufficient numbers to permit competition;
- f. Procedures to require that participating MBEs be identified by name when bids or proposals are submitted, and procedures to permit the legitimacy of MBEs and joint ventures involving MBEs to be ascertained;
- g. Procedures to insure that known MBEs will have an equitable opportunity to compete for contracts and subcontracts by arranging solicitations, time for the presentation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation of MBEs;
- h. Means by which MBEs may be assisted in overcoming barriers to program participation, such as through bonding, insurance, and technical assistance activities;
- i. Development of creative outreach programs to foster MBE such as professional staff exchanges between manufacturer and MBE, development of relationships with minority schools to foster recruits to the business world, participation in cooperative education programs with minority schools, and so on.
- j. Information and communication programs to make MBEs aware of their opportunities, with such programs being bilingual where appropriate;
- k. Opportunities for the utilization of minority-owned banks;
- l. A description of the methods by which the manufacturer will require subcontractors, as a precondition to a contract award, to comply with the provisions of as many of this section's paragraphs as are

pertinent to the work covered by the subcontract. The description shall contain the specific language to be included in agreements and contracts making the requirements applicable, as well as a summary of the ways the manufacturer will provide help to its subcontractors in drafting and implementing their programs for using MBEs. For example, a contract offering substantial subcontracting possibilities would require that the contractor, at a minimum, designate a liaison officer, consider the qualifications of minority firms, arrange for minority businesses to have a chance to compete, consider the use of set-asides, maintain records, submit reports, and cooperate with the manufacturer MBE liaison officer.

UMTA specifically would like comments on:

- a. How should goals be set? As a percent of what? For what procurement categories?
- b. How should major manufacturers monitor the MBE obligation passed along to primary suppliers?
- c. What other kinds of technical assistance can reasonably be supplied by manufacturers to MBE? What creative strategies can be devised to maximize benefits to both manufacturers and MBEs?
- d. How can technical assistance best be supplied? Directly? Through minority business organizations?
- e. What inter-corporate cooperation to implement this MBE policy can be created?
- f. Can major manufacturers facilitate the spinoff of MBEs from their own operations?
- g. Does this proposed policy statement complement or conflict with other Federal and state requirements? Should this policy be coordinated with that of any other governmental agency?

CURRENT POLICY. It is the current policy of UMTA to request that transit authorities require best efforts in the field of MBE by the manufacturers of transit vehicles who bid on UMTA-assisted contracts. In addition, transit authorities have been instructed to include a copy of this statement in their bid specifications as well as a copy of our letter transmitting this statement to them.

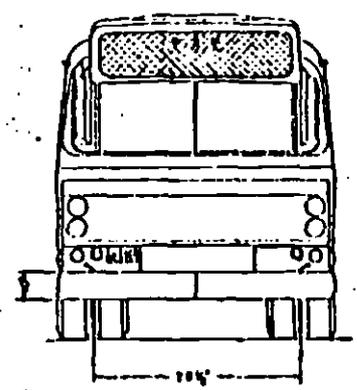
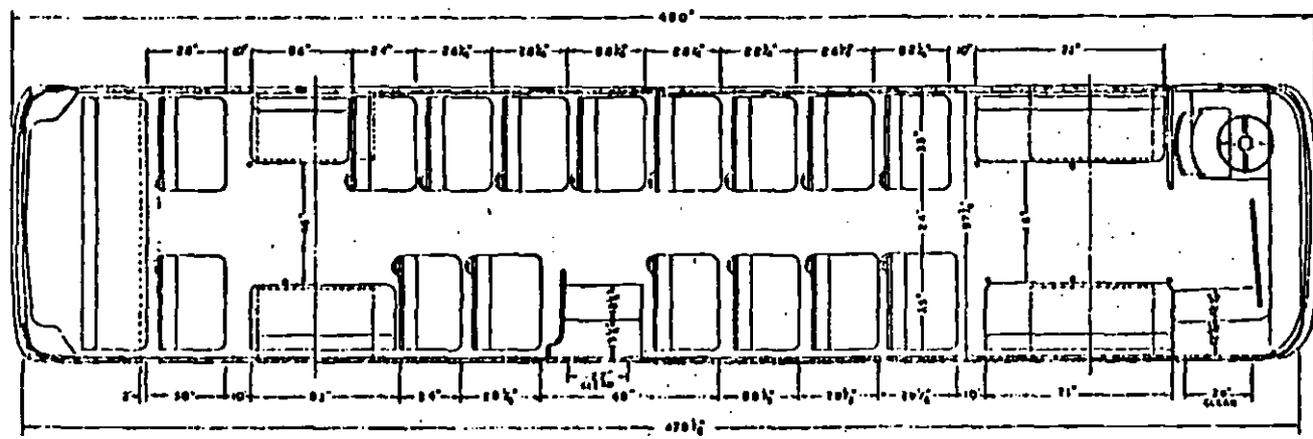
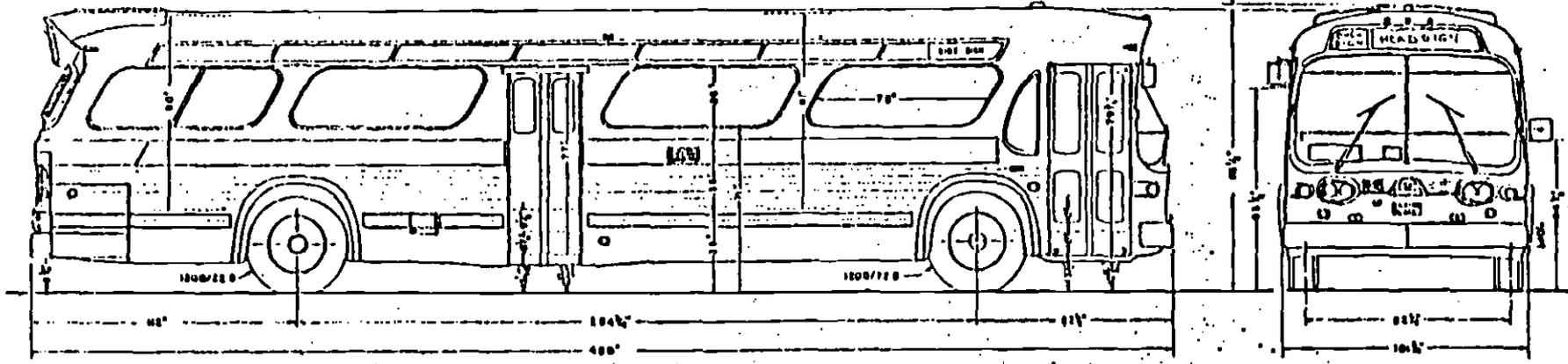
COMMENTS. All comments should be addressed to:

Harold B. Williams
Director
Office of Civil Rights
Urban Mass Transportation Administration
Washington, D. C. 20590

We would appreciate receipt of your comments by 1 December 1978.

Sincerely,


Charles F. Bingham
Deputy



MANUFACTURER
MODEL NUMBER
NET WEIGHT
FRONT AXLE
REAR AXLE
TOTAL -
ENGINE MAKE
HORSEPOWER
ENGINE DISPLACEMENT
TRANSMISSION MAKE
RATIOS
DIFFERENTIAL RATIO
MAX OPER. SPEED

YEAR
MODEL
AT
CYLS.
BPM
CU. IN.
MODEL
RORAL

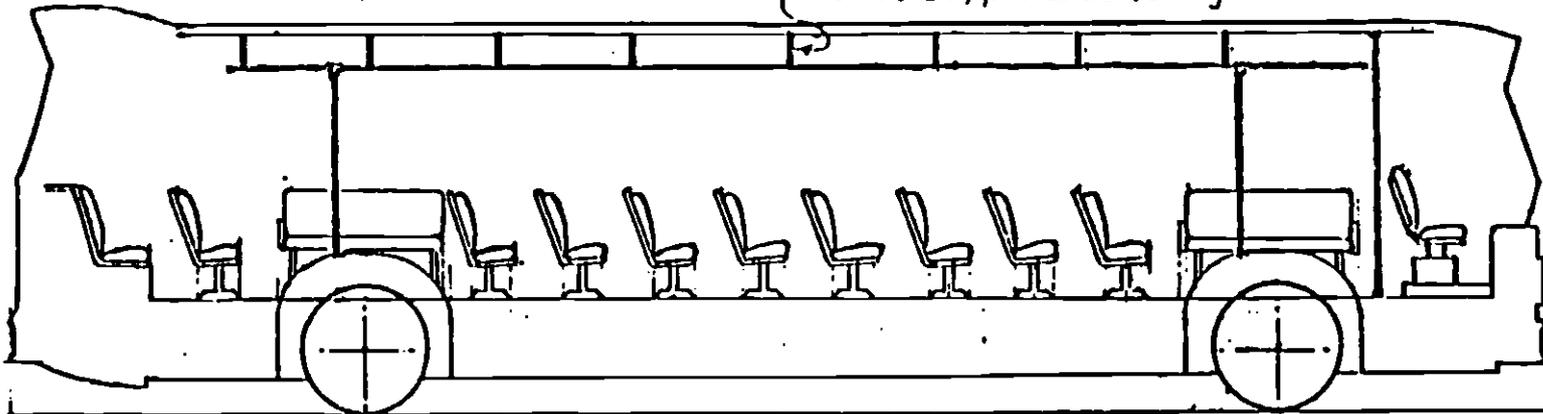
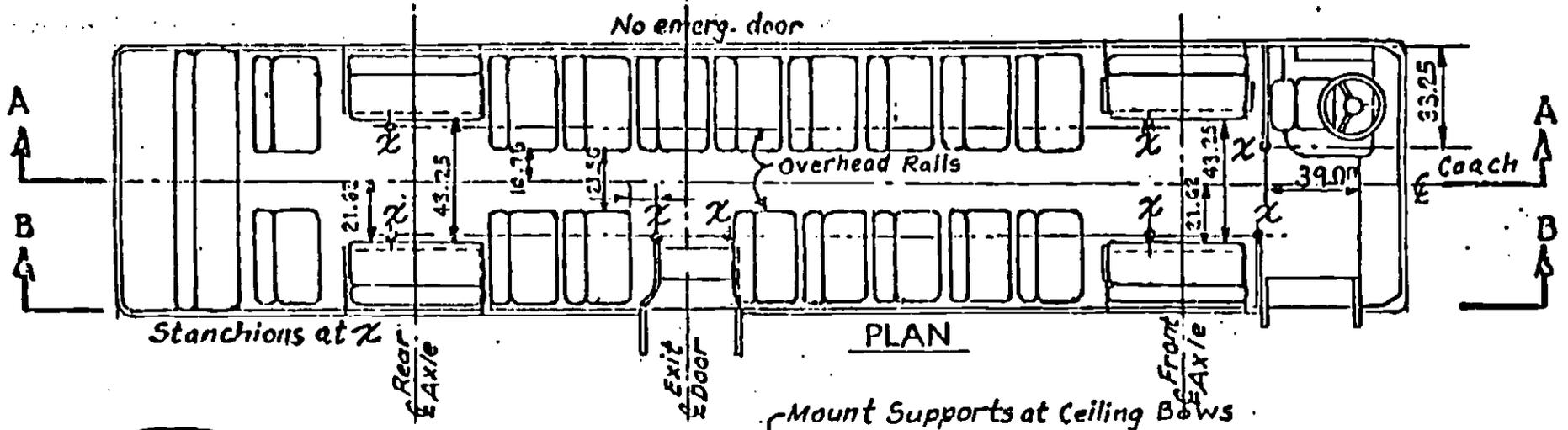
BRAKES
TIRE SIZE
FUEL TYPE
OIL TYPE
COOLANT TYPE
BATTERY TYPE
SEATING CAPACITY
SEATS TYPE
MANUFACTURER
MODEL -

DRUM SIZE FRONT
REAR
CAPY
CAPY
CAPY
SIZE
A/P-RR
OO.

RIGHT TURNING CLEARANCE OUTSIDE RADIUS FT.
LEFT TURNING CLEARANCE OUTSIDE RADIUS FT.

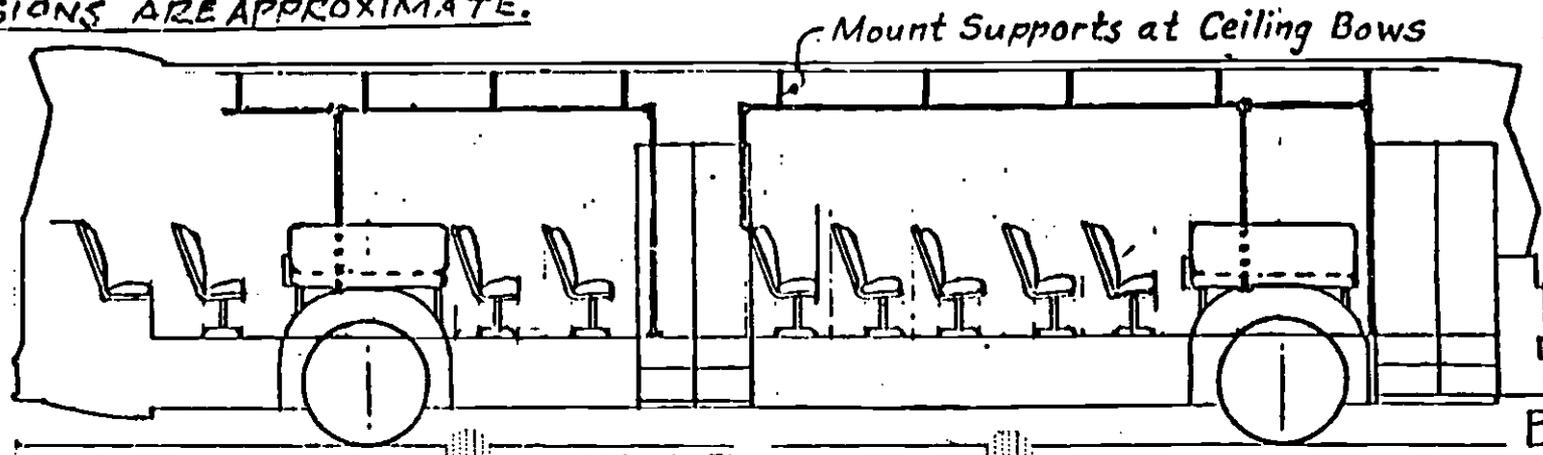
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT **RTD**

0000 SERIES CITY TRANSIT BUS



TYPICAL STANCHION AND SEATING ARRANGEMENT

DIMENSIONS ARE APPROXIMATE.



JOB NO 318
B-1220-A-3

⑦ Keystone Brkt. Mounting Assy.
GMC #22 65073—Chrome.
Or approved equal.

⑥ Stainless Steel Cap
 $1\frac{1}{4} D \times \frac{1}{4}$

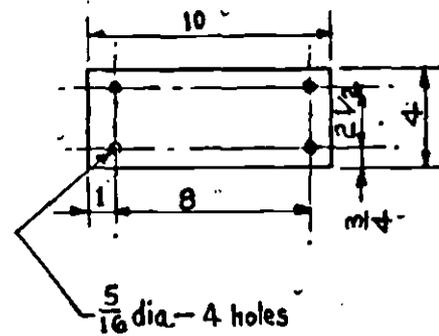
$\frac{1}{2}$ (A)
or across
top + bottom.

⑤ $1\frac{1}{4}$ O.D.
Stnls. Stl.
Tubing

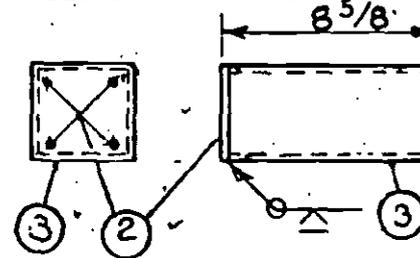
⑧ (2) $\frac{1}{4}$ -20 Hex. Hd. Bolts (Typical)

VERIFY DIMENSIONS, LINES, GRADES, DETAILS,
MEASUREMENTS, LOCATIONS AND CONDITIONS
AT SITE; AND REPORT ALL DISCREPANCIES
BEFORE PROCEEDING WITH THE WORK.

NOTE:
A. Weld top + bottom.



① PLATE
 $\frac{3}{8}$ Stl. P

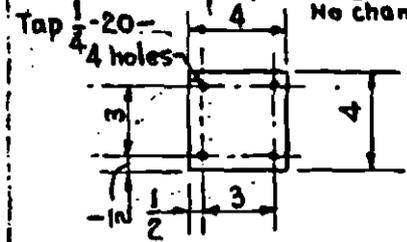


These dimensions are for ④
④ BASE ASSY.

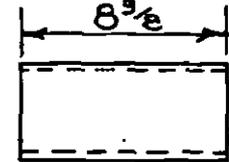
REV. 2-25-74
REV. 6-5-74

CHANGES

Redrawn from B-1205-
D-15 of 3-21-70
No change.



② PLATE
 $\frac{1}{4}$ Stl. P

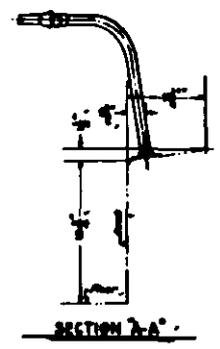
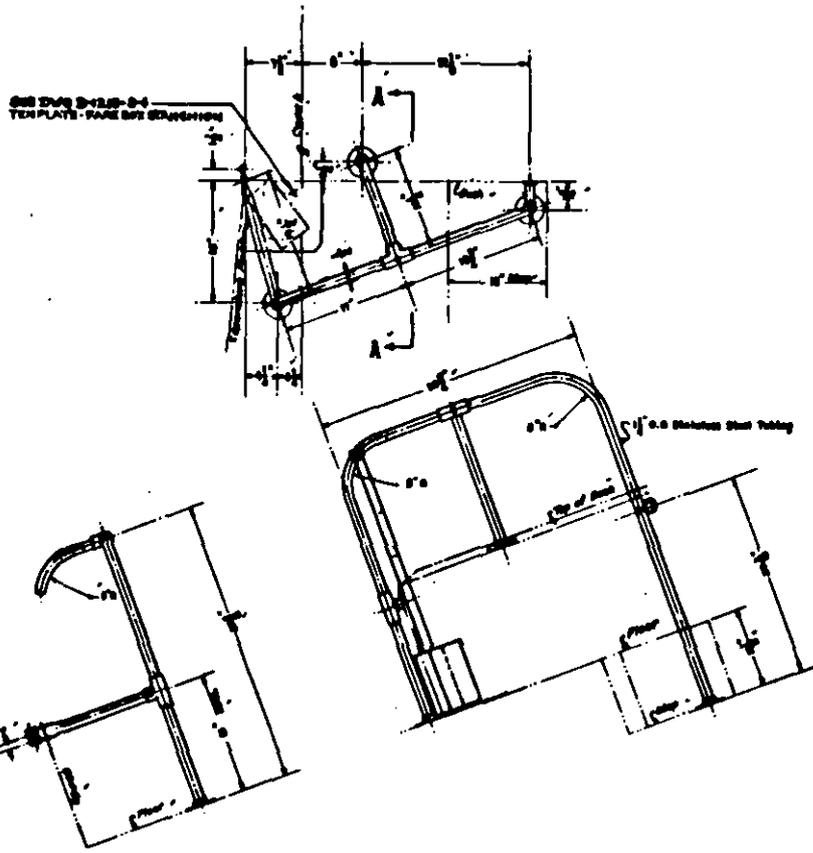


③ SQ. TUBE
T.S. 4 x 4 .1875

Note! \triangle Stanchion shall be constructed of vandal-resistant alloy steel of sufficient hardness, and shall be subject to the approval of S.C.R.T.D.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
TITLE
BUS - ALL CLASSES BODY & DETAIL.
SUBTITLE
FAREBOX STAND & STANCHION

DRAWN CEA UGER	CHECKED	DATE 4-7-72	SCALE AS NOTED
REF.	WORK ORDER	JOB NO. 318	DRAWING NO. B-1205-A-15
APPROVED GEN. SUPT. OF MAINTENANCE	APPROVED MGR. OF OPERATIONS		



DATE
 APPROVED
 BY OR AUTHORITY OF

APPROVED
[Signature]
 GEN. SUPT. OF MAINTENANCE

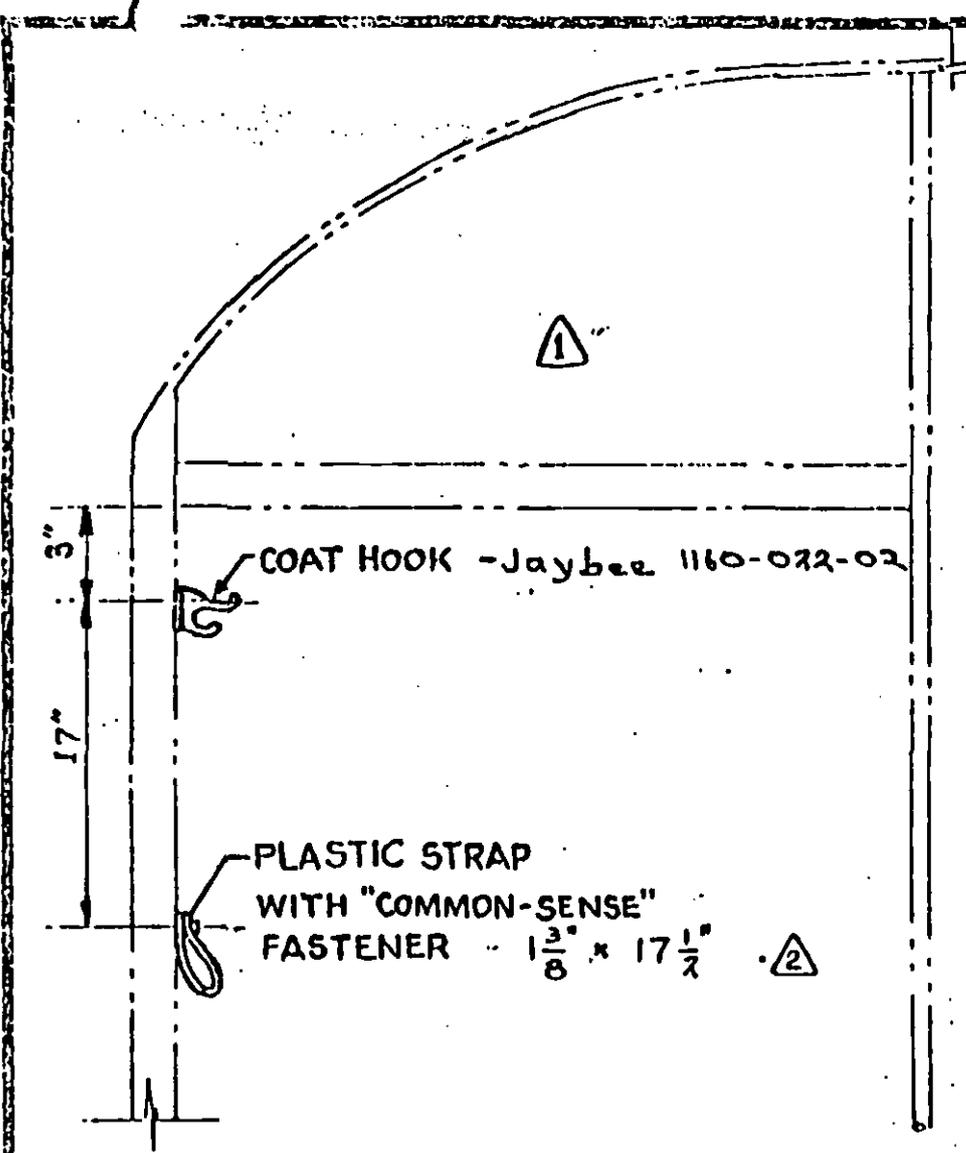
APPROVED
[Signature]
 ASST. MGR. OF OPERATIONS

ok [Signature]

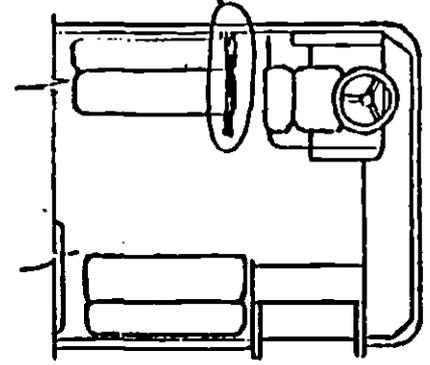
SOUTHERN CALIFORNIA GAS & ELECTRIC COMPANY
 DIVISION RAILROAD ATTACHMENT
 TITLE WITH CHECK
 DATE 10/25/50
 DRAWN BY
 CHECKED BY
 10-205-11

CHANGES

⚠ PUBLIC NOTICE
HOLDER REMOVED
REDRAWN. OLD NO
WAS D-1168-B-26
OF 5-12-70.
② REV. 2-25-74

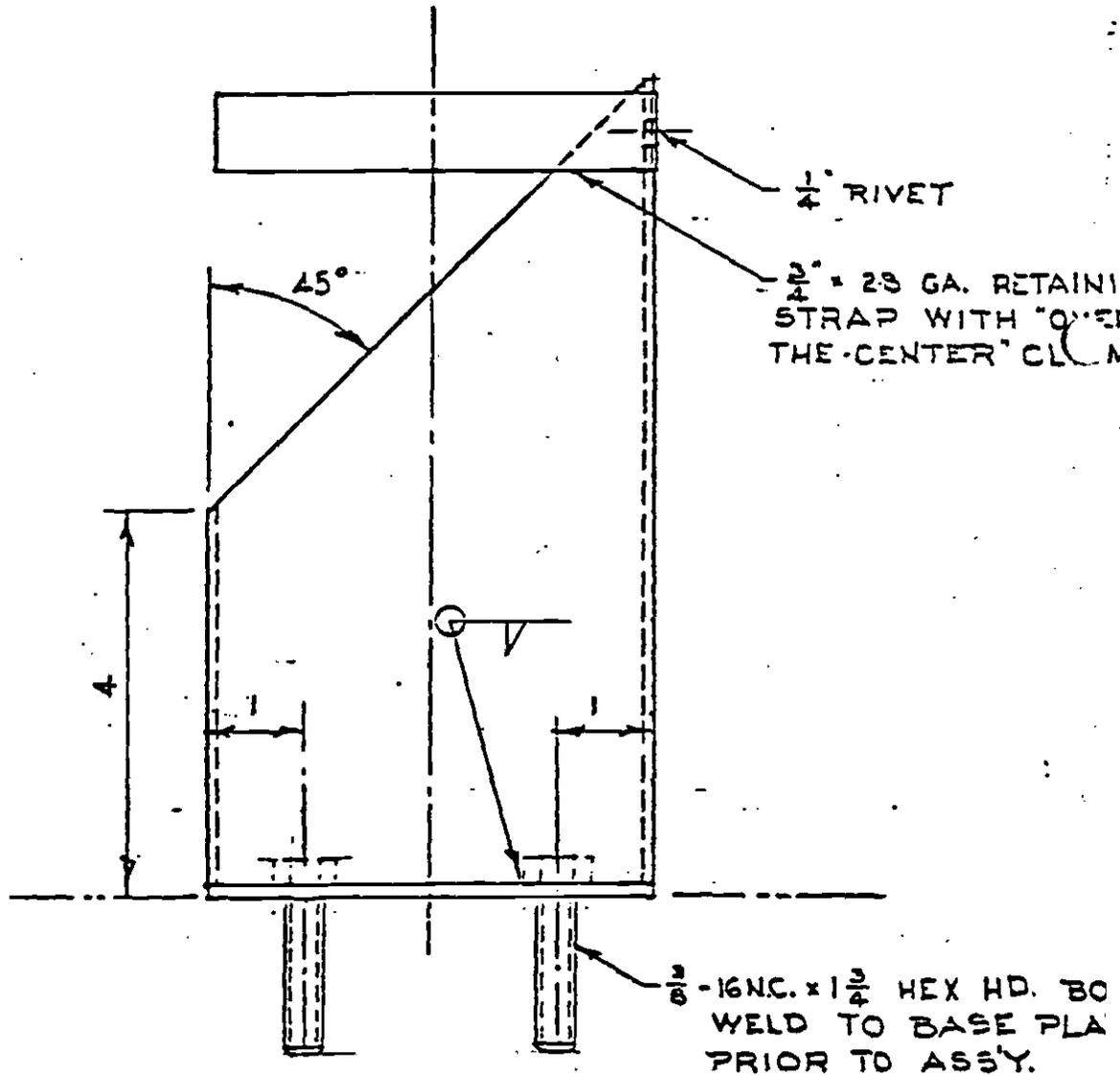
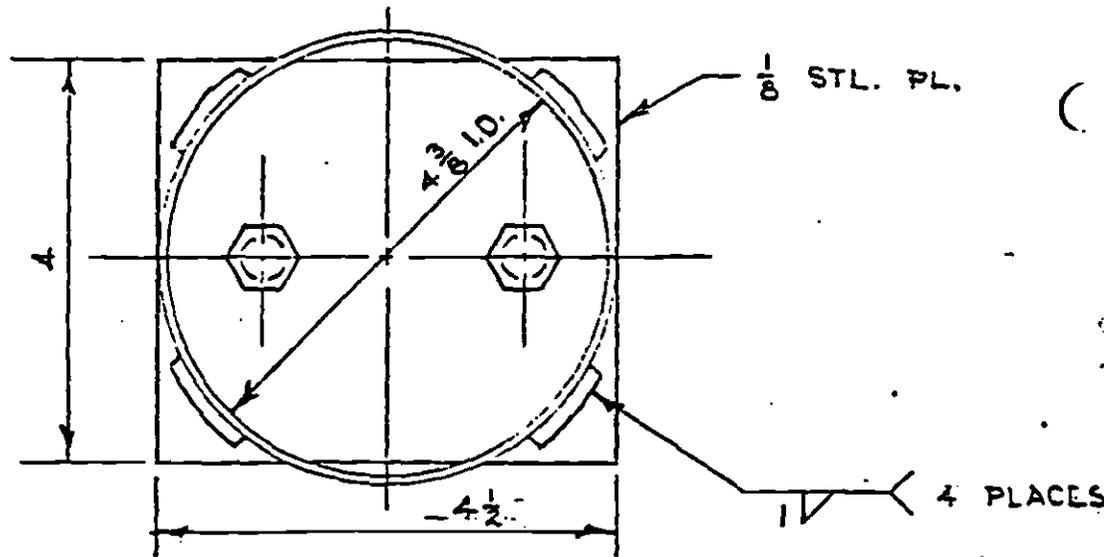


... LOCATION OF JOB



VERIFY DIMENSIONS, LINES, GRADES, DETAILS,
MEASUREMENTS, LOCATIONS AND CONDITIONS
AT SITE; AND REPORT ALL DISCREPANCIES
BEFORE PROCEEDING WITH THE WORK.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT			
TITLE BUS - ALL CLASSES BODY & DETAIL			
SUBTITLE COAT HOOK & STRAP			
DRAWN UGER - <i>CEA</i>	CHECKED	DATE 3-28-72	SCALE NOT TO SCALE
REF.	WORK ORDER	JOB NO. 318	DRAWING NO. D-1168-A-26
APPROVED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DATE	



DESIGNED	DATE
DRAWN BY	DATE 11-23-54
CHECKED	DATE
DC Allen	

SOUTHERN CALIFORNIA
RAPID TRANSIT DISTRICT
1000 SOUTH BROADWAY
LOS ANGELES, CALIFORNIA 90015

APPROVED

DATE

ALL BUSES ...

FIRE EXTINGUISHER
BRACKET

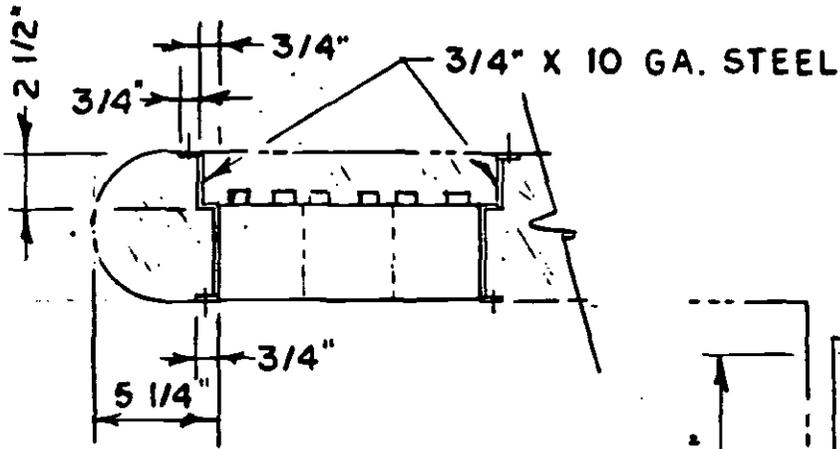
CONTRACT NO.

FILE NO.

CRNG. TYPE/NO.

SK 74-A

SHEET

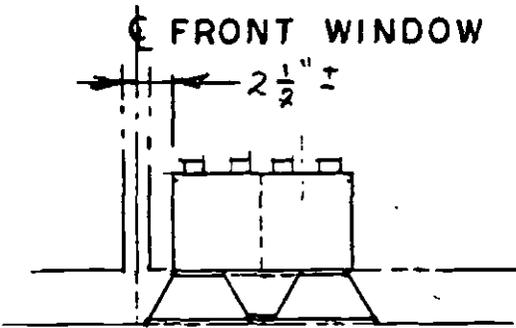


FRONT DOOR

FLXIBLE BUSES

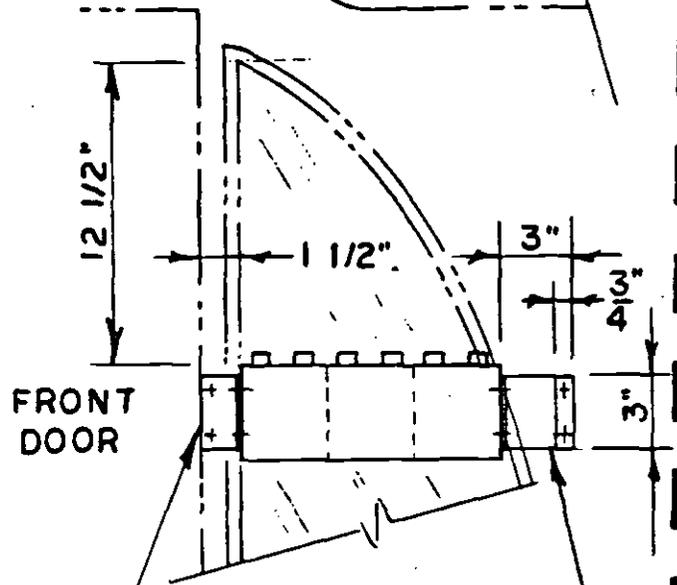
SIDE SIGN

SCALE: 1 1/2" = 1'-0"



ALL BUSES

BUS RUN SIGN



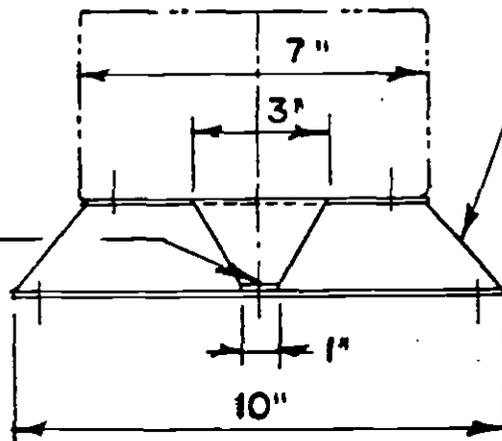
G.M. BUSES

SIDE SIGN

SCALE: 1 1/2" = 1'-0"

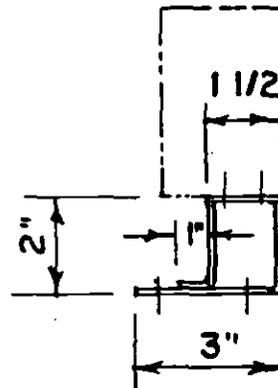
BRACKETS 16 GA. STEEL

SPOT WELD
2 PLACES



BUS RUN SIGN BRACKET

SCALE: 3" = 1'-0"

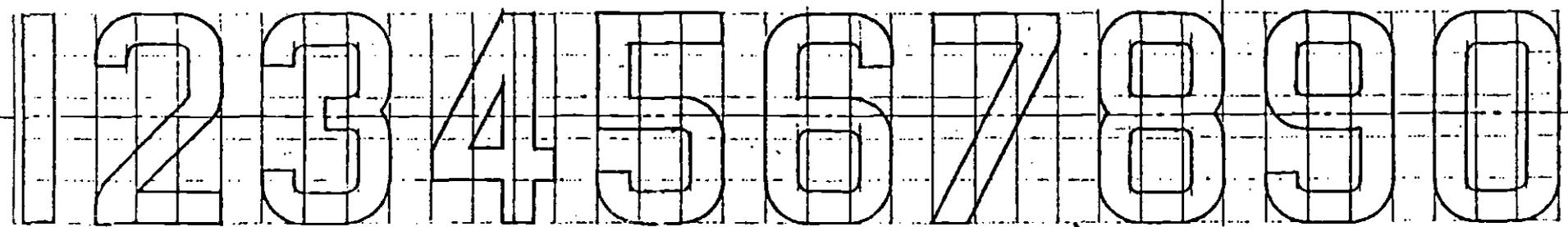
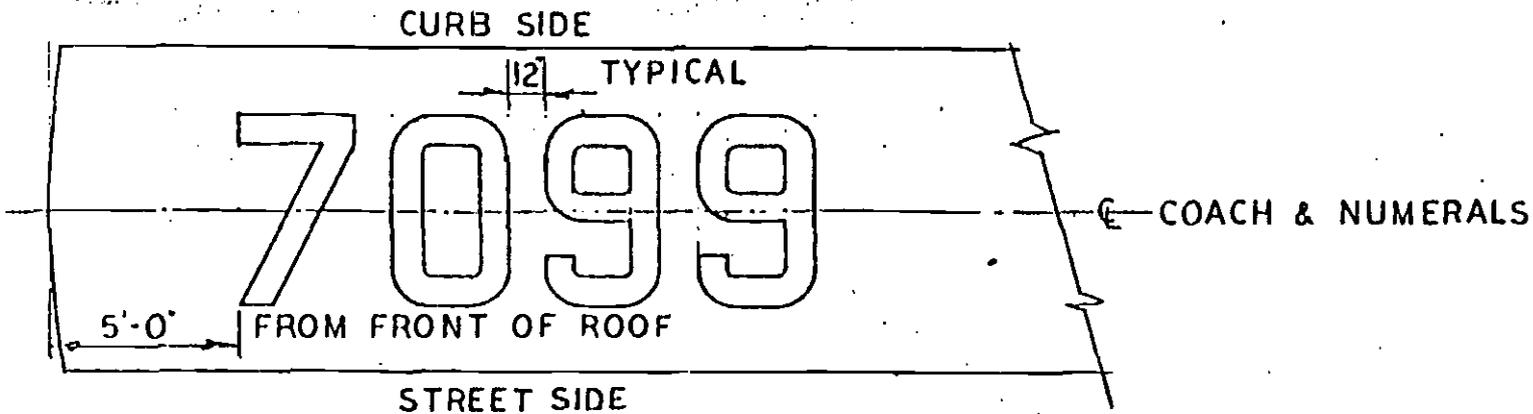


DESIGNED	DATE
DRAWN BY	DATE 12-73
D C Allen Jr.	
CHECKED	DATE
APPR. REC.	DATE

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT RTD 1060 SOUTH BROADWAY LOS ANGELES, CALIFORNIA 90015	
APPROVED	DATE

SIGNS
2 DIGIT & 3 DIGIT
SIGN LOCATIONS
GM & FLXIBLE BUSES

CONTRACT NO.
FILE NO.
DRWG. TYPE/NO. B-1210-A-
SHEET



NUMERALS ARE 36" X 60" WITH A 9" STROKE.
 INSIDE RADIUS 3"
 OUTSIDE RADIUS 12"
 COLOR, BLACK

NOTE! USE 54" LETTER HEIGHT ON
 96" WIDE BUS.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT TITLE LETTERING - MOTOR COACHES			
SUBTITLE COACH NUMBER ON ROOF			
DRAWN D.C. ALLEN	CHECKED	DATE APR. 17, 1972	SCALE
REF.	WORK ORDER	JOB NO. 318	DRAWING NO. B-1205-A-16
APPROVED <i>[Signature]</i> Supt. of Maintenance		APPROVED <i>[Signature]</i> Asst. Dir. of Operations	

VERIFY DIMENSIONS, LINES, GRADES, DETAILS, MEASUREMENTS, LOCATIONS AND CONDITIONS AT SITE; AND REPORT ALL DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

APPENDIX

VIII. ANTI-FREEZE/COOLANT SPECIFICATION

The Anti-Freeze/Coolant utilized by the bus manufacturer shall have an ethylene glycol base with anti-corrosive inhibitors and shall have the same characteristics as and be compatible with BASF Wyandotte 241-7 Anti-Freeze.