

**MEMORANDUM OF UNDERSTANDING
BETWEEN
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
AND
NATIONAL RAILROAD PASSENGER CORPORATION**

THIS MEMORANDUM OF UNDERSTANDING (“MOU”) is entered into as of this 17th day of July, 2008, by and between the STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, whose address is Haydon Burns Building, 605 Suwannee Street, Tallahassee, FL 32399-0450 (“State”) and the NATIONAL RAILROAD PASSENGER CORPORATION, whose address is 60 Massachusetts Avenue N.E., Washington, DC 20002 (“Amtrak”).

WHEREAS, State and CSX TRANSPORTATION, INC. (“CSXT”) have entered into an agreement whereby State will acquire from CSXT and operate a line of railroad from Milepost A749.7(Sta. 39409+00) at or near DeLand, Florida to Milepost A814.1(Sta. 42718+10) at or near Poinciana, Florida (“State Property”) and such State Property will be used for rail freight service provided by CSXT, commuter rail provided by the State and intercity rail passenger service provided by Amtrak; and

WHEREAS, State intends to engage in rail construction projects within and adjacent to State Property in anticipation of commencement of its Central Florida Commuter Rail Transit (“CFCRT”) service over the State Property, which projects may cause temporary disruption to Amtrak service for which the State desires to accommodate Amtrak and its passengers; and

WHEREAS, Amtrak operates an Auto Train maintenance and yard facility in Sanford, FL (“Amtrak Facility” or “Facility”), certain portions of which may be suitable for use in servicing and maintaining CFCRT’s Diesel Multiple Unit (“DMU”) railcars; and

WHEREAS, Amtrak is willing to service and maintain CFCRT's DMU railcars, subject to the negotiation of an appropriate Contractual Services Agreement between Amtrak and State; and

WHEREAS, Amtrak uses passenger station facilities in Winter Park and Orlando, FL and has agreed to modifications to the platform layout at such stations for use by State's CFCRT, as shown on Exhibits IV-V hereof; and

WHEREAS, there will be additional passenger station facilities that will require coordination between State and Amtrak for platform and other modifications; and

WHEREAS, the parties desire to reach a mutual understanding as to general terms and conditions regarding the matters set forth in this MOU;

NOW, THEREFORE, the parties indicate their understanding to be as follows:

I. PURPOSE.

This MOU is entered into for the purpose of setting forth the understandings between the parties as to: (1) the provision of Bus Bridge service (as described in Section II below) for Amtrak passengers in the event Amtrak's intercity rail service is disrupted due to construction work performed by State in anticipation of CFCRT commuter rail service on State Property; (2) compensation for any Amtrak Auto Train service that must be cancelled due to such construction work; (3) negotiation of a Contractual Services Agreement pursuant to which the CFCRT DMU vehicles will be serviced and maintained at the Amtrak Facility; (4) modifications to platforms for CFCRT passenger use, initially at Winter Park and Orlando, FL, and at other locations in the future; and (5) negotiation of an Operating Agreement for Amtrak service over State Property.

The parties agree that each intends to be bound by the general understandings set forth in this MOU and to negotiate in good faith a Contractual Services Agreement and an Operating Agreement consistent with the terms of this MOU.

II. BUS BRIDGE SERVICE

A. State shall make a good faith effort to plan and implement its construction on State Property in a manner that is least disruptive to Amtrak intercity rail service. The construction time period is estimated to be from May 2009 to and through March 2011 ("Construction Period"). In the event it becomes necessary from time to time during the Construction Period for State to request Amtrak to cancel or terminate passenger service to points in Florida south of Jacksonville, Bus Bridge service (consisting primarily of substitute bus service) shall be provided by Amtrak for affected passengers and train crews at the sole expense of State. The parties acknowledge that the Construction Period set forth above may be amended prior to actual commencement of construction.

B. Prior to commencement of the Construction Period, State will provide to Amtrak, for its review and approval, a proposed work schedule setting forth pre-scheduled curfew times agreed upon between CSXT and State during which State construction crews will be working on the track. Such review and approval by Amtrak shall be limited to the issue of whether the proposed work schedule will interfere with peak travel periods to or from Florida on Amtrak trains. Amtrak's approval shall not be unreasonably withheld or delayed in the instance of any such proposed interference. Following Amtrak's approval, Amtrak and State will prepare a tentative Bus Bridge plan based on the approved work schedule, including identification of specific time periods during which there will be no interruption of Amtrak train service. During the Construction Period, Amtrak and State will communicate on a no less than monthly basis (or more frequently as may be needed) to update the work schedule. State will provide Amtrak with 45 days' advance written notice of the specific dates (not to exceed more than 54 contiguous hours within any 7-day period) on which Amtrak should be prepared to implement the Bus Bridge plan. Amtrak will notify State of its acceptance or disagreement as to such dates within 2 business days of receipt of State's notice. In the event State does not receive a reply from

Amtrak within such 2-day period, State will notify Amtrak's Southern Division General Superintendent by telephone at 904-245-6620. If no acceptance or disagreement to such dates is forthcoming from Amtrak within two business days thereafter, the dates will be deemed agreed to by Amtrak. In the event Amtrak disagrees with the dates provided by State, the parties agree to consult promptly to finalize dates reasonably acceptable to the parties.

State will also make a good faith effort to provide Amtrak with a minimum of 72 hours advance notice that work schedules will not require implementation of the Bus Bridge plan on a given day and time. Once Amtrak is notified to implement the Bus Bridge plan, all costs associated with the implementation, cancellation or modification of such plan shall be at State's sole cost, regardless of whether such Bus Bridge service is actually provided to Amtrak passengers and crews.

C. When the agreed-upon schedules require, Bus Bridge service shall be provided by Amtrak for its *Silver Service* trains to and from all stations between Jacksonville ("JAX") and Tampa ("TPA") and Jacksonville ("JAX") and Miami ("MIA"). State acknowledges that significant costs are incurred each time a train is cancelled or terminated due to State's construction activities and that each cancellation or termination will necessarily mean that two trains must be cancelled or terminated (one northbound and one southbound). The estimated itemized costs for cancellation or termination of each train and the associated Bus Bridge services are set forth in Exhibit I, attached hereto. The total estimated cost should a cancellation or termination be agreed upon is \$2,036 per day. In addition, the estimated cost associated with each train and the associated Bus Bridge services is \$29,368 per train for a *Silver Meteor* train (Trains 97 and 98) and \$31,339 per train for a *Silver Star* train (Trains 91 and 92). State agrees to reimburse Amtrak for actual costs incurred in cancellation or termination of each train and provision of associated Bus Bridge services. Upon each cancellation or termination of a train, State shall pay Amtrak the appropriate estimated amounts set forth above (i.e., \$29,368 or

\$31,339 plus \$2,036/day). Actual costs, for the items specifically noted on Exhibit I, shall subsequently be reconciled as set forth in Paragraph F below.

D. Amtrak shall make a good faith effort to minimize the expense to State for Bus Bridge services. State acknowledges that Amtrak may operate additional scheduled service or special train service during the Construction Period which may require Bus Bridge service at State's expense. Amtrak will provide State with reasonable advance notice of additional planned scheduled service or special trains and will not implement plans to operate such trains without prior consultation with State.

E. The Bus Bridge service described above, and the fees and actual costs paid therefor by State, are all inclusive. Amtrak shall be solely responsible for providing the Bus Bridge service contemplated herein and for responding to all complaints or claims related thereto.

F. State payments to Amtrak for Bus Bridge service shall be made by State in accordance with State's standard vendor invoice payment procedures. Amtrak shall invoice State for the total estimated amount set forth in Paragraph C above each time Amtrak cancels or terminates a *Silver Service* train and provides associated Bus Bridge services and State shall promptly process and pay such invoice. Subsequent to the end of each calendar year, Amtrak shall provide State with a final invoice for such calendar year setting forth, for each train cancellation or termination and associated Bus Bridge service, and for the cancellation or modification of any Bus Bridge plan, the actual costs incurred broken out for each "actual" cost item set forth in Exhibit I, indicating whether the actual cost was above or below the estimated cost for those items and, for costs claimed in excess, providing reasonable substantiation therefor. The parties agree to meet to discuss reconciliation of the overcharges and undercharges indicated on Amtrak's final invoice and arrive at a final amount due for such calendar year to Amtrak or State as the case may be. State agrees it will review such invoices in good faith and

not unreasonably deny any charges claimed by Amtrak. All invoices submitted shall be in sufficient form for pre-audit and post-audit of the services performed pursuant to Section 287.058, Florida Statutes and shall be signed by an Amtrak representative who can represent that the costs and expenditures contained in said invoices are true and correct to the best of that person's knowledge or belief.

III. AUTO TRAINS

A. State shall make a good faith effort to plan and implement its construction on State Property in a manner that does not require Amtrak to cancel any Auto Trains. In furtherance of this effort, Amtrak has requested that the State perform any construction work that might affect the Auto Train during the months of February and September. State agrees to make a good faith effort to do so. State will provide Amtrak with a minimum of 60 days' advance notice in the event State requires Amtrak to cancel an Auto Train and, thereafter, State shall be obligated to reimburse Amtrak for the costs related to such cancellation as set forth in Paragraph B below. State acknowledges that each such cancellation will necessarily mean that two Auto Trains must be cancelled (one northbound and one southbound).

B. For each Auto Train cancelled hereunder, State shall reimburse Amtrak \$25,000 as further described in Exhibit I. This amount is all inclusive. The State's payments to Amtrak for any Auto Train cancellation shall be made by State in accordance with State's standard vendor invoice payment procedures. Amtrak shall be solely responsible for all complaints and/or claims related in any way related to cancellation of any Auto Train. No further reconciliation of "actual" costs associated with the cancellation of an Auto Train will be required.

IV. PROVISION OF SERVICES AT AMTRAK FACILITY, SANFORD, FL.

A. The parties agree they shall negotiate in good faith to enter into a Contractual Services Agreement detailing the terms and conditions for provision by Amtrak of maintenance and other services at the Amtrak Facility, e.g., : (1) monthly, 45/92/182/365 day and two year

inspections; (2) repair, replacement and servicing of DMU roof-mounted equipment; (3) axle/wheel maintenance; (4) sanding of DMU railcars on an as needed basis; (5) exterior washing of DMU railcars; (6) storage of component parts and materials for DMU maintenance; and (7) use of other buildings and tracks as need arises. All capital and operating expenses associated with any work performed by Amtrak for the State at the Amtrak Facility shall be paid by the State. All services performed at the Amtrak Facility will be provided by Amtrak employees and shall conform to generally accepted industry or other standards of workmanship and meet all state and/or federal regulatory requirements. It is anticipated that initially up to 14 CFCRT DMU railcars will require such services; provided, however, that subsequently as many as 34 DMU railcars could require such services depending of the scope and success of CFCRT passenger service. CFCRT will be solely responsible for the acquisition of all DMU cars and associated parts/infrastructure needed to maintain them in good working condition.

B. The initial term for the Contractual Services Agreement shall be five (5) years with annual renewal thereafter, upon agreement of both parties, for up to a total of ten (10) years.

C. Amtrak acknowledges that it has reviewed “Central Florida Commuter Rail Transit Technical Memorandum – Assessment of Amtrak Auto-train Yard and Maintenance Facilities at Sanford to Perform Vehicle Maintenance for the CFCRT,” attached hereto as Exhibit II, has consulted with the State regarding the contents thereof and can provide the services set forth therein without significant modifications to the Amtrak Facility. The details of services to be provided, required equipment and facility modifications, and payment terms will be addressed in the Contractual Services Agreements to be negotiated by the parties.

D. Amtrak agrees to be bound by service schedules set forth in the Contractual Services Agreement.

E. Amtrak acknowledges that State will be constructing certain facilities on land in Sanford adjacent to the Amtrak Facility and hereby approves the construction layout as shown in

Exhibit III, "CFCRT Storage Yard and Maintenance Facility," attached hereto. State agrees to consult with Amtrak during construction to assure such construction does not have an adverse impact on Amtrak operations, on the safety of such operations or on the Amtrak Facility. The parties agree to negotiate in good faith to enter into agreements for use by Amtrak of track constructed or acquired by State near the Amtrak Facility provided such use does not unreasonably interfere with CFCRT operations and use of such track. Amtrak shall be responsible for maintenance of track within the Amtrak Facility; State shall be responsible for maintenance of all other track.

F. The parties agree that Amtrak's Auto Train shall have priority on entering and exiting the Amtrak Facility via the Aloma Spur.

G. Amtrak shall endeavor to provide State with reasonable advance notice in writing in the event Amtrak intends to close or cease services which may affect CFCRT operations or the maintenance of the DMU railcars at the Amtrak Facility. The Contractual Services Agreement shall address responsibility for Labor Protection or other labor costs, if any, associated with the provision of services under such Agreement, termination thereof or suspension or termination of services in whole or in part at the Amtrak Facility. As used herein, "Labor Protection" shall mean the costs, if any, incurred by Amtrak as a result of the sale of, or other suspension or cessation of services (in whole or in part) at, the Amtrak Facility, which costs may be incurred pursuant to the provision of a collective bargaining agreement or pursuant to rule, decision, or final order of any governmental agency having jurisdiction over the event or costs, if any, incurred by Amtrak or State pursuant to Federal Transit Act Section 13 (c).

V. WINTER PARK AND ORLANDO, FL AMTRAK PASSENGER STATIONS

Amtrak hereby agrees to the platform modifications which the State intends to make at the Winter Park and Orlando passenger stations as set forth in Exhibit IV, "Winter Park Station" and Exhibit V, "Orlando Park Station", attached hereto. The State shall be solely responsible for

obtaining Federal Transit Administration (FTA), Federal Railroad Administration (FRA), and any other approvals prior to construction of any platform modifications.

Amtrak further agrees it shall assist the State to obtain any FTA, FRA or other approvals for the modifications set forth in Exhibits IV and V relating to issues involving transportation and/or the Americans with Disabilities Act.

VI. CONTRACTUAL SERVICES AND OPERATING AGREEMENTS

The parties agree they shall use every good faith effort to finalize by August 2008: (1) a Contractual Services Agreement and (2) an Operating Agreement for Amtrak passenger service over State Property, which will include terms and conditions regarding dispatching priority for Amtrak trains while operating on State Property, station operations, maintenance and leasing terms as applicable. The parties acknowledge that various issues (e.g., those relating to sovereign immunity, indemnity, insurance, legislation and the rights, duties and obligations of the parties) remain unresolved as of the date hereof, and that agreement on these issues must be reached before the parties can execute either a Contractual Services Agreement or an Operating Agreement.

VII. COORDINATION MEETINGS

The Parties acknowledge that the understandings herein require coordination and cooperation to implement. The parties agree to make reasonable efforts to do so through effective communications and timely, well informed, decision making and, to this end, agree to:

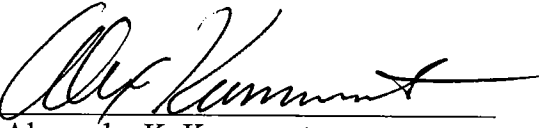
- (1) Designate one or more representatives for coordination of the following: (a) negotiation of the Contractual Services Agreement anticipated hereunder; (b) negotiation of the Operating Agreements anticipated hereunder; and (c) to serve as a point of contact for coordination of day-to-day activities during the Construction Period, most particularly activities related to Bus Bridge service and passenger station modifications.

(2) Hold monthly meetings or conference calls of such representatives, and other appropriate personnel as designated thereby, until execution of the Contractual and Operating Agreements and thereafter through completion of Construction Period, unless such representatives agree otherwise. Regarding the Construction Period, the parties acknowledge that State and CSXT have agreed to monthly meetings and that Amtrak has been invited to participate in those meetings, which will constitute fulfillment of Amtrak's coordination agreement under this Section.

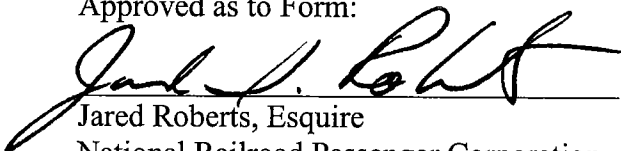
(3) Provide timely exchange of information and response to requests in order to ensure a better understanding of issues and problems and, thereby, assist in eliminating uncertainties and ambiguities. The parties agree to cooperate with one another with respect to the exchange of information that each of the parties, in its discretion, considers necessary to fulfill the requirements of this MOU.

IN WITNESS WHEREOF, State and Amtrak have caused this MOU to be executed by their duly authorized respective representatives as of the date first above written.

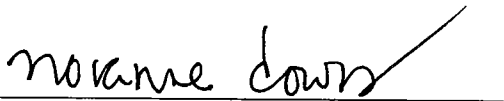
NATIONAL RAILROAD PASSENGER
CORPORATION

By 
Alexander K. Kummant
President and Chief Executive Officer

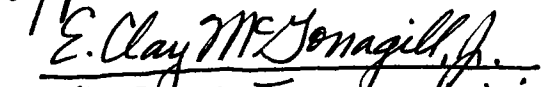
Approved as to Form:


Jared Roberts, Esquire
National Railroad Passenger Corporation

FLORIDA DEPARTMENT OF
TRANSPORTATION

By 

Approved as to Form:


Fla. Dept. Transportation
E. Clay McGonagill, Jr., Esquire

Attached Exhibits:

Exhibit I: Estimate of Itemized Costs for Bus Bridge Service and Cancellation of Train Sets
Related Thereto (per instance costs)

Exhibit II: “Central Florida Commuter Rail Transit Technical Memorandum – Assessment of
Amtrak Auto-train Yard and Maintenance Facilities at Sanford to Perform Vehicle
Maintenance for the CFCRT”

Exhibit III: CFCRT Storage Yard and Maintenance Facility Layout

Exhibit IV: Winter Park Station Layout

Exhibit V: Orlando Park Station Layout

EXHIBIT I**MEMORANDUM OF UNDERSTANDING BETWEEN STATE OF FLORIDA DOT AND NRPC
ESTIMATE OF ITEMIZED COSTS FOR BUS BRIDGE SERVICE AND CANCELLATION OF TRAINS****FOR SILVER SERVICE TRAINS:****Costs Per Day:**

Switch Crew - Sanford FL (SFA)	\$1,028
Communications	100
Security *	150
Catering Transportation *	644
	<hr/>
Sub-Total	\$1,922
General & Administrative @ 5.93%	\$114
Total	<hr/> \$2,036 <hr/>

Costs Per Train:	Silver Meteor Trains 97/98	Silver Star Trains 91/92
Food Cost for Busing *	\$1,750	\$2,130
Passenger Transportation *	9,270	12,096
OBS Transportation	650	650
T&E Transportation	1,200	1,000
T&E Lodging SFA *	240	180
Fuel Savings	(4,200)	(5,400)
Mechanical Labor *	4,000	4,000
CSX Mileage Rate	(666)	(861)
Net Loss of Revenue *	15,480	15,790
	<hr/>	<hr/>
Sub-Total	\$27,724	\$29,585
General & Administrative @ 5.93%	\$1,644	\$1,754
Total	<hr/> \$29,368 <hr/>	<hr/> \$31,339 <hr/>

Example - Costs billable for the cancellation of one Silver Meteor train and one Silver Star train for one day will be \$62,743 (\$2,036+\$29,368+\$31,339) .

* Actual costs/revenue loss detail will be provided for these items during reconciliation process outlined in Section II.F. All other costs will be assumed as actual expenses .

FOR AUTO TRAIN SERVICE:

Amtrak will charge and the State will pay a flat rate of \$25,000 for each Auto Train cancelled. This reflects Amtrak's revenue loss and is based on Amtrak's ability to re-schedule Auto Train passengers to alternative booking dates with advanced notice and coordination of Auto Train cancellations. This flat rate is fixed and will not be subject to any reconciliation process.

EXHIBIT II
Central Florida Commuter Rail Transit

**Technical Memorandum - Assessment of Amtrak Auto-train Yard and
Maintenance Facilities at Sanford to Perform Vehicle Maintenance
for the CFCRT**

TABLE OF CONTENTS

1. Executive Summary
2. Background
 - 2.1 – Earlier Assessment of Maintenance Facilities
 - 2.2 – Consideration of Amtrak Auto-Train Yard and Maintenance Facility for CFCRT Maintenance
3. Description of Amtrak Auto-train Yard and Maintenance Facility
 - 3.1 – Introduction
 - 3.2 – Auto-train servicing performed
 - 3.3 – Detailed Description of Amtrak Auto-train Maintenance Facilities
4. Description of DMU Maintenance Requirements
 - 4.1 – Earlier Assessments of Maintenance Requirements
 - 4.2 – Summary of Required Inspection Periods and Maintenance for DMU Cars
5. Assessment of Amtrak Auto-train Maintenance Facilities to Perform CFCRT Vehicle Maintenance
6. Conclusions and Recommendations

Appendix A - Colorado Railcar – DMU Maintenance Requirements

Appendix B - Drawings

Appendix C - Photographs

Central Florida Commuter Rail Transit

Technical Memorandum - Assessment of Amtrak Auto-train Yard and Maintenance Facilities at Sanford to Perform Vehicle Maintenance for the CFCRT

1. Executive Summary

Amtrak has indicated receptiveness to their Auto-train maintenance shops and yard facility at Sanford being used for CFCRT vehicle maintenance. This Technical Memorandum will examine the Amtrak Auto-train facilities and assess the suitability of the shops and other facilities for maintaining the fleet of DMU vehicles for the CFCRT.

The Auto-train shops and yard complex is used on a daily basis as the terminus for the Auto-train and all inspection, repairs and cleaning of the Auto-train locomotives, coaches and auto carriers. The yard and most shop areas are fully utilized each day after the Auto-train arrives at 08:30 and departs at 16:30. Outside of this period, the shops have minimal or no Amtrak activity and may be available for maintaining the CFCRT vehicles.

The Auto-train yard is conveniently located off the main line and adjacent to the old Sanford Station where it is proposed to construct a train storage yard for the CFCRT vehicles. The shop facilities however, have limitations with regard to their suitability for maintaining the DMU vehicles. Inspection track(s) with posted rails and good undercar and lower side access are required to adequately inspect and maintain the DMU vehicles and only one such location for a single vehicle exists in the Auto-train Diesel Shop. Consequently, it will be necessary to construct a separate Inspection Shed with posted rails. For the Full Build, this memorandum recommends that a four-car Inspection Shed with support facilities be constructed in the proposed train storage yard adjacent to the old Sanford Station/Terminal. The Inspection Shed would primarily be used for Daily and Weekly Inspections and possibly interior cleaning.

For other longer term periodic maintenance activities it would be practical to use the Amtrak Auto-train facilities, as follows:

- Diesel Servicing Area in the Diesel Shop: Monthly, and 45/92/182/365 Day Inspections; maintenance and change-out of roof mounted equipment; and intermediate repairs
- Service Pit Shop: Two year inspections; maintenance and change-out of roof mounted equipment; truck change-out; and heavy repairs
- Drop Table Shop: Axle/Wheel Set Changing
- Materials Storage Building: Partition part of enclosed/secure storage area for storing DMU components and consumable items
- Additional Shop Equipment: For the above shops, some additional shop equipment will be required, as follows:
 - Two (or four) additional portable car jacks would be required to lift complete DMU car bodies (Cost \$70,000 to \$130,000)
 - Portable scissor lift platform(s) or portable ladder trestles (Cost \$10,000 to \$30,000) to facilitate change-out Roof Mounted Equipment

- Additional partitions/caged areas and additional shelving units for Material Storage Building (Cost \$5,000 to \$20,000)
- Car Wash: While the Amtrak Auto-train Car Wash is basically suitable for cleaning the DMU cars, the existing clearance through the car wash is not sufficient for the double-decker DMU cars. Therefore, the wash equipment will need to be modified (raised) approximately 12". While this would be relatively straightforward, further investigation will be required to ascertain the extent of modifications required and associated cost.
- Fueling and Sanding Facility: This is located at the east end of the Diesel Shop and fueling (for Amtrak locomotives) is done from a tanker truck. This may not be practical for a large number of DMU vehicles (34 vehicles for Full Build) but would possibly be workable for the IOS (14 vehicles). Further investigation will be necessary with Amtrak and local distributors/vendors in the area, which could provide the fuel truck service, to ascertain the practicality of fueling 14 or more DMU vehicles each night. If fueling from a tanker truck proves not practical, consideration will need to be given to installing a small fueling storage and dispensing system either within the Auto-train yard or possibly in the proposed train storage yard adjacent to the old Sanford Station/Terminal.

The Initial Operating Segment (IOS) is currently planned to have a total of 14 DMU vehicles. Assuming the same requirements for daily and weekly inspections, at least a two-car inspection track/shed will be required (approximately 30' x 220'). This could initially be constructed and expanded at a later date for the Full Build alternative.

It is recommended that the support facilities for the Full Build be constructed for the IOS. The complete Control Room will be required in any event and to construct approximately half of the remaining facilities and expand at a later date would not be cost effective.

For the Amtrak Auto-train facilities, the same facilities will be required for the IOS as for the Full Build, except that the daily (or nightly) usage would be approximately 50% less.

Subsequent to review of this Technical Memorandum by FDOT, copies should be provided to Amtrak and Colorado Railcar for their review and comment.

2. Background

2.1 Earlier Assessment of Maintenance Facilities

In February 2006 a Vehicle Storage and Maintenance Facilities Technical Memorandum was submitted. The report identified the basic functional requirements for a Vehicle Storage and Maintenance Facility (VSMF) for 34 DMU vehicles for the 60.8 mile Full Build option for the CFCRT. The memorandum also briefly evaluated five potential locations for the VSMF. At that time, the Rand Yard was recommended as the preferred location for the VSMF, along with a recommendation to consider and further assess the suitability of the Sanford Amtrak Auto-train yard and maintenance facility.

2.2 Consideration of Amtrak Auto-train Yard and Maintenance Facility for CFCRT Maintenance

Since the VSMF Technical Memorandum was produced in February 2006, Amtrak indicated they will consider providing the Auto-train facility for CFCRT vehicle maintenance. At a meeting with FDOT and Amtrak on June 21, 2007, Amtrak agreed that

further investigations could be made to use the Auto-train maintenance facility for some or all CFCRT vehicle maintenance. However, they stated that maintenance activities will primarily have to be performed during evenings and nights when little or no Auto-train activity occurs. Amtrak also agreed at the June 21 meeting that the CFCRT design consultant could visit the Auto-train facility to perform an assessment of the facility and current operations and its suitability as the VSMF for the CFCRT. A field trip was subsequently arranged with Tom Farr, Master Mechanic and the Auto-train facility manager on July 5, 2007.

3. Description of Amtrak Auto-train Yard and Maintenance Facility

3.1 Introduction

The Amtrak Auto-train yard and maintenance facility is located in Sanford, adjacent to the CSXT main line tracks and the Auto-train Terminal and just to the north of the CSXT Rand Yard. The former Sanford Terminal/Station, located southwest of the yard, is now closed and abandoned and all Auto-train Terminal activity is located on the north side of the yard with access from the CSXT lead to the Aloma industrial track that heads east towards Sanford and the Airport (see the Functional Layout plan).

Amtrak Auto-train No. 53 is scheduled to arrive daily from the north at 08:30. Auto-train No. 52 is scheduled to depart daily at 16:30. Car and motorcycle vehicle unloading and loading occurs throughout the day. All Auto-train maintenance activities are performed during the day on the diesel locomotives, Superliner passenger coaches and the auto carriers in the adjacent maintenance facility.

3.2 Auto-train servicing performed

Each day, the summary of maintenance performed is as follows:

Locomotives

Daily Inspections (2)
Exterior Cleaning (2)
92/180/365 day inspections (none)
Servicing, fueling and sanding (2)
Repairs as required

Superliner Coaches

Daily Inspections (16)
Exterior Cleaning (16)
Interior Cleaning (16)
92/180 day inspections (5)
365 day inspections (1)
Repairs as required
Wheel changing approx 2 axles a day

Auto Carriers

Daily Inspections (24)
Exterior Cleaning (24, three times a week)
180/365 day inspections (1)
Repairs as required
Wheel changing approx 2 axles a day

All of the above maintenance is performed during a single day shift by Amtrak forces. The maintenance facilities are effectively closed from 17:00 until 08:00 the next day. On average, there are seven Superliner coaches, ten auto carriers and one locomotive in the yard overnight. Generally these are held on yard tracks and not on shop tracks unless more extensive repairs are required than can be performed during the normal day shift. The full compliment of Amtrak maintenance and operations staff on the day shift is 96.

3.3 Detailed Description of Amtrak Auto Train Maintenance Facilities

Each shop or area is shown on the attached Functional Layout plan and described below. Photos are attached under Appendix C.

Service Pit Shop

120' x 30' (3,600 SF)

- There is one track through the shop with an inspection pit approximately 100' long
- The floor either side of the inspection pit is approximately level with ToR
- Shop has open sides and ends
- Lowest clearance in shop is 22' from ToR, and crane clearance is 23'
- A 10 ton bridge runs the full length of the shop and two portable 35 ton jacks are used to lift auto carriers (and occasionally Superliner cars) to change-out trucks
- Trucks are overhauled in the open shed to the rear of the shop
- This shop is primarily used to perform 184/365 day inspections on the Auto Carriers

Drop Table Shop

180' x 50' (9000 SF)

- There are two tracks through shop with shallow inspection pits (approx 10' x 10') either side of single axle drop table on the south track S2
- The north track S1 is used only to stage and store axle/wheel sets
- The floor throughout the shop is level with ToR
- Shop has open sides and ends
- Lowest clearance in shop is 22' from ToR
- There are two portable 50 ton jacks in this shop but they are not used on a regular basis
- There is a 5 ton bridge crane over track S1 at the drop table with 16' 10" clearance
- Currently there is no high bridge crane over both tracks but it is understood that a 10 ton bridge is to be installed in this shop
- The shop is primarily used to change-out single axles/wheel sets from Auto Carriers and Superliner cars.

Diesel Shop

360'410' x 38' (14,600 SF)

- The shop has two tracks, D1 and D2, approximately 19' apart
- The Diesel Servicing area is 81' long with platforms on all sides, depressed floor and posted rails. The pit between the rails is 3' below ToR, the depressed floor is 2' 5" below ToR, and the platforms are 5' 3" above ToR
- The tracks either side of the Diesel Servicing area are on exposed ties and the surrounding floor is approximately level with the top of ties (about 8" below ToR)

- The shop has open ends and, with the exception of the Diesel Servicing area, the shop has predominantly open sides
- Lowest clearance in shop is 22' 5" from ToR
- A 5 ton bridge crane runs over the Diesel Servicing area only. The clearance under the bridge to ToR is 23'
- The tracks at the east end of the shop are used primarily for refueling and sanding (see further below)

Enclosed Store House Building

240' x 60' (14,500 SF)

- The west end of the shop is predominantly open with two stacked office trailers approximately 12' x 40'
- The east end is fully enclosed and secure with pallet racks, shelves, and a storage mezzanine. The enclosed storage area is approximately 8,000 SF and estimated to have approximately one third spare capacity.

Special Projects Shop

100' x 100' (10,000 SF)

- The shop has three tracks (#1, 2, and 3) approximately 30' apart
- The two north tracks (#1 and 2) have between-rail 3' deep inspection pits, 85' long
- The south track (#3) has a flat floor level with ToR.
- The shop is fully enclosed with coiling doors at each track. The clear height at these doors is only 18'
- There is a 2 ton transverse bridge at the east end of the shop crane spanning all three tracks
- Storage pallet racks are located between the two west tracks
- This shop is used for special projects on the Superliner cars and evidently underutilized, other than where it's used for component storage and repairs.

Exterior Inspection Tracks #1, 2 and 3

- The complete open area east of the Special Projects Shop for approximately 120' is paved flush to ToR on each track
- Each track is equipped with standby power, compressed air and water for coach servicing
- 92 and 184 day inspections are performed on the Superliner coaches each day

Fueling and Sanding Tracks

- Locomotive fueling and sanding is performed each day at the east end of tracks D1 and D2
- The tracks at this end of the diesel shop have an industrial drainage system to contain and treat any fuel or oil run-off should it occur
- All fueling is done from a tank truck and shelter is provided for the tank truck. The tank truck service is provided by a local fuel vendor/distributor and is on site for limited periods only
- Sand is dispensed via a small compressed air hopper system adjacent to track D2

Elevated Yard Track #14

- This track is elevated approximately 18" from the surrounding ballast and can accommodate up to 9 cars
- In the past, the track was used for car inspections. It is now only used for holding Superliner and/or auto carrier consists.

Car Wash

120' x 25' (3000 SF)

- The wash system is simple single pass process consisting of a detergent application arch, single vertical agitator brushes on each side and a clean rinse arch. There is no recirculation system.
- Run-off from the wash process is discharged directly to a city sanitary sewer system
- The clear height to the underside of the detergent and rinse arches, and the brush frame assembly is 19' 9" (from equipment drawings)
- The car wash is used on average twice a day for partial consists of Auto-train coaches and auto-carrier cars

4. Description of DMU Maintenance Requirements

4.1 Earlier Assessments of Maintenance Requirements

The February 2006 Vehicle Storage and Maintenance Facilities Technical Memorandum summarized the cleaning, inspection and repair requirements for a fleet of DMU cars. These requirements were further enumerated in the Rail Fleet Maintenance Plan, Version 1.2, submitted June, 2007.

As part of this assessment, the consultant discussed DMU maintenance requirements with Colorado Railcar. Colorado Railcar subsequently produced a detailed description of all inspection and maintenance requirements based on their experience with the South Florida RTA DMU operations – their document is attached under Appendix A. A summary of required maintenance periods and work performed, based primarily on the Colorado Railcar information, is provided in Section 4.2

For maintenance assessment purposes the, Full Build Option assumes a maximum of 34 DMU cars. It is also assumed that this includes a 20% Maintenance Spares Ratio (MSR), as stipulated in the Rail Fleet Maintenance Plan. This implies a service requirement of 28 cars and 6 spare cars.

4.2 Summary of Required Inspection Periods and Maintenance for DMU Cars

All manhours in this section are based on information provided by Colorado Railcar. A copy is attached under Appendix A.

Daily Inspections

This is the most important interval for vehicle reliability and safety and includes the mandatory Class I air brake test. In addition to a thorough test and inspection of braking systems, it includes a primarily visual inspection and some functional testing of all car systems. Side and undercar access is required to perform most aspects of this inspection.

- Estimated man-hours per car: 6.8. Four cars need to be inspected per hour assuming an 8 man gang and an 8 hr shift. Each inspection requires approximately 1 hour (32 cars per day).

Weekly Inspections

Additive to the Daily Inspection. Includes wheel gauging, air conditioning, batteries, radiator system, engine fuel and water system and more detailed interior inspection.

- Estimated man-hours per car: 3.15 in addition to the Daily Inspection. Assuming a 3 man gang, these inspections would take approximately 1 hour (5 cars per day). These inspections can be performed in conjunction with the Daily Inspection.

Monthly and 45 Day Inspections

Additive to the Daily and Weekly Inspection but could be performed at a different location equipped to service engines and transmission systems. Engine oil and all filters changed. Transmission and final drive systems checked.

- Estimated man-hours per car: 3.70 if Monthly and 45 Day Inspections combined (1.55 + 2.15 man-hours). Assuming a 4 man gang, these inspections will take approximately one hour (one to two cars required per day).

92/182/365 Day Inspections

This includes a detailed inspection, adjustments and change-out of various components to meet mandatory requirements, plus other necessary maintenance. Side and undercar access is essential to perform most aspects of these inspections. Given the time involved, these inspections may be best performed at different location to all shorter inspections. Unless defects are found, it should NOT be necessary to lift cars for any of these inspections.

- Estimated man-hours per car: 37.75, 45.65, and 53.85 respectively for 92, 182 and 365 day inspections, or an average over a year of 48 man-hours per car. Assuming a 6 man gang, these inspections would take approximately 8 hours (one car every 3 days or 11 per month).

Two Year Inspections

These are basically the same as an annual (365 day) inspection but cars are lifted and trucks rolled out for inspection, maintenance and change-out of worn components. A flat floor either side of shop track equipped with four portable jacks would be best suited to this inspection. An inspection pit between the rails would be optional. A bridge crane, minimum 10 ton capacity would be required to handle trucks.

- Estimated man-hours per car: 122. Assuming an eight man gang, these inspections will take approximately 16 hours or two days - assuming single shift operation (one car every 24 days for two days or one-two cars per month).

Beyond Two Years

As stated in the Colorado Railcar document, the South Florida DMU maintenance contract does not extend beyond the two year period. Major overhaul of trucks, diesel engines and other components will have to be scheduled during the 5 to 10 year timeframe. However, assuming most of these items (trucks, engines, etc.) were outsourced or sent to another more comprehensive overhaul and rebuilding facility, the change-out of such equipment can be performed either in conjunction with on-going Two Year Inspections or on separate

cycle(s) with little additional shop time/occupation involved, other than allocating storage space for replacement trucks, engines, etc.

Roof Mounted Equipment

Air conditioning condensers and engine cooling radiators are roof mounted on the Colorado Railcars and will periodically need to be removed. On a program basis, this will hopefully be no less than every five years or so but inevitably these items will occasionally become defective and require change-out. A 2 to 3 ton bridge crane, with sufficient clearance over a car (ideally at least 25') will be required. Fixed roof access platform(s) or a portable scissor lift platform will also be required to gain access to the roof mounted equipment.

Wheel Maintenance

Axle/wheel sets may be changed-out with a single axle drop table when re-profiling or replacement is necessary. While this is a variable, wheels should not require re-profiling in less than one year. Access to an underfloor wheel truing machine would be extremely beneficial for re-profiling but it is understood that no such facility exists within, or close to, the Full Build CFCRT route.

Fueling and Sanding

The DMU cars will probably need to be refueled once a day and, assuming full servicing running, at least every two days. Sanding would be required infrequently.

Exterior Cleaning

Depending on time of year and other local conditions, cars should be exterior washed at least every two to three days.

Interior Cleaning

Basic cleaning and sweeping/vacuuming will be performed each night and this can be done in conjunction with daily inspection or on yard storage tracks. More complete cleaning of all interior surfaces will be required at intervals of one week to one month and performed in conjunction with weekly or monthly inspections. The initial estimate is four cleaning staff for interior cleaning.

Staff Requirements

Based on the above assessment and assumptions, staffing needs for a single night shift are estimated as follows:

Task	Staff	Notes
Daily Inspections	32	8 per car x 4 cars
Weekly Inspections	3	
Monthly/45 Day Inspections	2	
92/182/365 Day Inspections	6	
Two Year Inspections	8	For approx 20% of work days
Beyond Two Years	0	Same staff as Two Year Inspections
Wheel Maintenance	0	Same staff as Two Year Inspections
Miscellaneous	0	Same staff as Two Year Inspections
Fueling and Sanding	2	
Car Wash	1	
Interior Clean	4	
Total	58	
Supervisory Staff	6	

This is an approximate assessment and the exact numbers of required staff requires further analysis. However, this analysis will be adequate for assessing facility requirements (locker rooms, toilets, etc.)

5. Assessment of Amtrak Auto-train Maintenance Facilities to Perform CFCRT Vehicle Maintenance

Daily and Weekly Inspections

These inspections need good undercar and side access. Ideally the inspection track(s) have a depressed floor with posted rails in the 3' to 4' height range. Good lighting is essential along with electrical receptacles and compressed air outlets. Also, approximately 30 cars will need to be inspected each day (or night) and assuming the one hour period (identified in Section 4.2) required to perform these inspections, at least four car inspection positions will be required. This also assumes that the four cars will be removed/replaced eight times during a normal eight hour shift ($8 \times 4 = 32$).

No such track with the above facilities exists within the Auto-train shop complex. Track 14 does have an elevated track approximately 18" above the adjacent grade, but this will not permit easy access to the undercar equipment on the DMU cars. The Diesel Servicing area in the Diesel Shop would be suitable but it is only a single position and it would be impossible to cycle all of the cars on to this track during a single shift.

Consequently, it is recommended that the Daily/Weekly Inspection facilities are constructed on one track in the proposed train storage yard adjacent to the old Sanford Station (see Amtrak Autotrain plan). This could be a single track with posted rail track/depressed floor sufficiently long enough to hold at least four cars. A roof over the tracks and partially enclosed sides would be desirable to provide weather protection. This four car Inspection Shed would be approximately 400' long x 30' wide. An alternative is a two track facility (each track two cars long) approximately 200' long and 60' wide.

Monthly and 45 Day Inspections

These inspections are additive to the Daily and Weekly Inspections and add engine oil and all filter changing. Transmission and final drive systems are also checked.

These inspections could ideally be performed at the Diesel Servicing area in the Diesel Shop. All appropriate facilities exist at that location. Depending on the size of the inspection gang, each Monthly or 45 Day Inspection would take one to two hours and one or two cars could easily be cycled through the Diesel Shop during a normal shift for these inspections.

92/182/365 Day Inspections

As for the Monthly or 45 Day Inspections, these more involved inspections could be performed at the Diesel Servicing area in the Diesel Shop.

While each inspection is estimated to take a complete shift, only one car every three days would be scheduled for a 92/182/365 Day Inspection. On the other days, Monthly and 45 Day inspections could be scheduled as proposed above.

Two Year Inspections

Basically the same as an annual inspections but cars are lifted and trucks rolled out for inspection, maintenance, and change-out of worn components. A flat floor either side of

shop track equipped with four portable jacks is best suited for this inspection. An inspection pit between the rails would be optional. A bridge crane, minimum 10 ton capacity will be required to handle trucks, should wheels or other components have to be changed.

The Service Pit Shop is the only location that is long enough (120'), has a flat floor level with ToR suitable for portable car jacks and has a 10 ton bridge crane. It is recommended that Two Year Inspections be performed in this shop.

There are only two portable jacks in this shop and two more (or a new set of four) will be required to evenly lift a complete DMU car body. Due to tight undercar equipment clearances, it is not recommended to lift only single ends of a DMU car to remove a truck.

Each Two Year Inspection will take in excess of one day but these inspections will be scheduled infrequently, on average every 24 days. Consequently, the facility will be available for Amtrak Auto-train servicing on all but two or three days a month.

Roof-Mounted Equipment

Air conditioning condensers and engine cooling radiators are roof-mounted on the Colorado Railcar DMU's and will periodically need to be removed. On a program basis, this will hopefully be no less than every five years or so, but inevitably these items will occasionally become defective and require change-out.

These items could be changed-out in either the Diesel Servicing area in the Diesel Shop (assuming a bridge crane is installed as proposed by Amtrak) or in the Service Pit Shop. Portable scissor lift platform(s) or portable ladder trestles will also have to be considered to gain access to the roof mounted equipment.

Wheel Maintenance

Axle/wheel sets will have to be changed-out when re-profiling or replacement is necessary. The single axle drop table in the Drop Table Shop is well suited for this purpose. Wheels should not require re-profiling less than once every year or so. Therefore, on average the drop table may need to be used about once a week.

Fueling and Sanding

Assuming the DMU cars will need to be refueled once every one or two days, at least twenty cars will need to be refueled during each night shift. Fueling needs to be done on the fueling tracks at the east end of the Diesel Shop where a full spill containment system exists. It should be possible to position three DMU cars on these tracks (two on track D2 and one on D1) for refueling at any one time. Thus, cars would have to be cycled through these tracks perhaps eight times during a night shift. While refueling each car takes only about 15 minutes, it is unlikely that cars could be cycled more frequently than every 30 minutes to/from these tracks. Consequently, refueling of all or most DMU cars is likely to take 4 to 6 hours.

Currently, fueling for Auto-train locomotives is done from a fueling truck that is on site for a limited period during the day. For the DMU cars, that will have to be refueled at night, an on-site fuel supply and dispensing system would be more reliable than relying on a truck fueling service. However, this would be costly to install and still would have the problem of cycling individual DMU cars to a fueling facility.

Another alternative for fueling would be to group DMU cars on Tracks 14 and/or 15 and have a fueling truck move along the roadway from car to car. This is the practice at other locations but there is the risk of fuel spillage on to tracks that have no spill containment system. It is recommended that fuel supply vendors/distributors in the area be contacted to ascertain if they would be prepared to fuel at night over an extended period (say 4 to 6 hours) and what precautions they would employ to avoid/contain a fuel spill.

Sanding would be required infrequently and the existing compressed air hopper system should be adequate.

Exterior Cleaning

Depending on time of year and other local conditions, cars should be exterior washed at least every two to three days. This should be easily achievable with the existing car wash and could be done in conjunction with the same yard move as refueling.

While the car wash is basically suitable for cleaning the DMU cars, the existing clearance through the car wash is not sufficient for the 19' 10" high (from ToR) DMU cars. The existing equipment is designed for vehicles having a maximum height of 18' 9" (the Auto Carriers). Therefore, the wash equipment needs to be modified and raised approximately 12". From visual observations of the equipment, this should be relatively simple. The car wash building is significantly higher than the wash equipment so no modification to the building structure is expected.

Component and Materials Storage

The existing Materials Storage Building and enclosed store house appear to have spare capacity to accommodate spare components and materials for day-to-day maintenance of the DMU cars. It would certainly be preferable if the stores area for the DMU cars was separated from Amtrak's stored materials and this could probably be accommodated by rearranging or installing new partitions/caged areas and additional shelving units.

If sharing storage facilities is considered to be viable, the specific requirements will require further identification and evaluation of DMU storage requirements, Amtrak's storage requirements and store house layout to ensure all user needs can be accommodated.

Special Projects Shop

This shop and the three tracks therein, are not well-suited for DMU maintenance. While two tracks have between-rail inspection pits, the surrounding floor is flush with the top of rail making the area unsuitable for inspections of the DMU cars. Also, there are no bridge cranes suitable for changing out roof mounted equipment, and existing track entrance doors are too low at 18'.

6. Conclusions and Recommendations

Construct Four Car Inspection Shop for Daily and Weekly Car Inspections

No suitable facilities exist at the Auto-train facility to perform Daily and Weekly DMU car inspections. It is therefore recommended that suitable inspection facilities be constructed on one track in the proposed train storage yard adjacent to the old Sanford Station (see Amtrak Autotrain plan). This could be a single track with posted rail track/depressed floor sufficiently long enough to hold at least four cars. A roof over the tracks and partially enclosed sides would be desirable to provide weather protection. This four car Inspection shop would be approximately 400' long x 30' wide. Alternatively, it could be a two track facility with two car positions on each track, approximately 200' long x 60' wide.

Use Amtrak Auto-train Maintenance Facilities for All Other Maintenance and Inspection Activities

Maintenance activities could be performed in the various shops as follows:

- Monthly, and 45/92/182/365 Day Inspections: Diesel Servicing Area in the Diesel Shop
- Two year inspections: Service Pit Shop. Two additional portable car jacks will be required to lift complete DMU car bodies
- Change-out Roof Mounted Equipment: Diesel Servicing Area and Service Pit Shop. Portable scissor lift platform(s) will be required to gain access to the roof mounted equipment
- Axle/Wheel Set Changing: Drop Table Shop

Use Amtrak Auto-train Component and Materials Storage Building

The existing Materials Storage Building and enclosed store house appear to have spare capacity to accommodate spare components and materials for day-to-day maintenance of the DMU cars. It would certainly be preferable if the stores area for the DMU cars is separated from Amtrak's stored materials and this could probably be accommodated by rearranging or installing new partitions/caged areas and additional shelving units.

If Amtrak is amenable to sharing storage facilities, it is recommended that further investigations be performed in conjunction with Amtrak and the DMU car manufacturer to establish specific requirements for component and material storage.

Consider Further Using Amtrak Fueling and Sanding Facilities

Three alternatives are possible and presented for further consideration:

1. Cycle all DMU cars to fueling tracks at the east end of the Diesel Shop and fuel from a fueling truck. This will be time consuming and arranging for fueling truck for an extended period at night may be problematic.
2. Group DMU cars on Tracks 14 and/or 15 and have a fueling truck move along the roadway from car to car. The fueling truck should be on site for shorter overall period, but there would be a concern for possible fuel spillage on tracks that have no spill containment system.
3. If neither of the above options are practical, consider installing a small fueling storage (above ground tank) and dispensing system either within the Auto-train yard or possibly in the proposed train storage yard adjacent to the old Sanford Station/Terminal.

It is recommended that the first two options are investigated further with Amtrak and possibly with distributors/vendors in the area that can provide the fuel truck service. Spill containment considerations will be a significant factor in any further investigations.

Use Amtrak Exterior Car Cleaning Facilities

While the Amtrak Auto-train Car Wash is basically suitable for cleaning the DMU cars, the existing clearance through the car wash is not sufficient for the 19' 10" high (from ToR) DMU cars. The existing equipment is designed for vehicles having a maximum height of 18' 9" (the auto carriers). Therefore, the wash equipment needs to be modified and raised approximately 12".

Based on drawings provided by Amtrak, it is assumed that Amtrak designed the complete car wash system. It is therefore recommended that Amtrak be asked to investigate further the modifications required to raise the equipment and to provide a cost estimate for the modifications. Alternatively, if Amtrak is not in a position to address the engineering requirements, it is recommended that specialist train wash companies be contacted who could possibly investigate/estimate the modification costs and make the necessary modifications. Specialist train wash companies who could provide these services include:

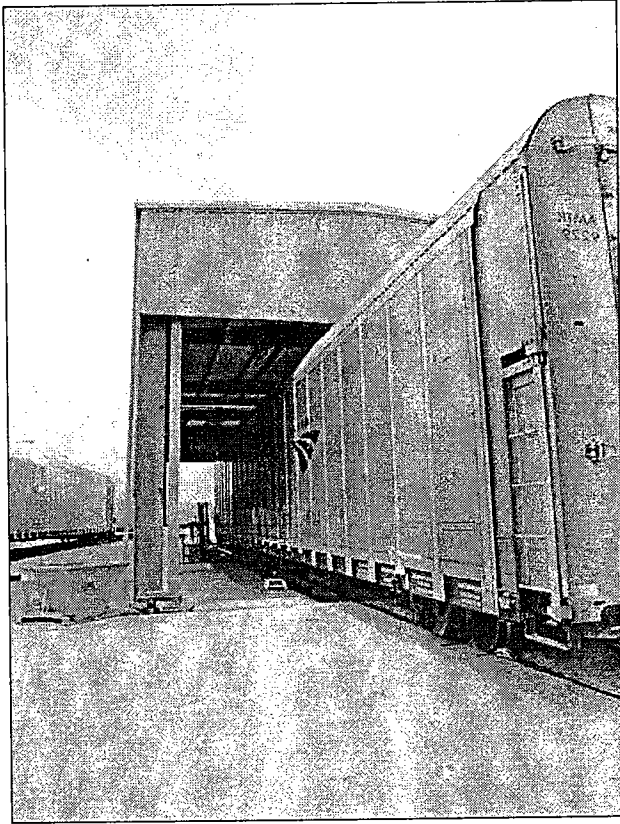
- InterClean Equipment, Inc.
- Rieskamp Equipment Co.
- NS Wash Systems

6.3 Required Facilities for the Initial Operating Segment (IOS)

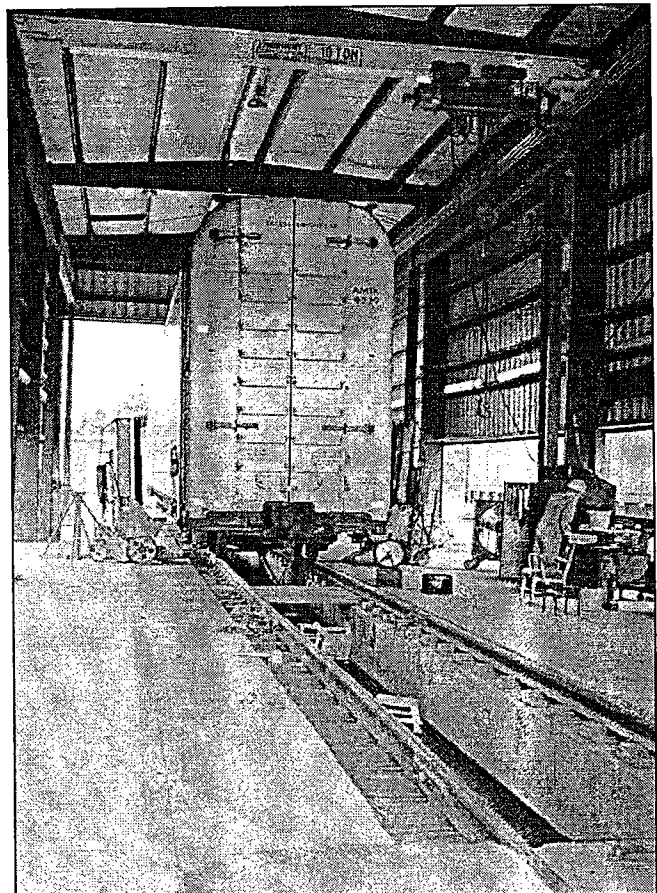
Current plans for the IOS indicate 14 DMU vehicles. Assuming 6.8 man-hours are required per vehicle for each daily inspection and an 8 man gang is employed for each inspection, at least a two-car inspection track/shed will be required. This could initially be constructed and expanded at a later date for the Full Build alternative.

It is recommended that the support facilities for the Full Build be constructed for the IOS. The complete Control Room will be required in any event and to construct approximately half of the remaining facilities and expand at a later date would not be cost effective.

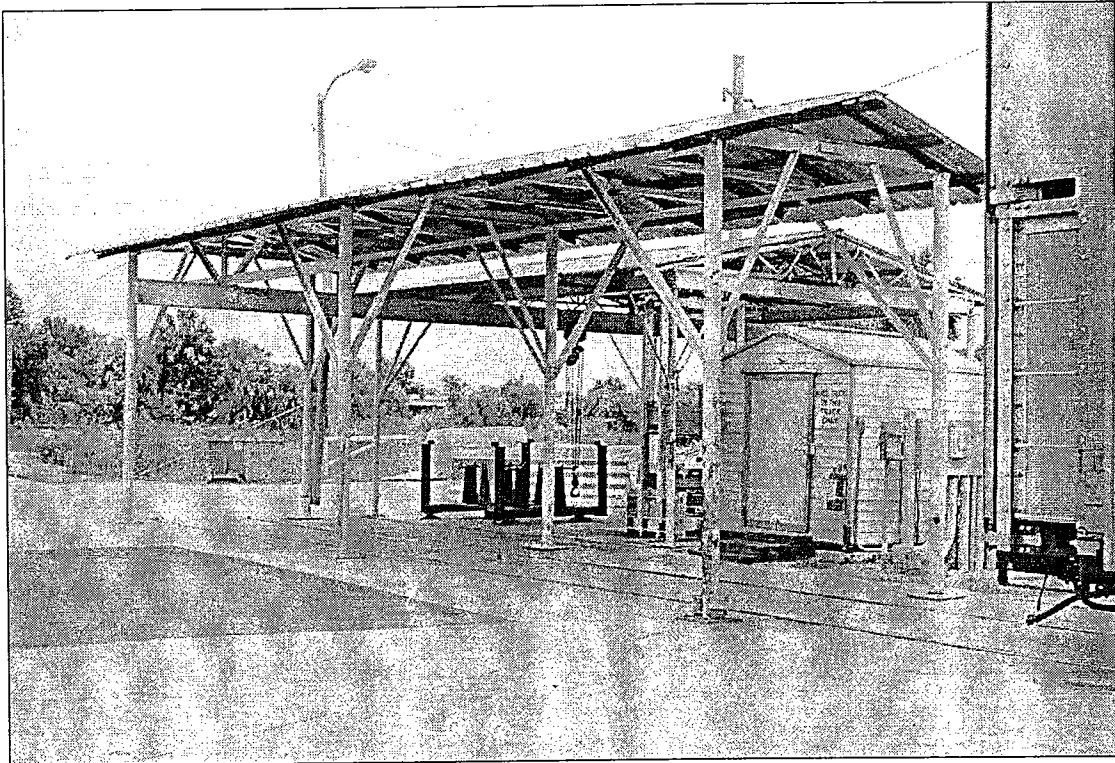
For the Amtrak Auto-train facilities, the same facilities will be required as for the Full Build, except that the daily (or nightly) usage would be approximately 50% less.



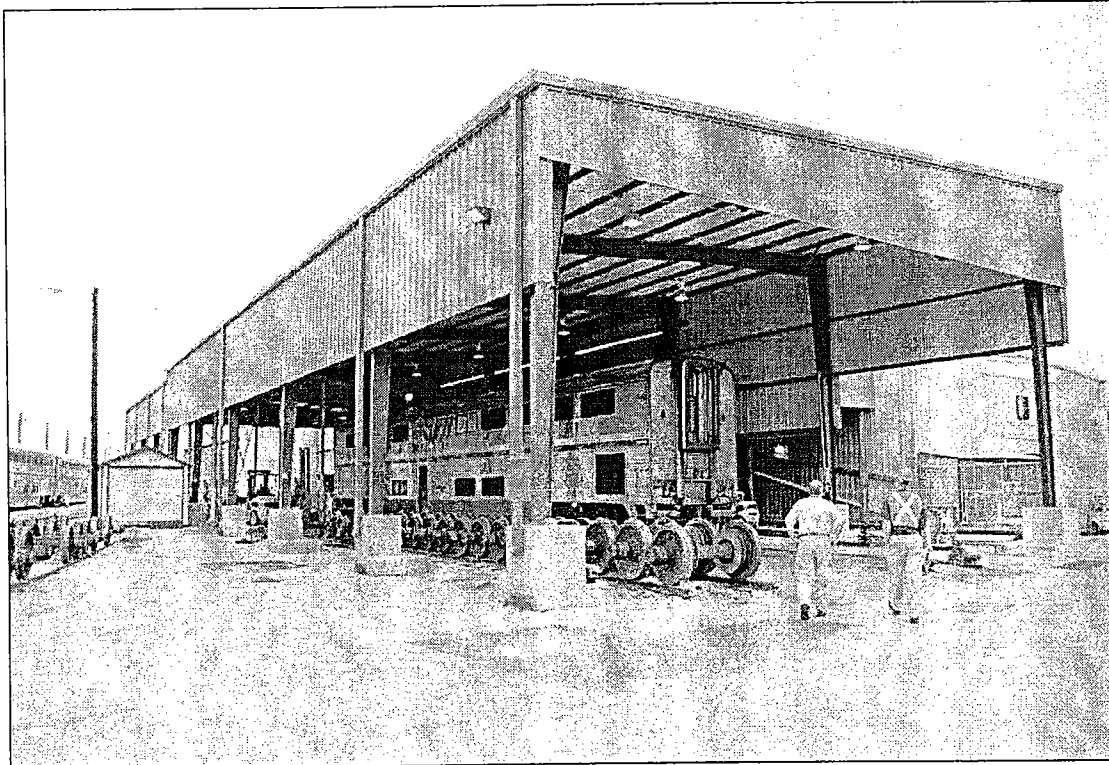
Service Pit Shop



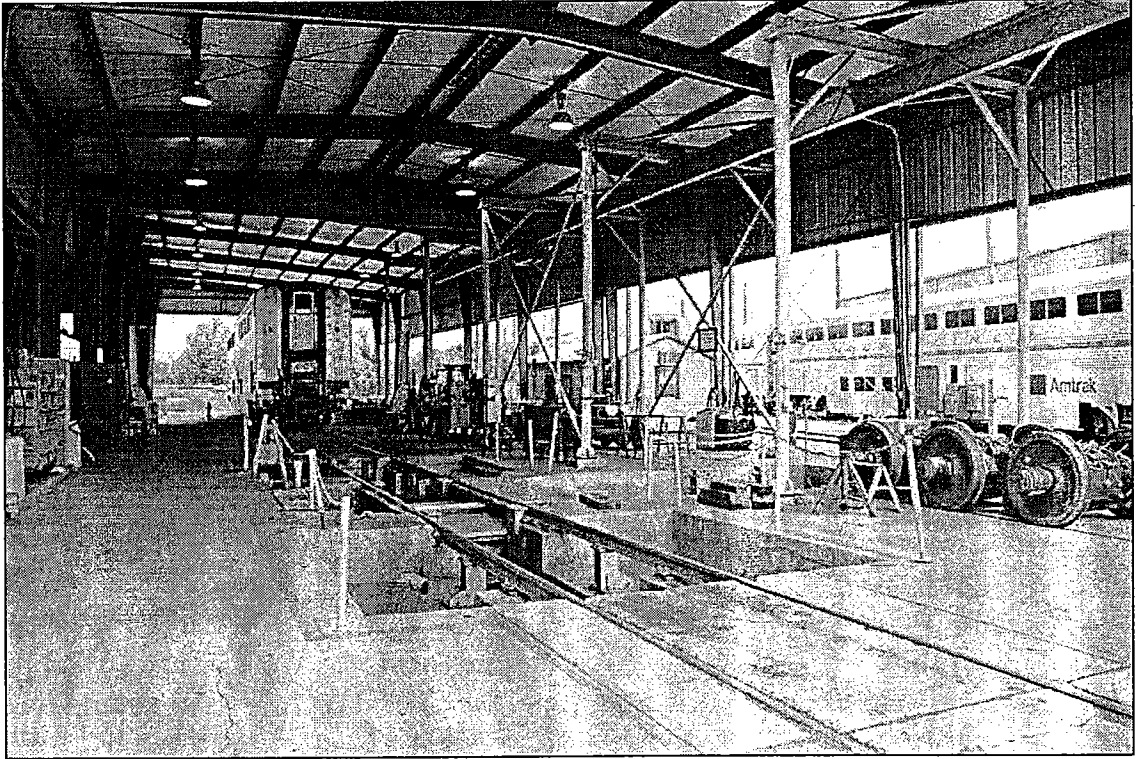
Service Pit Shop



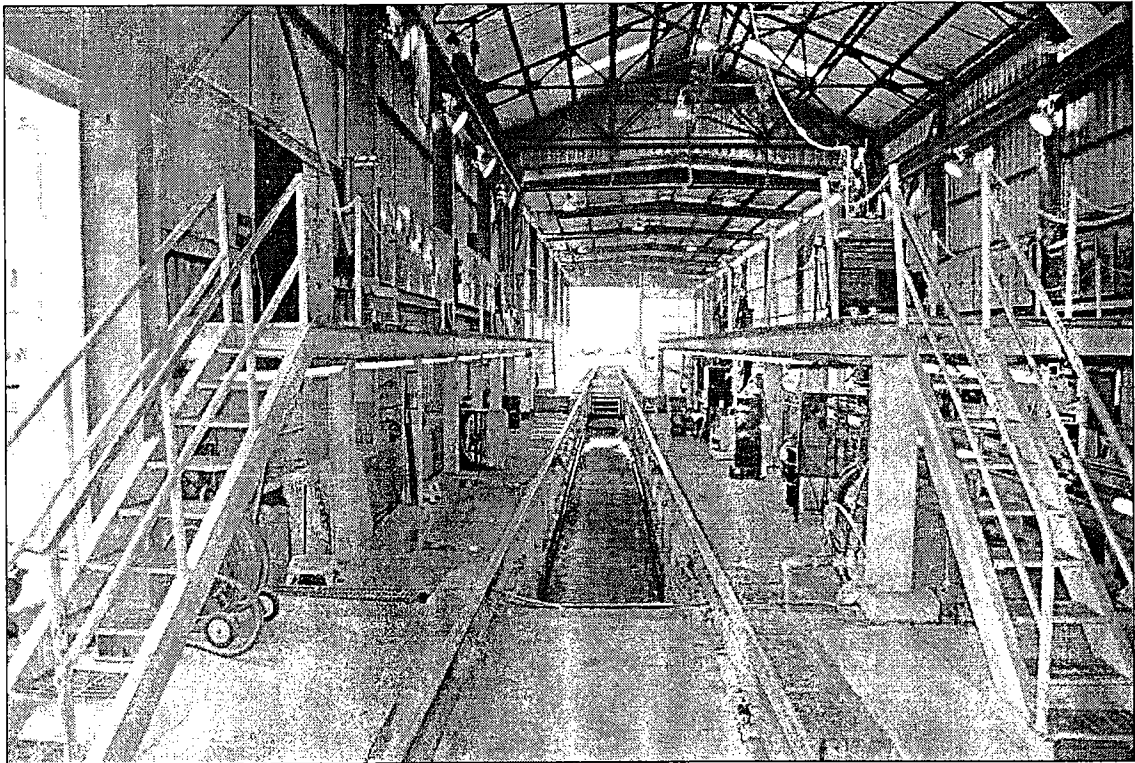
Drop Table Shop



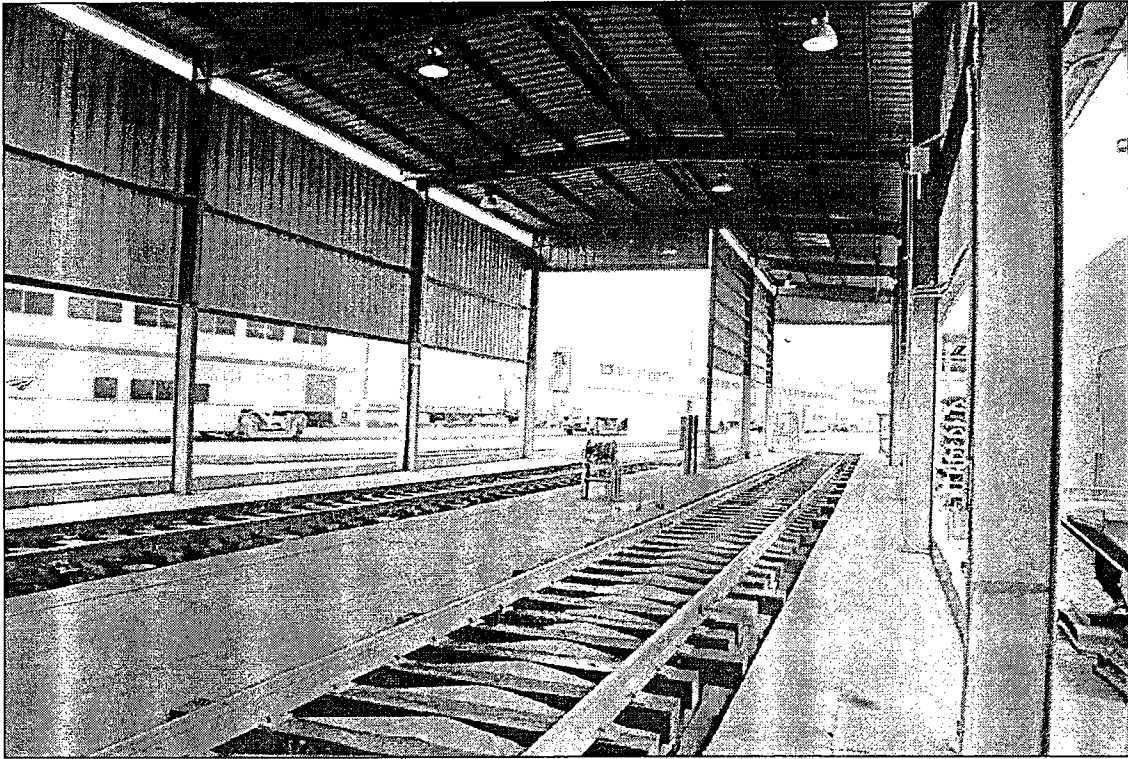
Drop Table Shop



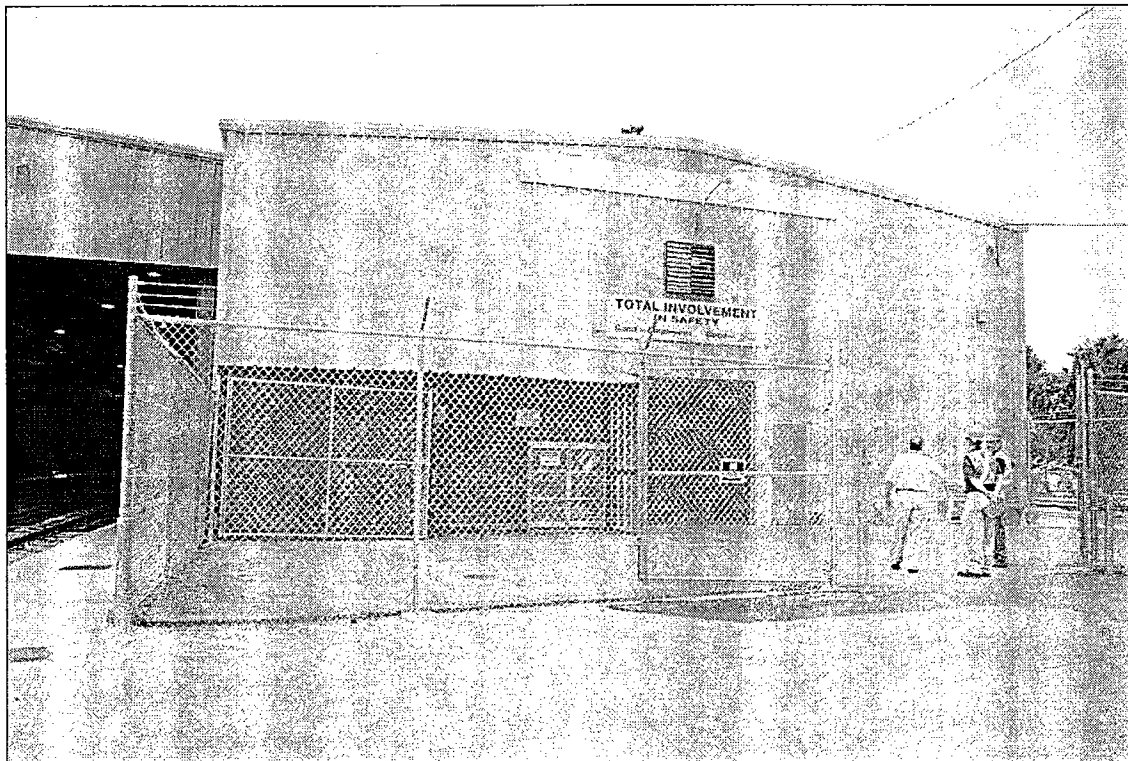
Diesel Shop



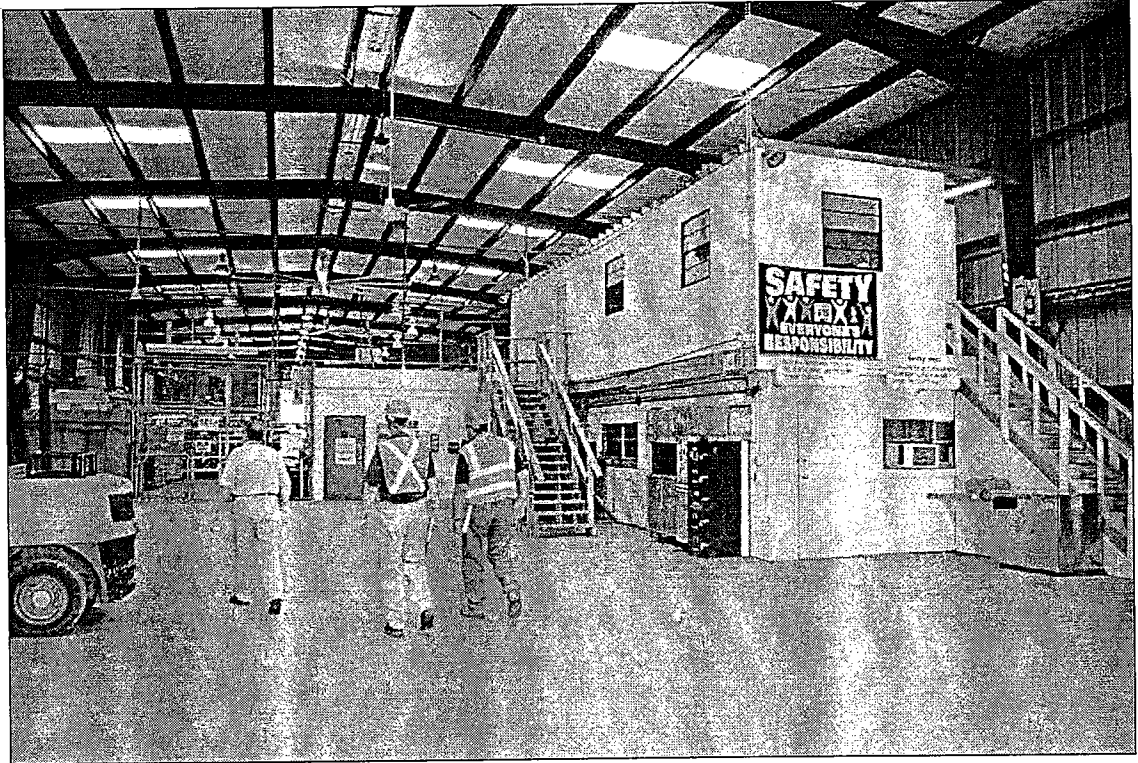
Diesel Shop



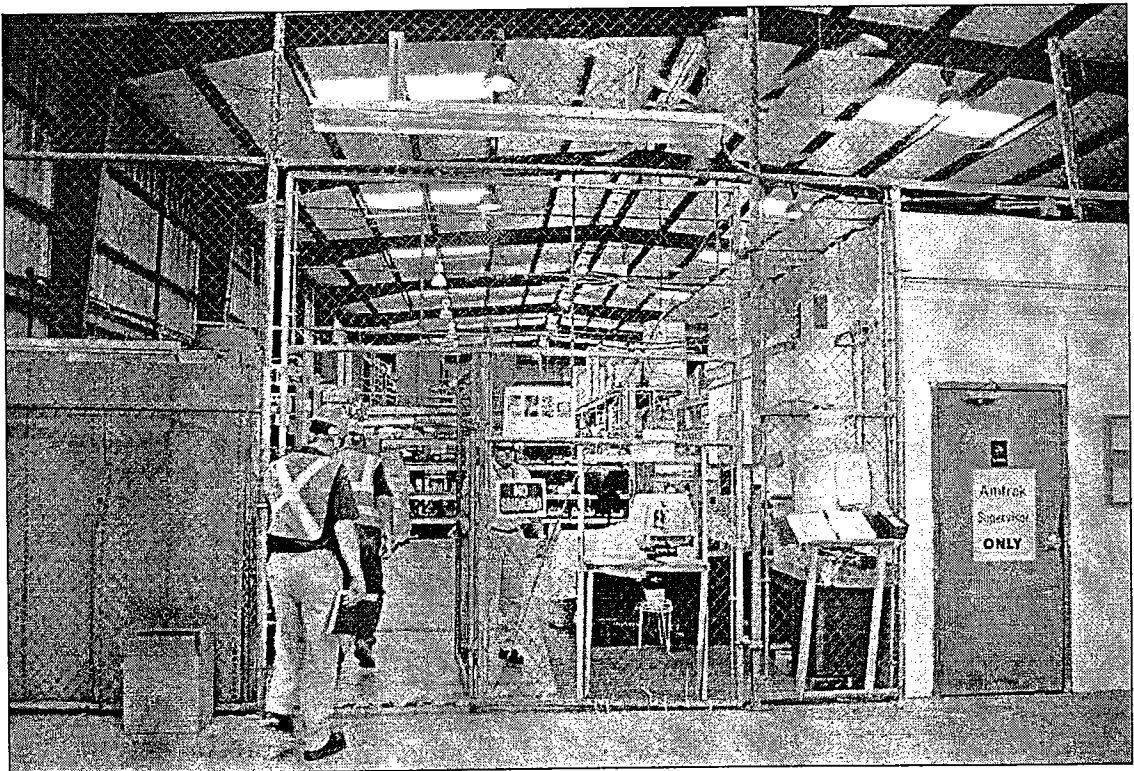
Fueling and Sanding Area



Material Storage Building



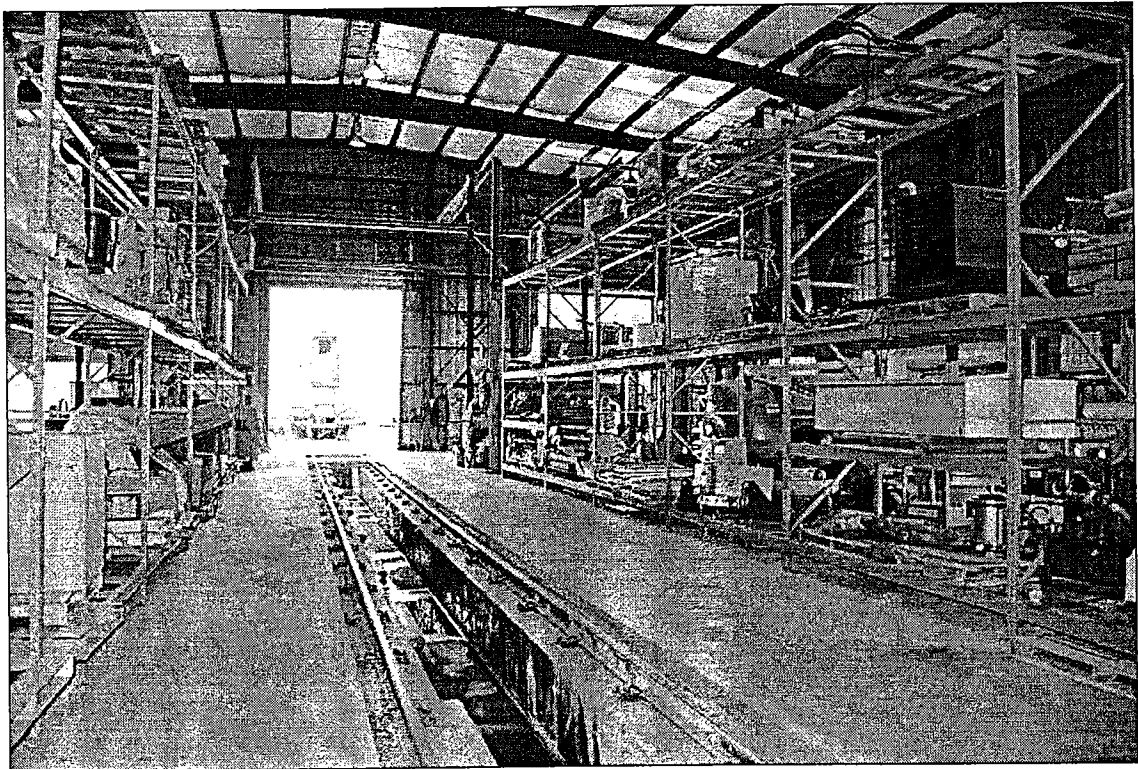
Material Storage Building



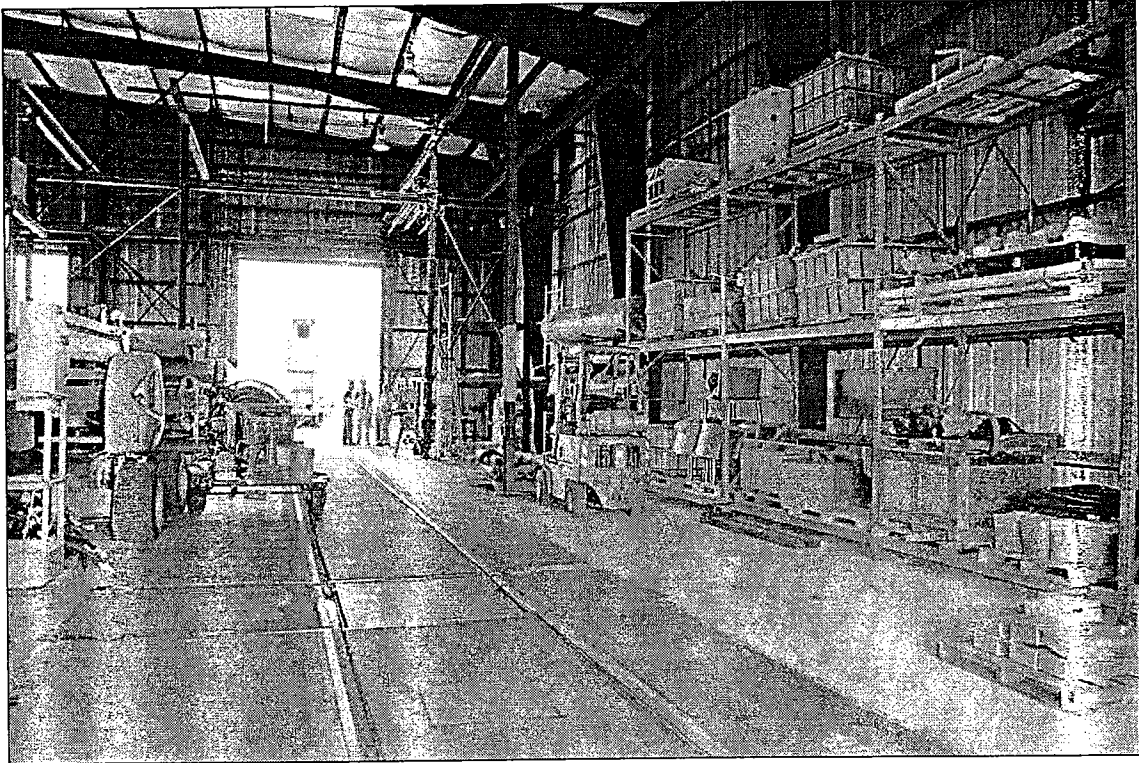
Material Storage Building



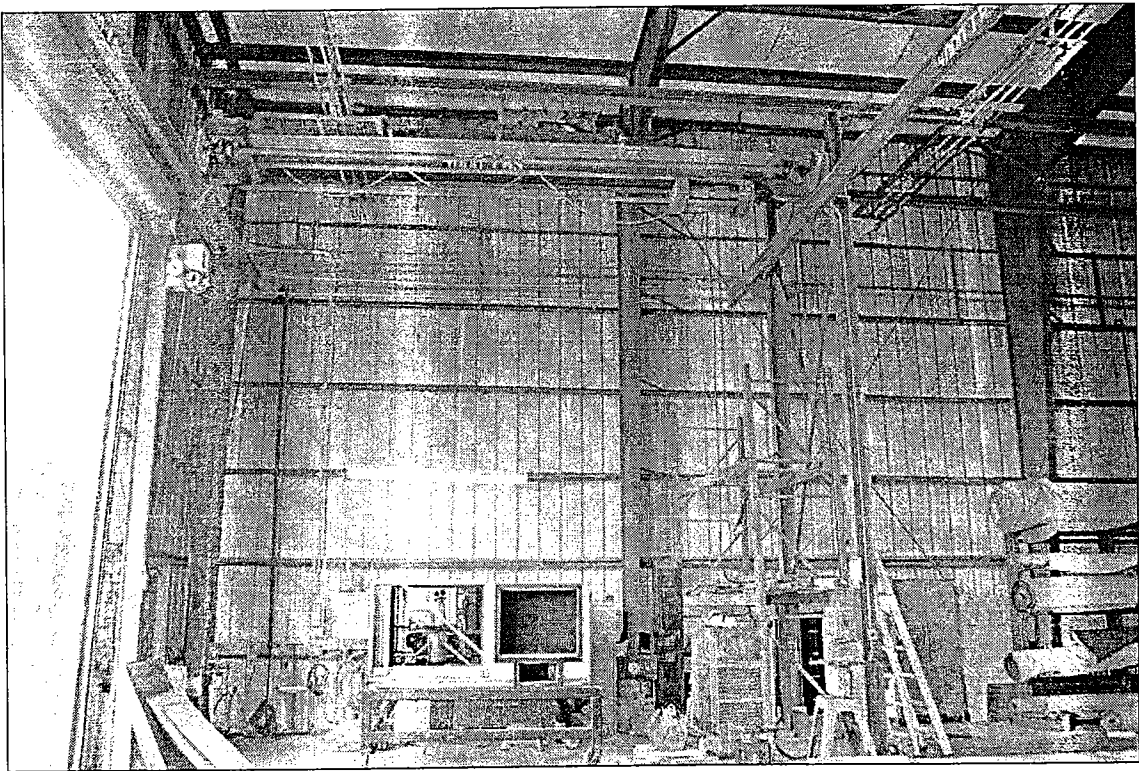
Material Storage Building



Special Projects Shop

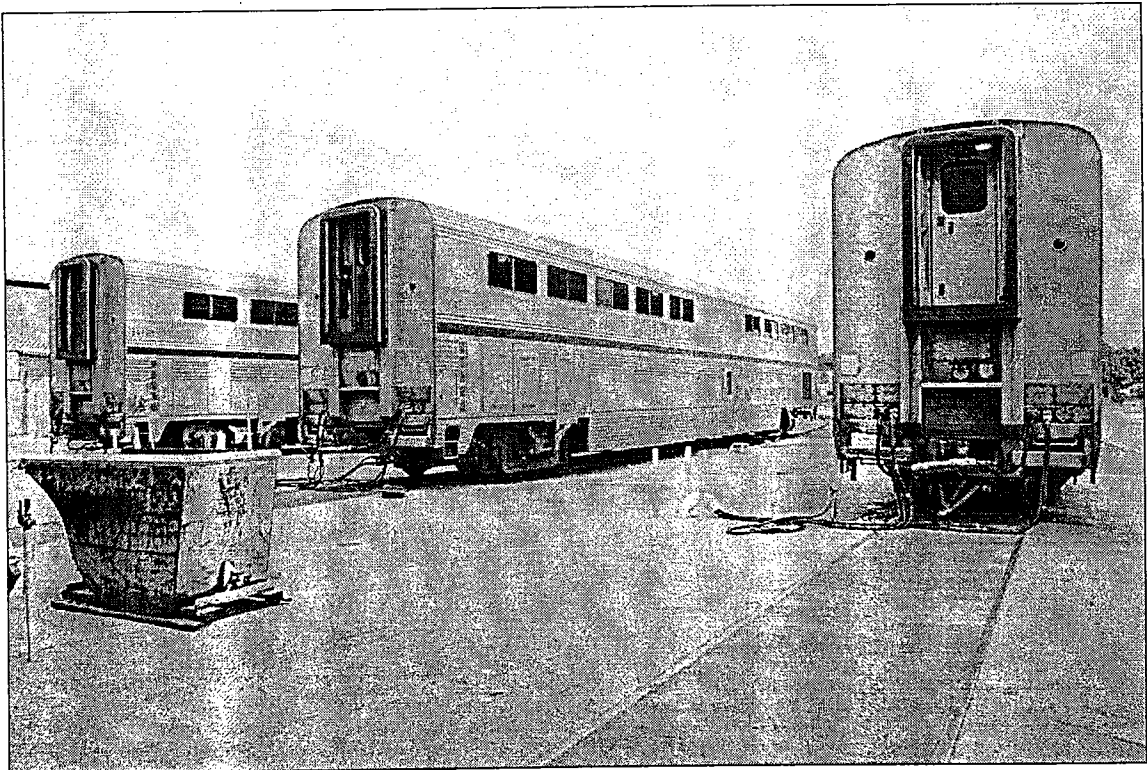
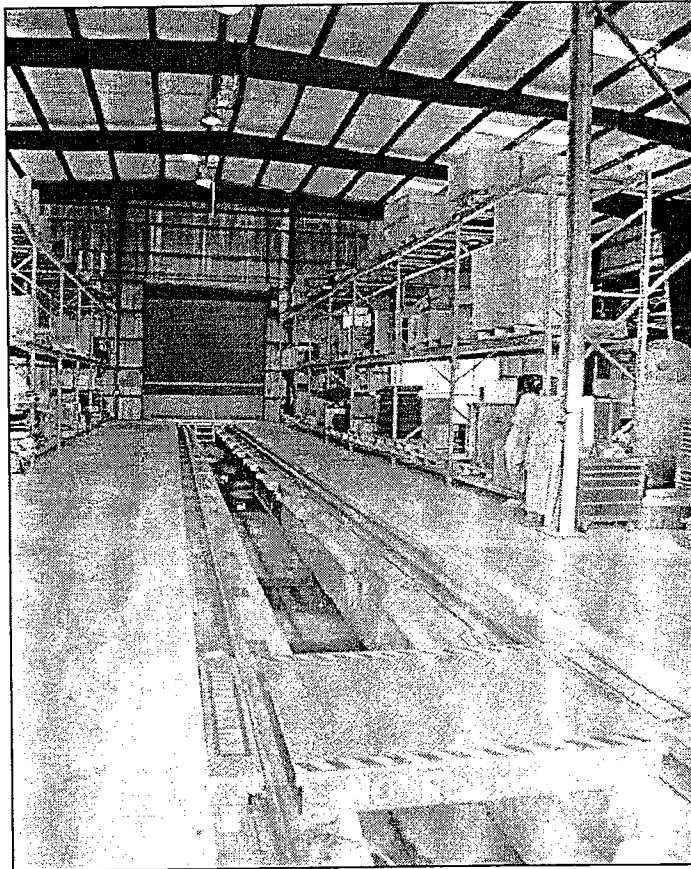


Special Projects Shop

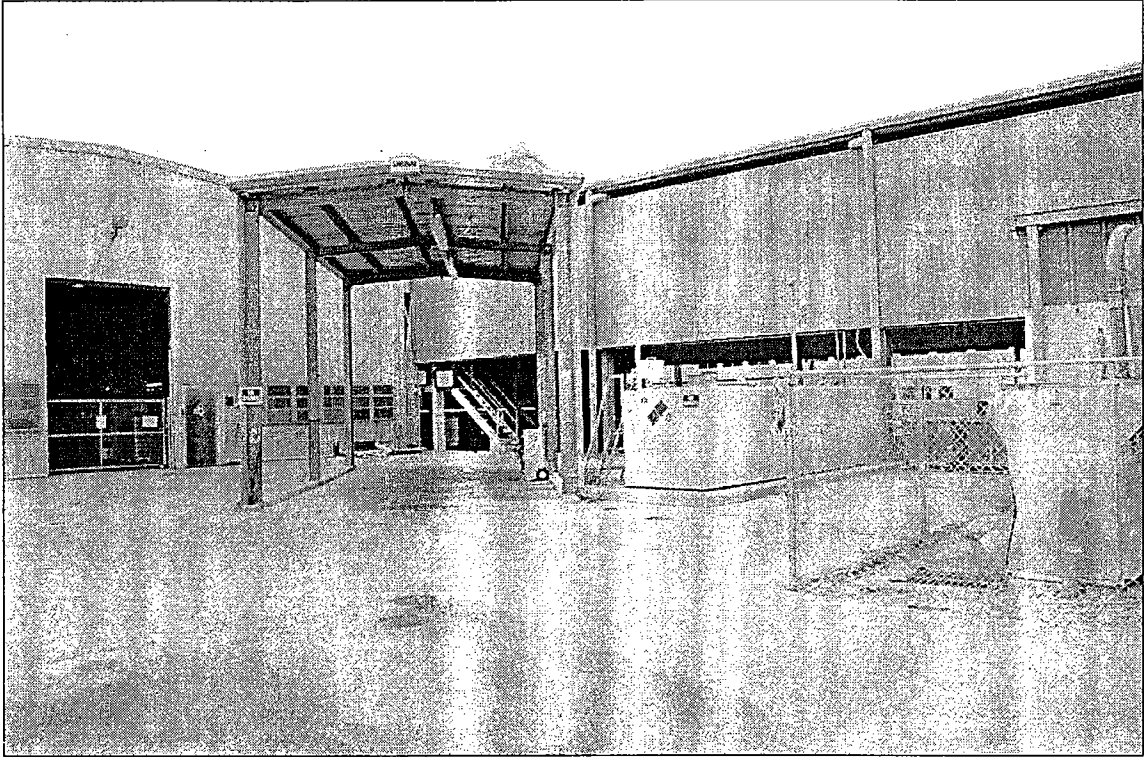


Special Projects Shop

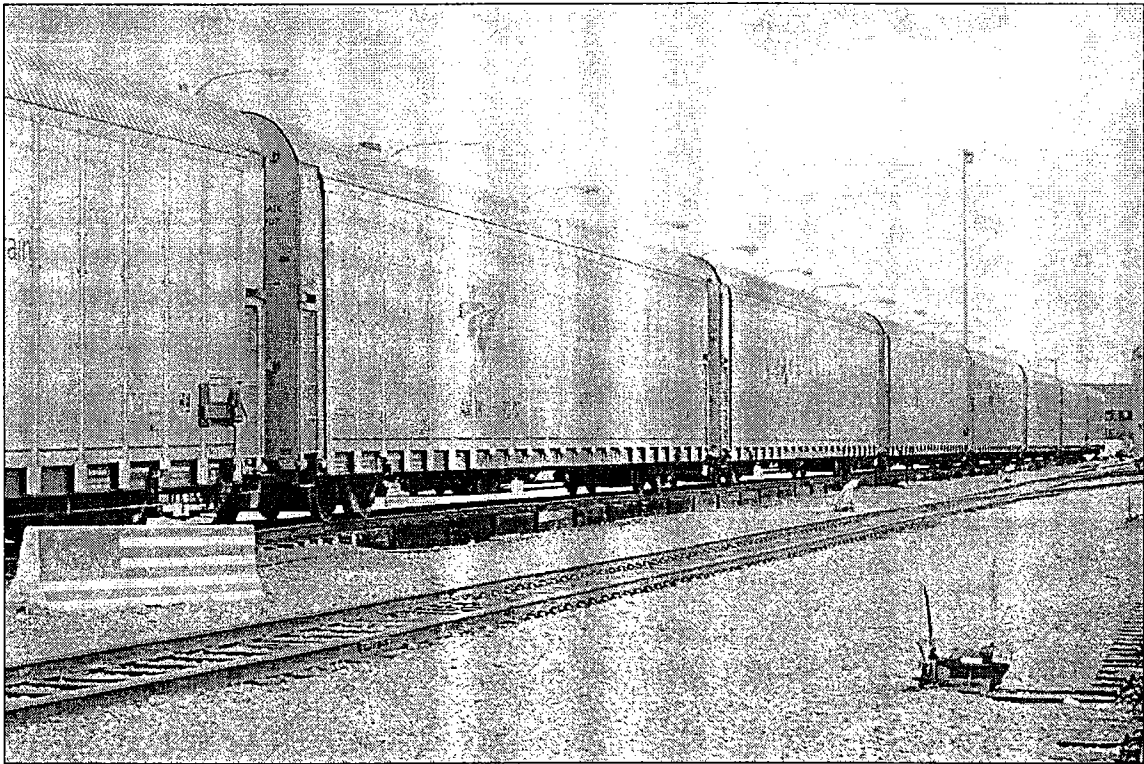
Special Projects Shop



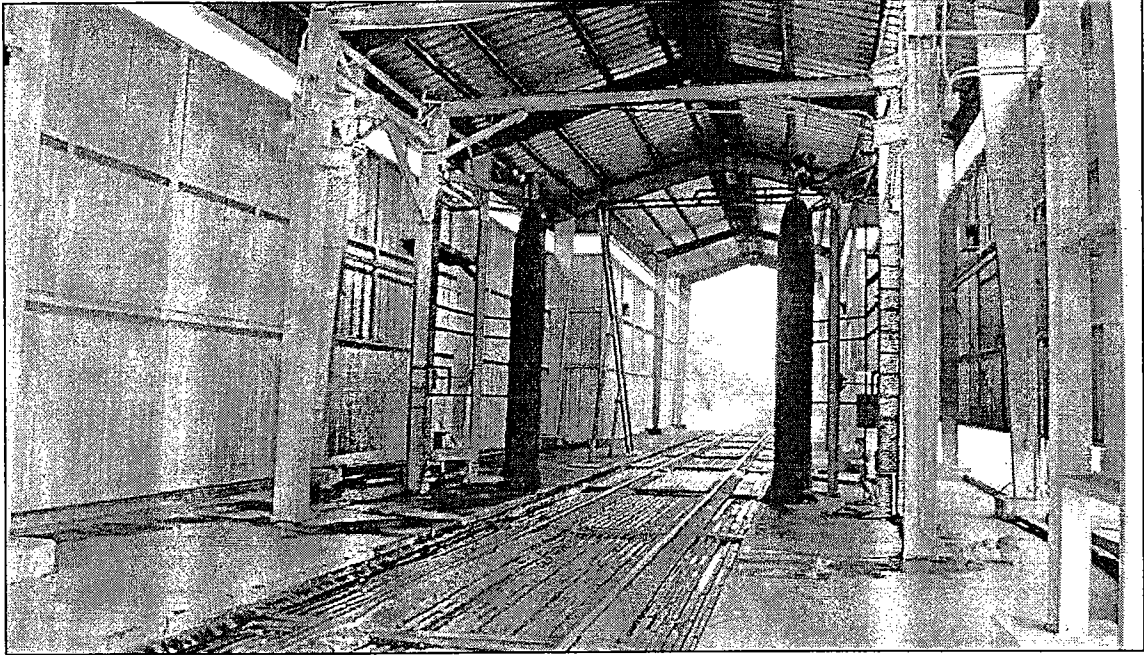
Exterior Inspection Tracks



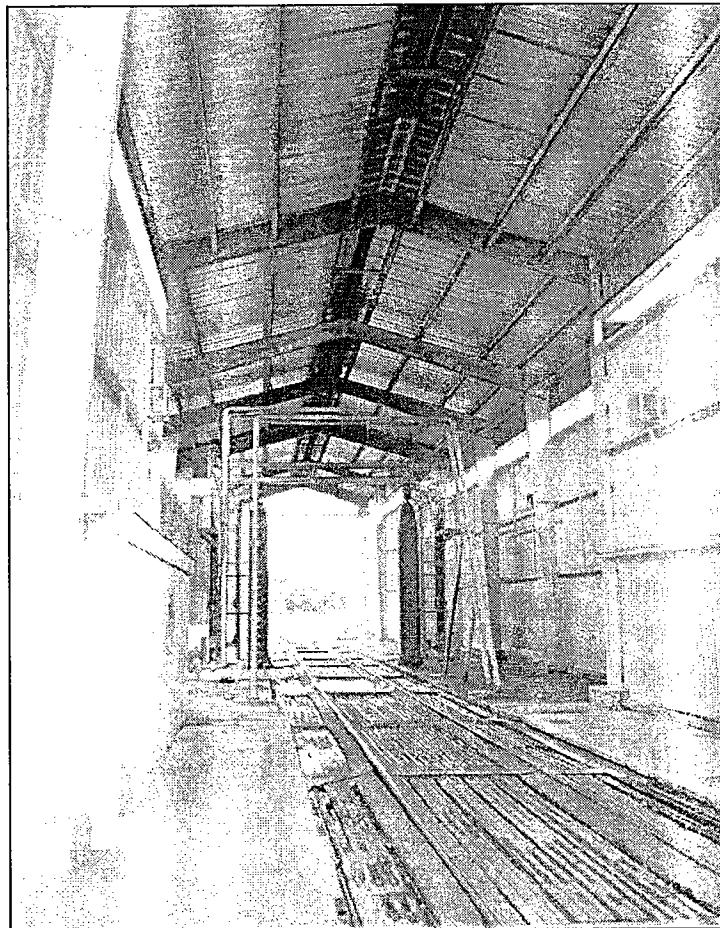
Tank Truck Shelter



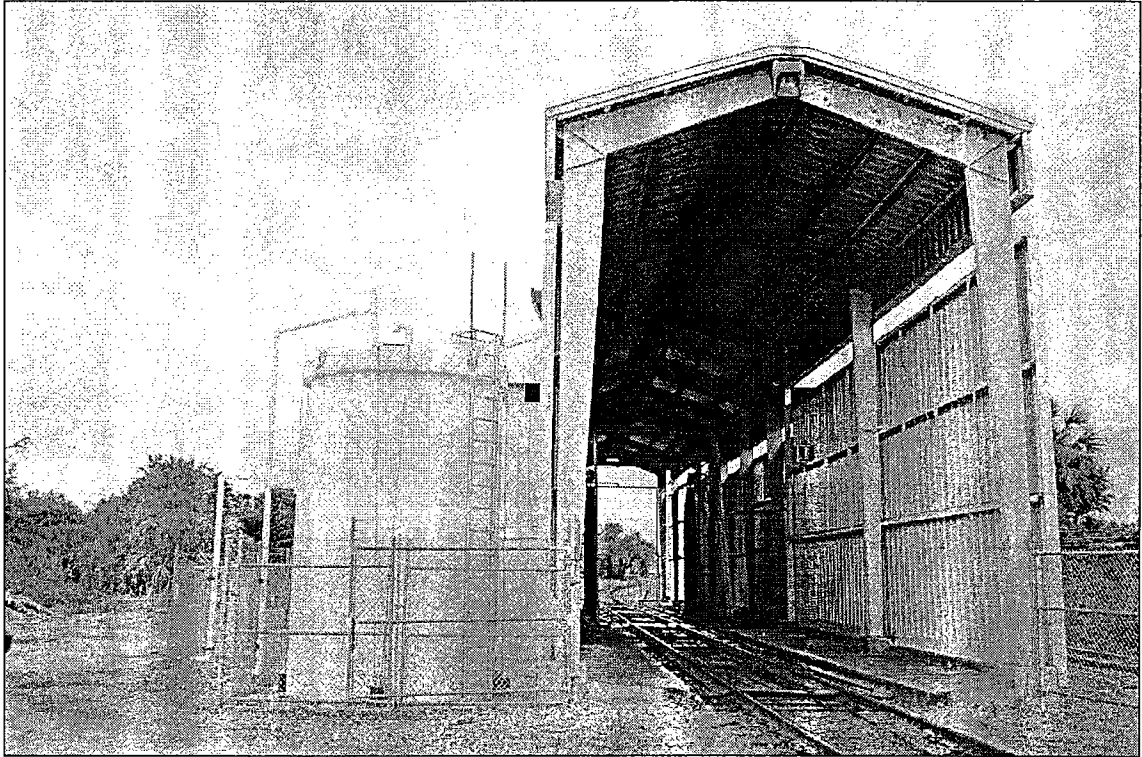
Elevated Yard Track



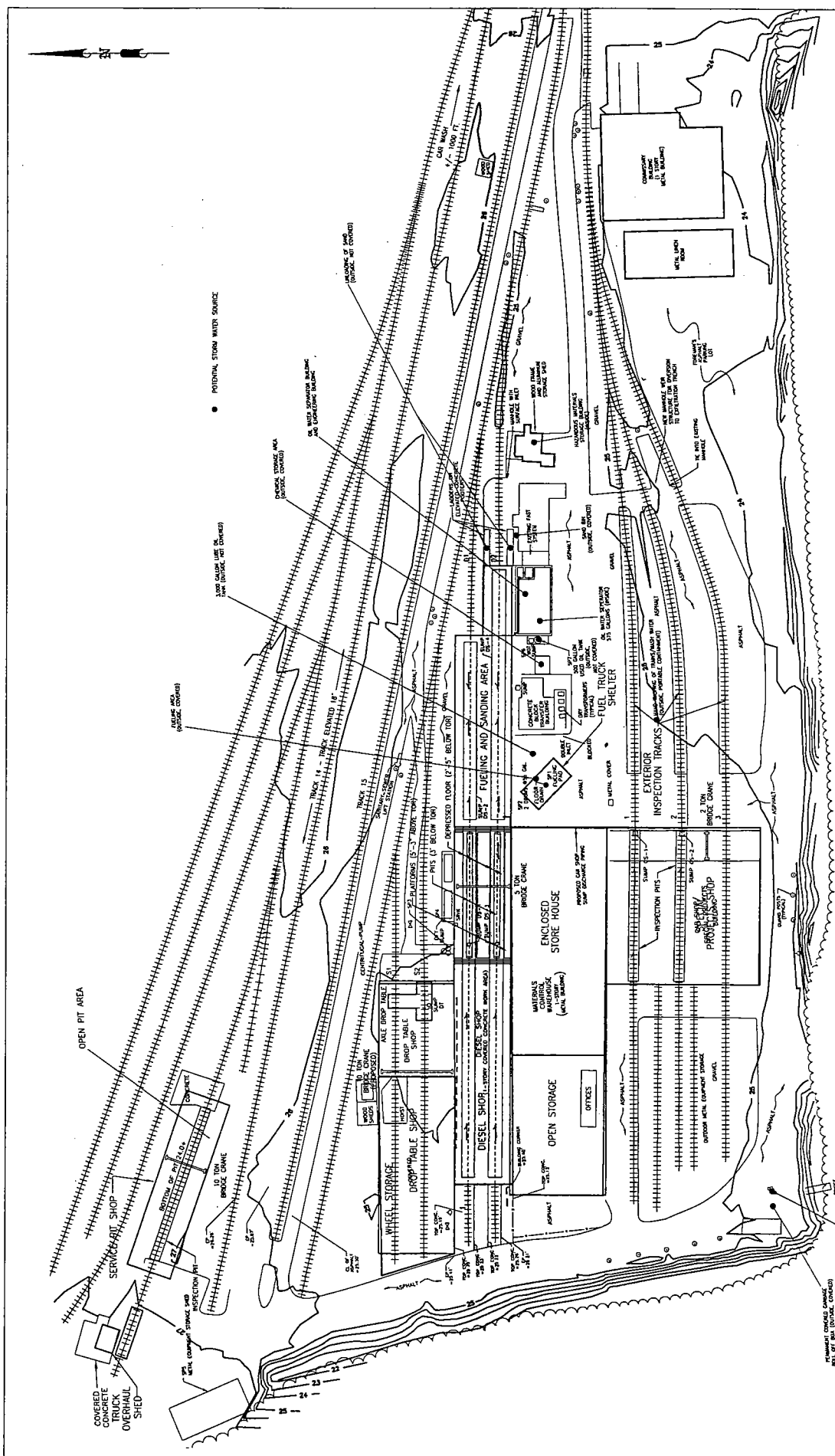
Car Wash



Car Wash



Car Wash



A horizontal scale bar with alternating black and white segments. The segments are labeled 0', 15', 30', and 60' from left to right. The word "SCALE" is written vertically below the bar.

FUNCTIONAL LAYOUT



EarthTech
A Tyco International Ltd. Company

8-14-07

REMOVED BY:
DRAWN BY:
-\\home\josh.kerr

DMU Maintenance Requirements CFCRT

The following items are responses by Colorado Rail Car to questions posed by Mr. George Gault of Earth Tech. Responses are based on the maintenance plans developed for South Florida and the results of almost a year of experience there. Plans are based on thirty years experience maintaining rail passenger equipment in a variety of operating situations. Colorado Rail Car continues to learn something almost every day, but the plans have generally held up well.

Summary of Work Performed at Each FRA Inspection:

The plans are based on FRA inspection intervals (Daily, 92 day, 182 day, 365 day). Experience has shown that those are reasonable intervals for inspection and maintenance as well as being regulatory. Weekly, monthly, 45-day and a two-year inspection, primarily for the purpose of accommodating maintenance intervals specified by the engine manufacturer and the transmission manufacturer, were added to these intervals.

Copies of the standing work orders for each inspection are attached.

Daily Inspection:

The most important maintenance interval is the daily inspection and Class I air brake test. This is the inspection and maintenance interval that keeps safety and reliability high. When correctly performed, the periodic inspections (92 day, 180 day, 360 day) are simple. The daily inspection and maintenance consumes the majority of programmed man-hour resources. Total man-hours planned for the daily inspection and test of one DMU are 6.8. If repair items are found during the inspection and test, those man-hours are additive.

Weekly Inspection:

This inspection adds a wheel gauging inspection, and exterior car body wash, battery inspection, radiator and piping inspection, a more complete interior inspection and engine fuel/water separator inspection and draining to the daily inspection. Weekly inspections consume 3.15 man-hours above the daily inspection. Repair items are additive.

Monthly Inspection:

This inspection adds engine oil and oil filter inspections and fuel filter changes to the daily inspection. It includes the 250-hour engine maintenance as specified by the manufacturer. Monthly inspection consumes 1.55 man-hours above a daily inspection. Repair items are additive.

45-Day Inspection:

In addition to daily inspection items, this inspection covers the transmission service interval, final drive service interval and the engine air filter interval. The 45-Day inspection consumes 2.15 man-hours above the daily inspection. Repair items are additive.

92-Day Inspection:

This inspection includes all of the 92-day regulatory items plus numerous engine, transmission, truck, brake and sub-system items. Total man hours required is 37.75 above a daily inspection. Repair items are additive. It is a major service interval.

182-Day Inspection:

This is a 92-Day inspection with certain items added. Total man-hours required are 45.65 above the daily inspection. Repair items are additive.

Annual Inspection:

This is the 182-Day inspection with certain maintenance items added. Total man-hours required are 53.85 above the daily inspection. Repair items are additive.

Two-Year Inspection:

This is an Annual inspection with major rollout truck inspection and maintenance added plus a few other items. Repair items are additive. Total man-hours required above the daily inspection are 122.

Beyond Two Years:

The inspections repeat. There are additional items that need to be considered. In retrospect, regular inspection, maintenance and test of air conditioning systems needs to be augmented. At that interval, it is recommended that replacement of major items such as trucks, transmissions, air conditioning units, generator, etc, with re-conditioned, re-manufactured or new units as appropriate. This ensures quality work and greatly reduced out of service time as compared with trying to do it on the car. This overhaul interval is necessary to the maintenance objective: Maintaining the Performance and Serviceability originally designed and manufactured into the vehicle.

Fueling, Lubrication and Sanding Requirements:

Lubrication is covered in the inspections/maintenance intervals described above and in the inspection work orders. Fueling and sanding are service items outside the scope of maintenance and are usually performed by the operating department. Experience in South Florida where cars operate 450 miles per day is that it is prudent and convenient to perform the servicing function once per operating day although the train could operate longer than that before fuel and sand would be required. Estimated man-hours to perform the fueling and sanding operation is 0.25 man-hours if one has available the usual railroad fueling and sanding facility and not including the time to position the vehicle at the facility.

Other Maintenance Requirements:

Washing the train exterior, cleaning the interior and re-stocking the train are also functions that must be performed at intervals to be determined by the railroad. Washing the train once per week is included in the weekly work order. Interior cleaning is usually required once per day, but some railroads with high passenger thru-put may do it twice per day. Some railroads wash the exterior more frequently. Alaska Railroad, for instance,

hand washes every passenger train either once per day for 200 mile per day trains and once every other day for 500 mile per day trains. It is a facility issue for the long haul train. They believe that their market requires this level of cleanliness.

Roof-Mounted Equipment:

Air conditioning condenser units are roof-mounted, as are engine-cooling radiators. A three-ton overhead crane is adequate for handling this equipment as well as handling wheel-sets and other parts on the shop floor. The overall height of the car body above top of rail, including the roof-mounted equipment is 19'-10". Recommend providing a full 23' of clearance for the doors and at least 35' between the bottom of the crane bridge and the top of rail.

An overhead traveling bridge crane is one of the most versatile and time saving tools in a railroad equipment shop, not only for removing and placing roof-mounted equipment, but also for moving components and tools about the shop floor. Required crane size depends on how heavy and how often equipment and tools need to move. The following is provided as an aid for the double deck DMU:

•	Engine radiator assembly	2,100 lbs, each
•	Condensing unit assembly	2,100 lbs each
•	Un-powered disc brake wheel set	2,100 lbs. each
•	Engine/transmission cradle assembly	8,000 lbs. each
•	Generator assembly	4,200 lbs. each
•	Truck assembly with wheels	20,500 lbs. each
•	Car body w/o trucks	200,000 lbs. each
•	Car body with trucks, wheels and fluids	250,000 lbs. each

Maintaining Under Car Equipment:

Ideally, a pedestal pit accommodating the full length of the car (89 feet) with an adjacent 110-foot flat concrete floor section with embedded rails, on the same maintenance track, will be ideal. The pedestal pit section is important to the under car inspection, changing brake pads and servicing under car equipment. A pedestal pit is essential to the efficient inspection and servicing of under car equipment, especially to cars equipped with disc brakes. The flat track section is needed for extraction of the engine/transmission assembly, removal of under car equipment such as water tank, waste tank, fuel tank, air conditioning compressors, charge air cooler assembly and the like and jacking the car body for truck removal. The floor must be reinforced for safe jacking operations. There needs to be sufficient floor space on either side of the maintenance track to extract equipment and use a forklift truck. If not possible to put these two maintenance spots in line on the same track inside the shop building, then locating them side-by-side is a possible, but less desirable alternative. However, the need to jack the car may be eliminated if a full truck drop table can be provided as described below.

Wheel Maintenance:

A single axle drop table is sufficient for wheel set removal. Both powered and un-powered axles may be removed by this method. However, consideration should be given

to the idea of a full truck drop table if it is desired to remove trucks for maintenance without having to jack the car. A full truck drop table would also conveniently allow the removal of the entire power assembly, engine, transmission and power cradle as an assembly. There is tremendous flexibility with a full truck drop table if properly designed to perform multiple functions including the extraction of virtually all, large, under car equipment.

Great time and cost savings and equipment availability enhancement are available if the shop is equipped with an in-floor wheel true table. The train comes in with a shelled wheel or a thin flange and in a couple of hours, the wheel set is trued back to proper profile, all without removing the wheel set, or replacing it with a spare or sending it to a wheel shop where the expense of bearing replacement must be incurred under AAR rules and the additional handling costs of a wheel shop is incurred.

Truck Maintenance:

The trucks applied to the double deck DMU are a derivation of the most effective and reliable truck ever applied to American passenger equipment. This is the General Steel Industries design, commonwealth style, cast steel truck fitted with TFM disc brakes. The specific truck fitted to the DMU is a particularly heavy-duty variation of the design. The maintenance standards developed by Amtrak for this type of truck based on decades of experience are appropriate.

The truck requires a rollout inspection and maintenance every 200,000 miles. Repairs that may be anticipated at this interval are shock absorber replacement, wear liner replacement, pin and bushing replacement, air brake cylinder overhaul, bushing and pin replacement – all on an as needed basis.

Trucks usually require overhaul at 500,000 to 600,000 mile intervals. This varies depending on type of service, track condition and how well and reliably the 200,000-mile inspections and repairs have been done.

Jacking Cars:

At an all-up weight approaching 250,000 with trucks and fluids, jacking the entire car is going to require four of the portable Whiting, 35-ton screw jacks at a minimum. Fortunately, the DMU car weight is fairly evenly balanced. One usually jacks only the car body leaving the trucks on the rail, but the 35 ton jacks are still the standard. From a safety perspective it is better to lift the whole car body evenly. Lifting only one end introduces angularity that is not wise, especially when one considers how high one would have to go to roll a truck out (typically 42 to 48 inches). It may be desirable to remove some of the end of car obstructions if planning to roll trucks out so as to reduce the height of the lift required. The floor where the jacking occurs must have the bearing capacity for a concentrated load at the jack base. The load bearing capacity of the floor should be calculated by structural engineers, together with the code required safety factor. Spreader plates may be used to spread load, but the load bearing calculations and spreader plate design must be done.

Summary:

The maintenance program being employed on DMU equipment currently operating in south Florida is described. The report includes recommendations for the most desirable maintenance equipment in a DMU based passenger equipment shop. Clearly, capital cost is a consideration and must be traded off against long-term maintenance savings and equipment availability. That equation will have to be worked for each railroad based on operational considerations and capital availability.

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated 15 November 2005

DMU 45 day (six week) Inspection Work Order Car Number _____

Location _____

Date _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.
This work order is a standing work order that will be completed on each DMU once in each 45 days (Six Weeks).

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, W6 = 45 day, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr.	6 min. = 0.1 hr.	12 min. = 0.2 hr.	18 min. = 0.3hr.
24min. = 0.4 hr.	30 min. = 0.5 hr.	36 min. = 0.6 hr.	42 min. = 0.7 hr
48 min.=0.8 hr.	54 min. = 0.9 hr.	60 min. = 1.0 hr.	

<u>Task No.</u>	<u>Man Hrs</u>	<u>Description</u>	<u>49 CFR Reference</u>	<u>Inspector Initials OK</u>	<u>Inspector Initials Not OK</u>	<u>Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.</u>
001W6	0.1	Beginning of shift safety briefing.				
002W6	0.05	Beginning of shift work plan meeting				
003W6	0.1	Establish blue flag protection	218.29			
005W6	0.00	Complete daily inspection only if scheduled for service this day. See daily inspection work order.				
006W6	0.3	Clean generator radiator fins				
007W6	0.2	Inspect prime mover air cleaners. Replace if not serviceable for another 45 days.				
008W6	0.2	Change transmission oil filters after the first 45 days of operation. Do not change filters again until the two-year maintenance point.				
009W6	0.2	Check oil level in transmissions and add oil to restore to full. Record quantity added in comments.				
010W6	0.3	Grease drive shaft joints.				
011W6	0.6	Change oil in final drive, F & R ends, after first 45 days (12,400 miles) of operation. Do not change again until the 7-year interval.				
012W6	0.1	Supervisor secures the facility.				

TOTAL: 2.15 man-hours

COMMENTS

<u>Task No.</u>	<u>Comment - Action Taken</u>

MATERIAL REPORT

[illegible]

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated 15 November 2005

DMU 92 Day Inspection Work Order

Car Number _____

Location _____

Date _____

Inspector signature _____

Inspector signature _____

Supervisor signature _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.

This work order is a standing work order that will be completed on each DMU once in each 92 days. This is a Federal inspection interval.

NOTE: Car must be over a pit to perform this inspection.

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, W6 = 45 day, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr.	6 min. = 0.1 hr.	12 min. = 0.2 hr.	18 min. = 0.3 hr.
24 min. = 0.4 hr.	30 min. = 0.5 hr.	36 min. = 0.6 hr.	42 min. = 0.7 hr
48 min. = 0.8 hr.	54 min. = 0.9 hr.	60 min. = 1.0 hr.	

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials <u>OK</u>	Inspector Initials <u>Not OK</u>	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001Q	0.1	Beginning of shift safety briefing.				
002Q	0.05	Beginning of shift work plan meeting				
003Q	0.1	Establish blue signal protection	218.29			
005Q	0.00	Complete daily inspection only if car is scheduled for service this day. See daily inspection work order.				
006Q	0.3	Clean generator radiator fins				
007Q	0.2	Replace prime mover air cleaners.				

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials OK	Inspector Initials Not OK	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
008Q	0.1	Change generator cooling air intake filter.				
009Q	0.00	Check oil level in transmissions and add oil to restore to full. Deleted – done on daily inspection				
010Q	0.5	Grease drive shaft joints and telescopic section of drive shafts.				
011Q	1.0	Inspect generator fuel hoses for leaks, abrasions, cracks, brittleness or other defects.	238.307			
012Q	0.3	Change generator primary and secondary fuel filters.				
013Q	0.3	Change generator water pump belt.				
014Q	0.3	Change generator alternator V-belt.				
015Q	0.5	Change generator primary air filter.				
016Q	0.00	Deleted				
017Q	0.4	Change prime mover and generator air compressor filters.				
018Q	0.2	Grease prime mover cooling pump (2 each).				
019Q	2.0	Change prime mover belts.				
020Q	0.1	Grease prime mover fan hub. (2 each)				
021Q	0.3	Run oil pressure check on prime movers and record results in comments,				
022Q	1.0	Inspect/test charge air coolers, clean air coolers, clean fans and inspect for connection air and coolant leaks.				
023Q	0.3	Replace dessicant in air brake system air dryer.				
024Q	0.00	Deleted. Combined with 010Q				

<u>Task No.</u>	<u>Man Hrs</u>	<u>Description</u>	<u>49 CFR Reference</u>	<u>Inspector Initials OK</u>	<u>Inspector Initials Not OK</u>	<u>Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.</u>
025Q	4.0	Clean engine cooling radiators. Use man-lift and tie-off for fall protection				
026Q	0.00	Inspect and test engine cooling radiator fans.				
027Q	0.0	Deleted task				
028Q	0.3	Inspect engine cooling expansion tank.				
029Q	0.2	Replace HVAC air filters.				
030Q	0.2	Test/inspect wheel slide protection system.	238.307			
031Q	10.4	Replace all 16 brake caliper pads. Mount new pads on backing plates in anticipation of next replacement.	238.307			
032Q	0.5	Do under car inspection of draft gear, pocket, lugs and carrier to the extent they are visible.	238.307			
033Q	0.2	Test and inspect potable water pump deck and measure water pressure. Record in comments.	238.307			
034Q	0.1	Inspect potable water tank for damage or leaks.	238.307			
035Q	0.1	Inspect black water tank for damage or leaks.	238.307			
036Q	0.5	Replace potable water filters.				
037Q	0.2	Test and inspect three air compressors including pressure switches and un-loaders.				
038Q	0.1	Inspect three auxiliary air tanks and automatic tank drains.				
039Q	0.2	Inspect compressor air hoses.				

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials OK	Inspector Initials Not OK	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
040Q	0.5	Test and NA1 valve for correct water tank pressurization.				
041Q	0.3	Inspect and test Amerex fire suppression system using test squib..	238.307			
042Q	1.0	Inspect and test smoke and fire detectors using jumper wire.	238.307			
043Q	0.5	Inspect emergency equipment including break-out tools, first aid kits and fire extinguishers. Inspect for presence of passenger emergency instructions.	239.101			
044Q	0.6	Test exhaust /turbo system on the two prime mover engines and the generator. Look for leaks and fire risks. Inspect the insulating blankets on turbos and exhaust piping for damage or oil. Replace if damaged or oil soaked.	238.307			
045Q	0.3	Inspect the engine compartments of all three engines. Look for exposed combustible material, oil, dirt and exhaust leaks. Repair any conditions observed. Pressure wash engines and compartments if oily or dirty.	238.307			
046Q	0.4	Test engines for oil or coolant leaks. Repair any found.	238.307			

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials OK	Inspector Initials Not OK	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
047Q	0.2	Take engine oil samples for laboratory analysis. Do this before adding oil. Turn samples in to the supervisor for shipping.				
048Q	0.5	Test engine starter motors. Inspect motor brushes and replace if more than one-third consumed.				
049Q	0.2	Inspect all coolant hoses for leaks, loose or deteriorated clamps, hose cracks or brittleness. Replace as needed.	238.307			
050Q	0.2	Inspect and test starting batteries. Measure cranking voltage. Replace weak batteries.				
051Q	0.2	Inspect and test emergency lighting batteries. Replace weak batteries.	238.307			
052Q	0.2	Test EFCO to kill all three engines. Restart all three engines.	229.25			
053Q	0.1	Test generator for power output, frequency, voltage.				
054Q	0.4	Test each prime mover for throttle and control function. Test transmissions for control direction. Test both prime movers for direction and throttle synchronization.	229.25			
055Q	0.4	Download event recorder. Inspect output for proper recording of all channels. Check for proper unit ID display.	229.25			

<u>Task No.</u>	<u>Man Hrs</u>	<u>Description</u>	<u>49 CFR Reference</u>	<u>Inspector Initials OK</u>	<u>Inspector Initials Not OK</u>	<u>Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.</u>
056Q	0.6	Inspect couplers and gauge using proper H-Tightlock gauges. Check for draft arrangement free slack – not grater than ½ inch.	238.307			
057Q	0.2	Inspect end of car hoses for condition and in-date.	238.307			
058Q	0.2	Inspect end of car cables and connectors for condition and safety.	238.307			
059Q	0.3	Inspect under car cables and end of car cables for integrity & securement.	229.25			
060Q	0.1	Inspect car body and truck grounding straps for integrity.	229.25			
061Q	0.6	Inspect trucks, central bearings, locking center pins, body bolsters, center sills for proper securement and absence of cracks or damage to the extent that they are visible without lifting car body.	238.307			
062Q	0.2	Inspect side bearings and measure side to side clearance – not less than 3/8 inch combined. Record measurement.	238.307			
063Q	0.1	Inspect interior and exterior safety signage for completeness and legibility.	238.307 239.107			
064Q	0.00	Deleted.	229.25			
065Q	0.1	Test emergency brake application from interior conductor's valve.	229.25			
066Q	0.1	Test alerter.	229.25			
067Q	0.2	Test all cab functions and lighting.	229.25			

<u>Task No.</u>	<u>Man Hrs</u>	<u>Description</u>	<u>49 CFR Reference</u>	<u>Inspector Initials OK</u>	<u>Inspector Initials Not OK</u>	<u>Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.</u>
068Q	0.2	Test CCBII air brake controls for proper function and display.	229.25			
069Q	0.5	Inspect all electrical equipment for proper guarding, absence of loose or frayed wiring, absence of fire hazard and general electrical safety.	229.25 238.307			
070Q	0.5	Inspect all seats and seat attachments for security and safety.	238.307			
071Q	0.2	Inspect all luggage racks for security and safety.	238.307			
072Q	1.0	Remove one emergency exit window to check function. Re-install. Record window removed and result. Remove a different window each 92-day.	238.307 239.107			
073Q	0.4	Test exit door internal and external emergency door releases.	238.307 239.107			
074Q	0.2	Ensure that all emergency window and door exits are unobstructed, lighted or marked with luminescent signage.	238.307 239.107			
075Q	0.2	Inspect toilets for proper function and sanitary condition. Test doors and locks. Test lighting.	238.307			
076Q	0.2	Write repair work orders for any defects found and correct before permitting the vehicle to return to service.	229.25 238.307 239.107			

<u>Task No.</u>	<u>Man Hrs</u>	<u>Description</u>	<u>49 CFR Reference</u>	<u>Inspector Initials OK</u>	<u>Inspector Initials Not OK</u>	<u>Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.</u>
077Q	0.1	Record periodic inspection in DMU cab on Form FRA F 6180-49A (the Blue Card) and sign form. Make sure form is clearly visible in transparent cab holder.	229.25			
078Q	0.3	Measure drive wheel circumference (diameter) and compare per FRA specification and Voith specification.	229.73			
079Q	0.00	Note: Wheel truing and replacement will be made based on forecasts provided by weekly wheel profile measurements as well as inspection.				
080Q	0.1	Remove blue signal protection	218.29			
081Q	0.1	Supervisor secures the facility.				

TOTAL: 37.75 man-hours

COMMENTS

<u>Task No.</u>	<u>Comment - Action Taken</u>

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated 15 November 2005

DMU 182 Day Inspection Work Order

Car Number _____

Location _____

Date _____

Inspector signature _____

Inspector signature _____

Supervisor signature _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.

This work order is a standing work order that will be completed on each DMU once in each 182 days. This is a Federal inspection interval. NOTE: Car must be over a pit to perform this inspection.

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, W6 = 45 day, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr.	6 min. = 0.1 hr.	12 min.= 0.2 hr.	18 min.= 0.3hr.
24min.= 0.4 hr.	30 min.= 0.5 hr.	36 min.= 0.6 hr.	42 min.= 0.7 hr
48 min.=0.8 hr.	54 min.= 0.9 hr.	60 min.= 1.0 hr.	

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials <u>OK</u>	Inspector Initials <u>Not OK</u>	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001S	0.1	Beginning of shift safety briefing.				
002S	0.05	Beginning of shift work plan meeting				
003S	0.1	Establish blue signal protection	218.29			
005S	0.00	Complete daily inspection only if scheduled for service this day. See daily inspection work order.				
006S	0.3	Clean generator radiator fins				
007S	0.2	Replace prime mover air cleaners.				

008S	0.1	Change generator cooling air intake filter.					
009S	0.00	Check oil level in transmissions and add oil to restore to full. Deleted – done on daily inspection.					
010S	0.5	Grease drive shaft U-joints and telescopic section of drive shafts and check flanges.					
011S	1.0	Inspect generator fuel hoses for leaks, abrasions, cracks, brittleness or other defects.	238.307				
012S	0.3	Change generator primary and secondary fuel filters.					
013S	0.3	Change generator water pump belt.					
014S	0.3	Change generator alternator V-belt.					
015S	0.5	Change generator primary air filter.					
016S	0.00	Deleted.					
017S	0.3	Change generator coolant.					
018S	8.0	Remove generator from car. Adjust valves and re-install.					
019S	0.4	Change prime mover and generator air compressor filters.					
020S	0.2	Grease prime mover cooling pump (2 each).					
021S	2.0	Change prime mover belts.					
022S	0.2	Grease prime mover fan hub. (2 each)					
023S	0.3	Run oil pressure check on prime movers and record results in comments.					
024S	1.0	Inspect/test charge air coolers, clean air coolers, clean fans and inspect for connection air and coolant leaks.					
025S	0.3	Replace dessicant in air brake system air dryer.					
026S	0.00	Deleted and combined with 010S.					

027S	4.0	Clean engine cooling radiators. Use man-lift and tie off for fall protection.					
028S	0.5	Inspect and test engine cooling radiator fans.					
029S	0.0	Deleted task					
030S	0.3	Inspect engine cooling expansion tank.					
031S	0.2	Replace HVAC air filters.					
032S	0.2	Test/inspect wheel slide protection system.	238.307				
033S	10.4	Replace all 16 brake caliper pads. Mount new pads on backing plates in anticipation of next replacement.	238.307				
034S	0.5	Do under car inspection of draft gear, pocket, lugs and carrier to the extent they are visible.	238.307				
035S	0.2	Test and inspect potable water pump deck and measure water pressure. Record in comments.	238.307				
036S	0.1	Inspect potable water tank for damage or leaks.	238.307				
037S	0.1	Inspect black water tank for damage or leaks.	238.307				
038S	0.5	Replace potable water filters.					
039S	0.2	Test and inspect three air compressors including pressure switches and un-loaders.					
040S	0.1	Inspect three auxiliary air tanks and automatic tank drains.					
041S	0.2	Inspect auxiliary air hoses.					
042S	0.5	Test NA1 valve for correct water tank pressurization.					
043S	0.3	Inspect and test Amerex fire suppression system using test squib.	238.307				
044S	1.0	Inspect and test smoke and fire detectors using jumper wire.	238.307				

045S	0.5	Inspect emergency equipment including break-out tools, first aid kits and fire extinguishers. Inspect for presence of passenger emergency instructions.	239.101			
046S	0.6	Test exhaust /turbo system on the two prime mover engines and the generator. Look for leaks and fire risks. Inspect the insulating blankets on turbos and exhaust piping for damage or oil. Replace if damaged or oil soaked.	238.307			
047S	0.3	Inspect the engine compartments of all three engines. Look for exposed combustible material, oil, dirt and exhaust leaks. Repair any conditions observed. Pressure wash engines and compartments if oily or dirty.	238.307			
048S	0.4	Test engines for oil or coolant leaks. Repair any found.	238.307			
049S	0.2	Take engine oil samples for laboratory analysis. Do this before adding oil. Turn samples in to the supervisor for shipping.				
050S	0.5	Test engine starter motors. Inspect motor brushes and replace if more than one-third consumed.				
051S	0.2	Inspect all coolant hoses for leaks, loose or deteriorated clamps, hose cracks or brittleness. Replace as needed.	238.307			
052S	0.2	Inspect and test starting batteries. Measure cranking voltage. Replace weak batteries.				
053S	0.2	Inspect and test emergency lighting batteries. Replace weak batteries.	238.307			

054S	0.2	Test EFCO to kill all three engines. Restart all three engines.	229.25				
055S	0.1	Test generator for power output, frequency, voltage.					
056S	0.4	Test each prime mover for throttle and control function. Test transmissions for control direction. Test both prime movers for direction and throttle synchronization.	229.25				
057S	0.4	Download event recorder. Inspect output for proper recording of all channels. Check for proper unit ID display.	229.25				
058S	0.6	Inspect couplers and gauge using proper H-Tightlock gauges. Check for draft arrangement free slack – not greater than ½ inch.	238.307				
059S	0.2	Inspect end of car hoses for condition and in-date.	238.307				
060S	0.2	Inspect end of car cables and connectors for condition and safety.	238.307				
061S	0.3	Inspect under car cables and end of car cables for integrity & securement.	229.25				
062S	0.1	Inspect car body and truck grounding straps for integrity.	229.25				
063S	0.6	Inspect trucks, central bearings, locking center pins, body bolsters, center sills for proper securement and absence of cracks or damage to the extent that they are visible without lifting car body.	238.307				
064S	0.2	Inspect side bearings and measure side to side clearance – not less than 3/8 inch combined. Record measurement.	238.307				

065S	0.1	Inspect interior and exterior safety signage for completeness and legibility.	238.307 239.107				
066S	0.00	Deleted					
067S	0.1	Test emergency brake application from interior conductor's valve.	229.25				
068S	0.1	Test alerter.	229.25				
069S	0.2	Test all cab functions and lighting.	229.25				
070S	0.2	Test CCBII air brake controls for proper function and display.	229.25				
071S	0.5	Inspect all electrical equipment for proper guarding, absence of loose or frayed wiring, absence of fire hazard and general electrical safety.	229.25 238.307				
072S	0.5	Inspect all seats and seat attachments for security and safety.	238.307				
073S	0.2	Inspect all luggage racks for security and safety.	238.307				
074S	1.0	Remove one emergency exit window to check function. Re-install.	238.307 239.107				
075S	0.4	Test exit door internal and external emergency door releases.	238.307 239.107				
076S	0.2	Ensure that all emergency window and door exits are unobstructed, lighted or marked with luminescent signage.	238.307 239.107				
077S	0.2	Inspect toilets for proper function and sanitary condition. Test doors and locks. Test lighting.	238.307				
078S	0.2	Write repair work orders for any defects found and correct before permitting the vehicle to return to service.	229.25 238.307 239.107				
079S	0.3	Measure drive wheel circumference (diameter) and compare per FRA specifications and Voith specs.	229.73				

080S	0.1	Record periodic inspection in DMU cab on Form FRA F 6180-49A (the Blue Card) and sign form. Make sure form is clearly visible in transparent cab holder.	229.25				
081S	0.1	Remove blue signal protection	218.29				
082S	0.1	Supervisor secures the facility.					

TOTAL: 45.65 man-hours

COMMENTS

Task No.	<u>Comment - Action Taken</u>

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated 15 November 2005

DMU 2 Year Inspection Work Order

Car Number _____

Location _____

Date _____

Inspector signature _____

Inspector signature _____

Supervisor signature _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.

This work order is a standing work order that will be completed on each DMU once in each 732 days. This is a Federal inspection interval. NOTE: Car must be over a pit to perform this inspection.

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, W6 = 45 day, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr.	6 min. = 0.1 hr.	12 min. = 0.2 hr.	18 min. = 0.3hr.
24min.= 0.4 hr.	30 min.= 0.5 hr.	36 min.= 0.6 hr.	42 min.= 0.7 hr
48 min.=0.8 hr.	54 min.= 0.9 hr.	60 min.= 1.0 hr.	

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials OK	Inspector Initials Not OK	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001Y2	0.1	Beginning of shift safety briefing.				
002Y2	0.05	Beginning of shift work plan meeting				
003Y2	0.1	Establish blue signal protection	218.29			
004Y2	0.00	Complete daily inspection only if scheduled for service this day. See daily inspection work order.				

005Y2	32.0	Jack car, remove trucks, perform truck inspection and body central bearing inspection, body bolster/center sill inspection. Write repair work orders based on inspection results.					
006Y2	16.0	Re-install trucks upon completion of repair work.					
007Y2	0.7	Pressure wash all three engines					
008Y2	0.3	Clean generator radiator fins					
009Y2	0.2	Replace prime mover air cleaners.					
010Y2	0.1	Change generator cooling air intake filter.					
011Y2	0.00	Check oil level in transmissions and add oil to restore to full. Deleted - Done on daily inspection.					
012Y2	0.3	Grease drive shaft U-joints and telescopic section of drive shafts. Check flange connections.					
013Y2	1.0	Inspect generator fuel hoses for leaks, abrasions, cracks, brittleness or other defects.			238.307		
014Y2	0.3	Change generator primary and secondary fuel filters.					
015Y2	0.3	Change generator water pump belt.					
016Y2	0.3	Change generator alternator V-belt.					
017Y2	0.5	Change generator primary air filter.					
018Y2	0.5	Change generator pre-filter.					
019Y2	0.3	Change generator coolant.					
020Y2	8.0	Remove generator from car. Perform fuel injection nozzle check. Adjust valves and re-install.					
021Y2	0.4	Change prime mover and generator air compressor filters.					
022Y2	0.2	Grease prime mover cooling pump (2 each).					

023Y2	2.0	Change prime mover belts.					
024Y2	0.2	Grease prime mover fan hub. (2 each)					
025Y2	0.3	Run oil pressure check on prime movers and record results in comments,					
026Y2	1.0	Inspect/test charge air coolers, clean air coolers, clean fans and inspect for connection air and coolant leaks					
027Y2	0.5	Perform prime mover crankcase pressure check.					
028Y2	1.2	Replace prime mover thermostat and seal.					
029Y2	16.0	Replace prime mover fuel injector nozzles and valve cover gasket. Remove and re3-install charge air cooler to gain access. Clean and inspect before re-installing.					
030Y2	0.3	Replace dessicant in air brake system air dryer.					
031Y2	2.0	Change transmission oil and oil filter.					
032Y2	0.00	Deleted and combined with 012Y2.					
033Y2	4.0	Clean engine cooling radiators. Use man-lift and tie off for fall protection.					
034Y2	0.5	Inspect and test engine cooling radiator fans.					
035Y2	0.0	Deleted Task					
036Y2	0.3	Inspect engine cooling expansion tank.					
037Y2	0.2	Replace HVAC air filters.					
038Y2	0.2	Test/inspect wheel slide protection system by using Knorr self-test button.	238.307				
039Y2	10.4	Replace all 16 brake caliper pads. Mount new pads on backing plates in anticipation of next replacement.	238.307				

040Y2	4.0	Remove draft gear carriers and perform inspection of draft gear, pocket, lugs and carrier. Exercise extreme caution working with this equipment.	238.307			
041Y2	0.2	Test and inspect potable water pump deck and measure water pressure. Record in comments.	238.307			
042Y2	0.1	Inspect potable water tank for damage or leaks.	238.307			
043Y2	0.1	Inspect black water tank for damage or leaks.	238.307			
044Y2	0.5	Replace potable water filters.				
045Y2	0.00	Deleted.				
046Y2	0.1	Inspect three auxiliary air tanks and automatic drain valves..				
047Y2	0.2	Inspect air compressor hose connections.				
048Y2	0.5	Test and inspect NA1 valve by taking pressure reading of water tank.				
049Y2	0.3	Inspect and test Amerex fire suppression system using test squib.	238.307			
050Y2	1.0	Inspect and test smoke and fire detectors using jumper wire.	238.307			
051Y2	0.5	Inspect emergency equipment including break-out tools, first aid kits and fire extinguishers. Inspect for presence of passenger emergency instructions.	239.101			
052Y2	0.6	Test exhaust /turbo system on the two prime mover engines and the generator. Look for leaks and fire risks. Inspect the insulating blankets on turbos and exhaust piping for damage or oil. Replace if damaged, thin or oil soaked.	238.307			

053Y2	0.3	Inspect the engine compartments of all three engines. Look for exposed combustible material, oil, dirt and exhaust leaks. Repair any conditions observed. Pressure wash engines and compartments if oily or dirty.	238.307				
054Y2	0.4	Test engines for oil or coolant leaks. Repair any found.	238.307				
055Y2	0.2	Take engine oil samples for laboratory analysis. Do this before adding oil. Turn samples in to the supervisor for shipping.					
056Y2	0.5	Test engine starter motors. Inspect motor brushes and replace if more than one-third consumed.					
057Y2	0.2	Inspect all coolant hoses for leaks, loose or deteriorated clamps, hose cracks or brittleness. Replace as needed.	238.307				
058Y2	0.2	Inspect and test starting batteries. Measure cranking voltage. Replace weak batteries.					
059Y2	0.2	Inspect and test emergency lighting batteries. Replace weak batteries.	238.307				
060Y2	0.2	Test EFCO to kill all three engines. Restart all three engines.	229.25				
061Y2	0.1	Test generator for power output, frequency, voltage.					
062Y2	0.4	Test each prime mover for throttle and control function. Test transmissions for control direction. Test both prime movers for direction and throttle synchronization.	229.25				
063Y2	0.4	Download event recorder. Inspect output for proper recording of all channels. Check for proper unit ID.	229.25				

064Y2	0.4	Inspect couplers and gauge using proper H-Tightlock gauges. Check for draft arrangement free slack – not grater than ½ inch.	238.307			
065Y2	0.4	Replace end of car air hoses, both EOC car connection hoses and coupler carrier hoses.	238.307			
066Y2	0.2	Inspect end of car cables and connectors for condition and safety.	238.307			
067Y2	0.1	Inspect under car cables and end of car cables for integrity & securement.	229.25			
068Y2	0.1	Inspect car body and truck grounding straps for integrity.	229.25			
069Y2	0.0	Deleted inspection.	238.307			
070Y2	0.2	Inspect side bearings and measure side to side clearance – not less than 3/8 inch combined. Record measurement.	238.307			
071Y2	0.1	Inspect interior and exterior safety signage for completeness and legibility.	238.307 239.107			
072Y2	0.00	Deleted.	229.25			
073Y2	0.1	Test emergency brake application from interior conductor's valve.	229.25			
074Y2	0.1	Test alerter.	229.25			
075Y2	0.2	Test all cab functions and lighting.	229.25			
076Y2	0.2	Test CCBII air brake controls for proper function and display.	229.25			
077Y2	0.5	Inspect all electrical equipment for proper guarding, absence of loose or frayed wiring, absence of fire hazard and general electrical safety.	229.25 238.307			
078Y2	0.5	Inspect all seats and seat attachments for security and safety.	238.307			
079Y2	0.2	Inspect all luggage racks for security.	238.307			

080Y2	1.0	Remove one emergency exit window to check function. Re-install.	238.307 239.107				
081Y2	0.4	Test exit door internal and external emergency door releases.	238.307 239.107				
082Y2	0.2	Ensure that all emergency window and door exits are unobstructed, lighted or marked with luminescent signage.	238.307 239.107				
083Y2	0.2	Inspect toilets for proper function and sanitary condition. Test doors and locks. Test lighting.	238.307				
084Y2	0.3	Replace all end of car air brake hoses, both car connection and intermediate.					
085Y2	0.2	Do annual certification of Amerex fire suppression system.					
086Y2	0.2	Certify hand held fire extinguishers.					
087Y2	1.5	Replace with cleaned and tested brake system relay valve (if equipped), dirt collector, brake pipe vent valve and main air reservoir safety valves. Replace air brake system filters. Record and sign on FRA form F6180-49A in locomotive cab and on this work order.	229.27				
088Y2	0.3	Perform test of air brake pressures displayed in the cab by comparison with calibrated pressure gauge or conduct automated self-test if so equipped. Record and sign on FRA form F6180-49A in locomotive cab and on this work order.	229.27				
089Y2	1.0	Test and set air brake compressor governor in accord with regulation. 49CFR 229.49	229.49				

090Y2	0.2	Write repair work orders for any defects found and correct before permitting the vehicle to return to service.	229.25 238.307 239.107				
091Y2	1.0	Do annual car body exterior paint touch-up.					
092Y2	0.3	Measure drive wheel circumference (diameter) and compare with FRA specifications and Voith specs.					
092Y2	0.1	Record periodic inspection in DMU cab on Form FRA F 6180-49A (the Blue Card) and sign form. Make sure form is clearly visible in transparent cab holder.	229.25				
093Y2	0.1	Remove blue signal protection	218.29				
094Y2	0.1	Supervisor secures the facility.					

TOTAL: 122 man-hours

COMMENTS

<u>Task No.</u>	<u>Comment - Action Taken</u>

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated 15 November 2005

DMU Annual Inspection Work Order

Car Number _____

Location _____

Date _____

Inspector signature _____

Inspector signature _____

Supervisor signature _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.

This work order is a standing work order that will be completed on each DMU once in each 368 days. This is a Federal inspection interval. NOTE: Car must be over a pit to perform this inspection.

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, W6 = 45 day, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr. 6 min. = 0.1 hr. 12 min. = 0.2 hr. 18 min. = 0.3 hr.
 24 min. = 0.4 hr. 30 min. = 0.5 hr. 36 min. = 0.6 hr. 42 min. = 0.7 hr.
 48 min. = 0.8 hr. 54 min. = 0.9 hr. 60 min. = 1.0 hr.

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials OK	Inspector Initials Not OK	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001A	0.1	Beginning of shift safety briefing.				
002A	0.05	Beginning of shift work plan meeting				
003A	0.1	Establish blue signal protection	218.29			
004A	0.00	Complete daily inspection only if scheduled for service this day. See daily inspection work order.				
005A	0.7	Pressure wash all three engines				
006A	0.3	Clean generator radiator fins				

007A	0.2	Replace prime mover air cleaners.				
008A	0.1	Change generator cooling air intake filter.				
009A	0.00	Check oil level in transmissions and add oil to restore to full. Deleted – done on daily inspection.				
010A	0.5	Grease drive shaft U-joints and telescopic section of drive shafts. Check flange joints.				
011A	1.0	Inspect generator fuel hoses for leaks, abrasions, cracks, brittleness or other defects.	238.307			
012A	0.3	Change generator primary and secondary fuel filters.				
013A	0.3	Change generator water pump belt.				
014A	0.3	Change generator alternator V-belt.				
015A	0.5	Change generator primary air filter.				
016A	0.00	Deleted.				
017A	0.3	Change generator coolant.				
018A	8.0	Remove generator from car. Perform fuel injection nozzle check. Adjust valves and re-install.				
019A	0.4	Change prime mover and generator air compressor filters.				
020A	0.2	Grease prime mover cooling pump (2 each).				
021A	2.0	Change prime mover belts.				
022A	0.2	Grease prime mover fan hub. (2 each)				
023A	0.3	Run oil pressure check on prime movers and record results in comments,				
024A	1.0	Inspect/test charge air coolers, clean air coolers, clean fans and inspect for connection air and coolant leaks.				
025A	0.5	Perform prime mover crankcase pressure check.				

026A	1.2	Replace prime mover thermostat and seal.					
027A	0.3	Replace dessicant in air brake system air dryer.					
028A	0.00	Deleted. Combined with 010A.					
029A	4.0	Clean engine cooling radiators. Use man-lift and tie off for fall protection					
030A	0.5	Inspect and test engine cooling radiator fans.					
031A	0.0	Deleted task.					
032A	0.3	Inspect engine cooling expansion tank.					
033A	0.2	Replace HVAC air filters.					
034A	0.2	Test/inspect wheel slide protection system.	238.307				
035A	10.4	Replace all 16 brake caliper pads. Mount new pads on backing plates in anticipation of next replacement.	238.307				
036A	0.5	Do under car inspection of draft gear, pocket, lugs and carrier to the extent they are visible.	238.307				
037A	0.2	Test and inspect potable water pump deck and measure water pressure. Record in comments.	238.307				
038A	0.1	Inspect potable water tank for damage or leaks.	238.307				
039A	0.1	Inspect black water tank for damage or leaks.	238.307				
040A	0.5	Replace potable water filters.					
041A	0.2	Test and inspect three air compressors including pressure switches and un-loaders.					
042A	0.1	Inspect three auxiliary air tanks and automatic drain valves..					
043A	0.2	Inspect tank air hose connections.					
044A	0.5	Test NA1 valve for correct water					

045A	0.3	tank pressurization. Inspect and test Amerex fire suppression system using test squib.	238.307				
046A	1.0	Inspect and test smoke and fire detectors using jumper wire.	238.307				
047A	0.5	Inspect emergency equipment including break-out tools, first aid kits and fire extinguishers. Inspect for presence of passenger emergency instructions.	239.101				
048A	0.6	Test exhaust /turbo system on the two prime mover engines and the generator. Look for leaks and fire risks. Inspect the insulating blankets on turbos and exhaust piping for damage or oil. Replace if damaged or oil soaked.	238.307				
049A	0.3	Inspect the engine compartments of all three engines. Look for exposed combustible material, oil, dirt and exhaust leaks. Repair any conditions observed. Pressure wash engines and compartments if oily or dirty.	238.307				
050A	0.4	Test engines for oil or coolant leaks. Repair any found.	238.307				
051A	0.2	Take engine oil samples for laboratory analysis. Do this before adding oil. Turn samples in to the supervisor for shipping.					
052A	0.5	Test engine starter motors Inspect motor brushes and replace if more than one-third consumed.					
053A	0.2	Inspect all coolant hoses for leaks, loose or deteriorated clamps, hose cracks or brittleness. Replace as needed.	238.307				

054A	0.2	Inspect and test starting batteries. Measure cranking voltage. Replace weak batteries.					
055A	0.2	Inspect and test emergency lighting batteries. Replace weak batteries.	238.307				
056A	0.2	Test EFCO to kill all three engines. Restart all three engines.	229.25				
057A	0.1	Test generator for power output, frequency, voltage.					
058A	0.4	Test each prime mover for throttle and control function. Test transmissions for control direction. Test both prime movers for direction and throttle synchronization.	229.25				
059A	0.4	Download event recorder. Inspect output for proper recording of all channels. Check for proper unit ID display.	229.25				
060A	0.6	Inspect couplers and gauge using proper H-Tightlock gauges. Check for draft arrangement free slack – not greater than ½ inch.	238.307				
061A	0.0	See task 081A	238.307				
062A	0.2	Inspect end of car connectors for condition and safety.	238.307				
063A	0.3	Inspect under car cables and end of car cables for integrity & securement.	229.25				
064A	0.1	Inspect car body and truck grounding straps for integrity.	229.25				
065A	0.6	Inspect trucks, central bearings, locking center pins, body bolsters, center sills for proper securement and absence of cracks or damage to the extent that they are visible without lifting car body.	238.307				
066A	0.2	Inspect side bearings and measure	238.307				

		side to side clearance – not less than 3/8 inch combined. Record measurement.					
067A	0.1	Inspect interior and exterior safety signage for completeness and legibility.	238.307 239.107				
068A	0.00	Deleted.					
069A	0.1	Test emergency brake application from interior conductor's valve.	229.25				
070A	0.1	Test alerter.	229.25				
071A	0.2	Test all cab functions and lighting.	229.25				
072A	0.2	Test CCBII air brake controls for proper function and display.	229.25				
073A	0.5	Inspect all electrical equipment for proper guarding, absence of loose or frayed wiring, absence of fire hazard and general electrical safety.	229.25 238.307				
074A	0.5	Inspect all seats and seat attachments for security and safety.	238.307				
075A	0.2	Inspect all luggage racks for security and safety.	238.307				
076A	1.0	Remove one emergency exit window to check function. Re-install.	238.307 239.107				
077A	0.4	Test exit door internal and external emergency door releases.	238.307 239.107				
079A	0.2	Ensure that all emergency window and door exits are unobstructed, lighted or marked with luminescent signage.	238.307 239.107				
080A	0.2	Inspect toilets for proper function and sanitary condition. Test doors and locks. Test lighting.	238.307				
081A	0.3	Replace all end of car air brake hoses, both EOC car connection and coupler carrier hoses.					
082A	0.2	Do annual certification of Amerex					

		fire suppression system.					
083A	0.2	Certify hand held fire extinguishers.					
084A	2.0	Replace with cleaned and tested brake system relay valve 9 if equipped), dirt collector, brake pipe vent valve and main air reservoir safety valves. Replace air brake system filters. Record and sign on FRA form F6180-49A in locomotive cab and on this work order.	229.27				
085A	0.3	Perform test of air brake pressures displayed in the cab by comparison with calibrated pressure gauge or conduct automated self-test if so equipped. Record and sign on FRA form F6180-49A in locomotive cab and on this work order.	229.27				
086A	1.0	Test and set air brake compressor governor in accord with regulation 49 CFR 229.49.	229.49				
086A	0.2	Write repair work orders for any defects found and correct before permitting the vehicle to return to service.	229.25 238.307 239.107				
087A	1.0	Annual car body ext. paint touch-up.					
088A	0.3	Measure drive wheel circumference (diameter) and compare with FRA specifications and with Voith specs.	229.73				
089A	0.1	Record periodic inspection in DMU cab on Form FRA F 6180-49A (the Blue Card) and sign form. Make sure form is clearly visible in transparent cab holder.	229.25				
090A	0.1	Remove blue signal protection	218.29				
091A	0.1	Supervisor secures the facility.					

COMMENTS

Task No.	Comment - Action Taken

South Florida RTA Maintenance Plan

Updated 15 November 2005

49 CFR (238.301) and (229.21)

DMU Daily Inspection Work Order

Car Number

Location

Date

Inspector Signature

Inspector Signature

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.

This work order is a standing work order that will be completed on each DMU once in each calendar day (from midnight to midnight).

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr. 6 min. = 0.1 hr. 12 min.= 0.2 hr. 18 min.= 0.3hr.
24min.= 0.4 hr. 30 min.= 0.5 hr. 36 min.= 0.6 hr. 42 min.= 0.7 hr
48 min.=0.8 hr. 54 min.= 0.9 hr. 60 min.= 1.0 hr.

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials <u>OK</u>	Inspector Initials <u>Not OK</u>	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001D	0.1	Beginning of shift safety briefing.				
002D	0.05	Beginning of shift work plan meeting				
003D	0.1	Establish blue flag protection	218.29			
004D	0.1	Move tools and parts to car				
005D	0.05	Review crew write-ups				
006D	0.1	Download Fault Archives for action items				

007D	0.0	During inspection, be especially alert for safety hazards including fan openings, exposed equipment, exposed electrical equipment, fuel leaks, hot pipes, fire potential, etc. If any found, schedule repair and write WO.	229.41 229.45 229.83 229.85 229.87 238.305				
008D	0.05	Inspect and test handbrake	231.12 238.231				
009D	0.3	Inspect A & B end trucks including: Equalizers, truck frame, spring plank, spring pockets, springs, swing hangers, cross bars, pedestal liners, pedestal jaw clearance, shocks, safety straps, center plate, pins and bushings.	238.301 229.67				
010D	0.1	Inspect side bearings and clearance, 3/8" total, side to side.	238.303 229.69				
011D	0.2	Inspect truck brake system including pads, discs, cylinders, calipers and hoses	238.313 229.57				
012D	0.2	Inspect wheels and bearings including end caps and bolts.	229.75 238.303				
013D	0.05	Inspect under car clearance. Minimum = 2.5 in. above Top Of Rail (TOR)	229.71 238.303				
014D	0.05	Inspect pilot or end plate height above TOR. Minimum = 3" Maximum = 6"	229.123				
015D	0.1	Inspect couplers, draft arrangement and cut levers, including anti-creep	238.303 229.61				
016D	0.1	Inspect end of car equipment including buffer, hoses, cables and diaphragms	229.89 238.303				
017D	0.05	Check function of main air reservoirs auto drain valves.	238.303				
018D	0.05	Inspect air dryer for function	238.231				

019D	0.1	Check fuel tanks for leaks, damage, attachment, fuel gauge, sight glass, vent and fuel level	229.95 229.97 229.45			
020D	0.1	Test sanders for proper function. Check sand levels in sand tanks and record in comments.	229.131			
021D	0.2	Inspect gearboxes, transmissions and drive shafts. Check final drive gearbox oil level and top off. Check drive shaft safety hangers. Look for leaks or damage.	238.303 229.45			
022D	0.05	Inspect holding tanks for leaks, damage, attachment and level	229.45			
023D	0.05	Inspect water tanks for leaks, damage, attachment and level	229.45			
024D	0.2	Inspect/service engine compartments, including Stadco generator. Look for leaks or damage. Check engine oil level. Record quantity added in comments. Check air filter service indicator. Check belts. Check inlet air connections.	229.91			
025D	0.0	If excessively dirty or oily, pressure wash engine compartment and test engine for leaks. (corrective WO)	229.91			
026D	0.3	Inspect engine and generator exhaust system and turbo for integrity and safety. Look for exhaust gas leaks, especially at flexible joints. Look for fire hazards.	229.43 238.303			
027D	0.1	Test function or air brake system compressors (3 each)	229.49			
028D	0.2	Inspect under car HVAC units for damage, clogged evap, securement. etc.	229.45			
029D	0.00	Inspect batteries and connections for function and safety. Moved to weekly.	238.303 238.225			

030D	0.3	Test coolant pressure for in-range.				
031D	0.05	Check battery chargers for proper function	238.225			
032D	0.05	Inspect safety appliances for damage and proper clearance.	231.14			
033D	0.05	Inspect under car equipment doors for proper securement.	229.45			
034D	0.0	Check radiators and piping for damage or leaks and fluid level. Replaced by 030D.	229.45			
035D	0.05	Record all fluid levels and quantities added, if any in the comments section.				
036D	0.1	Inspect steps, doors, trap doors and step lights for function and safety	238.305			
037D	0.1	Test exterior lights including step lights, head lights, ditch lights, door position lights and marker lights for proper function.	221.15 229.125			
038D	0.05	Test cab interior lights, cab HVAC.	229.127			
039D	0.05	Test horn and bell for proper function	229.129			
040D	0.05	Test radios and for function.				
041D	0.05	Inspect cab windshield and windows	229.119			
042D	0.05	Test windshield wipers. Test windshield heat when possible.				
043D	0.05	Inspect cab seats	229.119			
044D	0.05	Inspect cab for clean and sanitary condition	229.119			
045D	0.2	Test engine functions and alarms. Does RPM correspond to throttle position?	229.101			
046D	0.1	Test MU train-line functions including forward, reverse.				
047D	0.1	Test communications train-line				

		functions including PA and doors					
048D	0.05	Test wheel slide system function by depressing Knorr test button	229.115				
049D	0.00	Deleted	238.303				
050D	0.05	Test Alert	238.237				
051D	0.05	Test emergency air brake valve in cab	229.47				
052D	0.1	Test function of HVAC. Does it heat and cool properly?					
053D	0.1	Test and inspect interior lights	238.305				
054D	0.05	Test interior emergency lights	238.115 238.305				
055D	0.1	Test and inspect toilets, lavatories	238.305				
056D	0.05	Check supplies including toilet paper, towels, soap, etc.					
057D	0.05	Inspect windows from the inside for damage/deterioration	223.8				
058D	0.1	Inspect and test interior doors	238.305				
059D	0.05	Inspect floors for damage or hazards and cleanliness	238.305				
060D	0.15	Inspect seats for functionality, damage and condition	238.305				
061D	0.00	Inspect walls, ceiling and bulkheads Moved to weekly	238.305				
062D	0.00	Inspect condition of safety signs and labels. Moved to weekly	238.305				
063D	0.1	Supervisor writes work orders for immediate corrective action	238.305 229.21				
064D	0.4	Perform Class I air brake test on the entire consist & document, including air test slip signed by test inspector.	238.313				
065D	0.5	Take corrective actions on repair work orders issued. Person making repair must sign the work order upon completion.	238.305 229.21				

066D	0.05	Enter the daily inspection on the cab daily inspection log sheet and sign.	229.21					
067D	0.05	Affix the signed Class I air test slip to the cab control consol, controlling cab.	238.313					
068D	0.2	Clean shop and put away tools						
069D	0.05	Remove blue flag protection	218.29					
070D	0.1	Supervisor writes work orders for future corrective action	238.305					
071D	0.1	Supervisor completes and closes work orders accomplished	238.305 229.21					
072D	0.05	Supervisor files copies of daily inspection report (work order) and any repair completed per FRA requirements. Copies sent to VP Maintenance, CRM, in Evergreen, CO	238.305 229.21					
073D	0.1	Supervisor plans next shift and evaluates people performance						
074D	0.1	Supervisor prepares and forwards material report to VP Maintenance and to VP Materials						
075D	0.05	Supervisor secures facility						

TOTAL: 6.8 man-hours

COMMENTS

<u>Task No.</u>	<u>Comment - Action Taken</u>

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated 15 November 2005

DMU Monthly Inspection Work Order

Car Number _____

Location _____

Date _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.
This work order is a standing work order that will be completed on each DMU once in each 30 days (Monthly).

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, W6 = 45 day, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr.	6 min. = 0.1 hr.	12 min. = 0.2 hr.	18 min. = 0.3hr.
24min.= 0.4 hr.	30 min.= 0.5 hr.	36 min.= 0.6 hr.	42 min.= 0.7 hr
48 min.=0.8 hr.	54 min.= 0.9 hr.	60 min.= 1.0 hr.	

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials <u>OK</u>	Inspector Initials <u>Not OK</u>	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001M	0.1	Beginning of shift safety briefing.				
002M	0.05	Beginning of shift work plan meeting				
003M	0.1	Establish blue flag protection	218.29			
005M	0.00	Complete daily inspection only if scheduled for service this day. See daily inspection work order.				
006M	1.0	Perform 250-hour prime mover engine oil and oil filter change (two engines).				
007M	0.2	Change prime mover engine fuel filters (two engines).				
010M	0.1	Supervisor secures the facility.				

TOTAL: 1.55 man-hours

COMMENTS

Task No.	<u>Comment - Action Taken</u>

MATERIAL REPORT

[illegible]

South Florida RTA Maintenance Plan 49 CFR (238.301) and (229.21)

Updated on 15 November 2005

DMU Weekly Inspection Work Order

Car Number _____

Location _____

Date _____

Assumes one double deck DMU vehicle. Non-powered coaches are covered by a different work order.
This work order is a standing work order that will be completed on each DMU once in each calendar week (from Sunday - Saturday).

Note that task numbers are coded by frequency: D=daily, AD= alternate days, W=weekly, M=monthly, Q=92 day, S=180 day, A=annually, Y2=two year, Y3=three year, Y5=five year

3 min. = 0.05 hr.	6 min. = 0.1 hr.	12 min. = 0.2 hr.	18 min. = 0.3 hr.
24 min. = 0.4 hr.	30 min. = 0.5 hr.	36 min. = 0.6 hr.	42 min. = 0.7 hr.
48 min. = 0.8 hr.	54 min. = 0.9 hr.	60 min. = 1.0 hr.	

Task No.	Man Hrs	Description	49 CFR Reference	Inspector Initials <u>OK</u>	Inspector Initials <u>Not OK</u>	Action Taken (Repaired, Repair Scheduled, Car Removed From Service) Detail action in the "comments" below, with task number.
001W	0.1	Beginning of shift safety briefing.				
002W	0.05	Beginning of shift work plan meeting				
003W	0.1	Establish blue flag protection	218.29			
005W	0.00	Complete daily inspection only if scheduled for service this day. See daily inspection work order.				
006W	0.05	Drain water from generator fuel/water separator.				
007W	0.50	Using AAR narrow flange wheel gauge with finger, gauge all wheels. Record readings. Determine if wheels are good for at least one more week of service. Schedule future wheel truing or wheel replacement based on readings and				

COMMENTS

<u>Task No.</u>	<u>Comment - Action Taken</u>

MATERIAL REPORT

[illegible]

CFCRT STORAGE YARD AND MAINTENANCE FACILITY LAYOUT

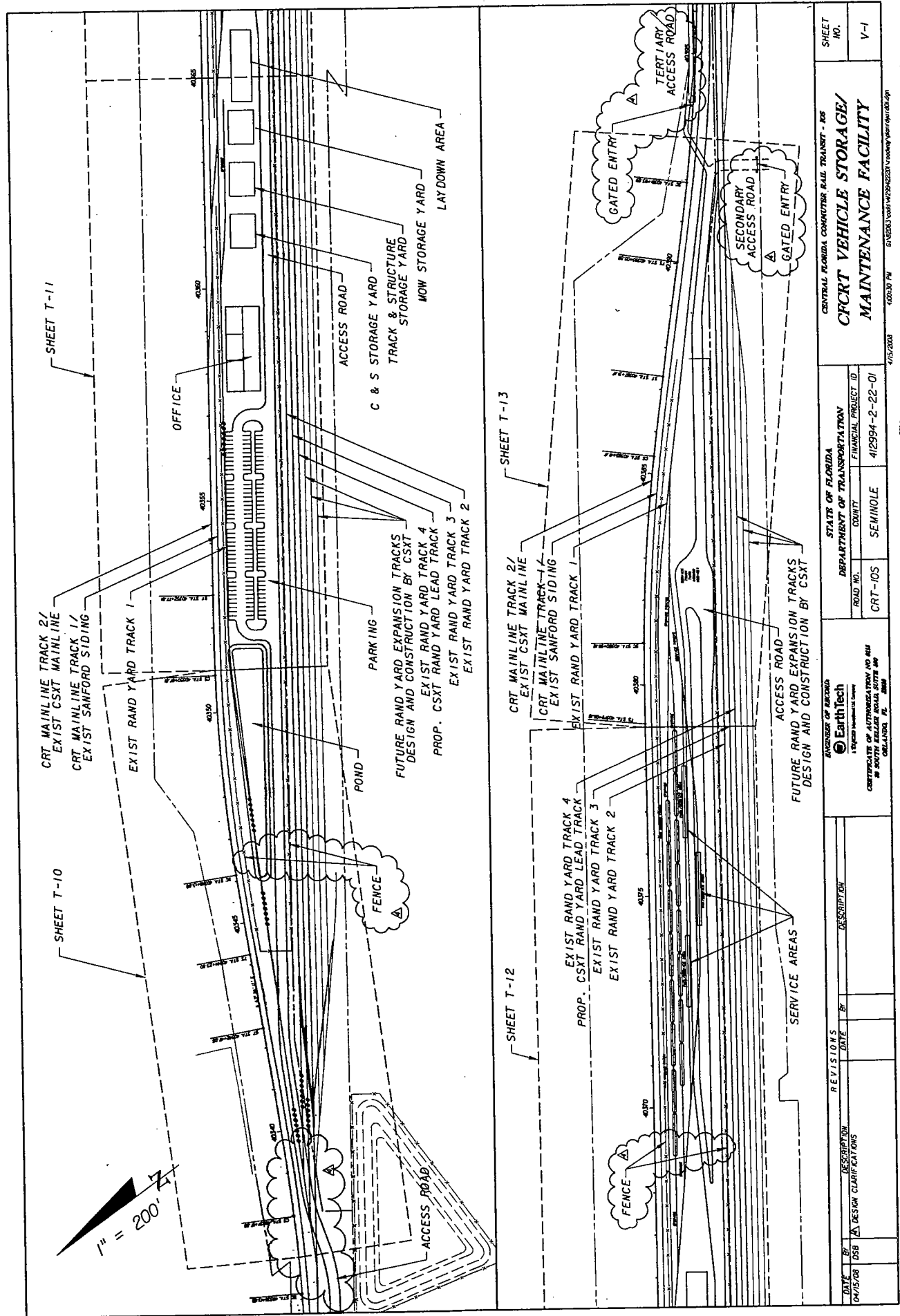


EXHIBIT IV



ORLANDO STATION LAYOUT

