

EXHIBIT A1 – TECHNICAL REQUIREMENTS

Bidder: _____

Specification No. MA-24-31

TECHNICAL REQUIREMENTS HI-RAIL BACKHOE WITH TRAILER AND BALLAST TAMPER

Instructions for completing this form.

- A. State your company name in the “Bidder” field above.
- B. Submit your Bid with column “C” **COMPLETELY FILLED OUT**. In order to be considered responsive to the technical requirements, Bidder must respond to **ALL** specified line items highlighted in yellow below by stating “In compliance”. For minimum or maximum value requirements, indicate value offered. “In compliance” shall be part of your response, for example:

A	B	C
Bucket Rotation	190 deg.	As specified, 190 deg.
Fuel Tank	45 gallons minimum	In compliance, 46 gallons

- A. **PLEASE REFER TO LOI-10 FOR DETAILS RELATED TO THE APPROVED EQUALS (GOODS) PROCESS. BIDDERS SEEKING LACMTA’S AUTHORIZATION FOR SUBSTITUTION OF GOODS OR PROCESSES, INCLUDING THE SPECIFICATIONS BELOW, MUST SUBMIT A WRITTEN REQUEST FOR AN “OR EQUAL” SUBSTITUTION TOGETHER WITH DATA SUBSTANTIATING THE BIDDER’S REPRESENTATION THAT THE NON-SPECIFIED ITEM IS OF EQUAL QUALITY TO THE ITEM SPECIFIED.**
- B. By submitting your Bid, you agree to supply an item(s) in full compliance with this specification. **DO NOT** modify columns A and B as it may render your Bid to be non-responsive. **PLEASE REFER TO THE IFB DOCUMENT LOI-10 APPROVED EQUALS (GOODS) AND LOI-14 CRITICAL DATES FOR ADDITIONAL DETAILS AND DEADLINE TO SUBMIT REQUESTS FOR APPROVED EQUALS.**

1.0	Features		
#	A	B	C Complete This Column
1.1	Model	John Deere model 710-P <u>or approved equal</u> meeting all performance requirements herein. Please state make and model offered.	
1.2	Drive	4-wheel drive.	
1.3	Cab	Fully enclosed.	
1.4	Operator Station	Roll and falling over protection system (ROPS/FOPS) design.	
1.5	Turning Radius (on-road)	180 inches maximum.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

1.6	Wheelbase	102 inches maximum.	
1.7	Engine	Minimum 4.5L, 150 hp Gross Peak Power at 2, 240 rpm. Please state the engine model, capacity and power rating.	
1.8	Digging Depth	Extended backhoe 260 inches nominal.	
1.9	Bucket Rotation	190 deg. nominal.	
1.10	Loader Lift Capacity	Loader lifting capacity to full height shall be not less than 9,500 lb. Please state loader lift capacity.	
1.11	Height	Overall height to top of cab shall be 117 inches maximum.	
1.12	Engine Cooling System	Engine cooling system must be capable of maintaining operating temperature in reverse operation.	
1.13	Engine Exhaust System	Engine and exhaust aftertreatment shall be fully compliant with EPA Tier 4 Final and CARB requirements for off-road diesel equipment.	
1.14	Alternator	160 amps. Minimum.	
1.15	Transmission	Manufacturer's standard.	
1.16	Reversing Gearbox	Manufacturer's standard, 3 or 4 speed synchromesh with hydraulically actuated clutches and electric forward/reverse control.	
1.17	Main Battery	12V, Group 31, Heavy duty starting system with 950 minimum CCA rating.	
1.18	Body Construction	All steel unitized mainframe, heavy-duty steel plate.	
1.19	Fuel Type	Diesel.	
1.20	Fuel Tank	45 gallons minimum.	
1.21	Seats	Heavy-duty with spring suspension, vinyl, manufacturer's darkest standard color.	
1.22	Brakes	Service Brakes: Power assisted, hydraulically actuated. Parking Brakes: spring applied hydraulically released.	
1.23	Steering	Power assisted.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

1.24	Differential Lock	Push button or foot actuated hydraulically engaged mechanical lock.	
1.25	Exterior Color	Manufacturer's standard, safety yellow color.	
1.26	Loader Bucket	Multipurpose, 4 in 1 type. 92" nominal.	
1.27	Backhoe Bucket	▪ 24" with teeth. ▪ 36" with no teeth. ▪ 8" railroad cribbing bucket for digging between railroad ties. ▪ 18" pavement removal bucket with side sheets cut out to permit the teeth to slide under the edge of a concrete slab and lift it onto a truck or spoil pile.	
1.28	Dipper Crips	Serrated teeth located on the dipper stick used for picking up items.	
1.29	Hydraulic System	Hydraulic system shall provide sufficient flow and pressure to operate all specified attachments and ballast tamper functions continuously.	
1.30	Hydraulic requirement for Ballast Tamper	• Drain line for the motor circuit required. • <u>Circuit 1-Vibrator motor</u> Type: Uni-directional + case drain line required. Case drain line size min -08 size (1/2" hose) Flow GPM/PSI (min/max): 18-21 / 3000 • <u>Circuit 2-Tine Squeeze Arms</u> Type: Bi-directional circuit for open/close function Case drain line size min -08 size (1/2" hose) Flow GPM/PSI (min/max): 10-15 / 3000 • <u>Circuit 3-Rotation</u> Type: Electro-hydraulic Requires installation of wire cable kit provided for operating solenoid on diverter valve Valve mounted on tamper work head • Jumper hose lines from attachment bulkhead to machine lines with disconnects	
1.31	Tires	All tires shall be compatible in size and rating with the vehicle and its maximum rated load range. Full size spare tire with its wheel shall be provided. This shall include one spare tire for front and one for rear, if different. Mini-spacer tires will not be acceptable.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

1.32	Lights	Whelen, Super-LED beacon strobe light, L360 series, model L31HAF or approved equal, with light protection cage mounted in the center of roof cab. Four work lights, two in front and two in rear. Pioneer Floodlight- 75 watts LED package with 6,000 lumens. Please state make and model offered.	
1.33	Keys	The vehicle shall be provided with a minimum of six (6) sets of keys. Duplicate keys shall be provided with OEM parts and can be made by local labor. However, non-OEM key parts will not be acceptable.	
1.34	Backhoe Coupler Type	Mechanical type coupler shall be provided to allow quick change out of the backhoe attachments.	

2.0 Accessories			
#	A	B	C Complete This Column
2.1	Mirrors	Outside right and left rear view mirrors. Factory standard.	
2.2	Back-Up Alarm	Preco model CEO 45AA Solid state or approved equal. Please state make and model offered.	
2.3	Fire Extinguisher	5 lb. rechargeable fire extinguisher, ABC class, with mounting bracket, supplied loose.	
2.4	Other Accessories	3" retractable seat belt. 1500 lb. front counterweight. - Factory installed ride control. - Extendahoe. - Stabilizer, per manufacturer recommendation. - Manufacturer's type two-lever style backhoe controls. - Hour meter. - Single or dual parallel dump cylinders. - Bucket position indicator. - Toolbox. - Sun visor. - Lift and tie down eyes. - One hook on each bucket to hold 3/8" chain. - Railroad tie handler suitable for concrete and wood ties of approximately 750 lbs, Mitchell Equipment or approved equal.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

2.5	Hammer	Hydraulically actuated hammer. Case model CH750, Huskie model HH750 or approved equal: ▪ Impact energy: 825 ft. Lbs. ▪ Max. weight: 1,175 lbs. ▪ Required oil flow: 13 to 25 gpm. ▪ Blows/minute: 600 to 1,080. Tool diameter: 3". Please state make and model offered.	
2.6	Hi-Rail Gear	Removable High-rail gear as attachment.	

3.0 Trailer			
#	A	B	C Complete This Column
3.1	Model	Trail King TK40LP or approved equal meeting all performance requirements herein. Please state make and model offered.	
3.2	Payload Capacity	40,000 lbs. minimum.	
3.3	Deck Length	Minimum 21 feet flat deck with 5 feet beavertail, 26 feet total deck length minimum. Please state the length.	
3.4	Axles	Dual Axle (22,500 lbs per axle)	
3.5	Tow Hitch	Adjustable height hitch (16.5 inches to 32 inches)	
3.6	Brakes	Air brakes	
3.7	Tires	Continental, 215/75R17.5 HTL2, 18 ply or approved equal. Please state make and model offered.	
3.8	Loading Ramp	Adjustable dual loading ramp.	
3.9	Electrical System	Per DOT Regulations	
3.10	Features	• Safety chains with grab hooks • Lockable Toolbox • Safety headboard • Registration holder • LED lights • Red & white conspicuity markings • D-rings (10 minimum)	

4.0	Ballast Tamper
------------	-----------------------

EXHIBIT A1 – TECHNICAL REQUIREMENTS

#	A	B	C Complete This Column
4.1	Model	Dymax Rail Series 14-270 degree rotation x 1 motor-backhoe loader-class 20, Model No. DX-BT-DYM14-270x1-BL-20 or approved equal meeting all performance requirements herein. Please state make and model offered.	
4.2	Features	• 14 in tine spacing • 270-degree rotation • 2" thick AR400 tines with weld on replaceable pads • DymaxRail Heavy Duty Vibrator Group • Single cylinder, center mounted • Machine adapter pins • 12V Electro Hydraulic valve mounted on workhead with cable kit • Transport stand with tie downs included	

5.0	Hi Rail Gear Design Requirements and Rail Drive System																						
#	A	B	C Complete This Column																				
5.1	Rail Track Design & Clearance Requirements	Metro Light Rail system requirements for Overhead Catenary System Only. <table><tr><td>Most Restrictive Curvature Radius</td><td>100' radius</td></tr><tr><td>Maximum Grade</td><td>6.0 Grade</td></tr><tr><td>Rail</td><td>115 RE</td></tr><tr><td>Rail Cant</td><td>1:40</td></tr><tr><td>Track Gauge</td><td>Std gauge 56.5"</td></tr><tr><td>Super Elevation</td><td>0" to 6"</td></tr><tr><td>Most restrictive turnout</td><td>190' radius</td></tr><tr><td>Maximum Vertical Load</td><td>28,000 lbs.</td></tr><tr><td>Max Vehicle Dimensions on Rail</td><td>14' High, 8'-6" Wide, 3'-3" above rail (Platform Height).</td></tr><tr><td>Drawings</td><td>Rail Drawings are shown in specification section 10.</td></tr></table> Please provide documentation that unit as configured will meet the curvature radius specified.	Most Restrictive Curvature Radius	100' radius	Maximum Grade	6.0 Grade	Rail	115 RE	Rail Cant	1:40	Track Gauge	Std gauge 56.5"	Super Elevation	0" to 6"	Most restrictive turnout	190' radius	Maximum Vertical Load	28,000 lbs.	Max Vehicle Dimensions on Rail	14' High, 8'-6" Wide, 3'-3" above rail (Platform Height).	Drawings	Rail Drawings are shown in specification section 10.	
Most Restrictive Curvature Radius	100' radius																						
Maximum Grade	6.0 Grade																						
Rail	115 RE																						
Rail Cant	1:40																						
Track Gauge	Std gauge 56.5"																						
Super Elevation	0" to 6"																						
Most restrictive turnout	190' radius																						
Maximum Vertical Load	28,000 lbs.																						
Max Vehicle Dimensions on Rail	14' High, 8'-6" Wide, 3'-3" above rail (Platform Height).																						
Drawings	Rail Drawings are shown in specification section 10.																						

EXHIBIT A1 – TECHNICAL REQUIREMENTS

5.2	Manufacturer	Hi-rail gear shall be provided by a qualified manufacturer experienced in rail guidance systems for backhoe loaders and shall meet all requirements specified in Section 5.1. All vehicles specified must be able to meet the light and heavy rail clearance envelope. The heavy rail is the most restrictive around the third rail area and most large vehicles will require super singles as the outer set of dual rear tires usually comes in contact with the third rail in switches and some curves. The proposed vehicle must meet the clearance envelope. Please state the manufacturer & model of the hi-rail system.	
5.3	Material of Construction	The gears shall be all steel construction with standard flange cast steel wheels. The gauge is standard 56½" steel with tapered roller bearings. Hi-Rail gear shall be non-insulated with pin type lock.	
5.4	Shunting System	Shunt system shall be provided. When on track, the machine shall be able to shunt between the 2 rails. A control switch shall be provided inside the cab with ON and OFF switch to allow the operator to either select or deselect shunting the track.	
5.5	Brakes	Hi-Rail gear shall have rail brake assist.	
5.6	Locking Mechanism	The Hi-rail gear shall be equipped with a locking pin mechanism with easy access to the operator to allow locking the gears in place in stowed position.	
5.7	Welding	All welding shall be done by certified welders.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

6.0	Warranty		
#	A	B	C Complete This Column
6.1	Warranty Terms	Warranty for all components shall commence no later than 30 days from date of delivery to the METRO providing there are no pending acceptance issues. Warranty for all specified equipment including aftermarket accessories shall be the responsibility of the prime contractor. All warranties shall be with \$0.00 deductible.	
6.2	Tractor Warranty	The successful bidder shall warrant the tractor furnished including the drive train (engine with accessories, transmission, and drive axles) to be free from defects in design, material, and workmanship for a period of two (2) years or 2,000 hours minimum, or manufacturer's standard warranty, whichever is greater. Please state the warranty terms offered.	
6.3	Trailer Warranty	The successful bidder shall warrant the trailer specified in 3.0, with manufacturer's standard warranty. Please state the warranty terms offered.	
6.4	Hi-Rail Gear Warranty	The successful bidder shall warrant the hi-rail gear, with manufacturer's standard warranty. Please state the warranty terms offered.	
6.5	Ballast tamper Warranty	The successful bidder shall warrant the ballast tamper specified in Section 4.0, with manufacturer's standard warranty. Please state the warranty terms offered.	
6.6	Warranty Coverage	Bids received from dealers outside 60-mile distance radius from Los Angeles will be accepted based on the warranty being fully recognized and accepted by a local like dealer. The local dealer shall offer the same full warranty service coverage as the original Bidder. The Bidder shall certify that full warranty service coverage is available in the Los Angeles area by providing names of local dealers that will perform all warranty coverage services.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

7.0	Instruction & Parts Manuals The following manuals and schematics shall be furnished at the pre-delivery inspection. If unable to provide any or all of the following manuals and schematics at the pre-delivery inspection, please submit, in writing, to the designated METRO Contract Administrator the reason for non-compliance with this specification requirement and provide a specific date that the manuals and schematics will be delivered to the METRO.		
#	A	B	C Complete This Column
7.1	Operator's Manual.	Three (3) complete copies of the operator's manual.	
7.2	Maintenance, Repair, And Parts Manuals.	Three (3) complete sets of the maintenance, repair, and parts manuals and for any optional items or accessories specified. Digital versions of OEM manual are acceptable.	
7.3	Electrical Schematics	Three (3) complete sets of electrical schematics and for any optional items or accessories specified, unless said schematics are already included in the maintenance, repair, and parts manuals. Digital versions of OEM manual are acceptable.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

8.0	Track Testing & Unit Acceptance		
#	A	B	C Complete This Column
8.1		Final acceptance shall be made by Metro after inspection and successful completion of track testing to verify compliance with this specification. Performance testing shall be conducted by Metro personnel on Metro rail property. A vendor representative may be present during testing if requested. The unit shall demonstrate satisfactory operation on track, including negotiation of specified track curvature, grades, clearances, hi-rail system operation, braking, and all safety systems and installed equipment, as applicable. Metro test personnel shall perform a minimum of two (2) runs in each direction, or as otherwise determined by Metro. If the unit fails to meet any specified requirement, the Contractor shall make all necessary corrections, adjustments, repairs, or modifications at no additional cost to Metro. Final acceptance shall not occur until all testing is completed successfully, all deficiencies are corrected, and all required manuals, training, warranties, and deliverables have been provided.	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

9.0 Training Requirements			
#	A	B	C Complete This Column
9.1	Training Requirements	As part of the final acceptance process, the Contractor shall provide onsite training for Metro personnel. Training shall be provided by the vehicle OEM, hi-rail system manufacturer, or an OEM-authorized representative. Training shall be conducted at a Metro facility designated by Metro and shall be completed within thirty (30) calendar days after final acceptance, unless otherwise approved by Metro. Contractor shall provide all training materials, operator guides, and service references at the time of training. Training costs shall be separately identified in the bid price.	
9.2	Operator Training	The Contractor shall provide a minimum of four (4) hours of operator training for up to ten (10) Metro personnel. Training shall include, but not be limited to: • Vehicle familiarization and safety systems • Vehicle and/or equipment operating procedures • Pre-trip inspection procedures • Road operation and worksite operation • Hi-rail gear deployment and stowage procedures • Road-to-rail and rail-to-road transition procedures • Rail travel operation, braking, and steering characteristics • Emergency operating procedures • Safe operation of all installed attachments, auxiliary systems, and body equipment, as applicable	
9.3	Maintenance Training	The Contractor shall provide a minimum of four (4) hours of maintenance training for up to ten (10) Metro maintenance personnel. Training shall include, but not be limited to: • Preventive maintenance requirements • Mechanical, hydraulic, pneumatic, and electrical systems, as equipped • OEM diagnostic systems and fault code interpretation • Troubleshooting and repair procedures • Service intervals and lubrication requirements • Inspection, adjustment, and replacement of hi-rail system components • Emergency recovery procedures	

EXHIBIT A1 – TECHNICAL REQUIREMENTS

10. Drawings

10.1

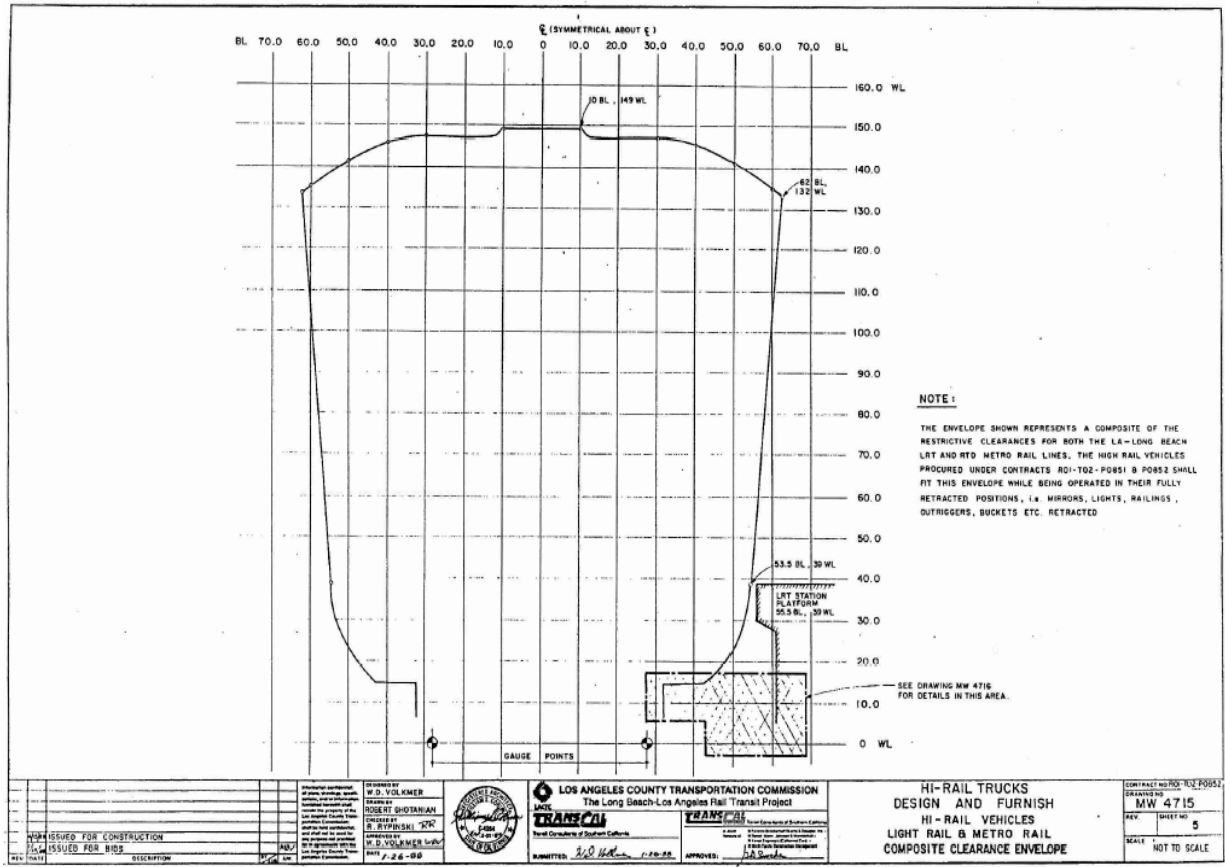
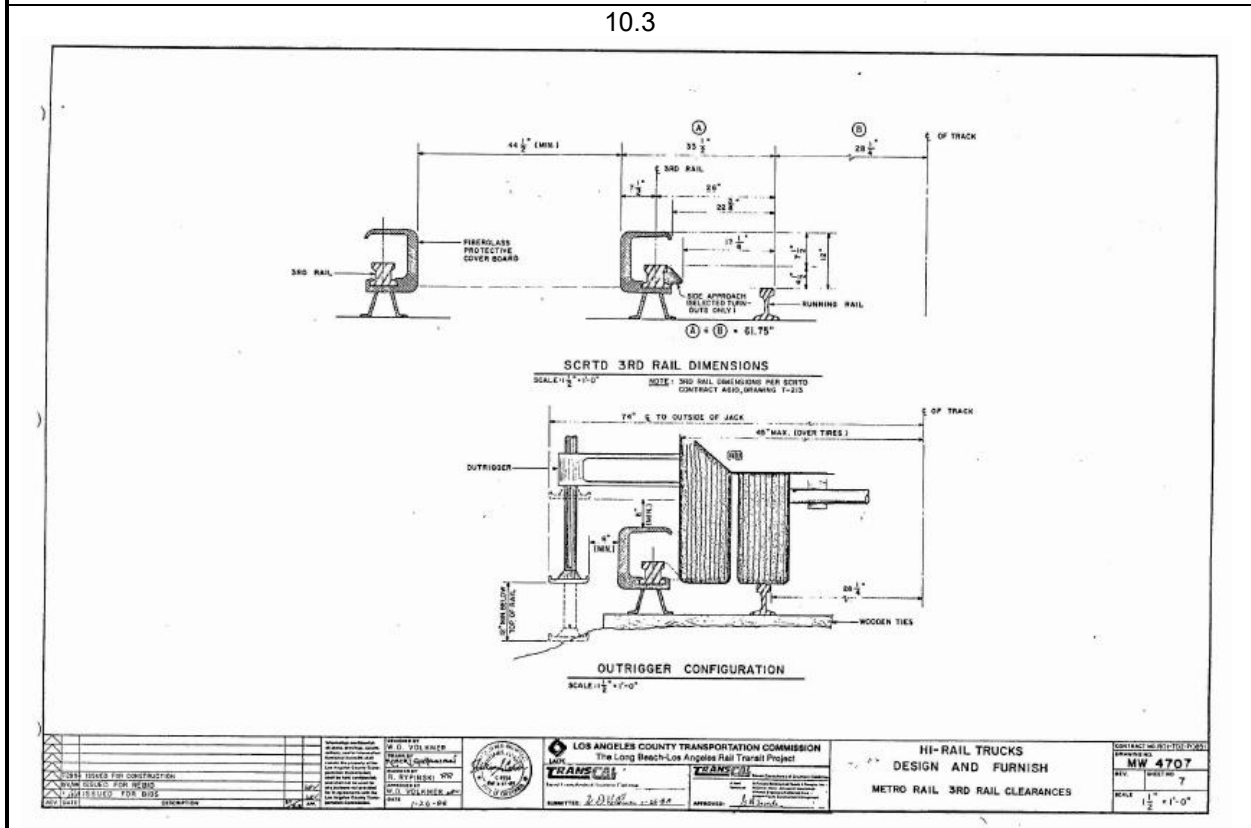
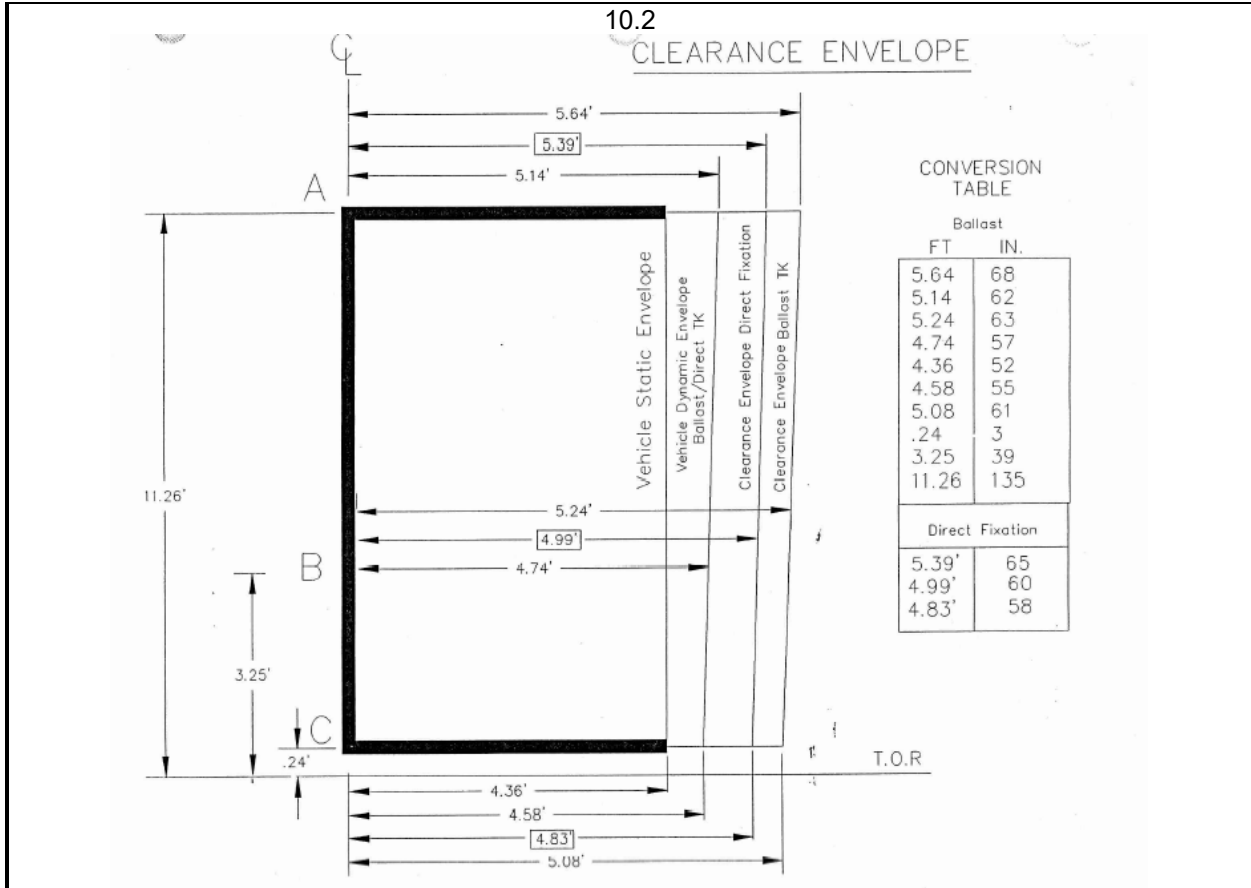


EXHIBIT A1 – TECHNICAL REQUIREMENTS



10.4



1. SEE & NOTE 4 ON AR-3201 - AR-3206 FOR ADDITIONAL INFORMATION.

ALL EXPOSED METAL SHALL BE PAINTED
COLOR AS APPROVED BY CONSTRUCTION MANAGER OR AS SCHEDULED.
SEE FINISH SCHEDULE, SHEET AR-3217

$$\frac{1}{2}^n = 1 - O^n.$$

AR-8207, AR-8209, AR-8201, AR-8206
AR-8211

0 1 2 3 4 5 6
GRAPHIC SCALE

TYPICAL SECTIONS

$$\frac{1}{2}'' = 1' - 0''$$

A Joint Venture of
 ■ Parsons Brinckerhoff Quade & Douglas, Inc.
 ■ Kaiser Engineers (California) Corporation
 ■ Cecil Mann Johnson & Randall

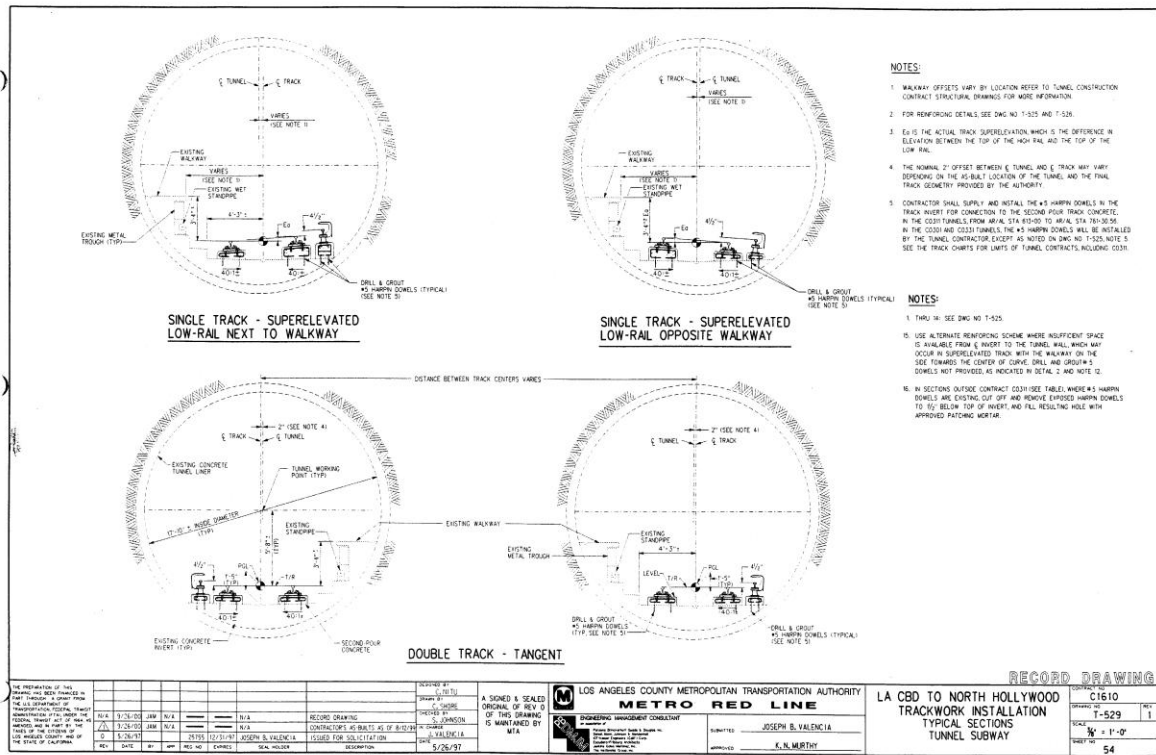
P:2/2

10:23394

JAN-20-2005 23:09 FROM: MTA LDC 66 WAYSIDE 323-563-9411

EXHIBIT A1 – TECHNICAL REQUIREMENTS

10.5



10.6

