



**STEAM DEPARTMENT
WESTERN PACIFIC RAILROAD MUSEUM AT PORTOLA**

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To: The WPRM Board of Directors
Submitted: October 7, 2006
By: Chris Allan, WPRM Steam Department Coordinator

RE: 165 Restoration Estimate

Board Members:

Please find attached my preliminary restoration estimate to return the Western Pacific steam locomotive number 165 to operational status. *This estimate assumes that no sheet replacement will be necessary on the boiler.* All sheets which are currently exposed have been visually inspected and look to be in good shape. Full inspection will take place upon removal of the asbestos lagging, which has not been undertaken to date due to the cost of remediation. After asbestos removal, any corrosion present under the lagging will be assessed and if sheet replacement is warranted this estimate will be revised.

Funds expended to date have been applied only to components necessary for cosmetic restoration. Significant tear-down of the locomotive should be put off until a suitable amount of funding is secured. Non-cosmetic low cost tasks that can be undertaken prior to funding are:

1. Removal of boiler tubes and superheater flues and superheater units to permit cleaning and inspection of the boiler interior.
2. Removal and storage of firebrick to permit firebox and firepan inspection.
3. Complete boiler survey including ultrasonic inspection of all boiler courses and sheets.
4. Generate CAD drawings of boiler.
5. Begin calculations necessary for generating new FRA form 4.

Items 3 through 5 can only take place after asbestos remediation. None of these tasks will affect the outward cosmetic appearance of the locomotive.

A fully operational FRA compliant restoration is estimated at \$101,881.25 including contingency. Please note that additional items *will* be added upon teardown for an operating restoration. No matter how detailed the survey and cost estimation, an unpleasant surprise can arise at any time.

At this date I would urge the Board to press ahead and securing funding for the asbestos remediation.

Respectfully submitted,

J. Chris Allan, Coordinator/CMO
WPRM Steam Department

WP185_COMPONENT_LIST

WPRM LOCOMOTIVE #165 - ALCO SCHEN. C/N 58787 - EVALUATION / RESTORATION. EST. FOR WPRM - 10/7/06						VOLUNT.	OUTSOURCE				
BY CHRIS ALLAN, HISTORIC RAILWAY CONSULTANTS, LAKEWOOD, CALIFORNIA (562) 809-7455						HRS. V	HRS. SHOP	Material Cost	Status	COSMETIC	MECH
COMPONENT DESCRIPTION	GENERAL CONDITION	REPAIR	REPLACE	NOTES							
ENGINE ASSEMBLY	1=BEST - 5=CONDEMN										
CROSSHEADS & WRISTPINS	3			CH - 3/16" CLEARANCE BOTH SIDES LT/RT	4						X
CROSSHEAD GUIDES	2			NO UNUSUAL WEAR - PROBABLY IN TRAM	6						X
CYLINDER WALL CONDITION	?			INSPECT ON DISASSEMBLY	2						X
CYLINDER CASTINGS	2			NO CRACKS VISABLE							X
VALVE GEAR	3			SEEMS TIGHT - INSPECT ON DISASSEMBLY	40						X
VALVE STEM & VALVE XHEADS	3	X		1/8" CLEARANCE - CAN SHIM	6						X
VALVE	?			INSPECT ON DISASSEMBLY	2						X
CYLINDER HEADS	?			INSPECT ON DISASSEMBLY	2						X
MAIN RODS & BRASSES	3			INSPECT ON DISASSEMBLY - POLISH	12		\$ 150.00			X	
CONNECTING RODS & BRASSES	3			INSPECT ON DISASSEMBLY - POLISH	20					X	
REVERSE LINK	2			REBUSH	15		\$ 250.00				X
LINK HANGER	2				2						X
PISTON RINGS	?			INSPECT ON DISASSEMBLY	2						X
BEARING BLOCK-REV SHAFT	3			INSPECT ON DISASSEMBLY	2						X
CYLINDER COCKS	3			CLEAN & INSPECT	8						X
SHOES & WEDGES	3			INSPECT ON DISASSEMBLY - 1 SPRING DAMAGED	24		\$ 250.00				X
CROWN BRASSES	3			50% TO 60% LEFT	2						X
DRIVER CENTER CASTINGS	2			NO CRACKS EVIDENT - NO SHIMS IN AXLE BORES	2						X
TIRES	2			TREADS LOOK NEW - NO TURNINGS LEFT							X
JOURNAL SURFACES	2			INSPECTED - VISIBLE SURFACES GOOD	8						X
LATERAL SURFACES	3			1/2" - OK FOR NOW							X
PISTON & VALVE PACKING	5		X	SEGMENTED PACKING LIKELY - RENEW	40		\$ 400.00				X
BOILER & APPURTENANCES	GENERAL CONDITION	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH	
BOILER	?	X		INSP. PENDING - UT TEST ALL SHEETS - RETUBE - FORM 4	2500	16	\$ 9,500.00			X	
SUPERHEATER UNITS	?	X		INSP. PENDING - ASSUME 30% REPLACEMENT	500		\$ 1,500.00				
FLEX STAYBOLT CAPS	VISABLE-2 / OTHERS?			ASSUME 25% REPLACEMENT + GASKETS	200		\$ 1,150.00				
SMOKEBOX	2			NEEDS CLEANING - RELATIVELY DRY - NO SULPHUR	4				X		
SMOKE STACK & BASE	2			SMALL CRACK ON RIGHT SIDE BASE						X	
NETTING & SPARK ARRESTOR	N/A			NOT USED						X	
FIREBOX DOOR	3			FABRICATE PEEPHOLE COVER	4				X		
DOOR FRAME	2			NO CRACKS EVIDENT						X	
FIREBOX DAMPER	3			LINKAGE MISSING FABRICATE	8				X		
SMOKE BOX FRONT	2			NEEDLESCALE	8				X		
SMOKE BOX DOOR	2			NEEDLESCALE - FABRICATE 2 MISSING DOGS	8		\$ 50.00		X		
STEAM DOME COVER	4	X		PATCH CANCER	8				X		
SAND DOMES & SANDERS	4	X		PATCH CANCER	12		\$ 60.00		X		
CHECK VALVES	4	X		REPLACE STEM ON LT. SIDE - LAP	10		\$ 125.00		X		
FEED LINES	5		X	HOLE IN LT. SIDE - REPLACE BOTH	20					X	
INJECTORS	1 MISSING	X		LT. SIDE MISSING - RT. SIDE SIMPLEX W/ HANDLE MISSING	20		\$ 3,500.00	WOODLAND	X		
SUPERHEATER PATENT PLATE	1		X	ON ORDER	8		\$ 20.00		COMPLETE	X	
ALCO PATENT PLATE	MISSING			LT. SIDE ABOVE BUILDERS PLATE - AS PER WP 164	8		\$ 125.00		PATTERN	X	
SPOT PLATE	3	X		REMOVE & REPAIR BRASS RING ADD NUMERALS	20		\$ 70.00		COMPLETE	X	
BUILDERS PLATES (2)	1		X	PURCHASED FROM Wayne James	8		\$ 130.00		COMPLETE	X	
BELL & CRADLE	2	X		POLISH - MAY NEED NEW LEVER CAST	8		\$ 150.00		X		
EXHAUST NOZZLE	2									X	
WHISTLE & LINKAGE	3	X		LINKAGE MISSING - LEVER INTACT	8		\$ 60.00		X		
FIRE PAN	3			CLEAN & INSPECT AFTER BRICK REMOVED	24					X	
HANDRAILS	3	X		MAKE BALL FINIALS FOR SMOKEBOX END	8		\$ 20.00		X		
FIRE BRICK	2			DRY - RETAIN AND REUSE POSSIBLE	2		\$ 500.00			X	
BLOWDOWN VALVE	3	X		REMOTE AIR OPERATED - CLEAN, INSPECT & LAP	8					X	
BOILER PLUGS	3		X	AT LEAST 3 MISSING	12		\$ 250.00			X	
ASBESTOS REMEDIATION				COMPANY SELECTED	40		\$ 8,000.00	PENDING	X		
LAGGING	N/A		X	USE SILICA BLOCK/BLANKET AS REPLACEMENT	10		\$ 2,700.00		X		
JACKETING	5	X		RETAIN FOR FABRICATION - PATTERN FOR NEW	60		\$ 800.00			X	
POWER REVERSE	3	X		CLEAN & INSPECT	8					X	
SNIFTERS	1 MISSING		X	FABRICATE ONE	20		\$ 500.00		X		
SAFETY VALVES	2 MISSING		X	NEED TWO EA. 3" SAFETIES - ONE MUFFLED	4		\$ 5,800.00			X	

WP165_COMPONENT_LIST

FOUNDATION	GENERAL CONDITION	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH
FRAME	2			NO CRACKS OR WELDS FOUND - DYE/CHECK JAWS	10					X
FRAME BRACKETS	3			SOME BRAKE HANGER BRACKETS WELDED - BUSH	40					X
BRAKE CYL BRACKETS	2			INSPECT						X
BRAKE CYLINDER	2			CLEAN & INSPECT - NEW CUPS	8		\$ 200.00			X
PILOT BEAMS	2			CAST IRON						X
FOOTBOARDS	5		X	MISSING ON FRONT, REPLACE WOOD ON TENDER END	8		\$ 250.00		X	
RUNNING BOARDS	2			INSPECT - APPY NO SKID COATING			\$ 125.00			X
COUPLER POCKETS	2			REMOVE COUPLERS & INSPECT						X
COUPLERS	3			CHECK FOR WEAR PER FRA	2					X
SPRING RIGGING	4	X		LEVERS & PINS WORN	200		\$ 1,200.00			X
SPRINGS	5	X		AT LEAST 3 BROKEN	120		\$ 8,000.00			X
BRAKE RIGGING	5	X		REBUSH & NEW PINS NEEDED	240		\$ 300.00			X
BRAKE SHOES	4		X	MAKE NEW PATTERN OR POSSIBLY PUCHASE NEW	40		\$ 650.00			X
FLANGE GREASERS	NEEDED			GRAPHITE STICK OR EQUIVALENT?	10		\$ 250.00			X
CAB	GENERAL CONDITON	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH
CAB	4	X		REPAIR FLOOR - CANCER AROUND BASE	80		\$ 400.00		X	
CYLINDER COCK LINKAGE	3		X	LEVER & ROD MISSING	20		\$ 50.00		X	
THROTTLE LEVER	MISSING		X	MAY BE RETURNED	40		\$ 200.00		X	
REVERSE LEVER ASSEMBLY	4		RACK	QUADRANT RACK MISSING	20		\$ 50.00		X	
FIRING MANIFOLD	5		X	REPLACE WITH SCH 80 BLACK	10		\$ 450.00		X	
BURNER ASSY & FIRING VALVE	NEED HANDLE	X		FIRING HANDLE MISSING	20		\$ 300.00		X	
SEATBOXES	3	X		NEED TO MAKE 2 CUSHIONS	8		\$ 150.00		X	
WINDOWS & WOODWORK	4	X	X	HEADLINER REPAIRABLE - MAKE DOORS & WINDOWS	80	12	\$ 1,200.00		X	
FIRING VALVE	3			CLEAN & INSPECT	4					X
STEAM TURRET	3	X		MOST VALVES PRESENT	10					X
OIL PIPING	3		X	REPLACE AS NEEDED	10					X
STEAM GAUGE	NEED 1		X	NEED 1. 10" DIA. 400# DOUBLE SPRUNG - TEST	4				X	
HYDRO. LUBRICATOR	2	X		MISSING 6 SITE GLASSES - RECENT THEFT	20		\$ 425.00	WOODLAND	X	
WATER GLASSES	MISSING - NEED 2		X	STILL COMMERCIALY AVAILABLE	4		\$ 800.00		X	
TRICOCKS	REPLACE ALL 3		X	TOO FAR GONE - BUY NEW	4		\$ 300.00		X	
APRON	3	X			4					X
TENDER DRAWBAR & PIN ASSY	3			DYE/CHECK PER FRA PART 230	8					X
AIR BRAKE SYSTEM	GENERAL CONDITION	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH
PUMP LUBRICATOR- AIR SIDE CUP	3			CLEAN & INSPECT	2					X
AIR RECIEVER	3			CLEAN & INSPECT - HAMMER TEST	8					X
AIR COMPRESSOR	3			X-CMPND- CLEAN & INSPECT - REMOTE DRAIN	16					X
COMPRESSOR GOVERNOR	REPLACE		X	BASE ONLY - NEED DOUBLE TOP	8		\$ 400.00			X
AIR BRAKE VALVES - 6ET	MISSING		X	BRACKETS ONLY - NEED 1 EA. S4 & H4	12		\$ 800.00		X	
FEED VALVES	MISSING		X	BRACKETS ONLY NEED 2 EA. M3-A	8		\$ 400.00		X	
AIR PIPING	4			REPLACE AS NEEDED -SCH 80	20		\$ 1,500.00			X
BRAKE GAUGES	MISSING		X	NEED 4" DUPLEX AND 3" DUPLEX	4		\$ 1,000.00		X	
DISTRUBUTING VALVE	3	X		CLEAN & INSPECT	8					X
SAFETY VALVE ON MAIN RES	NEVER INSTALLED		X		4		\$ 45.00			X
ELECTRICAL SYSTEM	GENERAL CONDITION	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH
DYNAMO	REPLACE		X	GENERATOR SIDE MISSING - FIND REPLACEMENT	8		\$ 1,800.00		X	
ELECTRICAL WIRING	5		X	EMT CONDUIT	16		\$ 125.00		X	
GAUGE LIGHTS	MISSING		X	NEED 6 - PYLE CAST ALUMINUM	8		\$ 400.00		X	
FRONT HEADLIGHT	1	X		REFLECTOR INTACT - SOME HARDWARE FAB. NEEDED	20		\$ 300.00	COMPLETE	X	
CLASS LIGHTS & BRACKETS	MISSING		X	STYLE DESIRED TBD- NEED BRACKETS	20		\$ 1,500.00		X	
HEADLIGHT & CAB SWITCHES	MISSING		X	W/ RESISTOR FOR DIMMING HEADLIGHT-NH	6		\$ 500.00		X	
CAB RADIO & 12V BATTERY	NEVER INSTALLED		X	NEEDED OR USE PACK-SET7?	4		\$ 1,200.00			X
SPEEDOMETER	NEVER INSTALLED		X	USE BICYCLE SPEEDO - PER FRA PT. 230	8		\$ 50.00			X

WP165_COMPONENT_LIST

TENDER	GENERAL CONDITION	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH
TENDER FRAME	3			LOOKS STRAIGHT - few minor dents	8					X
TENDER DECK	5		X	REPLACE W/ NEW WOOD	24		\$ 2,400.00		X	
WATER TANK	?	X		CLEANOUT - SANDBLAST - APPLY COATING	40		\$ 1,500.00		X	
WATER TANK LEVEL GAUGE	NEVER INSTALLED		X	PER FRA PT. 230			\$ 125.00			X
STRAINERS	3	X		REPAIR	12		\$ 200.00			X
TOOL BOXES	3		X	CLEANOUT - SANDBLAST - APPLY COATING	32				X	
OIL TANK	3			CONTRACT ENVIRON. COMPANY TO PUMP OUT AND CLEAN	8					X
OIL LEVEL MEASURE ROD	MISSING		X				\$ 50.00		X	
EMERGENCY SHUT-OFF LEVER	MISSING		X	REPLACE W/ PULL CABLE & HANDLES			\$ 50.00			X
CENTERPLATES	3			INSPECT ON DISASSEMBLY-LUBE	2				X	
BACKUP LIGHT	4	X		RESTORE	20		\$ 300.00		X	
TENDER TRUCK ASSEMBLYS	GENERAL CONDITION	REPAIR	REPLACE	NOTES	HRS. V	HRS. SHOP	Mat. Cost	Status	COSMETIC	MECH
TRUCK BOLSTER	?			INSPECT ON DISASSEMBLY	4					X
BRAKE BEAMS	?			INSPECT ON DISASSEMBLY	4					X
BRAKE SHOES	4		X	STOCK ITEM	6		\$ 600.00			X
CENTER PLATES	?			INSPECT ON DISASSEMBLY	2					X
JOURNAL BOXES	2		SEALS	INSPECT ON DISASSEMBLY	8		\$ 160.00		X	
WHEELSETS	2			TREADS GOOD.	2					X
AXLES & JOURNAL SURFACES	3			INITIAL INSPECTION GOOD, REINSPECT LATER.	2					X
TRUCK FRAME MEMBERS	?			INITIAL INSPECTION GOOD, REINSPECT LATER.	2					X
BRAKE RIGGING	?			REINSPECT LATER.	24		\$ 400.00			X
JOURNAL BRASSES	3			INITIAL INSPECTION GOOD, REINSPECT LATER.	4					X
EQUALIZER BARS	2				2					X
PREP. PAINT, LETTERING & FINISH WORK				IMRON BLACK - SMOKEBOX GRAPHITE	250		\$ 5,000.00		X	
STARTUP FUEL & SUPPLIES				FUEL OIL, LUBRICATION, GREASE, ETC.			\$ 4,500.00			X
TOTAL VOLUNTEER LABOR (HRS)					5417					
MISC. & CONTINGENCY - VOLUNTEER LABOR					1625.1					
TOTAL EST. VOLUNTEER LABOR + CONTINGENCY					7042.1					
TOTAL SHOP LABOR (HRS)					28					
SHOP LABOR COST @ \$80.00 / HR						\$	2,240.00			
TOTAL MATERIALS						\$	76,465.00			
TOTAL LABOR & MATERIALS						\$	78,705.00			
ADD CONTINGENCY 25%						\$	19,676.25			
MISC. EXPENSE (RENTALS, ADMINISTRATIVE ETC)						\$	3,500.00			
TOTAL COST						\$	101,881.25			
NOTE:										
ESTIMATES ASSUME NO SHEET REPLACEMENT ON BOILER.										
ESTIMATES ASSUME NO REMOVAL OF DRIVER SETS.										
MATERIAL COST ESTIMATES APPROX. (THEY WILL GO UP)										
ADDITIONAL ITEMS WILL BE ADDED UPON DISASSEMBLY.										
SUBMITTED BY CHRIS ALLAN - 10/7/06										