APPENDIX H-2

CONSTRUCTION NOISE ANALYSES

APPENDIX H2: CONSTRUCTION NOISE ANALYSES

This appendix provides a database of construction equipment noise generation estimates plus charts illustrating predicted noise levels in the vicinity of selected construction projects that are proposed under the Proposed Action or the RLA Alternative. The selected construction projects were chosen because of their relative proximity to noise sensitive land uses, the types of construction activity expected to occur, and the scale of the anticipated construction activity. Consequently, the illustrated noise levels for different construction activity phases provide a reasonable guide to noise levels expected during construction activities at the remaining construction projects.

The detailed spreadsheets documenting the construction noise analysis generally do not lend themselves to hard copy printing. Electronic versions of the spreadsheets can be made available on request.

CONSTRUCTION EQUIPMENT NOISE GENERATION DATABASE

LOOKUP CODE	ITEM	DEFAULT REFERENCE dBA LEVEL	REFERENCE DISTANCE (feet)	ABSORPTION COEFFICIENT (dB/100 meters)	GENERAL dB RANGE FOR EQUIPMENT	GSA NOISE LIMITS (dBA at 50 ft)	DEFAULT % OPERATING TIME IN ACTIVE HOURS	SHORT NAME FOR HEADERS
0	not used	0	0	0	0	0	0%	not used
1	Wheeled Dozer	85	50	0.75	75-95	80	85%	Wheeled Dozer
2	Tracked Dozer	85	50	0.75	75-95	80	85%	Tracked Dozer
3	Tracked Tractor	85	50	0.75	75-95	80	85%	Tracked Tractor
4	Wheeled Tractor	85	50	0.75	75-95	80	85%	Wheeled Tractor
5	Tracked Loader	80	50	0.50	73-85	79	75%	Tracked Loader
6	Wheeled Loader	80	50	0.50	73-85	79	75%	Wheeled Loader
7	Wheeled Backhoe-Loader	83	50	0.50	73-95	85	85%	Backhoe
8	Skid-Steer Loader (Bobcat)	80	50	0.50	73-85	79	75%	Bobcat
9	Trencher	83	50	0.50	73-95	nd	85%	Trencher
10	Medium Power Shovel/Excavator	85	50	0.75	75-95	nd	85%	M Power Shovel
11	Large Power Shovel/Excavator	87	50	0.75	75-95	nd	85%	Lg Power Shovel
12	Motor Grader	82	50	0.75	80-93	85	85%	Motor Grader
13	Scraper	85	50	0.75	80-93	88	85%	Scraper
14	Mobile Crane	82	50	0.50	75-88	83	65%	Mobile Crane
15	Side-Boom Tractor	82	50	0.50	75-88	83	65%	Side-Boom
16	Derrick Crane	87	50	0.75	86-88	88	75%	Derrick Crane
17	Forklift	80	50	0.50	73-85	nd	65%	Forklift
18	Off-Road Heavy Truck	85	50	0.32	80-95	91	25%	Off-Road Truck
19	Water Truck	80	50	0.50	75-90	91	65%	Water Truck
20	Street Sweeper	70	50	0.50	68-80	nd	35%	Street Sweeper
21	Roller/Compactor	73	50	0.45	65-75	nd	85%	Roller/Compactor
22	Concrete Pump	82	50	0.50	81-83	82	75%	Concrete Pump
23	Cement Mixer Truck	68	50	0.50	63-71	nd	75%	Cement Truck
24	Portable Cement/Mortar Mixer	82	50	0.50	75-88	85	90%	Portable Mixer
25	Concrete Finishers & Vibrators	75	50	0.50	69-81	76	85%	Vibrators
26	Asphalt Paver	87	50	0.75	87-89	89	100%	Asphalt Paver
27	Concrete Paver	87	50	0.75	87-89	89	100%	Concrete Paver
28	Asphalt Crusher	81	50	0.54	75-95	nd	65%	Asphalt Crusher
29	Pavement Breaker	82	50	0.66	75-90	nd	75%	Pavement Breaker
30	Bore/Drill Rig	87	50	0.66	81-98	nd	100%	Bore/Drill Rig
31	Pile Driver (Leq)	97	50	0.54	90-105	101	100%	Pile Driver, Leq
32	Pile Driver (Lpeak)	101	50	0.54	95-106	nd	100%	Pile Driver, Lpk
33	Portable Generator (generic)	78	50	0.66	70-85	78	100%	Generator
34	15 kW [20 HP] Generator (gas engine)	76	50	0.60	70-85	78	100%	Generator (20 hp)
35	60 kW [80 HP] Generator	81	50	0.81	70-85	78	100%	Generator (80 hp)
36	Compressor	81	50	0.66	75-86	81	100%	Compressor
37	Portable Pump	83	50	0.41	75-90	76	100%	Portable Pump
38	Jackhammer	90	50	1.36	80-100	88	75%	Jackhammer
39	Rock Drill	95	50	1.90	85-100	98	65%	Rock Drill
40	Electric Saw	80	50	0.46	73-82	78	25%	Electric Saw
41	Pneumatic Wrench	87	50	1.43	80-95	86	33%	Pneumatic Wrench
42	Chain Saw	87	50	0.75	75-100	nd	50%	Chain Saw
43	Wood Chipper	91	50	0.75	89-97	nd	65%	Wood Chipper
44	Riding Mower (small - medium size)	70	50	0.75	68-73	nd	90%	Riding Mower
45	Coal Stacker/Reclaimer	59	50	0.32	55-65	nd	100%	Stacker/Reclaimer
46	Belt Conveyor	55	50	0.32	50-65	nd	100%	Conveyor
47	Coal Car Dumping	63	50	0.55	60-70	nd	75%	Railcar Dumping
48	Railcar Coupling (Leq)	89	50	0.25	85-95	nd	50%	Car Coupling, Leq
49	Railcar Coupling (Lpeak)	97	50	0.25	90-105	nd	50%	Car Coupling, Lpk
50	High Pressure Steam Release	115	50	0.26	100-120	nd	10%	Steam Venting
51	Clamshell Dredge	82	50	0.75	75-90	nd	100%	Clamshell Dredge
52	Cutterhead (Suction) Dredge	89	50	0.75	85-95	nd	100%	Suction Dredge
53	Tugboat	82	50	0.75	80-90	nd	100%	Tugboat
54	Aircraft Auxiliary Power Unit (generator)	90	50	0.66	86-93	nd	100%	Aircraft APU
55	Gas Turbine Ground Power Unit (generator)	90	50	0.66	79-99	nd	100%	Turbine GPU
56	Gasoline Ground Power Unit (generator)	72	50	0.66	67-76	nd	100%	Piston GPU
57	Welder	70	50	0.50	nd	nd	75%	Welder
58	Concrete Saw	85	50	0.50	nd	nd	75%	Concrete Saw
59	Plate Compactor	75	50	0.75	nd	nd	75%	Plate Compactor

CONSTRUCTION EQUIPMENT NOISE GENERATION DATABASE

LOOKUP CODE	ITEM	DEFAULT REFERENCE dBA LEVEL	REFERENCE DISTANCE (feet)	ABSORPTION COEFFICIENT (dB/100 meters)	GENERAL dB RANGE FOR EQUIPMENT	GSA NOISE LIMITS (dBA at 50 ft)	DEFAULT % OPERATING TIME IN ACTIVE HOURS	SHORT NAME FOR HEADERS
60	Aerial Lift	75	50	0.50	nd	nd	65%	Aerial Lift
61	Belt Sander	70	50	0.75	nd	nd	65%	Belt Sander
62	Electric Hand Drill	74	50	0.75	nd	nd	50%	Power Drill
63	Paint Sprayer	81	50	0.75	nd	nd	75%	Paint Sprayer
64	Hammer Drill	90	50	1.40	nd	nd	65%	Hammer Drill
65	Pneumatic Percussion Drill	95	50	1.40	nd	nd	65%	Pneumatic Drill
66	Power Lawn Mower	66	50	0.75	nd	nd	90%	Lawn Mower
67	Mitre Saw	78	50	0.50	nd	nd	25%	Mitre Saw
68	Skill Saw	76	50	0.50	nd	nd	25%	Skill Saw
69	Tile Saw	77	50	0.50	nd	nd	25%	Tile Saw
70	Circular Sander	66	50	0.75	nd	nd	50%	Circular Sander
71	Router	71	50	0.50	nd	nd	25%	Router
72	Planer	70	50	0.50	nd	nd	35%	Planer
73	Table Saw	70	50	0.50	nd	nd	25%	Table Saw
95	placeholder row; insert added rows above	na	na	na	na	na	0%	not used

Notes: Available data indicate that some types of equipment frequently exceed noise limits adopted by GSA.
Auxiliary power units and ground power units included as additional portable generator examples.
APUs are typically 80 - 400 hp. Gas turbine GPUs are typically 200 - 600 hp. Piston (gasoline) GPUs are mostly in the smaller size ranges.
Data for welders, concrete saws, plate compactors, and aerial lifts are a best guess based on comparison to other items.

Noise generation data for construction equipment comes from various sources, including:

U.S. Environmental Protection Agency. 1971. Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances. (NTID300.1). Prepared by Bolt, Beranek and Newman. U.S. Government Printing Office. Washington, DC.

Gharabegian, A., K. M. Cosgrove, J. R. Pehrson, and T. D. Trinh. 1985. "Forest Fire Fighters Noise Exposure". Noise Control Engineering Journal25(3): 96-111.

Dennison, E. E., D. C. Kanistanaux, and S. Ying. 1980. "Outdoor Noise of Coal-Fired Power Plants". Noise Control Engineering14(1): 30-37.

Cowan, James P. 1994. Handbook of Environmental Acoustics. Van Nostrand Reinhold. New York, NY.

National Institute for Occupational Safety and Health. nd. NIOSH Sound Meter: How Loud is Your Workplace? Operator position data from NIOSH website (www.cdc.gov/niosh/noise/hptherm.html) extrapolated to 50-foot distance.

National Institute for Occupational Safety and Health. nd. Carpenters Noise Exposures. Operator position data from NIOSH website (www.cdc.gov/niosh/noise/chnoises.html) extrapolated to 50-foot distance.

Noise data for dredges and tugboats from:

U.S. Army Corps of Engineers San Francisco District and Port of Oakland. 1998. Final Environmental Impact Statement/Report, Oakland Harbor Navigation Inprovement (-50 Foot) Project. SCH No. 97072051.

Noise data for aircraft APUs and airfield GPUs from:

Noise Pollution Clearinghouse website online library [www.nonoise.org/library.htm]: United States Environmental Environmental Protection Agency Bibliography of Noise Publications, 1972 - 1982; in abstract listing for:
U.S Environmental Protection Agency. 1981. Evaluation and Abatement of Noise From Aircraft Auxiliary Power Units and Airport Ground Power Units. EPA-550/9-81-322. NTIS document PB82-1683360.

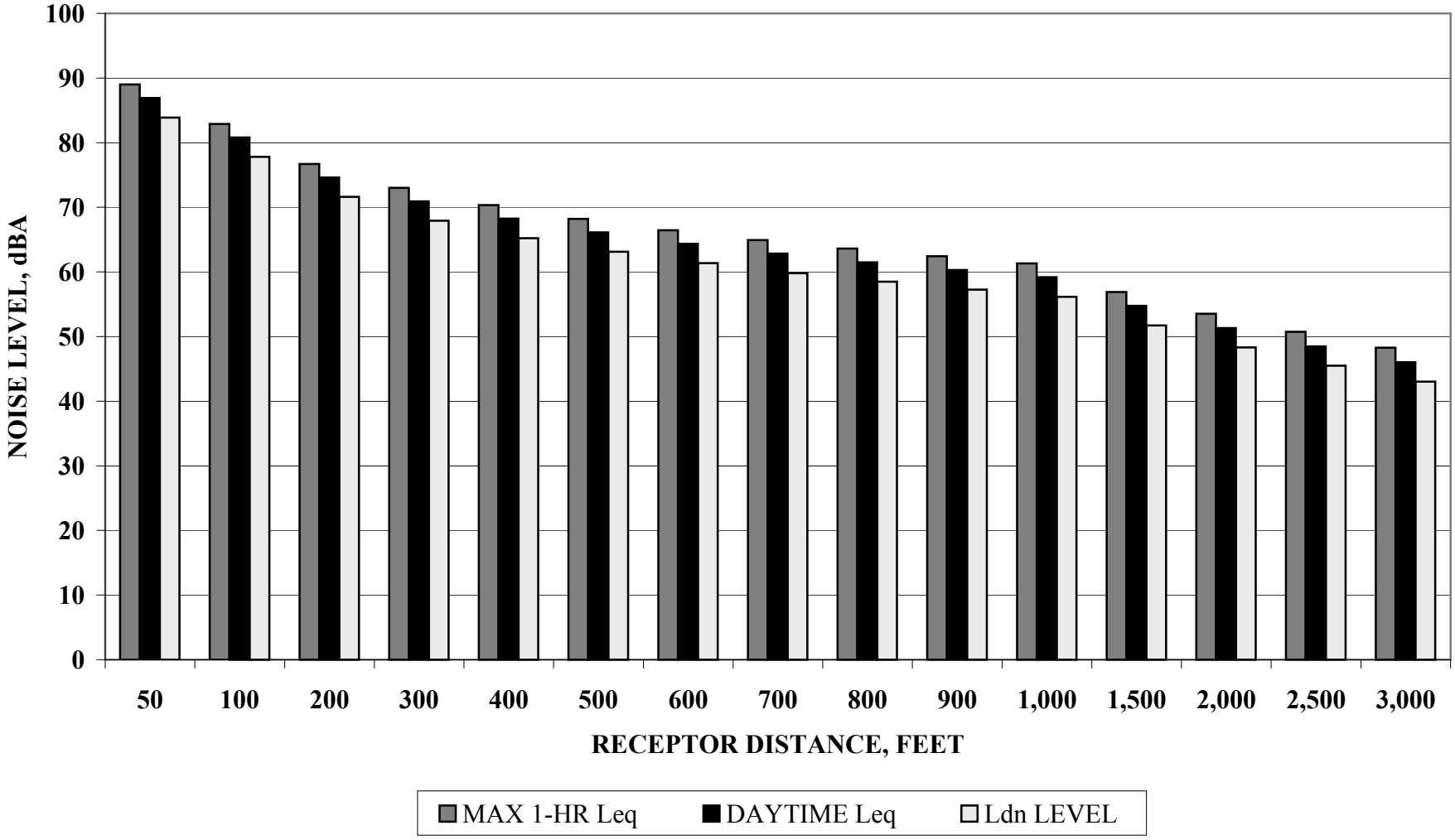
Standard GSA noise limits for federal contracts (as presented in Cowan 1994) based on:

U.S. General Services Administration. 1987. GSA Supplement to Masterspec, Section 01040. Washington, DC.

Atmospheric absorption coefficients calculated using available frequency spectrum data and procedures from:

Acoustical Society of America. 1978. American National Standard: Method for the Calculation of the Absorption of Sound by the Atmosphere. (ANSI S1.26-1978; ASA 23-1978). New York, NY.

CONSTRUCTION NOISE IMPACTS FOR VIRTUAL FIGHTING FACILITY: SITE PREPARATION



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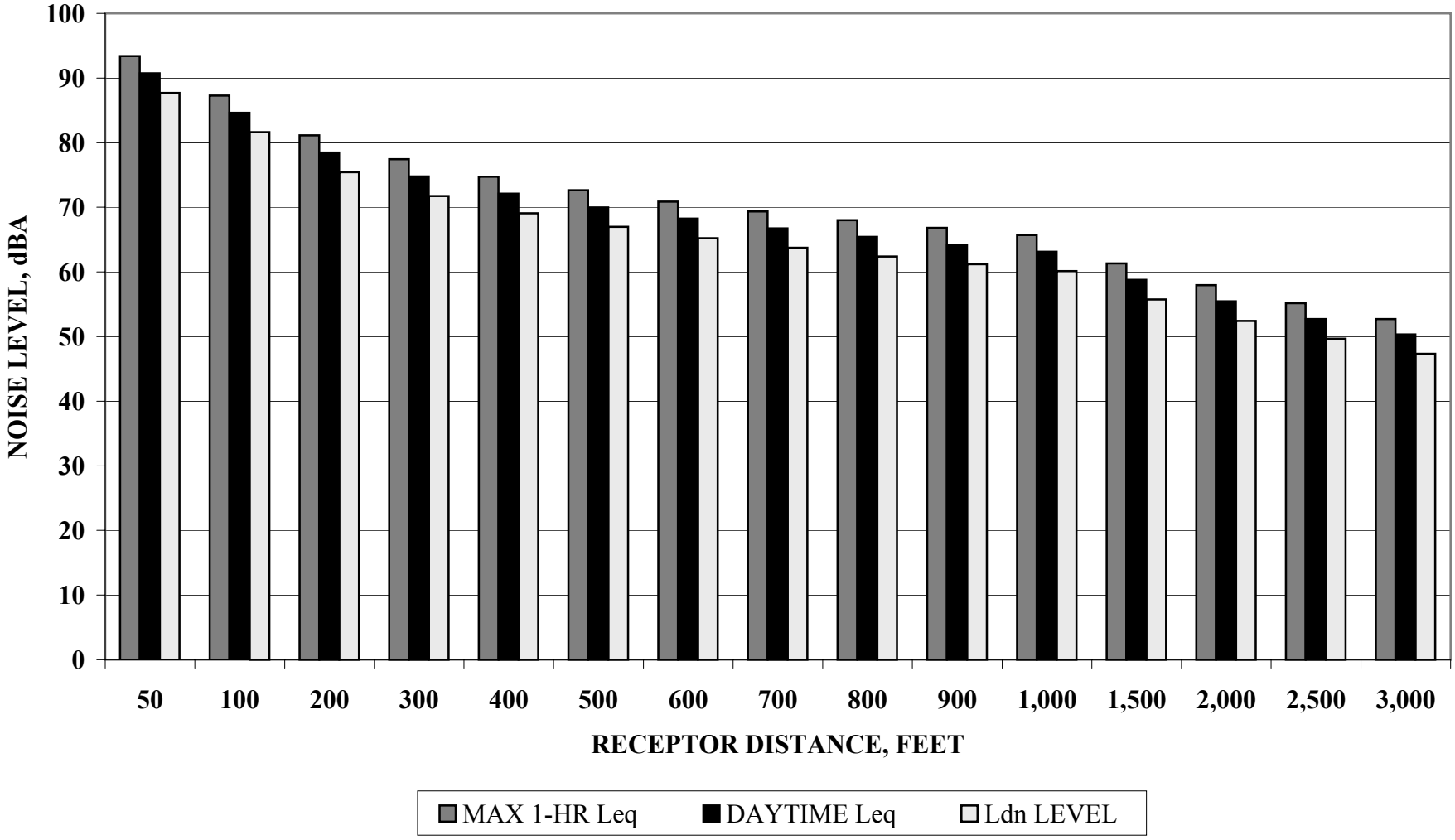

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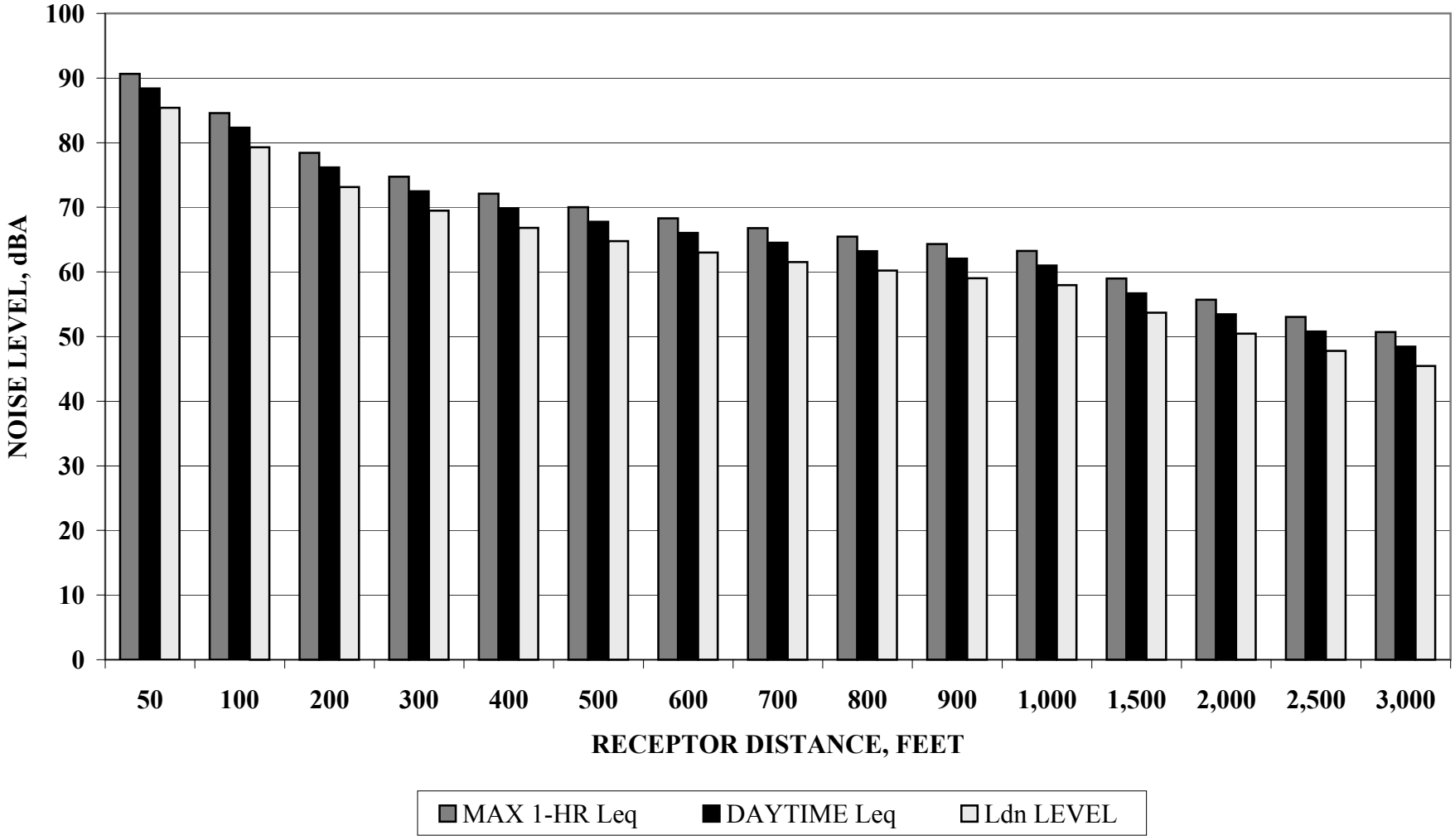

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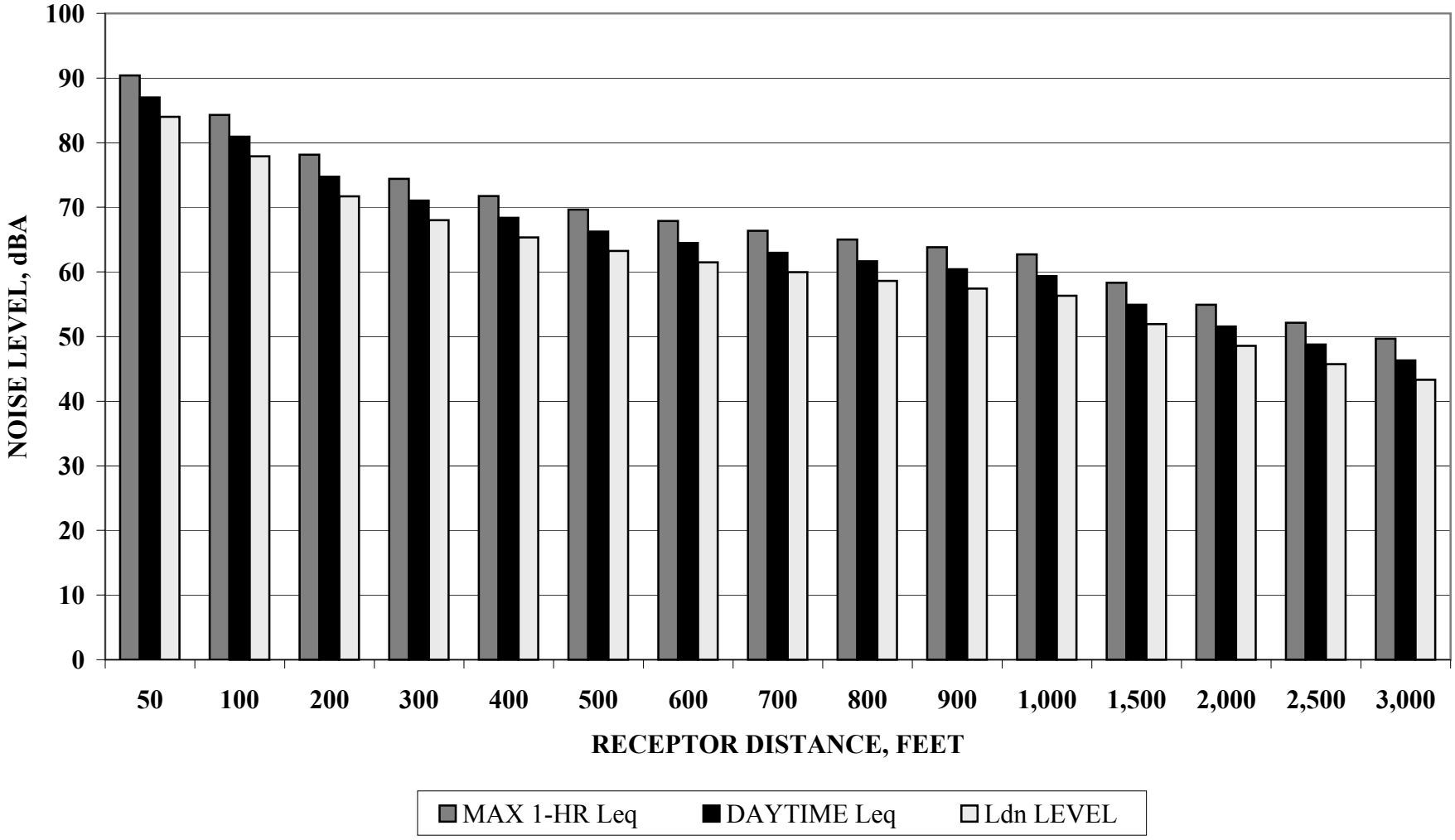

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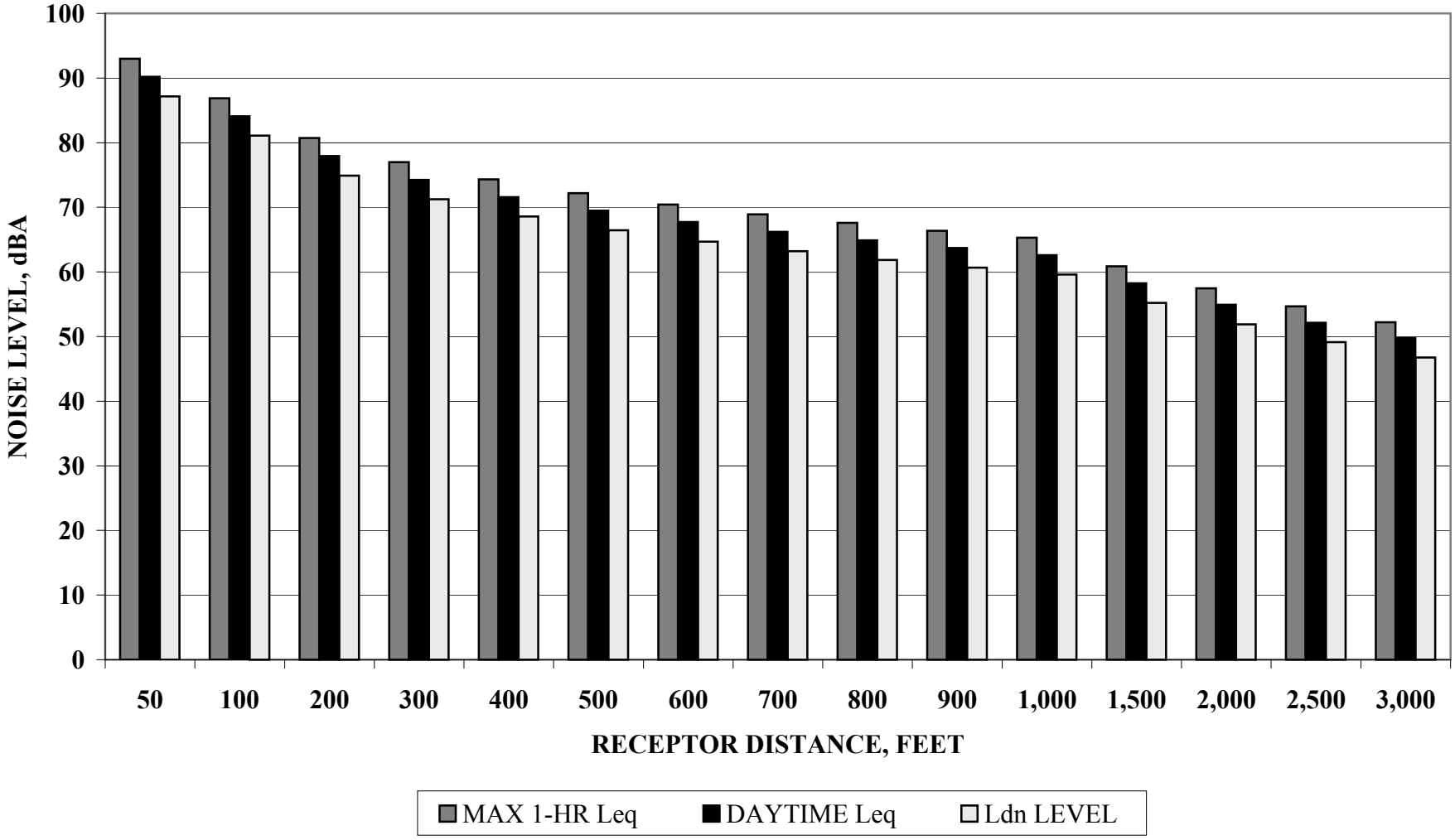

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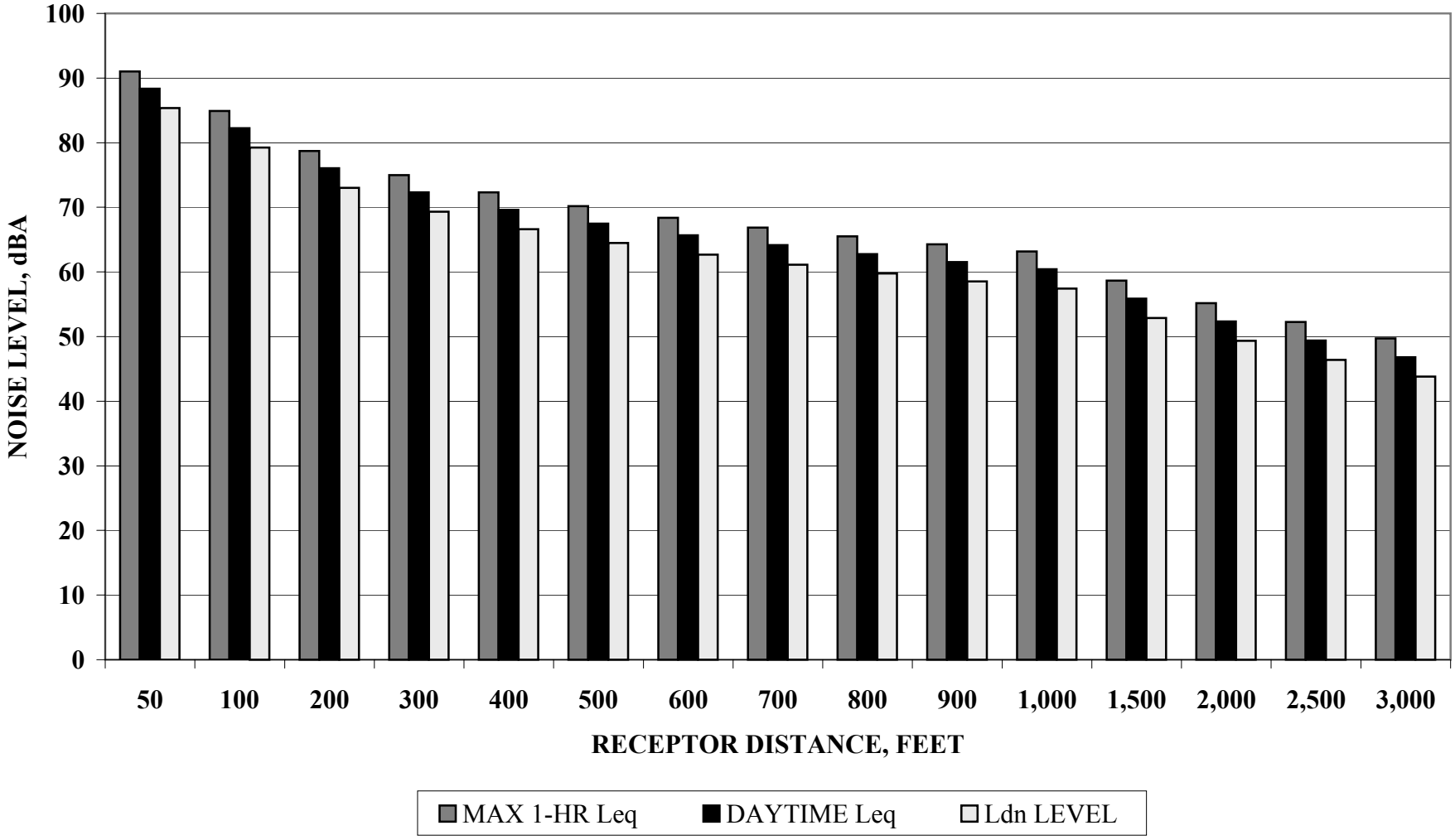

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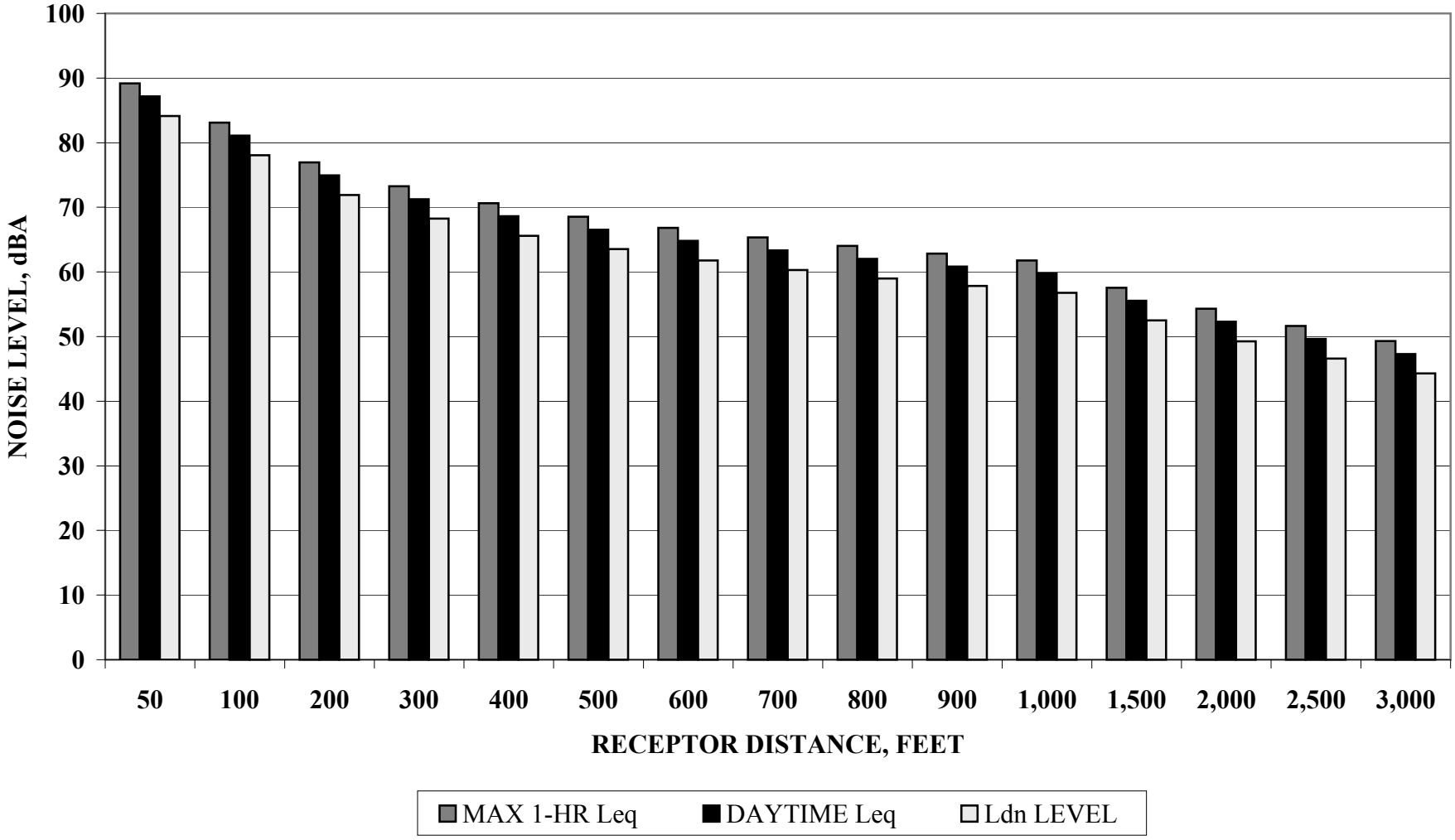

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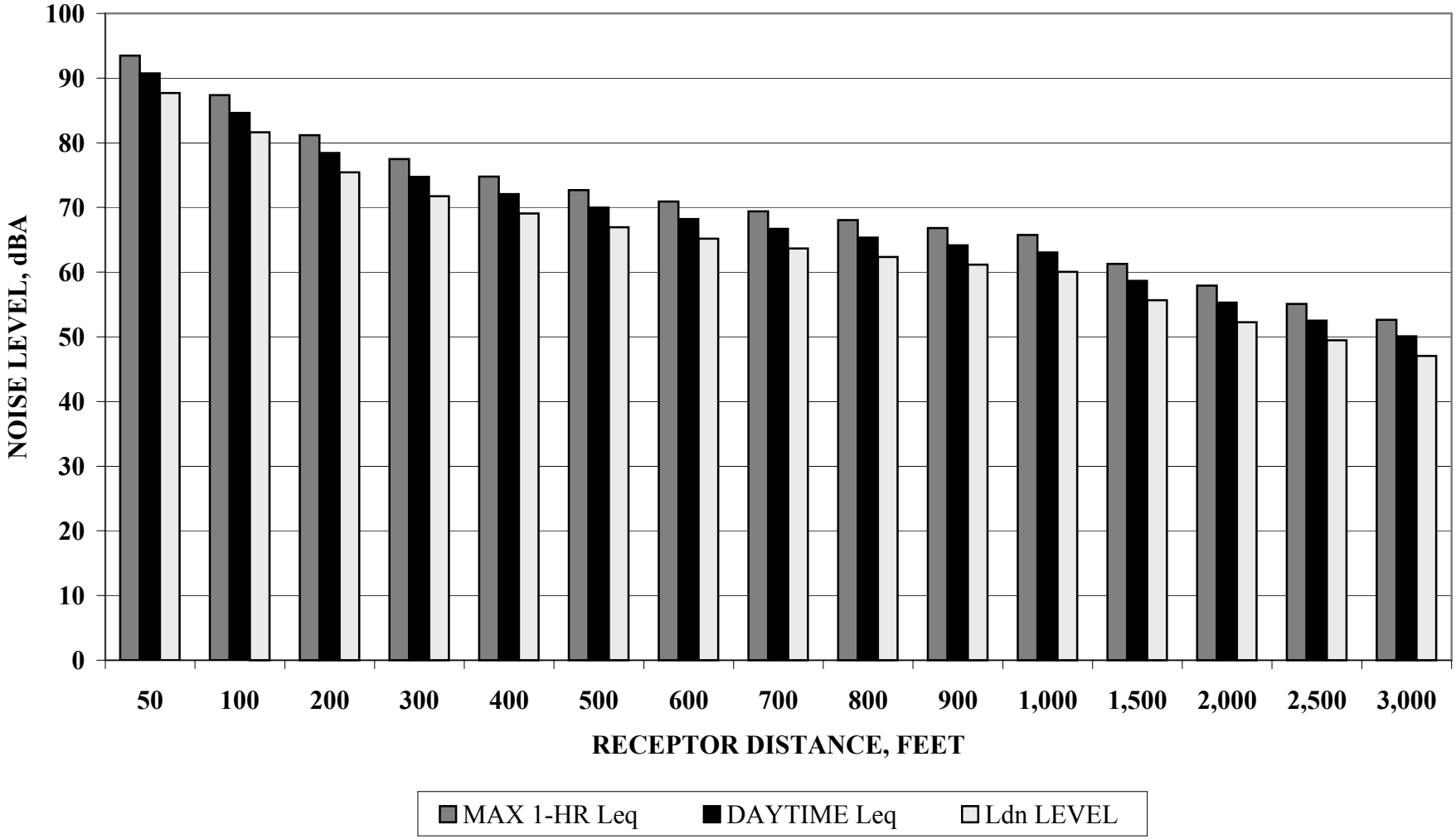

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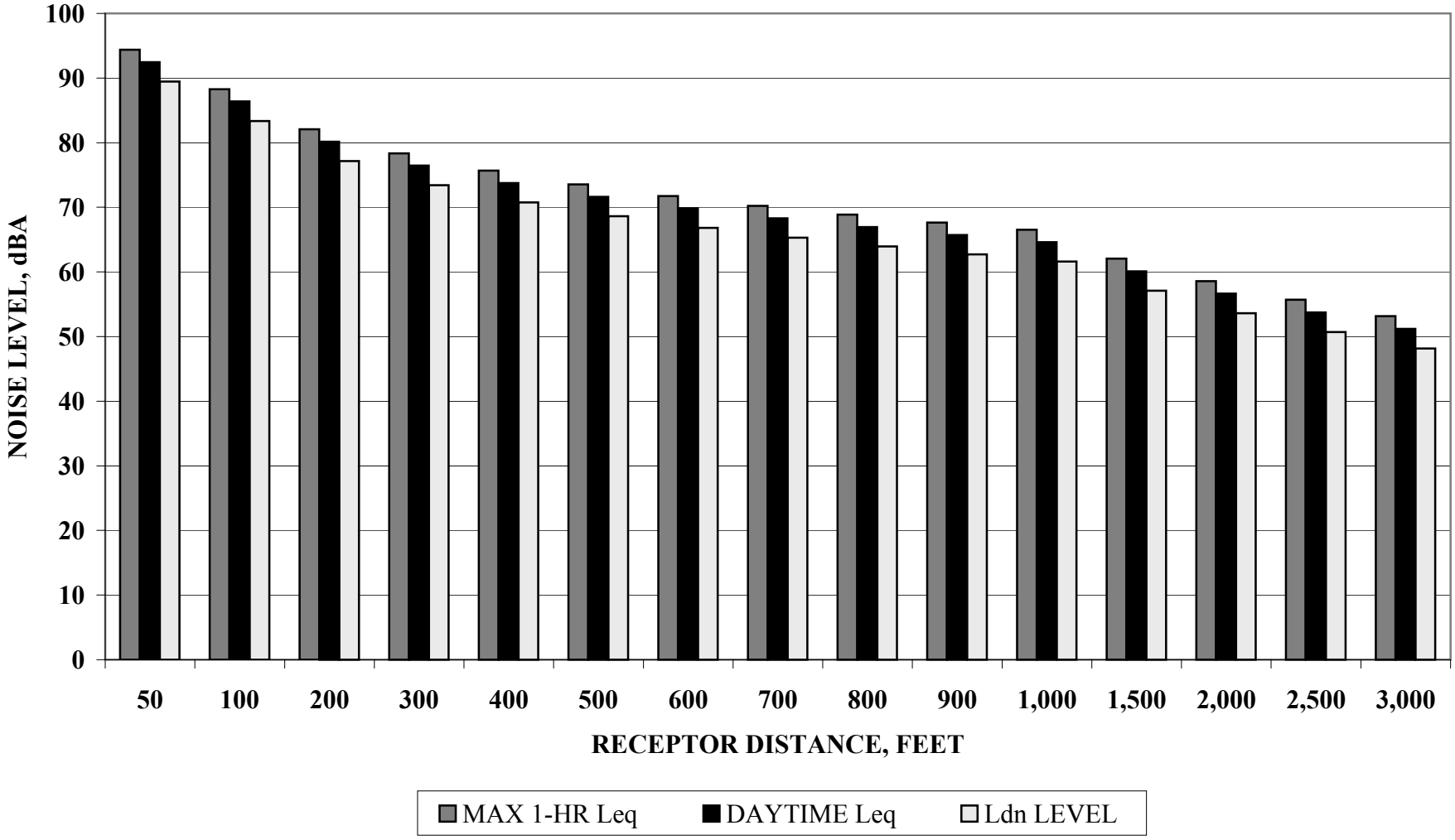
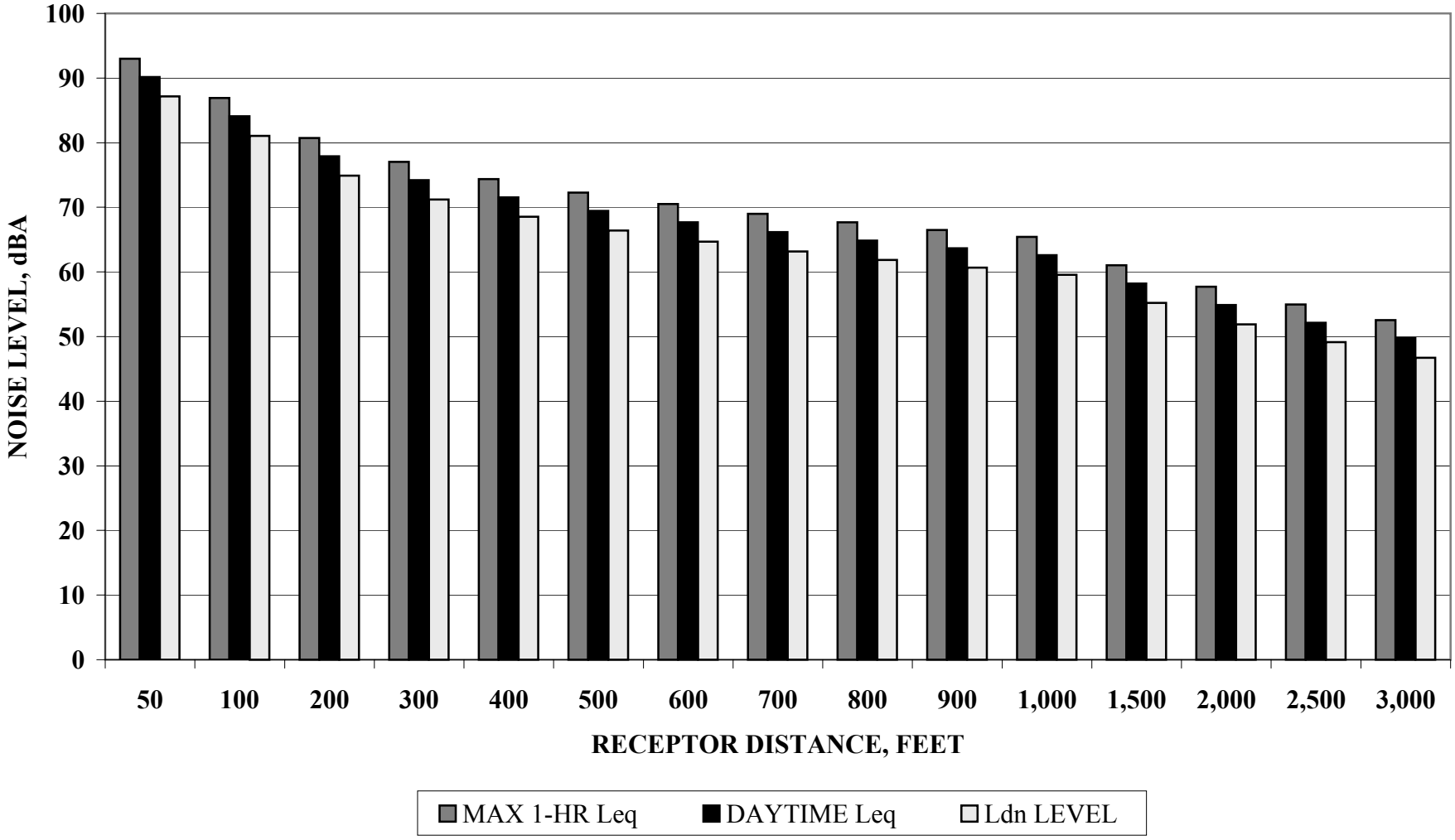


CONSTRUCTION NOISE IMPACTS FOR SCHOFIELD MOTOR POOL FACILITY: BUILDINGS, UTILITIES



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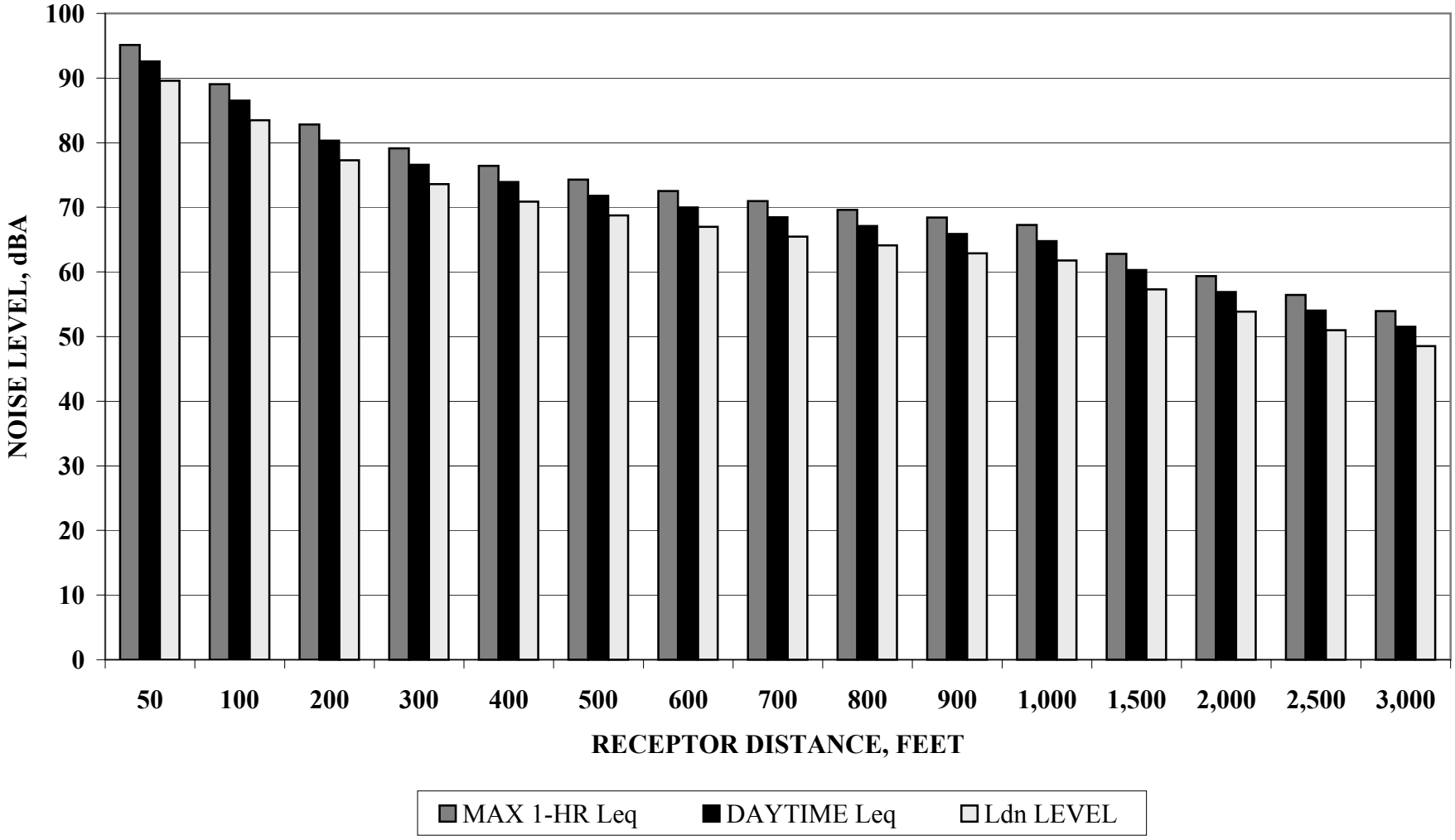

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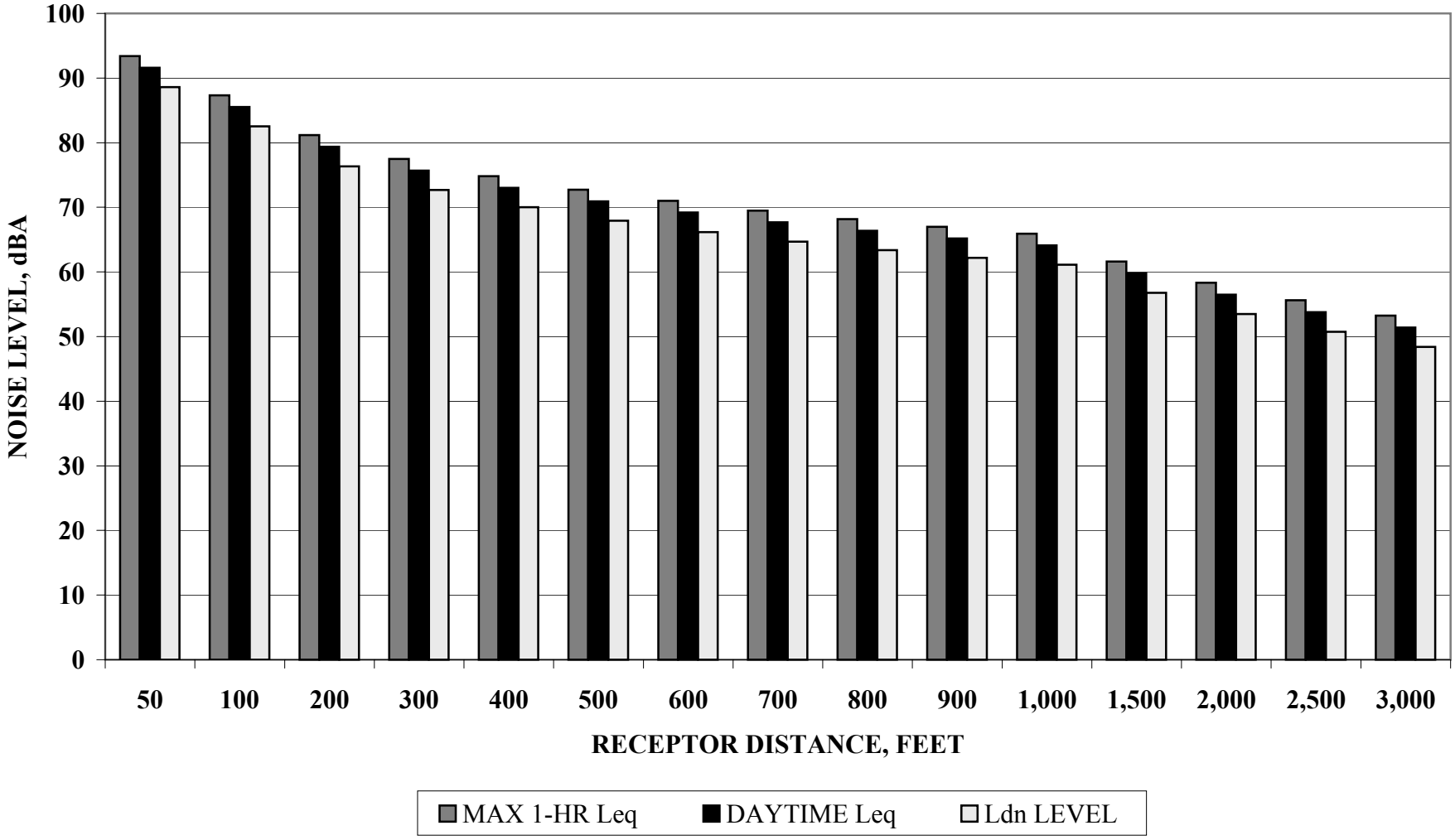

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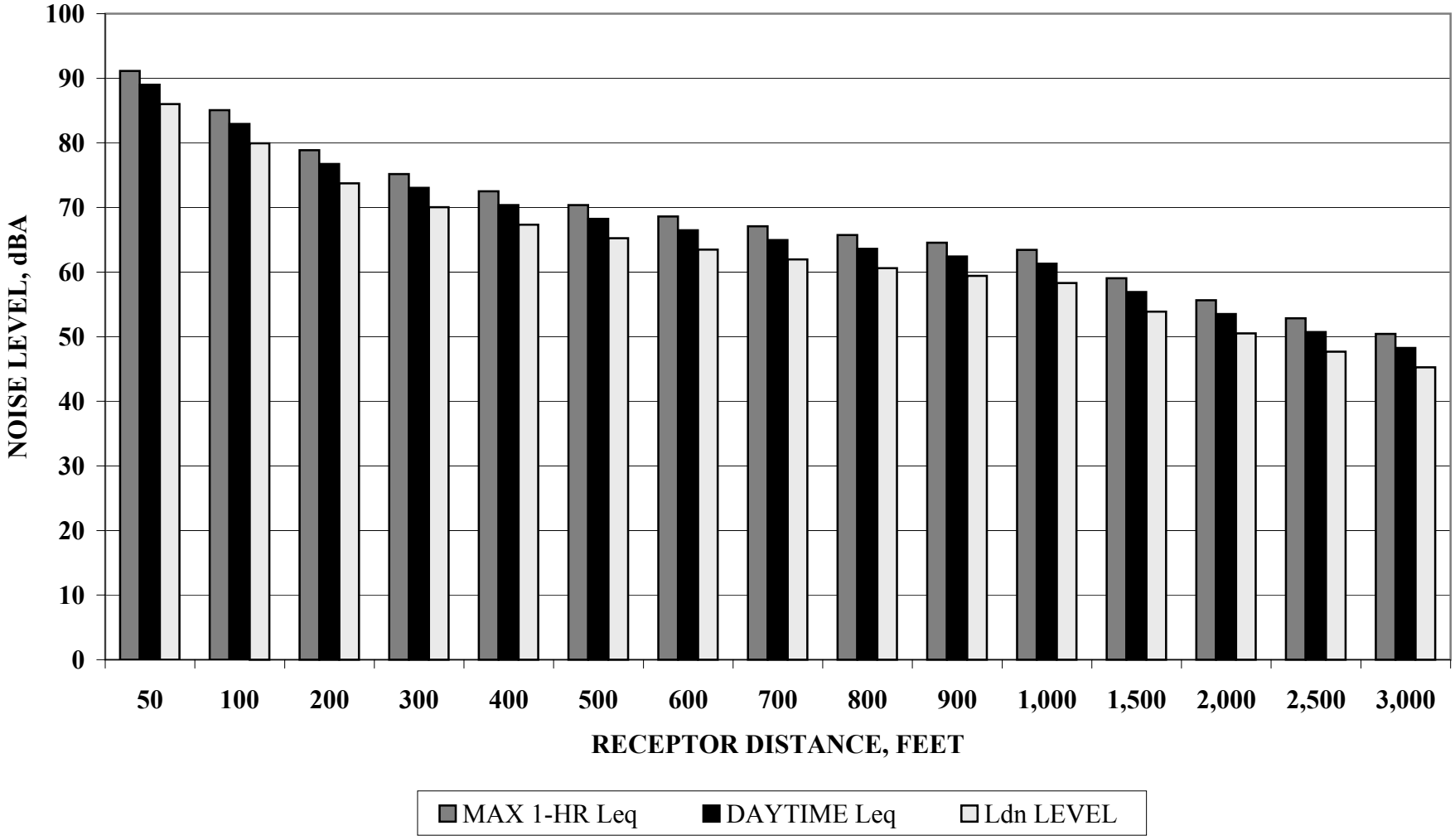

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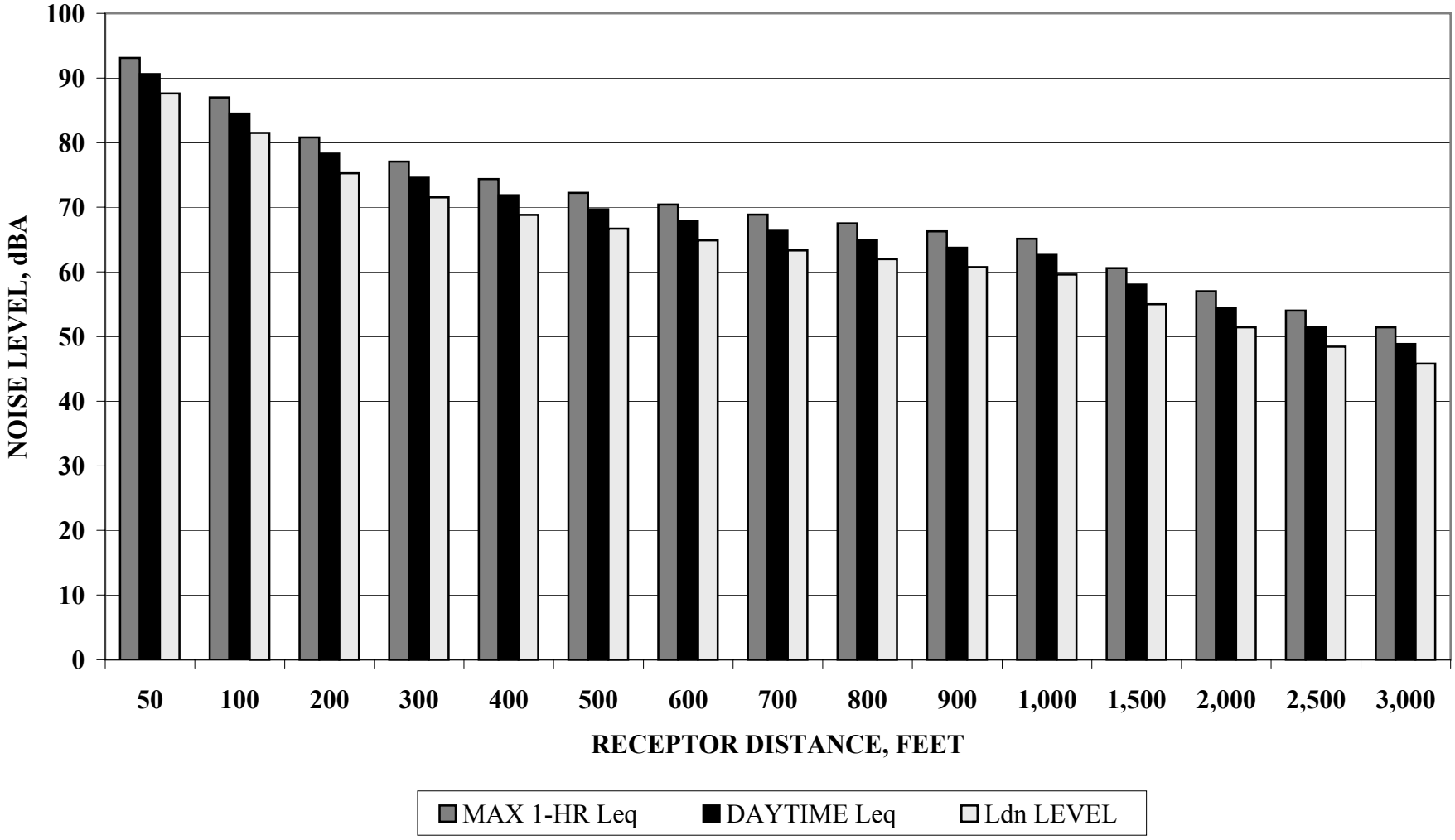
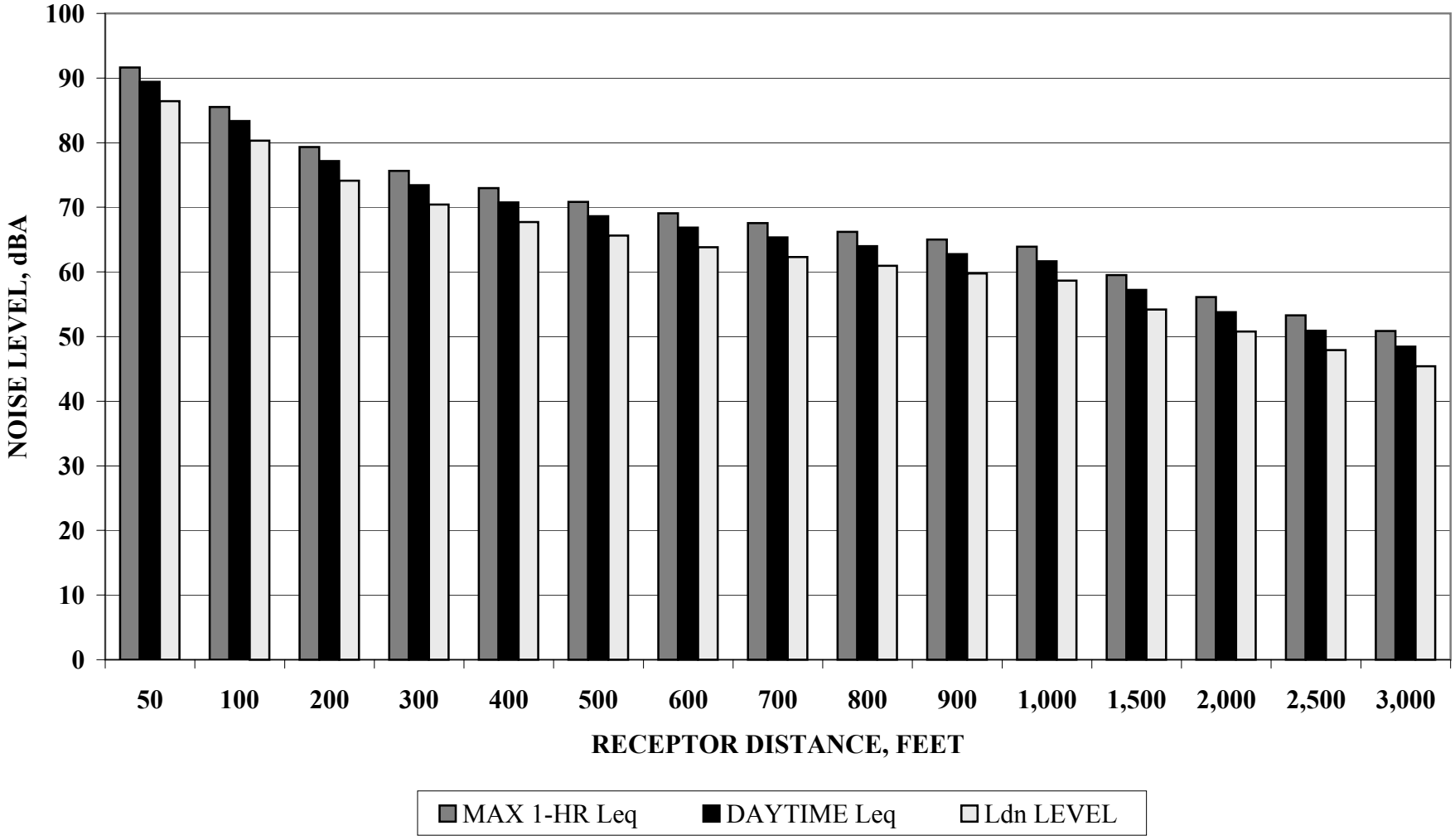


CONSTRUCTION NOISE IMPACTS FOR PTA
RANGE MAINTENANCE FACILITY: BUILDING DEMOLITIONS



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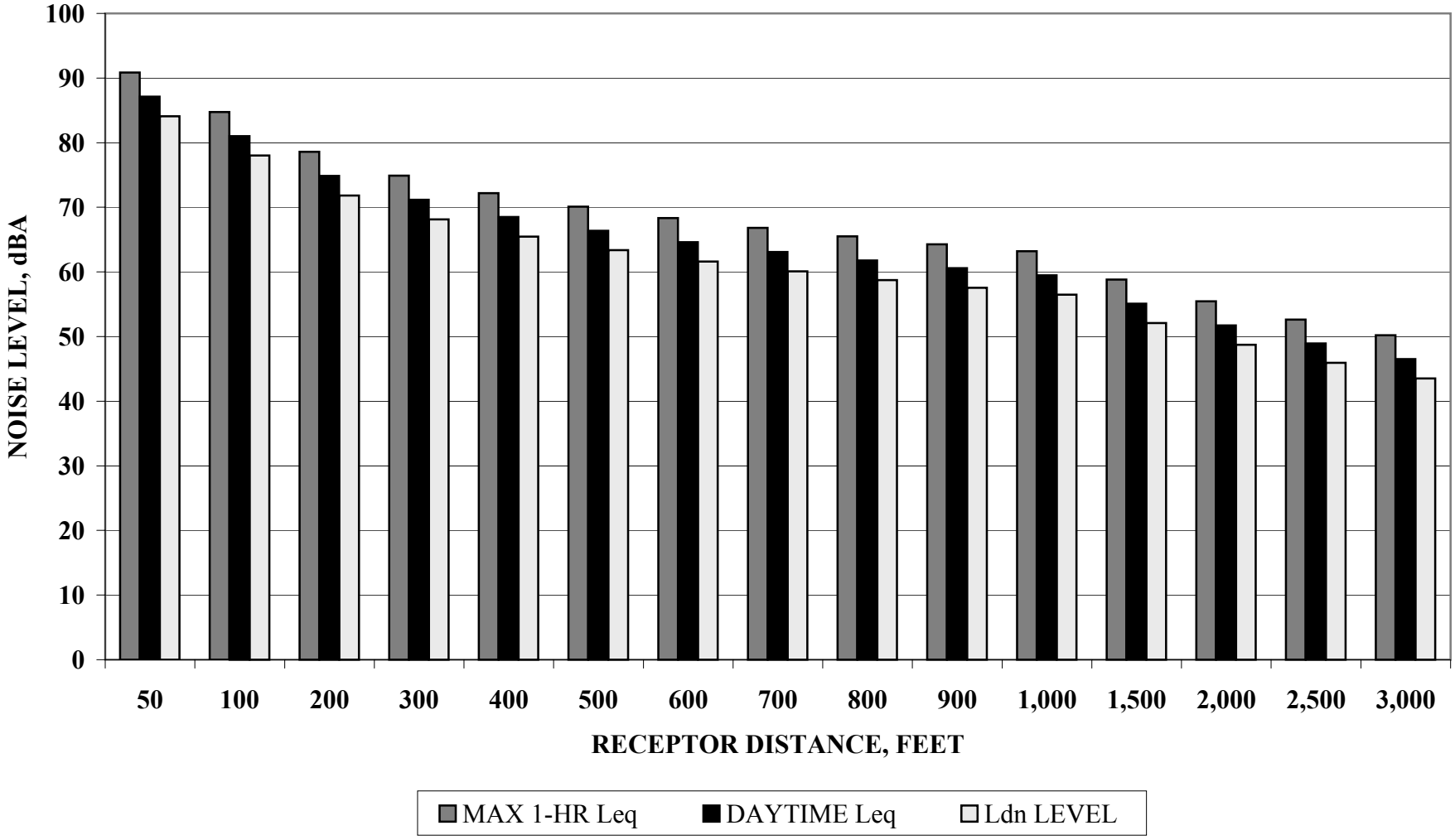

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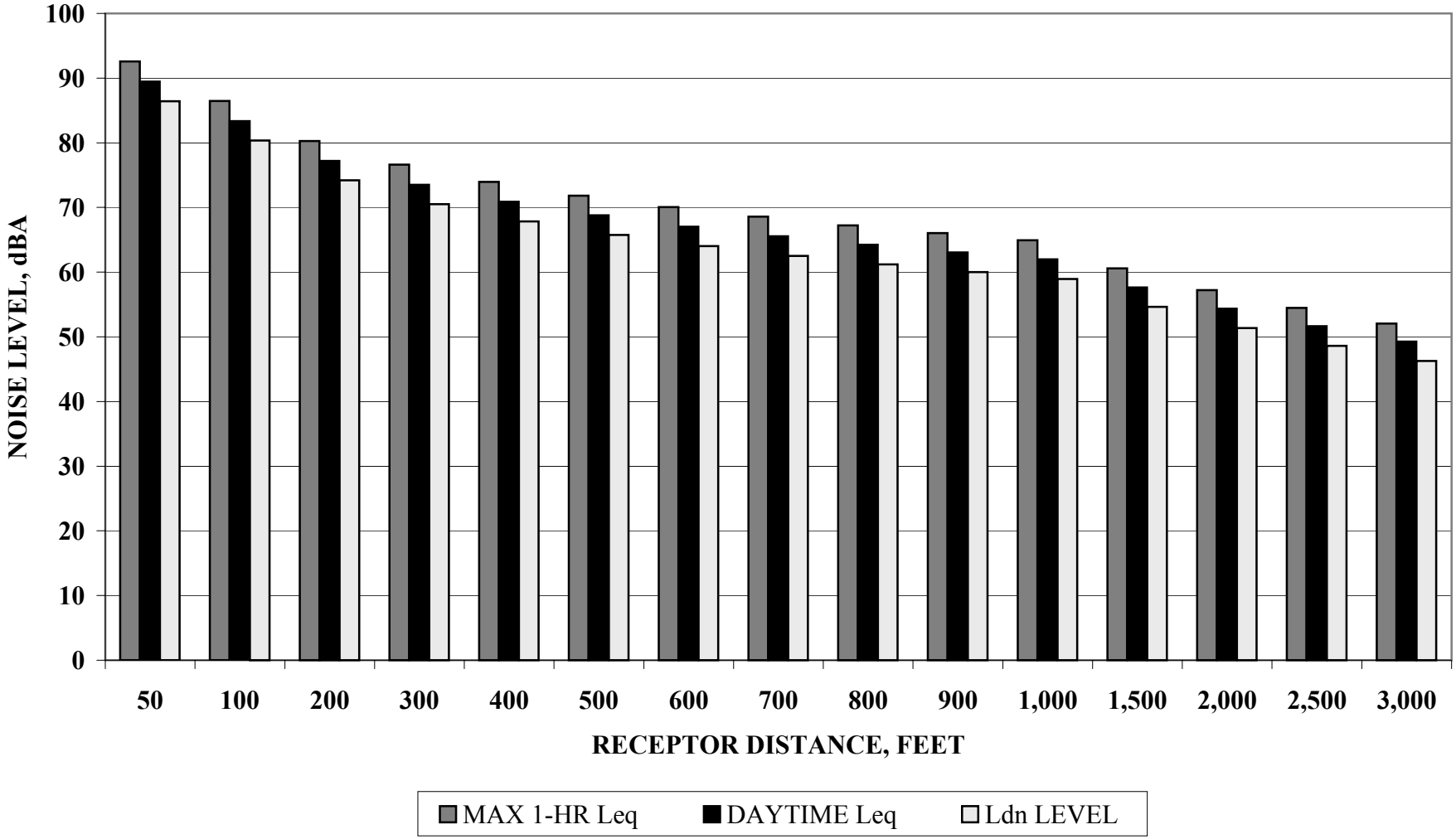
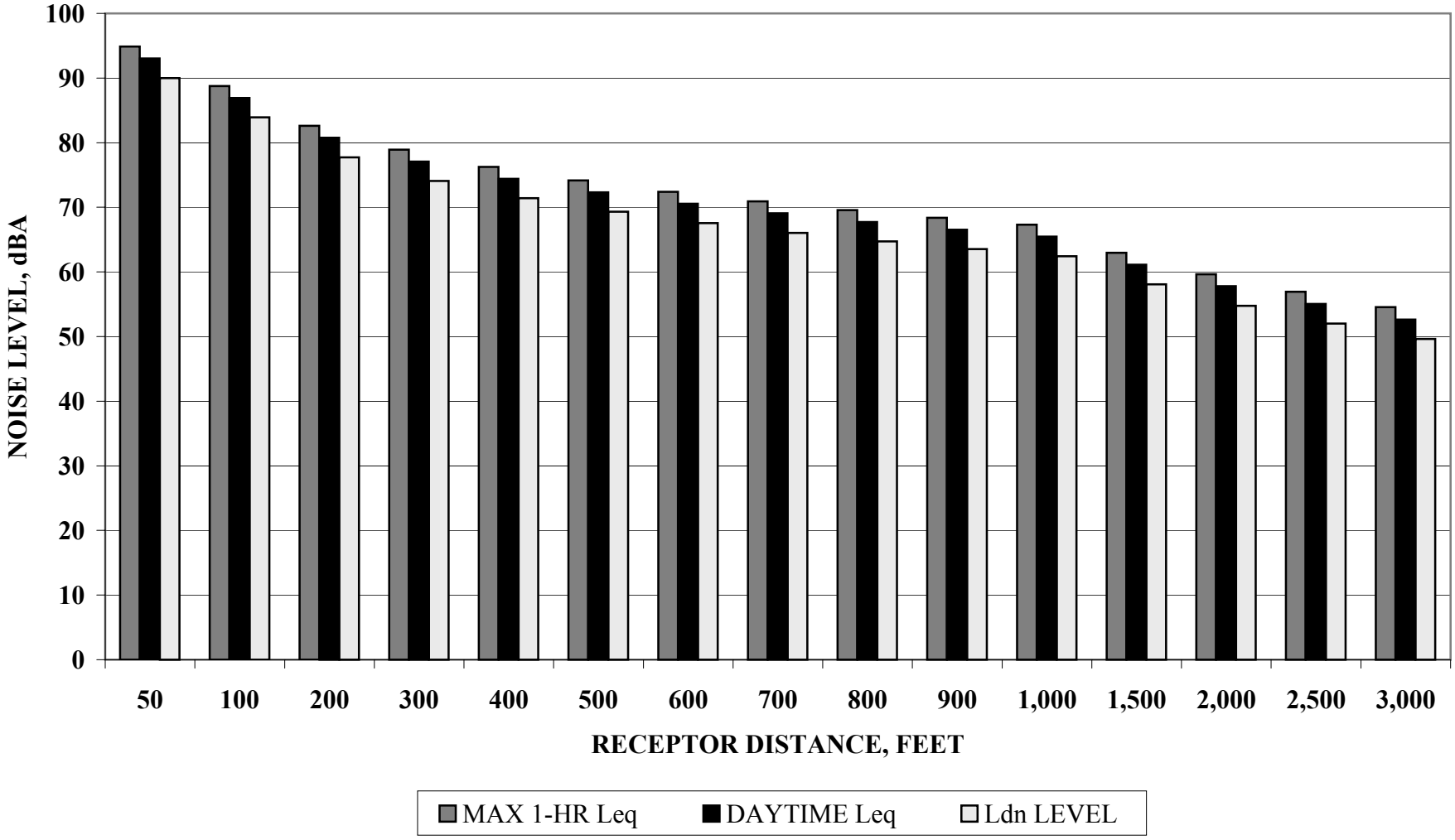
RANGE MAINTENANCE FACILITY: BUILDING SHELLS & PAVING



CONSTRUCTION NOISE IMPACTS FOR PTA
BRADSHAW AIRFIELD UPGRADE: PAVEMENT REMOVAL



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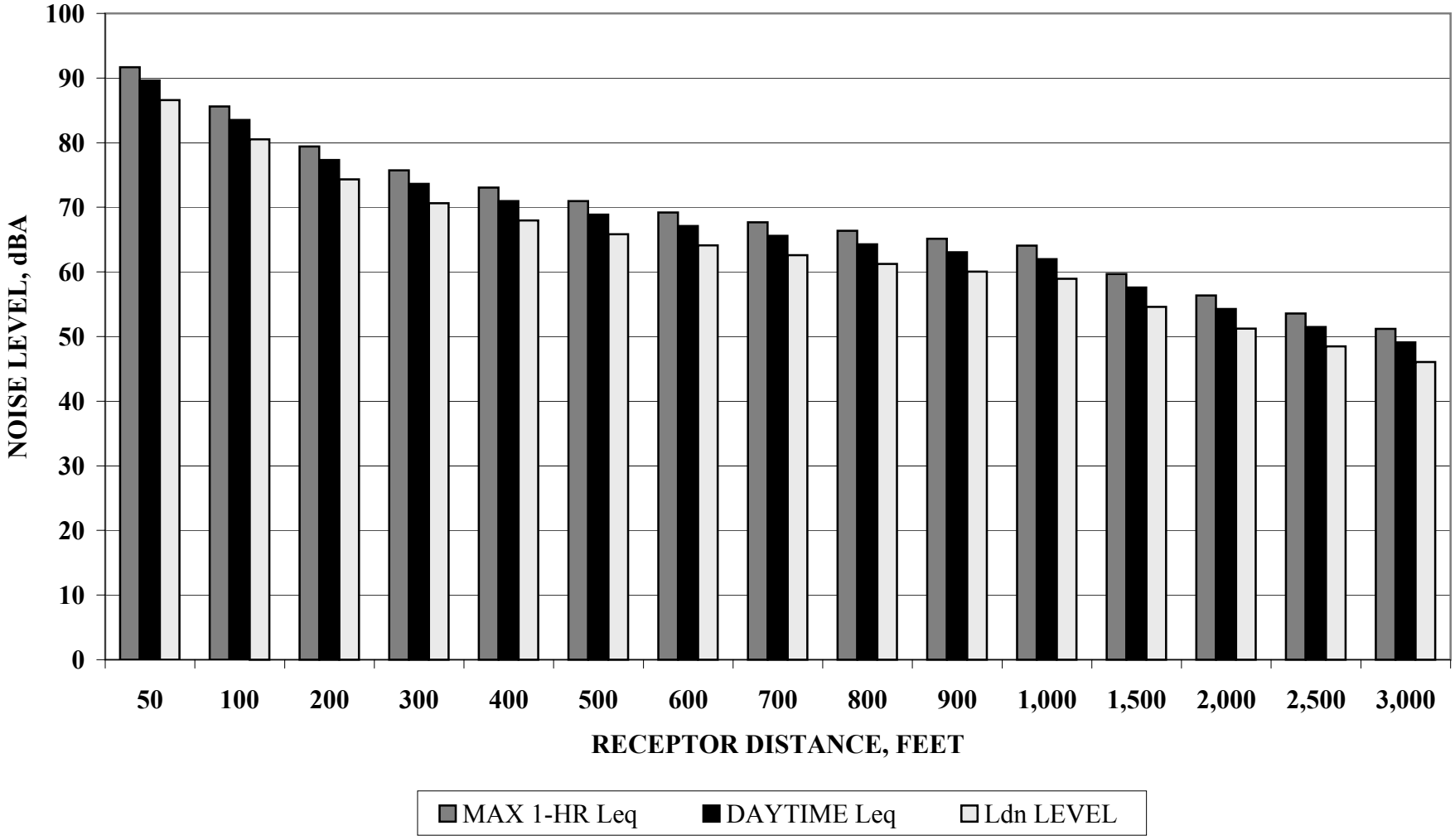
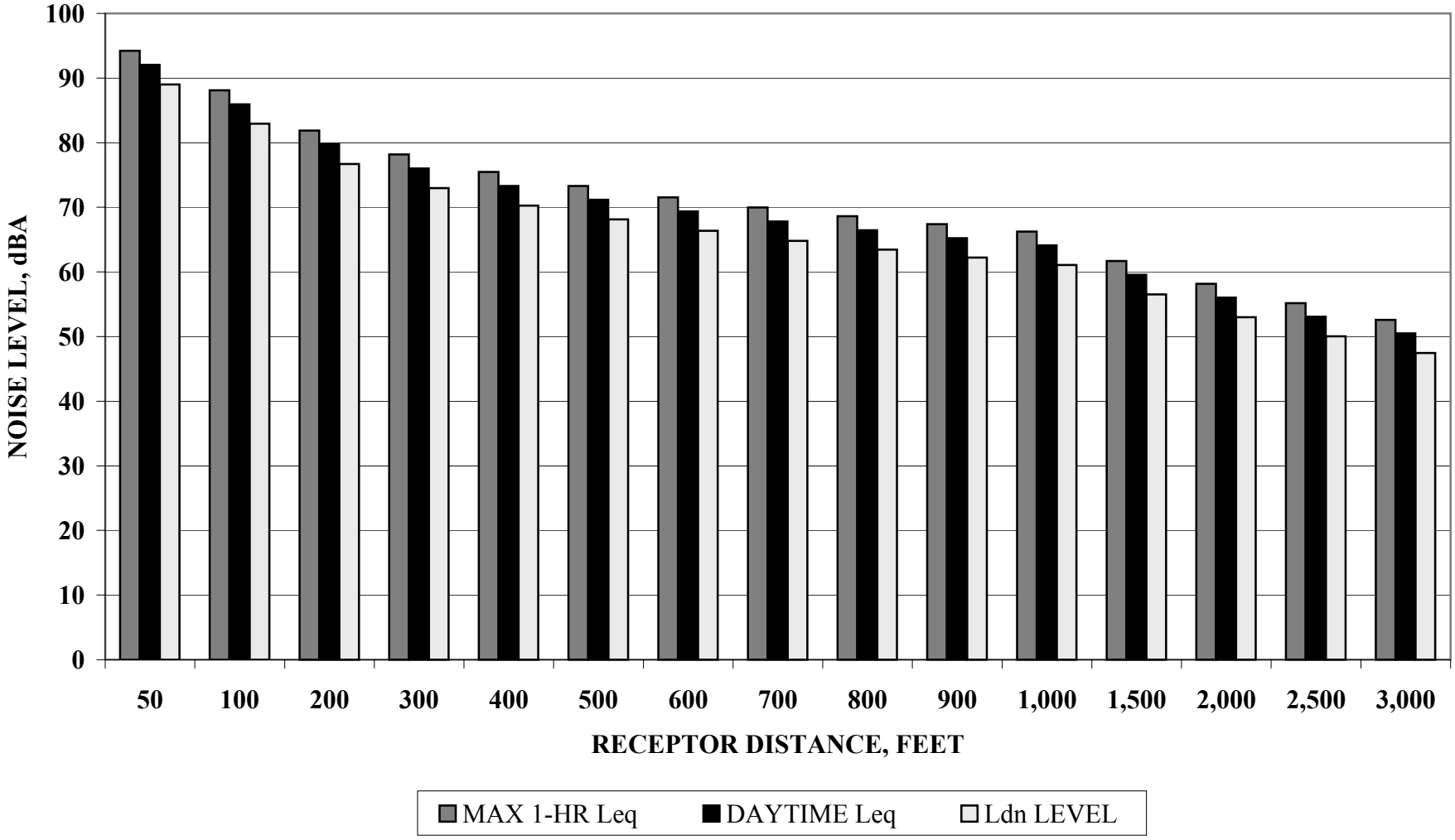


CONSTRUCTION NOISE IMPACTS FOR PTA
BRADSHAW AIRFIELD UPGRADE: REPAVING



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BRADSHAW AIRFIELD UPGRADE: BUILDING CONSTRUCTION