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**USER MANUAL**  
**TENANT QUESTIONNAIRE**  
**SURVEY**

November 1987

Canada

Public Works Canada  
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**USER MANUAL**  
**TENANT QUESTIONNAIRE**  
**SURVEY**

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17. Abstract <p>This manual describes the Tenant Questionnaire Survey, a simple approach to assessing occupants' ratings of office building performance. It is based on taking occupant surveys using a standard questionnaire. Occupants are asked to rate how certain aspects of the building interior affect their comfort and satisfaction at work. The ratings are compared to a norm that is derived from average ratings from previous building surveys, which are stored in a computer database. The result of the comparison indicates whether the building is performing within the same range as other office buildings or whether there are any aspects that require further investigation or action. The manual provides complete instructions for performing a Tenant Survey. All necessary documents are provided, including the questionnaire and sample letters. Users may perform the tabulation and analysis of ratings themselves using the worksheet and look-up charts provided, or can ask PWC Headquarters Technology to do it. All users are requested to send completed questionnaires to Public Works Canada Headquarters for input to the Tenant Survey database.</p>			
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## 1. INTRODUCTION

### 1. Purpose of the Manual

This Manual introduces a simple and easy-to-use approach to assessing office building performance, called the "Tenant Survey" method. It is based on occupants' ratings of a building in the form of a simple questionnaire. The manual provides step-by-step procedures for carrying out a Tenant Survey.

The method is based on a comparison of a building's average rating by its occupants with a norm derived from other buildings already rated using the same technique. The result of each survey is a "Building Survey Profile" comprising scores for seven factors, or dimensions: Thermal Comfort, Air Quality, Office Noise Control, Spatial Comfort, Privacy, Lighting, and Building Noise Control. The score for each dimension can be compared to the normative score.

For instance, a Tenant Survey might be done in response to occupants' complaints regarding the building noise in their office. If the assessment shows that the level of building noise (from HVAC systems, for example) is rated by the sampled occupants as no worse than the norm, the facility manager can plan investigative action according to this normal building rating.

### 2. Intended Audience

The Tenant survey method is being introduced to PWC managers, who may need to evaluate building performance. PWC Regions can use the method to respond promptly to occupants' complaints. Questionnaire scores will help facility managers to target building and rate priorities for preventative maintenance and building repairs.

The method provides a strategic basis for planning building changes and a structure for setting long-range priorities for building improvement. For instance, space planners can use the method to evaluate changes made in office layout and to improve existing spatial layouts. Project managers and design staff can use Building Survey profiles to help them plan and design new space.

## 1. INTRODUCTION

For each environmental area surveyed by the questionnaire, the PWC Building Performance Group in the Technology directorate developed testing techniques that range from simple to complex. The Tenant Survey method was designed to be compatible with these instrumentation tests. For instance, it can be used in conjunction with small scale hand-held instrument tests designed to troubleshoot building problems.

### 3. How to Use the Manual

The remainder of this manual is in four chapters:

Chapter 2 describes the Tenant Survey concept, explains how the assessment works and offers useful applications for the results. Managers who are considering carrying out a Tenant Survey assessment will find this chapter useful in evaluating whether the method is suited to their needs.

Chapter 3 describe the theoretical basis of the method. This chapter is intended only for users who are interested in the statistical basis of the sampling technique.

Chapter 4 gives step-by-step implementation procedures for administering a Tenant Survey, with checklists for managers and investigators. The documents needed to perform the survey are provided in the Appendices.

Chapter 5 describes the type of results that can be expected. It explains how they are interpreted and used to improve building performance and to solve problems. This chapter also identifies useful applications for the building performance knowledge yielded by an assessment.

## 2. TENANT SURVEY METHOD

### 1. Description

The Tenant Survey method uses the judgements of building occupants to provide a quick overview of an office environment. A sample of building users is asked to assign ratings to a set of 22 environmental conditions. For each respondent in the sample, these ratings are summarized into seven groups called dimensions (Thermal Comfort, Air Quality, Office Noise Control, Spatial Comfort, Privacy, Lighting, and Building Noise Control). The dimension scores are averaged across respondents to yield a single mean score on each dimension for the building.

Analysis of data from five surveys of typical large PWC office buildings determined that the seven dimensions represent the most important aspects of occupants' experience of the interior of the office building.

Each building surveyed yields its own mean score on each of the seven dimensions, called the "Building Survey Profile." The profile can then be compared, dimension by dimension, to the "norm" or average profile derived from buildings already rated.

This comparison between a building's profile of seven dimension scores and the normative profile of scores is called the "Tenant Survey Assessment."

### 2. Applications

Dimension scores that are below the norms are an indication that the building's performance is below average and that remedial action may be required. The building could be improved to a level comparable to known buildings on that dimension, or to a higher desirable level.

As assessment may show, for example, that the lighting dimension in an office building is rated worse by its occupants than lighting in other PWC office buildings. Facility managers then have a basis for further examination of the lighting environment in that building.

As another example, managers may have been receiving complaints about ventilation conditions in a building. They might determine from the Building Survey Profile that air quality in the building is rated about the same as the norm for indoor air quality in other buildings. As a result, the facility manager may decide not to make ventilation improvements a priority even though the norm for air quality is low generally.

## 2. TENANT SURVEY METHOD

### 3. Benefits

The Tenant Survey method makes use of a cumulative database derived from surveys of PWC buildings, which is the product of a detailed and lengthy survey and data analysis. This minimizes the need for collecting large amounts of data. Small amounts of critical information are acquired from each building and compared to the existing database in a pre-established way.

As each building is assessed, the ratings are added to the database. This upgrades and enlarges the basis on which the normative scores for each dimension are computed. The survey data is thus a valuable resource that adds to the validity of further assessments.

Analysis and interpretation of results can be achieved quickly using one of two options. Results can be analyzed by a simple manual method using look-up charts that show at a glance what a building's scores mean in terms of follow-up action; or the questionnaires can be sent to PWC HQ for data entry and analysis.

The Tenant Survey Method is quick and easy to administer. It takes only a few minutes to complete a questionnaire. The survey can be conducted in a morning and the analysis can be ready the next day. The result is a quick and inexpensive profile of office building performance that can be put to use for troubleshooting building problems and setting priorities for maintenance work.

### 3. RATIONALE FOR QUESTIONNAIRE ASSESSMENT

#### 1. The Theory

The Tenant Survey Method is based on the analysis of approximately 3,000 survey questionnaires completed by occupants of PWC Office buildings in the period between early 1983 and Spring 1984. A detailed account of this work is contained in a technical report that describes the derivation of the approach.\*

In a Tenant Survey assessment, a single building's score may be compared to database norms for each of seven dimensions. This determines whether the target building is above or below normal on each dimension.

Each dimension comprises three or four critical environmental conditions relating to office interiors. The core of the assessment system is occupants' ratings of these conditions, on a scale of 1 through 5. On this standard scale, 5 is good or comfortable; 1 is poor or uncomfortable; and the other three points represent in-between ratings.

These environmental conditions are referred to as scales. There are 22 scales, which make up the seven dimensions. Each scale is formatted on the questionnaire as follows:

Temperature					
Comfort . . . .	1	2	3	4	5
	BAD				GOOD

A carefully selected random sample of occupants in the building targeted for study is given the questionnaire and asked to complete it immediately. From the results, an average score is calculated for each of the seven dimensions and compared to the norm.

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\*R. Dillon and J.C. Vischer, "Derivation of the Tenant Questionnaire Survey Method: Office Building Occupant Survey Data Analysis, AES/SAG 1-4:86-9." The report is available from the PWC Architectural and Engineering Services Documentation Centre.

### 3. RATIONALE FOR QUESTIONNAIRE ASSESSMENT

#### 2. Normative Scores

Ratings on the 22 scales are combined into seven Tenant Survey dimensions: Thermal Comfort, Air Quality, Office Noise Control, Spatial Comfort, Privacy, Lighting, and Building Noise Control. The Building Survey Profile is derived from the mean scores for each of the seven dimensions.\*

The seven dimensions and their component scales are shown in Table 1. The dimensions are described in more detail in Appendix A.

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\*The technical report explains the relationship between the 22 scales on which occupants' ratings are elicited, and the seven Tenant Survey dimensions for which building performance scores are calculated.

### 3. RATIONALE FOR QUESTIONNAIRE ASSESSMENT

TABLE 1: DIMENSION SCORES

Dimension	Scales	Score
Thermal Comfort	Temperature comfort	TOTAL/3
	How cold it gets	
	Temperature shifts	
Air Quality	Ventilation comfort	TOTAL/3
	Air freshness	
	Air movement	
Office Noise Control	Noise distractions	TOTAL/3
	Background office noise level	
	Specific office noises	
Spatial Comfort	Furniture arrangement	TOTAL/4
	Amount of space	
	Work storage	
	Personal storage	
Privacy	Visual privacy	TOTAL/3
	Voice privacy	
	Telephone privacy	
Lighting	Electrical lighting	TOTAL/3
	How bright lights are	
	Glare from lights	
Building Noise Control	Noise from air systems	TOTAL/3
	Noise from office lighting	
	Noise from outside the building	

### 3. RATIONALE FOR QUESTIONNAIRE ASSESSMENT

For example, the Air Quality Dimension score for each occupant is obtained by adding up the ratings (from 1 to 5) given to the scales for Ventilation, Air Freshness, and Air Movement. The mean, or average, of all these ratings is found by dividing the total by 3, resulting in an Air Quality dimension mean score between 1 and 5.

A Building Survey Profile contains a score between 1 and 5 for each of the seven dimensions. Table 2 shows the normative scores for each dimension. These are the database averages to which survey results are compared. They are listed in descending order.

TABLE 2: NORMATIVE DIMENSION SCORES

Dimension	Normative Score
Building Noise Control	4.4
Spatial Comfort	3.3
Lighting	3.3
Office Noise Control	2.9
Thermal Comfort	2.8
Air Quality	2.3
Privacy	2.3

Note that there are differences in how occupants rate the seven dimensions in "normal" buildings. On average, people rate Building Noise highest (mean = 4.4) and Privacy and Air Quality lowest (mean = 2.3), with the other dimensions rated in between.

Dimensions below a median rating of 3, particularly Air Quality and Privacy, suggest that buildings tend to be somewhat unsatisfactory to tenants in regard to these dimensions.

Each comparison between a building's scores on a dimension and the norm for that dimension provides information on whether the building is normal, above normal, or below normal for that dimension. The degree of deviation from normalcy provides a basis for action.



### 3. RATIONALE FOR QUESTIONNAIRE ASSESSMENT

#### 3. Sample Size

The size of the sample depends on statistical theory rather than on the total number of occupants in the building. To be valid, the sample size should not be smaller than 30. An optimum size is between 35 and 50.

In general, the sample size need not be larger than 75 respondents because there is no significant increase in survey results with larger samples. If there are fewer than 75 occupants in a building, it is best to sample all of them.

#### 4. PROCEDURES

##### 1. Checklist for Project Managers

The following checklist itemizes steps to follow when organizing a Tenant Survey. Conduct the survey BEFORE carrying out any building performance tests to avoid influencing occupants' perceptions and responses.

##### 1 Prepare and issue introductory and cover letters

Ten days before the study, issue an introductory letter to ALL building occupants. The letter should explain the purpose of the study; who is doing it; the planned time for distribution of questionnaires; and the reason for asking a sample of occupant, not all occupants, to respond. It should be signed by an appropriate level of authority within the Department. A sample introductory letter is provided in Appendix B.

Prepare a cover letter that will be distributed with the questionnaire to randomly-selected occupants. An example of a cover letter is provided in Appendix C.

##### 2 Select occupant sample size

Choose a sample size between 30 and 75, preferably between 35 and 50. For most buildings a sample will be taken from all occupants using the sampling method described in section 3, next. The only exceptions will be when it is necessary to give the questionnaire to all building occupants; or when there are special circumstances requiring that the questionnaire be given only to a sample taken from a subgroup of occupants.

Give questionnaires to ALL building occupants only when:

- the building population is 75 or less;
- all occupants demand questionnaires. In this case, the completed questionnaires should be numbered and sampled following the sampling procedures described in section 3, next.

The occupant sample should represent the building as a whole. For this reason you should not select the sample from a group of occupants unless there is a

#### 4. PROCEDURES

YY: Floor ID number

Enter the floor number on which each questionnaire is issued, in case of follow-up verification or error.

ZZ: Workstation ID number

Enter a workstation number derived from the Random Number Table.

A complete ID number for workstation number 47, on the second floor of building number 09, would be: 09/02/47.

#### 5 Train investigators

Train investigators on survey procedures. These are contained in the Investigator's Checklist (next clause).

Assign investigators to floors or specific areas of the building and give each investigator:

- the appropriate questionnaires matching the workstation numbers in the assigned area;
- a floor plan or sketch of the area showing the location of the workstations.

#### 6 Receive completed questionnaires

On the day of the survey, check each bundle of questionnaires delivered by the investigators. Ensure that EVERY questionnaire is accounted for at the end of the day, whether completed or not.

#### 7 Conduct analysis

Two options are available for analysis of survey results:

Conduct a manual analysis then send questionnaires to PWC HQ Technology for entry of results to the Tenant Survey database. Follow the procedures outlined in section 3 to perform a manual analysis.

#### 4. PROCEDURES

Send questionnaires to PWC HQ Technology for analysis and entry of results to the Tenant Survey database. Instructions are provided in section 4.

#### 2. Checklist for Investigators

##### 1 Distribution procedures

When distributing questionnaires, tell each respondent:

- that it takes only a few minutes to complete the questionnaire and you will be back in about an hour to collect it;
- to complete the questionnaire as soon as possible after receiving it;
- to refrain from discussing the ratings with colleagues until the questionnaires have been collected;
- to leave the completed questionnaire on the desk.

##### 2 Collection procedures

The validity of the Tenant Survey procedure depends on a high rate of questionnaire completion. Do everything possible to ensure that EVERY occupant selected for inclusion in the sample completes a questionnaire.

Leave respondents alone while they complete the questionnaires.

Return every hour to collect completed questionnaires and to remind non-respondents that only a few minutes of their time is required.

At the end of the day, collect all uncompleted questionnaires as a result of absence or refusal to participate.

Return all questionnaires to the Project Manager or designated person. Never leave completed questionnaires lying around, since this would be a breach of the respondent's anonymity.

#### 4. PROCEDURES

### 3. Manual Analysis and Interpretation

Important: When the manual analysis is complete, send the questionnaires to PWC HQ Technology so that the ratings can be added to the Tenant Survey database.

#### 1 Calculate dimension scores

On each questionnaire, add the total scores for each dimension.

Use the Tenant Survey Worksheet (Appendix F) to calculate the mean scores for each dimension.

#### 2 Compare to norms

Select the Tenant Survey Profile (Appendix G) that matches the sample size for the survey.

For each dimension, mark the mean dimension score (calculated on the worksheet) with an "X".

For each dimension, note whether the score falls in the white area, the hatched area or the shaded area.

- **White area:** within the norms

Any dimension score that falls within the white area can be considered normal.

The dimension score may be above the mean or below it, but as long as a dimension score is within the white area it is considered normal in the sense that it is consistent for that dimension with other buildings - no better, and no worse.

When a score falls within the white area, no further action or investigation is required for that dimension, if the manager is satisfied with this normal performance.

- **Hatched area:** marginally outside the norm

The hatched area represents building results that are ambiguous. Buildings falling in this area for a dimension may or may not be normal on that dimension.

#### 4. PROCEDURES

If a score from a particular survey does fall within one of the hatched areas, it will not always mean that the building is outside the norm for that dimension. It is difficult to conclude whether a building that falls within the hatched area is normal or not.

A score that falls in the hatched area below the norm indicates that there could be some cause for concern. Further performance testing is recommended.

- **Shaded area:** outside the norm

Building dimension scores that fall in one of the shaded areas are **not** consistent with the norms.

If the score falls in the shaded area above the mean, the building can be considered better than average for that dimension. No further action or testing is required, except perhaps to determine the cause of the above-average rating.

If the score falls in the shaded area below the mean, the building can be considered lower than average for that dimension. Further investigation and testing would be needed to define the cause of the problem in order to plan remedial action.

#### 4. PWC HQ Analysis and Interpretation

Complete and send the Tenant Survey Analysis Request sheet (Appendix H) along with all the completed questionnaires to PWC HQ at the address provided on the sheet.

PWC HQ Technology will provide users with:

- Tenant Survey dimension scores;
- an analysis of how each dimension score compares with the norm for that dimension;
- an interpretation of the amount of deviation for each dimension. (Two levels of deviation are computed; one is marginally outside the norm, the other is substantially outside the norm);

#### 4. PROCEDURES

For each score, a recommendation for action is given that reflects the level of deviation and whether the deviation is higher or lower than the norm. Such recommendations would be "Needs follow-up performance testing," "Needs immediate improvement," or "No further investigation required," or "Is unusually excellent".

## 5. INTERPRETATION AND FOLLOW-UP

### 1. Meaning of the Normative Approach

Use of the Tenant Survey method does not indicate whether performance of a building is acceptable in an absolute sense. The fact that a building is in the normative range on a dimension does not imply that the building is "good" or "acceptable" on that dimension; only that it is comparable to other known PWC office buildings. The normative approach does not make any value judgement as to whether the norm is acceptable.

For example, that the normative rating on Air Quality is only 2.3 on the 5-point scale. Finding that the Air Quality score for a building is "normal" indicates that the people in the building rate its air quality about the same as people in the normative group, that is, low.

Since the norms are quite low for Air Quality and Privacy, and to a lesser extent for Thermal Comfort and Office Noise Control, improvements may be warranted even if a building falls within the norms on any of these dimensions.

### 2. Importance of Dimensions

Not all the dimensions are equally important. Some have a greater effect on workers' comfort and productivity than others. Although all the Tenant Survey dimensions have some effect on workers' satisfaction and productivity, the same dimensions are not necessarily as important to one person as they are to another.\* The most important dimensions for productivity and satisfaction are shown in Table 3.

TABLE 3: IMPORTANT DIMENSIONS FOR WORKER PRODUCTIVITY AND SATISFACTION

Productivity	Satisfaction
1. Spatial Comfort	1. Spatial Comfort
2. Office Noise Control	2. Privacy
3. Privacy	3. Lighting

\*The relative importance of dimensions to productivity and satisfaction is explained in the technical report.



## 5. INTERPRETATION AND FOLLOW-UP

The most important dimension for worker satisfaction AND productivity is Spatial Comfort. This means aspects of furniture comfort and workstation design and layout, including storage, size of workspace, and furniture arrangement.

The next most important dimension for productivity is Office Noise Control, meaning the unwanted and disturbing sounds caused by people using office equipment and by people's voices. This is followed by Privacy, meaning the amount of visual and speech privacy that workers feel they have.

The second most important item for people's satisfaction is their Privacy, and next is Lighting. Feeling that a workspace is private increases a person's overall satisfaction. Good lighting in the work area means not too bright or overlit, and no glare.

### 3. Follow-up Actions

Each Tenant Survey dimension score will yield a result that falls into one of five categories. Each category indicates a certain follow-up action should be considered. These are shown in Table 4.

TABLE 4: RESULTS AND FOLLOW-UP ACTION

Results	Action
Normal	None required, if the norm is satisfactory.
Marginally above norm	None required.
Marginally below the norm	Further investigation to determine whether the dimension should be considered normal or not.
Above the norm	More information may be of interest.
Below the norm.	Further investigation is needed to pinpoint the source of the problems.

## 5. INTERPRETATION AND FOLLOW-UP

A plan of action may be devised that assigns priorities for action on the basis of this information. Possible options are described next.

### 1 Collect further information

You may feel that more information is needed in order to solve the problem. If, for example, Lighting is well below the norms in the shaded area, it would be necessary to know whether this is due to a problem of window glare, non-functioning overhead fixtures, heavy Visual Display Terminal (VDT) use and glare, or some combination of these.

You may be able to obtain more information from a simple walk-through inspection or from simple instrument measurements. In some cases, you may feel that more technical investigations are warranted.

### 2 Plan for building maintenance and repair

Develop a plan for maintenance and repair that corresponds to Tenant Survey priorities. Tenant Survey dimensions that fare badly according to the norms can be taken care of first; those dimensions that seem to be less of a problem can be relegated to a second level of urgency. A third level of urgency, taking a long-term view, is those Tenant Survey dimensions on which the norm itself is lower than 3, particularly Air Quality and Privacy.

### 4. User Feedback

The Tenant Survey method is intended as a preliminary diagnostic tool to help set priorities for further tests, maintenance and repairs, or building upgrades. PWC HQ Technology would welcome any comments on the usefulness of the method.

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Appendix A:

**TENANT SURVEY DIMENSIONS**

## TENANT SURVEY DIMENSIONS

**Thermal Comfort**

The Thermal Comfort Dimension scales are Temperature Comfort, where 5 is Good and 1 is Bad; How cold it gets where 5 is Comfortable and 1 is Too Cold; and Temperature Shifts, where 5 is Constant and 1 is Too Frequent.

**Air Quality**

The Air Quality dimension incorporates scales pertaining to temperature and ventilation. They are Ventilation Comfort, where 5 is Good and 1 is Bad; Air Freshness, where 5 is Fresh Air and 1 is Stale Air; and Air Movement, where 5 is Circulating and 1 is Stuffy.

**Office Noise Control**

The Office Noise Control dimension does not incorporate traditional measures of the acoustic environment such as acoustic privacy and communication conditions, but pertains to intrusive or disturbing noise levels. The scales are Noise Distractions, where 5 is Not a Problem and 1 is Bad; Background Office Noise Level, where 5 is Comfortable and 1 is Too Noisy; and Specific Office Noises of Voices and Equipment, where 5 is Not a Problem and 1 is Disturbing.

**Spatial Comfort**

The Spatial Comfort dimension scales are Furniture Arrangement, where 5 is Good and 1 is Bad; Amount of Space in your Workspace, where 5 is Good and 1 is Bad; Work Storage, where 5 is Adequate and 1 is Insufficient; and Personal Storage, where 5 is Adequate and 1 is Insufficient.

**Privacy**

The Privacy Dimension incorporates Voice Privacy and Telephone Privacy, which are often considered a factor in dimension of acoustic comfort; and Visual Privacy, often considered as part of workstation layout. For all three scales, 5 is Good and 1 is Bad.

TENANT SURVEY DIMENSIONS

Lighting

The Lighting dimension deals with the amount of light in the workspace. Its component scales are Electrical Lighting where 5 is Good and 1 is Bad; How Bright Lights Are, where 5 is Not Too Bright and 1 is Too Much Light and Glare from Lights, where 5 is No Glare and 1 is High Glare.

Building Noise Control

The Building Noise Control dimension is interesting because one would have expected it to be an aspect of the Office Noise Control dimension. It emerged as a separate experience for building occupants. Its scales relate to noise generated by the building itself rather than by its occupants. They are Noise from Air Systems, where 5 is Not a Problem and 1 is Disturbing; Noise from Office Lighting, where 5 is Not a Problem and 1 is Buzz/Noisy; and Noise from Outside the Building, where 5 is Not a Problem and 1 is Disturbing.

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Appendix B:

**SAMPLE INTRODUCTORY LETTER**

SAMPLE INTRODUCTORY LETTER

Distribute to all building occupants 10 days before the survey.

To: Occupants of \_\_\_\_\_  
Building

We will soon be initiating a study of this building, which will include asking occupants to complete a questionnaire survey. The purpose is to help us understand more about the technical performance of the building in providing a comfortable environment for people who work in it.

The questionnaires will be distributed on (date). Not everyone will receive a questionnaire. Questionnaires will be distributed to a sample of approximately 50 building occupants, selected using statistical sampling techniques.

Please complete the questionnaire as soon as you receive it. It will take only a few minutes. To ensure an unbiased result, do not discuss your responses with colleagues until all the questionnaires have been collected.

The ID number on each questionnaire is for purposes of distribution and collection control. Individuals are not identified. Please be frank in your response.

Questionnaire responses will be entered into a database for comparison as a group to responses from other buildings. The results will tell us whether any aspects of this building's performance warrant further investigation.

Thank you for your cooperation in this study. Further details are available from \_\_\_\_\_.

Signed by suitable level of authority.

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Appendix C:

**SAMPLE COVER LETTER**



SAMPLE COVER LETTER

For distribution with the questionnaire to a randomly selected sample of building occupants.

To: Occupants of the \_\_\_\_\_  
Building

We want to know how well you feel you can get your work done in the office environment in which your workstation is located.

Attached you will find a short list of questions, each in the form of a 5-point scale. Each question asks you to rate an aspect of your office environment on a scale of 1 to 5, where 1 is poor and 5 is good or comfortable. On each scale, circle the number that best represents your experience of working in this building. Please use pen, not pencil.

The purpose of this survey is to compare occupants' ratings of this building with ratings from other typical office buildings to understand which offices work best for the people who use them.

You have been randomly selected from all the people working in the building. It is important that you be the person to complete the questionnaire. Your workstation location can be identified by the ID number on the questionnaire, but your name is not required and your response will remain completely anonymous.

Please don't discuss your responses with people sitting around you. Answer the questions as quickly and honestly as possible.

We are very grateful for the time you spend on the questionnaire and appreciate your involvement in this project.

Signed by a suitable level of authority.

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Appendix D:

**RANDOM NUMBER TABLE**

## RANDOM NUMBER TABLE

721	285	859	676	462	129	506	865
537	527	322	411	952	747	520	428
767	709	354	009	589	166	945	173
331	687	905	766	874	453	006	090
055	646	367	102	295	209	455	850
157	110	029	495	046	806	975	381
777	681	142	117	139	174	377	459
735	487	680	959	430	539	644	618
026	429	689	564	938	043	995	919
880	633	202	638	060	515	450	715
741	801	350	435	077	623	853	287
732	211	948	950	256	860	748	634
908	838	657	962	830	216	200	489
119	828	257	079	269	529	599	437
170	412	791	241	562	720	595	553
313	074	700	179	770	003	018	606
928	957	004	041	807	668	083	348
528	734	757	153	684	154	829	615
717	501	014	503	481	696	235	815
698	387	096	970	447	673	692	024
273	168	374	464	336	067	583	505
334	132	920	776	091	744	574	416
561	641	811	823	953	488	890	143
401	693	805	305	135	237	600	855
347	478	664	438	954	961	541	228
650	188	674	749	635	071	138	647
217	592	778	417	804	798	323	534
845	234	733	648	097	409	045	930
238	596	769	049	339	126	140	992
728	251	547	822	951	879	375	458
391	796	226	942	773	059	298	072

## APPENDIX D

## RANDOM NUMBER TABLE

601	723	536	351	183	252	436	278
996	085	730	910	376	604	180	816
902	837	087	445	069	976	189	877
099	114	652	400	470	032	611	222
040	333	260	286	011	012	095	282
895	947	940	582	311	587	598	812
929	249	276	939	571	456	316	554
386	086	788	468	022	907	263	390
366	894	098	607	308	423	629	246
479	971	039	239	052	002	247	514
082	772	210	490	524	513	021	116
221	500	306	123	535	451	413	136
786	892	293	661	789	871	236	946
740	625	259	361	346	434	704	471
630	627	362	303	984	973	056	265
532	991	516	005	743	271	422	980
960	294	397	703	177	476	373	107
232	000	763	125	925	124	517	449
722	552	628	508	840	227	548	240
427	556	175	315	756	781	573	883
944	914	103	867	519	122	327	158
819	891	834	911	705	559	380	758
965	465	352	182	755	802	882	231
108	818	525	104	498	719	760	576
565	207	569	042	399	731	677	678
876	649	841	101	266	981	958	888
550	025	745	198	988	151	310	065
019	626	827	868	875	624	941	001
344	706	751	849	404	555	663	105
691	682	918	304	421	694	836	643
686	128	023	199	220	253	738	597

## APPENDIX D

## RANDOM NUMBER TABLE

746	474	439	356	392	729	120	297
695	881	206	338	578	903	887	985
826	724	726	486	161	979	325	699
858	268	897	332	581	187	642	586
382	370	448	685	852	924	752	165
679	862	645	431	443	290	605	809
783	073	146	033	540	670	008	017
148	274	886	111	089	335	038	272
383	765	632	530	365	824	602	229
820	270	144	324	224	372	774	927
201	989	544	825	035	054	904	926
842	176	844	716	538	915	130	398
155	223	987	533	088	034	563	848
163	889	917	713	616	580	637	147
710	473	007	614	353	511	993	502
349	843	275	255	466	467	558	061
935	058	986	857	480	194	047	821
440	764	133	585	394	442	178	469
477	522	542	754	543	244	690	803
707	899	790	575	491	737	972	169
337	167	521	672	768	631	775	160
639	912	281	145	608	931	483	504
675	493	075	921	066	048	214	301
405	106	385	482	364	426	291	100
164	817	797	113	718	658	683	964
317	171	603	662	669	192	134	739
656	831	131	937	762	408	112	137
983	507	070	277	080	389	343	388
384	497	020	378	955	568	053	420
185	172	262	873	667	800	472	345
030	750	591	094	795	566	432	588
328	279	878	546	913	949	369	326

## APPENDIX D

## RANDOM NUMBER TABLE

280	358	057	782	833	433	062	936
847	204	051	619	551	896	414	560
621	212	203	015	725	213	254	264
761	785	622	418	208	594	218	314
261	162	636	572	121	885	901	793
403	494	990	653	078	319	742	159
701	612	933	219	230	307	579	666
195	410	526	118	545	215	076	141
884	651	419	233	978	081	714	496
288	909	190	835	360	932	463	659
509	999	245	109	711	792	250	654
283	610	617	665	870	856	379	736
425	156	205	444	460	712	036	753
196	127	340	923	893	092	966	846
977	655	044	407	475	300	799	994
916	922	318	115	577	446	869	267
037	371	584	284	320	296	031	402
248	027	780	510	968	010	832	181
415	242	759	512	225	967	393	028
943	492	863	355	309	302	193	499
292	093	794	518	485	620	064	702
063	016	441	866	461	864	357	813
329	184	406	808	424	660	727	013
084	997	454	191	771	906	152	197
258	312	590	787	567	609	784	851
810	814	613	898	289	982	549	186
457	671	998	243	452	484	934	363
396	050	640	708	974	593	956	688
068	900	395	854	321	557	299	963
969	872	779	359	531	330	341	868
839	570	149	150	342	523	697	368

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**USER MANUAL**  
**TENANT QUESTIONNAIRE**  
**SURVEY**

November 1987

Appendix E:

**TENANT SURVEY QUESTIONNAIRE**



Date
ID Number

# TENANT SURVEY QUESTIONNAIRE

**INSTRUCTIONS:** Please rate the following attributes of **your particular desk location** in this building by circling the appropriate number between 1 and 5 that best summarizes your experience of working here.

Temperature comfort	1 BAD	2	3	4	5 GOOD
How cold it gets	1 TOO COLD	2	3	4	5 COMFORTABLE
Temperature shifts	1 TOO FREQUENT	2	3	4	5 CONSTANT
Ventilation comfort	1 BAD	2	3	4	5 GOOD
Air freshness	1 STALE AIR	2	3	4	5 FRESH AIR
Air movement	1 STUFFY	2	3	4	5 CIRCULATING
Noise distractions	1 BAD	2	3	4	5 NOT A PROBLEM
Background office noise level	1 TOO NOISY	2	3	4	5 COMFORTABLE
Specific office noises (voices and equipment)	1 DISTURBING	2	3	4	5 NOT A PROBLEM
0. Furniture arrangement in your workplace	1 BAD	2	3	4	5 GOOD
1. Amount of space in your workspace	1 BAD	2	3	4	5 GOOD
2. Work storage	1 INSUFFICIENT	2	3	4	5 ADEQUATE
3. Personal storage	1 INSUFFICIENT	2	3	4	5 ADEQUATE
4. Visual privacy at your desk	1 BAD	2	3	4	5 GOOD
5. Voice privacy at your desk	1 BAD	2	3	4	5 GOOD
6. Telephone privacy at your desk	1 BAD	2	3	4	5 GOOD



17. Electrical lighting	1 BAD	2	3	4	5 GOOD
18. How bright lights are	1 TOO MUCH LIGHT	2	3	4	5 NOT TOO BRIGHT
19. Glare from lights	1 HIGH GLARE	2	3	4	5 NO GLARE
20. Noise from air systems	1 DISTURBING	2	3	4	5 NOT A PROBLEM
21. Noise from office lighting	1 BUZZ / NOISY	2	3	4	5 NOT A PROBLEM
22. Noise from outside the building	1 DISTURBING	2	3	4	5 NOT A PROBLEM

*How would you rate your overall satisfaction with your workspace*

1 DISSATISFIED	2	3	4	5 VERY SATISFIED
-------------------	---	---	---	---------------------

*Please rate how this space affects your ability to do your work*

1 MAKES IT DIFFICULT	2	3	4	5 MAKES IT EASY
-------------------------	---	---	---	--------------------

Comments \_\_\_\_\_

Thank you for your cooperation.

For enquiries about the results of this survey, please contact:

Name _____	Telephone No. _____
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**USER MANUAL**  
**TENANT QUESTIONNAIRE**  
**SURVEY**

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Appendix F:

**TENANT SURVEY WORKSHEET**



# TENANT SURVEY WORKSHEET

Date of Survey	Total Number of Questionnaires Completed
Building Name	
Address	

*Dimension*

*Sum of attributes for the dimension*

*Mean scores*

## Thermal Comfort

1 "Temperature comfort": \_\_\_\_\_ (1)

2 "How cold it gets": \_\_\_\_\_ (2)

3 "Temperature shifts": \_\_\_\_\_ (3)

$$\frac{([1] + [2] + [3])}{(3 \times [TOT])} = \boxed{\phantom{00}}$$

## Air Quality

4 "Ventilation comfort": \_\_\_\_\_ (4)

5 "Air freshness": \_\_\_\_\_ (5)

6 "Air movement": \_\_\_\_\_ (6)

$$\frac{([4] + [5] + [6])}{(3 \times [TOT])} = \boxed{\phantom{00}}$$

## Office Noise Control

7 "Noise distractions": \_\_\_\_\_ (7)

8 "Background office noise level": \_\_\_\_\_ (8)

9 "Specific office noises": \_\_\_\_\_ (9)

$$\frac{([7] + [8] + [9])}{(3 \times [TOT])} = \boxed{\phantom{00}}$$

## Spatial Comfort

10 "Furniture arrangement": \_\_\_\_\_ (10)

11 "Amount of space": \_\_\_\_\_ (11)

12 "Work storage": \_\_\_\_\_ (12)

13 "Personal storage": \_\_\_\_\_ (13)

$$\frac{([10] + [11] + [12] + [13])}{(4 \times [TOT])} = \boxed{\phantom{00}}$$

## Privacy

14 "Visual privacy": \_\_\_\_\_ (14)

15 "Voice privacy": \_\_\_\_\_ (15)

16 "Telephone privacy": \_\_\_\_\_ (16)

$$\frac{([14] + [15] + [16])}{(3 \times [TOT])} = \boxed{\phantom{00}}$$

## Lighting

17 "Electrical lighting": \_\_\_\_\_ (17)

18 "How bright lights are": \_\_\_\_\_ (18)

19 "Glare from lights": \_\_\_\_\_ (19)

$$\frac{([17] + [18] + [19])}{(3 \times [TOT])} = \boxed{\phantom{00}}$$

## Building Noise Control

20 "Noise from air systems": \_\_\_\_\_ (20)

21 "Noise from office lighting": \_\_\_\_\_ (21)

22 "Noise from outside the building": \_\_\_\_\_ (22)

$$\frac{([20] + [21] + [22])}{(3 \times [TOT])} = \boxed{\phantom{00}}$$

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**USER MANUAL**

**TENANT QUESTIONNAIRE**

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Appendix G:

**BUILDING SURVEY PROFILES**

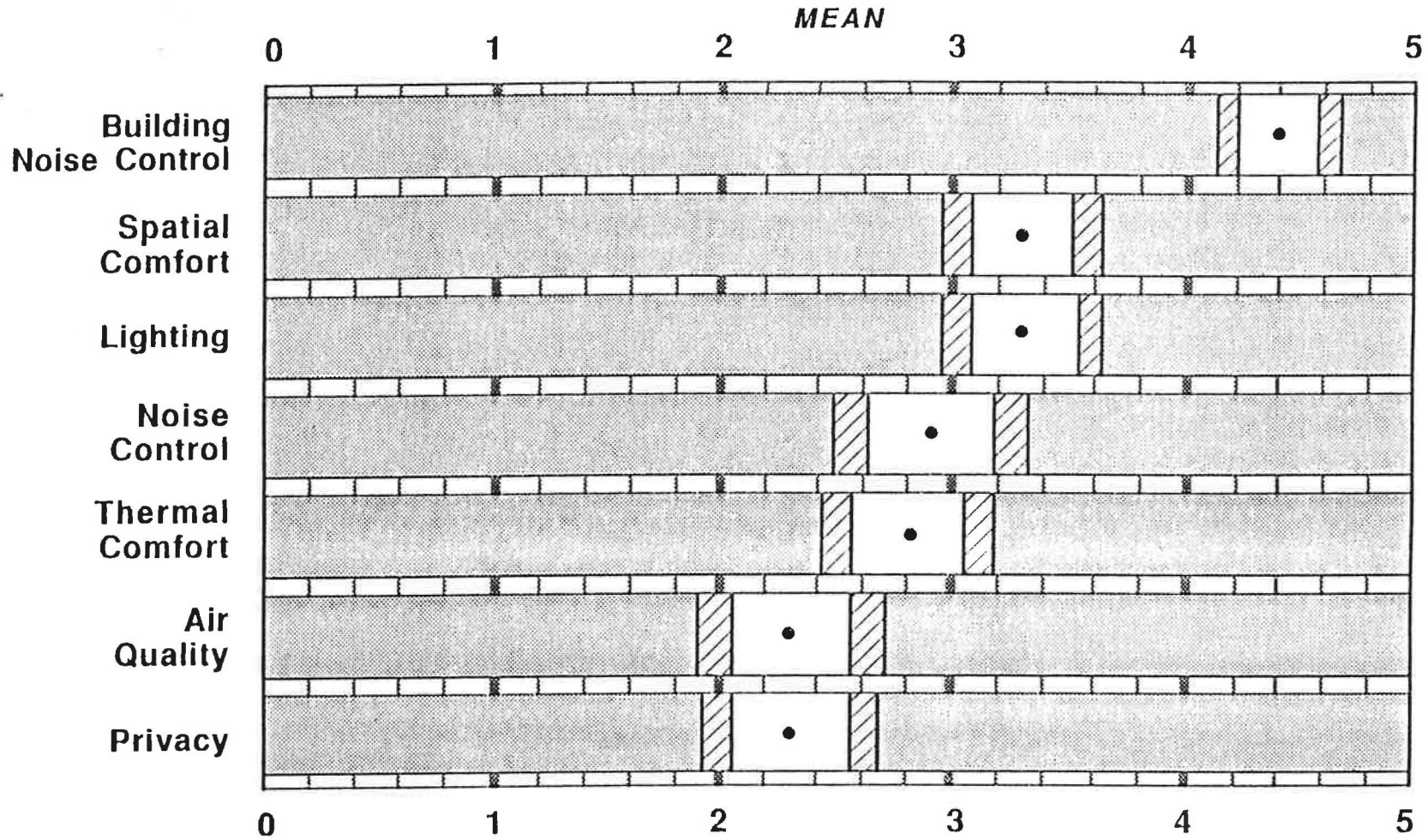
BUILDING SURVEY PROFILES

Use these look-up profiles to check mean scores from the survey results against norms derived from other buildings.

Select the profile that corresponds to your sample size, rounded to the nearest multiple of 5.

# Building Survey Profile

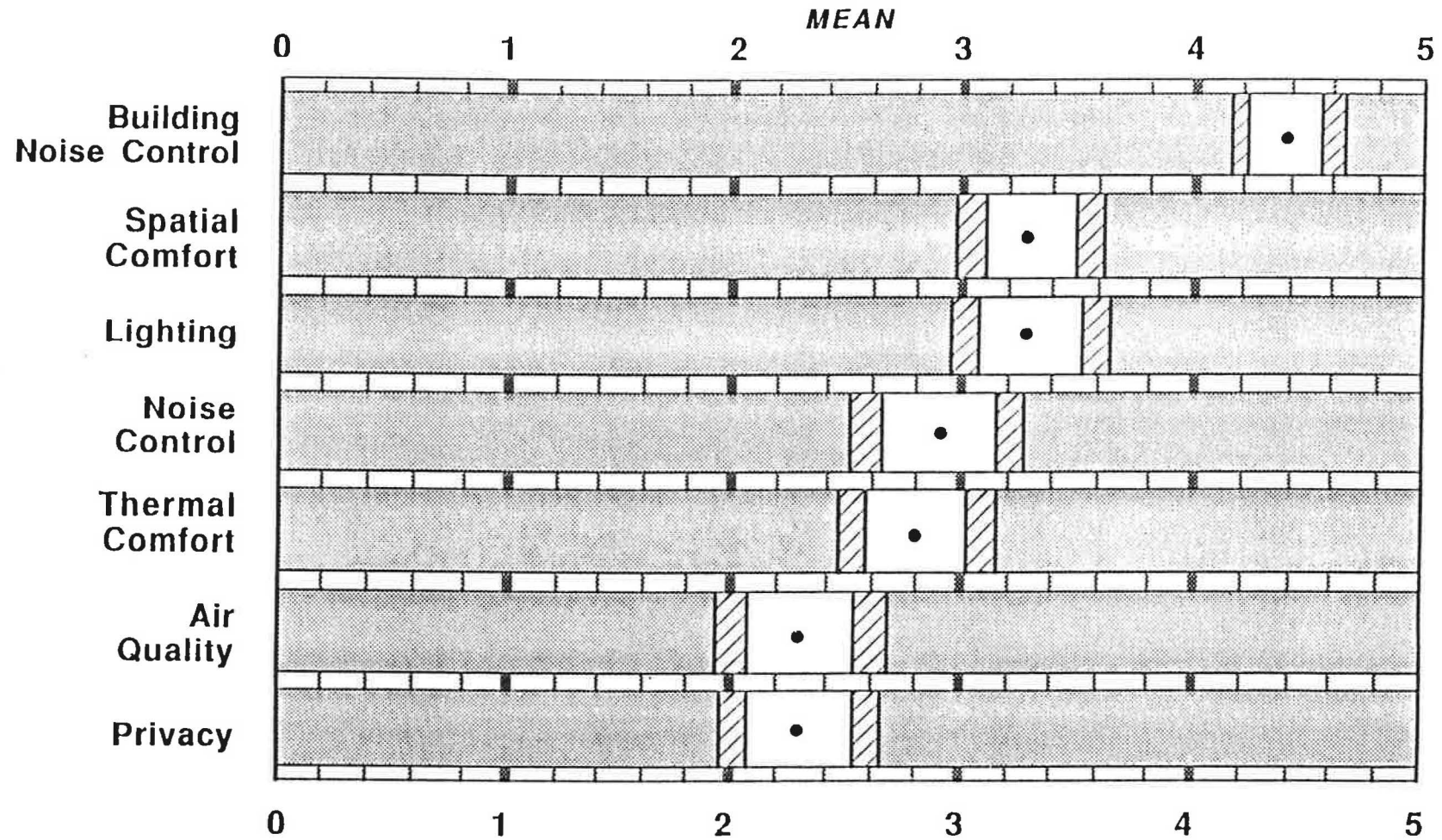
Building	Sample Size <b>▶ 30</b>
----------	-------------------------



# Building Survey Profile

Building Sample Size **▶ 35**

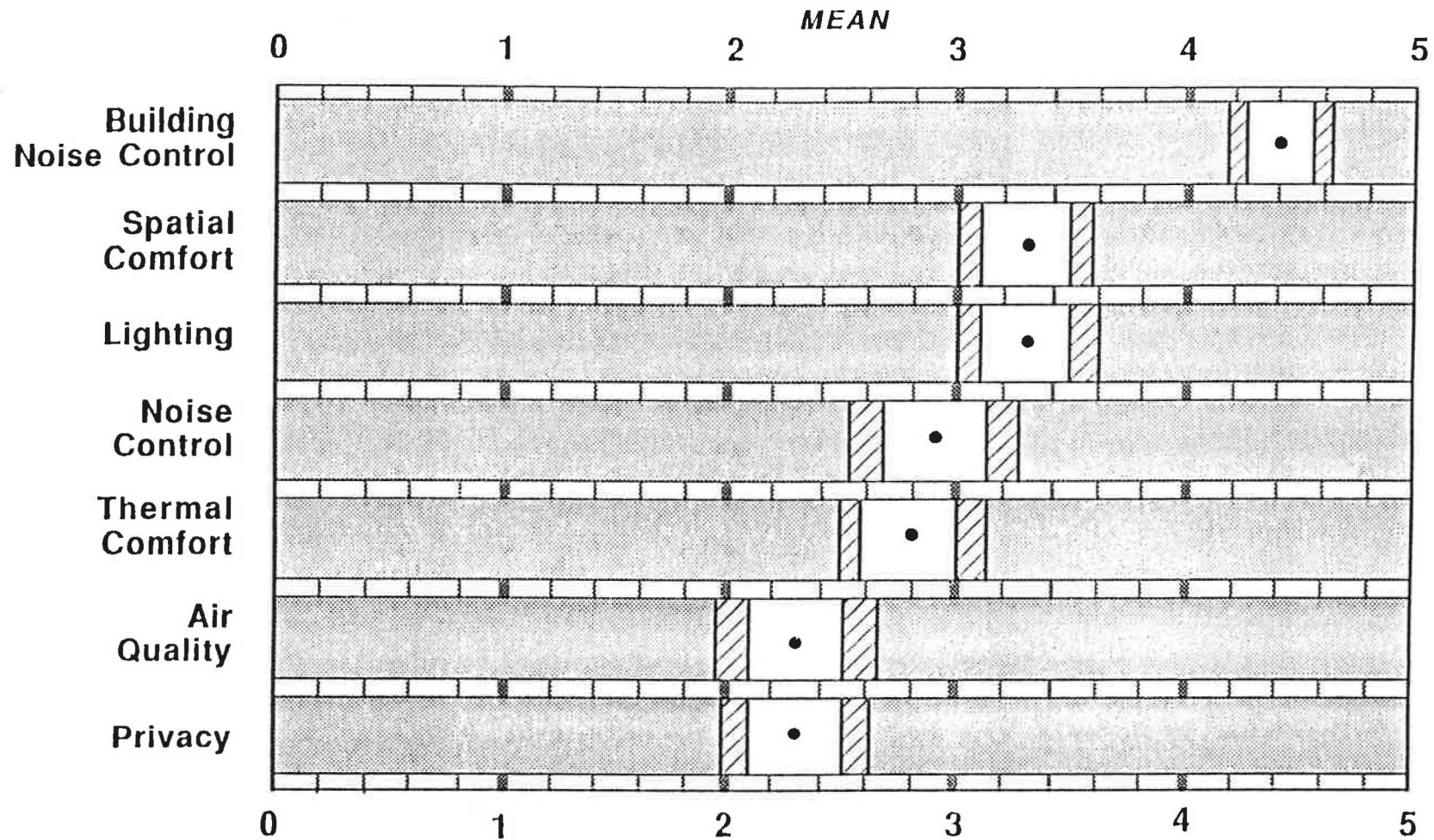
Page G3



# Building Survey Profile

Building Sample Size **▶ 40**

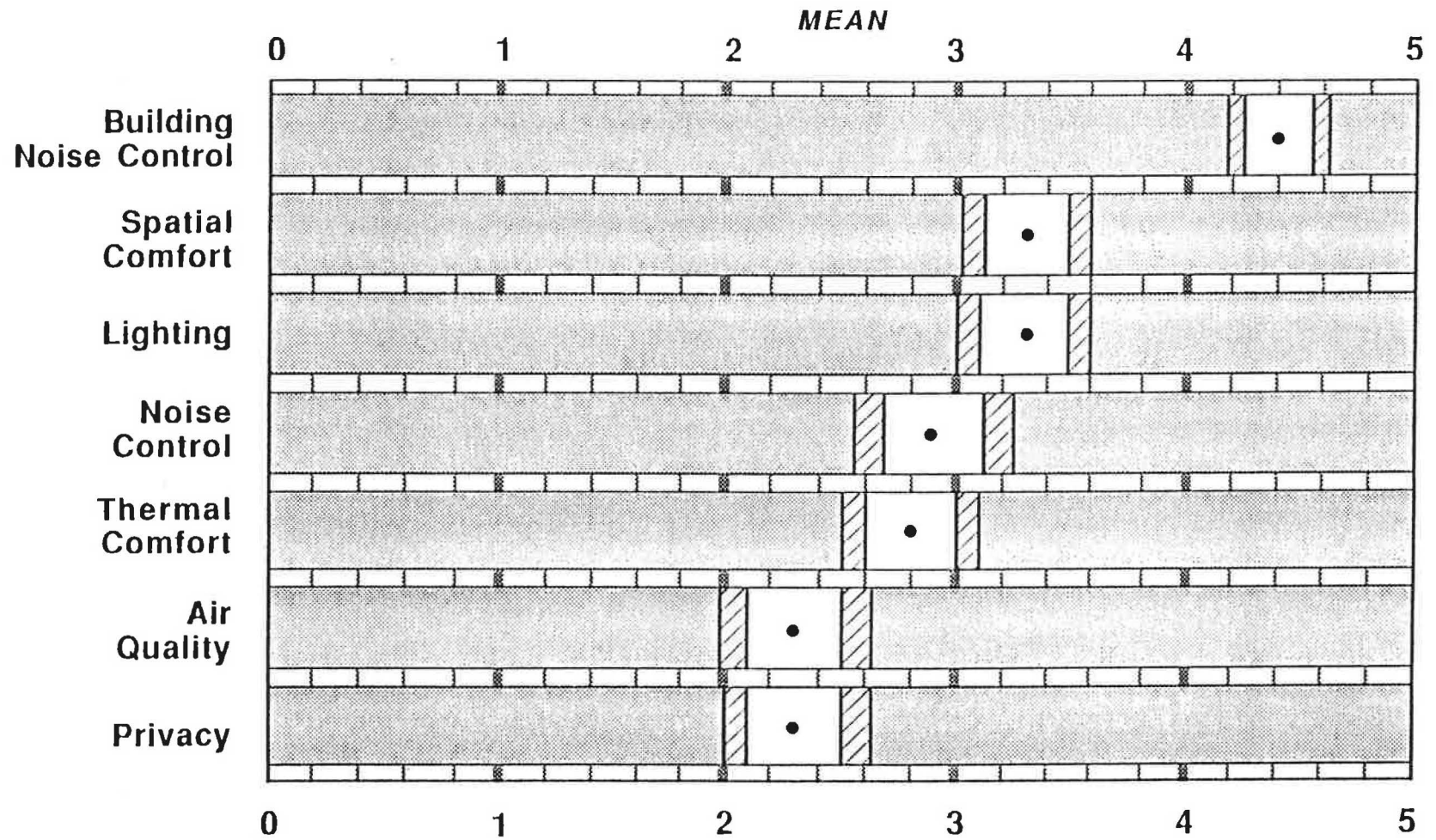
Page G4





# Profile

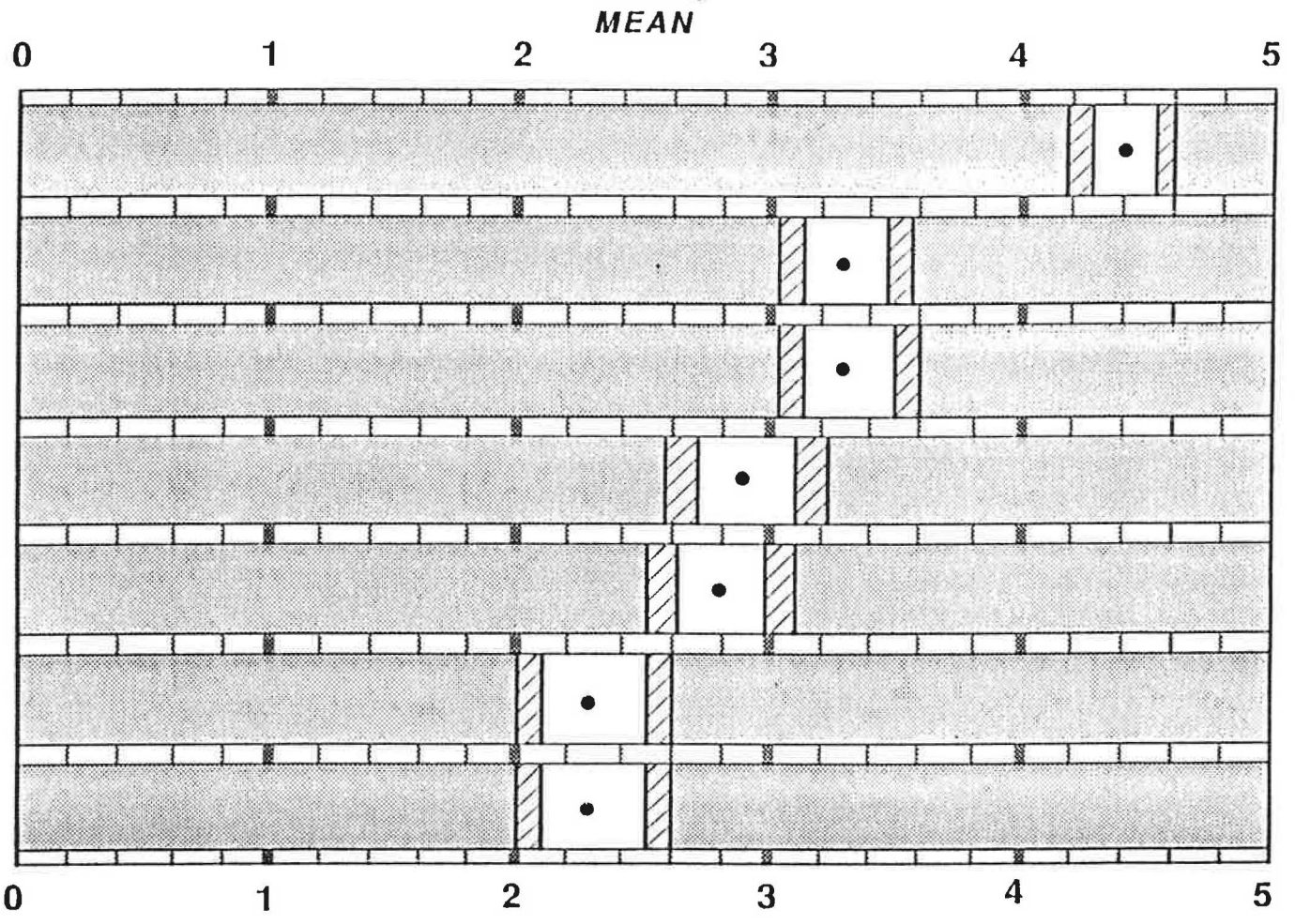
Page G5



# Building Survey Profile

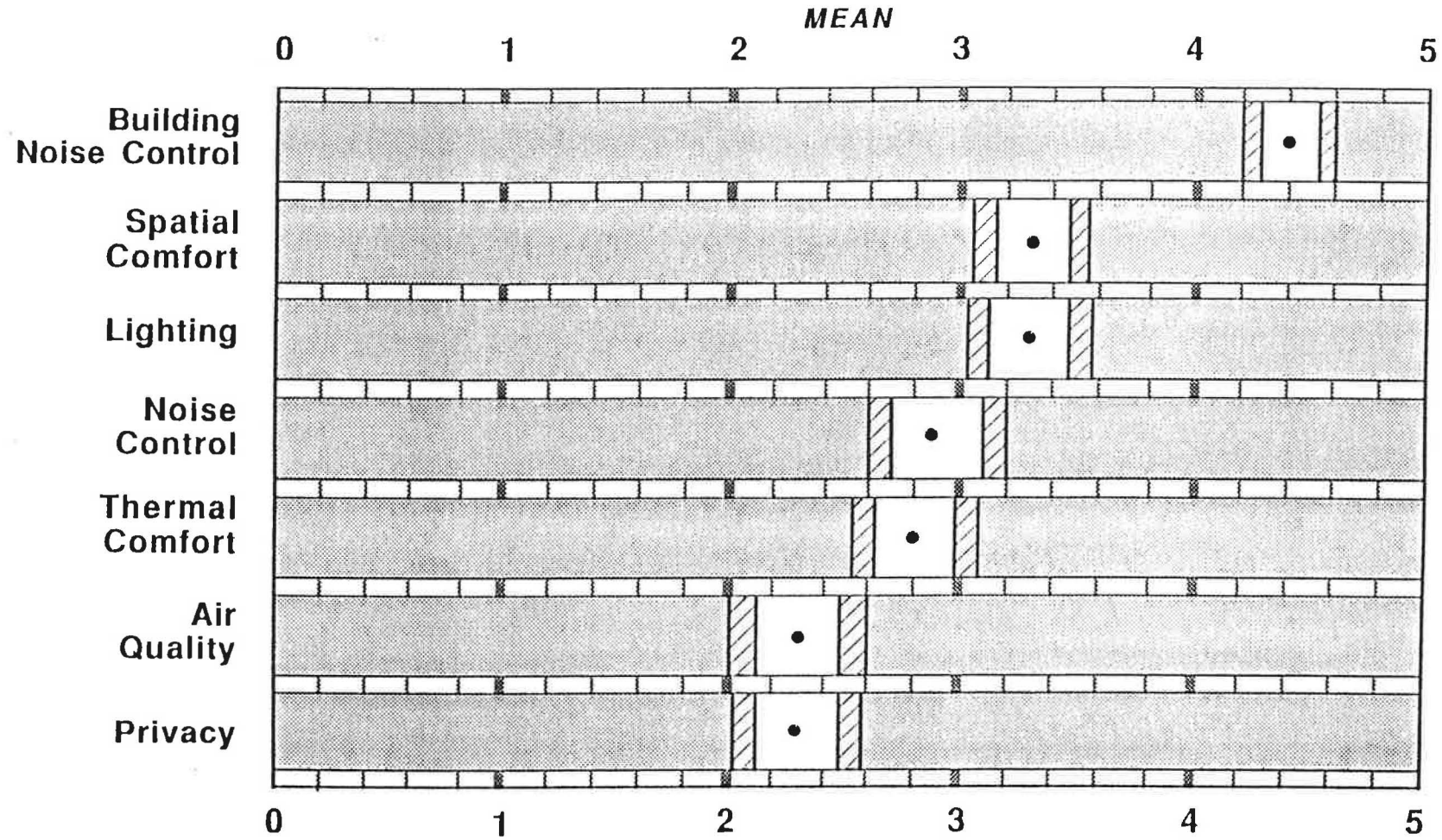
Building	Sample Size <b>▶ 50</b>
----------	-------------------------

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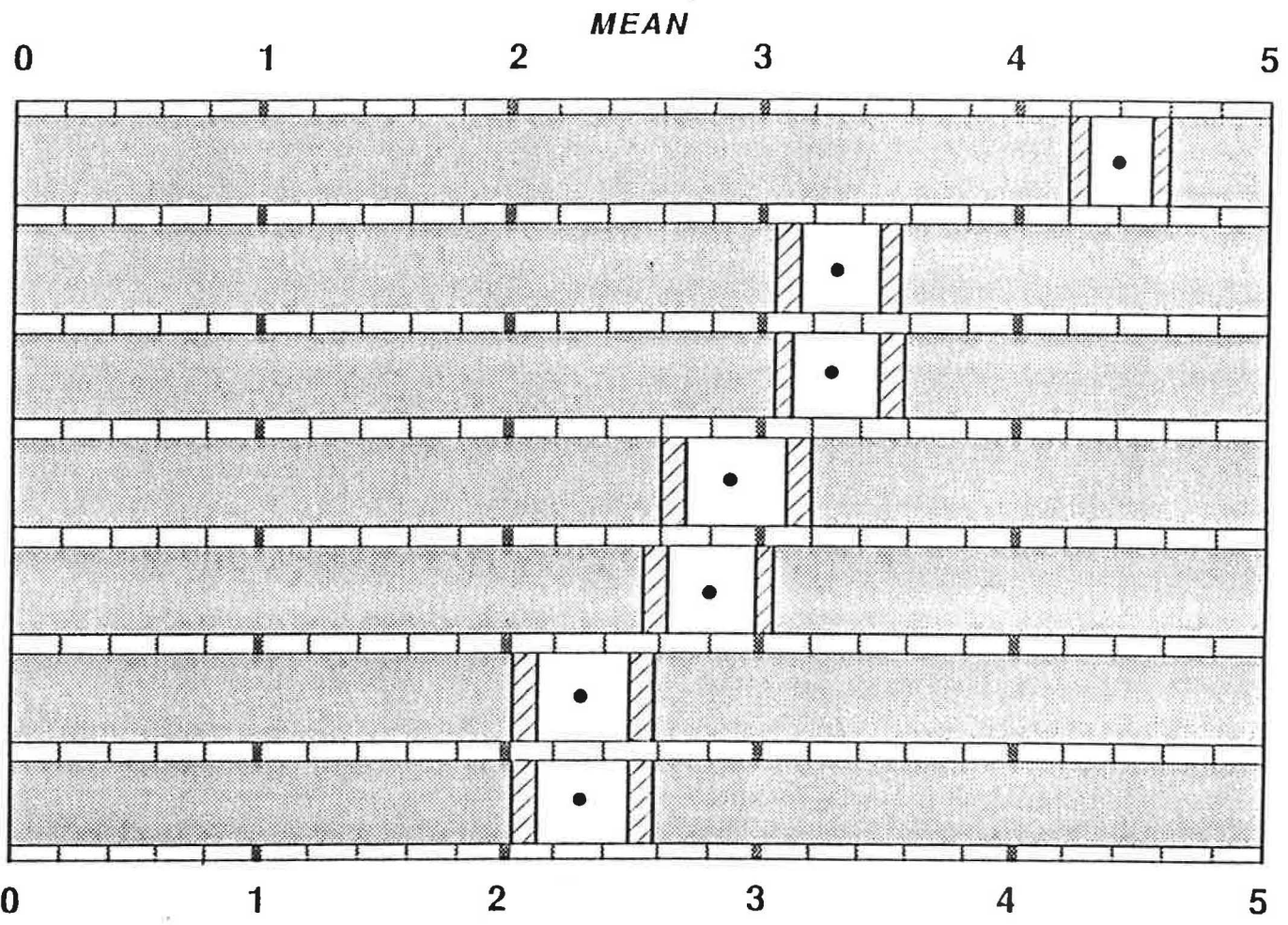
# Building Survey Profile

Building	Sample Size <b>▶ 55</b>
----------	-------------------------



# Building Survey Profile

Building Sample Size **▶ 60**



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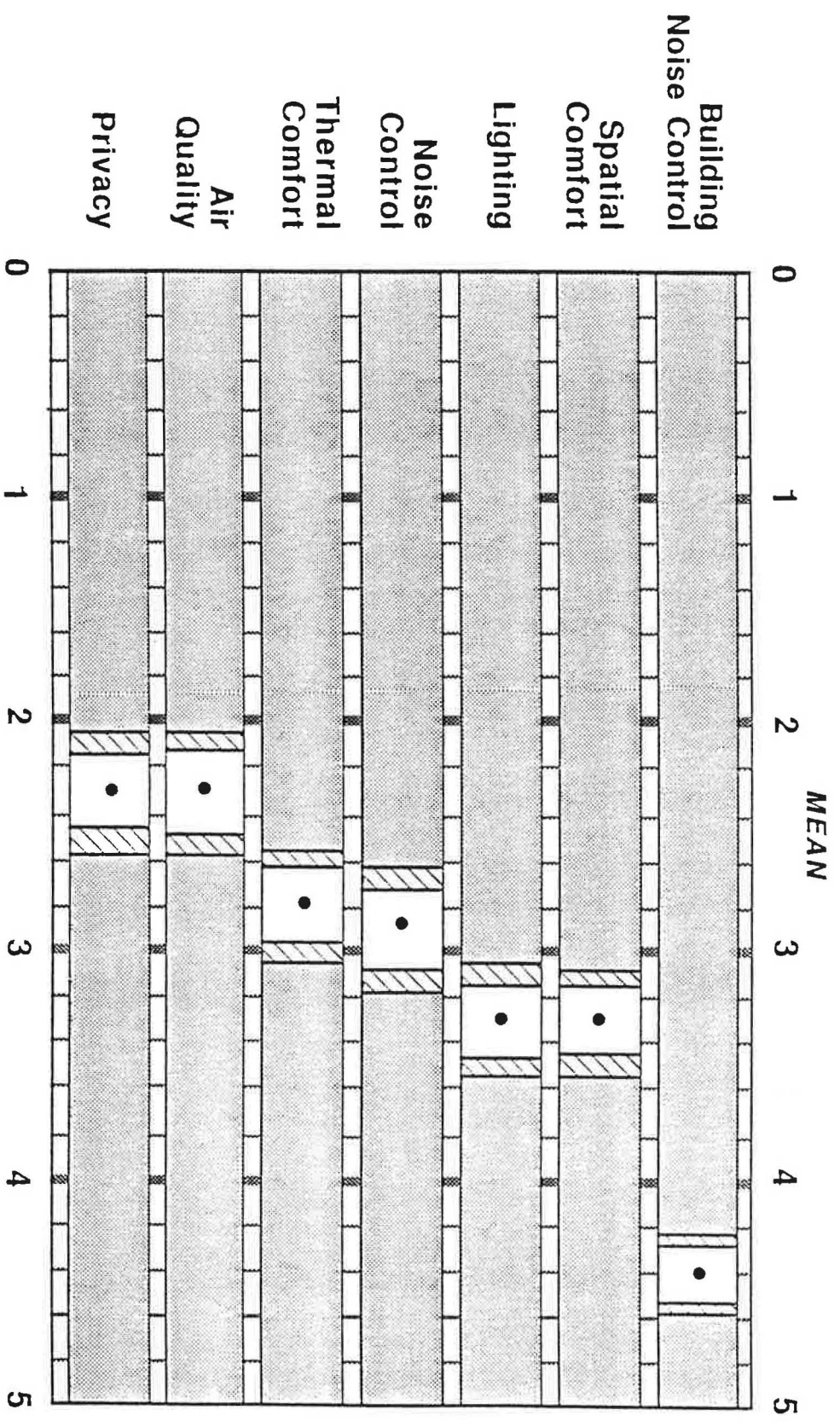


# Building Survey Profile

Building

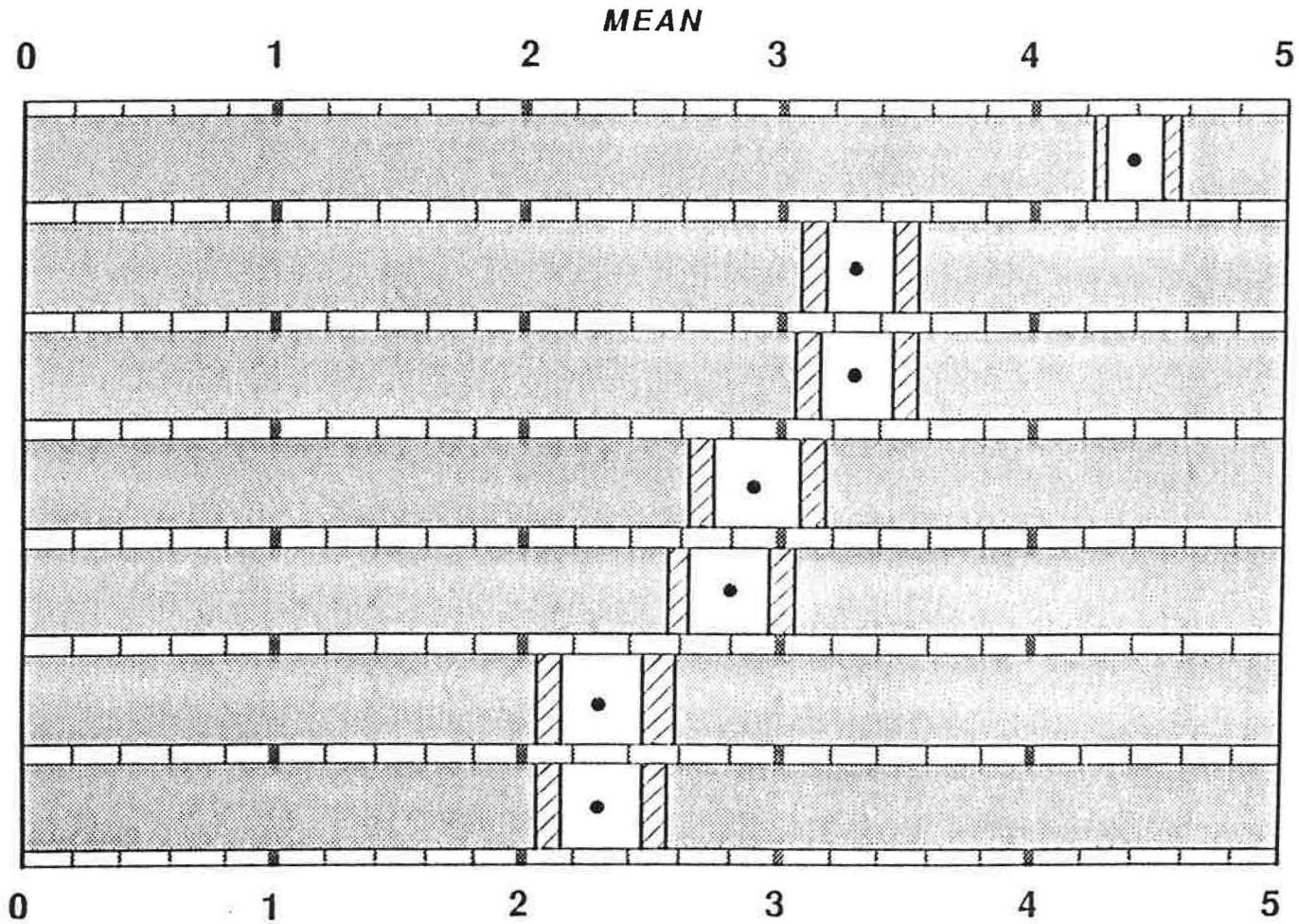
Sample Size

65



# Building Survey Profile

Building	Sample Size <b>▶ 70</b>
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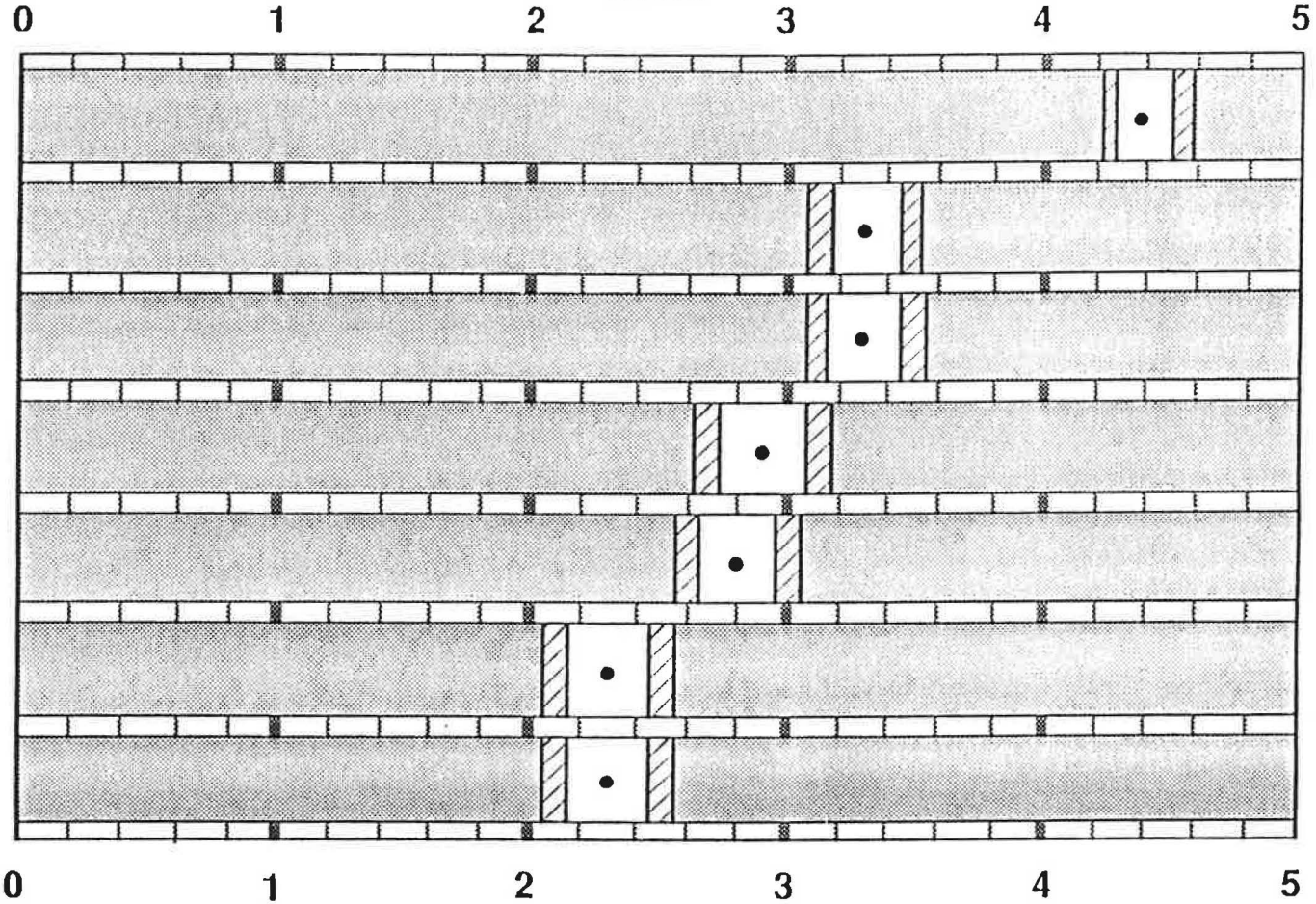
# Building Survey Profile

Building

Sample Size

▶ 75

MEAN



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**USER MANUAL**  
**TENANT QUESTIONNAIRE**  
**SURVEY**

November 1987

Appendix H:

**REQUEST FOR**  
**A TENANT SURVEY ANALYSIS**



REQUEST FOR A TENANT SURVEY ANALYSIS

Request submitted by:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

PWC Region: \_\_\_\_\_

Group or Division: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Name of Building Surveyed:  
\_\_\_\_\_

Date of Survey: \_\_\_\_\_

Total number of building occupants  
(approx.): \_\_\_\_\_

Number of Questionnaires  
distributed: \_\_\_\_\_

Number of Questionnaires  
completed: \_\_\_\_\_

Reason for doing Survey:

Return this sheet with the completed surveys to:

Public Works Canada  
Tenant Survey Analysis  
Technology Directorate  
Sir Charles Tupper Building  
OTTAWA, Ontario  
K1A 0M2