Lucent Technologies
Bell Labs Innovations

DEFINITY® Wireless Business System
Estimator

555-232-106
Comcode 108214420
Issue 2
May 1998

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About This Book

Introduction

This document provides the user with the background and procedural information needed to install and operate the DEFINITY® Wireless Business System (DWBS) Estimator tool.

NOTE:
The examples in this document are based on an earlier release of the Estimator. Therefore, your results from the Estimator may not match the results in this document. However, there is no change to the input presented.

Audience

This document is intended for a member of the account team who will be using the Estimator. This is usually a design specialist in the sales organization.

Organization

This book is organized as follows:

- **Chapter 1, "Tool Description and Data Gathering,"** provides an overview of the Estimator and its components, along with general guidelines for gathering customer site data that will serve as input to the Estimator tool.
- **Chapter 2, "Determining the Estimate (Mt. Airy Office),"** discusses how to prepare for and conduct a site walk-through at a customer site. A typical office is used as the site. Also discusses how to use the information gathered before and during the walk-through to create and review an estimate for the office scenario.
- **Chapter 3, "Radio-Related Concepts,"** discusses the radio propagation factor and the role it plays in determining the estimate.
- **Chapter 4, "General Guidelines,"** discusses several topics relevant to determining the estimate, including sectionalizing, hints relevant to floor plan layout and floor clutter, and using the Estimator tool.
- **Appendix A, "General Requirements and Installation,"** discusses the Estimator computer environment requirements and also how to install the Estimator tool.
- **Appendix B, "Estimator Menu and Submenus,"** provides an overview of the Estimator menu and the features that are available to the Estimator application.
- **Appendix C, "Estimator Work Sheets,"** presents and discusses the work sheets and features used within the Estimator application.

An index is also included.

Typographic Conventions

The following typographic conventions are used in this book to convey information consistently and quickly.

- *This typeface* is used for references to titles of other information and for emphasis within other typefaces and for field names.
- **This typeface** emphasizes key words to help clarify meaning in a sentence or to call attention to a distinction. It is also used to designate menu items and field values.
- The following note icon identifies additional information pertinent to the text preceding it.


NOTE:

Related Information

This book serves as the Estimator user's guide for the DWBS. Other books in the DWBS series are:

- *DEFINITY Wireless Business System Site Planning, 555-232-601*
- *DEFINITY ECS Interface for the DEFINITY Wireless Business System Guide, 555-232-108*
- *DEFINITY Wireless Business System Installation and Test, 555-232-102*
- *DEFINITY Wireless Business System Maintenance, 555-232-103*
- *DEFINITY Wireless Business System 9601 Pocket Phone User's Guide, 555-232-105*
- *DEFINITY Wireless Business System 9601 Pocket Phone Quick Reference Card, 555-232-104*

Tool Description and Data Gathering

1

Introduction

This chapter describes the Estimator tool, and it presents a script that may be used during a site walk-through to obtain the information required for input to the Estimator. The Estimator output is sent to the Sales and Design Support Center (SDSC) to process the DWBS order.

Obtaining accurate information about the customer site is critical for generating a quote. All subsequent steps leading to the quote depend on this activity.

Generally, creating an estimate involves the following:

- Obtaining information during the customer site walk-through
- Using and organizing the data as input to the Estimator
- Calculating and refining the Estimator quote
- Saving the estimate
- Sending the Estimator output to the SDSC

It is highly recommended that customer site data be gathered during the site walk-through. The information later in this chapter is presented with this scenario in mind. However, if a site visit is not possible, contact the telecom manager and a building engineer to obtain the necessary data.

Tool Description

The Estimator tool is used to provide a quote of the customer's wireless equipment.

Based on the data entered, the Estimator calculates two types of quotes or estimates. One quote is for wireless coverage (the coverage quote) and the other quote is for wireless traffic (the traffic quote). The coverage quote indicates the number of wireless components needed to provide reliable radio service to the designated customer coverage area(s). The coverage quote serves as the starting base from which the traffic quote is derived. The traffic quote indicates the number of wireless components needed to traffic engineer wireless call usage for a customer site.

There are two possible outcomes for the calculation: the quotes are the same, or the traffic quote is higher than the coverage quote. If the coverage quote and traffic quote are the same, the quote indicates a *coverage-constrained* case. If these quotes differ (that is, the traffic quote is higher), the quote is considered a *traffic-constrained* case. A traffic-constrained case requires that a greater number of Wireless Fixed Bases (WFBs) be installed. Based on the customer's requirements, the individual responsible for the quote decides which quote is appropriate.

Data-Gathering Procedure

You must gather Information about the customer site before you run the Estimator. Whenever you gather site data, it is recommended that you contact the telecom manager and a building engineer. These people are excellent sources of information for obtaining the necessary data for a DWBS site. Once all data is gathered, this information is used to create an estimate for the DWBS site.

NOTE:
It is strongly recommended that you visit the customer site to view the site first hand.

It is essential that site data is obtained to get the most accurate quote for a customer's DWBS infrastructure.

In summary, be sure to do the following before making an appointment for the site walk-through:

- Request that a building engineer be available for the site walk-through. Obtain the engineer's contact number in case you need answers to questions before or after the visit.
- Obtain the architectural floor plans for the site. A complete set of the floor plans is required. Ensure that the dimensions on the plans are clearly indicated.

- Ensure that the telecom manager is available during the site walk-through to discuss wireless requirements (for example, coverage, traffic, etc.).

Estimator Site Walk-Through Script

This section contains an example of a script to use regardless of whether or not you visit the site. The script takes into account the coverage and traffic inputs necessary to get a reliable Estimator quote, and it includes the questions you will answer when you are using P-Builder (which is used to calculate a p-factor). Before asking the questions, you must have a copy of the floor plan(s) for all the areas requiring coverage.

NOTE:
The following script is presented only as an example. You may modify the script to satisfy your needs.

As you receive answers to the following questions, look over the floor plan(s). If there are multiple floor plans for the customer site, the questions apply to each floor plan.

- What are the actual dimensions of the area(s) for which coverage is desired (length and width dimensions)?

  NOTE:
  If the area is not shaped like a rectangle or square, obtain the dimensions of the smaller rectangles that make up the shape of the area. This is a case where viewing the two-dimensional floor plan helps in sectionalizing the area into smaller rectangles. The results from sectionalizing are used later when inputing information into the Estimator application.

- Where are the stairwells and elevators on the floor plan (if not clearly marked)?

  NOTE:
  Stairwells are usually made out of concrete, and elevators are usually made out of metal.

- What is the building type for all areas under consideration for coverage?

  NOTE:
  Buildings can have a combination of building types. For example, part of a hotel can be considered an office building (containing guest room areas) and a convention hall (containing meeting rooms and ballrooms). Therefore, the hotel should be sectionalized accordingly when running the quote.

- What is the building frame structure made out of; or, what is the exterior construction material? For example, older buildings are made out of concrete block, whereas modern buildings have a concrete steel frame.
- What is the ceiling construction material?
- What is the floor construction material?
- Do the areas under consideration for coverage have a dropped ceiling?
- Do the areas under consideration have duct piping work in or above the ceiling? Does the piping completely fill or partially fill the space?
- What is the wall material of the partitions in the floor plans? Is there any architectural decor?
  - If there are stairwells, what is the wall material of the stairwells?
  - If there are elevators, what is the wall material of the elevators?

    NOTE:
    Elevators are not to be considered as areas for providing wireless coverage.

Be sure to understand the building environment; this will allow you to probe effectively for more information. For example, if you learn that all partitions are made out of one kind of wall material, probe further to see if indeed that is the case.

The following list contains site types and example questions for conducting further probes at each site:

- **Office**. Are there any computer rooms, labs, studios, interior pillars, etc.? What are the wall materials of the partitions?
- **Healthcare/Hospital**. Are there any X-ray rooms, nursing stations, etc.? What are the wall materials of the partitions?
- **Convention Hall**. Is there any paneling, or are there any temporary walls?
- What objects or floor clutter are in the area?
  - Are any of these floor objects as high as the ceiling? If so, get an estimate of how many of these objects may be found in a particular area or areas. Note that you may not want to include areas with large obstructions as part of your original estimate quote until you consult with an expert about the area in question.
  - Are any of these objects as high as one-half to three-fourths of the ceiling height?

  The following list contains site types and examples of objects that may exist on the floor in these type of environments:

  - **Office**. Computer machines, libraries, etc.
  - **Healthcare/Hospital**. X-ray machinery, etc.

— **Retail**. Supermarket shelves stocked with food products, etc.

By answering the questions pertaining to floor objects, you can determine the clearance space for the antenna-mounting position.

The following questions pertain to wireless usage and traffic for the site:

- Is this a Zone 1 or Zone 2?
- What is the total number of DWBS users?
- How many DWBS users, including roamers, will be administered on the switch?
- What is the typical wireless call use of a single DWBS user?
  - — What are the business hours for DWBS operations?
  - — How many wireless calls are anticipated during a day (24-hour period)?
  - — How many minutes of air time are used for all wireless calls?
  - — What is the acceptable blocking factor (1 of 100 or 1 of 1000)?
- Are there any areas that require a high throughput of DWBS calls?

NOTE:
Do not promise the customer 100 percent radio coverage, especially if certain floor areas will be difficult to cover (for example, elevators or rooms with large obstructions that go floor-to-ceiling). If you have any questions, send electronic mail to the following address: estimate@mtgbcs.lucent.com.

The site data gathered is used as input to the Estimator (specifically, to the Basic Input and Input By Section work sheets). The data gathered will impact the DWBS coverage and traffic quotes. It is important to obtain accurate data to get a reliable Estimator quote.

Determining the Estimate (Mt. Airy Office)

2

Introduction

The purpose of the Estimator is to provide a quote of the wireless equipment needed to provide reliable radio service at a customer site. The office scenario provided in this chapter illustrates how an account team representative, typically a design specialist, obtains input data for the Estimator tool to provide an accurate estimate. Lucent Technologies at 211 Mt. Airy Road in Basking Ridge, NJ, serves as the customer site used as the office scenario in this chapter.

NOTE:
It is recommended that you use this chapter in conjunction with viewing the Estimator training video.

The examples in this document are based on an earlier release of the Estimator. Therefore, the results you get using the Estimator may not match the results in this document. However, there is no change to the inputs presented.

Preparing for the Site Walk-Through

A site walk-through is required to understand the site wireless requirements for the Estimator. The walk-through allows the Estimator user to observe the radio environment on a first-hand basis.

The purpose of the site walk-through is to gather enough information about the customer site to provide a quote for the DWBS equipment needed to meet the customer's wireless coverage and traffic requirements.

Gathering Advance Information

The following should be planned in advance of the office site walk-through:

- The customer is contacted in advance to set up a date to do a site walk-through.
- A building engineer is requested to be available during the site walk-through. You should obtain a contact number for the building engineer. Having a building engineer for the site walk-through is important for verifying the site's construction materials when providing a quote.
- The telecom manager is available for consultation.
- Architectural floor plans of the site are obtained. (Floor plans of the complete site are required.) Check that the dimensions are clearly stated on the floor plans.

  NOTE:
  Additional information, such as the use of the building (for example, as an office, a hotel, a store, etc.), construction materials (walls, floors, ceilings, etc.), cabling infrastructure, etc., are helpful in preparing an estimate.

Orientation

The design specialist informs the telecom manager that he or she must understand the site's wireless requirements for both coverage and traffic. For coverage concerns, a building engineer is required to help understand the construction materials at the site. The design specialist explains that knowing the construction materials, especially of the walls, helps determine the strength of the radio signal in an indoor environment.

Question-and-Answer Period

Prior to and during the site walk-through, the account representative asks a number of site-related questions. The following sections present these questions and possible answers. The questions for the Estimator site walk-through script are based on the questions for the script presented in the previous chapter.

NOTE:
The questions and answers presented in the following sections are more in-depth than the questions and answers presented within the Estimator training video.

General Questions

General questions are asked to establish a rapport with the customer and to learn about the construction materials at the site.

Design Specialist: *What type of business operation is conducted in this facility?*
Telecom Manager: *This facility is used for planning marketing strategies for product development and delivering products to market.*

Design Specialist: *Are all areas in this facility considered office space? If not, please indicate these areas during the walk-through.*
Telecom Manager: *Except for the fitness center, briefing center, loading dock, auditorium, and cafeteria, the building can be considered office space. I'll point out these areas to you as we walk through the facility.*

Design Specialist: *What is the building frame structure material or the exterior construction material?*
Building Engineer: *Concrete reinforced by steel.*

Design Specialist: *What is the ceiling construction material?*
Telecom Manager: *The ceiling construction is concrete reinforced by steel.*

Design Specialist: *What is the floor construction material?*
Building Engineer: *The floor construction is concrete reinforced by steel.*

Design Specialist: *Do all areas considered for coverage have a dropped ceiling?*
Building Engineer: *Yes.*

Design Specialist: *How much piping and duct work is below the ceiling or in the dropped ceiling?*
Building Engineer: *In all areas of the facility, the dropped ceiling has some duct work. There is enough space to run cable and still see the floor or roof when the tile is lifted.*

Design Specialist: *As we walk through the site, be sure to indicate anything that differs from what you just told me. Coverage in the elevators cannot be guaranteed. I will also point out other areas that might not be suitable for coverage if I see any. Also, please indicate areas where coverage is critical.*

Traffic Questions

Traffic questions are asked to understand the site's wireless usage for traffic analysis.

Design Specialist: *How many wireless users will there be at your site?*
Telecom Manager: *The number of wireless phone users is 50.*

Design Specialist: *Will the wireless users be moving about the entire facility? If not, indicate how many wireless users there will be per section or area while we are touring the site.*
Telecom Manager: *We expect that calls will be made throughout the entire building.*

Design Specialist: *We will need an estimate of the total number of wireless calls along with the total number of minutes of wireless calls you expect on a typical business day.*
Telecom Manager: *The wireless users will spend about 20 percent of their time on a phone call during normal business hours. This comes to about 12 minutes per user per hour. Each user will make an average of four calls per hour.*

Design Specialist: *During the site walk-through, please indicate any special traffic requirements for relevant areas within the facility if you think of any (for example, there may be one or more areas that require a high throughput of calls).*

Conducting the Site Walk-Through

To understand the DWBS requirements at the site, the telecom manager, building engineer, and design specialist together conduct a site walk-through.

In general, the building has three floors and three distinct sections. The three sections are separated by two narrow sections. The following figures represent the floor plans for the site. The design specialist brings these plans to the site.

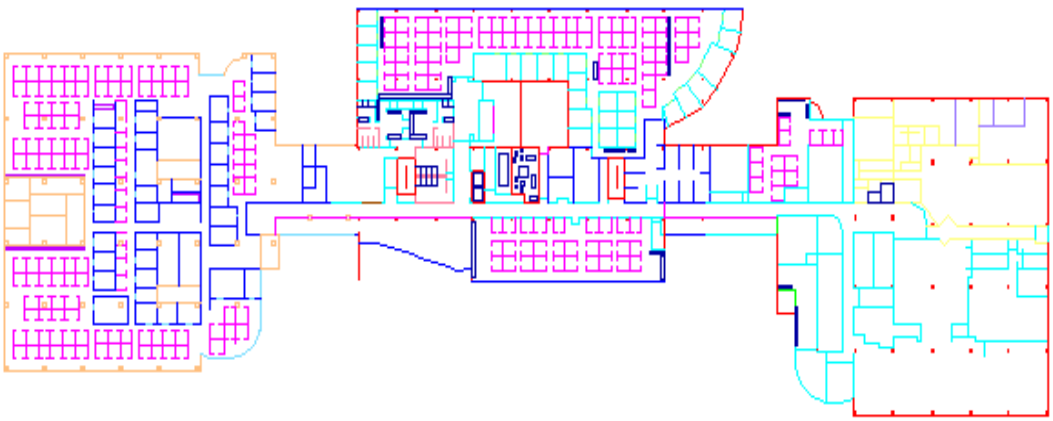


Figure 2-1. First Floor Plan for the Mt. Airy Office

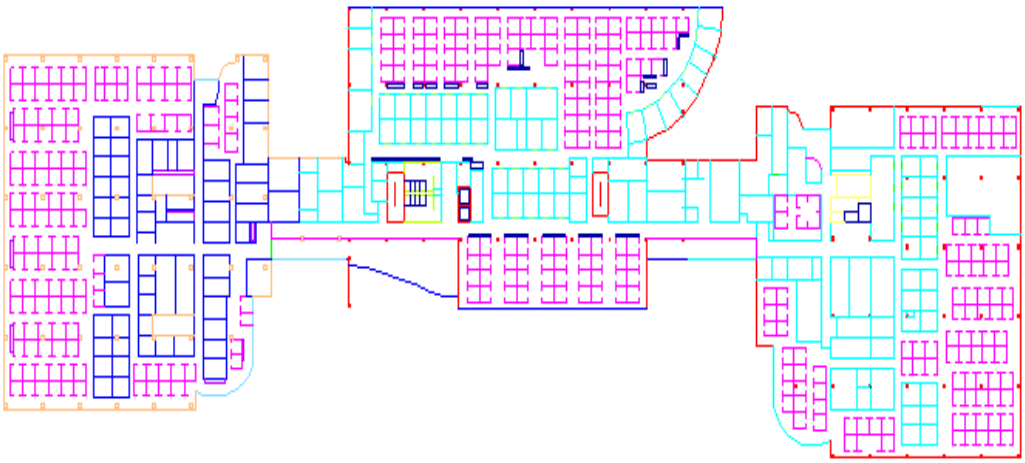


Figure 2-2. Second Floor Plan for the Mt. Airy Office

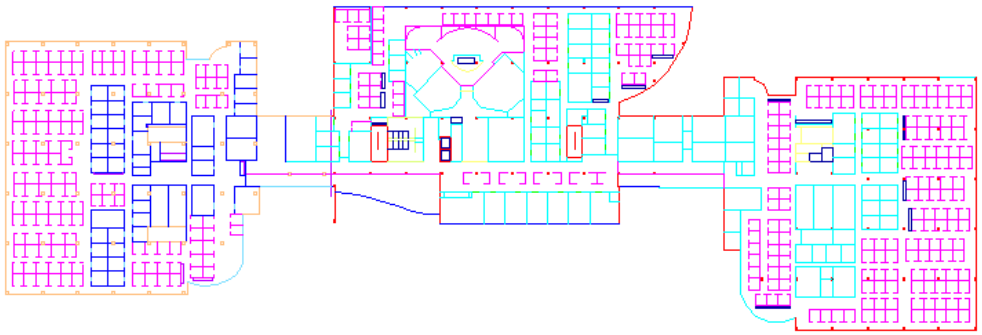


Figure 2-3. Third Floor Plan for the Mt. Airy Office

As the design specialist walks around, he or she notes the following: elevators, stairwells, architectural decor, large floor objects other than furniture, ceiling heights, and special-purpose areas (including the cafeteria, computer room, fitness center, etc.). The design specialist then asks questions pertaining to cabling, antenna-mount restrictions, etc.

The design specialist determines that the following characteristics are common throughout the building:

- Majority of the floor plan contains cubicles and offices that are made out of sheetrock and have 2-foot wide, floor-to-ceiling glass partitions next to the doors.
- Building contains large concrete pillars.

  NOTE:
  The materials for these pillars should be considered when describing the floor plan layout in the Estimator.

- It is confirmed that the elevators are typical metal constructions and that the stairwells are typical concrete constructions.
- Most sections *do not* have any large obstructions that would interfere with radio transmission.
- All the lavatories have ceramic tile.
- Coverage is desired everywhere.

The design specialist notes the following differences:

- Sections 1 and 3 on all three floors have the same dimensions, but Section 2 has different dimensions.
- As noted from the floor plans, Section 1 on Floor 1, Section 1 on Floor 2, and Section 1 on Floor 3 have a similar layout.
- Section 2 on each floor has unique features. Section 2 on Floor 1 contains the auditorium, fitness center, and locker room. The locker room contains rows of metal lockers. Section 2 on Floor 2 contains common office space filled with cubicles and offices. Section 2 on Floor 3 has an open area containing a briefing center. The briefing center has walls with decorative wood paneling.
- Section 3 on Floor 2 and Section 3 on Floor 3 have similar characteristics. However, Section 3 on Floor 1 contains the cafeteria, gift shop, and loading dock; this indicates a high percentage of open space. The loading dock area contains metal machinery and shelving that is fully stocked. The kitchen area in the cafeteria has high shelving that is fully stocked. The gift shop located near the cafeteria has glass partitions.

Summarizing the Office Data

After the site walk-through, the design specialist and telecom manager go back to the manager's office. There, the design specialist summarizes the wireless requirements for the manager as follows:

- Generally, all the sections on the three floors require wireless coverage. No coverage is required in the elevators, and minimal coverage is required in the wiring closets.

- The total number of wireless users is 50 and, on average, these users will spend about 20 percent of their time on the phone. All users will be mobile throughout the entire building.
- There are no special areas that require a high throughput of calls.

Planning the Mt. Airy Office Estimate

After completing the site walk-through, the design specialist returns to his or her office and summarizes the data collected during the visits. The design specialist organizes the information and does some preliminary planning before running the Estimator. This is important and recommended because the design specialist will enter data into the Estimator according to the sections of the building.

Sectionalizing Considerations and Guidelines

The design specialist considers the following in regard to sectionalizing the site:

- From an installation viewpoint, each floor is a separate section and always requires at least one installed WFB.
- Natural divisions between wings on the floor are recognized. Also, areas or corridors that connect wings can be treated as separate sections if they are more than 50 ft long.
- Some areas may have to be isolated due to the floor plan layout. Varying wall materials and open space are considered when examining the floor plan layouts.
- Traffic requirements may differ in different areas and, therefore, may require one or more separate sections.
- When entering information for sections into the Estimator, a multiplier is available that allows the design specialist to describe multiple sections having common characteristics. The common data can be entered once, and the multiplier can be used to account for the number of sections being described.
- A “best-fit” rectangle will be drawn around each sectionalized area to determine the area’s length and width.

The Mt. Airy site has three floors, and each floor has three distinct sections. The three sections are separated by two narrow corridors; this immediately calls for three sections per floor. The distinct right, middle, and left shapes of the building make up the sections. The two corridors are not considered separate sections since they are less than 50 ft long. (The corridors are included as part of the three sections.)

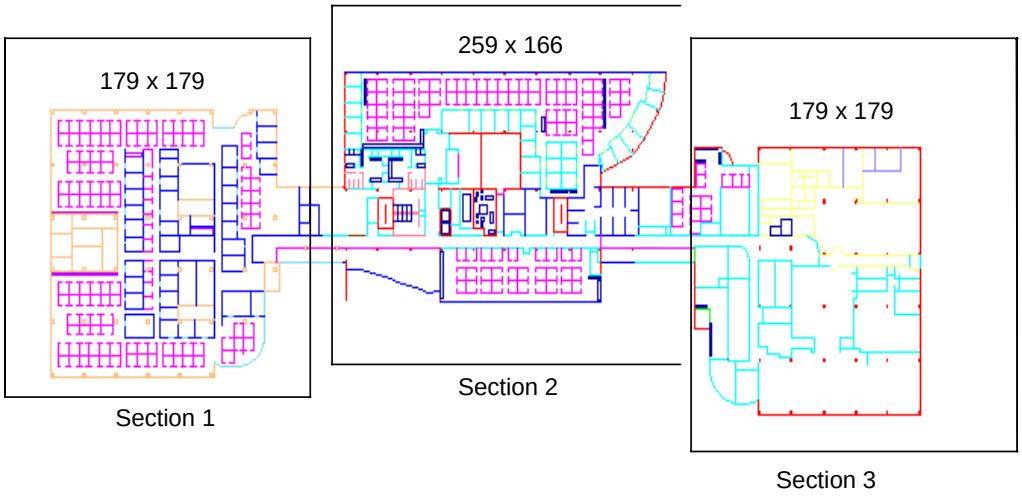


Figure 2-4. Total Floor Plan Layout for the Mt. Airy Office

The right and left sections have the same width and length. The dimensions of the center section are different from the dimensions of the other sections. Therefore, for sectionalizing purposes, start with two sections: one section with dimensions 179 x 179 (using a multiple of 6) and the section with dimensions 259 x 166 (using a multiple of 3).

In examining the data gathered for Mt. Airy, it is apparent that additional sections are required due to significant differences in building characteristics.

Summarizing General Characteristics

In evaluating the DWBS needs for Mt. Airy, the first consideration is the common characteristics for each section at the site. The corresponding data is entered as default values onto the Estimator's Basic Input work sheet. The defaults are used when the user starts entering section data on the Input By Section work sheet.

The characteristics are summarized in the following sections

Traffic

The design specialist was told that the wireless users would make and receive calls throughout the site. The design specialist was also told that all the areas at the site would be equally busy. Therefore, there was no need to sectionalize based on traffic patterns at Mt. Airy.

The design specialist received an estimate of the average length of a wireless call, the average number of calls that were expected during a typical hour, and the number of users. These values will be used to calculate a default value for erlangs. The term “erlangs” is used by the Estimator in regard to traffic usage. If there had been a need to sectionalize due to differing traffic requirements within sections of the building, the design specialist would have had to calculate erlangs for the differing sections by multiplying the average call length (in minutes) by the average number of calls (in an hour) and then dividing by 60 minutes.

Radio Propagation

The rest of the building characteristics are inputs to the P-builder, which is a part of the Estimator. The Propagation loss factor, or P, is the single most important input to the Estimator. The P-builder determines a value for P. This value accurately describes the radio environment of the section. In effect, P provides an indication of the radio signal strength.

Radio signal strength might be compared to the strength of human sounds. For example, you have no doubt experienced how walls and distance degrade human sound when someone is speaking. Also, as a speaker moves further away from you, the speaker’s voice decreases in volume. If someone is speaking in the next room, the sound is muffled. Radio signals, like any sound traveling through space, are absorbed and reflected by obstacles that are encountered along the way. Different materials affect radio signals differently. The following figure illustrates radio propagation.

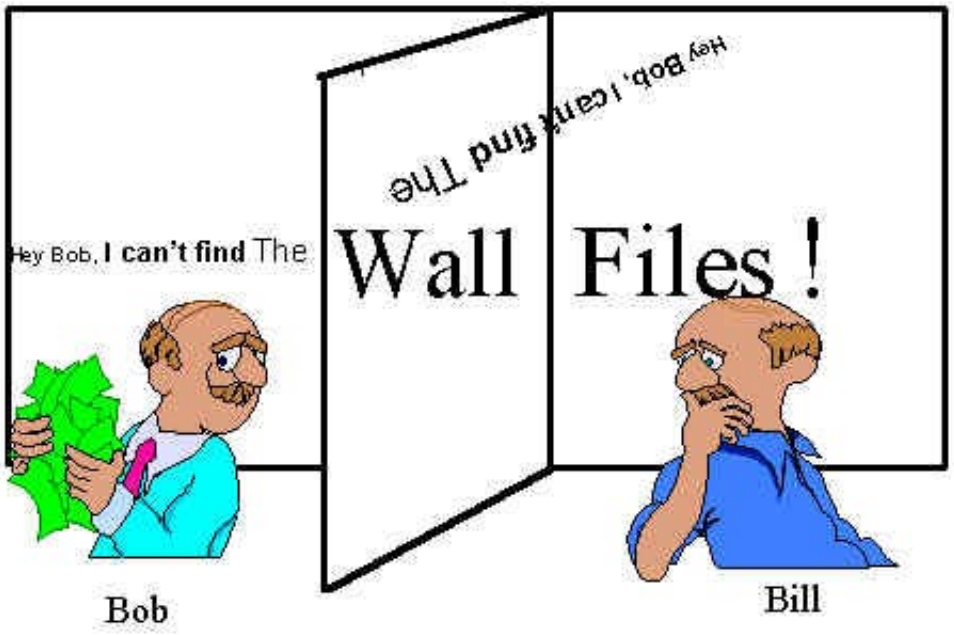


Figure 2-5. Illustration of Radio Propagation

Common Characteristics

The common characteristics discussed in this section have some impact on radio signals and are used to derive the propagation loss factor. Because these characteristics apply to each section at the site, the same answers will be entered for each section.

Common characteristics at the site are discussed in the following list:

- Building type: the entire building is used as a general office.
- Perimeter or bounding walls: all the sections identifed at this point have concrete reinforced steel.
- Ceiling and floor construction: the same floor and ceiling construction, concrete reinforced steel, is used throughout the site.
- Dropped ceilings with similar ceiling clutter are found throughout the site.
- Antenna clearance possibilities

Varying Characteristics

In some places, the floor plan layout and floor clutter at Mt. Airy vary from area to area. These two items require the user to estimate the percentage of floor space that includes walls of specified materials and floor clutter of various descriptions.

Floor Plan Layout

Determine inputs regarding the floor plan layout by viewing the floor plan as well as the data that was obtained during the site tour. Specifically, do the following:

- If 100 percent of a section's space is filled with walled corridors, rooms, and partitions, consider 100 percent of the section as partition space. Divide this percentage among the available construction materials within the table.
- If there is an area on the floor plan that appears to be larger than the rest of the floor plan layout, and if this area is greater than 10 percent of the floor plan space, weigh this area as open space. Then divide and assign the remaining percentage of the floor area among the available wall construction materials. Sections with significant open space typically include cafeterias or atriums.

  NOTE:
  The open space percentage should be usually less than 100 percent. The remainder is partition space.

- Do not include bounding or perimeter walls as part of the weighting factor because such walls are not considered part of the partition space. Remember that the perimeter walls are accounted for in a separate question in the P-builder.

Assign floor plan layout weights by doing one of the following:

- View the floor plan and assign percentages based on your observations.
- Use the following formula for areas containing a particular type of wall partition:

  (Total area (square footage) containing the wall type / Total area of section) x 100% = percentage of a particular wall partition type

- Count the number of interior walls. Then calculate the percentage of this wall type by using the following formula:

  Total number of walls for each wall type/Number of interior walls x 100%

At Mt. Airy, the floor plan layout forces the entry of additional sections. Floors 1 and 3 of the middle section contain open space. Floor 1 has an auditorium; Floor 3 has a briefing center. Floor 1 of the right-most section also contains open space, the cafeteria, and loading dock. (See the floor plan layout for Section 3 Floor 1.)

Section 1 on Floor 1, Section 1 on Floor 2, and Section 1 on Floor 3 have a similar floor plan layout; therefore, the following floor plan assignments were made: all 100 percent was assigned to partition space; 35 percent was assigned to cubicles; 35 percent was assigned to sheetrock; 20 percent was assigned to concrete; and 5 percent was assigned to glass. (See the floor plan layout for Floors 1-3.)

The briefing center in Section 2 on Floor 3 takes up about 20 percent of the space; therefore, 20 percent was assigned to open space. That left 80 percent of partition space to assign to wall materials, as follows:

- About 15 percent of the space contains cubicles.
- About 20 percent of the space contains wood panel in the briefing center, and 15 percent of the space contains offices with sheetrock walls.
- The offices have glass panels; therefore, 5 percent was assigned to glass. Also, 5 percent was assigned to ceramic tile for the tiled restrooms, and 20 percent was assigned to the concrete for the stairwells.

The following is an example of a completed Select Floor Plan Layout dialog box for the Mt. Airy site.

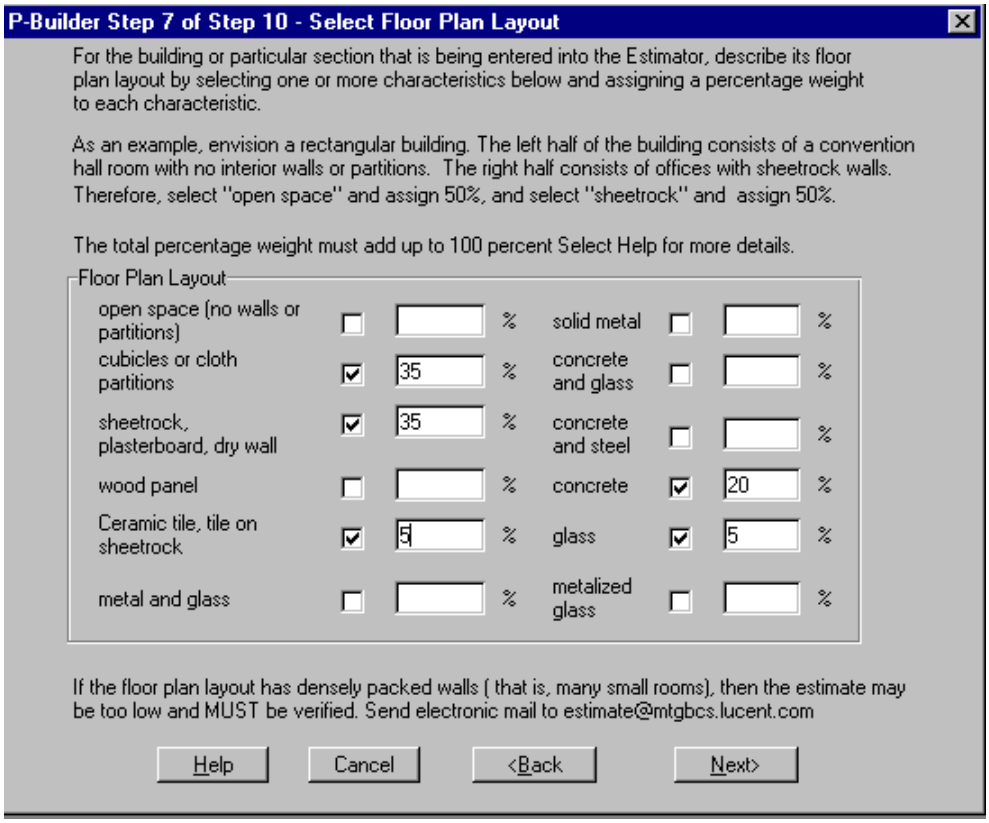


Figure 2-6. Select Floor Plan Layout Dialog Box for the Mt. Airy Site

Floor Clutter

Floor clutter weights are assigned for each section.

Typically, in an office environment, if there are no massive obstructions in the area, the rule of thumb for assigning floor clutter is as follows:

- 95 percent to minimal/furniture. This accounts for desks, shelving, chairs, tables, etc.
- 3 percent to shelves at one-half to three-fourths of the ceiling height. Always assign some shelving to account for large file cabinets or stockroom shelves.
- 2 percent to machinery and/or metal objects at one-half to three-fourths of the ceiling height. Some shelves, machinery and metal objects are typically found in all environments, including mechanical rooms, computer rooms, etc.

If there are areas in the section where the floor clutter is high, wide, or massive use the following formula to assign percentages for the type of floor clutter:

(Area of floor clutter / Total area) x 100% = Percentage assigned to floor clutter

Use this formula for each type of floor clutter. Assign the remainder of the percentage, if any, to minimal/furniture.

NOTE:
For Mt. Airy, you can use the previous rule of thumb for most of the sections because they contain typical office furniture.

Two sections on Floor 1 have other types of floor clutter that must be considered. The middle section contains a locker room; therefore, 5 percent instead of 2 percent was assigned to machinery/metal objects at one-half to three-fourths of the ceiling height. Also, the loading dock in the right-most section contains shelving and metal machinery that had to be considered.

The following is an example of a completed Select Floor Clutter dialog box for the Mt. Airy site.

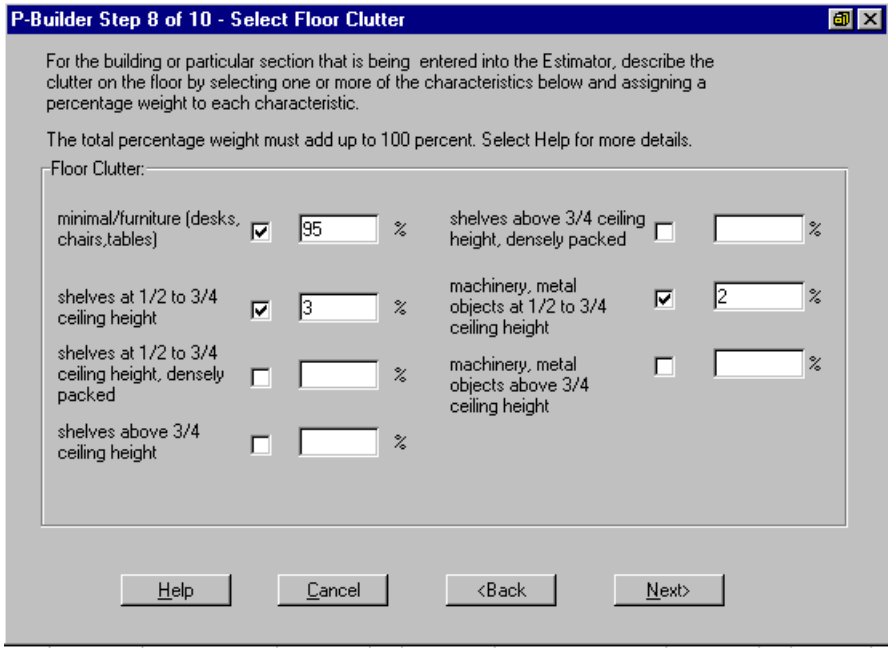
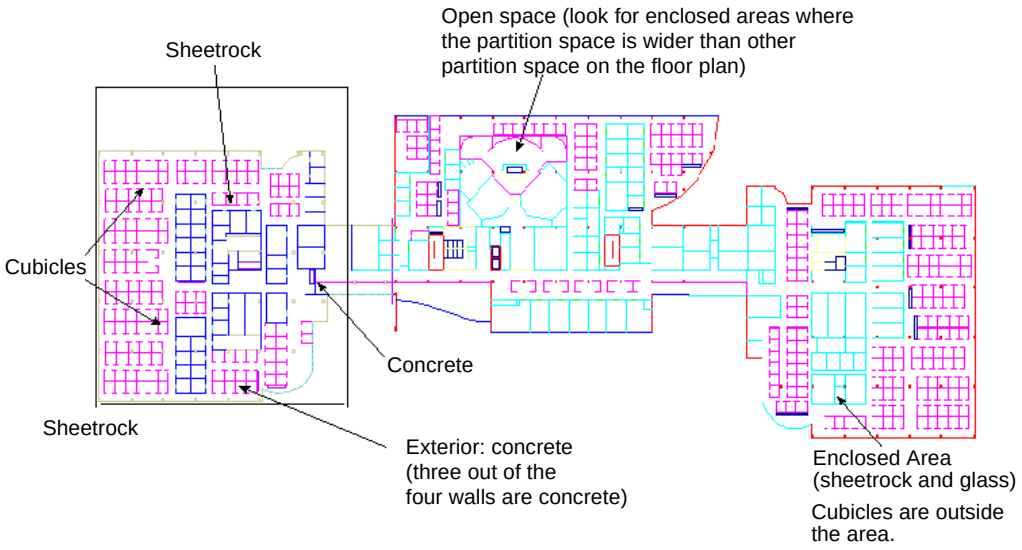


Figure 2-7. Select Floor Clutter Dialog Box for the Mt. Airy Site

In the dialog box, percentages of 95 percent, 3 percent, and 2 percent are assigned to the appropriate sources of floor clutter.

The following figure provides a breakdown of materials at the Mt. Airy office. This is followed by a section-by-section floor plan layout and floor clutter summary for the site.



NOTE: Tile over sheetrock in the lavortories and sheetrock offices contain glass windows and interior pillars made of concrete.

Figure 2-8. Breakdown of Materials at the Mt. Airy Site

Table 2-1. Section-by-Section Floor Plan Layout and Floor Clutter Summary for the Mt. Airy Office Scenario

Estimator Section	Description	Dimensions	Floor Plan Layout	Floor Clutter
1	Section 1 of Floors 1, 2, and 3; Section 3 of Floors 2 and 3	179 x 179	--- All space is considered partition space --- 100% partition space includes the following construction materials: 35% cubicles or cloth partitions; 35% sheetrock, plasterboard, and dry wall; 20% concrete; 5% glass; 5% ceramic tile over sheetrock	--- 95% minimal/furniture --- 3% shelving at 1/2 to 3/4 of the ceiling height --- 2% metal machinery at 1/2 to 3/4 of the ceiling height
2	Floor 1, Section 3	179 x 179	--- 20% is assigned to open space (loading dock and cafeteria) --- Remaining 80% divided as follows: 20% concrete; 50% sheetrock, plasterboard, and drywall; 5% glass; 5% ceramic tile over sheetrock	Due to loading dock and cafeteria --- 80% minimal/furniture --- 10% shelving at 1/2 to 3/4 of the ceiling height, densely packed --- 10% metal machinery at 1/2 to 3/4 of the ceiling height
3	Floor 2, Section 2	259 x 166	--- 100% is assigned to partition space --- Remaining 100% divided as follows: 35% cubicles or cloth partitions; 35% sheetrock, plasterboard, and dry wall; 20% concrete; 5% glass; 5% ceramic tile over sheetrock	--- 95% minimal/furniture --- 3% shelving at 1/2 to 3/4 of the ceiling height --- 2% metal machinery at 1/2 to 3/4 of the ceiling height
4	Floor 3, Section 2	179 x 179	--- 20% is assigned to open space (briefing center) --- Remaining 80% divided as follows: 15% cubicles or cloth partitions; 15% sheetrock, plasterboard, and dry wall; 20% concrete; 5% glass; 20% wood panel for the briefing center; 5% ceramic tile over sheetrock	--- 95% minimal/furniture --- 3% shelving at 1/2 to 3/4 of the ceiling height --- 2% metal machinery at 1/2 to 3/4 of the ceiling height
5	Floor 1, Section 2	259 x 166	--- 25% is assigned to open space (fitness center, auditorium) --- Remaining 75% divided as follows: 35% sheetrock, plasterboard, and dry wall; 20% wood panel; 10% concrete; 5% glass; 5% ceramic tile over sheetrock	Due to locker room --- 92% minimal/furniture --- 3% shelving at 1/2 to 3/4 of the ceiling height --- 5% metal machinery at 1/2 to 3/4 of the ceiling height (fitness center)

Summarizing Traffic Requirements

The following list summarizes the traffic requirements for the site:

- 50 wireless users
- Single wireless user spends approximately 20 percent of his or her time on the phone during normal business operations.

The following list summarizes the building type, construction materials, and other characteristics relevant to the site as a whole:

Creating the Estimate for the Mt. Airy Office

We are now ready to create an estimate for the office scenario. The user can create an estimate for a new customer or for an existing customer. For this scenario, we will be creating an estimate for a new customer.

The data gathered for the office site is used to enter data into two Estimator work sheets: the Basic Input work sheet and the Input By Section work sheet. First, however, it is necessary to access the Estimator application and learn to navigate through the application.

Accessing the Estimator Application

To access the Estimator application, do the following:

1. Open the Estimator by navigating to the c:\estimate folder and clicking either Estimate.xls or the Estimator icon (if one exists). The Welcome screen and accompanying password dialog box appear.
2. In the dialog box, enter the password **wise** (required for every session) and click OK .

   NOTE:
   Read the welcome work sheet and make sure you are using the latest version of the Estimator. If you do not have the latest version, retrieve it from IntraWorks™.

Navigating Through the Estimator Application

There are two ways to navigate through the Estimator worksheets. You can navigate by using the tabs at the bottom of the window. The worksheets are organized in the order required to enter information for a new estimate. Alternatively, you can navigate by using the Estimator menu “GoTo” functions. With a few exceptions, Estimator functions for saving, retrieving and modifying estimates are accessible through this menu.

Starting the Estimate

Start creating the estimate as follows:

1. To enter information for the new customer, pull down the **Estimator** drop-down menu and select the **New Estimate** menu item and then the **New Customer** submenu item. (In other words, choose **Estimator > New Estimate > New Customer**.) This displays the Customer Information work sheet and also the New Customer Information dialog box.
2. Enter the new customer information as requested into the New Customer Information dialog box and click OK. (See the following figure.) The customer input is displayed on the Customer Information work sheet and is now part of the database.

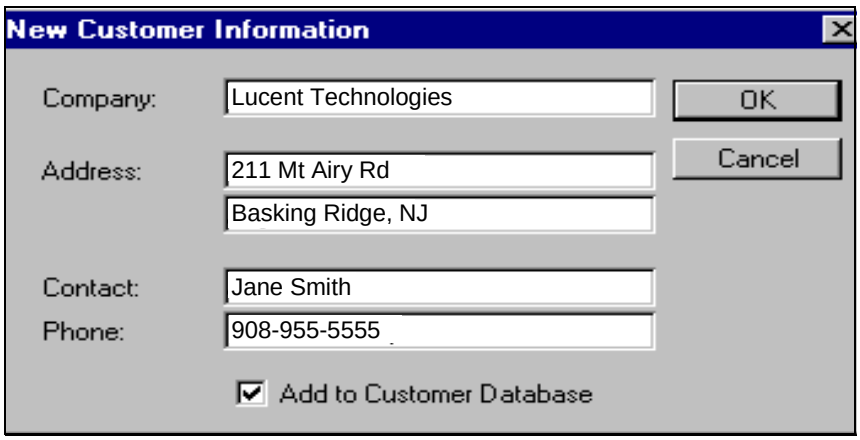


Figure 2-9. New Customer Information Dialog Box

We are now ready to input some DWBS parameters and to set up some default values.

Basic Input Work Sheet

The Basic Input work sheet is used to enter the site defaults for the DWBS site. Enter the appropriate information into each shaded cell.

Use the following instructions to complete the Basic Input work sheet. Be sure to enter the values indicated.

Supply the DWBS parameters as follows:

1. Enter **8** (default) for the number of available frequencies. (Always use the system default.)

2. Enter **3** (default) for the maximum number of CAUs. (Start with this default value to allow for growth; this value can be fine-tuned later once the quote is finalized.)
3. Per customer request, enter **50** for the maximum number of administered users. (This value will be used as a default value.)
4. Per customer request, enter **50** for the number of wireless terminals.

Supply the default values as follows:

5. Enter **0.01** for the blocking probability. (The customer has agreed that having one of 100 calls blocked is acceptable.)
6. Enter **4** for the average number of calls per user per hour. Calculate the average call length in minutes per user per hour as follows:

   14400 minutes of wireless air time / 24 hours of operation = 600 minutes of air time per hour
   600 minutes of air time per hour / 50 users = 12 minutes of air time per user per hour.
   12 minutes of air time per user per hour / 4 wireless calls per user per hour = average call length of 3 minutes per user per hour

   The average call length value for the number of calls per hour indicates that each user spends an average of 20 percent of his or her time making wireless calls.

   NOTE:
   Always use "24" as the "hours of operation" value, as shown in the previous example. The Estimator itself anticipates the peak number of hours for wireless usage.

7. Enter **524** for the length of the rectangle enclosing the entire site and **259** for the width of the rectangle enclosing the entire site. (These dimensions are used to calculate the I2 cable length in case the customer does not have his or her own coax cable to run from the switch to a WFB.)

Radio Propagation Loss Factor

Determine and then enter the radio propagation loss factor (P), as follows.

1. Within the Estimator, P is derived via the P-builder. P-builder requires the input of a large portion of the data gathered during the site walk-through. P and the data used to derive it act as defaults; therefore, it is beneficial to use the most efficient defaults. To determine these defaults, use the information gathered in the "Planning the Office Estimate" section earlier in this chapter.
2. Click p-builder on the Basic Input work sheet to build a P-factor that will be the default for P-builder when it is used later to enter data on the Input by Section work sheet. For the Mt. Airy site, Section 1 on Floors 1 through 3

and Section 3 on Floors 2 and 3 were selected as the default because the data for these sections applies to most of the sections that are common to one another.

NOTE:
If there are no areas in common, click p-builder to build a P-factor for either the largest section or your first section.

3. Enter appropriate values, as follows:
   - Building type: office
   - Bounding or perimeter walls: concrete reinforced by steel
   - Floor construction: concrete reinforced by steel
   - Ceiling: concrete reinforced by steel. Dropped ceilings can be found throughout Mt. Airy.
   - Ceiling clutter: partially full
   - Floor plan layout contains 100 percent partition space, which is divided as follows:
     - 35 percent for cubicles and cloth partitions
     - 35 percent for sheetrock
     - 5 percent for ceramic tile
     - 5 percent for glass
     - 20 percent for antenna clearance
   - Floor clutter: Mt. Airy has typical office furniture and no massive obstructions. The following assignments are made:
     - 95 percent for minimal/furniture
     - 3 percent for shelving at one-half to three-fourths of the ceiling height
     - 2 percent for machinery/metal objects

The P-Builder Summary report summarizes all of the choices made for building a P-factor. The report also displays the calculated P-factor based on all of the selections. This P-factor value applies to the building or particular section being entered into the Estimator. At this point, click Back to review and/or make revisions to your previous selections. Once you are satisfied with your choices, click Finish on P-Builder or the P-Builder Summary Report dialog box to accept the P-factor value.

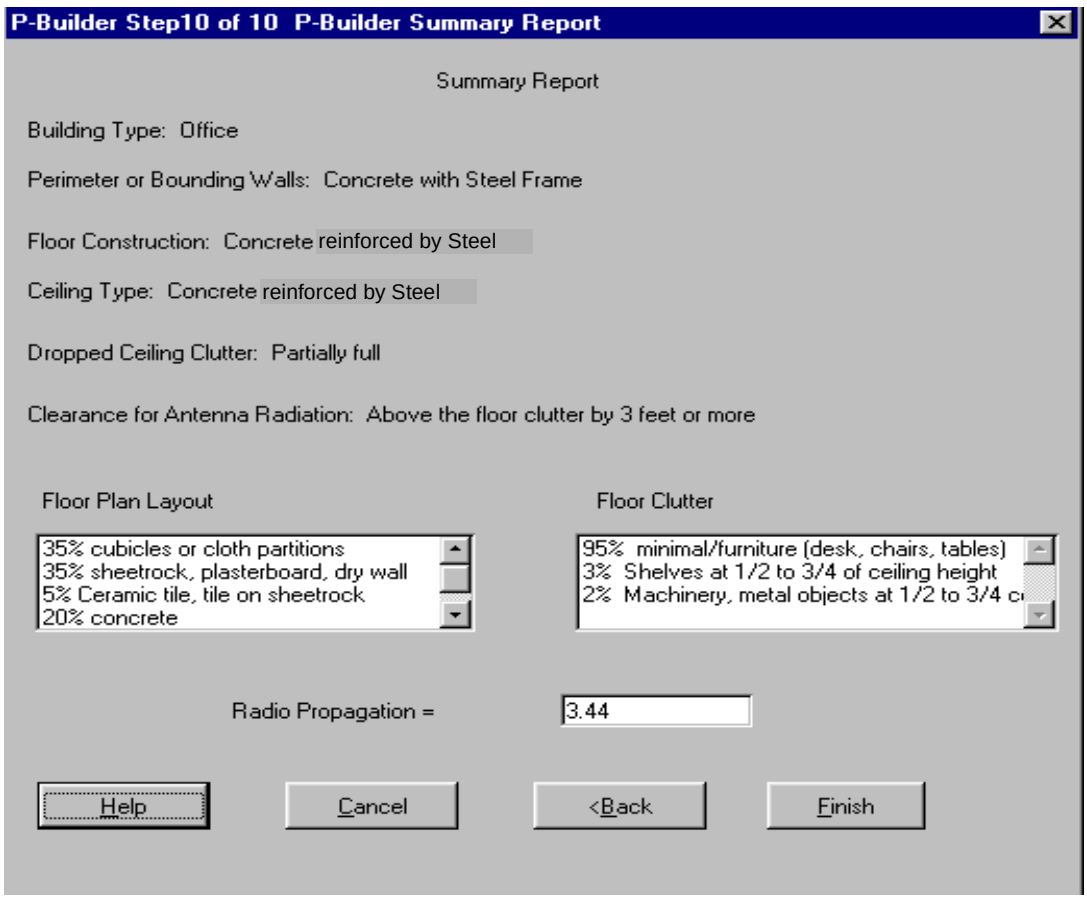


Figure 2-10. P-Builder Summary Report

This completes the input for the Basic Input work sheet. The following figure is an example of this work sheet.

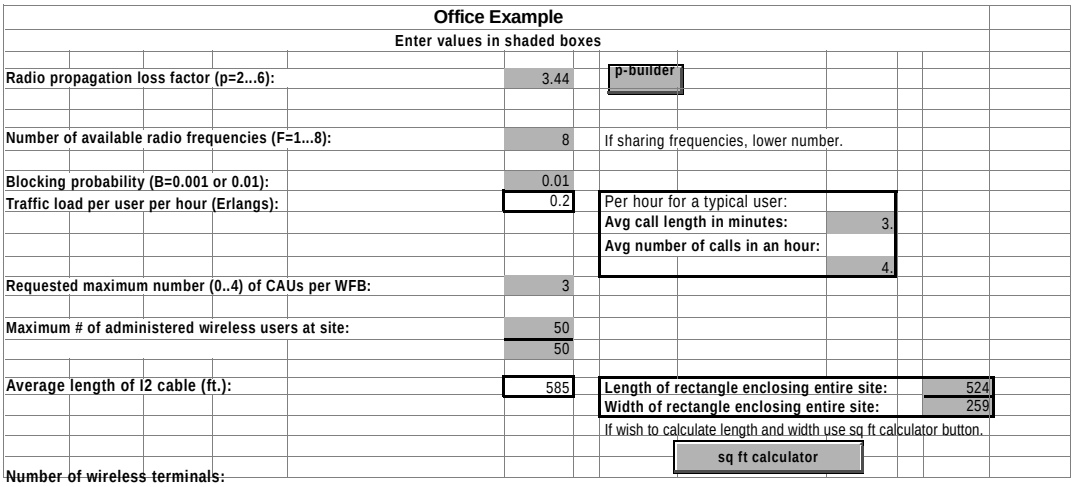


Figure 2-11. Basic Input Work Sheet

Input By Section Work Sheet

The Input by Section work sheet enables you to describe the site in detail (that is, based on sections). The data entered on the Basic Input work sheet is used as defaults to the Input By Section work sheet.

You are required to input data for at least one section. The number of sections required is determined by how the site's radio environment (including the floor plan and traffic requirements) are characterized.

To input descriptions of the sections, do the following:

1. Select the **Estimator > Update Input by Section > Add** menu item. The Add Section Dialog Box appears, as follows:

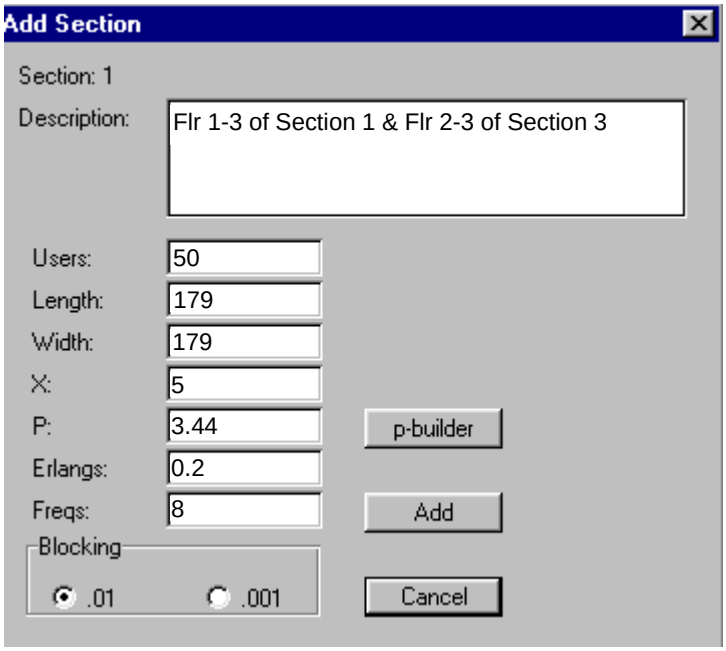


Figure 2-12. Add Section Dialog Box

2. Enter data for the following fields:
   - *Description*: Enter a meaningful description corresponding to the floor plan area.
   - *Users*: Accept the default of **50**.
   - *Length*: **179** ft
   - *Width*: **179** ft
   - *X*: Multiplier is **5** because the section being described includes five portions of the building.
   - *P*: Accept the P-factor from the Basic Input work sheet to serve as the default for the sections that have similar radio propagation characteristics. These are the common areas that were described for P-Builder.
   - *Erlangs:* Keep value **0.2**. If the percentage changes in an area, customize the percentage of wireless traffic to match the special condition. Use the following formula:

     erlangs = average call length * average number of calls per / 60 minutes

- *Blocking*: One of 100 calls may be blocked. The only other choice is blocking one of 1,000 calls. This value would be used if the area requires a very high throughput of wireless traffic (for example, an executive area).

3. Complete the Input by Section work sheet by adding the sections for the site using the data that was preplanned prior to starting the Estimator. For the sections that had different radio characteristics than those entered in the Basic Input work sheet, click p-builder to enter their unique characteristics.

The following figure shows a completed Input by Section work sheet based on the inputs identified in this section.

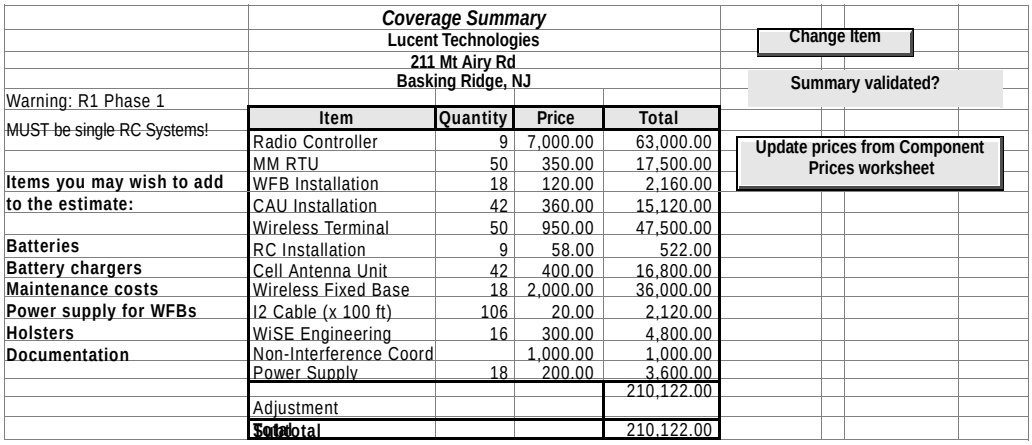
Total Coverage (K sq ft):
Avg Density (Users/K sq ft):
Lucent Technologies
211 Mt Airy Rd
Description
Basking Ridge, NJ
Calculate
Use Update Input by Section from the Estimator menu to add, change or delete section data.

Section	Users	Length	Width	K sq ft	Avg Density	X	Total K sq ft	Total Users	p	Blocking	Erlangs	Freqs
1	50	179	179	32.041	1.5605	5	160.205	250	3.44	0.01	0.2	8
2	50	179	179	32.041	1.5605	1	32.041	50	3.55	0.01	0.2	8
3	50	259	166	42.994	1.163	1	42.994	50	3.44	0.01	0.2	8
4	50	259	166	42.994	1.163	1	42.994	50	3.52	0.01	0.2	8
5	50	259	166	42.994	1.163	1	42.994	50	3.38	0.01	0.2	8

Figure 2-13. Input by Section Work Sheet

Calculating and Reviewing the Estimate

Once you finish entering the sections, click Calculate on the Input By Section work sheet to calculate a coverage and traffic estimate quote. The Estimator application displays the Coverage Summary work sheet once the calculation is completed. The following figures show the completed Coverage Summary and Traffic Summary work sheets for the Mt. Airy site.



Coverage Summary

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Change Item

Summary validated?

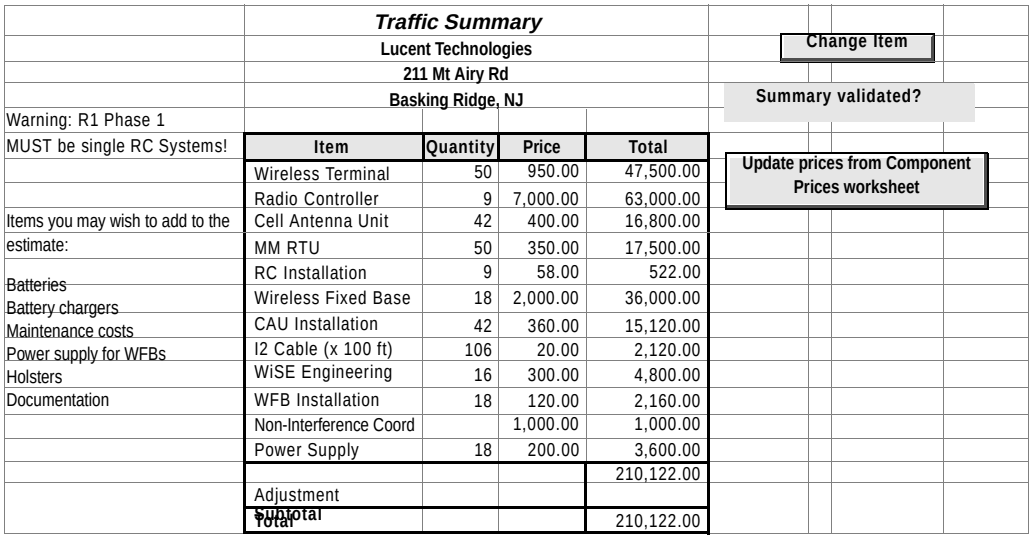
Update prices from Component Prices worksheet

Warning: R1 Phase 1 MUST be single RC Systems!

Item	Quantity	Price	Total
Radio Controller	9	7,000.00	63,000.00
MM RTU	50	350.00	17,500.00
WFB Installation	18	120.00	2,160.00
CAU Installation	42	360.00	15,120.00
Wireless Terminal	50	950.00	47,500.00
RC Installation	9	58.00	522.00
Cell Antenna Unit	42	400.00	16,800.00
Wireless Fixed Base	18	2,000.00	36,000.00
I2 Cable (x 100 ft)	106	20.00	2,120.00
WiSE Engineering	16	300.00	4,800.00
Non-Interference Coord		1,000.00	1,000.00
Power Supply	18	200.00	3,600.00
			210,122.00
Adjustment			
Subtotal			210,122.00

Items you may wish to add to the estimate:
Batteries
Battery chargers
Maintenance costs
Power supply for WFBs
Holsters
Documentation

Figure 2-14. Coverage Summary Work Sheet for the Mt. Airy Site



Traffic Summary

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Change Item

Summary validated?

Update prices from Component Prices worksheet

Warning: R1 Phase 1 MUST be single RC Systems!

Item	Quantity	Price	Total
Wireless Terminal	50	950.00	47,500.00
Radio Controller	9	7,000.00	63,000.00
Cell Antenna Unit	42	400.00	16,800.00
MM RTU	50	350.00	17,500.00
RC Installation	9	58.00	522.00
Wireless Fixed Base	18	2,000.00	36,000.00
CAU Installation	42	360.00	15,120.00
I2 Cable (x 100 ft)	106	20.00	2,120.00
WiSE Engineering	16	300.00	4,800.00
WFB Installation	18	120.00	2,160.00
Non-Interference Coord		1,000.00	1,000.00
Power Supply	18	200.00	3,600.00
			210,122.00
Adjustment			
Subtotal			210,122.00

Items you may wish to add to the estimate:
Batteries
Battery chargers
Maintenance costs
Power supply for WFBs
Holsters
Documentation

Figure 2-15. Traffic Summary Work Sheet for the Mt. Airy Site

Review the estimate as follows:

1. Examine the following work sheets:
   - Coverage Summary work sheet — provides the grand total of the wireless coverage equipment cost
   - Traffic Summary work sheet — provides the grand total of the wireless traffic equipment cost

- Coverage Detail work sheet — provides the total of the wireless infrastructure on a per-section basis

  The following figure shows the completed Coverage Detail work sheet for the Mt. Airy site.

Coverage Detail

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Summarize by: Description | Section | No Summary

			Per Section				
Section	Description	Price	Quantity	Total	X	Quantity	Total
1	Wireless Fixed Base	2,000.00	2.	4,000.00	5	10.	20,000.00
1	Radio Controller	7,000.00	1.	7,000.00	5	5.	35,000.00
1	I2 Cable (x 100 ft)	20.00	11.69	233.81	5	58.45	1,169.03
1	Cell Antenna Unit	400.00	4.	1,600.00	5	20.	8,000.00
1	RC Installation	58.00	1.	58.00	5	5.	290.00
1	WFB Installation	120.00	2.	240.00	5	10.	1,200.00
1	CAU Installation	360.00	4.	1,440.00	5	20.	7,200.00
2	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
2	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
2	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
2	Cell Antenna Unit	400.00	4.	1,600.00	1	4.	1,600.00
2	RC Installation	58.00	1.	58.00	1	1.	58.00
2	WFB Installation	120.00	2.	240.00	1	2.	240.00
2	CAU Installation	360.00	4.	1,440.00	1	4.	1,440.00
3	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
3	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
3	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
3	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
3	RC Installation	58.00	1.	58.00	1	1.	58.00
3	WFB Installation	120.00	2.	240.00	1	2.	240.00
3	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
4	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
4	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
4	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
4	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
4	RC Installation	58.00	1.	58.00	1	1.	58.00
4	WFB Installation	120.00	2.	240.00	1	2.	240.00
4	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
5	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
5	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
5	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
5	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
5	RC Installation	58.00	1.	58.00	1	1.	58.00
5	WFB Installation	120.00	2.	240.00	1	2.	240.00
5	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00

Figure 2-16. Coverage Detail Work Sheet for the Mt. Airy Site

- Traffic Detail work sheet — provides the total of wireless traffic infrastructure on a per-section basis

  The following figure shows the completed Traffic Detail work sheet for the Mt. Airy site.

Traffic Detail

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Summarize by: Description | Section | No Summary

			Per Section:				
Section	**Description**	**Price**	**Quantity**	**Total**	**X**	**Quantity**	**Total**
1	Wireless Fixed Base	2,000.00	2.	4,000.00	5	10.	20,000.00
1	Radio Controller	7,000.00	1.	7,000.00	5	5.	35,000.00
1	I2 Cable (x 100 ft)	20.00	11.69	233.81	5	58.45	1,169.03
1	Cell Antenna Unit	400.00	4.	1,600.00	5	20.	8,000.00
1	RC Installation	58.00	1.	58.00	5	5.	290.00
1	WFB Installation	120.00	2.	240.00	5	10.	1,200.00
1	CAU Installation	360.00	4.	1,440.00	5	20.	7,200.00
2	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
2	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
2	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
2	Cell Antenna Unit	400.00	4.	1,600.00	1	4.	1,600.00
2	RC Installation	58.00	1.	58.00	1	1.	58.00
2	WFB Installation	120.00	2.	240.00	1	2.	240.00
2	CAU Installation	360.00	4.	1,440.00	1	4.	1,440.00
3	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
3	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
3	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
3	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
3	RC Installation	58.00	1.	58.00	1	1.	58.00
3	WFB Installation	120.00	2.	240.00	1	2.	240.00
3	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
4	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
4	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
4	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
4	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
4	RC Installation	58.00	1.	58.00	1	1.	58.00
4	WFB Installation	120.00	2.	240.00	1	2.	240.00
4	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
5	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
5	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
5	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
5	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
5	RC Installation	58.00	1.	58.00	1	1.	58.00
5	WFB Installation	120.00	2.	240.00	1	2.	240.00
5	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00

Figure 2-17. Traffic Detail Work Sheet for the Mt. Airy Site

- Design Center Information work sheet — provides the total number of antennas on a per-section basis to serve as input to the antenna designs done at the Sales and Design Support Center (SDSC)

  The following figure shows the completed Design Center Information work sheet for the Mt. Airy site.

Design Center Information

Lucent Technologies

(Design Center Information is relevant for the Estimator release 1.7 or greater)

Basic Input Data

Requested maximum number (0..3) of CAUs per WFB:	3

Summary Data:

	Coverage	Traffic
Quote:	210122	210122
Total Non-Radiating WFBS:	18	18
Total Radiating WFBS:	0	0
Total CAUs:	42	42
Total Bases/Antennas used for Prediction:	42	42

Detail Data:

	Coverage				Traffic				
Section	**Non-Radiating WFBS**	**Radiating WFBS**	**CAUs**	**Bases**	**Non-Radiating WFBS**	**Radiating WFBS**	**CAUs**	**Bases**	**X**
1	10	0	20	20	10	0	20	20	5
2	2	0	4	4	2	0	4	4	1
3	2	0	6	6	2	0	6	6	1
4	2	0	6	6	2	0	6	6	1
5	2	0	6	6	2	0	6	6	1

Description Data:

Section	Description
1	Flr 1-3 of Section 1 & Flr 2-3 of Section 3
2	Floor 1, Section 3
3	Floor 2, Section 2
4	Floor 3, Section 2
5	Floor 1, Section 2

Figure 2-18. Design Center Information Work Sheet for the Mt. Airy Site

2. If necessary, refine the estimate quote as follows:

   - Make sure all sections are entered. In the office example, there is a grand total of nine sections. Examine the Input By Section work sheet and total up all the “X” multiplier values to ensure it equates to nine sections.
   - Go back to the Input By Section work sheet and refine by selecting the **Update Input By Section/Change** Estimator menu item to change any items, such as P-factor (via p-builder), number of wireless users, Erlangs, etc. After you make any changes, click Calculate from the Input By Section work sheet to recalculate the estimate quote.

NOTE:
You may decide to go back to the Basic Input work sheet and change the number of CAUs per WFB to **4**. This is recommended when the wireless capacities are greater than five RCs or if the site's facility is greater than or equal to 50,000 square feet per floor. (This helps reduce infrastructure cost.) After you make any changes, navigate back to the Input By Section work sheet and click Calculate from the Basic Input work sheet to recalculate the estimate quote.

3. Once you are satisfied with the estimate quote, add (if not already added) the items in the following list into the quote by clicking Change Item on the Coverage Summary or Traffic Summary work sheet and using the Add Item dialog box, which is shown in the following figure. Also, check the prices via the current configurator.

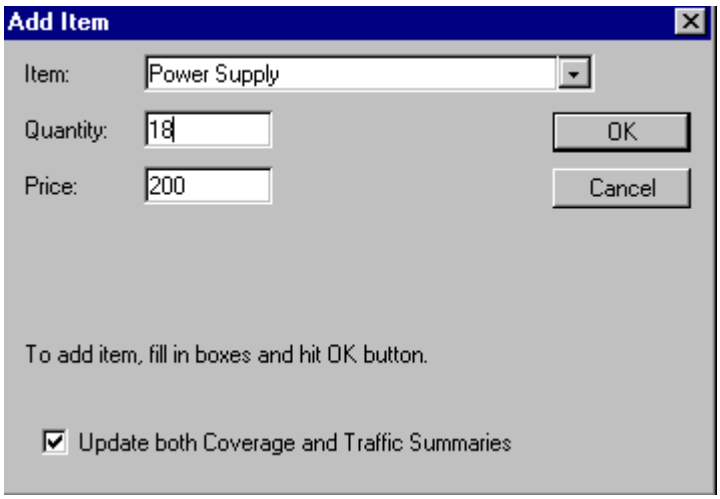


Figure 2-19. Add Item Dialog Box

NOTE:
If you want to add quantities for common items in both the Coverage Summary work sheet and the Traffic Summary work sheet, and if the quantities differ in both work sheets, deselect the "Update both Coverage and Traffic Summaries" option in the Add Item dialog box, make the appropriate changes for each work sheet, and click OK .

- Battery pack for the handset. (Verify if the customer wants more than one battery pack.)
- Battery charger. (Verify that the customer wants at least one charger per handset.)

- RC-to-handset download cable, which is used to update the firmware of the DWBS pocket phone. (Recommend that the customer acquire one cable per RC up to a maximum of five cables.)
- 10 Meg Flash Card

Use the following steps to add the items identified in the previous list:

a. Navigate to and click an empty row on the Coverage Summary work sheet.

b. Click Change Item.

c. Select the desired item (for example, “Battery chargers”) from the drop-down list of items.

d. Click OK.

4. To make any necessary changes at this point, click Change Item on the Coverage Summary or Traffic Summary work sheet and use the Update Item dialog box, of which an example is shown in the following figure:

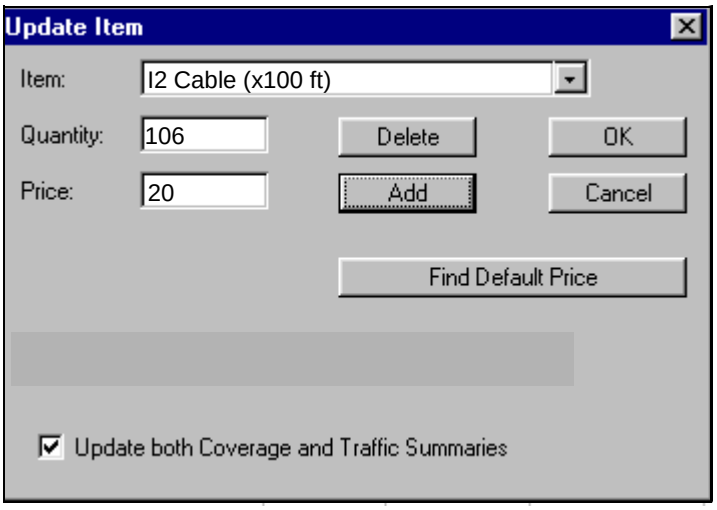


Figure 2-20. Update Item Dialog Box

NOTE:
In particular, provide an I2 price if the customer does not have his or her own I2 cable. To do so, click Change Item on the Coverage Summary work sheet and change the price as required**.**

5. Once you finalize the estimate quote, print the estimate quote to present to the customer by selecting the **Estimator > Print > Design Center Output** menu item. The following work sheets are printed:

- Coverage Summary, which includes the wireless equipment coverage quote
- Traffic Summary, which includes the wireless equipment traffic quote
- Input By Section, which indicates the areas that require coverage
- Design Center Information, which provides a breakdown of the antenna counts on a per-section basis
- Radio Propagation, which includes P-builder selections pertaining to the site and its sections. An example of this work sheet appears as follows:

Radio Propagation Factor Information						
Lucent Technologies				(Note: Section 0 info is from the Basic Input worksheet)		
Section	**P factor**	**Building Type**	**Perimeter Walls**	**Floor Construction**	**Ceiling Construction**	**False Ceiling**
0	3.44	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
0						
0						
0						
0						
2	3.55	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
2						
2						
2						
2						
1	3.44	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
1						
1						
1						
1						
4	3.52	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
4						
4						
4						
4						
4						
4						
5	3.38	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
5						
5						
5						
5						
5						

Figure 2-21. Radio Propagation Work Sheet (Page 1) for the Mt. Airy Site

Clutter	Antenna Clearance	Floor Plan Layout	Floor Clutter
Partially full	Above floor clutter by 3 feet or more	35% cubicles or cloth partitions	95% minimal/furniture (desk, chairs, tables)
		35% sheetrock, plasterboard, dry wall	3% Shelves at 1/2 to 3/4 of ceiling height
		5% Ceramic file, file on sheetrock	2% Machinery, metal objects at 1/2 to 3/4 ceiling height
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	20% open space	80% minimal/furniture (desk, chairs, tables)
		50% sheetrock, plasterboard, dry wall	10% Shelves at 1/2 to 3/4 of ceiling height, densely packed
		5% Ceramic file, file on sheetrock	10% Machinery, metal objects at 1/2 to 3/4 ceiling height
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	35% cubicles or cloth partitions	95% minimal/furniture (desk, chairs, tables)
		35% sheetrock, plasterboard, dry wall	3% Shelves at 1/2 to 3/4 of ceiling height
		5% Ceramic file, file on sheetrock	2% Machinery, metal objects at 1/2 to 3/4 ceiling height
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	20% open space	85% minimal/furniture (desk, chairs, tables)
		15% cubicles or cloth partitions	5% Shelves at 1/2 to 3/4 of ceiling height, densely packed
		15% sheetrock, plasterboard, dry wall	10% Machinery, metal objects above 3/4 ceiling height
		20% wood panel	
		5% Ceramic file, file on sheetrock	
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	25% open space	95% minimal/furniture (desk, chairs, tables)
		35% sheetrock, plasterboard, dry wall	3% Shelves at 1/2 to 3/4 of ceiling height
		20% wood panel	2% Machinery, metal objects at 1/2 to 3/4 ceiling height
		5% Ceramic file, file on sheetrock	
		10% concrete	
		5% glass	

Figure 2-22. Radio Propagation Work Sheet (Page 2) for the Mt. Airy Site

6. To save the estimate, select **Estimator > Save**. In the Save dialog box, enter a description of the estimate. Then click Save. The estimate is now saved and appears as an entry within the Estimate Index work sheet.
7. On the printed work sheet, indicate what quote was provided to the customer and send all the estimate outputs to the SDSC.

Summary

Remember that every building exhibits unique radio characteristics. Every estimate quote must take into account the differences and commonalties found in the building. Mastering the art of recognizing these differences in the building is what makes for an accurate estimate quote.

Information about the Estimator and the DWBS product offer is provided on Intraworks. Online help is available in the Estimator by using either p-builder or the “help” option from the Estimator menu.

Send any feedback or questions regarding the Estimator to the following electronic mail address: **estimate@mtgbcs.lucent.com**. For example, if you cannot find a wall material that describes one of the partitions at the customer site, feel free to e-mail a question in this regard. This feedback will be used to make improvements to the Estimator.

Radio-Related Concepts

3

Introduction

This chapter discusses the radio propagation factor.

Radio Propagation Loss Factor

The radio propagation loss factor, also called the P-factor, describes the radio characteristics at the site. The P-Builder is used to calculate the P-factor (for example, 3.9) by answering several questions from the Estimator application. The P-factor value determines the cell size. It is important to choose the P-factor that best describes the site or section. The P-factor is one of the most important inputs to the estimate's calculations.

Click p-builder from the Basic Input work sheet and the Add/Change dialog boxes from the Input by Section work sheets to lead you through a series of questions for calculating the P-factors at your site. These P-factors describe the varying characteristics at your site.

NOTE:
Your choices should be based on the information obtained from the site walk-through. Refer to the previous chapter for details.

The P-factor indicates at what rate with distance the radio signal strength diminishes. A higher P-factor selection generally indicates more obstructions in the radio wave's travel path. A higher P-factor also means a smaller cell size and, therefore, increases the amount of radio equipment needed for reliable radio service.

NOTE:
Raising or lowering the P-factor 1/10 of a point will result in more than a 1/10 of a point change in the cell size and, therefore, in the estimate calculation.

The following figure depicts a DWBS cell size calculated for a P-factors of 3.5 and 3.8.

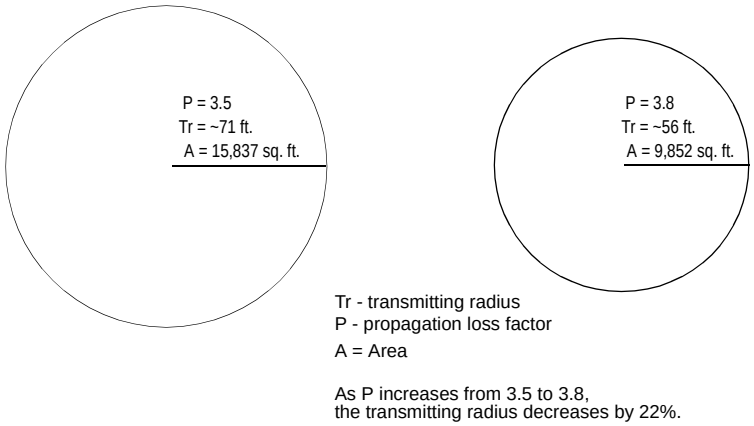


Figure 3-1. P-Factor Changes Determining Cell Area

The Estimator calculates the number of cells needed for the coverage area(s) by using the transmitting cell radius determined by the P-factor input. The Estimator estimates one antenna per cell. Antennas are CAUs attached to WFBs.

Whenever you are building the P-factor for a site, be sure to adhere to the following points:

- Do not manually determine the number of cells by using the maximum distance that a DWBS antenna can transmit.
- If you cannot find choices that best describe your site (for example, floor plan partitions, wall materials, etc.), send a query to the following electronic mail address: **estimate@mtgbcs.lucent.com**.

General Guidelines

4

Introduction

This chapter contains general guidelines for preparing the estimate and for using the Estimator.

Avoiding Common Pitfalls

Avoid these common pitfalls whenever you are deriving an estimate quote for the customer:

- Always ensure that you have the current release of the Estimator. This is available on Intraworks.
- Do not always apply the same radio propagation factor to an entire facility, especially if the area functions and the floor plan layout are clearly different. Remember that your powers of observation of the site and your floor plan will reveal differences that can correlate to differing radio characteristics.
- Avoid under-sectionalizing to make the price right for the customer. Instead, look for areas in the building that can accommodate the customer's budget and needs.
- You are providing quotes that are aligned with the current DWBS product offer. For the current Estimator release, refer to IntraWorks for the latest DWBS product offer.

Estimate Planning and Data Gathering

Be sure to do the following whenever you are planning the estimate and gathering the relevant data inputs:

- Arrange a site walk-through to introduce the product and to understand the customer's indoor environment and coverage areas.
- Always have accurate floor plans of the customer site prior to your visit.

Sectionalizing

Each building requires a separate estimate.

Consider each floor within a building as a separate section. (Antenna designs are engineered based on this strategy.) Treat each section as follows:

1. Use the architectural floor plans to guide you on how to sectionalize. Also, consider sectionalizing the floor further by using these guidelines:
   - If sections of the floors are drawn separately on the blueprint, treat these areas as separate sections.
   - If areas of the floor have different functions (for example, office and manufacturing), consider sectionalizing by function.
   - If the floor has one or more wide open areas (including, for example, one or more atriums, auditoriums, cafeterias, etc.), and if the open area(s) are greater than 10 percent of the total area, a separate section may be required.
   - If areas on the floor are completely enclosed with metal partitions or dense concrete, and if these areas cannot be reached via a 100-foot I2 cable from the WFB to the CAU, a separate section may be required.
   - If areas on the floor have special wireless traffic requirements, consider these areas as separate sections.
2. Fit these areas into rectangles. You may have to extend the coverage area since not all sections are going to fit into neat rectangles. For example, an L-shaped area may be combined into one section using the longest length and width. Divide this area into two sections, especially if you cannot position the WFB centrally and have the maximum 100-foot cable for CAUs reach the far-end corners of the area. If you cannot wire CAUs, divide this area into sections.

   NOTE:
   Use these guidelines for areas shaped like an H, Z or C (for which one to three sections may be necessary) or any odd-shaped areas that fit this criteria.

3. Group common sections together. For example, a multilevel story building contains five floors with the following characteristics:
    - Floor 1 is the basement.
    - Floor 2 includes the main entrance, auditorium and office space.
    - Floors 3 through 5 are office space and have the same dimensions and the same floor plan layout, including construction materials.
    - Floor 1 is a separate section.
    - Floor 2 is a separate section.
    - Floors 3 through 5 are considered one section. However, a multiplier of 3 is used on the Estimator Input By Section work sheet. The section data is entered once using this multiplier to account for three floors with the same characteristics.

Hints for Floor Plan Layout

This section contains suggestions regarding weighting floor plan layout partitions for the various indoor environments that you visit.

- Use any one of the following methods to assign floor plan layout weights:
    - — View the floor plan and assign percentages based on observations.
    - — Apply the following formula for areas including a particular wall material:

      (Total area in square footage with a particular wall material / Total area of section) x 100
    - — Count the interior walls of a particular type and use the following formula to calculate the percentage of such walls:

      Number of walls of a particular type / Total number of walls x 100
- If the majority of the wall material is sheetrock, and if the facility is a multilevel building, use the following weights:
    - — 95 percent for sheetrock
    - — 3 percent for concrete (account for the stairwells)
    - — 2 percent for metal (elevators)

    NOTE:
    Most buildings are made out of more than one material, even if you are told otherwise.

- Use the following pointers to determine the wall construction materials:
    - — *Concrete* is found in basements, loading dock areas, and older buildings dating from the pre-1960's.

NOTE:
This is typical of hospitals and universities.

— *Metal* is found in elevators, X-ray rooms, emergency rooms, magnetic-resonant imaging (MRI) rooms, and sound studios.

— *Glass* is found in nursing stations, intensive care unit (ICU) areas in a hospital (including the walls facing the corridor), and modern offices.

— *Fire-rated sheetrock* is found in hotels.

Hints for Floor Clutter

Use the following hints regarding floor clutter:

- Within an office environment, if there are **no** massive obstructions in the area, assign the floor clutter as follows:
  - — 95 percent for minimal/no furniture. (This accounts for desks, shelving, chairs, tables, etc., within less than one-half of the ceiling height or if there is no furniture.)
  - — 3 percent for shelving at one-half to three-fourths of the ceiling height. (Always assign some percentage to shelving greater than one-half of the ceiling height to account for any shelving or cabinets.)
  - — 2 percent for metal machinery at one-half to three-fourths of the ceiling height (to account for any computer equipment, kitchen facilities, or switching equipment).
- If there are areas in the section where the floor clutter is high and wide or massive, use the following guidelines to assign percentages for the type of floor clutter:
  - — For areas that have large amounts of floor clutter, apply this formula:

    (Area including clutter / Total area) x 100% = Percentage to assign for the floor clutter

    If varying clutter exists, use the percentage to divide further among the clutter selections available in P-builder. The clutter selection choices are for shelving, well-stocked shelving, metal machinery, and metallic objects where the height of these objects on the floor extends somewhere between one-half of the ceiling height and the top of the ceiling. Assign the percentages according to the options available for the floor clutter selections in the P-Builder.
  - — Assign the rest of the percentage to minimal/no furniture.

- Use your judgment to probe if floor clutter exists in the environment. For example, check for the following:
  - — Well-stocked shelving in retail stores (for example, supermarkets, hardware stores, retail stores, etc.), pharmaceutical areas, libraries, kitchens, and shipping areas
  - — Machinery and metal objects in computer labs, large administration filing cabinets, shipping areas, and the basement

General Requirements and Installation

A

Introduction

This appendix contains general requirements and installation procedures.

Estimator Computing Environment

The following list provides requirements for the Estimator computing environment:

- Microsoft® Windows NT™ version 3.51 or greater; or Windows™ for Workgroup 3.11; or Microsoft Windows 95™ with Microsoft Excel 5.0® installed is required.
- Microsoft Excel 5.0 or Microsoft Excel 7.0®
- 486/100 MHz or better PC is required; Pentium™ 100 MHz or better PC is recommended.
- Minimum 80 MB RAM is required for the Estimator and for saving the estimate.
- One Gigabyte hard drive is recommended (for file space).

The latest version of the Estimator is available via IntraWorks as a self-extracting executable file.

Installation Procedure

To install the Estimator, do the following:

1. Visit the FreeWorks™ IntraWorks page, which contains information about the DWBS Estimator.
2. Click the button that allows you to download the latest Estimator release to your PC. (Remember your current folder so that you can locate the file being transferred.)
3. Open your File Manager or Windows Explorer on the PC, and locate the folder to which the file was copied.
4. Click the estimate.exe file to install the latest version of the Estimator on your PC. Click the Unzip button so that the estimate.exe file will self-extract; then install the Estimator under the c:\estimate folder. Installation will either overwrite an existing Estimator version or create the c:\estimate folder if this is the first installation.

   NOTE:
   Whenever you are upgrading, existing estimates and customer information are not overwritten.

   Do not change the default folder; otherwise, the application will not run properly.

5. Execute c:\estimate\ estimate.xls to verify that the Estimator work sheet displays the latest version of the Estimator (for example, 2.3).

Creating an Estimator Icon

Once the Estimator is installed, the user can create an Estimator icon. This icon can then be clicked to run the Estimator in the future.

NOTE:
Creating an Estimator icon is recommended for efficiency.

Procedure for Windows for Workgroups 3.11 Users

To create an Estimator icon using Windows for Workgroups 3.11, do the following:

1. Open the program group in which the Estimator will be located.
2. In the Program Manager, choose **New** from the **File** menu.
3. In the New Program Object dialog box, select “Program Item” and click OK to display the Program Item Properties dialog box.
4. In the *Description* field, type “Estimator.”

5. Click Browse to display the Browse dialog box.
6. Locate and select the estimate directory in the Directories box of the Browse dialog box. Locate and select the estimate.xls file from the File Name box.
7. Click OK to close the Browse box.
8. Click OK to close the Program Item Properties dialog box.

Procedure for Windows 95 Users

To create an Estimator icon using Windows 95, do the following:

1. Open “Explore.”
2. Click the c: drive.
3. Click the Estimate folder.
4. Highlight the estimate.xls file.
5. Click the right-hand button and select the Create shortcut.
6. Highlight “New Shortcut.”
7. Drag and drop “Shortcut” into your Program Manager.
8. Rename “Shortcut” to “Estimator.”

Estimator Password

The password for the Estimator is **wise**.

Starting the Estimator

To start the Estimator, do the following

1. Navigate to the c:\estimate folder.
2. Right-click estimate.xls to start the application.

Restarting the Estimator

If you receive the message “You must restart EXCEL and close any open work sheets, including any BookX work books, before opening the Estimator,” do the following:

NOTE:
Except where noted, all the information and steps in this section pertain to Windows 95 users.

1. Ensure that the estimate.xls file is installed under c:\estimate (that is, that the c:\estimate directory contains the estimate.xls file). Also, review the readme.txt file and other notes that are distributed with the Estimator.
2. **(This step applies only to Windows for Workgroups 3.11 users only.)** Check the windows/excel/excel5.0/xlstart directory for *.xls files. If there are any such files, move them to another directory on your hard drive. These files interfere with the start-up of the Estimator (especially if a new work book is opened every time Excel is started).
3. Check either the windows/excel/xlstart directory or the MsOffice/excel/xlstart for *.xls files. If there are any such files, move them to another folder. These files interfere with the start-up of the Estimator (especially if a new work book is opened every time Excel is started).
4. If you are still receiving the message, rename estimate.xls to ESTIMATE.XLS until the bug is fixed in the next available release of the Estimator (2.0).

If you still cannot open the Estimator, do the following:

1. Create an Estimator icon if you have not already done so. (Refer to the “Creating an Estimator Icon” section earlier in this appendix.)
2. In The Estimator icon, right-click the item to view the properties menu.
3. In the target path, add the following: **c:\estimate\estimate.xls /p c:\estimate**. (The /p option specifies the working folder.)

If you are still getting the message that the Estimator cannot be opened because Bookx is opened, do the following:

1. In the Excel icon, right-click to view the properties menu.
2. In the target path, make the following change: **c:\msoffice\excel\excel.exe /e**. (The /e option forces Excel to start without opening a specific document.)

Adjusting Estimator Work Sheets on the Monitor

You may need to adjust the Estimator work sheets to fit on your monitor. To this purpose, do the following:

1. Select the cells identified in the following table for each work sheet that needs adjustment.

Table A-1. Work Sheet Adjustment

Work Sheet	Select Cells:
Estimator	A1 through I1
Customer Information	A1 through H1
Basic Input	A1 through M1
Input by Section	A1 through M1
Coverage Summary	A1 through I1
Traffic Summary	A1 through I1
Quote Summary	A1 through I1
Coverage Detail	A1 through I1
Traffic Detail	A1 through I1
Design Center Information	A1 through J1
Estimate Index	A1 through E1
Component Prices	A1 through H1
Frequency Reuse	A1 though I1
Customer DB	A1 through E1
Radio Propagation	A1 though H1

2. Select the **Zoom** menu item from the **View** drop-down menu.
3. Select the **Fit Selection** button from the Magnification dialog box and click OK to execute the adjustment.
4. Save estimate.xls.

Estimator Menu and Submenus

B

Introduction

This appendix provides an overview of the Estimator menu, which is part of the Estimator application. The Estimator menu is located on the main Microsoft Excel menu bar. The following figure is an example of the Estimator menu.

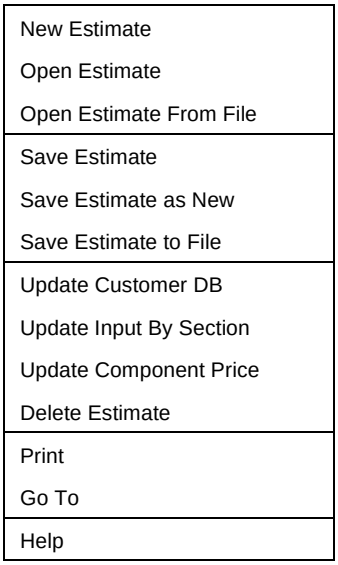


Figure B-1. Estimator Menu

NOTE:
Some Estimator menu items require that you are on the specific work sheet to select the item to be modified. If you are not on the required work sheet, the Estimator will place you on the work sheet when you select the appropriate menu item and instruct you to select the item to be modified.

Estimator Menu Items

The following sections discuss the Estimator menu items that are available to the user.

New Estimate

Select the **New Estimate** menu item whenever you need to create a new estimate. Whenever this item is selected, another drop-down menu appears, as shown in the following figure:

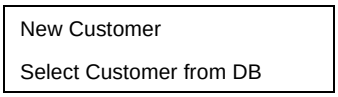


Figure B-2. New Estimate Drop-Down Menu

Select the **New Customer** menu item to create new estimates for customers for whom there is no current information in the customer database. Selecting this menu item displays the “New Customer Information” dialog box.

Select the **Select Customer from DB** menu item to create a new estimate using existing customer data. Selecting this menu item displays the “Select Customer” dialog box.

Open Estimate

The **Open Estimate** menu item allows you to open an existing estimate. You must be on the Estimate Index work sheet to open an estimate. However, if you are not already there, the Estimator will place you there once you select the **Open Estimate** menu item.

Once you are on the Estimate Index work sheet, place the cursor on the row of the estimate you want to open, and select the Open button. Opening an estimate populates the various work sheets with the data that was saved with the estimate (including the summary, section data, etc.).

Open Estimate From File

You can use the **Open Estimate From File** menu item to open an estimate from a file that was previously saved via the **Save Estimate to File** menu item (discussed later). This allows you to retrieve estimates that might be saved to a floppy disk or to other directories on the hard drive. Selecting this menu item displays the “Open Estimate From File” dialog box and enables you to select the file to open.

Save Estimate

The **Save Estimate** menu item allows you to save an estimate to the Estimate index. Select this item whenever you want to save the estimate output or start a new estimate. Selecting this item displays the “Save Estimate” dialog box.

Save Estimate As New

The **Save Estimate As New** menu item is similar to the **Save Estimate** menu item. This item is useful whenever you are fine-tuning an estimate and would like to keep multiple copies of the estimate. Perform various saves to compare estimates. Selecting this item displays the “Save Estimate” dialog box.

Save Estimate to File

The **Save Estimate to File** menu item allows you to save the estimate as a separate file. For example, you can save the estimate to a floppy diskette or to a different directory on the PC’s hard drive. This item is useful if you need to transfer the estimate electronically or ship it via a floppy disk. Selecting this item displays the “Save Estimate to File” dialog box, which enables you to select a file to which to save the estimate. An estimate saved to a file can be read via the “Open Estimate from file” menu item (discussed earlier).

Update Customer DB

The **Update Customer DB** menu item allows you to add, delete and modify entries in the Estimator's customer database. Selecting this item displays the customer database operations in the drop-down menu shown in the following figure.

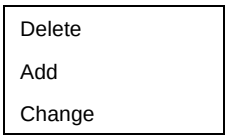


Figure B-3. Update Customer DB Drop-Down Menu

When you are selecting the Update Customer DB item, you should be on the Customer DB work sheet. However, if you are not already on this work sheet, you will be placed there once you select the **Update Customer DB** item.

Update Input By Section

The **Update Input By Section** menu item allows you to add, delete and modify the coverage and traffic data inputs on the Input By Section work sheet. (These inputs affect the coverage and traffic quote for a customer site.) Selecting this item displays the input by section operations in a drop-down menu, as shown in the following figure.

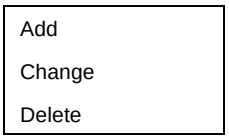


Figure B-4. Input By Section Drop-Down Menu

Selecting the **Update Input By Section/Add**, **Update Input By Section/Change**, or **Update Input By Section/Delete** item displays the "Add Section," "Change Section," or "Delete Section" dialog box, respectively. To select these items, you must be on the Input By Section work sheet. However, if you are not already on this work sheet, you will be placed there once you select the **Update Input by Section** item.

Update Component Price

The **Update Component Price** menu item allows you to modify or add to the Component Prices work sheet. Selecting this menu item displays the update component price operations in a drop-down menu, as shown in the following figure.

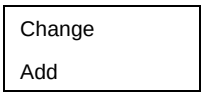


Figure B-5. Update Component Price Drop-Down Menu

Selecting the **Update Component Price/Add** or **Update Component Price/ Change** item displays the “Add Component Price” or “Change Component Price” dialog box, respectively. You must be on the Component Prices work sheet to select these items. However, if you are not already on this work sheet, you will be placed there once you select the **Update Component Price** item.

Delete Estimate

The **Delete Estimate** menu item allows you to delete estimates. You may consider deleting an estimate to save space or to remove a stale estimate. You must be on the Estimate Index work sheet to delete an estimate. However, if you are not already there, the Estimator will place you there once you select the **Delete Estimate** menu item.

Print

The **Print** menu item allows you to print the work sheets that are important to the customer and to the SDSC. Selecting this item displays a drop-down menu of print operations, as shown in the following figure.

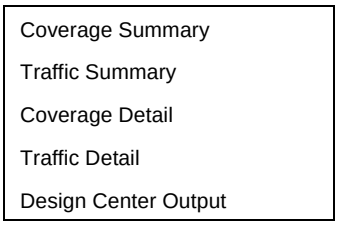


Figure B-6. Print Drop-Down Menu

Selecting the print option for Coverage Summary, Traffic Summary, Coverage Detail, and Traffic Detail prints the corresponding work sheet to a printer.

Selecting the print option for Design Center Output prints the Input By Section, Coverage Summary, Traffic Summary, Radio Propagation Factor, and Design Center Information work sheets.

NOTE:
Select this menu item and option to print the reports that are sent to the SDSC.

A printer must be set up to use the printing capabilities of Excel.

GoTo

The **GoTo** menu item allows you to navigate to any of the Estimator's work sheets; as such, it can be used instead of the tabs at the bottom of the screen. Selecting this item displays a list of work sheets, as shown in the following figure. Selecting any one of the items identified places you on the corresponding work sheet.

Figure B-7. GoTo Drop-Down Menu

Help

Selecting this item opens the Estimator's online help.

Estimator Work Sheets

C

Introduction

This appendix presents and discusses the Estimator work sheets. The Estimator work sheets are arranged in the order in which you enter data to create a new estimate. The work sheets are the essential items of the Estimator application. Using these work sheets, you will be able to create an estimate.

Estimator Work Sheet

This is the welcome work sheet presented to the user upon opening the Estimator. The work sheet includes the Estimator release number at the bottom of the work sheet and instructional messages. Check the Estimator work sheet for the current version of the Estimator.

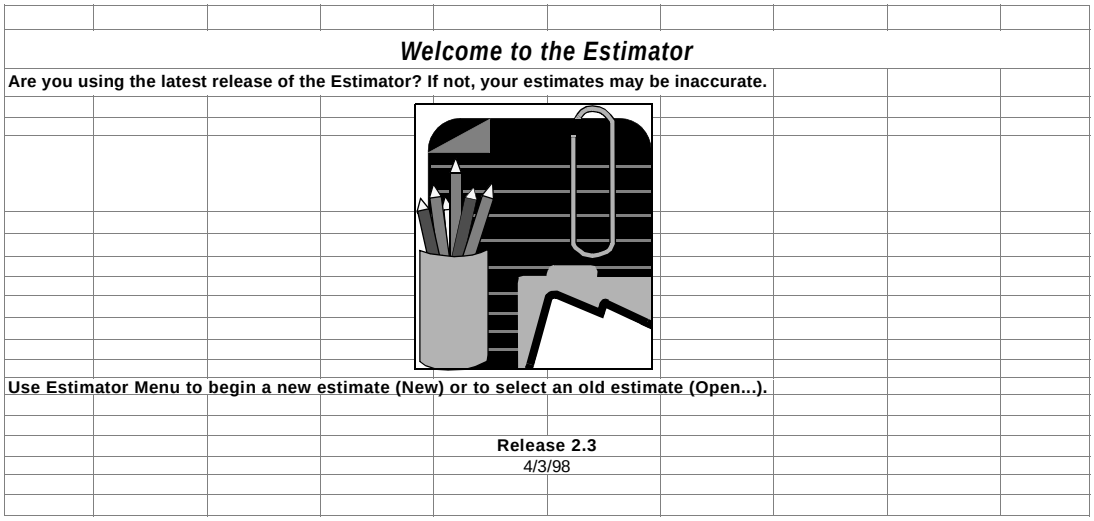


Figure C-1. Estimator Welcome Work Sheet

Customer Information Work Sheet

This work sheet contains information about the customer, including the company, address, contact, and phone number. The customer data is not populated until you create an estimate or open an existing estimate. The work sheet appears as follows.

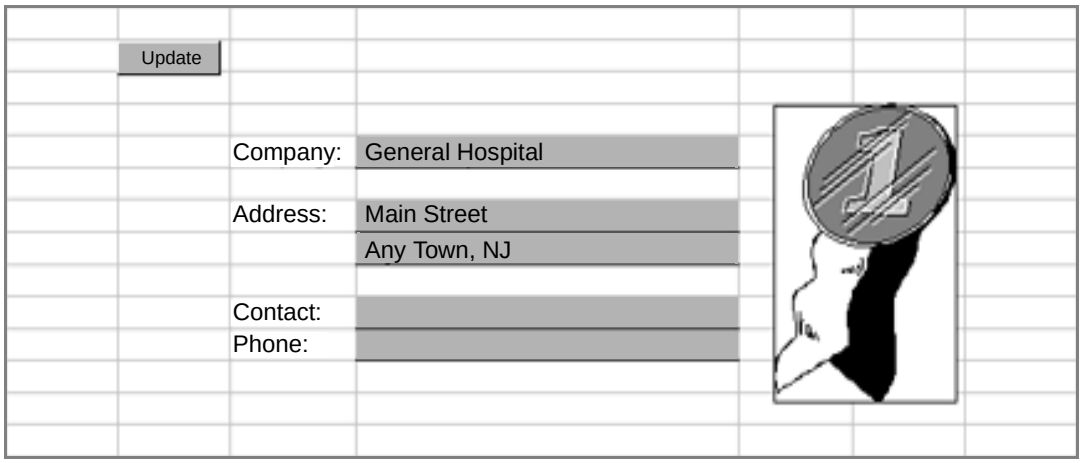


Figure C-2. Customer Information Work Sheet

The Update Button on the work sheet is used to modify the customer information that appears on the work sheet.

NOTE:
Using the update button does not update the Customer DB work sheet. It just updates the customer information that you are working on for the current estimate.

You can use the Update Button only when an estimate is opened in the process of being created.

Basic Input Work Sheet

This work sheet contains a number of fields that you must populate whenever you are creating an estimate. The work sheet appears as follows:

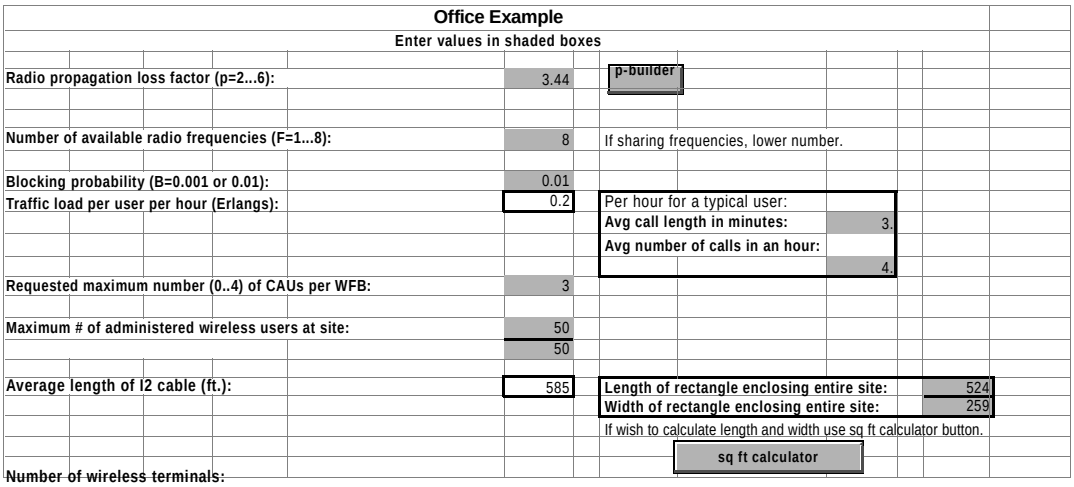


Figure C-3. Basic Input Work Sheet

The following list identifies and discusses the fields on the work sheet.

- *Radio propagation loss factor*

  Number used to determine the cell size based on the building environment. Use the P-Builder button to create a p-factor that best describes the site.

- *Number of available frequencies*

  Keep the default value **8**.

- *Blocking probability*

  Percentage of calls that may be blocked. Enter either **0.001** (to allow one of 1,000 calls to be blocked) or **0.01** (default, to allow one of 100 calls to be blocked).

- *Requested maximum number (0...4) of CAUs per WFB*

  Enter the maximum number of Cell Antenna Units (CAUs) per Wireless Fixed Base (WFB). Default is **3**, which is the maximum to allow for growth in the future in case more coverage is necessary. Currently, each WFB can support four antennas.

- *Maximum # of administered wireless users at site*

  Enter the number of administered users to be provisioned on the DEFINITY ECS. This value is used to include the mobility roaming fees in both the coverage and traffic quote.

- *Number of wireless terminals*

  Enter the number of wireless terminals that the customer plans to purchase. This number can be the same or different from the number of administered wireless users. This value is used to include the wireless terminal costs in both the coverage and traffic quote.

- *Average call length in minutes and Average number of calls in an hour*

  Enter the average number of wireless calls per hour for a single wireless user and also the average call length for a DWBS user. The call length multiplied by the number of calls should not exceed 60 minutes.

  NOTE:
  Always enter average values and not peak values. Peak values are calculated by the Estimator.

- *Traffic load per user per hour (Erlangs)*

  Automatically computed based on the values chosen for *Average call length in minutes* and *Average number of calls in an hour*.

- *Length of rectangle enclosing entire site*

  Indicates the length of the rectangle enclosing the entire site.

- *Width of rectangle enclosing entire site*

  Indicates the width of the rectangle enclosing the entire site.

Using the square foot calculator button is an alternative to entering the length and width of the enclosing rectangle. It takes the square root of the square footage to calculate the length and width of the square enclosing the entire site. The Average I2 cable length is then calculated.

Input By Section Work Sheet

This work sheet contains the information that is used to calculate the estimate. Specifically, it contains the input details of the site's radio coverage area(s) in section(s) and traffic requirements. The work sheet appears as follows.

Total Coverage (K sq ft):
Avg Density (Users/K sq ft):
Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ
Description
Calculate
Use Update Input by Section from the Estimator menu to add, change or delete section data.

Section	Users	Length	Width	K sq ft	Avg Density	X	Total K sq ft	Total Users	p	Blocking	Erlangs	Freqs
1	50	179	179	32.041	1.5605	5	160.205	250	3.44	0.01	0.2	8
2	50	179	179	32.041	1.5605	1	32.041	50	3.55	0.01	0.2	8
3	50	259	166	42.994	1.163	1	42.994	50	3.44	0.01	0.2	8
4	50	259	166	42.994	1.163	1	42.994	50	3.52	0.01	0.2	8
5	50	259	166	42.994	1.163	1	42.994	50	3.38	0.01	0.2	8

Figure C-4. Input By Section Work Sheet

The following list identifies and discusses the fields on the work sheet.

- *Section*

  Provides the section number (for example, 1, 2, 3, etc.).

- *Users*

  Indicates the number of wireless users in each section. If wireless users move throughout the entire site, use the value for the entire site. This field allows you to enter a specific number of wireless users in a section that has special traffic requirements.

- *Length*

  Enter the length (in ft) of the section.

- *Width*

  Enter the width (in ft) of the section.

- *K sq ft*

  Indicates the section coverage area in 1000 square ft. (This is automatically calculated.)

- *Avg Density*

  Indicates the density of users in the section. (This is automatically calculated.)

- *X*

  This is the multiplier for sections with the same characteristics. (This field is automatically calculated.)

- *Total K sq ft*

  Product of the square ft and a multiplier value “X.” (This field is automatically calculated.)

- *Total Users*

  Product of the total number of wireless users in the section(s) and a multiplier value “X.” (This field is automatically calculated.)

- *p*

  Indicates the propagation loss factor. This is the p-factor value entered from the Basic Input work sheet (default). If the section has a different p-factor, the user determines the appropriate p-factor for the building via the P-Builder button on the Input By Section dialog box.

- *Blocking probability*

  User either **0.01** or **0.001**. (The value from the Basic Input work sheet serves as the default.)

- *Erlangs*

  Product of average call length in minutes / 60 and the average number of calls in an hour. (The value from the Basic Input work sheet serves as the default.)

- *Freqs*

  Indicates the number of radio frequencies available in the section. (The value from the Basic Input work sheet serves as the default.)

In addition, the Input By Section work sheet contains these buttons:

- Description

  Select the Description button to display the entered text description for that section. Make any required changes.

- Calculate

  Once you enter all the data for the Basic Input work sheet and the Input By Section work sheet, select the calculate button. Once the calculate button is selected, the coverage and traffic quotes and the estimate output are calculated. (The output appears on several work sheets.)

Coverage Summary Work Sheet

The Coverage Summary work sheet provides the price quote for the radio components and services required for the DEFINITY ECS to support this site's coverage requirements. The work sheet appears as follows:

Coverage Summary
Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Change Item

Summary validated?

Update prices from Component Prices worksheet

Warning: R1 Phase 1 MUST be single RC Systems!

Items you may wish to add to the estimate:
Batteries
Battery chargers
Maintenance costs
Power supply for WFBs
Holsters
Documentation

Item	Quantity	Price	Total
Radio Controller	9	7,000.00	63,000.00
MM RTU	50	350.00	17,500.00
WFB Installation	18	120.00	2,160.00
CAU Installation	42	360.00	15,120.00
Wireless Terminal	50	950.00	47,500.00
RC Installation	9	58.00	522.00
Cell Antenna Unit	42	400.00	16,800.00
Wireless Fixed Base	18	2,000.00	36,000.00
I2 Cable (x 100 ft)	106	20.00	2,120.00
WiSE Engineering	16	300.00	4,800.00
Noninterference Coord		1,000.00	1,000.00
Power Supply	18	200.00	3,600.00
			210,122.00
Adjustment			
Total			210,122.00

Figure C-5. Coverage Summary Work Sheet

The following list identifies and discusses the required radio components.

NOTE:
On the work sheet, an installation fee is provided for each radio component.

- **Wireless Terminal**

  Formal name for "pocket phone." The user is able to walk the premises and establish a voice call using the wireless terminal.

- **Radio Controller (RC)**

  Circuit pack that provides the interface between the DEFINITY ECS and the DWBS radio subsystem. The RC provides real time control for a maximum of two WFBs over separate I2 interfaces.

- **Wireless Fixed Base (WFB)**

  Radio component that houses the fixed radio hardware. WFBs are connected to RCs via the I2 interface. Each WFB can support four Cell Antenna Units.

- **Cell Antenna Unit (CAU)**

  Component that extends the coverage of the WFB.

The following list identifies and discusses the required services.

- **Noninterference Coordination**

  Conducts a Zone 2 frequency clearing. Price is 0 for Zone 1 sites (for which no frequency clearing is necessary).

  NOTE:
  Obtain zone information about a site from Intraworks.

- **WiSE Engineering**

  Designs the DWBS antenna placement coverage map.

- **Mobility Manager Right To Use (MMRTU)**

  Allows use of the Mobility Manager software.

The Coverage Summary work sheet contains the following buttons and corresponding functions:

- **Change Item**

  Use this button to update, delete, or add items to the summary sheet. You can modify prices or quantities; you can also add items.

  NOTE:
  Also use this button to adjust the quote (for example, a price discount). The user selects the cell location with the text “adjustment” and then selects the button to apply a discount or price increase.

- **Summary Validated Check**

  Use this button to verify that the summary quote is acceptable.

  NOTE:
  Once this is done, the quote appears on the Quote Summary work sheet (discussed later).

- **Update Prices from Component Prices Work Sheet**

  Use this button to update prices on the Summary work sheets with prices from the Component Prices work sheet (discussed later).

Finally, the work sheet provides reminders regarding additional fees to include in the quote (for example, batteries, holster, documentation, etc.).

Traffic Summary Work Sheet

This work sheet contains a summary of the radio components (including RC circuit packs, WFBs, CAUs, wireless terminals, etc.) and the associated fees needed to traffic engineer the DWBS site. The work sheet appears as follows:

Traffic Summary

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Change Item

Summary validated?

Update prices from Component Prices worksheet

Warning: R1 Phase 1 MUST be single RC Systems!

Items you may wish to add to the estimate:
Batteries
Battery chargers
Maintenance costs
Power supply for WFBs
Holsters
Documentation

Item	Quantity	Price	Total
Wireless Terminal	50	950.00	47,500.00
Radio Controller	9	7,000.00	63,000.00
Cell Antenna Unit	42	400.00	16,800.00
MM RTU	50	350.00	17,500.00
RC Installation	9	58.00	522.00
Wireless Fixed Base	18	2,000.00	36,000.00
CAU Installation	42	360.00	15,120.00
I2 Cable (x 100 ft)	106	20.00	2,120.00
WiSE Engineering	16	300.00	4,800.00
WFB Installation	18	120.00	2,160.00
Noninterference Coord		1,000.00	1,000.00
Power Supply	18	200.00	3,600.00
			210,122.00
Adjustment			
Subtotal			210,122.00
Total			

Figure C-6. Traffic Summary Work Sheet

Note that the work sheet contains the Change Item, Summary Validated, and the Update Prices from Component Prices buttons.

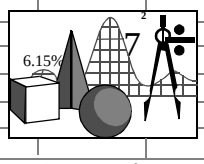
NOTE:
The coverage quote is the starting foundation for the traffic quote. The Traffic Summary work sheet has the same summary of items and buttons as the Coverage Summary work sheet. In some cases, the traffic quote will be the same as the coverage quote. In other cases, the traffic quote will be higher than the coverage quote because more radio components are necessary to accommodate the wireless traffic for the site.

Quote Summary Work Sheet

This work sheet contains the final price for both the coverage and traffic quotes for a DWBS site. Be sure to mark the summary validated box that appears on both the Coverage and Traffic Summary work sheets after the summaries are reviewed. An example of a Quote Summary work sheet appears as follows:

Quote Summary

General Hospital	
Coverage Quote:	29,838
Traffic Quote:	29,838



If quotes are blank, go to Summary sheets and validate.

Figure C-7. Quote Summary Work Sheet

Coverage Detail Work Sheet

This work sheet contains the breakdown of the radio infrastructure (identified on the Coverage Summary work sheet) on a per-section basis. The work sheet appears as follows:

Coverage Detail

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Summarize by: Description | Section | No Summary

			Per Section				
Section	Description	Price	Quantity	Total	X	Quantity	Total
1	Wireless Fixed Base	2,000.00	2.	4,000.00	5	10.	20,000.00
1	Radio Controller	7,000.00	1.	7,000.00	5	5.	35,000.00
1	I2 Cable (x 100 ft)	20.00	11.69	233.81	5	58.45	1,169.03
1	Cell Antenna Unit	400.00	4.	1,600.00	5	20.	8,000.00
1	RC Installation	58.00	1.	58.00	5	5.	290.00
1	WFB Installation	120.00	2.	240.00	5	10.	1,200.00
1	CAU Installation	360.00	4.	1,440.00	5	20.	7,200.00
2	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
2	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
2	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
2	Cell Antenna Unit	400.00	4.	1,600.00	1	4.	1,600.00
2	RC Installation	58.00	1.	58.00	1	1.	58.00
2	WFB Installation	120.00	2.	240.00	1	2.	240.00
2	CAU Installation	360.00	4.	1,440.00	1	4.	1,440.00
3	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
3	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
3	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
3	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
3	RC Installation	58.00	1.	58.00	1	1.	58.00
3	WFB Installation	120.00	2.	240.00	1	2.	240.00
3	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
4	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
4	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
4	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
4	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
4	RC Installation	58.00	1.	58.00	1	1.	58.00
4	WFB Installation	120.00	2.	240.00	1	2.	240.00
4	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
5	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
5	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
5	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
5	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
5	RC Installation	58.00	1.	58.00	1	1.	58.00
5	WFB Installation	120.00	2.	240.00	1	2.	240.00
5	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00

Figure C-8. Coverage Detail Work Sheet

The Coverage Detail work sheet contains the following buttons:

- Summarize by Description Button

  Summarizes the work sheet by component description.

- Summarize by Section Button

  Summarizes the work sheet by each section and provides a grand total for each section.

- Summarize by No Summary Button

  Returns the work sheet to its original form with no grand totals (default).

Traffic Detail Work Sheet

This Work Sheet contains the breakdown of the radio infrastructure (identified on the Traffic Summary work sheet) on a per-section basis. The Traffic Detail work sheet contains a Summarize By Description button, Summarize By Section button, and Summarize By No Summary button. An example of a completed Traffic Detail work sheet appears as follows:

Traffic Detail

Lucent Technologies
211 Mt Airy Rd
Basking Ridge, NJ

Summarize by: Description | Section | No Summary

			Per Section:				
Section	**Description**	**Price**	**Quantity**	**Total**	**X**	**Quantity**	**Total**
1	Wireless Fixed Base	2,000.00	2.	4,000.00	5	10.	20,000.00
1	Radio Controller	7,000.00	1.	7,000.00	5	5.	35,000.00
1	I2 Cable (x 100 ft)	20.00	11.69	233.81	5	58.45	1,169.03
1	Cell Antenna Unit	400.00	4.	1,600.00	5	20.	8,000.00
1	RC Installation	58.00	1.	58.00	5	5.	290.00
1	WFB Installation	120.00	2.	240.00	5	10.	1,200.00
1	CAU Installation	360.00	4.	1,440.00	5	20.	7,200.00
2	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
2	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
2	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
2	Cell Antenna Unit	400.00	4.	1,600.00	1	4.	1,600.00
2	RC Installation	58.00	1.	58.00	1	1.	58.00
2	WFB Installation	120.00	2.	240.00	1	2.	240.00
2	CAU Installation	360.00	4.	1,440.00	1	4.	1,440.00
3	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
3	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
3	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
3	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
3	RC Installation	58.00	1.	58.00	1	1.	58.00
3	WFB Installation	120.00	2.	240.00	1	2.	240.00
3	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
4	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
4	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
4	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
4	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
4	RC Installation	58.00	1.	58.00	1	1.	58.00
4	WFB Installation	120.00	2.	240.00	1	2.	240.00
4	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00
5	Wireless Fixed Base	2,000.00	2.	4,000.00	1	2.	4,000.00
5	Radio Controller	7,000.00	1.	7,000.00	1	1.	7,000.00
5	I2 Cable (x 100 ft)	20.00	11.69	233.81	1	11.69	233.81
5	Cell Antenna Unit	400.00	6.	2,400.00	1	6.	2,400.00
5	RC Installation	58.00	1.	58.00	1	1.	58.00
5	WFB Installation	120.00	2.	240.00	1	2.	240.00
5	CAU Installation	360.00	6.	2,160.00	1	6.	2,160.00

Figure C-9. Traffic Detail Work Sheet

Radio Propagation Factor Work Sheet

This work sheet provides detailed information on P-Builder selections. An example of a completed version of the work sheet appears as follows:

Radio Propagation Factor Information						
Lucent Technologies				(Note: Section 0 info is from the Basic Input worksheet)		
Section	**P factor**	**Building Type**	**Perimeter Walls**	**Floor Construction**	**Ceiling Construction**	**False Ceiling**
0	3.44	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
0						
0						
0						
0						
2	3.55	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
2						
2						
2						
2						
1	3.44	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
1						
1						
1						
1						
4	3.52	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
4						
4						
4						
4						
4						
4						
5	3.38	Office	Concrete with Steel Frame	Concrete reinforced Steel	Concrete reinforced Steel	Yes
5						
5						
5						
5						
5						

Figure C-10. Radio Propagation Factor Work Sheet (Page 1)

Clutter	Antenna Clearance	Floor Plan Layout	Floor Clutter
Partially full	Above floor clutter by 3 feet or more	35% cubicles or cloth partitions	95% minimal/furniture (desk, chairs, tables)
		35% sheetrock, plasterboard, dry wall	3% Shelves at 1/2 to 3/4 of ceiling height
		5% Ceramic file, file on sheetrock	2% Machinery, metal objects at 1/2 to 3/4 ceiling height
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	20% open space	80% minimal/furniture (desk, chairs, tables)
		50% sheetrock, plasterboard, dry wall	10% Shelves at 1/2 to 3/4 of ceiling height, densely packed
		5% Ceramic file, file on sheetrock	10% Machinery, metal objects at 1/2 to 3/4 ceiling height
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	35% cubicles or cloth partitions	95% minimal/furniture (desk, chairs, tables)
		35% sheetrock, plasterboard, dry wall	3% Shelves at 1/2 to 3/4 of ceiling height
		5% Ceramic file, file on sheetrock	2% Machinery, metal objects at 1/2 to 3/4 ceiling height
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	20% open space	85% minimal/furniture (desk, chairs, tables)
		15% cubicles or cloth partitions	5% Shelves at 1/2 to 3/4 of ceiling height, densely packed
		15% sheetrock, plasterboard, dry wall	10% Machinery, metal objects above 3/4 ceiling height
		20% wood panel	
		5% Ceramic file, file on sheetrock	
		20% concrete	
		5% glass	
Partially full	Above floor clutter by 3 feet or more	25% open space	95% minimal/furniture (desk, chairs, tables)
		35% sheetrock, plasterboard, dry wall	3% Shelves at 1/2 to 3/4 of ceiling height
		20% wood panel	2% Machinery, metal objects at 1/2 to 3/4 ceiling height
		5% Ceramic file, file on sheetrock	
		10% concrete	
		5% glass	

Figure C-11. Radio Propagation Factor Work Sheet (Page 2)

Design Center Information Work Sheet

This work sheet contains information that is relevant for the SDSC. The antenna totals on this sheet expedite the antenna engineering for the DWBS customer site. Specifically, the antenna section totals and grand totals are used as input to design an antenna placement map for the customer site. An example of a completed Design Center Information work sheet appears as follows:

Design Center Information

Lucent Technologies

(Design Center Information is relevant for the Estimator release 1.7 or greater.)

Basic Input Data

Requested maximum number (0..3) of CAUs per WFB:	3

Summary Data:

	Coverage	Traffic
Quote:	210122	210122
Total Non-Radiating WFBS:	18	18
Total Radiating WFBS:	0	0
Total CAUs:	42	42
Total Bases/Antennas used for Prediction:	42	42

Detail Data:

	Coverage				Traffic				
Section	**Non-Radiating WFBS**	**Radiating WFBS**	**CAUs**	**Bases**	**Non-Radiating WFBS**	**Radiating WFBS**	**CAUs**	**Bases**	**X**
1	10	0	20	20	10	0	20	20	5
2	2	0	4	4	2	0	4	4	1
3	2	0	6	6	2	0	6	6	1
4	2	0	6	6	2	0	6	6	1
5	2	0	6	6	2	0	6	6	1

Description Data:

Section	Description
1	Flr 1-3 of Section 1 & Flr 2-3 of Section 3
2	Floor 1, Section 3
3	Floor 2, Section 2
4	Floor 3, Section 2
5	Floor 1, Section 2

Figure C-12. Design Center Information Work Sheet

Estimate Index Work Sheet

This work sheet lists the estimates that were previously saved in the DWBS estimate database. The work sheet contains the customer name, contact, description, estimate creation date, estimate modification date, release number of the Estimator used to create the estimate, and a file index. The DWBS estimate database is stored and retrieved from the external *estidx* file using the file index. An example of an Estimate Index Work Sheet appears as follows:

Select estimate and hit Open [Open]

Customer	Contact	Description	Create Date	Last Update	File Index	Release Number
Home Depot	Val	4 CAU, threshold -65		11/3/96	1	Release 1.8
Law Specialists	law.wall	Test Case 28	9/23/96	9/23/96	10	Release 1.8
Home Depot	Val	3 CAU, threshold -65	9/22/96	11/3/96	19	Release 1.8
Home Depot	Val	3 CAU, threshold -68	11/3/96	11/3/96	28	Release 1.8
Home Depot	Val	4 CAU, threshold -68	11/3/96	11/3/96	37	Release 1.8
Mr. Retail		Test Case 25	9/22/96	11/4/96	46	Release 1.8
Lucent	Mark Noble	Test Case 30	11/4/96	11/4/96	55	Release 1.8
Middletown		Test Case 37-3 CAU, floor1/bldg 4	11/3/96	11/4/96	66	Release 1.8
Middletown		Test Case 38-3 CAU, floor 1	11/3/96	11/4/96	75	Release 1.8
Convention Center	indy.wall	Test Case 35	11/4/96	11/4/96	85	Release 1.8
Law Specialists	law.wall	Test Case 34	9/23/96	11/13/96	95	Release 1.8
Small Site	nhoh.wall	Test Case 32.	9/23/96	11/13/96	104	Release 1.8
Small Site	nhoh.wall	Test 3	11/13/96	11/13/96	113	Release 1.8

Figure C-13. Estimate Index Work Sheet

Component Prices Work Sheet

This work sheet contains the prices and components that can be applied to the coverage and traffic quotes for a DWBS site. An example of a Component Prices work sheet appears as follows:

Component Prices

Use Component Price function from the Estimator menu to change or add items to the Component Price list.

Description	Price
Wireless Fixed Base	2,000.00
Radio Controller	7,000.00
I2 Cable (x 100 ft)	0.00
Cell Antenna Unit	400.00
RC Installation	58.00
WFB Installation	120.00
CAU Installation	360.00
Wireless Terminal	950.00
Power Supply	200.00
MM RTU	350.00
MM RTU (roamer)	300.00
Noninterference Coord	1,000.00
WiSE Engineering	300.00
Flash Card	300.00
WT Battery Charger	36.00

Figure C-14. Component Prices Work Sheet

These components are available in a drop-down list box whenever you select the Change button that appears on both the Coverage Summary work sheet and Traffic Summary work sheet. Component prices can be modified or additional components can be added via the **Estimator/Update Component Price** menu item.

Customer DB Work Sheet

This work sheet serves as the customer database for DWBS estimates. Once an estimate is created with new customer information, the customer information is saved to a database file (customer database). The work sheet includes the following information: company, address, contact, and phone number. An example of a Customer DB Work Sheet appears as follows:

Use Update Customer DB from the Estimator menu to add, delete or change customer records.				
Company	**Address**	**City/State/Zip**	**Contact**	**Phone**
Ewald Investors, Inc	200 Wall St	NY, NY 10000	Rich Ewald	(800) Get Rich
Indiana Convention Center	100 S. Capitol Ave.	Indianapolis, IN 46225	Information #	(317) 262-3410
Jamie Enterprise	2249 Philadelphia Ave	Manasquan, NJ 08735	Jamie Herman	(908) 528-0807
Office Plaza XYZ	15 Executive Plaza	Princeton, NJ 12345	Christopher Jones	(800) 333-4XYZ
Parker Pen	200 Monroe Ave	Anytown, NJ	Parker Palm	(908) 957-7777
Retail ABC	Town Square Shopping Ctr.	Windsor, NJ 12345	Jane Smith	(800) 222-4ABC

Figure C-15. Customer DB Work Sheet

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