

Real Estate Financial Modeling
Office and Industrial Building Development

Module Audio Transcript

Version 1.0



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How this Transcript is Labeled and Organized

This Audio Transcript is organized by Video, then by Financial Model tab, then by Table of Contents marker within that tab. For instance, the sample listing below shows the video number, the tab of the Excel-based spreadsheet, and the content marker (as shown in the gray box in the top-left of the graphic below) within that video that corresponds to the text in that portion of the transcript.

Video #1

Tab: Profile, Lot and Building Info.

Profile, Lot & Building Info Tab Introduction

10

Video Number	Excel Tab	Content Marker
17		Maximum Allowable FAR
18		Lot SF
19		Maximum Allowable FAR (above
20		
21		
22		<u>Lot Coverage (Ground-Floor "Foot</u>
24		Maximum Allowable Lot Coverage
25		Maximum Allowable Building Grou
26		
27		
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32		
33		
34		
35		
36		

7,500 SF ground-
(75% lot coverage)

Illustrative aerial view. Footprint not to scale.

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Video #1

REFM Product Module Orientation

- Hello and thank you for choosing Real Estate Financial Modeling. Real Estate Financial Modeling Product Modules were developed to provide high-quality and in-depth financial modeling resources to the real estate community.
- In each module, we will explicitly walk through every line of every tab in the spreadsheet such that you intimately understand everything that is in the spreadsheet, and you will thus be able to customize it to your needs.
- As we go through the lesson, we will refer to specific cells by their exact coordinates, such as Cell D2, so for the purpose of the lesson it is critical that you do not add any rows or columns to your spreadsheet, or move any data around. Naturally, once you are ready to customize the model for your own use, you can make any and all changes you wish, but we recommend that you keep an unedited version of the lesson spreadsheet so that you can return to the videos and lesson spreadsheet later and all of the cell references in the video and audio transcript will remain valid.
- The model as you have downloaded it is fully functional and 100% unlocked, meaning there are no restricted access cells in the spreadsheet.
- The model is already populated with assumptions, which are formatted in bold blue type, and calculated values, which are formatted in black or red type. To view the formulas that lie behind the calculated values, simply select the cell and hit the F2 button. This will identify and color-code the constituent cells that are referenced in the calculation of the selected cell. To exit out of this formula display, simply hit the Escape key.
- As we go through each tab, we highly recommend that you just observe the lesson and keep the assumptions as they appear so that our references to specific dollar values remain valid and so that the model does not stop working.
- As with all of our tutorials, you are in full control of the video and you may navigate through or pause the content at any time.

Important Excel Settings

- This model contains calculations that cause what are known as circular references. These are when a formula refers back to its own cell, either directly or indirectly, creating a circular loop.
- An example of this is our calculation of the loan interest in the Sources and Uses of Funds tab because the calculation of the interest depends on the total project cost, which circularly depends on the amount of interest.
- Let's take a look at a very simple example of this to make sure that we understand the concept.
- What we have here is a simple calculation of Total Project Cost that assumes a Hard and Soft Cost amount of \$100,000, and an Interest cost amount of 10% times our Total Project Cost, where our Total Project Cost is calculated as the sum of the Hard and Soft Costs and the Interest.
- If we were to calculate the Interest as this 10% times our Total Project Cost amount, hit Enter and then run calculations on the sheet, we are going to get an error message? To circumvent this, what we are going to do is set up or enable Iterations in the spreadsheet, and to do that, we are going to go up to this icon here, click on it, and we are going to get this menu, and we are going to drag down to Excel Options. Click on that, which will bring up this dialog box, and we are going to click on Formulas, and we are just going to make some changes up here in the Calculation Options section, and all we are going to do is we are going to check this box that says "Enable iterative calculation", we are going to leave these default values as you see them here, if your values are not these values, then please change them to these values, and we are going to make sure that the radio button for Manual is selected.
- We select the Manual calculation option so that we are in control of when the spreadsheet runs its calculations. This is going to help us as our spreadsheets become more complex, so that we are not slowed down by the spreadsheet calculating every single item every time we input data into a cell.
- Once we have this, we can click the OK button, and we can now proceed to the cover page of the Module.

Tab: Office Industrial Module

Office Industrial Module Introduction

- Welcome to the Office and Industrial Building Development Module from Real Estate Financial Modeling. In this module, we will learn about how to build, use and customize a financial model to analyze the speculative development and sale of a commercial building. As our working example, we will use a multi-tenant downtown high-rise office building with a ground-floor retail component and a below-grade, income producing parking garage. While we will focus on this particular product, note that all of the principles taught and applied within apply as well to suburban office buildings and to industrial buildings with surface or structured parking.
- Let's get started by flipping to the FAR, Footprint and Massing tab.

Tab: FAR, Footprint and Massing

FAR, Footprint and Massing Introduction

- In all financial modeling for real estate developments, we always need to start first with understanding the basics relating to the lot and the physical building that we intend to construct on that lot.
- To that effect, let's discuss the concepts of Floor Area Ratio, Lot Coverage and Building Massing, in that order.

FAR

- FAR is the acronym for Floor Area Ratio, which as an abbreviation for the concept itself is a little bit confusing, so I have taken the liberty of referring to it as the Floor Area to Lot Area Ratio. The FAR is the ratio of the maximum amount of above-grade building Gross Square Footage that can be built on the site relative to the Square Footage, or area, of the land itself. This ratio is dictated by the Zoning in the jurisdiction in which you are developing. The FAR ratio is one of the elements that drives the value of the site because it tells you how much building you can build on the site.
- We calculate our maximum allowable FAR simply by multiplying the lot square footage by the FAR ratio, as is shown in this example of an 8.0 FAR applied to a 10,000 SF lot. I make the point of saying *maximum* because real estate development is most often about extracting the maximum allowable square footage and the maximum value from the land. Generally speaking, value cannot be extracted from allowable FAR that is not built out. We will proceed in this tutorial with the assumption that we will in fact build out our maximum allowable FAR.
- To understand the general massing and footprint of our building, we also need to know the maximum allowable lot coverage, which is also dictated by the zoning. So let's scroll down...

Lot Coverage

- In this example, the maximum allowable lot coverage is 75%, which simply means that no more than 75% of the area of the site may be covered, or consumed, by the

ground floor of the building. This lot coverage determines our building's ground-floor footprint on the site, which in this case is 7,500 SF, as shown by the gray shaded area in the illustrative diagram below.

Massing

- Once we know the footprint of the building, we can discuss its massing, or the bulk and shape of the building as defined by its exterior planes.
- Let's scroll down...
- The massing will be influenced partly by the allowable FAR and allowable footprint, and partly by zoning characteristics relating to height such as a stated maximum height limit or a maximum story count.
- In this example, we assume a maximum stated height limit of 150 feet.
- Next we assume that our average concrete floor slab-to-slab ceiling height is going to be 10 and a half feet, which is a market-driven assumption of average height that takes into account market preference for a higher ceiling on the ground floor for the retail space, and a higher ceiling on the top floor for the tenants of that floor.
- Assuming we will build to our height limit of 150 feet, we will have a 15-story building comprised of 14 full footprint floors and a setback 15th floor.
- If we assume that the shape of the building is simply this 3-dimensional rectangle with only the top floor setback, our building would have 14 equal floorplates of 5,600 SF, totaling 78,400 SF, and a significantly smaller 15th floor floorplate of 1,600 SF.
- However, before we decide to go with this calculation, we need to first confirm that our assumed ground-floor footprint of 5,600 SF does not exceed the maximum allowable lot coverage, which it does not, since that was 7,500 SF.
- Naturally, there are many different ways to design the building, and it may not be ideal to have the top floor configured in this way. It might be preferable to have a gradual stepping back of the upper several floors. It will be the job of you as the developer and your chosen architect to determine how to best fit all of the allowable

FAR onto the site. To that point, note that we have confirmed that there is no excess FAR with the calculation in Cell F48.

- Next let's flip to the Profile, Lot and Building Information tab, which is the first tab of the working model.

Tab: Profile, Lot and Building Info.

Profile, Lot and Building Info Tab Intro

- On this tab we will fully describe the lot and the project. Inputs we make here will drive very impactful calculations in the model, so it is important not to rush through this tab.

Project Profile

- At the top of the tab in Cell B2, we first name the project – I will name mine Center Tower. The name that we enter here will show up on every other tab in the spreadsheet.
- Proceeding down to the box labeled Profile, we enter in basic identifying information about the project such as the street address, county, the land owner, and zoning.

Lot & Above-Grade Building Description

- Next we will move down to the Lot and Above-Grade Building Description box, and will input the square footage of the lot in Cell D12. In this example, I say that the lot is 25,000 SF, which is a little more than a half an acre.
- We next put in the Maximum Allowable Floor Area to Lot Area Ratio, or FAR. In this example, the maximum FAR is 8.0.
- We see that our total allowable FAR of 200,000 was calculated for us here in Cell D16 by multiplying the lot square footage by the FAR ratio.
- In our example, the maximum allowable lot coverage is 75%, thus our maximum allowable footprint is 18,750 SF.
- Given this ground floor footprint, and assuming the building's other floors have the same square footage, the number of floors will be 10.67, or 10 full floors and a partial 11th floor. As noted earlier, assuming an average concrete floor slab-to-slab height of 10 and a half feet, taking into consideration any irregular floor heights, we need to confirm that the building will not exceed the height limit or the story limit, as

applicable, as spelled out in the zoning restrictions. We see in Cell D28 that our height of 112 feet is beneath the limit of 130 feet.

- Next we will make an assumption as to how much of the ground floor will be consumed by retail space. We know that we need to reserve space on the ground floor for the building lobby, the building core, which includes elevators and emergency stairs, and for emergency exit corridors, loading areas and the parking garage ramps. From speaking with our architect who has designed a similar building in this jurisdiction, we come to conclude that we can capture 65% of the ground floor space as retail square footage.
- We then deduct this square footage from the total building square footage to get to the Gross Square Footage of office space.
- I make the point here of labeling this Gross Square Footage, as there is a significant difference between Gross Square Footage and Rentable Square Footage. By speaking with our architect, based on the layout of the floors and the anticipated configuration and size of the building core, we estimate that our Efficiency Factor, or ratio of Rentable Square Footage to Gross Square Footage, is 91%. Thus, we are left with Rentable Office SF of 170,909 as shown here in Cell D38.

Below-Grade Parking Garage Description

- Next we will describe the below-grade parking garage.
- The first thing to understand when conceptualizing the garage is how much parking we need to have, and when we say need, we are referring to the greater of what the market demands, and what the zoning requires. To understand what the market demands, we speak with both office leasing brokers and parking operators of similar buildings in the submarket. To understand if there is a zoning requirement, we confer with our zoning counsel to make sure we understand the zoning code and its nuances as they relate specifically to our site and the intended square footage amounts of the different uses on the site.
- Here we have assumed that on average, between our retail space and our office space, we need to have 1.2 parking spots per 1,000 Rentable SF. We thus calculate our total

number of required spots by multiplying this 1.2 by the total rentable SF, both retail and office, and then dividing by 1,000, which yields 220 spots.

- From this number of 220 spots, next we will calculate how much garage area we need, and will then assume a floorplate size and how many levels underground we will need to go.
- From speaking with architects and parking operators, we have found that each parking spot requires 350 useable square feet, which, if that translates to a space 10 feet wide by 35 feet long, might seem high to you at first glance. However, by useable, we mean space through which a car can drive, so space with structural columns in it or other blockages does not count. This number thus makes more sense because while the space itself for a full-size car might only be 10 feet by 20 feet, each space needs to have square footage allocated to it for the ramps and the drive aisles that are required to enable the cars to drive to the spot.
- Multiplying 220 spots by 350 useable Square Feet, we get 76,901 useable SF needed.
- However, before we proceed, we still need to gross up this number to account for the Gross Square Footage we need to build to accommodate the building core, mechanical systems and other non-useable SF such as where the columns penetrate the floor. We apply a 15% factor for this, and thus come to the total Garage Gross Square Footage we must build in Cell D52 of 88,436 GSF.
- We must now allocate this total below-grade Gross Square Footage across multiple levels. In Cell D54, we assume that the garage floorplate is slightly smaller than the total lot square footage of 25,000 SF. By dividing the total required Gross Square Footage by the garage floorplate size of 23,000 SF, we determine the number of levels down that we must dig to provide all of the necessary parking as 3.85 levels as shown here in Cell D56. The partial level simply represents a smaller floorplate than the typical garage floorplate of 23,000 SF.
- We are now done with a basic description of the building both above and below grade. As we noted earlier, the assumptions and calculations we have made on this tab are very important to the outcome of calculations in the rest of the model. Let's flip now to the Capital Structure 1 tab.

Video #2

Tab: Capital Structure 1

Capital Structure 1 Tab

- When we model a real estate development transaction, we must do so with some assumptions relating to how the investment will be funded. In this section we will walk you through a sophisticated structure. Your transaction's capital structure might be less complex than what we will discuss, but it will benefit you to understand the more complicated structure.
- Let's take a look at the capital structure, also known as the capital stack, of a hypothetical \$100 million office building development with ground floor retail and underground parking. When we say \$100 million, we are referring to the \$100 million Total Development Cost, which is input in Cell E4. I have chosen \$100 million because it could reasonably be the cost of developing a medium size downtown office building in 2009, and, because it is a factor of ten, all percentages that we discuss with respect to the Total Development Cost will be simple to calculate quickly.
- What we're doing on this tab and the 3 tabs that follow is graphically representing the sources of the \$100 million that fund this Total Development Cost.
- We have listed these sources in the chronological order of their funding from top to bottom. Thus, the equity, which we assume to be 20% of the Sources, is invested, or funded first, then the Mezzanine Loan, which is 15% of the Sources, and lastly, the Senior Loan, which is 65% of the Sources. As shown, the Mezzanine Loan and the Senior Loan represent the financed portion of the project.
- Please note before we go any further that the size of the colored bars in the diagram are not proportionally accurate to their corresponding percentages. Pay attention to the percentages associated with each of the colored bars, not their size.
- What is important to take away from this tab is to understand the nature of the order of funding in a real estate development transaction. As you may imagine, the lending entities will want the development company itself, sometimes referred to as the

transaction's "sponsor", to demonstrate their belief in the transaction by investing their own capital, and of more importance, by putting their capital at risk first. When the developer does this, they are signaling to potential co-investors and lenders that they feel this transaction provides an attractive risk/reward profile.

- In this particular transaction, we are assuming that the amount of equity invested is 20% of the Total Development Cost. In your transactions this may be less and it may be more – each transaction is unique. The amount of equity invested will depend on a number of variables, including the availability of attractive financing and availability of attractive equity. When we say attractive, we are referring to both the cost of the capital and terms of the deployment and return of the capital.
- Typically, one could expect to see the developer entity put in a minority portion of the overall equity investment – for instance, where the developer entity put in only 10% of the equity and the developer's co-investor, also known as the Third Party Investor, invests the remaining 90% of the equity. Once again, each transaction is unique. One item to note is that it might be an issue with the lender if the developer entity does not personally have what the lender considers "enough" of their own developer capital at risk. If this issue arises, the developer might have to increase their contribution to the total equity amount. We'll talk more about equity in a few minutes.
- Let's talk for a moment about the two layers of Financing – i.e., the Senior and Mezzanine Loans. The Senior Loan is, by definition, subordinate to no other loans on the project. In other words, it has the most senior claim on the real estate and all fixtures thereon in the event of a default by the developer, and also in terms of the order in which the Loan's Interest and Principal are repaid. Specifically, the Senior loan will be funded last out of all sources of funds, and its interest and principal will be repaid first.
- This priority is addressed in this top yellow Comment box that talks about the Order of Funding and Refunding of Capital. Hit pause now to read what is conveyed in the comment. We will go into this in more detail in the actual model.
- The Mezzanine Loan, as shown in the diagram, sits in the middle of the Equity and the Senior Loan. Because the Senior loan funds last and the Equity funds first, the Mezzanine loan will by default fund second. Since the Mezzanine loan is not repaid until after the Senior loan interest and principal are repaid in full, the interest rate

charged by the Mezzanine lender will naturally be higher than that charged by the Senior lender, because the Mezzanine lender's capital is more at risk than that of the Senior lender.

- Note that, as mentioned in the top Comment box, the Mezzanine Loan Interest and Principal will be repaid prior to any return of Equity Capital. Since Equity capital is invested first and repaid last, it is the highest risk, and thus requires an even higher return than the Mezzanine loan.
- As noted in the bottom yellow Comment box, it is critical to understand that a project's sources and uses must be identical because the sources of funds are raised to literally match the uses of funds.
- Looking back at the green Equity box on this tab, which shows that 20% of the TDC is funded by Equity, click on the next tab, Capital Structure 2, and notice how the Equity is now sliced into two separate pieces.

Tab: Capital Structure 2

Capital Structure 2 Tab

- What we are showing here is a more realistic equity structure within the capital structure. As noted in the yellow Comment box, a typical equity investment for a development project where equity comprises 20% of the TDC might look like this:
 - The Developer entity invests 10% of the total equity, or \$2MM out of the \$20MM, which equates to 10% of 20% of the TDC, or 2% of the \$100MM TDC,
 - and where the Third Party Investor invests the balance, or 90% of the total equity, \$18MM out of the \$20MM, which equates to 90% of 20% of the TDC, or 18% of the \$100MM TDC).
- However, often the Developer equity itself is comprised of two separate investing entities – the Development Company, which we will refer to as the Developer Sponsor, and a Developer Partner.
- Click on the Capital Structure 3 tab to see how these portions of the Total Developer equity relate to one another.

Tab: Capital Structure 3

Capital Structure 3 Tab

- As we see here, and as noted in the yellow Comment box, the Developer Sponsor is investing only 20% of the Developer Equity (20% * 2% of the TDC or 0.40% of the TDC), whereas the Developer Partner is putting in the remaining 80% of the Developer Equity or 80% * 2% of the TDC, which is 1.6% of the TDC.
- Hit pause now to give yourself enough time to look at these values and to read through the Comment box.
- To understand this entire capital structure better, let's flip to the next tab, Capital Structure 4.

Tab: Capital Structure 4

Capital Structure 4 Tab

- This tab is a lot to take in, but it is critical that we understand everything here before we proceed into the rest of the model. This tab serves as a great visual aid for communicating the capital structure of the proposed transaction to potential investors and lenders.
- Looking at column B, just like on the Capital Structure 3 tab, we have all of our different capital sources represented.
- As a reminder, please note that the size of the colored bars in the diagram on this tab are not proportionally accurate to their corresponding percentages. Once again, pay attention to the percentages associated with each of the colored bars, not their size.
- Next let's look at Column F, the % of the TDC, but let's start at the bottom instead of the top.
- When looking at any transaction, we will probably determine how much equity must be invested by doing so on a residual basis. In other words, we will first make an assumption as to how much of the Total Development Cost could be funded by debt based on conversations with mortgage brokers, lenders and other developers currently in the market for financing for similar projects.
- As a result of our conversations, we have input 65% in Cell F11. By doing so, we are telling the model that 65% of the Total Development Costs will be funded by the Senior Loan. Similarly, we have input 15% in Cell F10 as the share of the TDC that would be funded by the Mezzanine Loan. The total amount of Debt, including both the Mezzanine and Senior Loans, as a % of the Total Development Cost is 80%, and is shown here in Cell J11.
- As a result of these debt assumption inputs, the residual amount to be funded by equity, is 20%, which is shown in Column H in Cell H7.

- To determine how that equity is split up, we will make our assumption inputs in Column D in Cells D7, 8 and 9. You will note that we have done so using the same proportions as shown and discussed on the Capital Structure 3 tab.
- The share of the TDC that each slice of equity represents is calculated automatically and appears in Column F and Cells F7, 8 and 9, and we notice that as we look down column F, it totals to 100%, comprised of that 20% equity and the previously calculated total of 80% debt.
- We can confirm that our Developer Sponsor and Developer Partner equity split is accurate by looking across to the calculated values in Column R.
- As noted by the asterisk in the headings of Columns L, N and P, these columns fill in automatically only once the model is populated for a total uses of funds in Cell I54 of the Sources and Uses tab.
- Take a step back now and look at this tab in its entirety to understand what we have just discussed.
- Next let's flip to the Conditional Statements Introduction tab.

Tab: Conditional Statements Introduction

Conditional Statements Introduction Overview

- Here on the Conditional Statements Introduction tab we introduce the technique of using conditional statements to allocate values over time. This technique will allow us to model our transactions more easily, especially as assumptions change, which they inevitably do. Once again, this discussion assumes our hypothetical office development with underground parking and a ground-floor retail component.

Control Panel

- The first element that we will talk about is the creation of a timeline “Control Panel”, which appears in the box in rows 7 through 19, in columns B through E.
- What we are doing here is numerically labeling the events or milestones in our financial model with respect to the project’s timeline, or *time coding* them. Because our pro-forma is going to be constructed on a monthly basis, our Project Start Date, or what some call the Analysis Start Date, will be designated Month #1 as shown in Cell E8. Thus, we will have input the number 1, and because this is an assumption, we have formatted it in bold blue type.

Timeline Compression Discussion

- Before we go any further, note that for the purpose of this lesson, we have significantly compressed the timeline of the transaction so that we can keep our screens magnified to a reasonable size and do a minimum of scrolling during the lesson. While our transaction in The Basics module spanned over 60 months, our transaction here lasts only 12 months. Nonetheless, the principles taught here are applicable to transactions of any length.

Pre-Construction Period

- As described in The Basics lesson, the period of the development transaction that pre-dates the construction period is known as Pre-Construction. We will quantify the duration of the Pre-Construction period at 3 months as shown in cell C9. Thus we have assumed that the land is controlled, the project is designed, all construction

drawings are produced, and a building permit is secured all within periods 1-3 of the project timeline.

Construction Start Month and Duration

- Thus, the first major milestone that we will calculate is the Construction Start month. This is shown in Cell E10, and is simply the sum of Cells E8 and C9.
- The next element to code is the duration of the construction period, also known as the construction schedule. We have assumed that this is 4 months, and have input the number 4 in Cell C11.

Construction End Month/C of O Received

- The next milestone is the Construction End month, which is often also when the building will receive its Certificate of Occupancy from the building inspector, declaring it legal to be occupied by tenants. Because we have designated the Construction Start month and the Duration, we will calculate the Construction End month. We make this a calculation instead of hard keying it so that when we inevitably need to make a change in either of the Construction Start month or Duration or both, the Construction End month will adjust for us automatically. Note that this formula includes a minus 1 at the end. This accounts for our starting construction in the beginning of the Construction start month.

Post-Construction Leasing Duration

- The final phase of development transactions is the Post-Construction phase. The important timing elements here are how long the lease-up will take, when the tenant rents will commence, and when the tenant improvements allowances will be paid.
- As shown in Cell C13 we have assumed a Post-Construction Leasing Duration of 5 months.

Office Tenant Rent Commencement

- Next, in Rows 14 and 15 we have designated the months in which our rents will commence, which is not to be confused with the months in which our leases are

signed. This distinction is important to note for the simple reason that there will be a lag between the point at which tenants *sign* their leases and when they occupy their fully constructed interior space and begin to pay rent. In all likelihood, there will be at least a few months required for the tenant to design their space with their interiors architect, get permits, and build out the space.

Tenant Improvement Payments

- In Rows 16 and 17 we have designated the timing for the payment of the Tenant Improvement allowances. We have made these timing designations calculations, with the calculation dictating that these allowances would be paid in a lump sum one month prior to the tenant occupies the space and begins to pay rent. Once again, keep in mind that we are using an artificially compressed timeline for the sake of this exercise. In reality, the payments could be made in a Percentage Completion manner over the course of the interior buildout, which could be multiple months depending on the size of the space being built out.

Disposition (Sale) of Office, Parking and Retail

- Next in Row 18 we have a calculation for the timing of the Disposition, or Sale, or the fully leased Asset. This calculation is simply the month # for the end of construction plus the Post-Construction leasing duration.

Retail Tenant Rent Commencement

- Lastly, in Row 19 we show the month in which the retail tenant's rent will commence. What we have done here by hard keying in month 15 is assume that we will have a retail tenant signed, but that their rent would not start until after we sell the Asset.
- Press pause now to step through each line in the Control Panel, hitting F2 to view and understand the formulas, before we move on.

Time Coding Overview

- Now let's talk about rows 21 through 25. What we've done here is set up the timeline for the project, and described, or coded each period, which in our case is a monthly period, in multiple ways.

Calendar Month

- The first row, Row 21, is simply the calendar month. To keep the entire model timeline compressed within one calendar year for the sake of this exercise, we have chosen January 2010 as the month that corresponds to Month #1, our Project Start Date. We enter this as 1/1/2010. We do the same for February by inputting 2/1/2010, and to get the rest of the values to fill in without inputting them by hand, what we do is hover the mouse over the bottom right corner of these two selected cells, and then we are simply going to drag across to the end of the range and our values will fill in automatically.

Counting Numbers

- In the next row, Row 22, we have simply labeled the project timeline in the counting numbers that correspond to those in Control Panel. The formula is very straightforward - the first month is hard coded as month number 1, and the second month and all subsequent months are the previous month plus 1.

Construction Month

- In Row 23, we introduce the concept of “Construction Month #”. This simply starts counting at month 1 of construction, and stops counting at the last month of construction. This is helpful to employ because your construction schedule will have certain milestones within it, such as the topping out the structure, which you will want to refer to in the context of what month of *construction* it is rather than what month # it is in the project.
- The formula here is a conditional statement that refers back to the milestones in the Control Panel. The formula says the following:
 - If the Current Month is greater than the month in which construction ends, return a dash, signifying construction has completed.
 - If the Current Month is greater than or equal to the # of months of Pre-Construction + 1,
 - And If the Current Month is = to the number of months of Pre-Constructions, then return a 1
 - Otherwise, return Last Month’s Construction Month # + 1

- Otherwise, return a 0, signifying construction has not yet commenced.
- This may seem a little bit confusing, but we see how the formula works here, as Construction month number 1 starts in April, which is month number 4, as designated and calculated in our Control Panel. Construction lasts 4 months, as designated in our Control Panel, and after the month in which construction ends, month 7, which is July 2010, the construction month shows dashes, which mean that construction has ended.

Cell Reference Locking

- You will note in this formula that I have introduced the cell reference locking function, which is activated and signified by dollar signs in front of either or both of the row and column coordinates.
- Let's take a second to make sure we understand the power of this function in Excel.
- Note that when you reference a cell in a formula without doing anything special, that cell reference is a *relative* coordinates reference, that is, the formula points to that cell based on where that cell is located on spreadsheet relative to the cell in which the formula itself resides.
- You can see this by simply looking at cells F22 and G22. When we copied over the formula from F22 and pasted it into G22, the new reference in G22 is F22, not E22 as it was previously.
- For Row 23, we want the formula to always reference the cells in the Control Panel, so what we want to do is “lock down” the reference in the formula so that it is not a relative reference but rather an absolute reference. We can do this by either typing dollar signs in between the row and column coordinates, or by placing our cursor in between the Column and Row coordinates and hitting the F4 button until the formula shows dollar signs in front of the both the column and row coordinates.
- We then do this in all of the other places where we want to retain this absolute reference, and then copy the formula across the timeline.

Construction Status

- In Row 24, we introduce the concept of “Construction Status”, whereby we designate status 1 as being Pre-Construction, status 2 as during Construction, and status 3 as Post-Construction. Once again, we code our timeline in this additional way because many of our costs will be driven off of the current phase of construction as we move through the model. The formula used here refers to the designations we made in the control panel. It says the following:
 - If the Current month # is less than the month # in which construction starts, code this month a 1;
 - If the Current month # is greater than the month # in which construction ends, code this month a 3,
 - Otherwise, code this month a 2.

Calendar Year

- The last row, Row 25, is simply a coding of each month with respect to which elapsed year it belongs so that when we want to summarize data by year, we can do so easily by writing a formula to check that row to see to which year each month (or each column) belongs. The formula introduces the ROUNDUP function and says the following:
 - Round up the quotient of the current month divided by 12, to the tens place. For example, for month 1, $1 \div 12 = 0.083$, which rounded to the tens place, is 1.0. You will notice that the formula returns a 1 for all of the first 12 months, and a 2 for the year starting in month 13.

Development Fee Example

- Now that we have all of this under our belts, let’s take a look at an example of applying a conditional statement to allocating one of our soft costs, the Development Fee, over the life of this hypothetical project.
- Assuming we are paid our development fee only during construction, and that we are paid the fee evenly during the construction period, we can set up a formula to check to see if the current month is coded Construction Status 2 as being a Construction month, and then have the formula consequently return the right value.

- This is shown here in Row 29, whose formula says the following:
 - If the Current Month is Construction Status 2, take the total Development fee and divide it by the number of periods of construction;
 - Otherwise, return the value 0.

- Note that we employ the locking feature here when referring to Cells C11 and C29, and also note the Development Fee is spread over evenly only the months of Construction, as shown here in Construction month 1, 2, 3 and 4.

- When you're ready to move on, click on the Sources and Uses of Funds tab.