the JOBSITE HANDBOOK

Everything you need to know for taking site dimensions and confirming site conditions.

SITE DIMENSIONS & SITE CONDITIONS

The more information about site measurements and site conditions known up front the better your project will go. But how do you know what information is needed?

This document was put together by our own DIRTT experts who have years of experience in the field. It is designed to give you direction for gathering the important measurements and site descriptions for the factory and the installation team. Accuracy is what counts here.

Detailed dimensional information goes directly into your ICE® file. Shop drawings (often used for client sign-off) are produced, materials are ordered and installation drawings are created based on the information in that ICE file. Most important, your project is manufactured to those exact specifications and the Interior Technicians use the information to layout and install the project. It is imperative that site dimensions are 100% accurate. This document gives you direction on providing precise measurements, even in difficult circumstances.

When it comes to site conditions; it is vital you see the building and project site for yourself. Don't blindly accept word-of-mouth information. This is the part of the project most obvious to the client. The more your team knows about getting the products safely and quickly to the site and installed the better everything will go with fewer opportunities for cost overruns. This is the time where your client can see DIRTT shine!

The following gives you excellent instructions on gathering that information. There is a glossary of terms, drawing examples, architectural icons and important things to look for in the building. Please use it and feel free to ask our experts any questions you have.

MEASURING SITE DIMENSIONS

SURVEYING A SITE

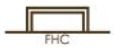
You will need a copy of the architectural blueprints which cover the entire site and which ideally show the client's planned layout.

Take the blueprints to site and work through the following steps:

1) Site measurements
2) Floors
3) Ceilings
4) Finishes
5) Exterior Windows
6) Plumbing
7) HVAC & Sprinklers
8) Electrical Doors

ARCHITECTURAL SYMBOLS

The following is a table of basic symbols used on layout to identify existing site conditions and client requirements.

	Ceiling Height		Data Outlet
	Single Light Switch		Telephone Outlet
	Double Light Switch		Blank Faceplate
	3-Way Light Switch		Junction Box
	Dimmer Light Switch		Thermostat
	Motion Sensor Light Switch		Fire Strobe
	Wall Sconce		Fire Alarm
	Duplex Outlet		Card Reader
	Isolated Ground		Electric Strike Release Button
	Ground Fault Interrupter		Fire Hose Cabinet
	Fire Extinguisher		

This is an example of some of the symbols you mayfind on a ceiling grid layout.

	2' x 4' Ceiling Grid		2' x 4' Fluorescent Light Fixture
	HVAC Supply Air		2' x 2' Fluorescent Light Fixture
	HVAC Return Air		Pot Light Fixture
	Sprinkler Head		

WHAT IS A COLD SHELL?

A Cold Shell is defined as "An unfinished floor area: e.g. raw concrete, no ceiling grid." The following is a detailed list of items that will help you determine a Cold Shell site:

- Exterior cladding is either incomplete or not yet weatherproof. Glazing may or may not be installed.
- Floor surface is unfinished, such as raw concrete. It might need to be 'floated' to help get it level and smooth.
- Structural columns are unfinished and/or not furred out.
- Plumbing and other pipes are not furred out.
- The building's core walls have not been finished.
- Ceiling grid has not been installed.
- HVAC, sprinklers, lighting systems have not been completed.

In this condition we may build our product to 'Hold To' dimensions. The two most important conditions would be furring out and ceiling height.

WHAT IS A WARM SHELL?

A Warm Shell is defined as "A floor space with finished exterior walls, all furring-out, flooring, and ceiling grid/tiles." The following will help you determine a Warm Shell site:

- Exterior cladding is complete and weatherproof. All glazing has been installed.
- All convector heating cabinets have been installed.
- All flooring has been installed.
  - There may be more than one type of flooring
  - Is there raised flooring? If so, which type is it?
- Structural columns are finished and furred out.
- The building's core walls have been finished.
- Ceiling grid has been installed.
  - Ceiling tiles installed is an ideal condition; however, a site survey can still be carried out if they have not been. In this case, take note of the location and height of the HVAC diffusers and sprinkler heads.
- There may be more than one ceiling type and height. You will need to consider this when you survey the site.
- HVAC, sprinklers, lighting systems have been completed.

Note: if there is a change in floor finish where the DIRTT walls will be installed, note the location of where the different floor finishes are being used in relation to the DIRTT walls.

SITE MEASUREMENTS

Walk the site and identify where the DIRTT product will be installed. Determine if the site is a Cold or Warm shell. Mark up the blueprint and confirm details, dimensions and sizes:

- Perimeter glazing wall details
- Building core walls, permanently built walls/partitions, and glazed partitions (are they plumb?)
- Structural columns and beams (if these are to be furred out, note all agreed to 'Hold-To' dimensions)
- Ceiling heights
- Doors
- Stairways
- Changes in floor levels – ramps, stairs, steps, computer room raised flooring, etc.
- Plumbing
- Built in place millwork
- AFFs of: light switches, thermostats, electrical outlets, strobes, sconces, etc.
- Special or custom base trim that our wall may be up against.

IMPORTANT

- Take long dimensions first – using a 100' tape measure
- Measure major elements first (column to column & mullion to mullion)
- Use progressive dimensions wherever possible
- After the overall dimensions are taken, take dimensions of smaller details in between structural elements.
- Check the sum of the smaller dimensions to ensure they add up to the overall. If they don't re-measure…
- Do not take a series of short dimensions and add them together. This often leads to errors.
- If necessary (and it usually is) measure twice to be absolutely sure!
- Either use metric or imperial dimensions, but don't use both in the same survey
- Use different colored pens for the dimensions lines, arrows and numbers for easier understanding, rather than a single color for all information.
- Take photos. Once you leave the site they can help you remember certain details of the site conditions.

When taking dimensions measure from the face of mullions and finished walls avoid measuring from:

- Face of base trim. Do note the type and thickness of base building trim. It may affect our interaction with perimeter walls.
- Face of unfinished drywall stud. . However, there may be occasions where we need to measure from raw studs. Note the thickness of drywall used and account for how it will affect your dimensioning.
- Face of glass

DIMENSION STANDARDS

- Measure from face of finished wall to face of finished wall
- Measure from center of mullion to center of mullion
- Take one long, then several small dimensions to confirm the long dimensions (check the math on-site before you leave)
- Draw a cross section:
  - Bulkhead details
  - Window details
- Show your dimensions:
  - Over 24" as feet and inches – 2'6"
  - Under 24" as inches only – 24"
  - Exception is the ceiling height which should always be in inches only – 108"

- A rough sketch (see below) that states "EQUAL" on the room sizes does not mean "equal centerlines" when building between drywall. "Equal" means room size; finish to finish.

FLOOR

Is it flat and is it level?

To determine this, establish a 'level plane' by using a rotating laser beam device, (rent one for the survey and see web for instructions) and take vertical measurements from it to the floor in as many places as possible. If a laser is not available a level plane can be established by using a line of string stretched tight between two structural elements.

CEILING

Is it flat and is it level?

It is essential that the vertical measurements from the 'level plane' be taken at the same places where you measured to the floor. This will help accurately establish any variations in the floor-to-ceiling dimension.

It is also important to locate and note the reflected ceiling plan:

- Changes in ceiling levels
- Ceiling grid and tile types
- Changes in ceiling grid and tile types
- Bulkheads
- Drywall and custom drywall ceiling areas
- Coffered ceiling areas
- Lighting units, especially ambient lighting units
- Radiant panels
- Plenum heights for suggested seismic details

If there is no ceiling grid installed you will need firm 'Hold-To' dimensions that we can manufacture from.

IMPORTANT

- Take measurements to the floor and ceiling in key locations where doors, glazed panels and curved panels are planned. Do this at structural columns and mid span of beams. Be sure to account for thickness of carpet and possible finished ceiling discrepancies based on tile type (eg: Tegular tile).

FINISHES

Confirm all existing finishes:

- Type of wall covering
- Glazing
- Base and top trim
- Electrical and cover plate finish

SELECTION AND USE OF A LASER

Selecting a Laser:

Get Quality (between $150 - $400 USD)
Tripod Included
Self Leveling
Rotates 360 Degrees

Set up and Use:
Go to the outside wall, preferably at the outside corner. (Outside corners are generally the highpoints.)
At this point, set the laser on the tripod.
Turn it on and let it adjust itself.
With a tape measure select an easy number to work with, say 40".
With the tape measure in front of the laser, crank the tripod up or down until the laser reads 40", this is your benchmark.
Walk away from the laser with the tape measure and spot-check the floor over the entire area where DIRTT wall is to be installed.
As you walk away from the laser using a reader card or the red glasses that come with the laser - take notes as to where the floor changes.

Use an imaginary grid on the floor to keep your bearings, approx. 4ft squares.

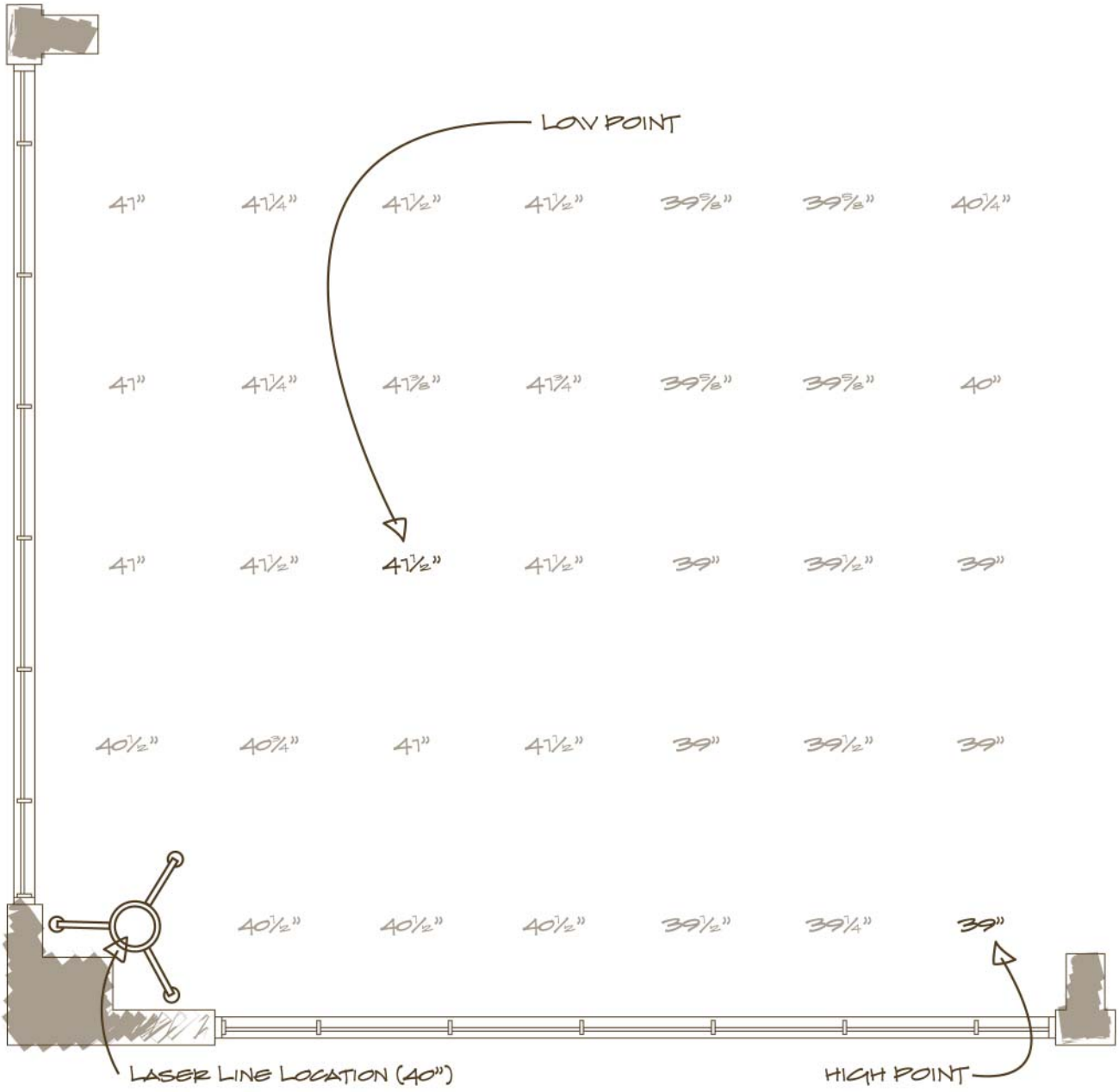
As you spot-check the tape reading will change. For instance if you checked the tape four-feet away from the laser and the tape now reads 40 ¾" the floor is dropping away.

At the 40 ¾" reading you now know that the floor dropped ¾" in that distance. Keep checking the floor in a grid like pattern and keep noting the numbers.

Numbers going up mean that the floor is dropping.

Numbers going down mean that the floor is coming back up.

In the example you see a few different numbers on the grid fluctuating up or down from 40.



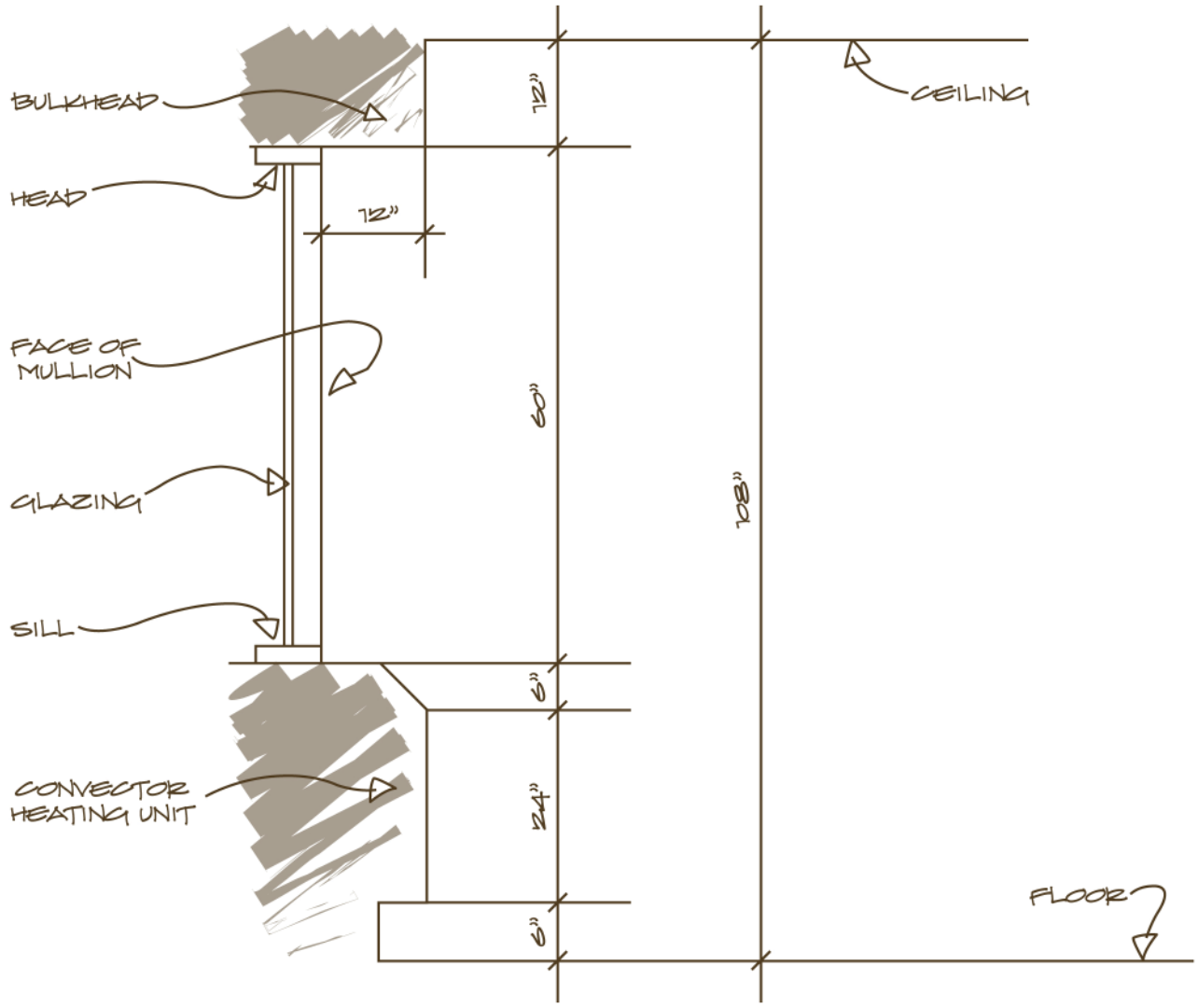
Take note of the highest number on the grid and the lowest number on the grid.
In this example the highest number is 41 ¾" and the lowest number is 39". Remember that the low number is the high point.
With these two numbers you establish that the floor has a total drop in some places of 2 ¾".
They also give you the median number to create the best module size for the walls.

But what happens when the floor is very uneven? In cases where it dips much lower you have to inform the client and GC and have a floor floated to meet the requirements for the walls. If it humps up dramatically, the GC will have to grind it down.

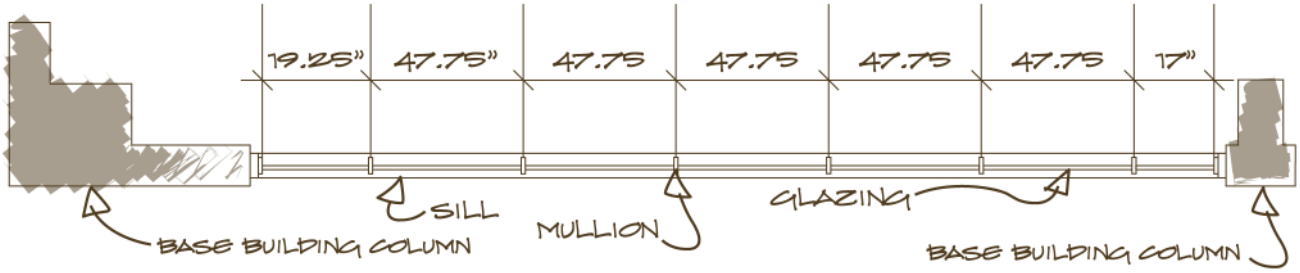
EXTERIOR WINDOWS

The detail of the perimeter windows is important to determine where you may need to use cuttable tiles. Ask what type of cuttable is desirable and most effective for the customer's use. Spandrel cuttables are easier to install but provide a lower STC rating. Monolithic cuttables are more labor intensive and may affect elevation aesthetics.

An isometric sketch or section of the perimeter window details, from floor to ceiling, will add value to your order. This sketch needs to include all dimensions (vertical and horizontal) and notes identifying the individual pieces.



Measure 'Center of Mullion to Center of Mullion' throughout the floor area; do not assume that all mullions are the same distance. Note the width of the mullions and be sure to check that they are all the same width throughout before making a general note specific to their width.



PLUMBING

If there is any exposed plumbing that will affect the DIRTT walls you need to mark, identify and note dimensions all fittings on your floor plan. This could include:

- Hot and cold water supplies
- Vent pipes
- Roof drain leaders
- Bathrooms
- Janitors rooms
- Soil stacks

HEATING VENTILATING AIR CONDITIONING (HVAC) & SPRINKLERS

If walls are planned for installation where sprinkler heads, HVAC diffusers or return air grilles are situated, the client needs to be informed immediately. They may have to be relocated or require a re-design the layout of the walls.

ELECTRICAL

Locate all the electrical and data outlets on your floor plan – complete with dimensions; horizontal and vertical (AFF). Specify size and types of devices. This is particularly important if there is electrical behind the area where we are installing a curtain wall and the power needs to be moved into the DIRTT wall.

Check if strobes or horns need to be mounted on the DIRTT wall. They could interfere with an antler, so their location must be noted on the shop drawings if a cutout is required. If light fixtures being mounted on a DIRTT wall, same issue; note it for the shops.

DOING A SITE MEASUREMENT WITHOUT ANY BLUEPRINTS

There may be a time where you have to survey a site before any blueprints or drawings are available. This is common for small projects. It could involve surveying an occupied space. The same level of detail is required for this type of survey.

Once you have walked the site you should:

- Use a page of grid paper to sketch a plan of the space you are in.
- Draw an arrow in one corner to indicate north.
- Estimate how big the floor area is on that page; use the squares on the grid paper as a key and use any installed ceiling grid or floor grid tile layout as a guide. Depending upon the size of the space you are surveying, you may choose to have one square represent 1'0" x 1'0", 2'0" x 2'0" or some other scale. Whichever you choose, note your chosen scale on the bottom of the page.
- If you need to draw the layout on more than one page, ensure that you note where one page ends and the other begins for clarity.
- First sketch the perimeter of the space, clearly identifying windows, pilasters, heating, cabinets, columns, etc.
- Second sketch any fixed-in-place walls, including doors, glazed panels, columns, 'jogs' in the walls, etc.
- If you have access to a photocopier, make a couple of copies at this point so you can have separate pages to note the dimensions, the reflected ceiling plan, the electrical or any additional notes that take up space. Title and date layouts.
- You will need to gather all the same information as if you had a blueprint including a perimeter glazed wall section.

SITE CONDITIONS

Go to the site with a pen, paper and camera and gather the following data. There may be some conditions best described or explained by a sketch; you are encouraged to do this to the best of your abilities. Photos are another excellent tool to help describe and assess site conditions.

ASSESSMENT CRITERIA

1) Access to the work area: (Obstacles en-route to the installation area)
   a. Look around the outside of the building to determine how a truck is going to approach it
   b. Is there a loading dock or will special parking arrangements be needed?
   c. Check the delivery route inside the building to get the product to the installation area
      i. Are all corridors wide enough to wheel dollies through?
      ii. Are doors wide enough?
   d. Will we need to protect the floor finish; e.g. by using plywood sheets over marble flooring
   e. What are the hours of the loading dock? Does it need to be pre-booked?
   f. Is there paperwork to be completed to gain access to the site?
      i. Confirmation of insurance?
      ii. Security checks?
      iii. Is documentation of safety or tool licenses or training required?
   g. Some sites have mandatory safety training that must be taken on site, these can range from a 30-minute video to a 4-hours class.
   h. Is citizenship an issue if we have a Canadian on-site assisting?

2) Location and size of the Loading Dock
   a. What size of truck can safely get to the Loading Dock
      i. Semi with 48' or 53' trailer?
      ii. Will we need a smaller truck; five-ton or one-ton? If this is the case where do we deliver the product for transfer to a smaller truck?
   b. If we can use a trailer, do we need to unhitch the tractor and park it somewhere else?
   c. If possible, make contact with the Loading Dock manager

3) If we cannot deliver via a Loading Dock and/or Freight Elevator, will we need to hoist the product up the outside of the building and in through a removed window or hole in the exterior wall? If so:
   a. Does a window need to be removed?
      i. Who do we arrange this with?
   b. Check the area where a crane or hoist can be situated
      i. Is there good access to this location?
      ii. Is the ground solid enough to accommodate the equipment when fully loaded?
   c. Who do we obtain approval from for exterior hoisting?
   d. Who is responsible for booking and paying for this equipment?

4) Time restrictions on construction work and installation of product
   a. Will we have access whenever we wish or do we book the Loading Dock and Freight Elevator?
   b. Is there a schedule for elevator use?
   c. If we have to book specific access times, who is our contact?
   d. What could happen if one of our trucks is late?
   e. Are there time restrictions for gas operated tools (e.g. Hilti Gun)

5) Security issues
    a. If we deliver our product, will it be secure and safe prior to and during installation?
    b. If security badges are required, how do we get them and who qualifies?

6) Location and size of the Freight Elevator.
    a. Is there one?
        i. If not, will we be using a passenger elevator or carrying the product up or down a staircase? (See #2 for exterior hoisting.)
    b. Survey and measure the elevator, (Length/Width/Height. Door size, load capacity) and its access. The module size of the DIRTT walls could be dictated by the size of the elevator and/or the base building doors.
    c. Do we have to book the elevator for specific time?
        i. If so, make contact with the person who manages the freight elevator.
    d. Will the elevator need protection? (moving blankets)
    e. Is there any cost for using the freight elevator?

7) Is the site union or non-union?
    a. This could materially affect the management, delivery and installation of product, particularly if union and non-union crews are working along side each other.
    b. There could be restrictions to the level of electrical we can offer

8) Trash Removal
    a. Confirm that we have access to trash bins on-site
    b. Confirm that payment for this is by the Client

9) Hours of operation on the site
    a. Are there any restrictions regarding access to, and work within, the site?
        i. Are they working Saturday or Sunday?

GLOSSARY OF TERMS

The following are a handful of terms common to the construction industry, and often apply to DIRTT Modular Wall projects.

Access to Egress	Any pedestrian route or corridor used to get to the egress of a building. (See 'egress' below)
AFF	Above Finished Floor e.g. the AFF of any electrical device is measured to the center of that device.
Building Core	The center vertical stack of a multi-storey building. Contains stairways, washrooms, vertical shafts for HVAC, plumbing and elevators.
Building Grid	The structural layout of the building. Determined by the Architect during the building design stage. Building grids are usually at the center points of structural columns and exterior glazing mullions.
Bulkhead	An area of ceiling that is lower than the main area. Usually finished with drywall.
Ceiling Grid	The suspended system for holding ceiling tiles, lighting, HVAC diffusers, sprinkler heads, etc.
Center Line Dimensions	
Coffered Ceiling	A recessed ceiling pattern.
Cold Shell	An unfinished floor area: e.g. raw concrete, no ceiling grid.
Convector Heating Unit	The cabinet at the perimeter of the floor plate that provides heating and air conditioning to the occupied space.
Cuttable Panel	The panel can be trimmed on-site to fit against a perimeter wall of mullion detail.
Deck	The flooring of a building or space.
Demising Wall	Any wall that separates two or more occupants in the same building.
Diffuser	A supply air grille; usually in the ceiling grid.
Drapery Box	A recess in the ceiling at the perimeter glazing to allow for drapes and drape track.
Egress	The way out of a building.
Entry Ramp	Any inclined floor surface that accommodates barrier free access usually to a raised floor area.
Face to Face	The horizontal dimension between two vertical faces, e.g. face of mullion to face of drywall.
Floated Floor	An area of the floor slab that forms a "valley" and has been filled in with a thin concrete 'slurry'.
GFI	Ground Fault Interrupter: an electrical outlet with a safety protection device built in. Usually to hide pipes and services.

Hold To Dimension	A dimension that the Client and/or General Contractor agree to build to if we are surveying a Cold Shell.
HVAC	Heating, Ventilating, and Air Conditioning.
Level Plane	An imaginary horizontal plane in a building from which a floor and ceiling can be measured from.
Mullion	Vertical member that separates panes of glass.
Profile	A vertical cross section of a part of a building. Most often used to capture perimeter glazing and convector cabinet details.
Radiant Panel	A heating panel as part of a soffit immediately above the inside face of the perimeter glazing.
Reflected Ceiling Plan	A plan showing details of the ceiling grid and what has been installed in it.
Return Air Grille	A grille in the ceiling to allow used air to return to the mechanical room.
Sill	The bottom member of a door or window frame.
Warm Shell	A floor space with finishes exterior walls, all furred out, flooring, and ceiling grid tiles.

JOBSITE DETAILS & ELEVATIONS

SCALE 1/4" = 1'0"

PROJECT: _____

NOTES: _____

_____

_____

DRAWING