

OF CALCULATING RINT OF A BUILDING

ENVIRONMENTALISM AND CONSERVATION ARE TWO THINGS THAT ARE VERY IMPORTANT TO ME. IT IS SO ENJOYABLE TO BE IN A PLACE WHERE SO LITTLE OTHERS HAVE BEEN. WALKING THROUGH THE WOODS WHERE NO HUMAN HAS ADAPTED IS PRECIOUS. ALTHOUGH THESE AREAS ARE PERFECT, THERE MUST ALSO BE SPACE FOR US TO ADAPT AND INHABIT, BUT WE MUST BE MINDFUL OF THE EXISTING ENVIRONMENT WHILE DOING SO.

IT IS WELL KNOWN THAT OUR CLIMATE HAS BEEN SIGNIFICANTLY IMPACTED BY CLIMATE CHANGE. CARBON DIOXIDE EMISSIONS IS THE LEADING DRIVER OF THE GLOBAL CLIMATE CHANGE. IT IS TALKED ABOUT WORLD WIDE HOW WE AS INHABITANTS NEED TO MAKE CHANGES. EVERYONE KNOWS THAT CHANGES NEED TO BE MADE FOR THE SAKE OF OUR ENVIRONMENT.

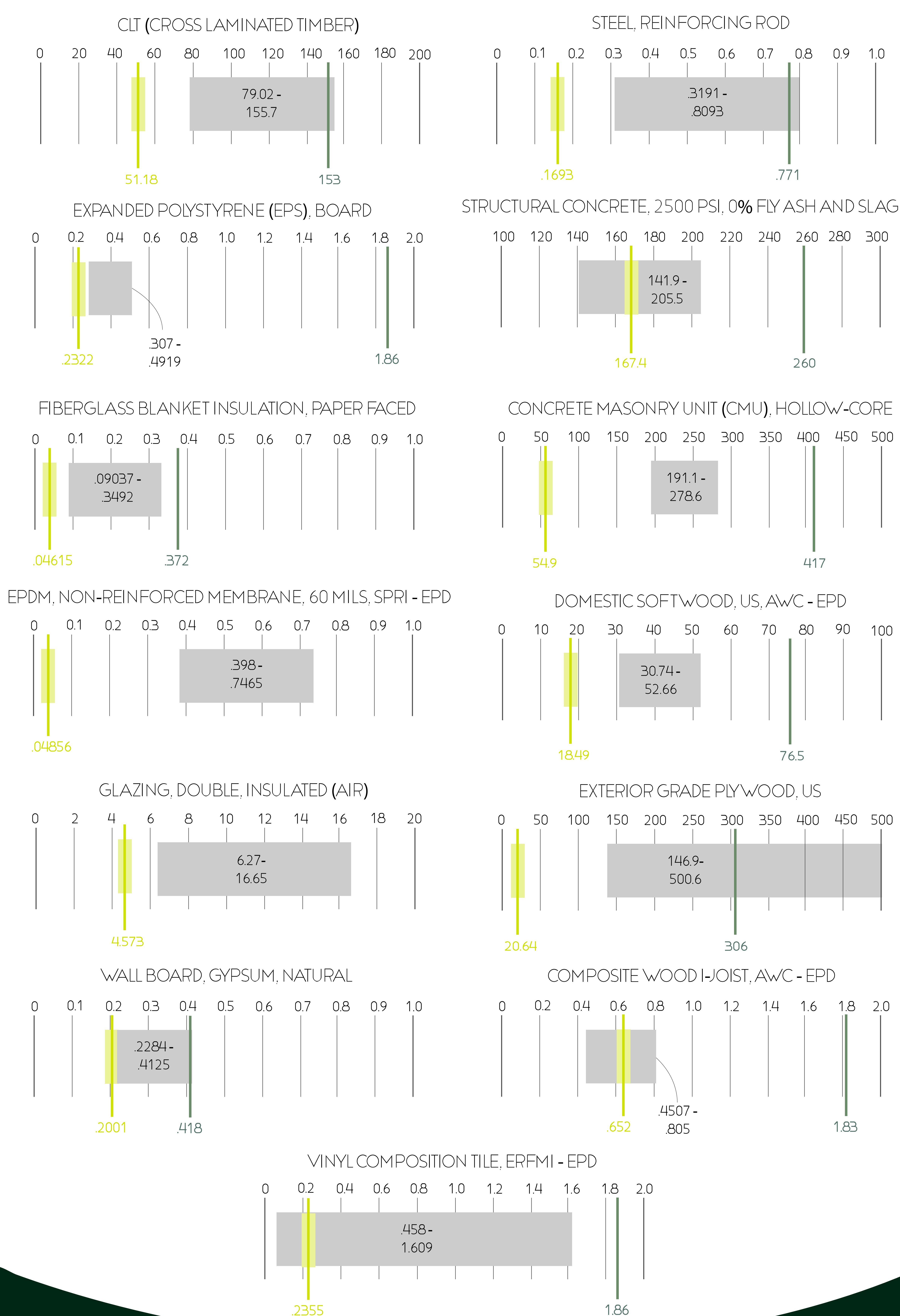
WHEN IT COMES TO DETERMINING WHO/WHAT IS RESPONSIBLE FOR PRODUCING EMISSIONS, THEY CAN BE CATEGORIZED BY REGIONS, COUNTRIES AND INDIVIDUALS. WHEN WE REALLY BREAK IT DOWN, IT PANS OUT THAT EACH AND EVERY ONE OF US IS RESPONSIBLE.



EC3 MATERIAL COMPARISONS

LEGEND

2021 CLF BASELINE AVERAGE RANGE OF GwPS LOWEST GWP RESULT



CARBON SEQUESTRATION VS. REDUCING CARBON FOOTPRINT

CARBON SEQUESTRATION IS THE TERM THAT IS USED TO DESCRIBE THE PROCESS OF CAPTURING, SECURING AND STORING CARBON DIOXIDE FROM THE ATMOSPHERE.

THE IDEA IS TO STABILIZE CARBON IN SOLID AND DISSOLVED FORMS SO THAT IT DOESN'T CAUSE THE ATMOSPHERE TO WARM.

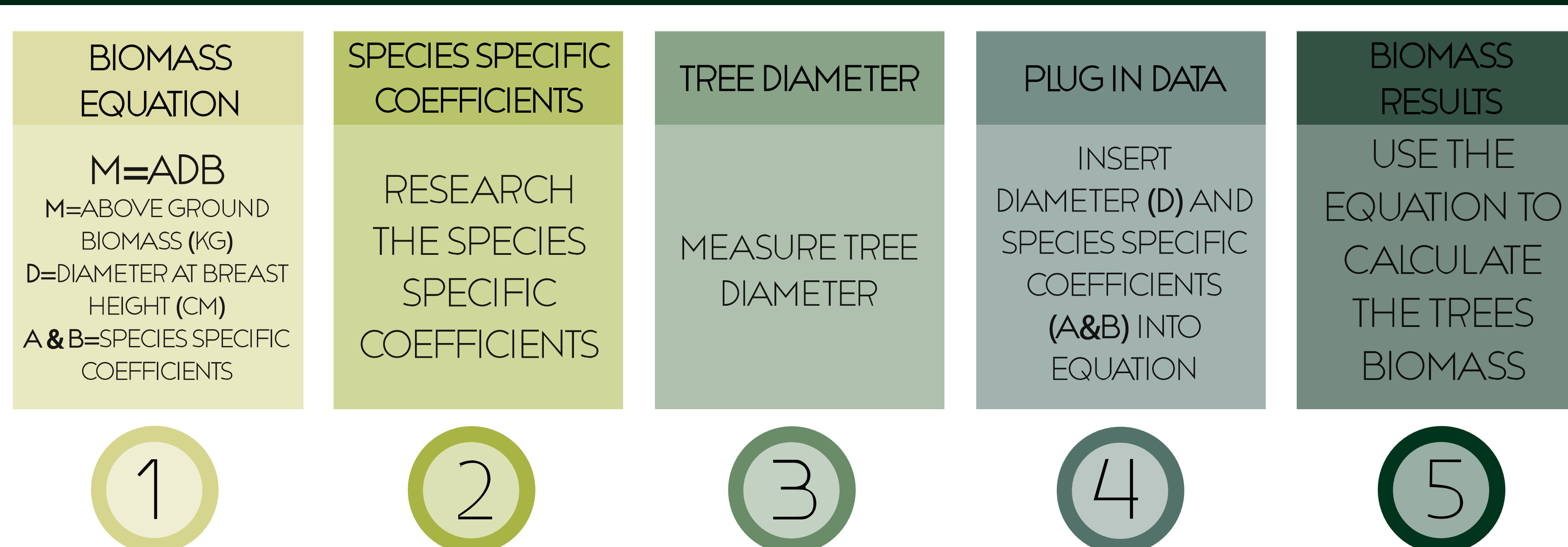
INTRODUCING MORE VEGETATION TO A SITE IS ANOTHER WAY OF HELPING TO REDUCE THE AMOUNT OF CARBON DIOXIDE AROUND THE SITE.

SEQUESTRATION

FOOTPRINT

REDUCING CARBON FOOTPRINT REFERS TO REDUCING GREEN HOUSE GAS EMISSIONS CAUSED BY HUMAN ACTIVITIES SUCH AS TRANSPORTATION, ENERGY PRODUCTION, AND INDUSTRIAL PROCESSES. IT INVOLVES REDUCING ENERGY CONSUMPTION, USING RENEWABLE ENERGY SOURCES, AND INCREASING ENERGY EFFICIENCY.

CALCULATING CARBON SEQUESTRATION EQUATION



THE METHODOLOGY OF THE CARBON FOOTPRINT

MY THESIS DESIGN SOLUTION IS TO CREATE A METHODOLOGY TO CALCULATING THE CARBON FOOTPRINT OF AN EXISTING OR FUTURE ARCHITECTURAL DESIGN.

THROUGHOUT MY YEARS OF ARCHITECTURAL RESEARCH, I HAVE HEARD A LOT ABOUT CARBON FOOTPRINTS AND HOW THEY IMPACT GLOBAL WARMING. WHILE TRYING TO LEARN MORE ABOUT THE CARBON FOOTPRINTS OF ARCHITECTURAL DESIGNS, I STRUGGLED TO FIND A WAY TO APPLY METHODS TO MY OWN DESIGNS.

THIS LED ME TOWARDS MY THESIS DESIGN IDEA. I WANTED TO FIGURE OUT A WAY THAT I COULD CALCULATE MY OWN DESIGN'S CARBON FOOTPRINT. DURING MY RESEARCH PHASE, I FOUND THAT THERE WERE MANY PROGRAMS THAT - FOR A PRETTY PENNY- COULD CALCULATE CARBON EMISSIONS OF A BUSINESS BUT THIS DID NOT REALLY SOLVE MY QUESTION: HOW CAN I CALCULATE THE CARBON FOOTPRINT OF A BUILDING?

I WANTED TO BE ABLE TO USE REVIT, WHICH IS THE SOFTWARE I USE THE MOST TO MODEL MY DESIGNS. THROUGH RESEARCH, I FOUND A REVIT EXTENSION CALLED TALLY. TALLY ALLOWED ME TO DEFINE SPECIFIC MATERIALS WITHIN MY REVIT MODEL THIS WAS ONLY THE FIRST STEP TO CALCULATING THE CARBON FOOTPRINT OF MY DESIGN. THE NEXT STEP WAS TO TRANSFER THE DATA TO BUILDING TRANSPARENCY'S EC3 TOOL. AFTER DEFINING ALL MATERIALS WITHIN MY MODEL, TALLY ALLOWED ME TO EXPORT THE DEFINED MATERIALS AND QUANTITIES TO THE EC3 TOOL. FROM THERE, I COULD SEE THE QUANTITIES OF EACH MATERIAL THAT IS USED WITHIN MY MODEL AND I COULD SEE HOW MUCH EMBODIED CARBON WAS PRODUCED FROM THE MATERIALS IN MY DESIGN.



EXISTING DESIGN - REVIT MODEL

THE EXISTING DESIGN THAT I CHOSE TO USE AS A RESEARCH MODEL IS MY PARENTS' CABIN. I CHOSE THIS DESIGN BECAUSE I AM FAMILIAR WITH THE DESIGN AND LAYOUT. ANOTHER REASON WHY I CHOSE THIS IS BECAUSE I WAS ABLE TO FOCUS ON A SMALLER DESIGN THAT DID NOT COMPLICATE THE MATERIAL IMPORTING SO THAT I COULD SEE RESULTS IN A FOCUSED WAY.

REVIT MODEL

SITE

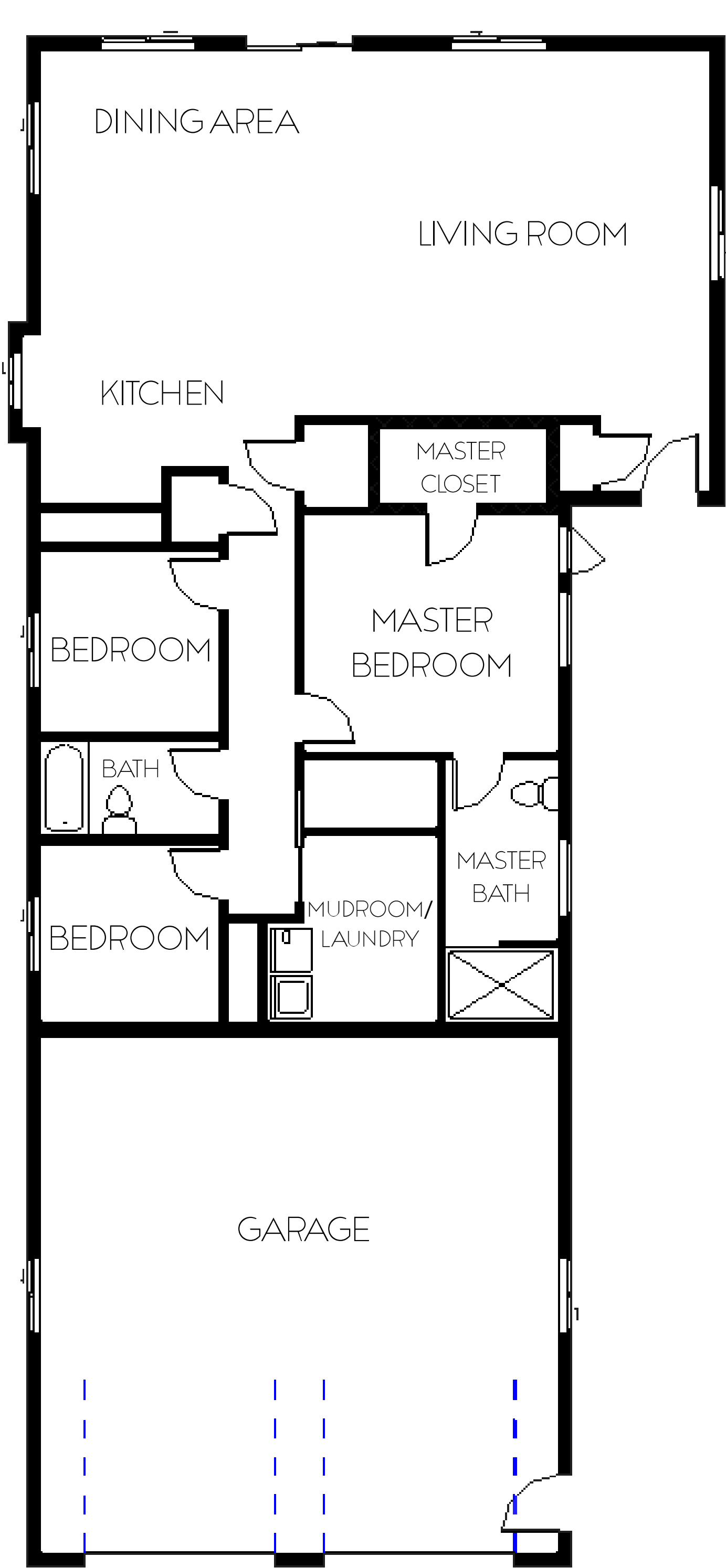
16622 HIGHTOP WAY
NW CASS LAKE, MN
56633



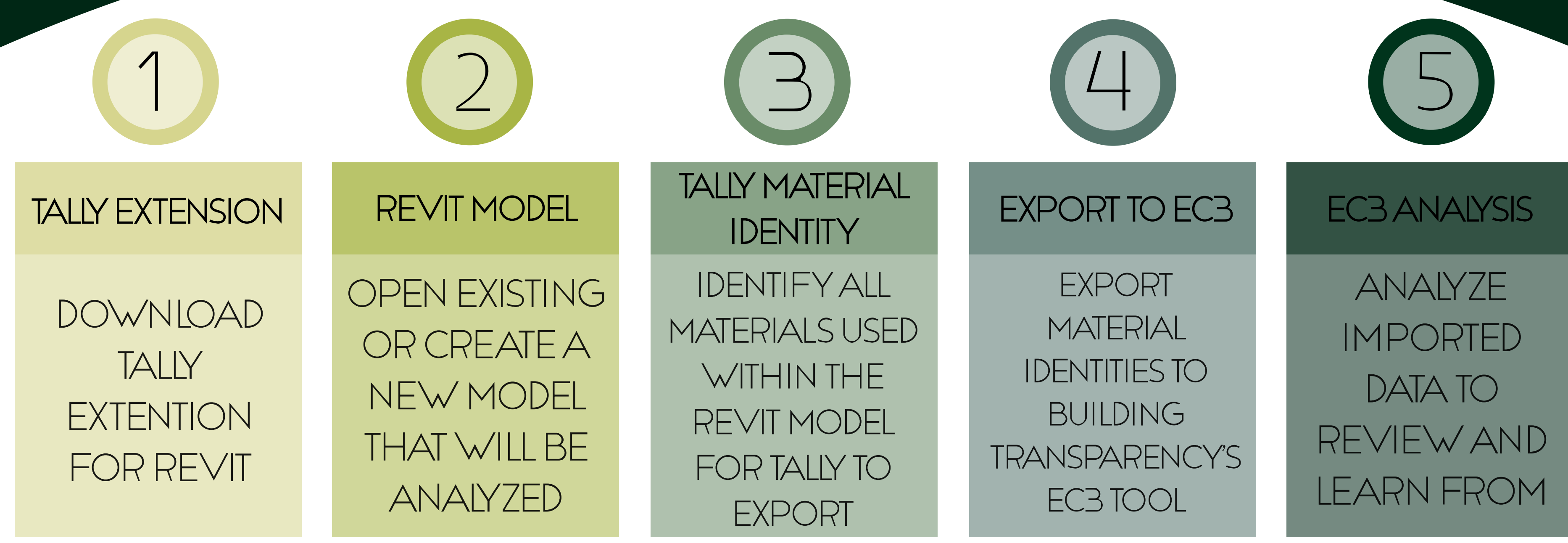
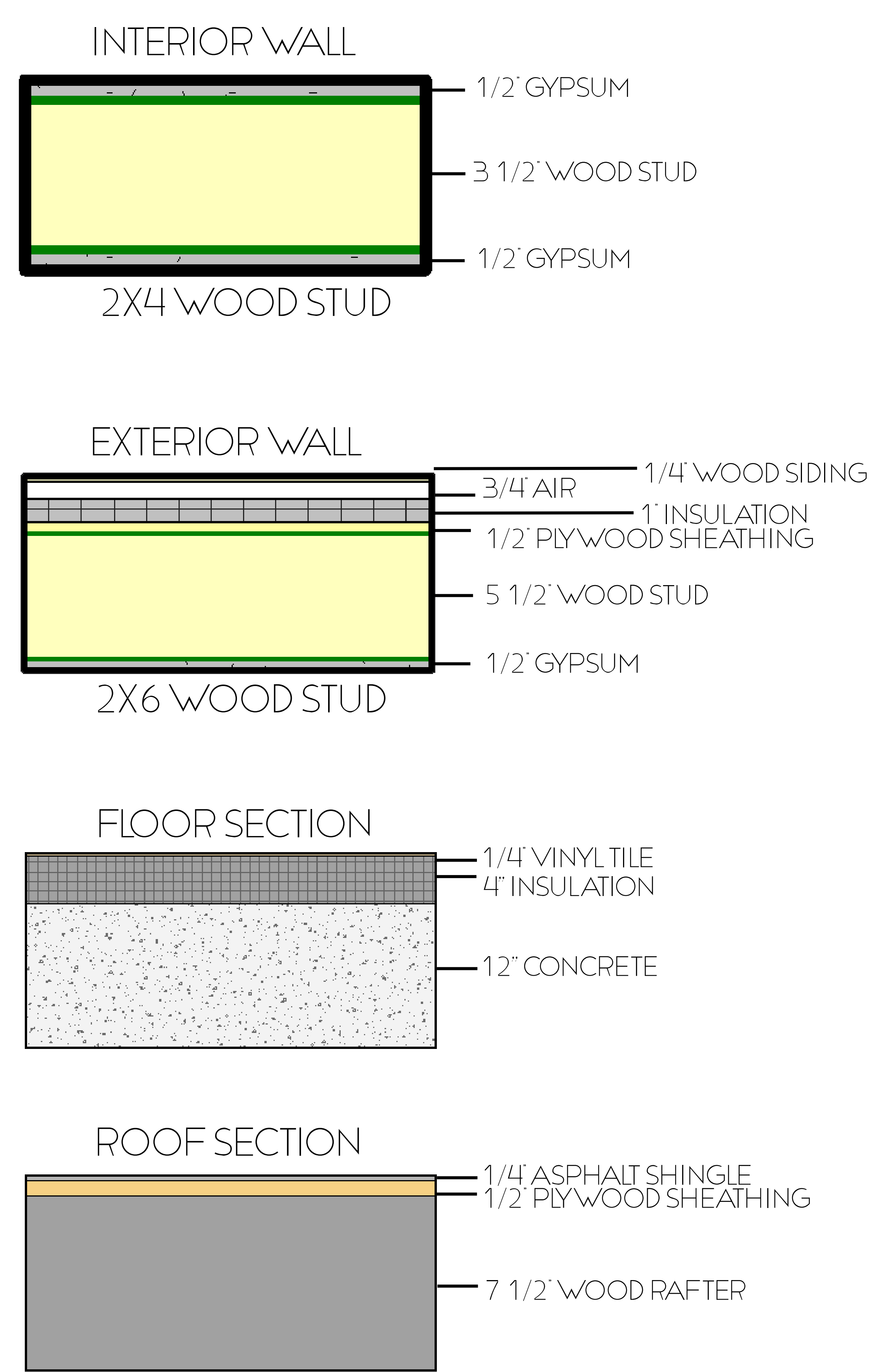
THIS SITE IS LOCATED IN NORTHERN MINNESOTA ON CASS LAKE.

FLOOR PLAN

- EXTERIOR DOORS: ALUMINUM
- INTERIOR DOORS: HOLLOW WOOD
- WINDOWS: DOUBLE PANE CASEMENT



CONSTRUCTION TYPES



METHODOLOGY PROCESS

IN MY THESIS PROCESS, I CHOSE TO CREATE MY OWN YOUTUBE VIDEO THAT WALKS THROUGH THE PROCESS OF USING THE THREE SOFTWARES TOGETHER. I WANTED TO SHARE WHAT I HAD LEARN WITH OTHERS WHO MAY BENEFIT FROM MY RESEARCH.



ACCESS MY TUTORIAL VIDEO BY SCANNING THE QR CODE TO THE LEFT