

Synthesize

TEAM
DYFR

Round two gave our team such an abundant amount of information that we spent a lot of time scoping down to something **inspirational yet realistic** in round three. We found ourselves cycling back to the idea that construction has a **greater opportunity to be life-centered**. How can it benefit more than just those who profit and those who utilize the space? What about the ecosystem? Could essential materials be used in a more mindful context?

Key Insights

Construction is human centered

Among the word study from our interview "People" was mentioned 45 times across all 7 interviewees, and has a high degree connecting many topical groups. We realized people and community hold biggest variables during the construction process (human centered) however this leads to the **lack of consideration of other environmental factors**.

People and community hold biggest variables during the process which need extra consideration for

Robbie and Pato Moore



US government regulations involve multiple different level municipalities' specific rules and project specific rules creating a culture that discourages trying new ideas like new sustainable practices.

Robbie, Simon, Kimberly, and Pj

Construction is getting better at solving the wrong problem not reframing the right problem

Beaucratic segmentation of the construction process and subsequent bidding system has created hard frames in which individual stakeholders work to fulfill their responsibilities for as cheap as possible. The resulting industry philosophy is, "you do your job and I'll do mine," opposed to, "lets figure out the best way to do this together." This way of thinking has allowed innovation to take place within each part of the process, or frame, but not within the process itself - **the network that connects the frames**.

In construction, money talks quicker than education

Looking to connect the individual parts of the process, we came to the realization that money is the only thing that connects all stakeholders in the construction industry. Consequently, we came to the insight that, in construction, **money talks quicker than education**. So, this means that, if we want to direct the industry towards more holistic problems like sustainability and waste reduction, we need to do so with financial incentives.

Money over sustainability is what everyone in the supply chains across the board are interested in

Mawed and Simon





Conservation of materials is of utmost importance when it comes to environmental protection

Pato Moore, Myles McGray and Mawed

"Materials" is the major junction where sustainability and construction intersect

There are many forms of waste in the construction industry, time, money, and even lives, but most of these other wastes are strongly connected as central waste, materials. In looking at the whole system, we realized that instead of trying to solve for every different type of waste in the industry, by effectively solving for material waste we have the opportunity to **reduce other forms of waste** as well - like wasted money for example.

Stakeholders don't know or consider environmental impacts of construction waste

People within C&D believe that their waste impacts the environment lesser than other industries. When in fact, 600 million tons of C&D debris were generated in the United States in 2018, which is more than twice the amount of generated municipal solid waste according to the EPA 2018 Fact sheet. We learned that there is a **lack of awareness of the impacts** of construction waste.

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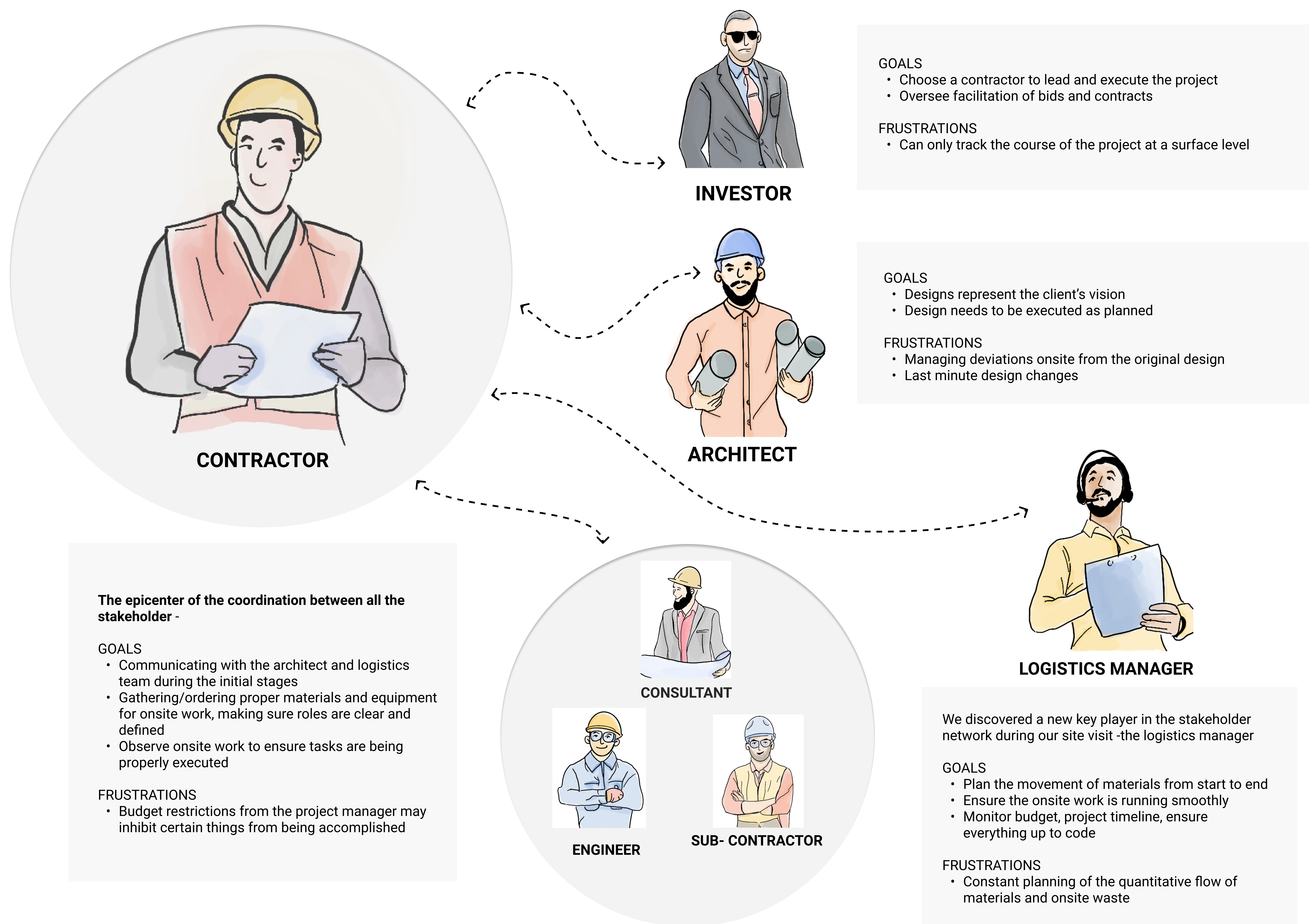
With construction having left over material means poor management and thus economic loss, not efficiency.

It's counter-intuitive how having extra material is a cost, you would think normally that extra is benefit but not in case of materials on-site. All our interviewees and our secondary research indicate that although it may be cheaper to use cheap material during a project, **it produces a lot more waste** that could be avoided if materials are carefully reclaimed/selected without error.

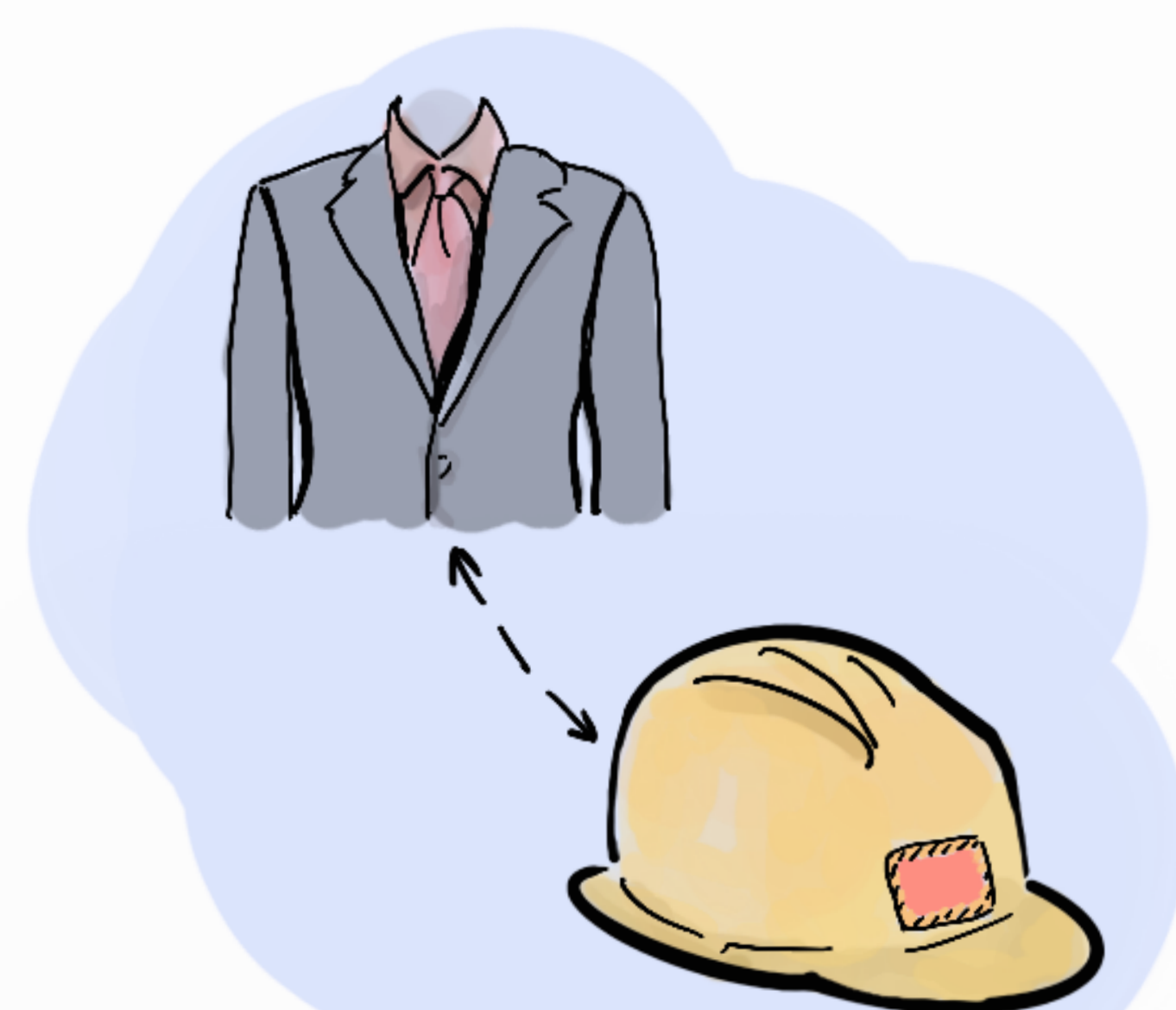
Summary

Looking at the system we realized that, instead of trying to solve for every different type of waste in the industry, by effectively solving for the material waste, we have the opportunity to reduce other forms of waste as well - like wasted money for example. Furthermore, we need to ensure that our solutions provide **strong financial incentives** for implementation, because the only thing that **connects all stakeholders throughout the entire process is money**. In doing so, we will organically shift stakeholder focus to problems like sustainability and reverse logistics that have previously been neglected - and ultimately **make the industry more circular**.

Scoping Down on our User

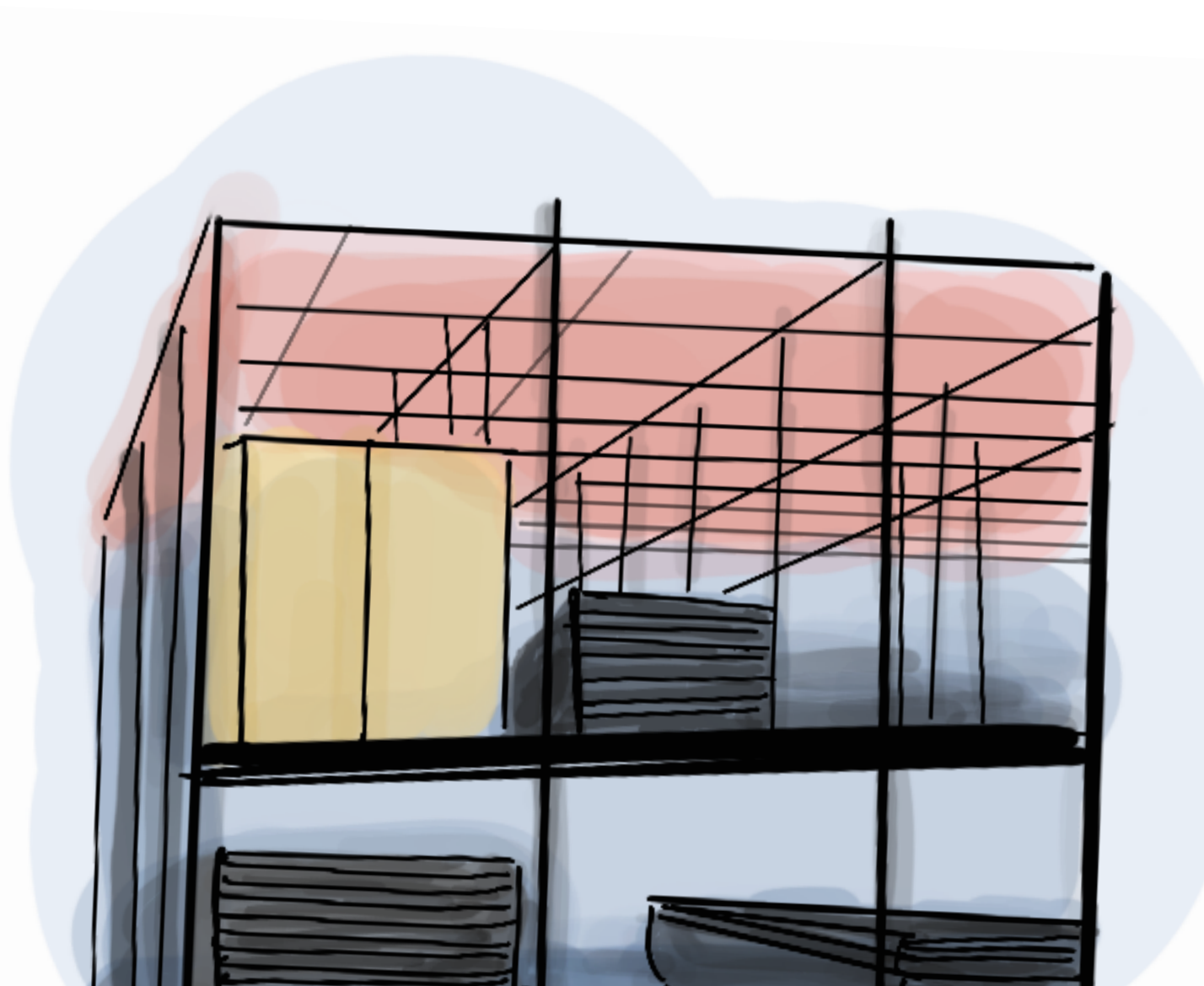


As a Contractor, here's my story



I'm the link between the suits and the hard-hats

There is an ecosystem of policy makers, clients and a hierarchy within the management - **I'm in the middle of it**



Material management is a meticulous process. Thankfully I work with a smaller team of experts

The types of materials are chosen by the architect and I carefully work with our **logistics team** in getting those materials on site



Waste is the last thing I think about but it is essential to manage

Excess materials needs to be collected away from the working area for the **safety of my operatives** and to **maximize job site efficiency**

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HMW Questions

1	2	3	4
HMW make sustainable practices more profitable than traditional practices?	HMW effectively remind stakeholders of the impact of their actions?	HMW make sustainable materials economically sustainable?	HMW apply life centered design to construction?

ELSI8 Analysis

Individual	Happiness	- Cheap, easy to access - Familiar
	Health	- Can be toxic - Air Pollution - Regulations (LEED, Local Laws, etc.)
Society	Economy	- Cheaper overseas, but takes time - Taking materials to the landfill costs \$\$\$
	Culture	- Not always authentic, materials tend to follow architectural trends - Certain companies will adjust to certain procedures - Materials used to execute functions of the building and nothing else
Life	Species	- Strips habitats of essential resources - End products only benefit human beings
	Ecosystems	- Trees being cut down ruins forest ecosystems - Landfills push away natural habitats - Ocean collects waste when there's not enough land
Materials/Energy	Materials	Wood, metals, paints, laminate, appliances, plaster, glass, etc.
	Energy	Heat, labour, gas

Need Statements & Hills

HILLS NEEDS	Contractors Adopting new methods of construction and demolition will allow contractors to look at the larger scope of the project through natural materials and better ways to recycle while also enabling successful economic sustainability.	Architects Discovering new and innovative methods to collect and gather natural materials closer to the site of construction will allow architects to save money and create more conscious building decisions on each project that will protect the environment while also serving the people.	Investors By finding a deeper purpose and having a holistic understanding of materials and their consequences on the environment, investors and clients can make more well-rounded decisions on what projects are beneficial to initiate.
	Contractors need to find a way to see the project from a systemic perspective to lead cross functional teams in a way that saves time and resources.	Architect needs a way to foresee potential problems during construction so that they can be worked out during the design process.	Investors need a way to find value in recycling materials so that they can not only save money but also positively impact the environment.