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Atlas

Ryan Langeveld
Thomas Jefferson University

Jordan Kissinger
Thomas Jefferson University

ATLAS

Jordan Kissinger & Ryan Langeveld


ATLAS


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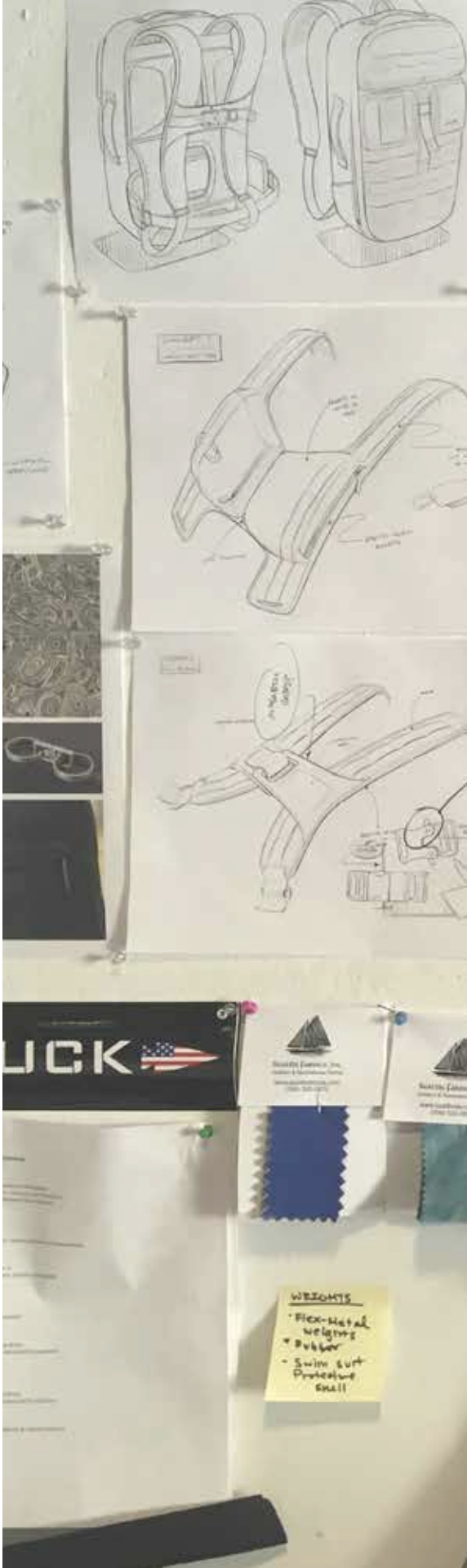
Rucking, a form of weight training centered around the use of a bag, is a new, niche market whose demographic is under-served with gear that does not provide features necessary for the best rucking experience.


ATLAS

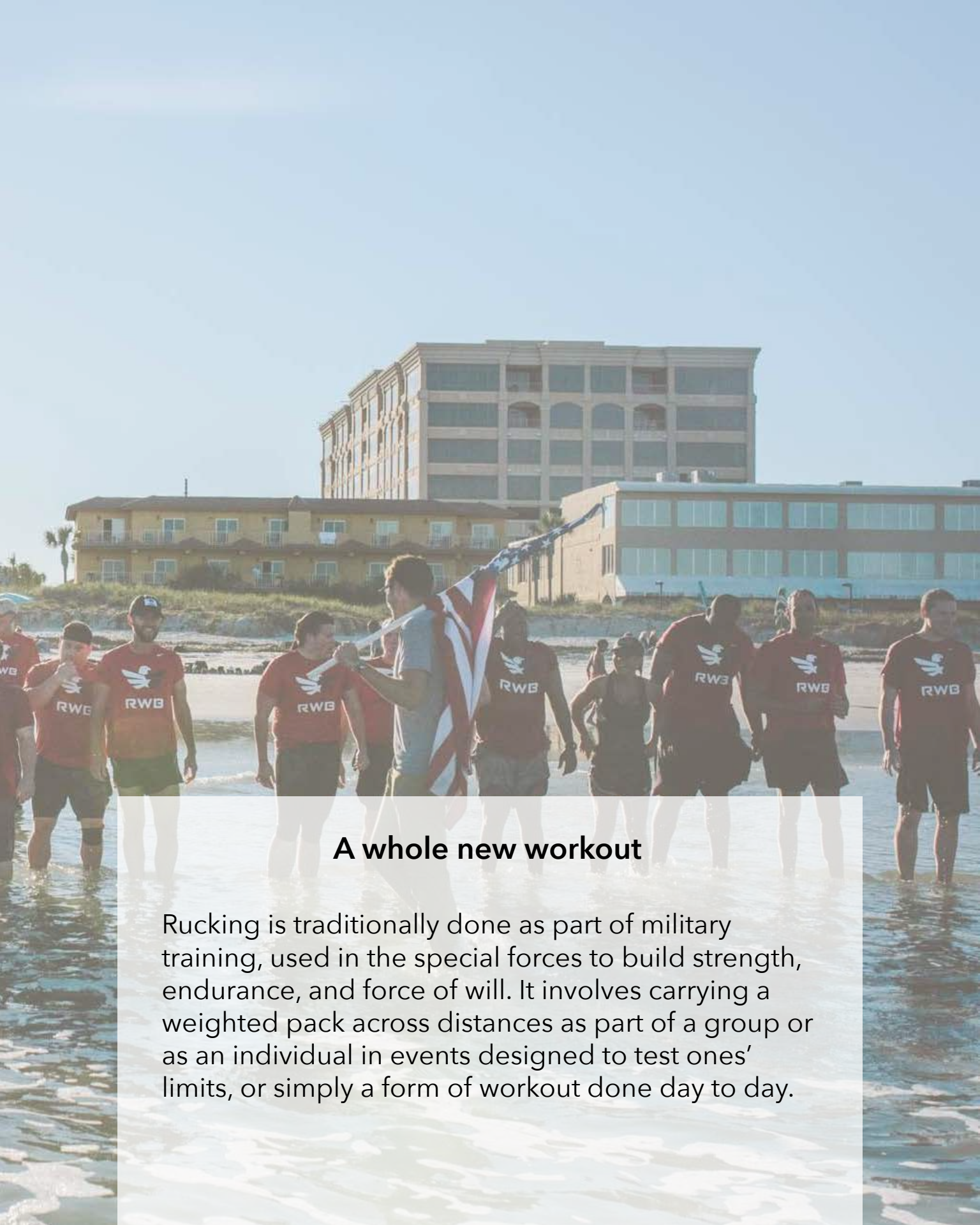
Atlas embodies human-centered design, incorporating features and performance ruckers need for an uncompromised experience without breaking the bank.




GORUCK
ARTISANATES

Rucking

(ruk-ing, verb)- walking from point A to B with weight or gear in your bag.



A whole new workout

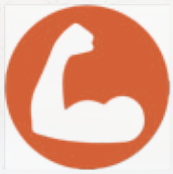
Rucking is traditionally done as part of military training, used in the special forces to build strength, endurance, and force of will. It involves carrying a weighted pack across distances as part of a group or as an individual in events designed to test ones' limits, or simply a form of workout done day to day.

Rewarding Benefits

Rucking offers cardiovascular, posture, and strength building without intense strain on joints like running. At a fast walking pace, rucking offers benefits to both experts and beginners.

Cardiovascular health- The cardio benefits of rucking are comparable to other long, slow distance exercises such as jogging, without all of the stress on the body. Adding weight and a moderate to fast walking pace increases heart rate while keeping stress on joints low.

Posture- Having weight on your back pushes your torso forward, taking part of the load off your back muscles. It can also relieve pain by taking pressure off of inflamed disks in your spine.



Strength- Strengthens the legs, back, and core muscles. It is a good foundational exercise that builds overall body strength, setting you up for other workouts.

Weight Loss- Just by adding weight, the calorie loss from walking can be tripled when applying 30 pounds to your pack for example.

Community- Rucking offers users of varying skill to stick together. Experts add more weight, and beginners start off smaller, but all stay at the same pace, making rucking a great group activity.(Weight is the great equalizer).

THIS IS WHO WE ARE.

Determined and dedicated, ruckers don't know the meaning of the words "I can't do it."

THIS IS WHERE WE CAME FROM.

Born from special forces training, rucking has been adapted into a revolutionary recreational activity that appeals to all, no matter the skill or background.

THIS IS WHAT WE DO.

With a tight knit community, rewarding benefits, and a chance to get into the elements, you'll be left wondering why you ever tried the gym in the first place.

Demographic Research

Having its roots in military training, the rucking demographic primarily consists of current or ex-military personnel and service members, as well as hikers, backpackers, and cross-fitters. It's rewarding benefits and low risk make it appealing to all kinds of people.

Most newcomers to rucking come from friend or family recommendation, past military experience, or social media exposure.

Market Analysis

GORUCK Rucker–

$195, Ruck plate pockets, molle, hydration compatable, non-removable inner frame sheet, 1000D Cordura.

GORUCK GR2–

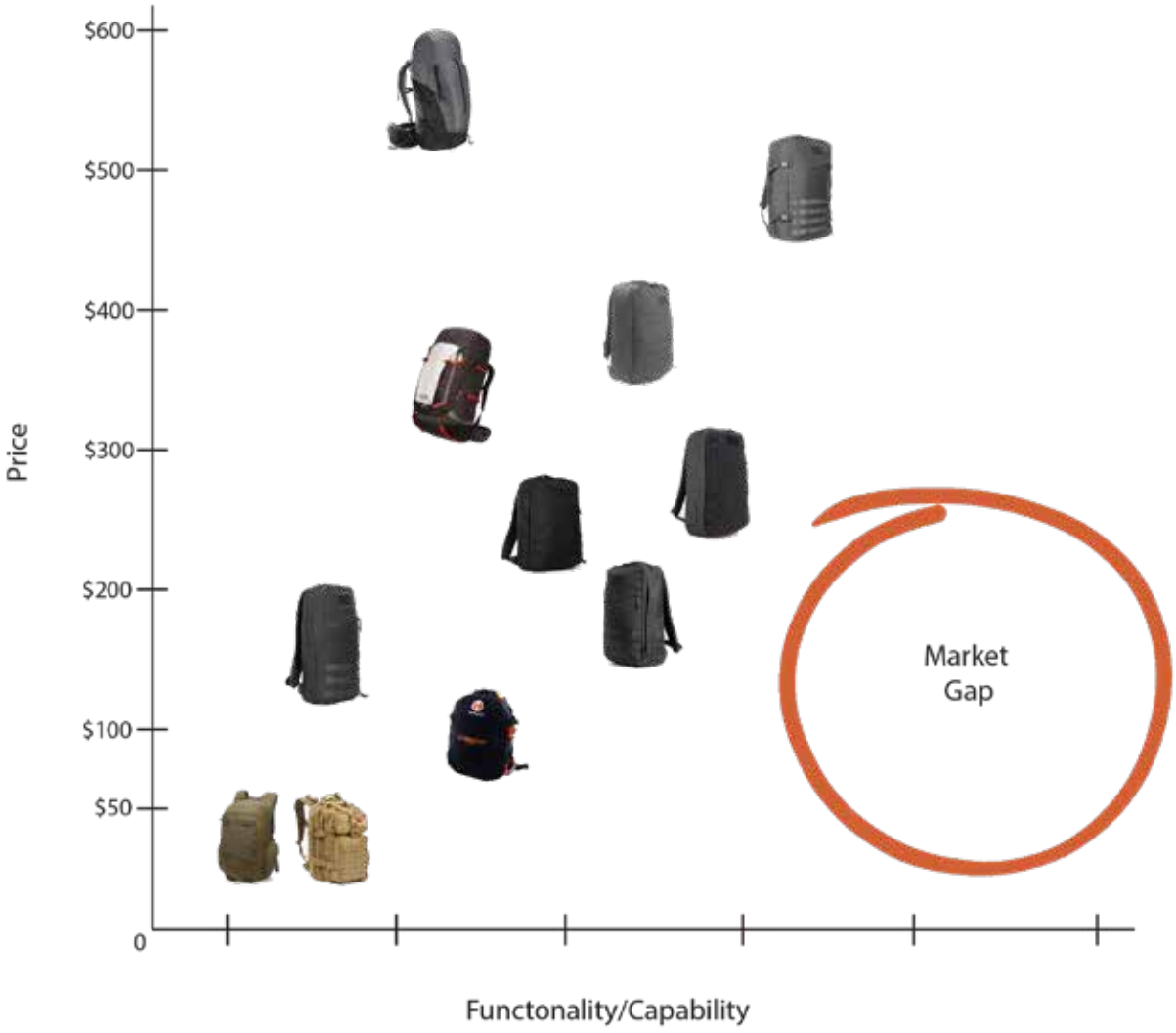
$395, Ruck plate pockets, rainproof, removable inner frame sheet, hydration compatable.

Reebow Gear Military Tactical Pack–

$49.99, Hydration compatable, modular molle, heavy duty zippers.

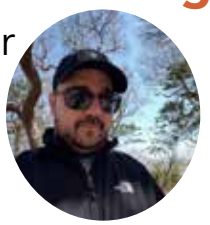
MardingtopTactical Backpack–

$39.99, Padded laptop pouch, molle, gear tie-downs and compression ties, interior organization.



While cheaper alternatives exist, they lacked the functionality that the more expensive GORUCK bags offered, but even those bags leave room for greater capability and human factor consideration to be desired. When you ask the demographic, they themselves are aware of the monopoly that GORUCK has, and would relish the opportunity to see better products at a more affordable cost.

"...GORUCK has the rucking pack on lock down right now and **I would love to see some new blood out there making a great product.**" -Nick Italiano, Recreational Rucker



A Market Divided

GORUCK

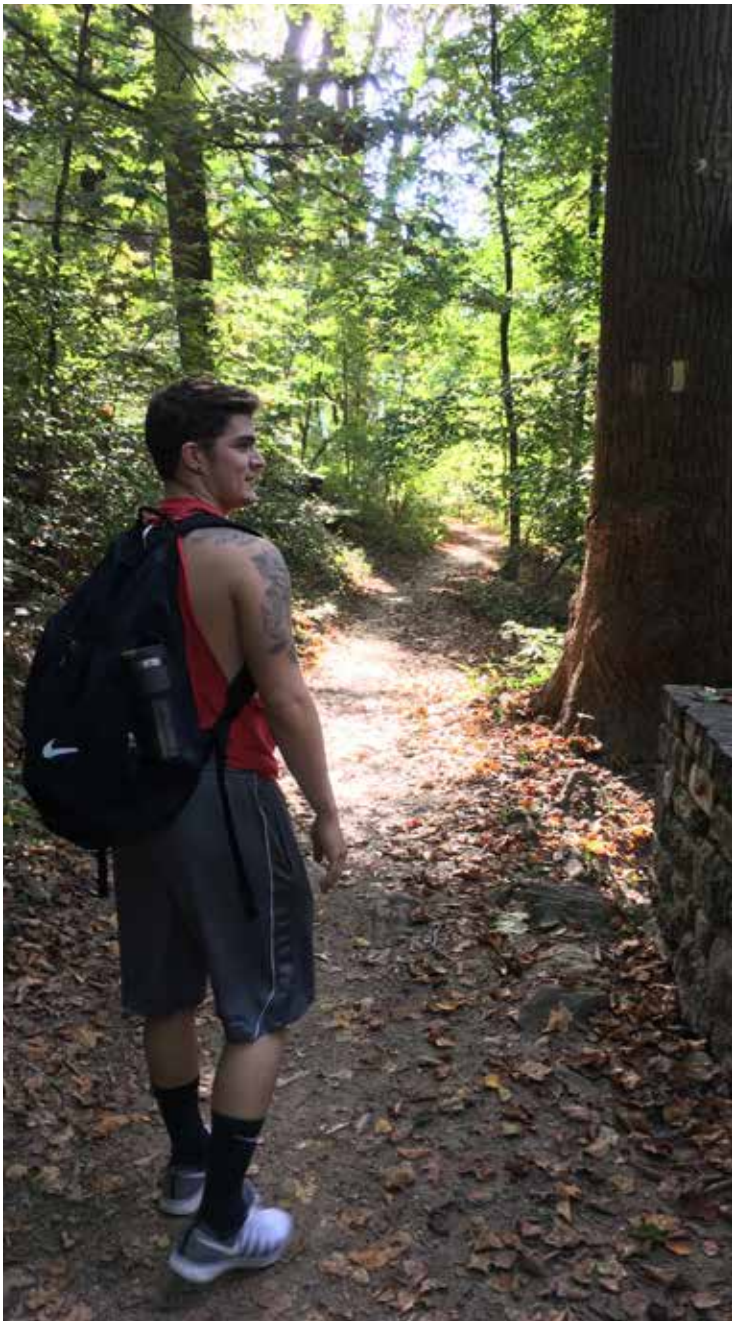
GORUCK, being the only source of specialized rucking bags, limits users to a set line of bags that are over-priced and under-featured. While they fit the aesthetic and material desires of the market, they compromise in functionality in ways that can undermine the benefits rucking can offer.

Common amongst our searches for alternative brands were tactical bags made by companies like 5.11 or The North Face. These bags are advertised on many rucking blogs and websites as “affordable alternatives”, which fit the aesthetic and price point needs of the market but are not made specifically for rucking.

Rucking Basics

For our first ruck we went into the Wissahickon trail system with 10 pounds of water bottles each and normal backpacks to get our feet wet in what rucking involves as beginners.

We found out first hand how important proper weight distribution is in a rucking bag, with the water bottle inertia in the bag distracting too much from the benefits rucking can offer. We knew moving forward that our bag should allow for multiple kinds of weight alternatives to be held snugly to prevent this.



Insights

Loose weight in a bag impedes your rucking pace

Poor adjustability and snugness of bags overall

We need better gear!

Choosing Gear

GORUCK Rucker

$195

Mid-size 20L bag

Internal HDPE frame

Competition size

GORUCK Bullet Ruck

$145

Small 10L bag

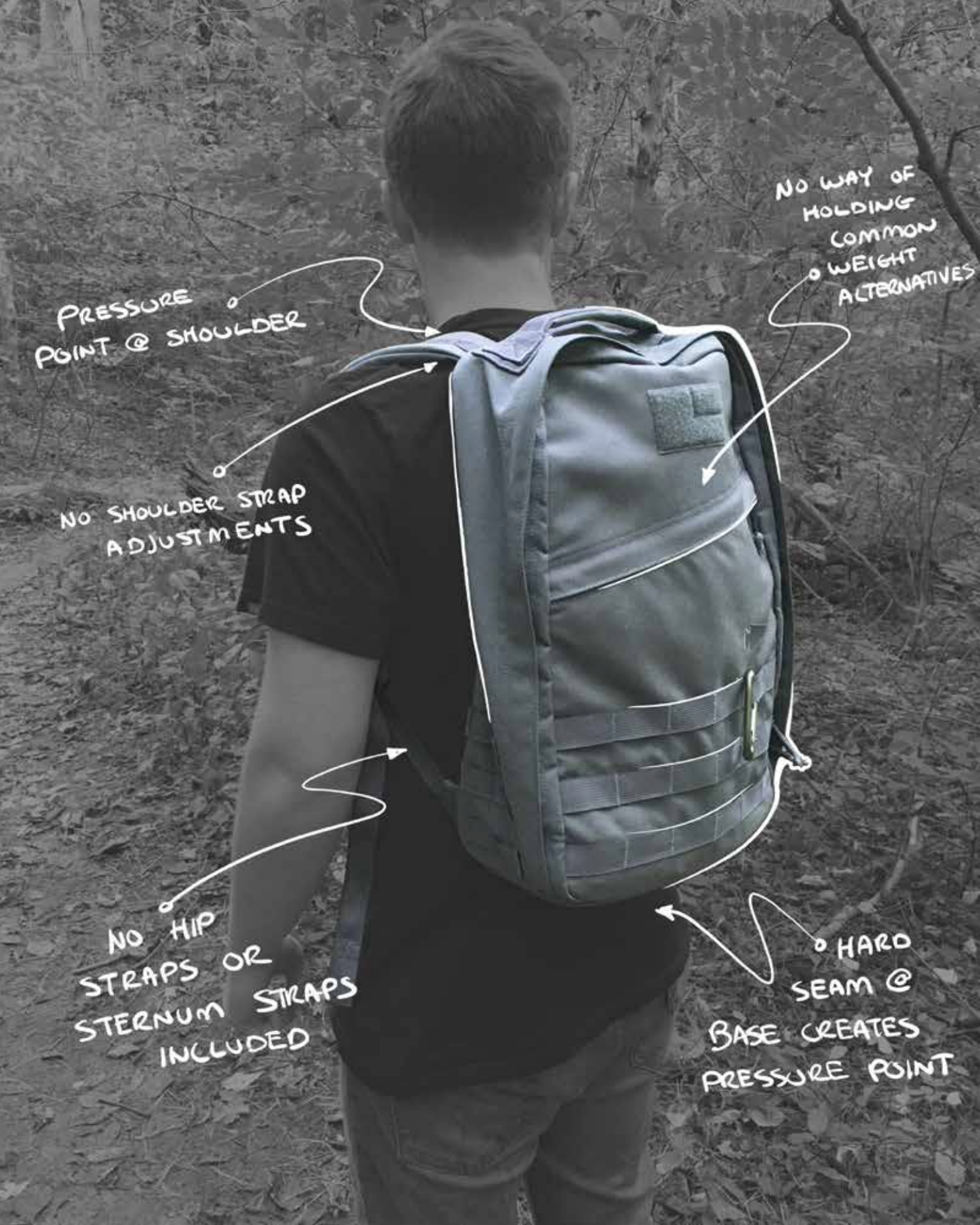
Hydration bladder pocket

Max weight of 20LBS

Testing GORUCK Gear

For this round of testing, we purchased GORUCK bags to get an understanding of how top of the line, specialized rucking gear should perform. We rucked at a twelve minute mile pace for 6 miles, paying close attention to the bags performance and capabilities, and how it felt on different terrains with varied weight types such as sand bags and ruck plates.

Among our observations were uncomfortable pressure points, lack of airflow and cushioning, and poor accommodation of important components such as sternum and hip straps that would have improved the experience dramatically.


PRESSURE POINT @ SHOULDER
NO SHOULDER STRAP ADJUSTMENTS
NO WAY OF HOLDING COMMON WEIGHT ALTERNATIVES
NO HIP STRAPS OR STERNUM STRAPS INCLUDED
HARD SEAM @ BASE CREATES PRESSURE POINT

Surveying in the Military

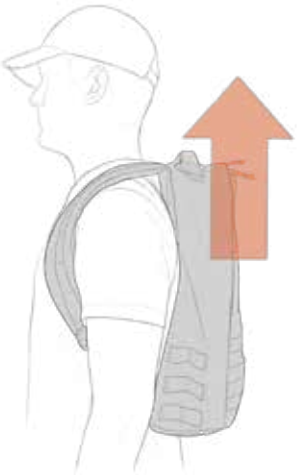
In order to gauge both sides of the rucking community, we first contacted and surveyed members of the military, both current servicemen and veterans alike. As rucking is integral to their training in the military, we knew they would have plenty of experience and insights regarding what made for a good ruck, and what was often done wrong.

We surveyed them about key points of rucking such as load placement within the bag itself, as well as how different components of the bag interact with the load such as how the frame affects the weight distribution, and how weight affects other gear within the bag like water. We took all of these insights, as well as our own from the rucks we went on ourselves, and began to develop our criteria for ATLAS.

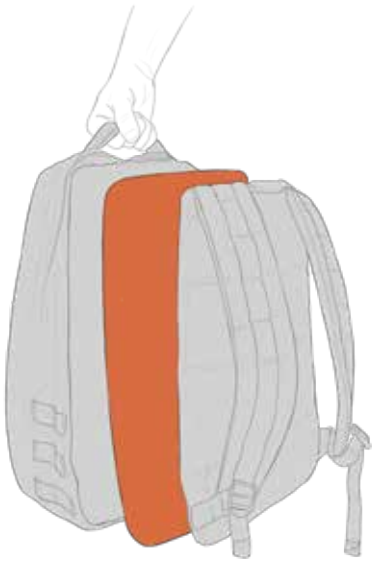
"What is the biggest issue you have with current rucksacks?"

"What is the average duration of your rucks?"

"Pain points are the **hip** and **shoulder** areas. Weight should be centered on these areas, and wobble (back and forth motion) should be kept to a minimum." – Austin Treubert, Senior at Naval Academy, Maryland

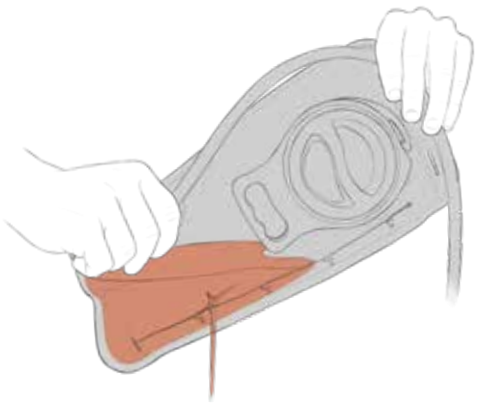


"The load should be as **high up** on the bag as possible, around head height. This helps the user keep their posture upright and doesn't push the hips forward."– Austin Treubert, Senior at Naval Academy, Maryland



"A **rigid** but **lightweight** materials should be used to provide back structure."– Austin Treubert, Senior at Naval Academy, Maryland

"Straps should also stay **as tight as possible**, and the heaviest weights in the bag as high and as close to you as possible."
– Joseph LaBianca, Sophomore at Virginia Tech



"I am not a fan of any bladder type system, they always **burst**." – Mark Pfeiffer, U.S. Army Veteran

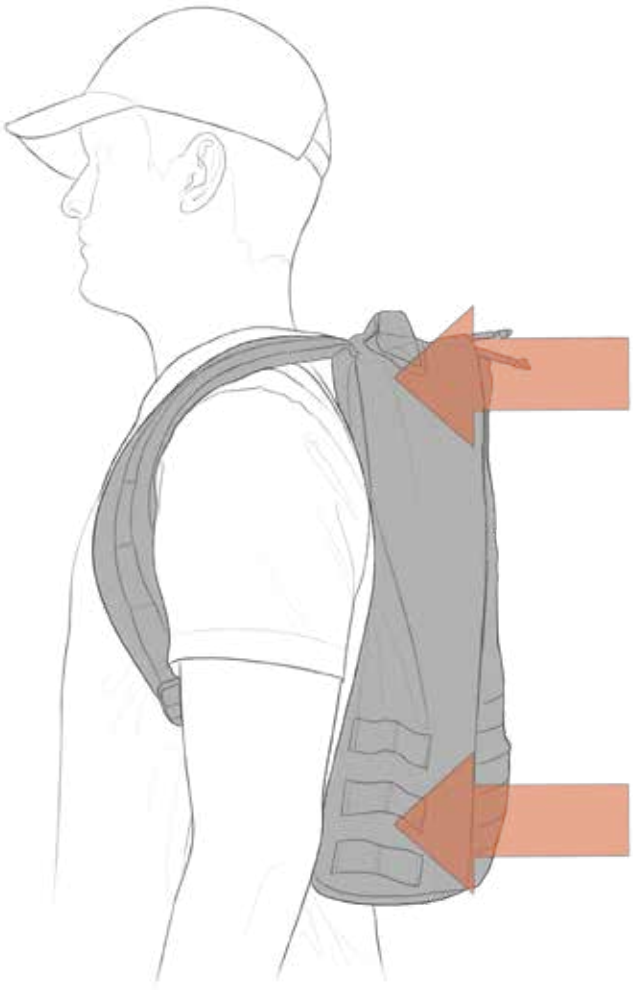
Design Criteria

Improved Hydration System

Common bladder systems require awkward storage, are prone to popping under large amounts of weight, and also force the user to pack their bag a certain way, only for the contents to be able to shift once the bladder empties.

Improved Weight Storage

Existing rucking bags only accommodate rucking plates, leaving all other common weight alternatives to hang loosely at the bottom of bags, letting inertia build up in bags and potentially causing harm.



More Supportive Frame

Straight, unmolded, and lower density frame sheets don't provide the necessary comfort or support for carrying weights over a long distance, and creates pressure points on the shoulders and the lower back.

Greater Adjustability

Lack of integrated straps and adjustment points on existing rucking bags means that bags can not be held as snugly to the user, a quality essential to garner the benefits from a ruck.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SIMPLE
OPTION
WITH BUCKLE!
PADDING, NON-
INTRUSIVE
TOO SMALL
FOR
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ATLAS
WHAT GOE
IN THIS

Benchmarking Bags

REI and Dick's Sporting Goods helped us to get a feel for what standard materials and sizes were like in the hiking, backpacking, and day-pack market. We were able to try on bags to check sizes and fits, compare prices and materials, and understand what worked for some bags and didn't for others.

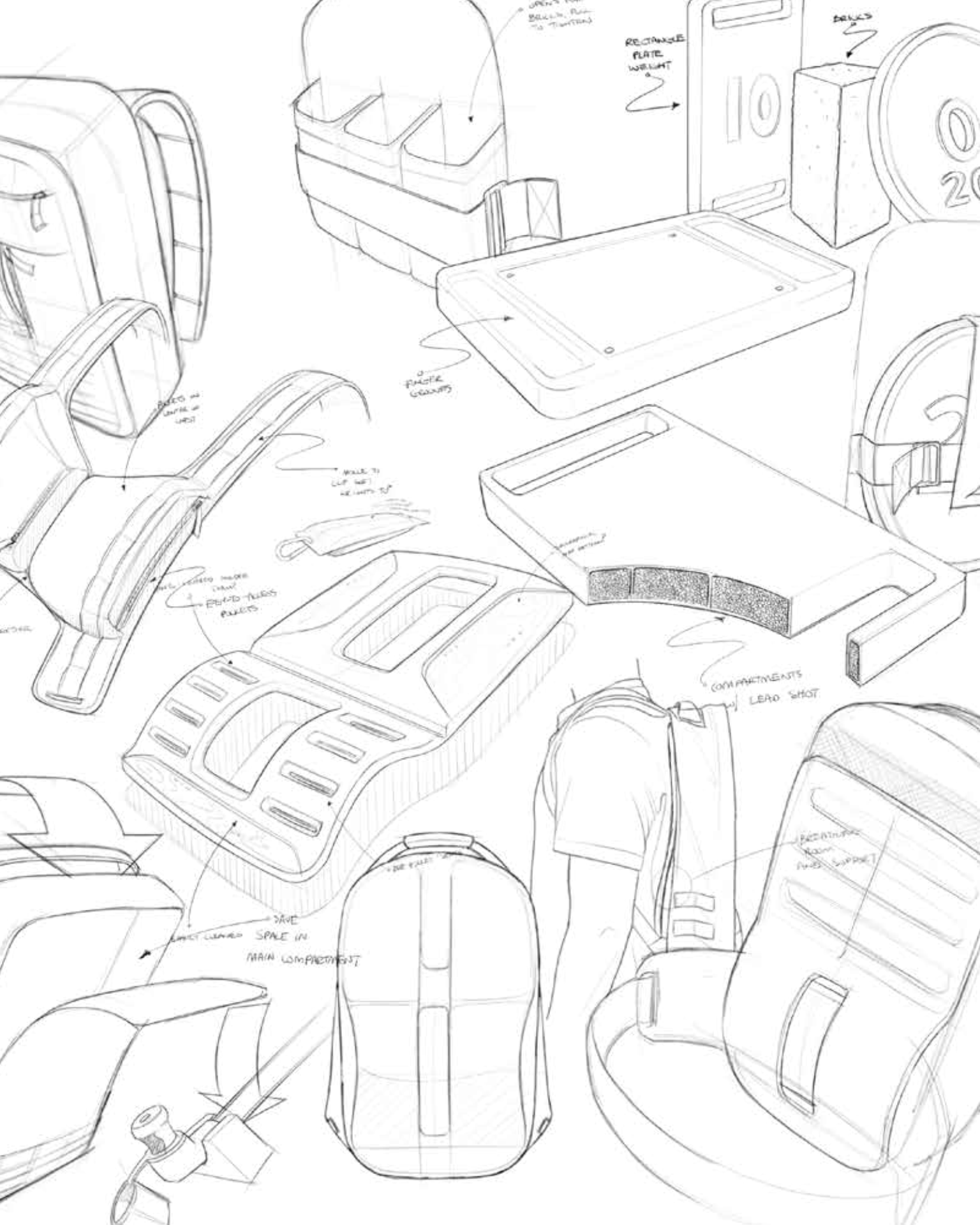
Benchmarking these kinds of comparative qualities helped point us in an aesthetic direction, as well as giving us a first look at what quality construction really meant.


OSPREY

Iterative Sketches

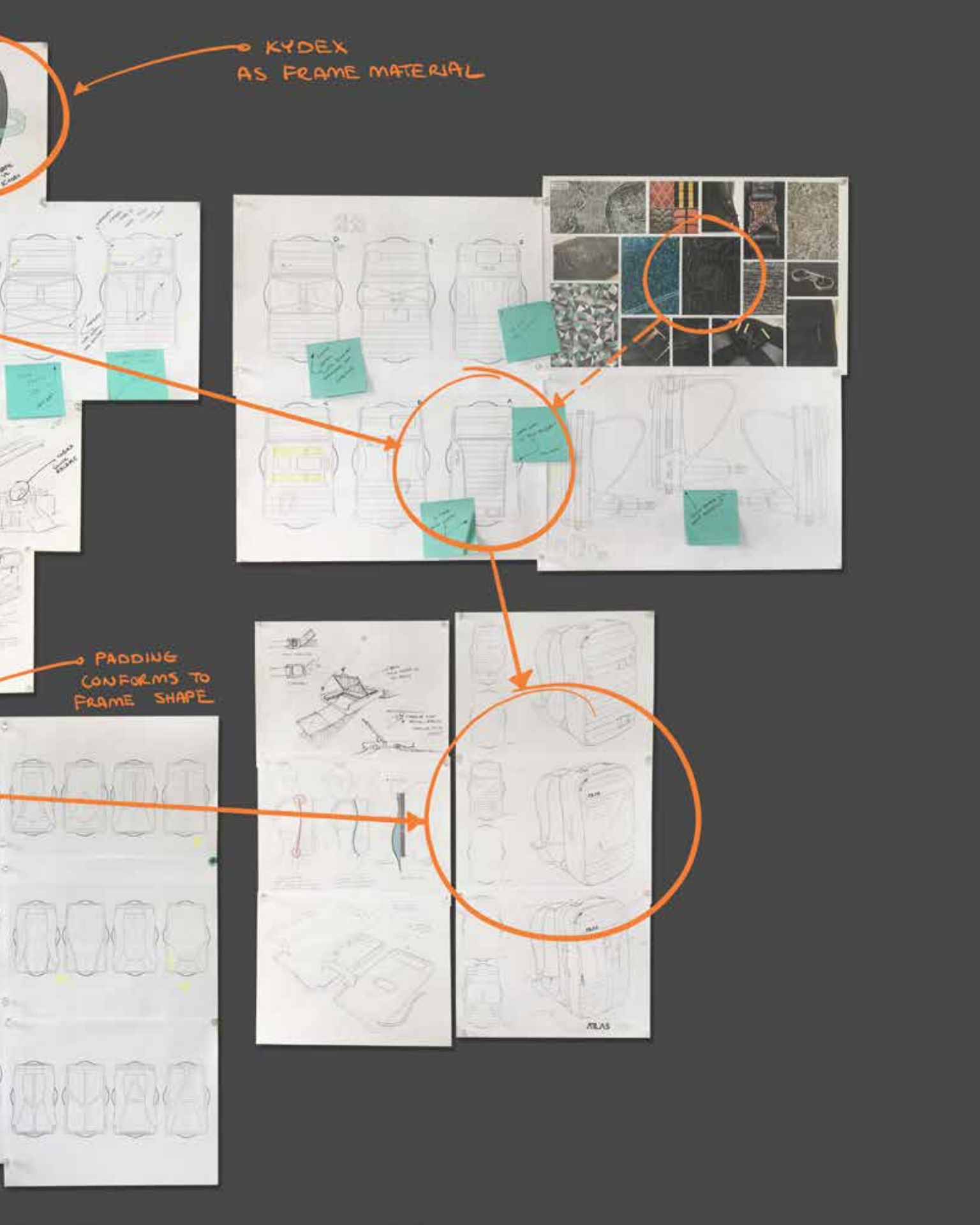
After our market research, benchmarking, and surveying, we began rapid iterations on what key features to focus on developing as a part of our bag's overall system. We looked at the parts of a rucking bag that add up to the most beneficial experience, and what was missing from current products that users both want and need.

The design therefore had to follow basic principles; the bag had to be comfortable, cost-efficient, effective, and feature rich. Using these criteria, we developed four key areas of focus.

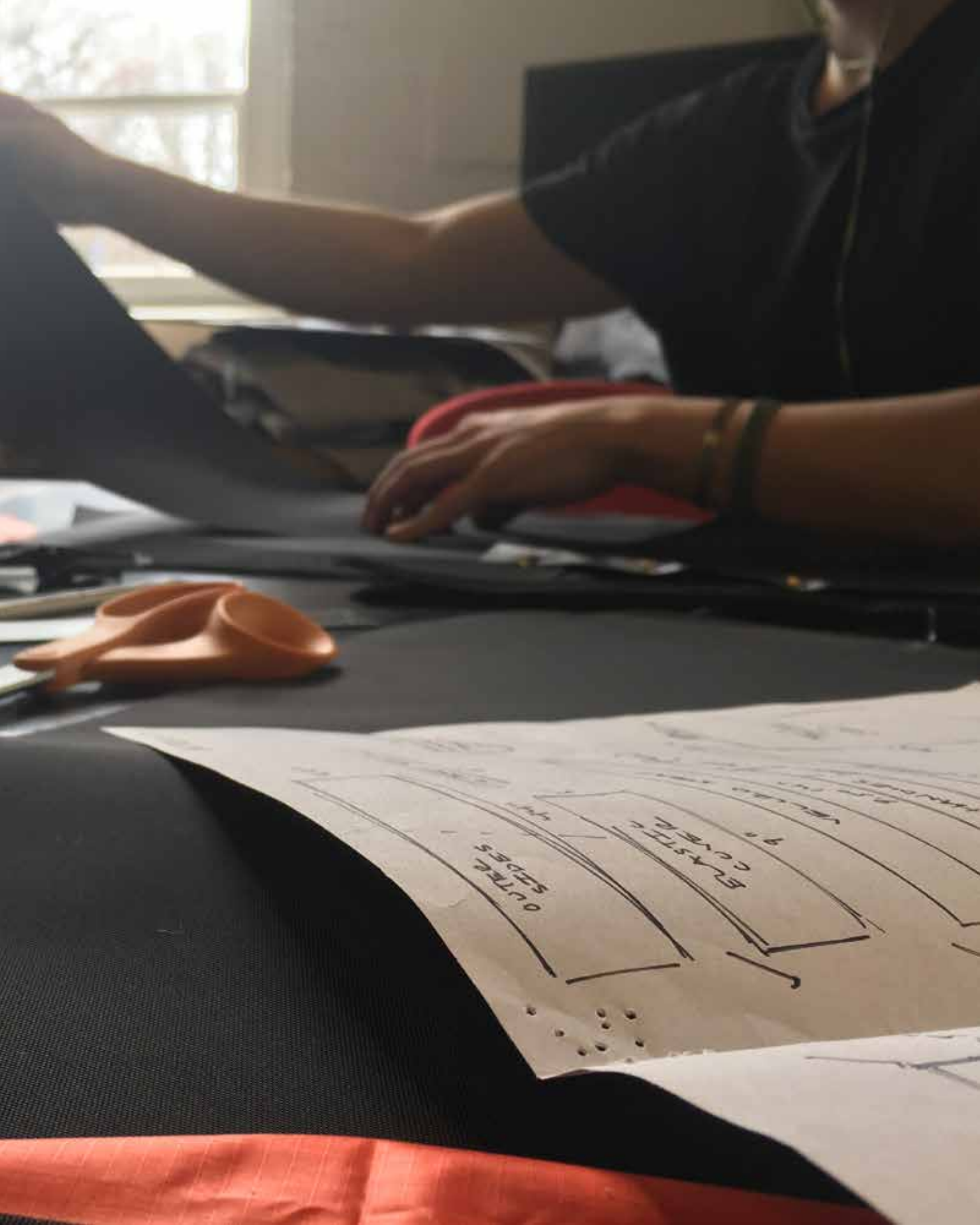

RECTANGLE PLATE WEIGHT
BRACES
FINGER GROOVES
COMPARTMENTS w/ LEAD SHOT
SPACE SPARE IN MAIN COMPARTMENT

Concept Development

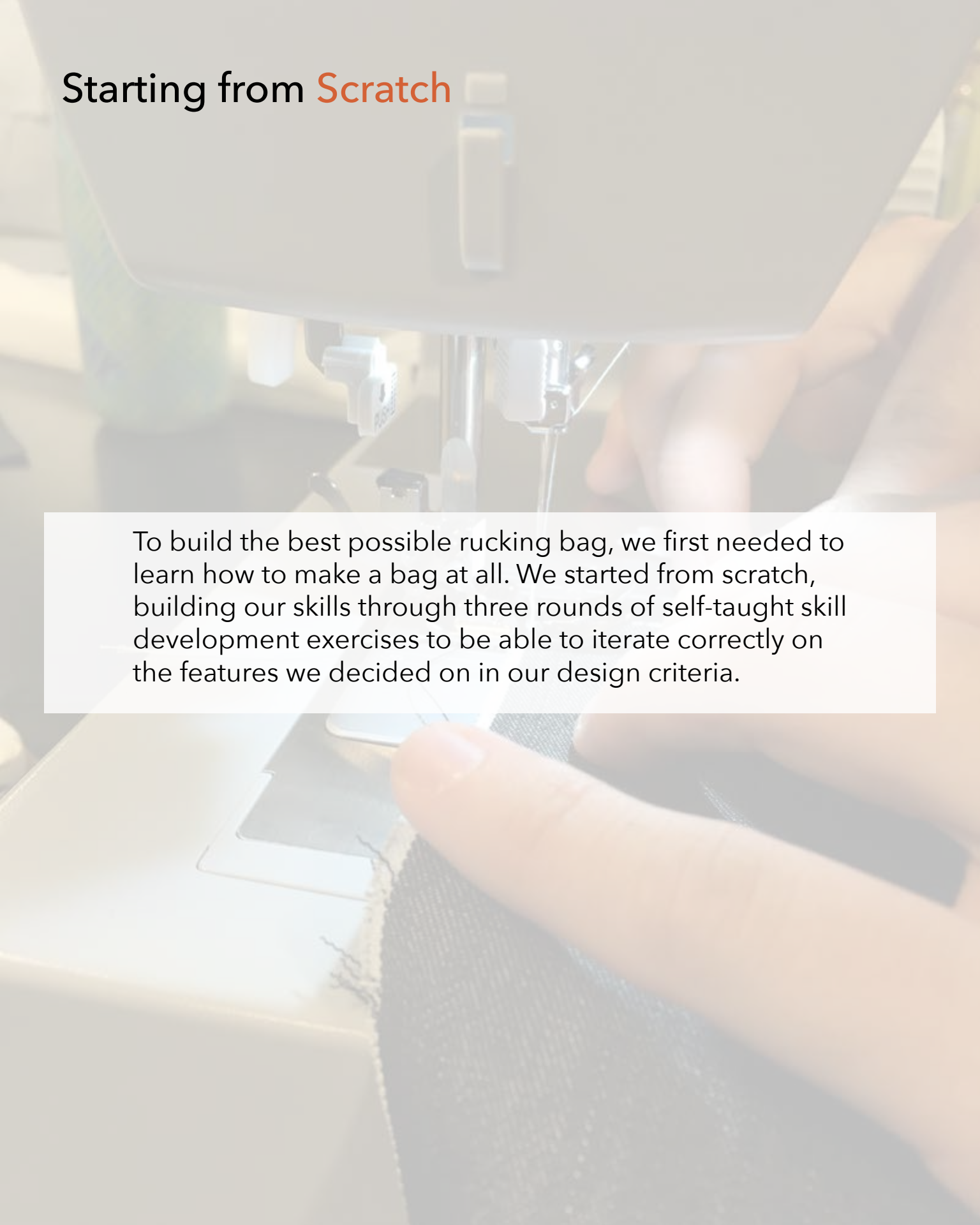
We then moved to several rounds of concept development sketching, focusing on material properties, technical feasibility, and aesthetic qualties that would match market trends and the demands of the demographic.


KYDEX
AS FRAME MATERIAL
PADDING
CONFORMS TO
FRAME SHAPE

ATLAS Final Concept


OUTER
SHAPES

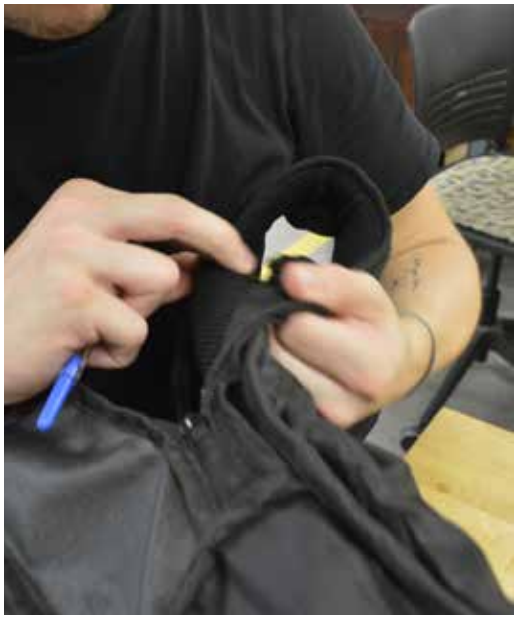
Starting from Scratch



To build the best possible rucking bag, we first needed to learn how to make a bag at all. We started from scratch, building our skills through three rounds of self-taught skill development exercises to be able to iterate correctly on the features we decided on in our design criteria.

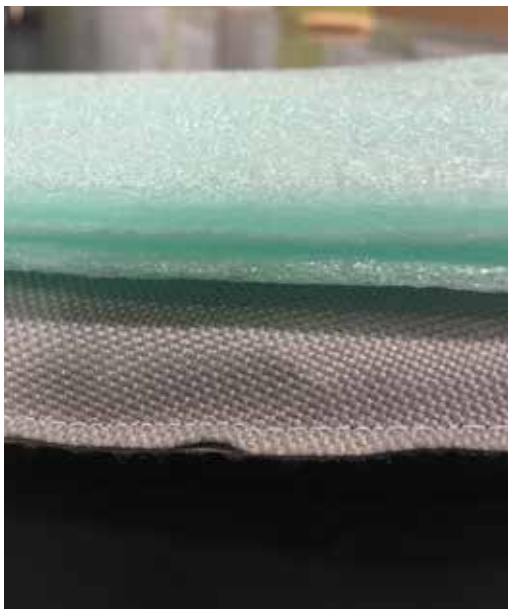
1 Taking Apart a Bag

We first needed to learn the basics of building a backpack. We started with a cheap bag, and took it apart to understand how it was made, what materials were used and where, and to use the parts we took off such as straps to use for future prototypes.



2 Straps

We built several strap iterations using the nylon material we purchased for prototyping and dish-foam. Layering the dish-foam gave us an idea of the feel and thickness we wanted in our straps. It also helped us understand seam allowance and proportions of these kinds of features.



3 DIY Bag

We then picked a DIY project bag from instructables.com to build ourselves. We combined the instructions provided with our observations from our bag dissection to gain a more thorough understanding of building a bag. It helped us understand key steps such as layering, order of operations, and component sizing.

Weight Pocket & Frame V1

After learning the basics about sewing, we felt confident moving forward with our first two features to develop based on our concept and design criteria, the weight pocket and the frame. This prototype was intended to test weight holding capabilities of our desired construction layout, as well as to test the form and fit of an non-molded piece of kydex as a frame sheet alternative, which provides more structure than standard rucking bag frame sheets.

We used a high denure nylon with a one-sided coating as our first prototyping material, as it would simulate to a degree the density of Cordura, a standard heavy duty material commonly used in the backpacking and rucking markets. This bag also served as a greater learning opportunity and a chance to develop our sewing skills.

Frame

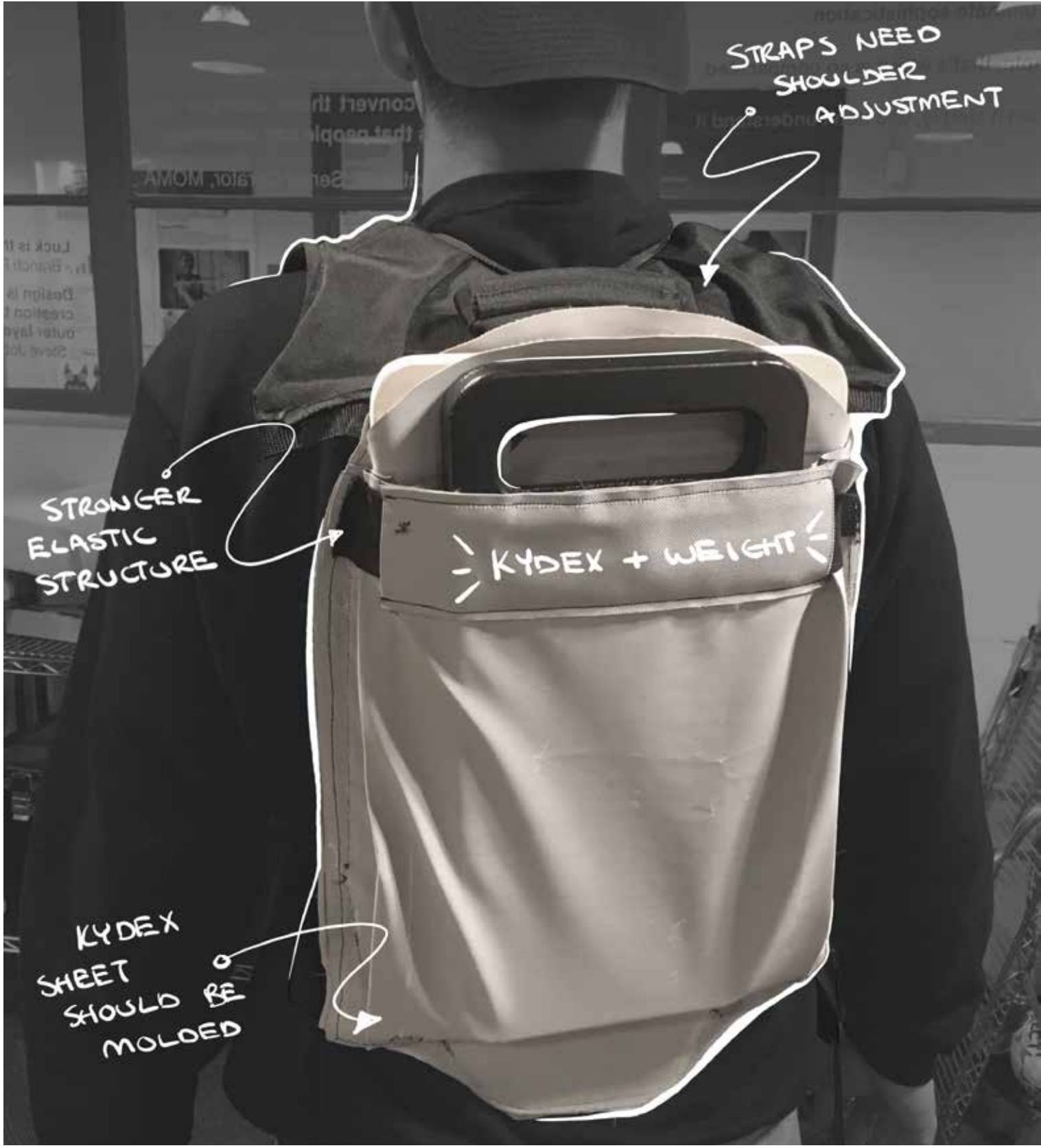
While the frame helped our bag with weight distribution, the lack of a molded curve still meant the bag ended too abruptly on the users lower back, with all of out test subject agreeing that a greater degree of change was necessary

Straps

The straps we took from the bag dissection worked to a degree, but their lack of adjustability meant the weight couldn't be pulled tightly up against the user's back.

Pockets

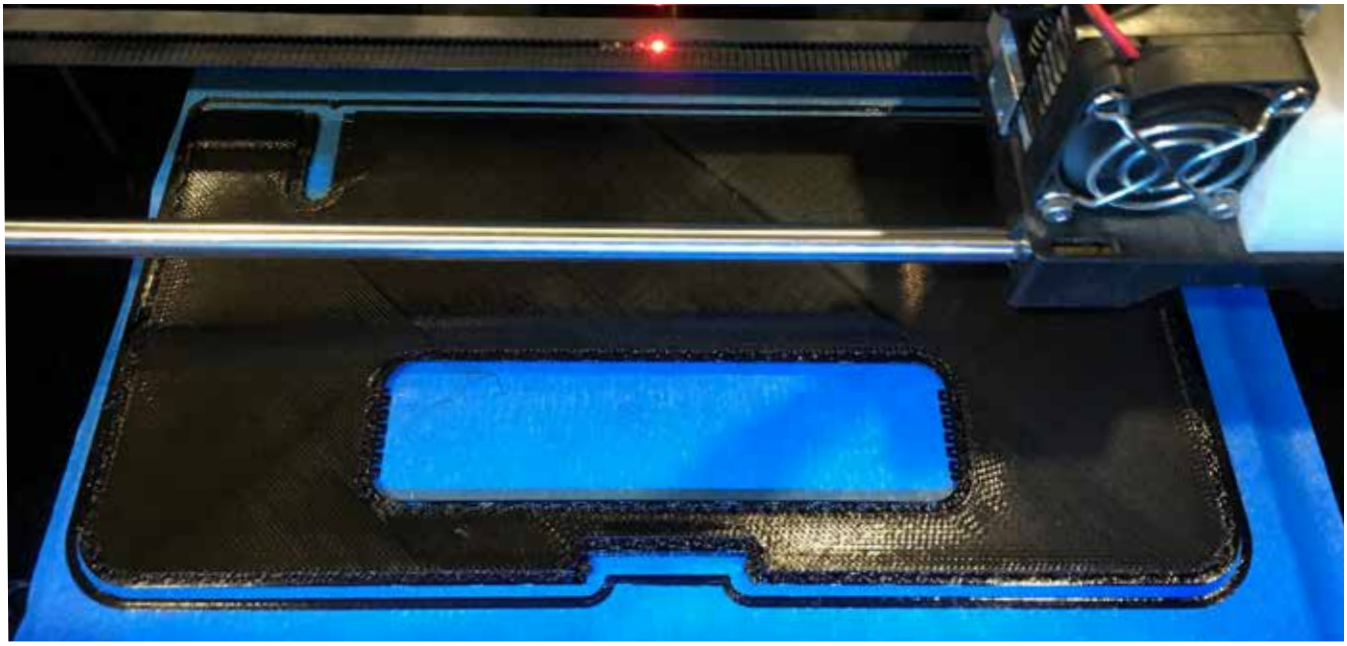
Excess play in the pockets meant that the next iteration should include tighter tolerances and more sewing reinforcement to provide more structure and strength.



Overall, this first version proved that weight could be taken off of the bottom of the bag and could fit more comfortably, but further development would be necessary for proper distribution of weight, as well as enabling greater degrees of adjustability.

Reservoir Prototyping

We began the design of the reservoir by taking the sketches we had done and using them to create several iterations in CAD, focusing on key aspects of the design such as component placement including level indicators, the water tube, and the clips that would hold the two halves together.



We then 3D printed and constructed several iterations of these designs, using existing urethane bladders and customizing them so that they would fit inside so we could test the design as a whole.

Reservoir Final Design

The final prototype was 3D printed and finished, with enough structure to test and demonstrate the intended function. It features three level indication windows to show the user the level of water left within the bladder, an ergonomic handle, and a custom-fit urethane water bladder and tube.

1 Remove the reservoir from the rear pocket of the bag using the integrated ergonomic handle.

2 Unclip the four integrated snap-clips on each side of the reservoir shell to separate the two halves.

3 Simply remove the bladder to clean and to refill from your desired source, and then replace by securing the bladder through the support ring in the center.

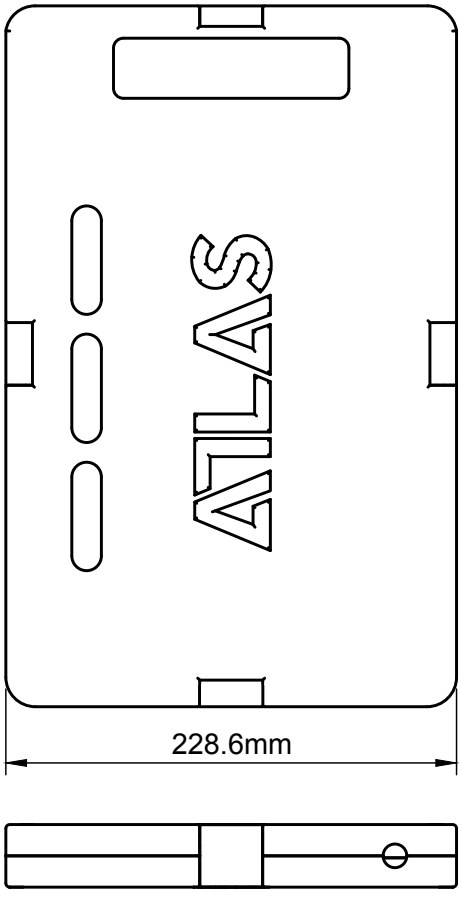
Uncompromised Hydration...

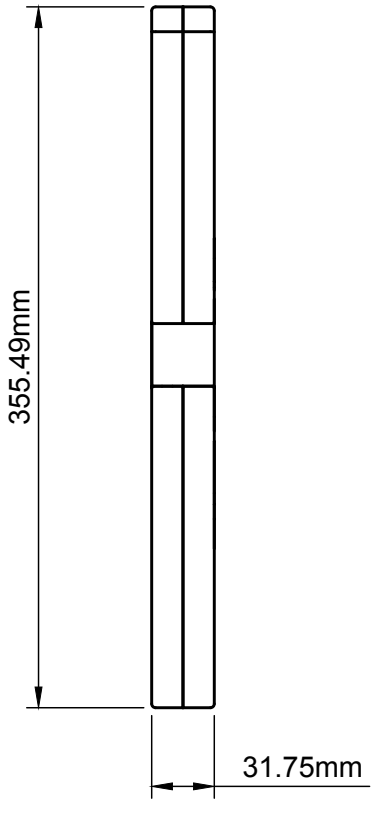
At 45lbs...

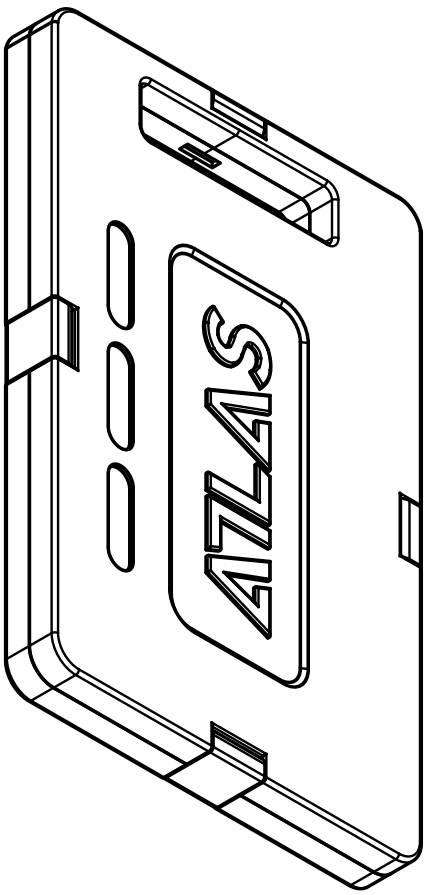
80lbs...

Or even 100lbs.

Injection molded ABS plastic provides the strength required for a part that will be constantly exposed to large amounts of weight, making sure the inner polyurethane bladder is well protected.



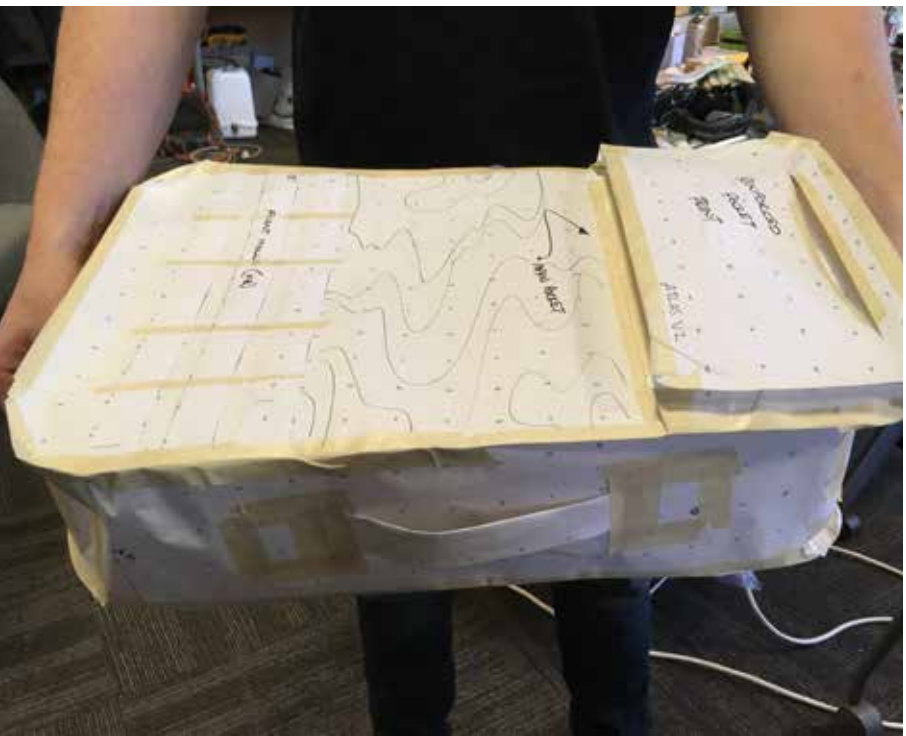




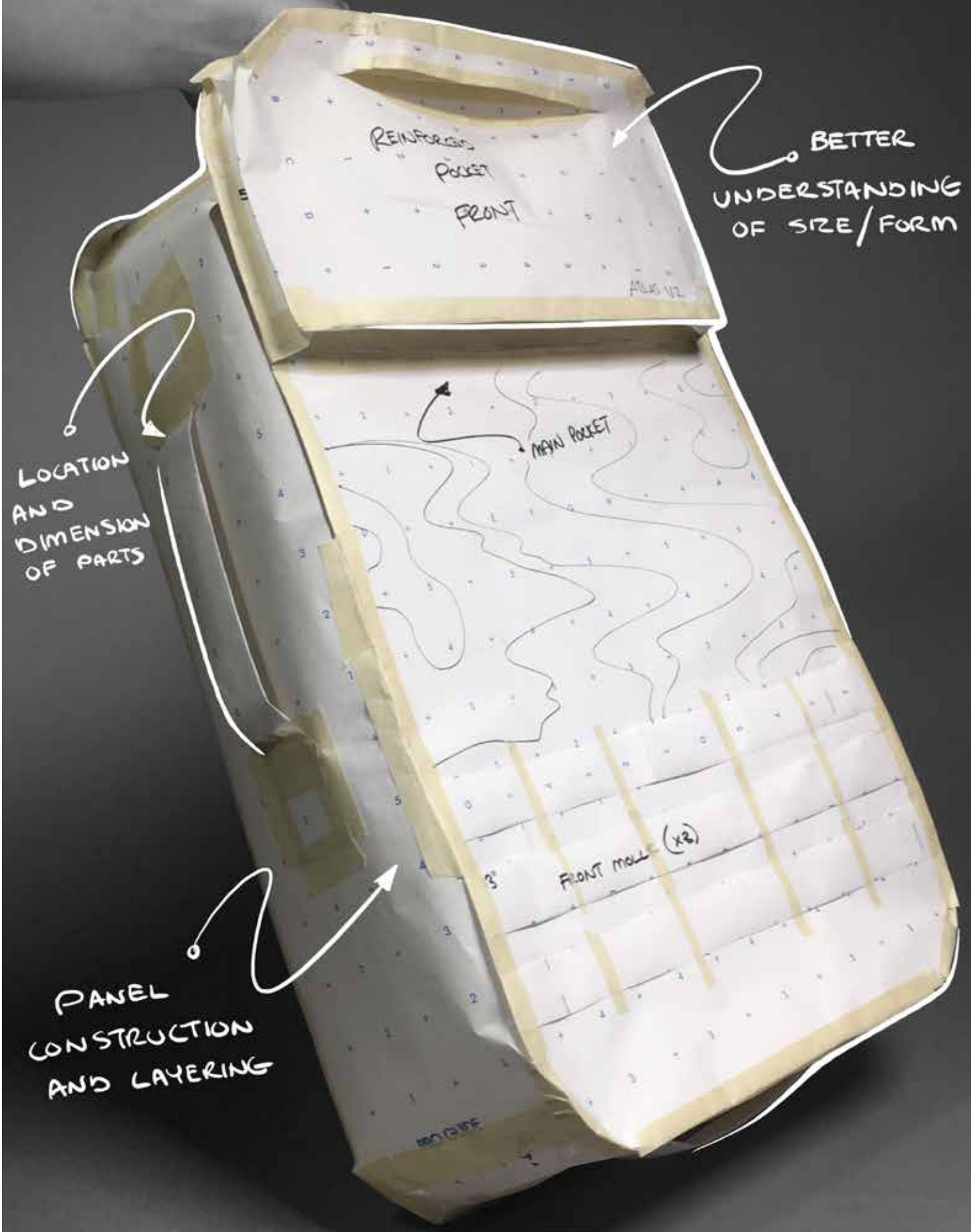
Paper Models

The next prototyping step was to start to make physical representations of a fully realized bag. Two paper prototypes proceeded, helping us to hone our patterning measurements, as well as giving us a more accurate idea of the proportion and form of the bag and its various layers and components. This method of prototyping also kept the development time low.

Patterning the bag, planning seam allowance, and the correct order of construction were all things we began to learn while working on the first paper bag.



For the second paper bag we experimented with foam structure in the base and walls of the bag to simulate how the bag would be padded when finally constructed.

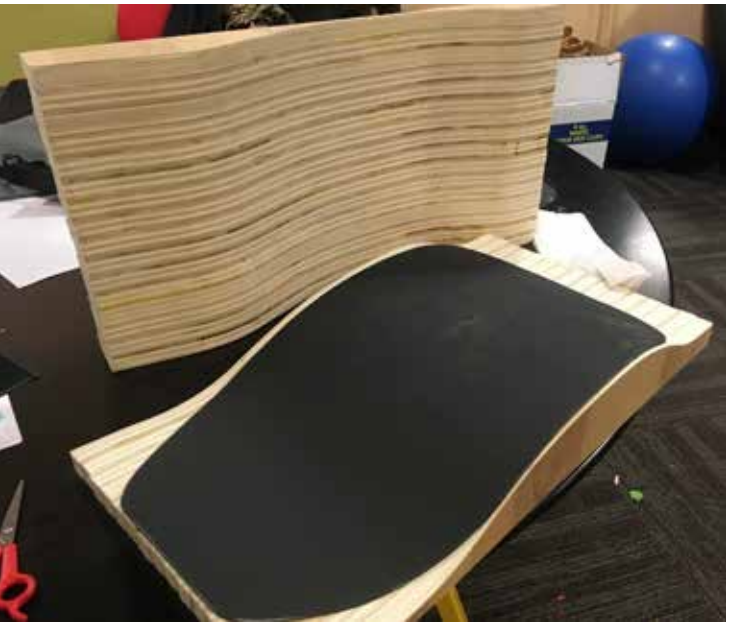

REINFORCED
POCKET
FRONT
BETTER
UNDERSTANDING
OF SIZE/FORM
MAIN POCKET
LOCATION
AND
DIMENSION
OF PARTS
FRONT PANEL (x2)
PANEL
CONSTRUCTION
AND LAYERING

Atlas V1

After completing several initial iterations, we moved to a fully realized prototype using materials similar to what would make up our final design. We used 420D packcloth and Ripstop to construct this prototype, utilizing the strength of these materials to hone construction, test weight capabilities, and to preform realistically so we could gain insights for our next version.

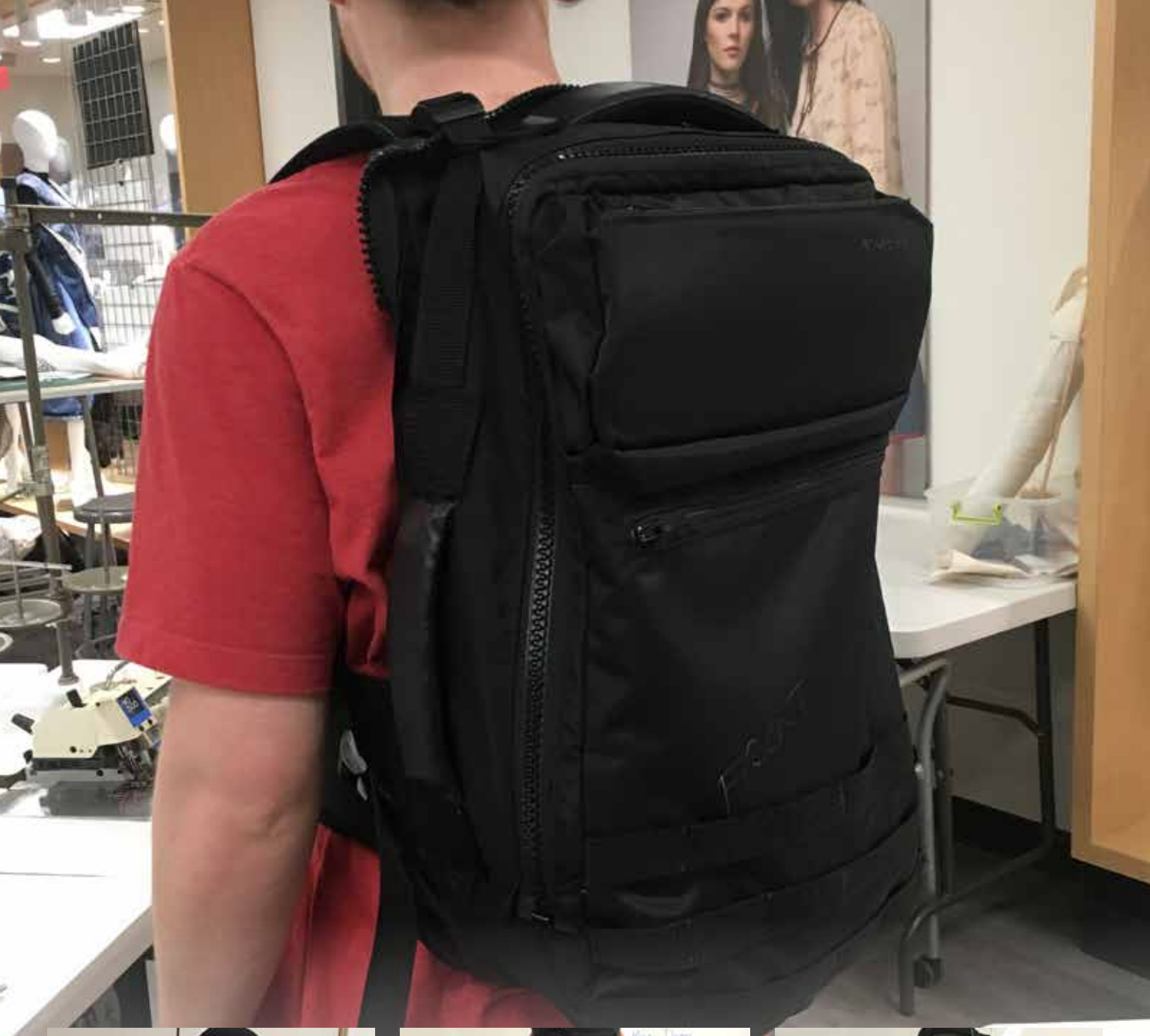
We took the patterning measurements we had taken from the previous paper bag iterations and applied a seam allowance. We also used dish foam and liner materials to create material contrast and to simulate details.

Building the inner pocket system, with modular molle covering the ruck plate and brick pocket system. In order to reduce cluttering the inside of the bag we will test with removable, modular “pockets” that hold different types of weights.



Heat molding the kydex sheet for a more comfortable fit while holding weight in the bag. Future iterations will have foam reinforcements to fill the gap created by the curve to keep a flat reference plane for the weights to rest against.

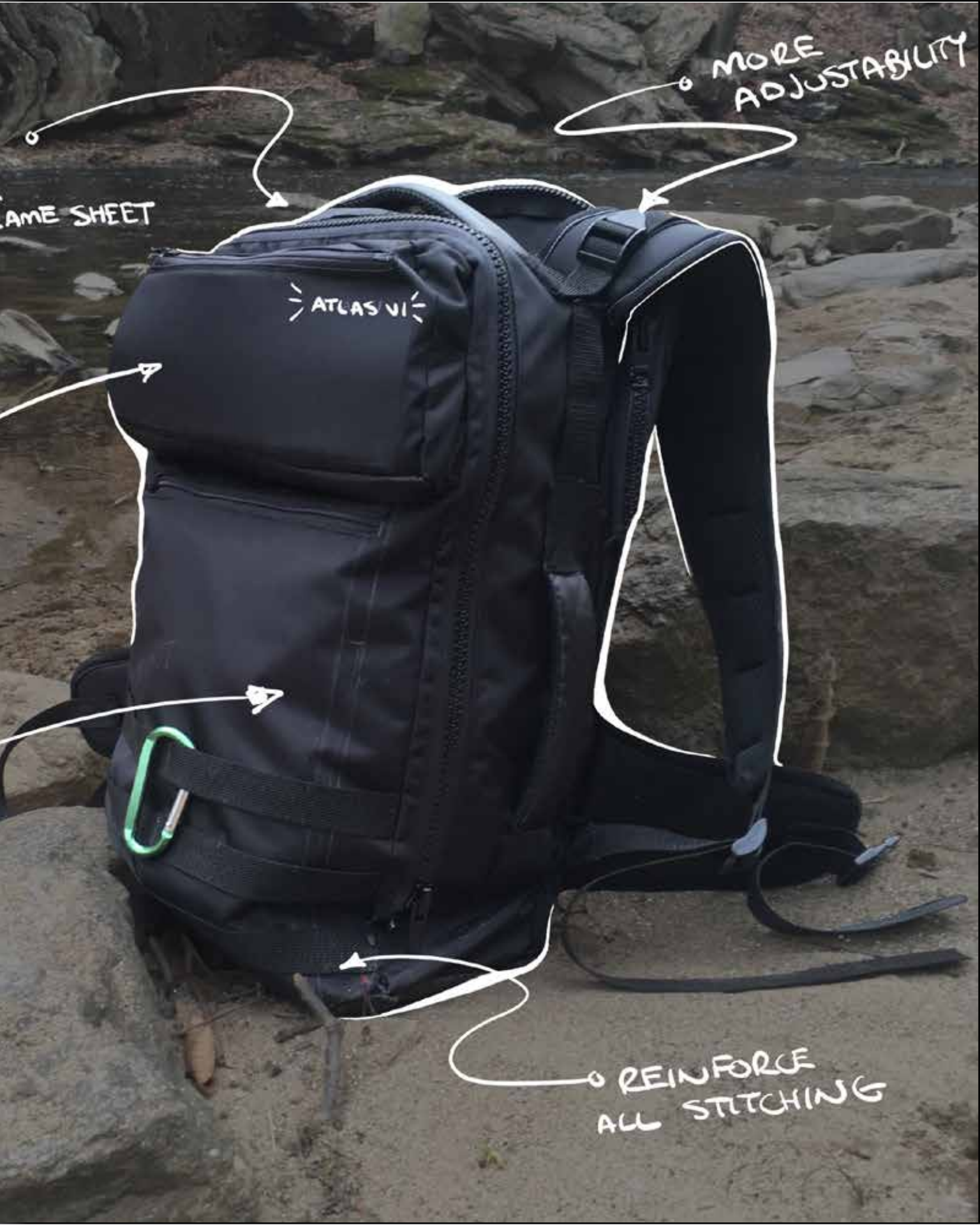
Putting the bag together. We took most of our construction observations from this stage, realizing that the frame sheet should be added last, and the seam allowances should be greater, along with other measurement changes.



SMALLER KYDEX FR

SMALLER REINFORCED POCKET

ADD THE DETAILS!

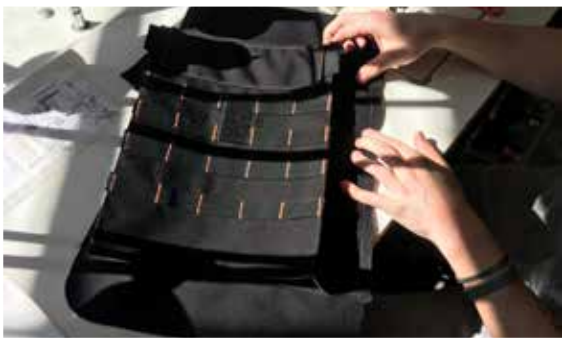

MORE ADJUSTABILITY
AME SHEET
ATLAS VI
REINFORCE ALL STITCHING

Atlas V2

A Focus on Stronger Construction

We began construction of ATLAS V2 with a renewed focus on construction techniques to improve the durability of the bag. We knew the best way to be able to test a bag to the fullest extent was to have it obviously not fall apart. We had also realized that the success of the previous iteration of ATLAS was the technical feasibility of the feature set, and the failure was the execution. Therefore we began to focus on using better materials, more precise patterning, as well as the beginnings of aesthetics such as color accents and designed patterns for looks, not just function.

Atlas V2 Construction



We used stronger materials such as Cordura and heavy duty 1" nylon webbing to get us closer to the durability we knew this bag required. We also reinforced areas of the bag we thought would be carrying the greatest load throughout testing. This attention to detail gave us a better bag prototype this time around, which in turn meant better testing results that gave us feedback and validation capabilities to use for the development of the final bag.

Atlas V2 Testing

This prototype was the first bag we were able to gain truly meaningful insights from. We tested at different locations such as Kelly Drive and the Wissahickon Valley, on varied terrain like paved paths and steep, rocky inclines. We tested with our 35 pound weight we had cut from plate steel.

Kelly Drive Trail | 2.6 mi

Wissahickon Valley Trail | 3.5 mi

While this testing was helpful enough in giving us things to work on moving forward, we knew that we had to have expert validation at this stage in the prototyping process to really validate the bag as a blend of features that created the right experience.

Expert Validation

Chris Williams

Over 13 years of military experience, and the current Platoon Leader of 382nd Engineer Company

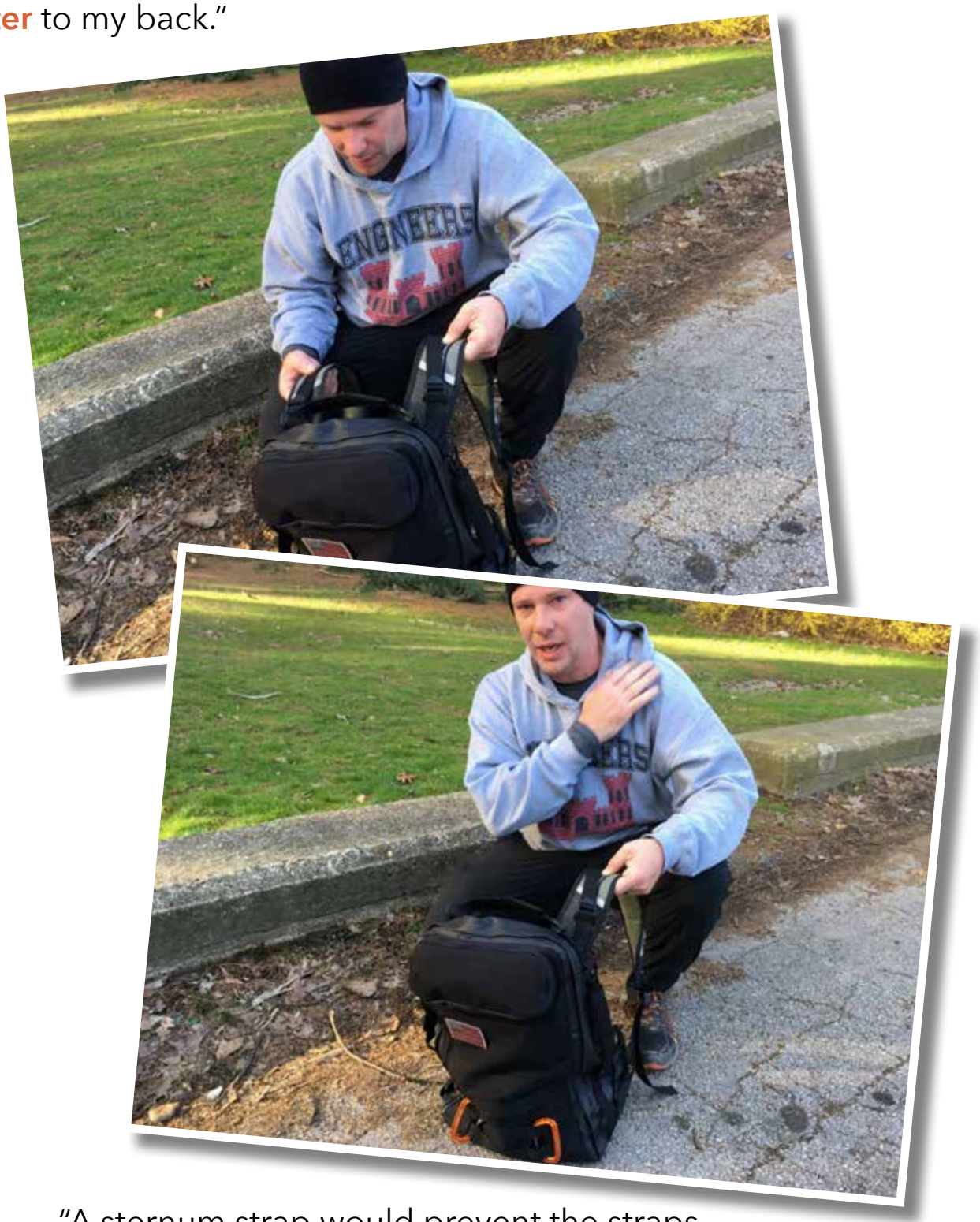
After almost a decade and a half of military experience, Chris has rucked countless miles, carrying nearly a hundred pounds each time of military gear including rifles, grenades, water, and other tactical essentials. He has also competed and placed in a number of rucking events throughout the years. This means he has no shortage of rucking experience, and was an excellent candidate to help us test our second prototype of ATLAS to make sure it was tough enough to keep up with the best.

Expert Feedback

"I know it's 35 pounds but **I really don't feel it** when it's on my back."

"I like the **frame** being curved- its comfortable without too much padding."

"I would definitely want to pull the **straps tighter** to my back."



"A sternum strap would prevent the straps from **pulling away** as much."

Military Testing

Testing with the **382nd Engineer Company** during their monthly 3-day field training regimen.

Chris was also generous enough to offer to take the bag along with him during his platoon's monthly field training regimen in which they carry out ruck marches and exercises to keep them in combat ready condition. This would be a great test of ATLAS' ability to keep up with the people that know rucking best.

The bag rucked over 30 miles, carrying some of the platoon's gear like water and even their rifles using the molle on the straps and gusset of the bag. This was on top of the existing 35-pound load we had supplied Chris with before the weekend began. Throughout this training regimen the 382nd put ATLAS through its paces, making sure that when we got it back that Monday it was filthy and in one piece, but just barely.

Moving Forward