



The
MANUAL



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FROM THE PRESIDENT

WELCOME TO THE MANUAL.

We're calling it THE MANUAL because we have no interest in running our business like the typical architectural product manufacturer. And sometimes that leaves you with questions. We are challenging the pillars this industry is built on: the terribly boring lunch and learn, the limiting idea of a product line and maybe most importantly, the care, or lack there of, that exists in too many of the products we purchase and specify.

While this very questioning was necessary for us, we couldn't run another manufacturing business simply churning out widgets, it's also a new approach. We don't look like—and more importantly don't act like—many of the companies out there.

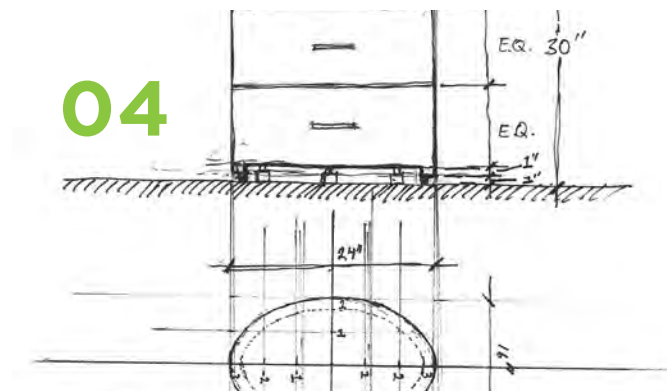
Stephen Hopkins

SO WHAT DO YOU DO WITH US?

Thus THE MANUAL was born. I hope this piece serves as a guidepost for you. Our intention is to give you a framework to understand how technology is changing the architectural product sector, what we would call Industrial Revolution 3.0. I also hope that this piece gives you a bit more insight into the work we are doing and demonstrates how 3.0 transforms the way you work.

It's what we all have been dreaming of: better design, faster, without completely sacrificing the budget. Welcome to 3.0 and please enjoy THE MANUAL.





HOW WE WORK

The scoop.

- 01 we are a Kansas City-based startup
- 02 who manufactures solid surface products
- 03 offering casework, lockers and other furniture
- 04 as a turnkey partner for architects and GCs
- 05 focusing on healthcare and a few other industries

INDUSTRIAL REVOLUTION 3.0

There's a lot of articles about what mass customization means to the consumer, but it's hard to find solid thinking and conversation about these macro-level changes in the manufacturing environment. While the rise of manufacturing 3.0 shifts thinking on how to purchase and specify products, it is still theoretical for most people. Real understanding comes with real implementation. The best way to explore this new model of design and manufacturing is to observe how it works in practice.

CUSTOM DOCUMENTATION STATION

There is nothing more functionally critical in a hospital than the operating rooms. The people and processes must work seamlessly

to make sure that the right care is delivered and communicated. For surgeons, nurses and even technicians, the operating room's components must function as a seamless extension of each position's process.

And that's where standard operating room furniture gets into trouble. For instance, most off-the-shelf documentation stations face the documenter away from the procedure. The nurse is forced to write or type on his or her lap to record what is happening and then turn 180 degrees to document it. In this project, the hospital's design team had a better idea.

When designing operating rooms for a new patient tower, the team actually realized they



could turn the desk 90 degrees, limiting the rotation needed to face the operating table. Through extensive user testing and interviews, they concluded that sometimes that was enough, but for longer operations, the nurse needed to face the operating table directly. While this is only a portion of the operations, the need is significant, given the time period of longer operating cases.

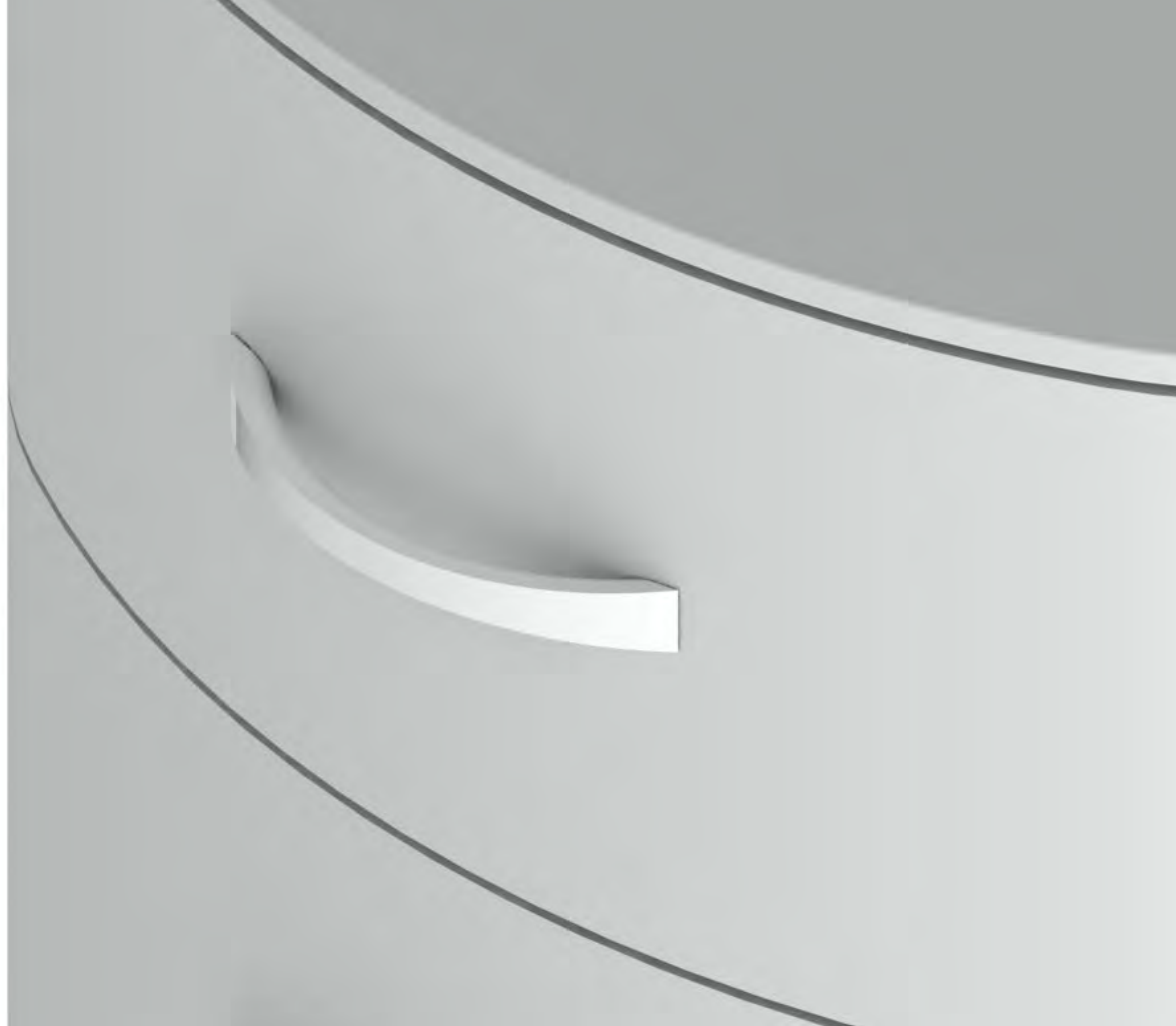
That's where Shield and the idea of Industrial Revolution 3.0 became a reality. The Shield staff took the concept of a rotating desk and worked through the details, testing and specifying the hardware, and applying the product's high engineering standards.

The end result is a 100-percent solid surface, custom documentation station that is completely nonporous, down to stainless steel hardware. (Even the underside is clad in solid surface for complete protection.) Equally important, the desk functions just as the staff needs, and was delivered inside of an extremely tight prototype schedule for less than comparable off-the-shelf products.

HEALTHCARE NIGHTSTAND

There is a long tradition of architects designing furniture for their buildings. This particular space had clean lines, a crisp palate and needed furniture to complement its careful planning. Unfortunately, too much





“True innovation in manufacturing 3.0 is developing flexible software and hardware solutions.”

of what is in the healthcare furniture space is clunky and outdated, leaving the team frustrated in their search.

The designers eventually found a piece they liked, but it was made for residential construction and was located overseas, so had an extremely long lead time. Not only worried about a potential delay's effect on the project timeline, the team was also concerned about how the piece would hold up over time.

Enter Shield. On this particular project, Shield's team engaged a bit earlier because the designers had some past experience with Shield and the company's manufacturing 3.0 model. However, they were still concerned about Shield's ability to hit the timeline and budget. Shield's patented connection process allowed the manufacturing team to take the design idea for the nightstand from a simple sketch and turn it into reality.

The true innovation in manufacturing 3.0 is developing flexible software and hardware solutions. While a particular piece appears to be custom, and in most respects is, the process to create it is actually a standard that can be applied to a myriad of circumstances.

That's exactly how the embedded metal inserts worked on this piece. Shield altered its drawer standard only slightly to meet the nightstand's

design. The company also had used casters hundreds of times in different projects and could rely on previous knowledge, connecting them in the same way that leveling feet attach to its standard cabinet line.

The last issue to address was the curved faces. Thermoforming with strict vacuum-forming standards made this possible. Working with solid surface on the exterior construction allowed the design to be as clean as imagined, since the material is moldable to a variety of shapes, once heated.

Finally, the Shield team was challenged to design a handle that fit a curved front. Luckily, the design team and Shield's staff were able to agree on a solid, cast-metal handle that could be bent in a metal jig to fit the curved surface perfectly. Manufacturing 3.0 at its best.

In short, we are in the midst of the greatest industrial revolution since the moving assembly line. Customization is possible in ways people could never have imagined a decade or two earlier, which makes it a great time to be a designer.

The only thing holding ideas back is internal inhibitions; the Shield team reports hearing often that clients are surprised at how easy custom can be.



Logic will get you from
A to B. Imagination will
take you everywhere.

- ALBERT EINSTEIN



SMART SINK 01

The Innovation Lab at DI started testing solutions to stop the spread of healthcare-associated infections. First stop: a smart sink that glowed when someone entered a patient room to spur proper hand-washing.



INITIAL BASE 02

The team needed a base for the sink, so they quickly put together a solid surface cabinet for user testing. Surprisingly, nearly every healthcare professional was more interested in the base than the actual smart sink.



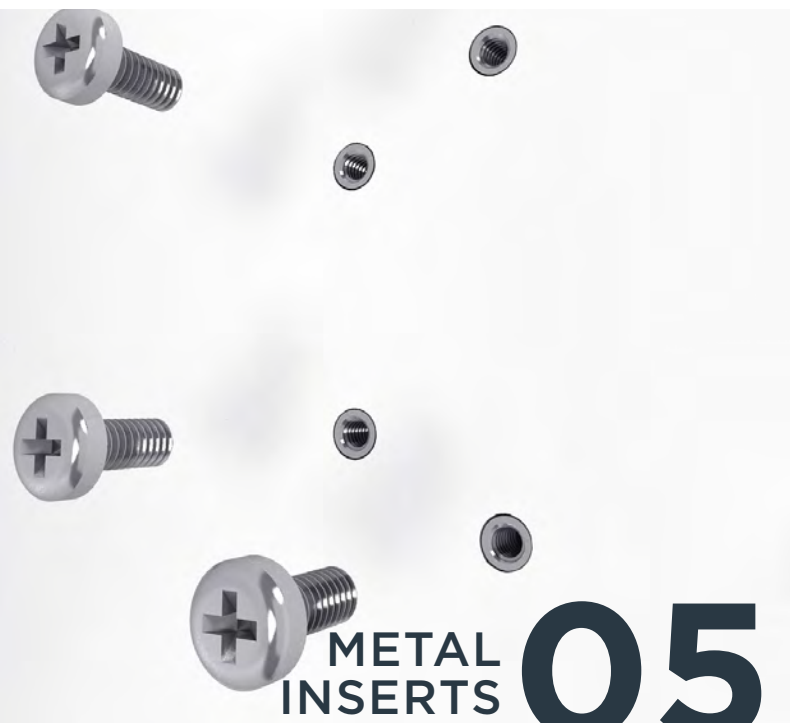
PRODUCT LINE 03

Shield Casework was born. After listening to healthcare experts, Shield set out on a mission to create their first product: a 100-percent solid surface casework line.



FIRST PATENT 04

Along the way, they discovered a faster, more efficient construction process that takes a flat sheet of solid surface and folds it into a seamless box, now the company's first patent.



METAL INSERTS 05

A solid surface box isn't much without being able to connect to it. The embedded metal insert, patent number two, was born. Metal-to-metal connections give Shield the ability to make the most durable box on the market.



ADOPTED SHIELDREN 06

As Shield grew, it adopted a few more employees, termed Shieldren, to join the team. In 2014, Stephen Hopkins, Shield president and one of the original inventors, came on board to steer the new direction.



THE WEDGE 07

Looking for greater design flexibility, the company developed new products to add to its casework line. The Wedge was introduced, merging the warmth of natural hardwoods with Shield's solid surface durability.



MASS CUSTOMIZATION 08

Proving mass customization doesn't have to cost more, Shield partnered with UCSD to manufacture 242 custom headwalls, delivering these faster and at a lower price than the alternative off-the-shelf product.

SOLID SURFACE LOCKERS

WHY IS A GOOD LOCKER SO HARD TO FIND?

Healthcare is not the only industry craving craftsmanship. Case in point: Shield Casework just partnered with a design firm and an NBA team to develop a stunning solid surface locker.

Modern sports locker rooms have evolved from simple changing areas to environments for relaxing and unwinding, with whirlpools, saunas and other spa-like amenities.

The heart of this luxury are the lockers themselves, said Mandy Stark, Shield Casework brand director.

“The problem that many teams and designers run into is that good lockers are expensive,” she added. “It’s pricey to fit out a room with high-end lockers, but more and more, that’s the expectation of owners, teams and players.”

SO LITTLE FOR SO MUCH

According to Shield President Stephen Hopkins, his team noticed a different problem.

“While we agree that price is an issue, we observed a lack of care in the details that was far more concerning,” he said. “For what a good locker costs, it seems like there should be more. But the more we looked, the more

we saw options we felt should be standard actually skyrocketed the price.”

The second issue he saw was the materials chosen. Hardwoods are beautiful, Hopkins notes, but costly. Metal, he says, is hideous. Laminates and veneers break down in dirty, wet environments, in Shield’s experience.

“Phenolic is more durable, but very pricey and yet somehow still looks cheap in most installations,” Hopkins said. “What options do you, as a designer, really have?”

The third issue the Shield team tackled was customization. Most locker products available are bought off the shelf, with a six-to-eight-week wait. Since these are standard product lines, Hopkins said, there is little to no ability to customize the design.

We decided there should be a better model,” Hopkins said. “Working closely with our design partners and the team, we created a one-of-a-kind, completely custom locker that isn’t more expensive than other models you can buy, despite its premium appearance. It’s mass customization realized.”

To think differently about how to create a locker, Hopkins said the team brought their

Custom doesn’t take forever or cost you everything.

signature method from the company’s casework line to this product. Instead of keeping a set inventory, Shield uses a flexible manufacturing process that focuses on the process of making a better box, he said. This way, the company can offer customization faster and for less cost.

CUSTOM WITHOUT COSTING

Designed for the Charlotte Hornets, this locker showcases the return of the Hornets brand. Equally important, Hopkins said, was the fact that the locker’s features must work for both the team and the needs of each player.

“Most lockers are focused on one thing – the needs of the team – and the player gets one drawer to use for his or her personal belongings,” he noted. “The rest of the space is open or for the team’s display purposes.”

Mixing the modern, clean look of white solid surface with the warmth of wood, the two areas of this locker are easy to spot. The team zone’s minimal lines included glass and white solid surface, which contrasts with the player zone’s richer tones of walnut, complete with lined shelves and personalized accessories.

On the left, the team has their half, with space for an illuminated jersey to be prominently displayed. At the same time, the player still has an entire closet on the right for their suit and other belongings without taking any access away from the team manager.

“It was important for the ownership and the design team to include both of these zones,” Hopkins said. “They wanted players to feel like their lockers were their own without





Custom doesn't have
be a dirty word in
manufacturing anymore.

sacrificing style or function for team. The result is a custom solution that offers personalized treatment and immense thought in every detail.”

DETAILS DENOTE CARE AND QUALITY

Lauren Lee, product manager for Shield Casework, says heavy, tall doors have a problem: they break down. Whether the hardware is simply not durable enough or the connection fails over time, she says it's no secret these types of doors test manufacturers greatly.

These lockers were no exception to the rule for the Shield team. In addition to testing multiple hinges until they were satisfied, the company also designed a custom connection for the etched glass doors, Lee said.

At first, they searched available glass door connectors. However, the standard is to place an aluminum frame around the glass. For Shield and their clients, this was ruled out quickly.

“We did not want the aesthetic of aluminum profile surrounding the entire door, and we were concerned about attaching a large tempered glass piece with only adhesive,” Lee said.

Shield developed a thin solid surface stile that traps the glass. Hidden dowels hold it in place with a system of inserts and screws. This mechanical fastening gives a stronger connection, she noted, and it preserves the doors' design intent.

TIMED JUST RIGHT

Timing was another project challenge for the Shield team. While the project officially began Aug. 1, it was shipped out Oct. 1.

This meant final design, engineering and manufacturing work for this brand-new product was completed simultaneously and in less than two months. Even installation was under a strict timeline: it had to wrap up by Oct. 10, in time for the first preseason game.

“Since there was only one chance to hit the timeline, digital prototyping was critical,” Hopkins said. “The design team worked simultaneously with our staff to select hardware, refine details and test each aspect of the locker in small stages. This flexible approach to product development prevented disruption between the conceptual design, engineering and manufacturing phases.”

Built from a solid surface frame with hardwood and glass door finishes, this is certainly a custom design. However, it only seems pricey, said Hopkins. He said this locker is several thousand less per unit than a similar locker that was clad with solid surface, not constructed entirely from it.

“Custom doesn't have be a dirty word in manufacturing anymore,” said Hopkins. “Welcome to manufacturing of the future; the Industrial Revolution 3.0.”



**CASE
STUDY**

01



UCSD JACOBS MEDICAL CENTER

PROJECT DETAILS

LOCATION La Jolla, Calif.

CLIENT University of California, San Diego

ARCHITECT CannonDesign Yazdani Studio

SCOPE 242 custom solid surface headwalls will be delivered to the brand-new patient rooms Jacobs Medical Center

TIMELINE Delivery throughout 2014 and 2015



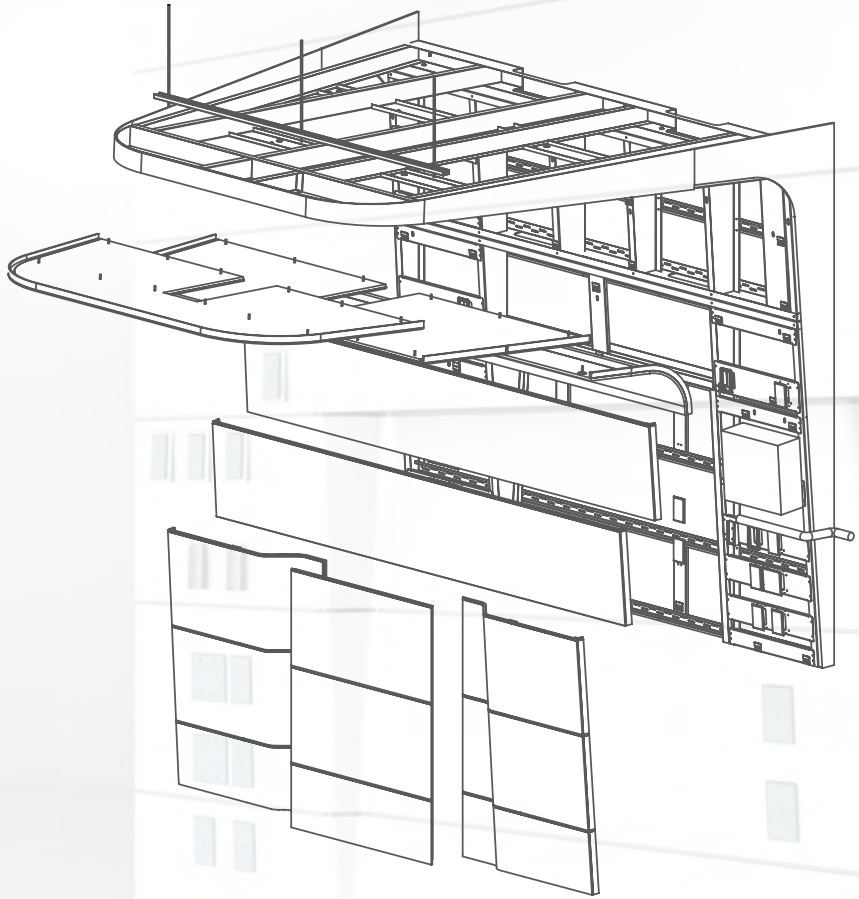
SHIELD DELIVERS 242 HEADWALLS TO NEW UCSD JACOBS MEDICAL CENTER

No matter what industry you look at, it's clear the market is hungry for original ideas. Original thinking leads to original execution, setting work and clients apart.

Solving problems for the real world was Cannon Design's goal with their design of the brand-new Jacobs Medical Center for the University of California – San Diego. Much of this originality

centered on an innovative headwall concept that houses patient rooms' technology in an arching canopy.

Executing this project meant delivering something the hospital and healthcare world hadn't yet seen. In fact, the headwall's complex design caused the project to temporarily stall in a search for a capable manufacturing partner.



AN EYE FOR DESIGN

Technology is crucial to hospital operations, yet too often it overwhelms the space. Fitting hundreds of feet of infrastructure into one functional hub was a design and fabrication challenge for this project. The headwall also had to meet stringent healthcare standards for cleaning and use, which made executing the compound, curved design difficult.

The canopy's organic and flowing nature softens the space while its high-tech core smoothly links all of the devices. It evokes a greater hospitality feel than traditional headwalls that simply take the place of drywall,

and keeps patients from feeling dwarfed by a cavernous ceiling. The canopy grounds the room in an envelope of warmth through ambient light and comfortable curving lines.

Not just reducing clutter and the potential for errors, the headwall also adds control: patients can make comfort decisions and access information without physical exertion. At the same time, nurses and care staff have a standard work zone. When patients check out, the room is quickly and easily reset for the next use.

PROTOTYPING KEY TO FABRICATION

The design and fabrication team used an intensive prototyping process to deliver the headwall as originally designed. Prototyping quickly revealed issues with detailing and materials.

Utility connection and curvature details were problematic, stalling progress and driving up cost. Initially, the headwall was fabricated with plastic laminate but the compound, tapering radius meant achieving a smooth surface was impossible without adding seams.

Shield's solid surface fabrication fit the complex requirements and preserved the

headwall's design. With the original project team Shield's staff simplified utility connections and worked through the complex build to meet the budget and design intent.

It is essential that this often-touched piece is inherently clean, which is why thermoformed solid surface material covers the entire headwall, right down to custom outlet covers that form to the slope of the design's curvature. Nonporous and seamless, the solid surface finish not only preserves the design intent but also makes the headwall easy to sanitize.





INSPIRING EXCELLENCE

The world is taking notice. The team's work was recognized when the headwall was selected as an International Design Excellence Awards (IDEA) 2014 finalist by the Industrial Designers Society of America (IDSA). Then, it received First Prize in the Industrial and Life Science Design competition in the International Design Awards (IDA).

Few facilities, if any, have integrated technology in a finished architectural solution like the UCSD headwall, making this medical product's value

clear to the world. Winning an IDA Gold award and being named an IDEA finalist adds the headwall to an exclusive list of highly crafted and designed products from across the world who set out to change their industry.

Perhaps even more impressive is the successful execution of this forward-thinking design on a never-before-seen scale: the project team will deliver 242 headwalls to UCSD's Jacobs Medical Center in early 2015.



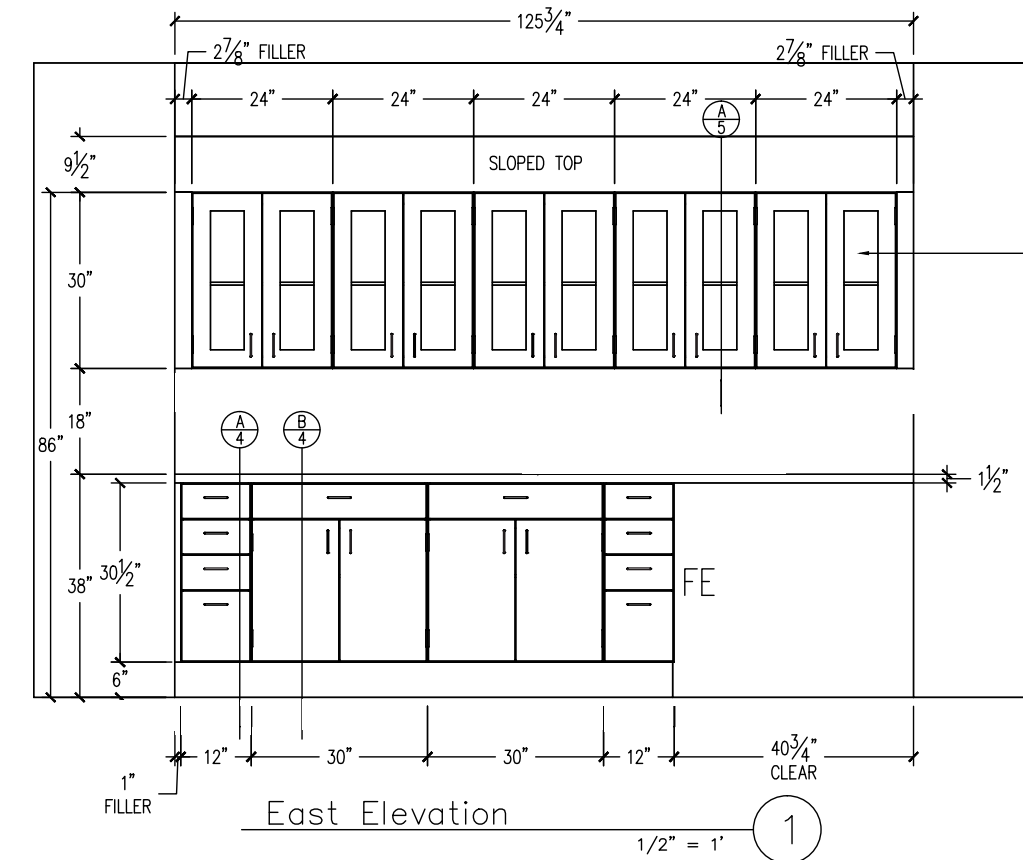


**CASE
STUDY**

02



ST. LUKE'S CARDIOVASCULAR OR



PROJECT DETAILS

LOCATION Chesterfield, Mo.

CLIENT St. Luke's Health System

ARCHITECT The Lawrence Group

SCOPE Base and wall elevations, as well as a solid surface documentation desk, in a cardiovascular operating room

TIMELINE 2013



One of the most difficult challenges in a hospital is keeping it clean. Designers and architects must be knowledgeable and diligent regarding how hospital-acquired infections (HAIs) are spread.

Healthcare designers are taking a “lessons learned” from the success of solid surface countertops, and creatively solving the “clean challenge” for many other furnishings found within critical environments. This is why solid surface casework has become a natural solution in operating rooms.

Placing three elevations in the cardiovascular operating room at St. Luke’s Hospital in a suburb of St. Louis, Shield worked with the architectural and construction team to help create a sanitary environment for critical procedures.

Shield’s seamless and nonporous solid surface construction helps to keep this space sterile. The workflow of the cabinets was specifically designed with ease of use – and cleaning – in mind, including options such as glass doors and sloped tops.



IN THESE PHOTOS: Casework and custom shelving featuring Shield’s signature solid surface manufacturing help ensure the CVOR stays sterile and functional during cases.

HARDWARE IN THE DETAILS

For some companies, prototyping is more than a method of working; it's a discipline. According to Shield Casework President Stephen Hopkins, prototypes speed up the process of building for the company, by weeding out ideas that won't succeed early and nurturing the ones that will.

"It is only when we put our ideas out into the world that we really start to understand their strengths and weaknesses," Hopkins said. "And the faster we do that, the faster our ideas evolve – both in the shop and digitally."

Shield didn't set out to be hardware experts, he said, but instead, naturally grew into the role as the company developed its products. In fact, Shield spent two years trying to define its standard door hardware and drawer glides.

"Our insistence on perfection has given us the reputation for being able to find hardware for any solution," Hopkins said. "Because we build differently than most manufacturers (we use 12 mm material instead of 3/4-inch), we've always had to search. We're used to it."

Operations Director Canaan Zeigler credits this constantly seeking mentality in building the company's expertise in things like ball bearings, wheels, glides, slides and pulls.

"Our flexibility leads us to say, 'we can probably find that for you' for multiple clients," Zeigler said. "It's led us to do things like bend handles to fit curved furniture fronts, to make sure we deliver the design our clients specify and the function we're known for."

"Our insistence on perfection has given us the reputation for being able to find hardware for any solution."



Many companies don't have the time or an inclination to dive into the details of hardware, Zeigler said. Since testing is something Shield does routinely – and enjoys – he claims his team is happy to take it on.

"We're ordering hardware for one of the country's biggest GCs because they recognize we know it better," Zeigler said. "They're glad to not have to bother with it, and we know we can help them find it faster and ensure the final pieces coordinate and work."

Shield recently used their hardware expertise when they built and installed complex, large sliding doors on a post-anesthesia care unit

(PACU). The team thought through the build, tested options in the shop and gave the project partners clear choices to ease the decision-making process.

Sometimes, good specs don't equal a good product, Hopkins noted.

"We built a prototype of a piece of rolling furniture per the specs and when we sent the mockup to the client, they reported it 'felt off,'" Hopkins said. "It was built to spec, and the fabrication received compliments."

"They simply weren't happy with the hardware chosen for the wheels – even though

it was rated to hold the weight – and didn't know until they tried it in the real world. That's the sort of knowledge you can't get anywhere except prototyping.”

One of the most complex hardware searches Shield carried out was for a hinge for the sliding door on the University of California, San Diego's birthing center headwall.

Designed to slide back and forth to allow access to med gases and other patient room technology, the thick, scalloped design of the headwall was problematic for hardware.

The door weighs more than 40 pounds and is 1 and 1/2-inches thick. The hinge has to clear that, then slide over several feet to uncover the technology panel. In addition, the design team wanted matching reveals across the door, so the hardware only had a half-inch space to operate.

Finding a hinge with that action that could find those dimensions was incredibly challenging, according to Hopkins. The Shield team looked at hundreds of possibilities, several different ways to build the door and even constructed three mockups.

“We're fairly confident when we say we found the only hinge in the world that meets these requirements,” he laughed.

However, Hopkins is quick to note that Shield isn't successful in searching every time.

“The handle for the birthing center headwall door is another story. We're custom designing a 100-percent solid surface handle because we can't find one to meet design intent and function,” he said. “But we can say the client will get exactly what they're looking for.”



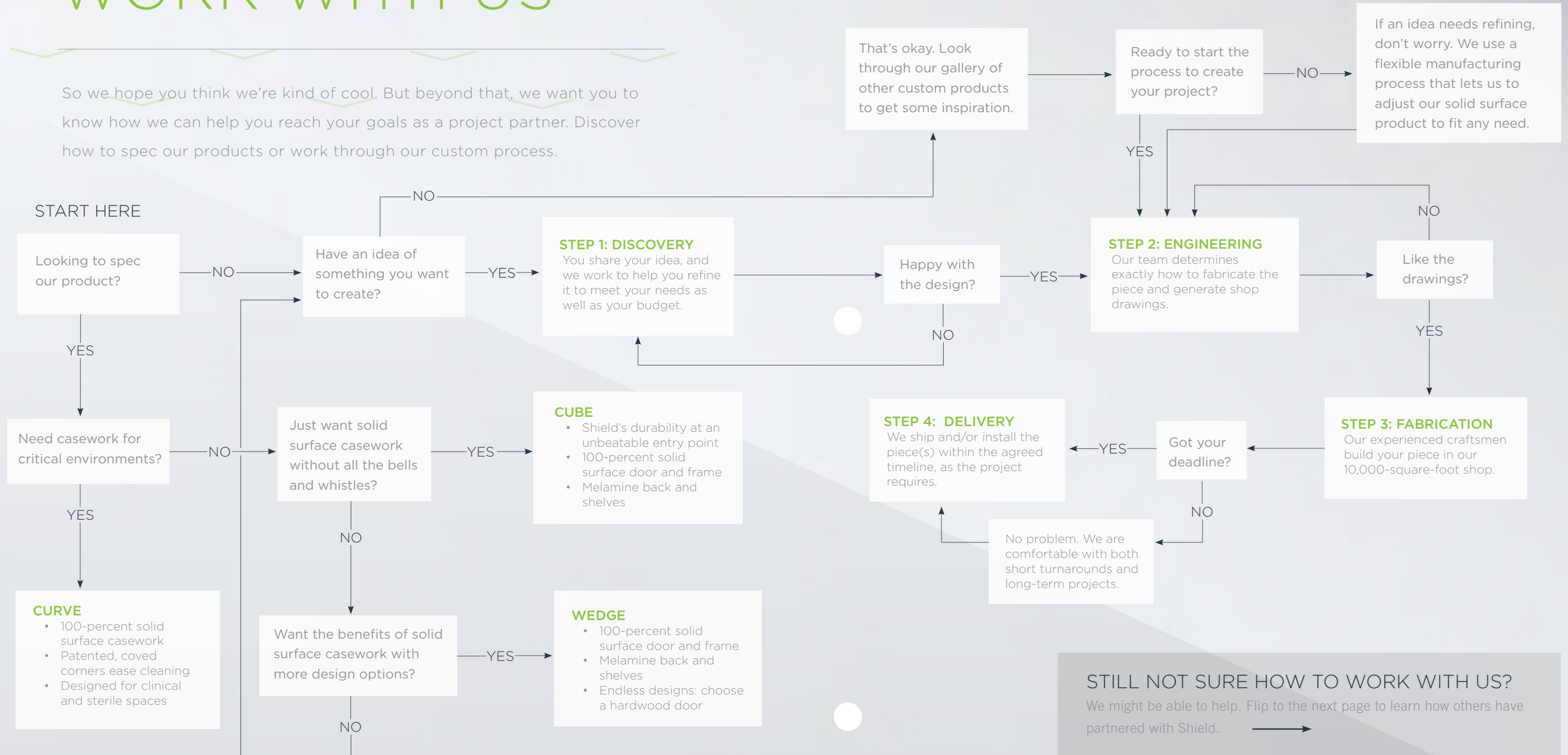


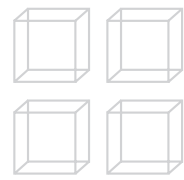
INTRODUCING THE WEDGE: **NEW IN 2014**



HOW TO WORK WITH US

So we hope you think we're kind of cool. But beyond that, we want you to know how we can help you reach your goals as a project partner. Discover how to spec our products or work through our custom process.





40%

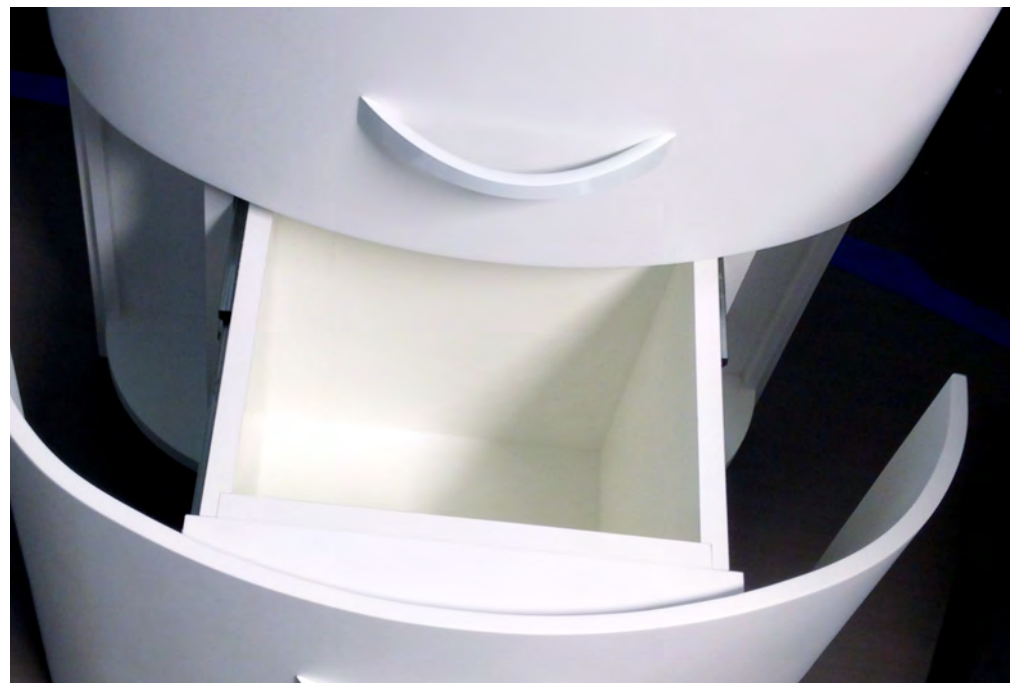
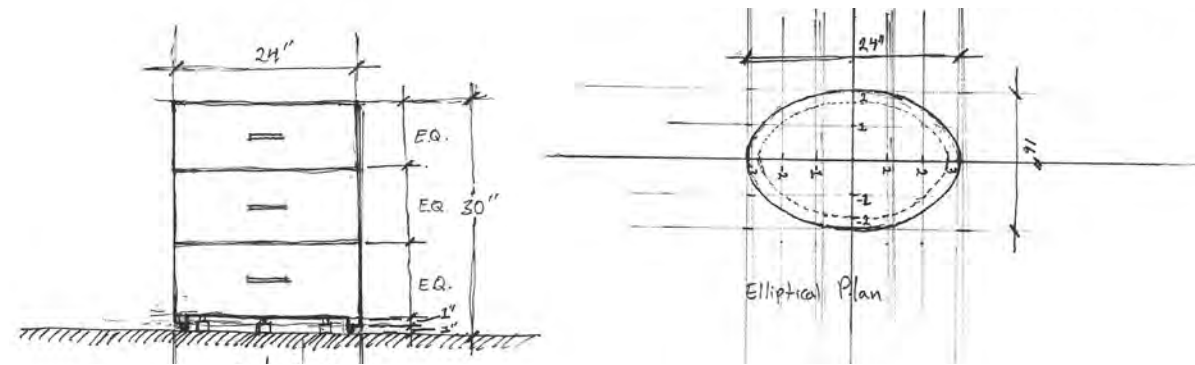
OF PEOPLE THAT REACH OUT TO US DO IT BECAUSE THEY WANT SOMETHING COMPLEX BUT NEED HELP CARRYING IT OUT

01

YOU KNOW WHAT YOU WANT BUT CAN'T GET IT OFF-THE-SHELF AND YOU DON'T WANT TO SPEND A ZILLION DOLLARS.

The design team here was originally looking at an Italian-designed nightstand that was going to take months to deliver and wasn't the right size. They sent us this sketch to see what we could do.

We took their sketch, and after refining some details, created the nightstand they wanted at a larger size and lower cost than the off-the-shelf product they had originally selected.

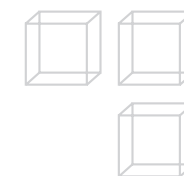


02

YOU'RE WORKING WITH A PROJECT THAT NEEDS A LONG-LASTING SOLUTION.

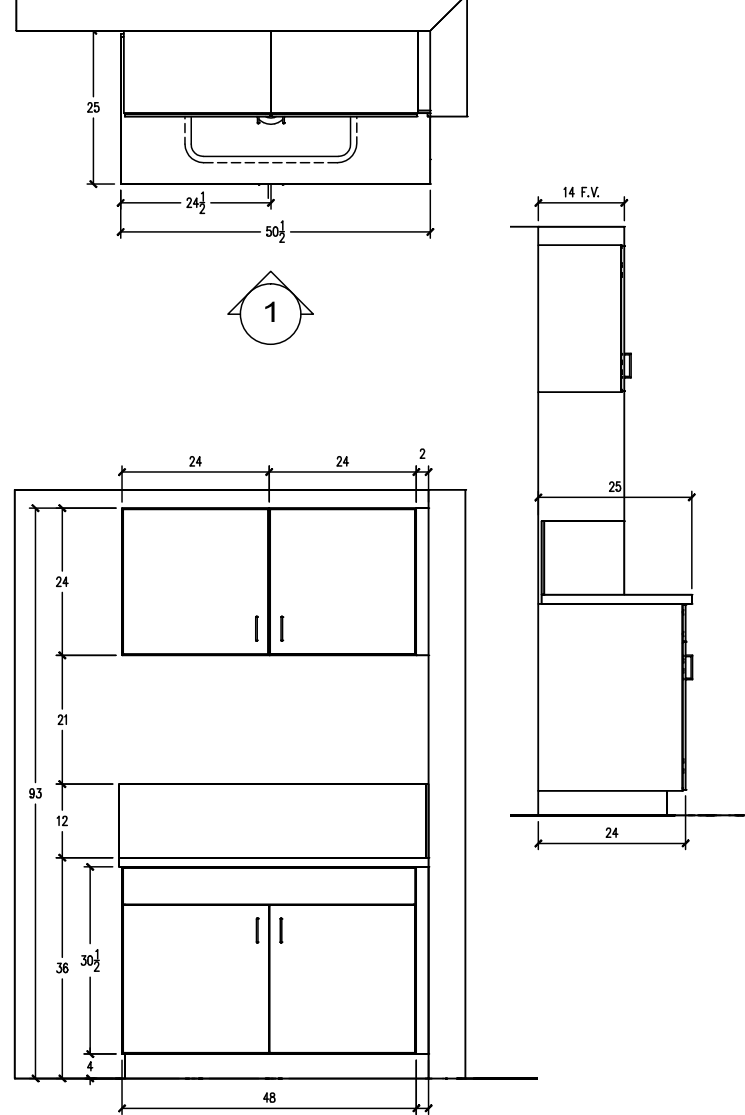
A Kansas City school needed durable, long-lasting casework for its in-house dental clinic. The project architect specified our system because he loved the clean, modern look of the white solid surface and its long-lasting durability.

He found Shield's modular design easy to work with, and outfitted the clinic with carefully selected hardware, under-cabinet lighting and other accessories to bring the design to life.



30%

WANT SOMETHING THAT LOOKS GREAT AND WILL LAST THEM A LONG TIME.

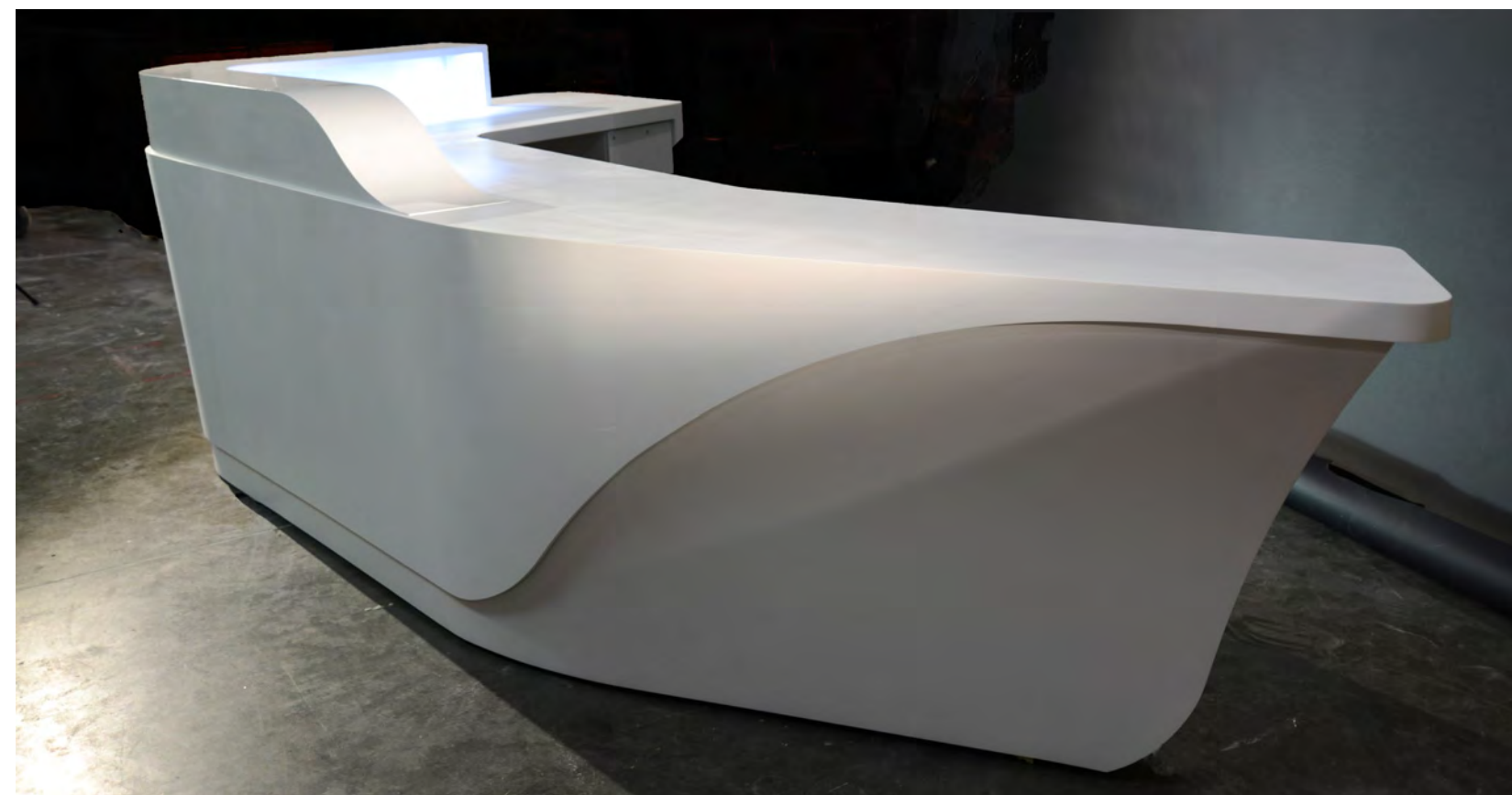
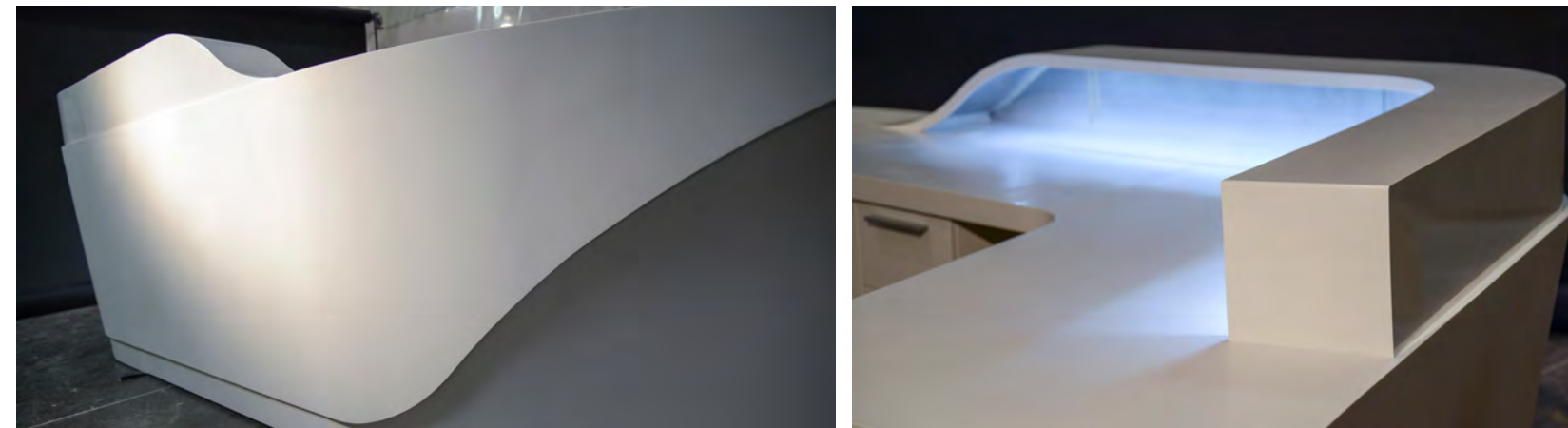


 **10%** | OF OUR CLIENTS DON'T KNOW EXACTLY WHAT THEY WANT.

04 YOU DON'T KNOW EXACTLY WHAT YOU WANT, BUT YOU WANT IT TO LOOK COOL.

An East Coast healthcare facility owner found Shield online, and contacted us about creating a custom reception desk. He wanted a strikingly beautiful piece to place at the entrance of his facility. He had some inspirational product photos to share with us, but he did not know exactly what he wanted.

After collaborating back and forth with the contractor and facility owner, we shipped an amazing custom reception desk as well as elevations for all of his exam rooms, the break room and other areas of the office.



03 YOU WANT A CLEAN, NONPOROUS PRODUCT THAT WILL RESIST HEAT, WATER AND EVEN CAT PEE.

Replacing laminate casework that fell apart after only eight months, Shield Casework was chosen for a newly renovated animal shelter in Ohio that houses only our feline friends.

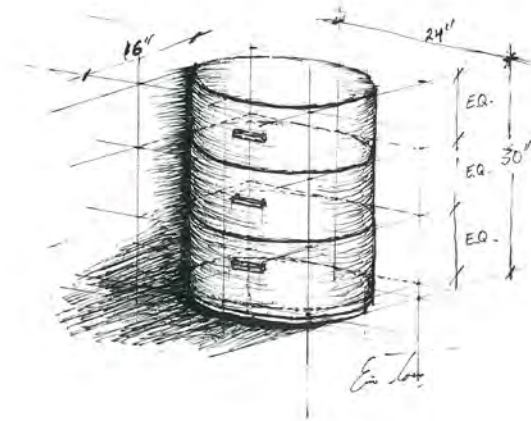
Both the design team and the client knew exactly what they wanted, and what the space needed: a long-lasting material that could hold up to the intense use the shelter required. Since the cats get free roam of the some of the rooms (in other words, cat pee ends up in weird places), it was vital to chose a product that would last.

Shield provided the design aesthetic the team was looking for with the sanitation and durability the clinic needed. The job included casework in exam rooms and storage areas and customizations for the cats, such as solid surface windowsill perches.



WE WOULD LOVE TO WORK WITH YOU.

Download our Product Specification or contact us to modify this for any projects you have in mind.



Let's start a conversation.
Find us online, or drop us a line.



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SHIELD