**Michael:**  Welcome and good afternoon. “Achieving forensic facility design excellence in the context of alternative project delivery.”

My name is Michael Moxam. I’m Vice President of Stantec Architecture. I work out of the Toronto office. Tom Kyle is a Senior Associate with Stantec Architecture and has worked very closely with us on the project. Russell McElroy is a senior principle with McClaren, Wilson & Lawrie, who is our partner on the project. Nicola Casciato is from WZMH Architects out of Toronto, and Adam Denmark is a principle with SmithGroupJJR, out of Phoenix.

There are four firms involved. You’ll understand how that works as we go through the process.

We’re really pleased to be here. This is a very important project to us. It’s the largest forensics facility in North America and, perhaps, the world. It’s a complex project.

We’re going to talk about it in six chapters. The first one, we’ll talk a little bit about what’s going on in Ontario today relative to public-private partnerships and the whole alternative finance procurement process. Then, we’re going to talk a little bit about the background of the forensic services and coroner’s court, just to give you a little bit of historical background of the project. Then, we’ll talk about the PDC process.

In this process there are two teams involved: Webb Zerafa and SmithGroupJJR. We’re what’s called the “planning design and compliance team.” They’re on the ground with the project first, developing project-specific outputs and specifications.

Then, there’s the bid period. We shortlist three proponent teams – which includes finance, contractors, and design teams – to bid on the project. There’s one winner. Then there is implementation and construction.

We’ll end with a tour of the completed building. The user groups are moving in as we speak. We were hoping to have a couple of representatives from forensics and the coroner’s court, but they both declined, saying, “We’re too busy moving.” It’s a product of timing.

The Ontario P3 delivery process: Ontario is obviously one of the key economic drivers in Canada. It’s got a half a trillion dollar economy and a population of 12.8 million people. It represents just under 40% of Canada’s gross domestic product and population. Toronto is the third largest financial center and the fifth largest urban center in North America, and very trade-oriented, with over $300 billion trade with the U.S. alone.

The Ontario government has committed over the course of a number of years to investing $30 billion in infrastructure upgrades. This involves healthcare, post-secondary, and complex projects like forensics.

They’ve identified five key principles to this procurement process:

1. The public interest is paramount. That’s very much what they’re out to protect.
2. Value for money must be demonstrable.
3. Appropriate public control. In other words, the public still owns the project at the end of the day.
4. Accountability must be maintained.
5. All processes – notably, procurement process – must be fair, transparent, and efficient.

To achieve this, a ministry called Infrastructure Ontario was developed. It was established as the execution agency for all of these projects that qualified to benefit from the use of the AAPF, which is the Alternate Financial Procurement Model.

Right now, the model is actually evolving. There are two key approaches to this finance and procurement. One is called “Build Finance,” and that’s, I would say, sometimes smaller, but definitely more complex projects that includes additions and renovations. From an architect’s perspective, it’s pretty much traditional services. But, when it goes out for tender, it goes out for tender for financial private partners as well as transfer of risk to the contractor – particularly risk around design coordination, the kind of issues we generally end up fighting about through the course of construction.

The one that applies to this project and certainly applies to all greenfield projects of any scale is the Design/Build/Finance/Maintain. That is the model that this project will represent.

In this diagram we have Infrastructure Ontario, which, as I’ve said, is the entity that leads this project. The compliance architect or the PDC is brought onboard. There is generally a partnership between Infrastructure Ontario and the sponsor group – in this case, the Ministry of Correctional Services – on behalf of forensics and the coroner’s court. They go through a traditional selection process and select their PDC group. In this case, it was Webb Zerafa with SmithGroupJJR.

Then, the successful proponent they call “Project Co” has their design team, has their investors, the financial piece, their construction piece, the facilities management piece, and systems integrator. It’s a very holistic approach. You’ll see how the process unfolds.

Generally, the difference from traditional procurement and risk transfer is that risk is essentially taken away from the public sector and basically laid on the private sector. Payment occurs only after construction is complete, so no public dollars flow until after substantial completion.

Long-term building maintenance concessions are tied in with the building team. These are generally 30-year management contracts. You build them and then you operate them. It’s operating the building – not the processes that go on inside. That’s all still publicly funded. The integration of design and construction with building maintenance and life cycle costs is very tightly tied together.

This is just a brief diagram. This is the more traditional model where much of the risk resides on the public sector side with construction and schedule really the only thing residing on the private side. The AFP model really strives to push as much risk over to the private sector side, really leaving functional programming and the preparation of the output specification as really the only risk on this side of the public sector.

In this case, the planning, design and compliance consultant is Webb Zerafa and SmithGroupJJR. Their role was to prepare the technical output specifications. They validate the program and prepare an illustrated scheme, working closely with the users to ensure that it can be delivered and to show that it can be delivered. A project agreement is also developed, which is a very key part of the contract between the successful proponent.

We were part of the winning team, Stantec Architecture with MWL as the design team for the winning proponent. Our task is to really test the illustrative scheme, develop it further, and again, be a part of the consortium that builds in accordance with the project agreement.

On the finance side, the consortium arranges financing for the project over the construction phase and that 30-year term. The project is paid for in installments over that 30-year period. As I said before, the public money starts flowing in monthly installments after substantial completion.

On the maintenance side, it’s based on the output spec, which is very specific in terms of what needs to be done from a long-term maintenance perspective. The RFP includes a detailed description and delineation of the hard FM services and other facilities management services.

With that, I’m going to ask Nic and Adam to go through a bit of the background on forensic services and PDC with you.

**Nicola:** Thanks, Michael. First thing I’m going to do is talk a little bit about forensics and who they are and what we did. Then, there will be a whole section dedicated to our plan, design, and compliance role.

Where does the forensic services fit within the ministry? They are within the Ministry of Community Safety and Correctional Services. There are other entities within that ministry – OPP, which is our Provincial Police, Emergency Management, Office of the Fire Marshal, Corrections – and then in the middle, you’ll see CFS, OCC, and OFPS, which are these people in the red box.

The building houses the Centre of Forensic Sciences, the Office of the Chief Coroner, the Ontario Forensic Pathology Unit, and it actually has two Coroner’s Courts that do inquests in the building itself. It’s a neat arrangement, to have everyone housed in one facility.

The first thing that the province does is outline the need for this facility and why they require it. There are some obvious ones, such as aging infrastructure and insufficient space. They were located right in downtown Toronto, difficult to get to, plus the real estate value is costly, going up in the downtown core, so they decided to move the building outside of the downtown core. Those are the primary reasons for the new facility.

Right off the bat, we established some of the design objectives with the group. In our document, we went in depth into each one of these points to outline what they were actually looking for from a design standpoint.

You can see:

* Flexibility and design,
* Warm and inviting environment,
* Collaboration,
* Security,
* Efficient and effective planning,
* Sustainable; imagery,
* Initial and ongoing economy, because this is a Design/Build/Finance and Maintain we have to always keep into account what the building looks like 30 years from now,
* Infrastructure and size, and
* Continuing continuity of operations.

Those were the key drivers. These points were actually touched on along the way while we were preparing the output specifications. It was very important to get those established early.

Adam is going to take you through the Forensic Sciences and each of the departments and specifically what they do.

**Adam:** As Nic talked about, there are a couple of main groups that fill the building. One of them is the Center for Forensic Sciences; this is essentially the crime lab. They scientifically investigate evidence that is brought into the laboratory for police or law enforcement uses.

Their existing facility is about 1/3 of the size of the new facility. They are looking at definite increases in amount of evidence that needs to be investigated. They are looking at doubling their staff within the next ten years and tripling it over the next 30 years.

One of the interesting things about the CFS is the amount of sections and groups that they have. They have pretty much any type of scientific investigative group that’s out there within this facility: there are seven overall sections in addition to research, development and quality assurance. Within those seven main sections, there are a bunch of subsections. There’s quite a swath of investigation opportunities.

The other main group is the Office of Chief Coroner. Under their purview is the Provincial Forensic Pathology Unit, which is where they do the medical or legal autopsies and those types of investigations; as well as the Coroner’s Court, where they do inquests and have a court proceeding for the different cases they investigate.

Right now, the PFPU does about 1,500 autopsies a year in their existing facility. They’re expecting that to more than double over the next ten years as the population continues to grow. In both cases, there are smaller facilities around the province that do some of this work, but the majority of the work comes into this central facility.

The Forensic Pathology Unit, in addition to the space – similar autopsy space that they have now – was really looking for CL3 (Containment Level Three) space, so a level to do higher bio-containment issues as they arise. They had a SARS incident within the last ten years, so they’re sensitive to those types of things.

**Nicola:**  I’m going to talk about the actual PDC role, which is the planning, design, and compliance role. I tried to outline it with a series of these three diagrams. What the planning, design and compliance architect does is essentially three major things. We develop the output specifications – the actual bidding documents – that the teams then bid on.

Once that is complete, there is a bidding process. Then, we evaluate those bids as they come in – three separate design presentations, and I’ll go through that a little bit later. Once a proponent is selected, we continue onto evaluate the construction to ensure that it’s compliant with our output specifications. Those are the three major things that we do as the compliance architect.

The first one is developing the PSOS: Project Specific Output Specifications. We use that term a lot through this presentation. That entailed analyzing the initial needs assessment that was done for this facility, to ensure that it was still relevant information. It was actually a process of challenging the user groups on that to make the building more efficient.

We did tours of the existing facilities to analyze their functional and special requirements and adjacency requirements. We did tours of related facilities to basically see what’s out there, what other people are doing, what the cutting-edge technology is. Then, we actually prepared the PSOS itself, which was quite a large document that contained written descriptions, a lot of adjacency diagrams, and floor plans, which you’ll see.

**Adam:** About 18 inches of worth of diagrams stacked on top of each other.

**Nicola:** Exactly. The last thing we did, which is an important one, is blocking and stacking with the end goal of essentially taking that blocking and stacking to the municipal authorities, having them agree in principle to the actual site plan of the facility. That’s important, because once the proponents are selected they have to move into construction right away.

With that initial site plan that’s been approved by the city – we actually get comments back from the city on the site plan – that gets handed over to the proponent. Once they’re selected, they can move right into construction and their dealings with the municipal authorities is shortened. They still have to actually deal with the authorities, but it’s shortened.

This is an illustrative diagram from a needs assessment. The first thing we did was take the needs assessment, try to make sense of it, and analyze that. Then we did tours of the facilities, and in reports we outlined some of the negatives and positives of the existing facility. Then we went to new facilities, where we took pictures, analyzed and pulled out the good points of those facilities, ideas that the user wants to transfer into the new facility.

At this point, SmithGroup, with their expertise in laboratory planning, went through a process of program validation and creation of adjacency and room diagrams. Adam is going to talk about that.

**Adam:** Obviously, one of the important parts of those tours was really getting on the same page with the users and being able to visually see the same thing and hear what they like, what they didn’t like, and other elements to incorporate in.

When we came in from the needs assessment, we basically started with the space program and a bunch of diagrams. The original space program was just north of 800,000 square feet. One of our early directions from Infrastructure Ontario was to get that down. They wanted something right at the middle of 500,000. That was a direction.

Going through, line by line with users, understanding what spaces were maybe oversized in the original program, and equally important, what spaces were undersized that needed to grow. There’s a validation process that we go through with the clients.

At the same time, there are really three parallel paths that are going on. For the PDC portion, there was an actual site that was put forth that the project had fit on, which is now part of the original needs assessment.

Understanding blocking, how does the building want to stack, what sections are going to drive the size of the floor plate: biology was one of the big ones there, really wanting that contiguous space. So trying to understand all those elements and what the site constraints and opportunities were in understanding how the program was really going to fit on the site itself.

Then, validating those space program reductions and/or additions through guide plates. Again, working through with the users, visually being able to communicate back to them: “When we say 330 square feet, this is what we’re talking about. This is the quality of the space that you’d have, the size,” and those types of things. An important component, certainly, from building the overall plan.

Hand in hand with guide plates are room data sheets. Being able to communicate mechanical, electrical, plumbing requirements, architectural finish requirements, any special requirements that each of these spaces might have, so that could be pulled through during the Design/Build/Finance/Maintain phase that’s going to immediately come after.

Once all those components come together, then working through the plan. There are a number of user meetings where you actually go in. At this point, we have an idea of adjacency, flow, and what’s important there, but then getting into, in reality, when these spaces come together, how they interact with each other, what’s the right flow, and those types of things.

As a complete side to all of that that’s going on, this project included an equipment – both mapping of existing as well as procurement – piece.

This is actually some people from our group walking – and a lot of times crawling – through their existing facility, 200,000 square feet, to barcode and document 3,000 or so pieces of equipment, some of which were being moved, some of which were being replaced, and then helping to create specifications so that the new pieces of equipment, GC-MSs, and instrumentations, things like that, could be procured as part of this DBFM group.

**Nicola:** Once all that information gets gathered, we went back to the blocking and stacking and really tried to solidify all that information into a set of floor plans and a site plan that we can actually take now to the municipal authorities to get approval on.

Our site plan ended up looking like this. Some of the key features on this site plan – and Michael is going to talk about this when he talks about design – what Michael is telling me today is that they walked through with the city planners who were involved with this project initially, and a lot of the things we had talked about were there. They were very pleased with what they saw.

This is the site plan facility. It’s amazing how the site plan that Michael and his group developed is very similar to this one here, although the tower of the building changed a little bit. He’ll explain why and how. The site plan kind of remained the same.

The main entrance to the forensic services is actually here. That was important for this street – which was actually a new street on this precinct – which is more of a larger campus of buildings. The Coroner’s Court’s entrance was in this area here, along a major avenue. Those were things that the city was looking for, to put some of the major public space on the major avenues. That’s here, and actually in this area here.

We had all of the service areas that happen in these buildings, with a secure wall around those facilities that you would expect in this type of facility. It is very important to establish this with the city early on, get their comments so that these can be fed back to the three bidders.

From there, we’ll show you a series of documents, floor plans, that capture the functional needs of each of the spaces plus the adjacencies that are required. These are the documents that the three bidders received, showing in great deal what all the requirements were from a planning standpoint. It was an illustrated scheme, but it was a very comprehensive scheme, from a functional standpoint.

You’ll also see we did elevations to really show the city what the material quality of this building would be in. It’s mostly glass on the office side and metal on the lab side. That was continued through, right through to Michael’s scheme.

These documents were, again, submitted to the city and submitted to the three proponents. We had to illustrate some of the material qualities of the space. One very important aspect of this building for this group was natural day lighting. You’ll see we actually included an atrium in this building. We wrote extensively about it. We did diagrams of how we thought it would work. You’ll see the implementation of that in a moment.

We also showed the green benefits of the building: green roofs, screen walls so that we can shade the west façade, and the natural day lighting for the autopsy spaces. Those were all key documents and key elements that we wrote about in our project specific output specifications that again get turned over to the proponents. We described the atrium and what we want it to look like.

It’s a very collaborative space. These users were used to working in their own silos, and this building actually brought everyone together, creating that one central space where there are a lot of synergies in this atrium. It was a very key component for them. We did our own diagrams to satisfy ourselves that we were on the right track from a massing and urban design standpoint.

You can see some of those things that we talked about there – the Coroner’s Courts, the canopy into the entrance, some kind of shading device on the west façade, and the autopsy suites with the natural day lighting.

Then, we actually got approvals from the city on this. These are some of the approval documents that we get from them. Once that document gets parceled together into those series of binders that you see up there, we then go through a component that’s called the “bidding period,” or the “RFP period” as some people refer to it as. That’s where the proponents present to us – in this case, three times – over the course of the development of their documents.

There were three proponent bidders that were prequalified based on their experience and their financials. The bidding period was about six months, where they are able to prepare these documents. The documents are brought to an advanced design and development level. That’s important because once they’re selected, they have to move into construction immediately. That’s why those municipal approvals are important.

The bidders present their progress to the planning, design and compliance teams, in this case, like I said, three times. We take the documents, we evaluate them against our documents, and then we write short reports back to the team saying, “This is where you are non compliant,” for example, “and you have to adjust these things.” That happens three times.

Then there’s a final evaluation of the final bid. We provide our comments to Infrastructure Ontario – the procurement or the execution agency – where they make the final decision based on financials, maintenance, and those other aspects. As the compliance architects, we’re mainly looking at the architecture and engineering of the building.

This is what some of the feedback looked like. I don’t expect you to read that, but just to show you that design presentation one is feedback of all the noncompliant things. This report was nearly five or six pages long. Each time the proponents submit something to us, we write a report back, saying, “Here’s where you didn’t meet he mark,” or, “Here’s what you missed.”

Once a proponent is selected, we then stay onboard through construction, where we go to regularly scheduled construction meetings, we walk through the site, we review construction documents, which is something that you wouldn’t find at a traditional model where you are just submitting construction documents. Now you have to submit construction documents that a compliance architect has to review to make sure that they’re building what they’re supposed to be building.

We also review materials, selected shop drawings – we don’t review all shop drawings, just selected ones, the important ones for us – and mockups, whatever we’ve asked for. For example, in this case here, we asked for a mockup of the fully functioning lab benches themselves. We reviewed the shop drawings for those, and we went and looked at the mockup.

During construction, we issue a series of reports, where we see things that are non-compliant. You’ll see that with the “N” there. This was a non-compliant item, and this is why it’s not compliant. This is a comment back from the team, saying why it’s not compliant, and so on and so forth. That dialogue goes on through construction.

We also walk the site, do our own site review reports. In this case here, walking through the site, we found that a clearstory window was missing into an office – something that might not get captured in an interior elevation on a floor plan, but we caught it. We pointed it out to the proponent, and so on and so forth.

That gives you an idea of what the compliance architect does throughout the phase of the project. At this point, Michael is going to talk about the bid period.

**Michael:** Thanks, Nic. I was saying to Nic last night that we always get feedback about what’s not compliant. You never hear what is compliant, which would put a bit of a positive spin on it.

The bid period is six months. We do get a pile of binders five feet high dropped on our doorstep, just full of this kind of stuff: very detailed requirements, specification requirements, compliance requirements.

Design presentation one is four weeks after the RFP is released. It’s kind of insane, actually. That’s the kind of pace the six-month competition period goes in. There are three design presentations through the six months. There are commercially confidential, ad hoc meetings where we get written and verbal feedback. It’s a pretty wildly paced process.

After reviewing the documentation that we had, we were quite comfortable with the two-bar concept, the central atrium. We liked the idea of the Forensic Commons, of creating that collaborative connection between the lab side and the office side. We did try a few things out just to test the waters, but eventually, we came back to the two-bar scheme, which we think is pretty strong.

One of the key ideas in this kind of a process is you want to deliver something really good. That was really motivating for us. We also need to deliver something that’s really efficient. At the end of the day, it is about price, so we needed to find some really clever ways of delivering the program and the idea in a way that was very efficient. Russ is going to talk about some of our thoughts there.

**Russell:** In short, when you back up and look at a project like this specifically, Nic and Adam set up the problem and then spend a lot of time working together with the users. Then, it comes to the point where it is in the bid phase.

The bid phase is when MW&L and Stantec come together as one of the three proponent bidders. At this point in time, we are not able to talk to the users at all. That’s part of it. There was even a fairness monitor to make sure that we had exactly the same type of presentation abilities associated with our presentations that we did as did all the other teams.

In our process, we had to take the best of our knowledge, use our forensic knowledge that we had, and apply it to this project to try to come up with the solution that would be right, specifically, for Infrastructure Ontario. We went all the way to the smallest level.

On the board, you see three different diagrams. The “3.2” is 3.2 meters – we’re in Canada, so we’re working metric. We took the number that they used for their grid spacing of 9.6 meters, and we said, “Let’s see what happens to that when we look at, as an individual lab, right down to when you have a very small lab with casework on either side and an aisle down the center – how will that work?”

If you set it up on 3.2 meters, like that is, it makes it possible for us to have a very small, simple laboratory that works efficiently with casework layout. If you go up one from that, you’ve got the 4.8. The 4.8 lets you take that same grid dimension and divide it into two pieces to get you some exam rooms that might be used for sexual assault cases. Or, if you go up even larger than that, you might have a large case that has lots of evidence to investigate. You can make that happen all within the 9.6 meters.

The plan that they had come up with was a 9.6 meter base spacing, and on the laboratory side, which is the larger block on top, it was 16 base across and along length, and 3 starting from north of the sheet there down to the atrium.

We actually looked at it and said, “What would happen if we adjusted the proportions of it and make it so that the building tower – just the tower portion – got smaller?” As Nic said, one of the things that was important to us was that he had already gone through the process for site plan approvals. If we go and change the building arrangements, our site plan approval process becomes void. We did not want to do that.

So we said, “Let’s look at the taller portions of it.” What we can gain from this is the ability to expand in the future. The plan was that our first floor plate would remain the same. We would design what stayed on that first floor plate as expandable above. One of the things that we found with all forensic science laboratories that we’re doing nowadays is that they all will look to expand somewhere in the future. Unfortunately, crime is not changing.

Our base spacing stayed at the same 9.6, but we were looking to emphasize that we still wanted natural light to come into the building. They went as far as to say, “You can have natural light into the building – you need to make sure you get it as far as 14.4 meters into the building.”

We looked and said, “Well, we can’t do that with our plan, but there are certain portions of forensic science that can be dark.” You actually want them to be dark so you can do alternate light source investigation. There are certain spaces that are like that. We created the dark core.

If you look all around the dark core, it’s no greater than 14.4 meters from the Forensic Commons, which is an atrium with natural light coming in, or to the north of page there, with natural light coming in there as well. We had no issues with the office branch on the lower side.

As you work your way around, you can see what happens with the natural light with all of the different arrows. We kept either end of the Forensic Commons open so we could take advantage of that amount of natural light coming in.

**Michael:** This is the master plan that Nic and we were given. It was approved by the city of Toronto for a new precinct. This is the forensic site here. This is the new Humber Hospital, which is currently under construction. There’s a new Downsview roadway here that connects back to Wilson. The 401 is just to the south. It’s got some pretty high exposure. There are other government facilities that will be built on this site over time. This is an aerial photograph. You can see the 401 down here, and here’s our site.

This is a diagram that describes the scheme. Here’s Wilson Street. See Agate, which is now called Morton Shulman Way, I believe. Morton Shulman was the first coroner in Ontario. That just happened a couple of months ago.

The excavation, the site footprint, which does essentially do what Nic’s scheme was doing: it addresses Wilson with the court services, it draws people in to the mid section to the forensic services.

One level of excavation – we’ve got the CL3 lab that sits at this level now, and materials management that is fed by a large ramp that comes from a secure compound on the east side. Parking fills the rest of the floor plate.

A single floor podium: we very much tried to maximize transparency in a program that really isn’t all that transparent. At the south end, we’ve got the pathology unit and we’ve got the evidence receiving area.

One of the significant changes we made was to bring the training components from the upper levels down to the lower level. We wrapped glazing around it so it’s accessible from all four sides. Interestingly, that allowed us to reduce the size of the office block on the upper levels, as well.

**Russell:** It also gave us better security. When you have a building like this and you have people coming specifically for training, they may not have permission to come deep into the building. Dropping it down a floor made it possible for them to enter the building, stay on the same level, and exit without being associated with the laboratory or office environment.

**Michael:** It also allowed a much broader expression of forensics entry through transparency. Then, the courts and the public space facing Wilson, really making a strong visual connection, as you’ll see. The vertical circulation connects to the forensics lobby as well as the training crush area.

Then, the second level, which is largely green roof and the Forensics Common, the atrium – which is conceptually seen as part of the outdoor space – and we’ve been able to create openings down to the training area so that they are involved in this idea of forensics connection.

The lab block on the east side, the very large mechanical penthousefor that,and an architectural plate that folds around the top and encompasses the mechanical penthouse into the overall strategy.

The very simple office block on the west side, defining the atrium in between, enclosing that atrium. The office side has very distinct mechanical requirements, so they’re very separate from the lab piece.

Again, it’s pretty straightforward. It really focuses at an urban level on making these street connections and making it very pedestrian-oriented, for a building that’s not particularly public in the first place.

**Russell:** One thing, too, to take a look at here: when you look at the two-tower concept, one thing that gave us the ability to create was to use two different structural frames. Laboratory environments have greater vibration issues to manage, versus office environments.

The office, being the smaller block on the right-hand side, could use a conventional steel frame structure, and also could use mechanical systems with supply and return air. We had a very clear separation between that and the lab space, which is higher vibration control management and exhausted air that can’t intermingle with any office air.

I wanted to try to highlight some of the things you might think about with forensic science. Those things are the ability to shoot guns inside the building. We shoot guns inside the building down a range that’s about 165 feet in length.

One thing that was very unique – Adam and I were discussing here earlier – was that they’d like to have a car to shoot at at the same time. We thought that was a little unusual and it caused us some real thinking to try to figure out:

1. How do you get a car into the range that you’re going to shoot?
2. How do you prevent any projectiles from getting out of the range, either through the doorway or by preventing somebody from actually coming through that passage, so that they don’t have an accidental shot down the range when the line of fire may be occurring?

Other things included in the red box are vehicle examinations. We’re doing all our vehicle examinations in a closed environment – concealed, protected, and temperature controlled – to make it easier on those folks doing that work.

We believe this is the first CL3 autopsy in Canada. CL3 is equal to our BSL-3 autopsy. Virginia did the first BSL-3 just south of Washington in Manassas. Our firm was involved in that. The CDC and the NIH certified it, and we are having some conversations with Health Canada about whether or not they will elect to do that. It seems like the Canadian autopsy folks are talking with the Virginia folks right now about going through that process.

We’ll look at a couple of pictures of the CL3 that make it unique. In a CL3, you may be dealing with a body that might be tuberculosis-contaminated or meningitis-contaminated. Those are two of the most likely candidates. TB is one of those things where quite a few medical examiners have actually contacted TB from cases that have come along, unfortunately.

In a CL3 arrangement, if we have a known TB case, the medical examiner can practice in a space that will help him prevent from being contaminated with it.

The space includes the ability, still, to do x-ray. It’s like a one-table autopsy suite. You’ve got cold rooms for both in and out; you have x-ray, to do x-rays like you might do in a primary autopsy; a primary autopsy suite in a small lab where they might do histology or some other casework; and a biosafety cabinet, which is special for being able to do level 3 containment.

If you go up a floor, the large blue box on the far right-hand side is their primary autopsy suite. This autopsy suite has the potential for doing as many as 6,000 autopsies annually – that’s quite a few. The number of tables incorporated there will give them the ability to do that.

The sketch you see on the right might be very similar to the sketch shown earlier. Just because it’s an autopsy suite doesn’t mean you can’t get natural light in there. We’re bringing filtered light in on the lower level, and where the person is standing there, they’re able to do observations. Some of the autopsies are required to be observed, and they can do those from there with clearstory light coming in high above.

These are our renderings that we prepared to help demonstrate our design ideas. With the low windows looking into an autopsy table, and a clearstory above showing that natural light will filter in as much as possible. We did slope the ceiling so we that could get those windows as tall as possible. As you came deeper into the building, the ceilings get smaller.

This would be the view from there. This is where an officer might observe a suspect death, like a suicide or homicide, where they are required to watch. They don’t have to be exposed to the autopsy environment.

Also included is a teaching environment. A teaching autopsy environment allows either the pathologist to educate officers so they know what it is that they’re looking at. Again, they’re outside the suite for their own safety.

Technology is one thing that this building is definitely not lacking. They have MRI, CT, and the ability to do just about any type of x-ray that you can imagine when it comes to doing their caseload.

When you go up to the second floor, the blue you see there are all the pathology offices. The green boxes are where all the autopsies occur. We wanted to give them a respite, to get away from all the hustle and bustle and what you can imagine their normal life is like. That brought them up to this level, which happened to also be the ground floor level of the Forensic Commons, that open area. It has a nice space to be working in.

**Michael:** That’s the beginning of the commons. It’s connected to the library. It sits like a pavilion out on the green roof. Green roof, north and south. Then, the commons continues through at the next level above, as you’ll see. Also, a couple of openings drop down to the first floor and allow the entrance and the training area to become part of that system. The rest of it are directorate offices.

**Russell:** The green roof on the right is the expansion area that’s designed so that the tower can get longer. You can see that it’s gotten a little shorter than some of the original pictures. It still follows the same grid pattern that we showed, which was in red earlier. If they needed to add on, it gives them that ability to do so. The forensic commons could keep on reading through on the uppermost levels.

This moves you up to the third floor. The third floor has mostly drug analysis and toxicology. The fourth floor is where they’re doing their DNA analysis. This one particular lab has about 100,000 square feet of analytical DNA space. On one side, towards the Forensic Commons, they’re doing their examinations. They may have a suspect kit that come in where they would need to go through and do a specific evidence case where they want to do exams.

On the left-hand side is where they might do very low copy DNA. I’m touching the microphone here – there’s my low copy DNA. They want to try to analyze my DNA from that, because they find something like a Coca-Cola can that’s part of their DNA analysis.

They’ll also do mitochondrial, where somebody has found some bones and they’re not sure who it might be associated with. They can analyze those and at least come up with a DNA profile and throw it in to CODIS and see if it comes back as a hit for a positive that they’ve been looking for someone.

On the far right-hand side, they would do known DNA cases. That’s where they have a case where somebody may be in jail and request a review, where they have large quantities of DNA. We keep those separate, because we don’t want any kind of cross-contamination to occur.

In the center of the plan is where they actually do their amplifications, away from all of these spaces.

**Michael:**  There are three bridges across the atrium. They are much more than bridges, they’re rooms that encourage collaboration on these main paths connecting the labs and the offices.

**Russell:** To give you an idea, one of the things we did specifically with this – and this is really an idea that I think may have spurred from you guys – is the fact that almost all of the laboratory casework is fully mobile casework.

When I say “fully mobile,” it’s fully mobile: it plugs into the ceiling, you can disconnect it, you can rearrange it, you can change it however you want to. We have found that however we lay out casework, when the users move in – especially if you don’t talk to them during your design phase – they will change it and rearrange it on their own, anyway.

So why not make it possible for them to do that in a way that we know it’s still going to be safe, it’s still going to work? This particular type of table system is a system that we’ve used to give them both gases and electricity on the bench.

The exam rooms were the same way. Everything should roll. We want to make sure it’s cleanable. So, we have a set up like this, and even the cabinetry was rolling and movable casework.

On the fifth floor, we collected most of the smaller sciences, things such as digital forensics, or we had some other firearms. We actually do fire guns on the fifth floor as well as in the basement.

The path of evidence: one of the important things, from our standpoint, was to demonstrate that when evidence came through, we knew exactly how it was going to move through the building. We mapped out the processes to make sure we didn’t have conflicts occur, and made it as efficient as we possibly could.

**Tom:** Thanks, Russ. Along the east side of the building was the lab block and along the west side of the building, separated from the labs by the atrium, was the office block. The office block environment is very important to everyone involved. We want to make sure that there are lots of opportunities for people to communicate easily amongst each other.

Also, have easy access to the labs, and keeping in mind that the office environment has to be separate from the lab environment for a number of reasons. Russell talked about different standards of vibration control, acoustics, and also a very different air quality standards requirement for the offices versus the labs. Certainly, it’s much more energy efficient and sustainable to think of the offices as stand-alone building, separated from the labs.

Having proper furniture: furniture has to be life cycled and maintained by the contractor group, essentially, for 30 years, so there is a lot of care in selecting that. Also, day lighting and views were absolutely critical to all of the writing. It was embedded in all of the writing that Nic did in the performance specifications.

This is all within the 14.4 meters of the perimeter. Of course, the exposure is by far this long western exposure. We really had to be careful about how we do the glazing there.

These are the easy connections between the lab block and the offices. At the end of each of these corridors is a clear view to the exterior across the city and over the treetops. These intermediary bridges or meeting spaces that Michael pointed out also allow for tours of the facility.

If people from the outside want a tour or the facility organizes a tour, you can bring them up into the atrium and actually see into some of the lab spaces without bringing them into that DNA lab, so you don’t compromise the integrity of the laboratories.

We studied day lighting quite a bit. We looked at all sorts of different types of transparencies and so on to control the shading on the western exposure. We have the good fortune of having the curtain wall fabricator on board during the RFP stage, so that we could go through all sorts of different permutations of how to solve that problem of creating a sustainable western façade, and then actually do mockups and bring samples to Nic during the PDC analysis during the RFP stage.

By the time we were preferred proponent, we could hit the ground running and we knew exactly what the envelope would be doing. We also knew at a greater level of detail what the energy modeling would be, because we had all the glass basically tied up in contracting.

In developing that western façade, which is for a very prominent elevation of the building, we looked at some of the history of DNA analysis and the earlier ways in which the output of DNA analysis occurred, and this created a sort of syncopated pattern.

The image of the building really was rooted in the historical imagery of DNA analysis. We did all of these different versions of reflective glass, fritted glass, and transparent glass. Visual clarity was also quite important on the lab side of things. You can’t really tint the glass there as it affects the viewing of some of the exhibits.

This was the western, as showing the office block tower, with its own mechanical equipment, with the lab block behind the atrium, tucked in higher.

By the end of the RFP stage or the bid phase, we did a video with music, just to allow everyone to visual what we were **[55:37 inaudible]**.

**[music]**

**Michael:** I have just a few words on implementation. The project is finished – as I said, they’re moving in. We had to get our photography before they moved in, because we’ll never get in again. You’ll see all that.

**Tom:** This slide illustrates the complexity of the schedule, in that design really does overlap with construction, and there are all sorts of risks associated with that. As you can see, that’s the RPF stage, the bid phase: that’s that hectic six-month period that Michael was talking about, where we’re trying to read into the specifications that Nic wrote, and getting feedback from Nic.

We get to a point where we’ve got schematic drawings – maybe a little bit better than schematic drawings – yet the contractor is putting a firm price to those drawings. There is a risk there that has to be managed.

Then, of course, that’s the competition. Through an analysis of compliance, we were selected as a preferred proponent. Then there’s another crazy three or four months after that that involves negotiations to negotiate out all the compliance issues, discrepancies, and so on, and to also meet for the first time, really, with in-depth user meetings, to fine tune things, to get things right, to add value to the end user.

When that’s completed, that’s called “financial close,” and construction really begins at that moment. You can imagine, site works and structural drawings have to be tendered, drawn, and under construction within weeks. It was a very intense period within that summer of 2010, followed by different levels of detail in mechanical, electrical, and architectural.

Throughout the entire process, including construction, of course, we’re doing sequential tendering and also submitting documents to the PDC team, to Adam and to Nic, for review for compliance at different phases of construction.

Managing all of that requires a lot of collaborative thinking with the contractor. In our case, we actually embedded a large team with the contractors on site throughout the entire construction process so that we could keep things moving and answer questions as they came up. Of course, there was tremendous amount of involvement, as well, with the PDC team during construction.

**Nicola:** Exactly. What we do here is remind you of the role that the planning and design and compliance architect does during this phase of the work, which is quality review. We walk around the set – we’re architects, we understand what we’re looking at – and we point things out when we see them.

We review selected shop drawings. Like I said, we prescribe right in the documents that we want to see this many shop drawings; these are very important to us, these are the ones we want to see. We review those. We review mockups throughout the course of the project. We’re walking on the construction site and we evaluate the construction to ensure that it meets the PSOS documents.

Michael is going to describe the role of the architect **[1:03:01 inaudible]**.

**Michael:** It’s pretty traditional from contract admin perspective, kind of like a Design/Build that way. We basically pick up where Nic’s team left off with municipal approvals. The project has changed, so we have to manage that with the planning group. That’s an ongoing thing.

As Tom mentioned, there’s constant sequential tendering – design, documentation, and construction are all happening at the same time. We’re also making regular submissions to the PDC to confirm that we’re compliant through all these phases. It’s a complex process.

I want to leave enough time for questions. We’ve got a quick tour for you through the building. This is looking north on the newly named Morton Shulman Way. This is that glazed corridor around the pathology unit for providing views in and bringing natural light into some office areas. There’s a tremendous amount of perceived transparency and accessibility. It’s really not a very public building, but it’s in a very urban place.

This is the court services entrance off of Wilson, and the glazed public space to that. This is a cedar-clad soffit that runs all the way from Wilson south to the forensics entrance. The wood of the atrium roof comes outside and becomes a similar family to the lower canopy. There is the charcoal gray cladding of the lab sign.

There’s also a syncopated rhythm of the monuments on the lab side, which relates to partitioning. There’s lot of partitioning. It also relates to that DNA patterning that we talked about. Then trying to encompass a very large penthouse into the overall strategy.

Looking west along Wilson, this is the secure courtyard. We tried very hard to make that feel more like a landscape wall and not a secure fence. The city was very pleased about that. You don’t really know it’s a secure yard, it just feels more like a masonry wall that slides into the building and is part of the architecture.

Once you’ve entered court services, the secure elements – obviously, everyone has to go through security protocol to get in – there’s a café space that relates to the court lobby. It’s beautifully connected to the city and to Wilson.

Looking east along the waiting area, this is the entrance into the two courtrooms. This is one of the typical courtrooms, full of all of the recording technology that you would expect. It’s a very warm space.

Now, we’ve gone further south and we’ve entered into the forensics lobby. It’s a LEED Silver building, and this is FSC work, so you get this interesting range of color, which we really tried to control.

Again, the idea of bringing in the wood ceiling in that’s part of the canopy that brings you from Wilson, and bringing in the stone as well – it’s very friendly. You come into the secure elevator core that brings you up. Just beyond that is the entrance to the training area. To the right is the access to the family viewing room and all of the pathology components of the program and, of course, reception and waiting.

Once you’ve gone into that training area, this is the space in front of the training room itself, set up for café kind of functions. It’s a very flexible space. It can be cleared out, with the opening to the forensics commons above and the entrance into the very large training space that’s divisible into eight smaller spaces. As I said before, it’s accessible from all four sides.

This is that glazed corridor to Morton Shulman Lane. It provides access into the training areas, but also provides a nice respite space during breaks. This is the teaching lab.

**Adam:** A few shots into the laboratory spaces themselves. As Russell mentioned, this is a teaching facility. One of the design aspects here was really providing a safe place for students to come in and observe in an auditorium-style seating arrangement so that they can look down onto the processes that are going on in the autopsy space adjacent.

**Russell:** When we keep them out of the space, we keep them safer. That’s one thing. You might think they don’t have the ability to see quite as well as if they were right there. They can gown up and go inside. But the fixtures that we used – the surgical lamp that is over the autopsy table – also has high definition cameras built into it. You can do stills or video, and the monitor just above gives the pathologists the ability to talk to the guys on the other side while showing them, in detail, what he is looking for.

**Adam:** This is a shot from the inside of that same teaching autopsy area.

This happens to be the histology laboratory for the forensic pathology unit. However, same ideas throughout all of the occupied laboratory spaces in the entire building: you really want to bring in that natural daylight and provide access for people who are going to be working in these laboratories every day, so they can have that connection to the outside.

**Russell:** This is also the path that leads the officers to where they would view autopsies. On the outside the glazing is all clear to bring natural light in to those guys in the histology lab. It looks like a regular histology lab.

But if you go further down the corridor, we don’t want people to see what’s going on inside. There you’ll see that the glazing is actually frosted so you can’t see in.

**Adam:** This is that corridor that Russell was just mentioning. This is the same idea as with the students. We want to provide a safe vantage point for those people who don’t need to be in the room where the autopsy is happening, but who still need to observe that autopsy as it’s going on so that they can make notes and have conversations.

This space is directly outside and rings around the autopsy area, providing a space for somebody to walk in through security, but from the street, without gowning up any differently, and actually have a very good vantage point of that autopsy, see what’s going on, and be able to have back-and-forth conversation with the pathologists as it’s occurring.

**Russell:** The floor system down the corridor actually sits about 18 inches higher than the primary autopsy floor.

**Adam:** This is inside the main autopsy area. There are a couple of important components going on here. You can see this is that observation corridor outside of the autopsy area, outside of that containment zone.

But there is lots of natural daylight going into the autopsy area. That was one of the big push points for the users. They really wanted to flood this area with light into the autopsy space, which is not traditionally done. Usually, they put them down in the basement – nobody really wants to know about it, and it just happens.

**Russell:** You might guess that autopsies are difficult to clean up after, so we do use a special flooring system that allows for that. We don’t allow anything to physically touch the floor, unless you can.

You don’t see casework or cabinetry on the floor. We try to cantilever everything off the floor, even right down to underneath. We put any kind of ventilation or water services coming to it on a plinth, to raise it up so it doesn’t get exposed to the normal fluids that might be associated with autopsy.

**Adam:** This is another area within that autopsy area, but this shows a little bit more depth. There are two groups of four autopsy tables that are open to each other – all eight really are, but are in different areas. There is a lot of visual communication between the different stations, so that you don’t feel like you’re working in a small room, but a much larger area.

**Russell:** This is kind of like a four-bank section, where you have two on one side of the room and two on the other. You can even see through the glass to the other bank, there’s another section there for another four autopsy stations. The key is to create safety by creating the ability to see what’s going on as long as it’s what’s going on within the pathology unit that people are accustomed to that.

**Adam:** You’ll see that frosted glazing behind, from that observation area, as well as up high, because there are tall buildings around here. We didn’t want photographers to be able to see what’s going on.

**Russell:**  The high profile cases and things of that nature, unfortunately, with today, we have to think about that helicopter that’s going to fly over and try to video an autopsy. It’s something that we have to look out for.

**Adam:** Vehicle extrication space: they’ll have instances where somebody crashes a vehicle, and the body is discovered either shortly after or a long time later. They have to come in and actually cut the vehicle apart to get to the remains. This is a space for them to do that.

**Russell:** Again, we give them very cleanable floors so that they can clean up afterwards. There are also things such as the ladder and platform on the other side, which is for doing photography. A lot of times, you may have to document all of this. This is really the case just about every time they have something like this they have to perform, because if it does go to court, you want to be able to present a case as accurately as possible, so they’ll photograph.

In addition, you have a gantry crane up above. Sometimes, large decedents may come in that weigh 1,200 pounds. You have to have some way of doing a lift on them. That’s one way this could be used.

**Adam:** This is actually down in the CL3 space, Containment Level Three. This is one of the isolated suites, where you do want to minimize the area that you have open to it, because you want to be able to keep all the bad things within a space. Again, it’s a cleanable space and the ability to decontaminate was important.

**Russell:** The unique things are: you see the floor drain in the lower left and you think, “What happens if something goes down the drain?” All of the affluent that comes from this suite gets collected into an affluent decontamination system – it actually gets cooked, just like an autoclave might do it – and then it can get discharged into the sanitary sewer. Literally, nothing leaves this space unless it’s been HEPA filtered or decontaminated.

**Adam:** This is the corridor and the CL3. This is a space to do tissue harvesting – one of the important things that they do here is harvest tissue for the living, to be able to do transplants and those types of things.

**Russell:** Then there’s body storage. We have the ability to store more than 400. In this case, they also have the ability to manage mass disaster by using either refrigerated trucks or refrigerated shipping containers, in the case of something like a 747 crash, or something like that; it could be a possibility.

**Adam:** The last one is the homicide autopsy space. There are instances where we do want to contain a case completely. In addition to the main open autopsy areas, space provided where I could have a little more secure area for doing an autopsy.

**Russell:** That’s the autopsy spaces.

**Michael:** This is a typical office environment. Tom talked about really encouraging access to daylight. It’s a very simple office space. The atrium, the connective stair, the glazing to your left is the elevator core that’s all glass-backed cars so that you can see as you move up through the levels. The typical bridges that are more about collaboration – or as much about collaboration as they are about circulation.

Looking south through the level three seating area in the Forensic Commons. This is the roof terrace, just outside of the north end of the Forensics Commons. The library is right here – the library has access to this space, as well. It’s a very secure but very wonderful space to be in. This is the Wilson entrance of court services. I think that’s it.

Are there any questions? Sorry we took a little longer than expected.

**Participant:** You didn’t mention cost.

**Michael:** The published project cost is $500 million. We don’t know the exact numbers, but we believe the construction cost is in the $300 million range.

**Russell:** We are doing our best to try to track it as close as we can. Because the published numbers don’t go out, it doesn’t make it possible for us to get an accurate number, but we can feel it somewhere in the $400 or so range. The building is 665,000 square feet.

**Participant:** Excellent presentation. It’s a very technical building, especially for **[1:18:15 inaudible]**. Being a compliance architect, how far did you take a design from an architectural standpoint, and how far do you take the engineering standpoint? **[1:18:23 inaudible]** position set up **[1:18:24 inaudible]**.

**Nicola [? 1:18:27]:** From an architectural standpoint, we issued traditional specifications for each architectural section that outlined the quality that we were looking for. In there, we also outlined some of the **[1:18:43 inaudible]**, like the LEEDitems that we needed.

From a mechanical engineering standpoint, at a certain level, we had to make sure that the building envelope that we were presenting to the city was the right envelope. To do that, you really have to understand that you can coordinate your mechanical systems in a certain **[1:19:06 inaudible]** beforehand,so you know how tall your building is going to be.

We took it to an advanced schematic level. I think the documents that we issued for mechanical were single-line type **[1:19:22 inaudible]** drawings, showing notional sizes of mechanical rooms and electric rooms. In the end, that was really the responsibility of the architecture director.

**Michael:** I think the process is geared towards trying to find innovations. When you go through the PSOS, there are things that Nic and Adam defined as “required.” Then, for other things, “Here’s one way of doing it; there are other ways of doing it.”

The systems, the structure: we had a hybrid steel and concrete structure. The PSOS, as I recall, was concrete. There’s a lot of room for design, development and innovation, particularly in the systems side of things.

**Adam:** Just to add on to that, there were actually engineers part of the PDC team – both HH Angus and SmithGroupJJR provided engineering input, especially MEP **[? 1:20:30]** to those systems. You had to think them out and understand the size and the capabilities.

**Participant:** Does it make it more difficult in a market that you probably want the best talent on your team and the bidding teams would want the best talent on theirs for the original –

**Michael:** It stretches resources.

**Adam:** You can only do one. Once you’re on a team, that’s your role. You’re not doing any of the other ones.

**Russell**: I don’t think we would want to be on more than one team. With the amount of effort and risk that you go through to be on one team – taking on two teams, you can’t do it.

**Tom:** Before the RFP, there’s an RFQ phase, which is brief. It allows infrastructure Ontario to identify the three qualified consortiums. They have been moving to a process where they begin by prequalifying the contractor group and the designers, together, but then not necessarily requiring them to put forward the qualifications of their mechanical and electrical contractors at that time.

In certain markets, that allows the smaller group of three consortiums to then go out and find their own mechanical and electrical contractors, once they are prequalified. It allows a situation to be avoided where you’ve got 20 different teams trying to get qualified down to three, each having to find 20 different mechanical and electrical trades that can do projects of this scale.

That may address a bit of your question from the contractor side.

**Participant:** There must have been a tremendous cost **[1:22:30 inaudible],** was there a stipend?

**Michael:**  They shortlist three proponents, and there’s a fairly healthy honorarium for each of them. Is it the kind of fee that we normally deal with at a schematic design stage? No. So there is some risk in doing them, but everybody is putting some risk.

It’s part of the game. We do get paid for it, it does cover costs, but there’s probably not a whole lot of profit in it, depending how you do it. The idea is to win. I think we figured that you’ve got to win one in three to make this risk worth taking.

In an environment like Ontario right now, if you’re a firm in healthcare, then you’re in P3. You don’t have a choice. You either do it or you move.

**Participant:** Is there another facility anywhere that is bigger than this? As you said, this is the type of facility that somebody hides inside a pre-engineered metalbuilding, that nobody ever sees the light of day. There’s a drive through sally port to drop everything off.

Achieving a budget and beauty and operational – is there anything else like this? This is brand new, ground up. Others have added on or expanded or remodeled. This is bleeding edge technology, wrapped up in something that’s architecturally pleasing. Is there anything like this anywhere else?

**Adam:** Not to this scale, necessarily. People certainly build these facilities new, and it’s not unusual to have medical examiner and a crime lab combined. But definitely, with this scale and consolidation-wise, in a lot of places in the U.S. you’ll see that the sheriff’s office and the PD and the different entities have their own small crime labs distributed around the city, where here, really, there’s one, and they do it for most of the province. That lends a lot to the scale.

**Participant:** I’ve done one. It’s next to the jail, it’s next to the sheriff’s office. I remember the coroner telling me, “Remember, I get a freezer.” Not cooler – freezer. I said, “What are you talking about?” He said, “Not everything we get is something that you want to look at **[1:25:26 inaudible]**. I need a flash fridge.” It’s just a whole different level of technology. Then, you’ve got to be able to **[1:25:37 inaudible]**. This is just gorgeous.

**Russell**: There is a facility that is similar in scale, and that’s the FBI in Quantico. It concentrates on forensic science; this is forensic science and medical examiner, and it has a courts component integrated into it. The one in Quantico is 506,000 square feet. Previously, I think that was one of the largest forensic laboratories.

**Participant:** How old is it?

**Russell:** It’s not that old. The trend for medical examiner facilities is to come out of the basement of hospitals and go into facilities that are designed in a way that’s much more friendly for the guys working in these facilities than the basement space. We are finding that they are extremely appreciative. They’re more energetic and efficient in doing their job if we can just give them some natural light and bring them up above ground.

**Participant: [1:26:45 inaudible]** Sacramento County Coroner’s Facility **[1:26:48 inaudible]** important **[1:26:58 inaudible]** in addition to just being **[1:27:00 inaudible]** there’s a very practical **[1:27:04 inaudible]** natural light allows them to get accurate **[1:27:08 inaudible]** of the body. **[1:27:09 inaudible]** trying to look at that under uncorrected **[? 1:27:17]** light tends to alter in most **[1:27:22 inaudible]** light. **[1:27:24 inaudible]**. Natural light is extraordinarily practical **[1:27:32 inaudible]**.

**Participant:** Some of us know in this room, there’s a reason there’s a body farm outside of Knoxville, Tennessee. People can see, instantly, like you say, all the things we don’t want to talk about here too close to lunch. They can look at and instantly and know whether this body is three days, three weeks, buried, temperature **[1:27:54 inaudible]**, whatever. It’s just extraordinary. Then, to take it to an alternative project delivery **[1:28:00 inaudible]**.

**Russell**: This does help us. There’s one completely different element. When it comes to just the building itself, the relationship, how it works specifically with medical examiners, is the sympathy that you need to provide a family that’s coming to identify potentially a relative.

When you do that, you have to be very careful with the environment you bring them into. This one does an excellent job of bringing them into the facility to do an identification, and not putting them into a place that they just absolutely don’t want to be. That makes a huge difference with at least the quality of doing an identification and how they can continue on with their grieving process.

**Nicola:** There were two facilities that we really looked at made an impression on me. One of them was St. Paul Crime Labs, which was a very nice architectural building as well as environment to work in.

The other one was the Orange County Coroner’s Office. It’s a fairly new facility. It had all of the **[1:29:07 inaudible]** – natural daylight, very nice design. Those two facilities influenced the whole user group that went down there.

**Participant:** I have two questions. **[1:20:22 inaudible]** There was some kind of process of keeping a different **[1:30:04 inaudible**].

**Nicola:** I will comment on two of them. The only thing I can say at this point about the other schemes is that we pushed all the proponents to be compliant. That was our job. The last thing you want to do is get a bid that’s not compliant. That wastes everyone time. Our job was to push everyone to be compliant.

The final selection, I can’t comment on how different or how similar they were, but what it really comes down to, when you look at the formula, is financial. Really, it comes down to financials, when you really look at the formula. That’s why it’s so important for us to push that design envelope right at the onset, because you know that it’s actually going to come down to **[1:31:02 inaudible]**. That’s about all I can say on that.

Your other question about the screen on the other building, that was one way to do it. In the document itself, we had written what we were looking for from a percentage standpoint of screening on that west façade. I don’t remember exactly what the number was, but we said, “You have to provide screening for this percentage.”

I think there were questions of, “Why did you show it with double skin?” That was just one way to do it. But in the document itself, we wrote prescriptively what we were looking for. I can say on that one, none of the teams did a double skin. What we were kind of hoping for it or **[? 1:31:51]** illustrated. They all reverted back to more conventional technology – **[1:31:59 inaudible]**.

That’s what it comes down to. We want to push the envelope from a design standpoint, but there is a financial **[1:32:08 inaudible]**.

**Tom:** You have to find a way to keep all the design ideas of the PDC scheme, but still build a less expensive mousetrap. Some of the key issues are bringing the training down to the ground floor: that meant less stair shafts.

The different arrangement to proportion of the upper floors, which actually reduced GFA, as well, and yet met the specifications for day lighting. That had a huge impact on cost. Dealing with emergency generators, locating them differently, had all sorts of cost benefits, and so on. It was a group of things really brought the cost down.

**Participant: [1:33:01 inaudible]** in square feet **[1:33:11 inaudible]**.

**Michael:** 665,000.

**Participant:** That’s the GFA, including the basement and the parking **[1:33:17 inaudible]**.

**Tom:** And the mechanical – it’s very large mechanical penthouse – double height.

**Participant:** Obviously, this is a DBFM delivery process. You **[1:33:36 inaudible]** it with a wonderful presentation. **[1:33:38 inaudible]** design piece of that’s what we’re all interested in, needless to say. With the whole builder financing and the maintenance piece – I think it goes without saying that those elements were on your team, as well.

**Michael:** Yes. The proponent team included a design team, construction team, and facilities management team. The finance guys were a bit in the background. The facilities management guys were at every design meeting. They could feed into any material decision that was made or any systems decisions that were made.

This 30-year maintenance is an interesting proposition. All of the sudden, you’re dealing with a contractor who wants to use a really good material, because it’s going to last 30 years, as opposed to the cheapest thing you can find. You get that kind of thing, too.

**Nicola:** On that note, on the compliance side, there is an FM compliance component as well. When their FM component submits their proposal, our FM compliance reviews that. And the same with financials.

**Participant:** What model does your **[1:35:12 inaudible]** module **[1:35:17 inaudible]** software, or did you use something else as well **[? 1:35:21]**?

**Michael:** The proponent that we were with are primarily facility managers and facility operators. They have all of their own systems, protocols and software. Its embedded in what they do.

**Participant:** Did you bring in your own **[1:35:41 inaudible]**?

**Michael:** In part, they were driven by the PSOS, and the proponent FM component had to be compliant.

**Tom:** All their manuals are prepared, much like a typical construction project, and verified through the FM team.

**Participant: [1:36:07 inaudible]** checklists **[1:36:15 inaudible]** frequencies and so forth **[? 1:36:17]**?

**Nicola [? 1:36:20]:** The FM guys **[1:36:23 inaudible]**.

**Tom:** They are the builders.

**Michael:** They were the owners.

**Nicola [? 1:36:28]:** **[1:36:28 inaudible]**. It’s not like somebody else **[1:36:36 inaudible]**.

**Russell:** Not only are they running the building, it’s Design/Build/Finance, and maintain 30 years, including utility cost. It really is the best value selection that should occur in a case like this.

**Tom:** Everything is amplified because of the interest on 30 years.

**Participant:** How long did the **[1:37:08 inaudible]** process take? **[1:37:12 inaudible]** six months – before the six months **[1:37:14 inaudible]** users in developing **[1:37:17 inaudible]**.

**Speaker:**  **[1:37:20 inaudible]**

**Michael:** They were pretty good. The representative who was on the team was pretty engaged in the team. Some things he was concerned about, some things he wasn’t; some things he commented on, some things he didn’t. If there was a real concern – like, the woods: soffit was a real point of discussion with him, but we won.

**Tom:** They also did their own energy modeling separate from the modeling we did for LEED. I think that’s an important point, actually. They’ve got other risks related to energy modeling, because of utility costs that they’re picking up. They did that work, distinct from our sustainability consultant.

**Participant:** You talked about being onsite **[1:38:39 inaudible]**.

**Michael:** We had a whole team.

**Participant:** You guys were there and they were there – what about their views **[1:38:47 inaudible]**? They were embedded full time?

**Nicola [? 1:38:52]**: No. They came and interviewed **[? 1:38:54] [1:38:55 inaudible]**.

**Michael:** We had a team of about six people onsite for the duration of the construction. Nic and his group came regularly, sometimes with –

**Participant:** **[1:39:07 inaudible].**

**Adam:** One of the other **[1:39:13 inaudible]** both the forensic pathology unit as well as the Center for Forensic Science dedicated a staff member to oversee literally the entire – they took them away from their normal duties. This was their job for five years, or whatever it was.

**Tom** **[? 1:39:30]**: Eight.

**Adam:** They dedicated **[? 1:39:31]** –they took their staff. They were the representatives that made all the decisions to go back to their people and come to consensus. Yes, that was their role **[1:39:47 inaudible]**.

**Nicola:** As Michael said, we invited them to this, but they’re busy moving into the building.

**Participant:** One final question. Obviously, you guys were through the whole process. All of us have been to a project and started off with one facility maintenance, and just about the time you think you’ve got everything, things change. I guess you got lucky enough that the facility management people were the same all the way through it or **[1:40:12 inaudible]** real major change in people or characters **[? 1:40:16]** in the middle **[? 1:40:17]**.

**Michael:** Staff did change, but they were from the same company and administered the same protocols.

Are there any other questions?

Thank you.