



CRA Design Review Committee
Held Virtually on Zoom
Meeting Notes
11-10-21

ATTENDEES

Barry Zevin (CRA Board), Kathleen Born (CRA Board), Hugh Russell (Planning Board), Louis Bacci (Planning Board), Tom Evans (CRA), Alexandra Levering (CRA), Fabiola Alikpokou (CRA), Carlos Peralta (CRA), Ian Hatch (BXP) Mike Tilford (BXP), Todd Lanham (Eversource) John Zicko (Eversource), Jamil Abdullah (Eversource), Charles Eck (Eversource), Joel Smith (Sasaki), Steve Engler (Sasaki), Liza Paden (Public Member), Christopher Arnieri (Eversource), Susan Barroso (Eversource), Adam Carr (Eversource), Henry Cobb (Eversource), Joseph Mayall (Eversource), Michele Beasley (Eversource)

PRESENTATION OF THE EVERSOURCE SUBSTATION INFRASTRUCTURE CONSTRAINTS AND OPEN SPACE DESIGN CONCEPTS

PRESENTATION

BXP, Eversource, and consultant Sasaki presented on the Eversource Substation Infrastructure Constraints and Open Space Design Concepts— Parcel 2 of the Kendall Square Urban Redevelopment Plan.

COMMITTEE COMMENTS

Infrastructure Constraints and Center Plaza Designs

Mr. Zevin noted that the diagram of the intake structure seemed tortured in that it fractures the louvered area into smaller pieces to conform to the sculptural form. He wondered what would happen if the intake form were dictated purely by engineering constraints to optimize it instead of trying to camouflage it or decorate it with some arbitrary architectural form? Mr. Tilford answered that the intake was very structured, and the focus was to ensure it does its job, which are the constraints. He also noted that they would come back with a more detailed design that offered options, including simpler and less sculptural elements. Mr. Tilford also added that they chose the current design of the exhaust vent to demonstrate a basic orthogonal shape, but there were opportunities for some more sculptural elements. Mr. Zicko said the required airflow would be 1.4 million cubic feet per minute, and the air velocity has been capped at 900 feet per minute to meet the sound level requirement. The air flow requires a free area of 1,555 SF, but the louvers cut the free area by 50%, doubling the surface area of the structure.

Mr. Bacci asked if the hatch would be below or above grade and if the scenario presented was looking at it above grade in the plaza? Mr. Zicko answered that the opening into the substation vault would be below the plaza and covered, but he was unsure what the top of the removable panel on the plaza would be. Mr. Tilford added that the intake and exhaust would have walls around them that would be

about 4ft above the flood elevation, and the intent was to put a cover on top of the equipment hatch. Mr. Smith added that the goal was to reach 25.45 ft above sea level and that the existing grade was only at an elevation of 23.5 feet. Therefore, they have to think about reaching the flood prevention goal while also integrating the hatch into the plaza design Mr. Zicko added that the design premise was to keep water from pouring over the hatch opening into the substation; therefore, the design has built up the opening in the plaza.

Mr. Bacci added that extending the walls around the hatch in the plaza, instead of having the hatch being flush as a roof creates its own problems. He also noted that putting the walls above the flood height encourages overtopping and ponding of water and that normally, the hatch cover would be flush with the plaza with the actual opening would be below grade. He asked if the cover on the plaza over the roof of the substation was raised one foot or two feet? Mr. Smith answered that it was about that range, but that it varies from south to north.

Mr. Bacci continued to add that the depth of the roof of the substation might be a problem because there's no distance or thermal insulation between the top of the roof of the substation, which might be the hottest part of the building. Therefore, he fears the deck will overheat. Mr. Lanham asked if the concept of having the hatch be a flush condition was a desired outcome or just a question?

Mr. Bacci stated that he does not understand the need for a wall if removable horizontal panels on the plaza would be waterproof. He also noted the considerable amount of real estate on the plaza occupied by the elevator, the stairway, and the ventilation stacks. Mr. Lanham pointed out that they are trying to create a rooftop garden on top of a working substation, and because of that, there are unique challenges they were trying to work around. Mr. Bacci agreed but added that he doesn't understand why there's a need for flood protection on an opening that could have waterproofing below grade.

Mr. Zevin added that the difference between a roof and the bottom of a swimming pool was that the roof doesn't need to carry several feet of water as a flush hatch might have to; a flush cover has much more demanding waterproofing and structural requirements than a cover/roof that's above the highest floodwater height. Mr. Bacci added the condition he was speaking of would have no depression. Mr. Zevin suggested the hatch should be considered a usable space and that there were opportunities to make useful and meaningful level changes above grade using the hatch in the plaza. Mr. Bacci asked whether it makes sense to have a flatter area be used by residents and people rather than having a two/three-foot-high pediment on the plaza that doesn't necessarily need to exist? Mr. Zevin answered no. Mr. Bacci continued to add that if the area were in a flush condition, it would be paved or have planters. He continued to note that the roof of the building was roughly two feet down and the waterproofing was not up at the plaza but below on the roof of the building.

Ms. Born commented that from an architect's perspective, the accepted method would be to make a raised hatch with a removable roof panel and a curb that could be effectively flashed to integrate it into the waterproofing membrane on the roof.

Mr. Russell added that he believed Eversource must be conservative because this is critical infrastructure; losing its function is not an option. Therefore, they were using their engineering judgment to create a plan that waterproofs up to an elevation of 25.45 feet and maybe has the ability to be raised in the next 100 years. He continued to add that the committee has to accept the situation as a given.

He said the smaller the exhaust structure, the better, and the ideal structure would be a slim cylinder that creates the smallest impact on people's view. Another vent form could be an octagonal structure, which based on Mr. Russell's quick calculations could be approximately 34 feet across and 34 feet tall. He said he would even prefer to make the louvers bright and shiny and have the structure twice as tall but slimmer. He asked whether the airflow speeds in the location where the vent penetrated the deck needed to be 900 cubic feet per minute or if it could be higher at that point? He continued to say that what he liked about an octagon was the view past its corners. Mr. Russell also noted that the ventilation towers were close to the apartments and office buildings; therefore, having a 40 foot long wall instead of 14 foot wall with two sides that go out sideways at 45-degree angles was rather different for folks living or working there. He noted he agreed with Mr. Zevin that the simplest exhaust structure would be the most attractive. He asked what the simplest way to form the structure with the least visual impact and least consumption of space would be on the plaza? Mr. Zicko noted that what was driving the base dimension of the stacks was that it sits atop of an internal vent stack that goes down to the lowest levels of the station, and the interior stack was sized for two reasons. One, to limit air velocity in the ducts, which limits noise. The second reason was to prevent the rise of the static pressure in the ducts, and that at a certain point, they run out of fan capacity to overcome the pressure drop inside the ductwork in the station. Therefore, the size of the stack coming up through the roof was well fixed by the practicalities of what it takes to move 1.4 million cubic feet of air a minute. Mr. Russell asked what the planned area of the shaft was?

Ms. Born noted her concern about unpredictable floods and massive failure. She asked if they were considering ringing the site with deployable water barriers? Mr. Tilford answered yes, and noted they have one in Atlantic Wharf on Boston Harbor, and one at 145 Broadway. Therefore, they were familiar with the technology. Mr. Zicko added that because they were dealing with a natural phenomenon, their design was based on the best information they had. He also noted that there was nothing in the design that prohibited them from deploying portable flood barriers in the future if deemed necessary. Ms. Born asked what form the deployable barriers come in, and Mr. Zicko noted that they come in many forms and go up easily. Mr. Zicko also stated that the hatch and the proposed wall were designed the way they are because if there was floodwater, they want to be able to open the hatch without having the water spill over into the station. He noted the same was true for rainfall or snow melt. Mr. Zicko continued to add that he envisions the barriers being deployed around the hatch and other openings or the entire plaza area if they predict an overtopping event. Ms. Born clarified that they were building a certain amount of flood protection into the hardscape, and beyond that, they were going to have the deployable barriers as an extraordinary means. Mr. Lanham asked if Ms. Born visioned the hatch taller or had it lower by making the entire area higher in elevation? Ms. Born answered that they have an expected flooded elevation, and every indication with climate change has ended up being worse; the prediction was dire, and her biggest fear was the substation would flood, and the city would lose power for a while. Mr. Lanham answered that the engineers included features to address the extreme events. Mr. Zicko added that they have included what they know was prudent based on their current information, which is subject to change. He continued to add that their priority is to keep the substation working.

Mr. Bacci agreed that they might need more elevation to add to the ability to make sure it was not too flat. He also noted it was better to have everything above the expected flooded level and then a touch more for the unexpected.

Mr. Russell asked if the blue line on the slide represented a couple of feet higher than the City's model of expected flood heights in 50 years? Mr. Tilford answered that there were two, the City's model, and what DPW shared with them which was a revised version, but only a draft. Mr. Russell asked what the line represented? Mr. Tilford answered that the line was the elevation identified by DPW as draft new flood elevations.

Mr. Russell continued to say that it makes sense to keep the plaza itself at roadway elevation in terms of usability, but how much do you protect the penetration? He also noted that it was easy to protect the air intake and exhaust towers, and the hatch was easy to raise up in 20-30 years, so he suggested to make it as low as possible for now. He also said that since the elevator and stairs were expensive to modify, they should consider designing an elevator with a shaft that's taller to stop it two-three feet higher, or to build the whole thing up so it'll be good for 150 years. Mr. Russell suggested creating a plan of action to keep the building in service for 150 to 200 years. Mr. Engler confirmed that it was 1% storm event from the DPW data they had. So, they are designing for two feet above that, but that he couldn't speak to the accuracy of the model. Mr. Tilford added that there was a cap beam that could be raised up, but then the useability of the park might be adversely impacted, but it was not dissimilar from the hatch idea.

Mr. Zevin asked if the reason to raise the whole thing would be if they were afraid that the water would be so deep that it would overstress the roof? Mr. Tilford answered yes and that they have structural engineers that can provide a memo that says the substation roof can sustain five feet of water or saturated soil. Mr. Zevin added that if raising some part of the plaza so the hatch curve was not high and didn't become a wall to lean against, but remained a wall to sit on could be okay.

Ms. Born noted that having the plaza level as designed does provide a natural connection between Broadway and Binney.

Mr. Russell was happy about the vent concept but noted that the exhaust structure seemed too big. However, if it was shown as a building with a café and it just happened to have a 10 feet high exhaust structure, it might be different. Mr. Russell also mentioned that if they aren't going to be able to have real trees, they should be artificial trees or shade structures. He suggested looking at an example at Harvard on top of the Cambridge Street underpass.

Mr. Zevin said the presentation was reasonable and asked if the Biogen bus fleet was going to return and if so, where the buses might stop —perhaps under the edge of Building C? Mr. Tilford answered that he had not spoken to Biogen, but he assumed they would return on the East Service Drive and would show it on future plans and get in touch with Biogen.

Mr. Bacci commented that the plaza has to do double duty because of the residential and commercial use. Therefore, he wants the designers to remember who would be using the space, like families with kids, and to consider who would be living there.

Ms. Born asked if the flexible lawn was referring to programing or physical description? Mr. Smith answered that it was more of a programing description but did not have specifics about what kind of programming would be available in the space; the term was to demonstrate that they have the flexibility to accommodate programs.

Ms. Born also asked if there would be a water feature on the plaza? Mr. Tilford answered yes; the water feature was still there. Mr. Smith noted that it was shifted off the substation, to be on Broadway near the cycle track which would hopefully draw people in.

Children's Play Area

Mr. Bacci said that the linear children's playground next to the Sixth Street Connector makes sense since Volpe's development would be on the other side. He suggested having it closer to the building itself to consider residents crossing.

Mr. Zevin said he was relieved a children's area was not on top of the substation and that it seemed like a good solution, but that the netting terrifies him.

Ms. Born noted that there was a tug between wanting to make the space the best urban space where people can feel comfortable and be excited about while also wanting to design a major utility that was resilient and safe.

Mr. Zevin asked if there was a need to access the elevator by ramp? Mr. Zicko said it would be very cumbersome, and ideally, to make the operation smooth, they would like trucks to back up to the plaza and offload there. Ms. Born asked what was going up and down in the elevator? Mr. Zicko answered it would be equipment. Ms. Born asked if the people working there would be using the elevator? Mr. Zicko answered that the station would be monitored and controlled 24/7 from their office in Dorchester because it was not staffed, but someone could be present if necessary. He added that he expected staff to do on-site monitoring once a month.

Mr. Bacci asked if the plaza would ventilate properly since it was sunken between many commercial buildings, and there would be a considerable volume of warm air coming out of the exhaust? Mr. Zicko answered that he understands the concern, and that they have asked for a heat dispersion study that includes a model of the area, the exhaust, and the intake to examine the temperature gradient and how the air will flow in and out of the plaza. They expect the study to be completed around November 25th. Mr. Zicko also added that Eversource was expecting a computational fluid dynamics model of the intake and exhaust structure, which would quantify the sound impact, and that that study was expected to finish in mid-January 2022. Mr. Bacci requested the study to also include a temperature from the roof of the substation since there was little cover over the building. Mr. Zicko noted that the equipment producing the most amount of heat would be at the lowest level in the station, and all the heat from that would be coming up through the exhaust stack. He also added that the equipment that would be on the first level below the plaza would have standard industrial equipment, like in a motor control center like AC, switchboards, emergency generators that rarely run, etc. Therefore, he noted there won't be a tremendous heat load directly under the plaza. Mr. Bacci expressed his concern for the temperature of the roof because of the little cover it has. Mr. Zicko added they need to prevent heat coming out of the lower-level transformers from damaging other equipment, so they want to remove the heat through the ventilation system. He also said by the time the heat travels 100 feet up, it would blend in with the background. He also added that the ventilation system was designed to skim hot air off the ceiling of the vaults and extract it. Mr. Bacci added that it was a gamble.

None