Hospital Building Safety Board

Administrative Processes, Code Changes, & Standard Details Committee

by

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APCCSD Meeting | June 22, 2020
AGENDA:

1. **Welcome and Introductions**  
   Facilitator: Michael O’Connor, Committee Chair

2. **Explore future impacts of COVID-19 on healthcare providers’ operations and planning, and to the design, agency review, construction, and inspection processes.**

   A. **Discussion: Potential Future Impact to Healthcare Facility Design Process**  
      Facilitator: Michael O’Connor, Committee Chair (or designee)

   B. **Discussion: Potential Changes to Design Team and Agency Review Process** — eServices Portal, ePlan Check, and video conferencing  
      Facilitator: Michael O’Connor, Committee Chair and Chris Tokas, OSHPD (or designee)

   C. **Discussion: Potential Changes to Construction Process** — Digitization  
      Facilitator: Pete Kreuser, Committee Member and Scott Karpinen, Frank M. Booth, Inc. (or designee)

   D. **Discussion: Potential Changes to Inspection Process** — Video and photos rather than wait for site visit  
      Facilitator: Mike Hooper, Committee and Joe LaBrie, OSHPD (or designee)
AGENDA:

D. Discussion: Technology Use, Video Conferencing, Webinars, and Remote Working Best Practices
   Facilitator: Chris Tokas, OSHPD and Michael O’Connor, Committee Member (or designee)

   Facilitator: Bill Gow, OSHPD (or designee)

4. Comments from the Public/Committee Members on issues not on this agenda
   Facilitator: Michael O’Connor, Committee Chair (or designee)
   The committee will receive comments from the Public/Committee Members. Matters raised at this time may
   be taken under consideration for placement on a subsequent agenda.
2. Explore future impacts of COVID-19 on healthcare providers’ operations and planning, and to the design, agency review, construction, and inspection processes.
COVID-19
Implications on Healthcare Design

Chris Tokas, Deputy Division Chief, OSHPD SAC
Bruce Rainey, Vice President – Healthcare, Jacobs Engineering
What Happened in the World?

31 Dec 2019
Wuhan Municipal Health Commission, China, reported a cluster of cases of pneumonia in Wuhan, Hubei Province. A novel coronavirus was eventually identified.

13 Jan 2020
Officials confirm a case of COVID-19 in Thailand, the first recorded case outside of China.

30 Jan 2020
World Health Organization (WHO) declared the novel coronavirus outbreak (2019-nCoV) a Public Health Emergency of International Concern (PHEIC). This is the 6th time WHO has declared a PHEIC since the International Health Regulations (IHR) came into force in 2005.

11 Mar 2020
WHO made the assessment that COVID-19 can be characterized as a pandemic.

What Happened in California?

26 Jan 2020
The Centers for Disease Control and Prevention (CDC) confirmed the first case in California, the third case in the U.S. The person, a man in his 50s, who had returned from travel to Wuhan, China, was released from the hospital in Orange County on February 1.

29 Jan 2020
The U.S. Department of State evacuated 195 of its employees, their families, and other U.S. citizens from Hubei Province aboard a chartered flight to March Air Reserve Base in Riverside County.

5 Feb 2020
U.S. evacuated 345 citizens from Hubei Province and took them to two air bases in California, Travis Air Force Base in Solano County and Marine Corps Air Station Miramar, San Diego, to be quarantined for 14 days.

What Happened in California?

Feb 2020
City of San Francisco, Orange County, San Diego County, Santa Clara County, Solana County declared a local health emergency.

4 Mar 2020
Governor Newsom declared a state of emergency. Communities begin shelter-in-place and stay-at-home orders.

10 Mar 2020
Governor Gavin Newsom announced 24 new cases of COVID-19 for a total of 157 confirmed cases in the state. San Francisco announces a ban on large gatherings and later issued an order forbidding visitors to hospitals.

18 Mar 2020
The Department of Defense said the Navy’s hospital ship USNS Mercy is being prepared for deployment in California, "to assist potentially overwhelmed communities with acute patient care"

What Happened in California?

19 Mar 2020
Governor Newsom announced a statewide stay-at-home order.

1 Apr 2020
Governor Newsom announced ordered the closure of all public and private schools for the remainder of the academic year.

9 Apr 2020
Governor Newsom announced the state would pay for hotel rooms for hospital and other essential workers afraid of returning home and infecting family members.

7 May 2020
Governor Newsom announced that the state is moving into Stage 2 of its four-stage reopening roadmap.

How Did Hospitals Respond?

**Operational Changes**

- Restrictions on visitors/non-healthcare workers
- Enhanced cleaning requirements throughout facility
- Limitation on points of entry into facilities
- Deployment of surge tents
- High use of PPE
- Closure of clinics
- Shut down of elective surgeries
- Increased use of Telemedicine/Telehealth
- Staff work-from-home programs
How Did Hospitals Respond?

**Facility Modifications**

- Conversion of non-isolation/non-patient spaces into isolation use
- Increased deployment of hand gels and improved hand hygiene requirements
- Increased deployment of UVC light emitting devices
- Deployment of staff and patient tracking mechanisms
Operational Changes in Healthcare Delivery Forced by COVID 19
Operational Changes in Healthcare Delivery Forced by COVID 19

- **The goal:** be able to isolate and treat infectious patients while continuing to provide other vital services that keep people healthy and bring in the revenue
  - Triage and check in patients remotely, quarantine the infected in separate facilities and reduce physical contact with caregivers to prevent the spread of disease
  - Resurgences of the coronavirus, and potential outbreaks of other infectious diseases
Operational Changes in Healthcare Delivery Forced by COVID 19

• **Making intake safer** (zero-contact intake process)
  • The end of traditional single entrance
  • Separate infectious patients
  • Quarantine zones
  • Portable buildings mobilized as needed
  • Rethinking the medical record preadmittance component
  • Digital Check-in patients as they approach the hospital (GIS) Red, Yellow, Green designation based on symptoms
    • higher-risk patients are escorted directly to care rooms

• **Choking down building access**
  • Separate patients and clinicians from visitor traffic

• **Rooms equipped with technology that prevents airborne diseases from escaping**
  • Increasing isolation-room capacity
  • Universal Rooms to provide more flexibility
  • Ability to convert Operating Rooms to Intensive Care Units when needed
Operational Changes in Healthcare Delivery Forced by COVID 19

• Building Management Systems that provide for changing room pressure differentials as needed

• Increase medical gases suction and electrical power capability, which can be deployed quickly to handle space needs in a massive patient surge
  • Providing medical gases and emergency power in non-patient areas

• Keeping doctors and patients at a distance
  • Doing virtual rounds with one doctor in the room and others connected via videoconference outside
  • In ICUs, IVs and monitors positioned outside the room so nurses can check patients’ status without unnecessary exposure for both
  • Computerized Robots go into patient rooms for telehealth visits
    • potentially enables doctors to have more-frequent visits with patients because they don’t need to take time to don and doff protective equipment
  • “Mechanized helpers” may also see more service in hospital wards
    • Robots to perform tasks that take nurses away from direct patient care, such as fetching and delivering medications and supplies to patient rooms and handling lab samples
Operational Changes in Healthcare Delivery Forced by COVID 19

• **Doing better follow-up**
  - Monitoring patients at home

• **Built new emergency departments with better disaster preparation**
  - Dedicated isolation and decontamination rooms that can be used for patients who present with infectious disease, behavioral-health or chemical-contamination issues
  - Multiple entrances for different levels of patient severity
  - Interdepartmental imaging and X-ray facilities so patients don’t have to be transported to the main hospital for tests
Operational Changes in Healthcare Delivery Forced by COVID 19

• More partnerships between health systems and payers as telehealth accelerates

• Technology will be the catalyst but it must be applied strategically
  • Augmented reality
  • Artificial intelligence-enabled technology,
  • Precision medicine; and,
  • Virtual care support

• The combination of increased data gathering and artificial intelligence to make the society more resilient to disease spread

• The most prized skills in physicians will be empathy, communication and self-awareness in the digital age
A. Potential Future Impact to Healthcare Facility Design Process
ACHA recently surveyed its certificates, fellows, candidates and applicants in an effort to reveal their insights on the future of healthcare architecture and the role of design in the COVID-19 healthcare crisis.

The survey revealed the following:

- Over 63% of respondents helped clients evaluate alternative care sites.
- Over 60% of ACHA experts were called on to help healthcare systems increase capacity – 28% created over 100 beds.
- Over 70% of respondents believe design for mass casualty patient surges will be an important element for hospitals in the future.
- Over 80% of respondents thought the telehealth boom would have major impact on facility design.

ACHA surveyed more than 100 certified professional healthcare designers to reveal lessons learned from COVID-19 and the role of medical planner in addressing the crisis. Participants represent areas across North America, including many of the most severely affected states such as New York, New Jersey, Illinois, Massachusetts, California, and Pennsylvania.
WHICH OF THESE STRATEGIES ARE YOUR HEALTH SYSTEM CLIENTS USING TO RESPOND TO COVID-19?

- Increasing ED throughput (23%)
- Halting elective surgeries and procedures (92%)
- Aggregating COVID-19 into one site or hospital (53%)
- Increasing ICU capacity (56%)
- Increasing Medical Acute Care Isolation rooms (53%)
- Other (19%)
HOW WILL THE COVID-19 PANDEMIC IMPACT THE DESIGN AND CONSTRUCTION OF HEALTHCARE FACILITIES IN THE FUTURE?

More accommodations for telehealth (82%)

Requirements for more surge capacity (70%)

More intensive care units / negative pressure isolation (66%)

Increased adoption of prefabricated / modular elements for flexibility (43%)

Other (28%)
HAVE YOU BEEN INVOLVED IN ANY MEASURES TO CREATE TEMPORARY PATIENT SPACE FOR COVID-19 TREATMENT?

- Yes (63%)
- No (37%)
IF YES TO THE PREVIOUS QUESTION

- Converting existing patient units for higher acuity (acute care to ICU for example) (38%)
- Alter systems to create more negative pressure isolation patient rooms (44%)
- Creating / adapting triage space (31%)
- Developing temporary structures such as tents / trailers (24%)
- Developing Alternate Care Sites (ACS) such as convention centers / hotels (50%)
- Not applicable (8%)
- Other (22%)
HOW HAVE DESIGN TEAMS BEEN ASSISTING HEALTHCARE CLIENTS DURING THE COVID-19 CRISIS BEYOND PROJECT WORK?

- Providing healthcare design research (54%)
- Code searches (35%)
- Evaluating Alternate Care Sites (64%)
- Coordinating engineering services (42%)
- Other (27%)
IF YOU HAVE HELPED CLIENTS CREATE MORE BEDS AS SURGE CAPACITY, HOW MANY BEDS HAVE YOU CREATED?

- 24 or less (9%)
- More than 25 (10%)
- More than 50 (9%)
- More than 100 (16%)
- More than 500 (12%)
- n/a (43%)
HOW HAS YOUR HEALTHCARE PROJECTS / WORKLOAD BEEN AFFECTED BY COVID-19?

- Accelerated to meet current need (33%)
- On hold until after pandemic restrictions are lifted (67%)
- Changed to meet new programmatic requirements (25%)
- Projects been cancelled indefinitely (23%)
- No change (20%)
- Other (21%)
UPCOMING CHALLENGES FOR HEALTHCARE DESIGN

Upcoming challenges:

• How can hospitals be designed so normal operations (such as elective procedures) can continue through a pandemic so as not disrupt regular patient treatment and reduce financial challenges?

• Restrictions will likely be implemented on patient/visitor traffic flow to control cross-contamination. How will this transform facility intake and entry design?

• How can architects emphasize on building flexible, adaptable facilities that can be easily modified to allow a quick response to changing medical priorities?

• How can healthcare and non-healthcare facilities be designed to handle patient overflow in a more expedient fashion?
Reimagining Healthcare Design After COVID-19

• **Improving Infection Prevention**
  - The hospital’s infection control/prevention team is going to become a greater influence in many design meetings going forward.
  - There will be increased pressure to make design features more easily cleaned and use finishes that withstand harsher chemicals.
  - More health systems will use UV light or sterilizing mists in high- and medium-risk areas. Low-risk areas like exam rooms will need more thorough cleaning protocols and room turnover processes.
  - No-touch patient facility solutions –Sensor Controls Sensor/voice/motion activated controls
  - Touchless concepts for highly used surfaces
  - All this needs to be done without sacrificing the warmth and hospitality of today’s designs.

• Source Healthcare Design Perspectives May 7, 2020
Reimagining Healthcare Design After COVID-19

• Triaging patients before they enter the ED: re-envision the triage and intake process
  • ways to triage people before they walk in the front door
    • tele-triage, apps, and multiple entries and waiting solutions, based upon medical needs.
  • Overflow facilities that are external to the hospital need to be sturdy, durable, and quickly erected, with utility connections planned for and already in place.
• Urgent care sites may be outfitted with drive-through windows or exterior-access exam rooms, to permit infectious or “worried-well” patients to be tested in a socially distanced manner, while still allowing patients to gain access to an in-person care provider.
• Overflow facilities that are external to the hospital need to be sturdy, durable, and quickly erected, with utility connections planned for and already in place.
Reimagining Healthcare Design After COVID-19

- **Re-imagining waiting rooms and public spaces & Patient Processing**
  - All public spaces including waiting rooms, lobbies, and dining facilities will have to be carefully planned and designed to create greater physical separation between people, with appropriate queuing.
  - More discreet and sub-divided waiting areas, leveraging contemporary audiovisual and other interactive technologies to maintain line-of-sight and communication pathways
  - Separate pathways to intensive care units, to minimize cross-contamination
  - Nobody liked the waiting room previously, but now it seems inconceivable that people will be willing to sit next to possibly infectious strangers while they wait for an appointment or a loved one’s procedure.
  - Trends like self-check-in and self-rooming will accelerate to minimize interactions with other people.
Creating Safe Staff Zone

- **Mechanically enhanced** staff safe zones in healthcare facilities (humidity control, air treatment systems, additional outside air) **systems to provide a cleaner and safer environment.** This will become especially critical as providers call on retired or physically-compromised staff to address acute staff shortages.
- Large, shared break rooms and locker rooms may be eliminated in favor of smaller, more discrete spaces.
- Administrative departments may be moved off-site or work-from-home arrangements may be devised to reduce the staff on campus.
- Off-stage safe hub for home and telehealth monitoring sites (virtual care centers)
Reimagining Healthcare Design After COVID-19

• Increasing isolation room capacity & the “Patients Journey”
  • The biggest conversion most facilities have undertaken during the pandemic is increasing the number of isolation rooms. Going forward, hospitals will need groups of rooms and entire units and wings that can be negatively pressurized and cut off from the rest of the hospital in a pandemic. These units will need easy ways to get patients in from the ED, as well as trash out, without going through the entire hospital. While anterooms are not required in the Facility Guidelines Institute’s guidance, design teams will still need to address how staff can remove PPE without contaminating the hallway outside isolated patient care areas.
Reimagining Healthcare Design After COVID-19

• Greater supply chain control
  • Hospitals and health systems will seek greater control of their own supply chain and will likely stockpile key supplies, equipment, and medication to avoid future supply shortages. They may develop acquisition agreements with third party supply and equipment vendors for stockpiles they cannot afford to maintain on their own and will expect greater support from their group purchasing organizations.
  • Some stockpiles may be at individual hospitals, while larger systems may maintain supplies regionally or nationally.
  • We will need to design facilities to house these inventories as well as systems to maintain, refresh, and replenish them.
Reimagining Healthcare Design After COVID-19

• Telemedicine’s impact on facility sizing
  • Telemedicine has boomed throughout this crisis, allowing clinicians to perform routine check-ups and triage with patients without putting either doctor or patient at risk. While the future reimbursement for telemedicine is unclear, the impact on our designs will be tremendous.
  • The technology is relatively cheap, physicians can see more patients in the same amount of time, and there are virtually no space requirements. It’s likely that many service lines will need smaller outpatient centers in the future as telemedicine reduces the need for exam rooms, waiting rooms, and support spaces.
  • Clinicians may even be encouraged to do a portion of their clinic days from home, rather than from their on-site office.
Reimagining Healthcare Design After COVID-19

• Planning for inpatient surge capacity
  • We’ve been designing for flexibility in hospitals for years, and now we must consider how a hospital could accommodate double or triple the number of patients. Questions to ask include, “How could two beds fit in every room?” “Which rooms can flex up to intermediate care or ICU capacity?” “How can surgical prep and PACU be converted into overflow ICUs?” and “If they are needed, how are emergency surgeries still performed?” We need to explore these questions through every building system (HVAC, E-power, med gas, etc.) to make sure that services to these units can meet the vastly increased patient and equipment load.

• Finding surge capacity in outpatient centers
  • The continued growth in ambulatory care will resume as soon as our current crisis passes.
  • Because many of these facilities are often owned by healthcare systems and already have emergency power or limited medical gasses, they have the potential to provide faster surge capacity, with fewer disruptions, than the field hospitals being erected in hotels and convention centers.
  • Many hospitals already include these buildings within their surge plans, even though they weren’t specifically designed to accommodate this use.
  • As we develop outpatient clinics, freestanding EDs, and ambulatory surgery centers, we need to consider the infrastructure that’s necessary for these facilities to support sicker patients during the next pandemic.
Reimagining Healthcare Design After COVID-19

IMPACT TO HVAC SYSTEM DESIGN

• ASHRAE / CDC / WHO – Position / Recommendations

• Mode of transmission: droplets / aerosols?

• Ventilation / Air Cleaning Strategies
  • Room Pressure Differential / Directional Airflow
  • HEPA Filtration
  • UVGI
  • 100% OA vs Recirculation

• Temperature & Humidity
Reimagining Healthcare Design After COVID-19
IMPACT TO MEDICAL GAS SYSTEM DESIGN

• Revisit Diversity Factors - Oxygen, Medical Air

• Piping Sizing Impact

• Consider adding outlets in area that could be used for surge

• Availability of Ventilators

• Systems Capacity / Emergency Plan
What Should be Considered in Design?

- Ability for the BMS to change an area from return air to 100% exhaust where supported
- Use of UV-C for contaminant controls in return air systems
- Technology for patient tracking, staff tracking, etc., in order to manage influx and discharge effectively (entry/exit pathways)
- Telehealth and its impact on design and space needs
- Connections for emergency response units on campus (may not be next to hospital)
- Use of robots (AGVS’s, AMR’s, etc.) to lower human interactions
• More airborne infection isolation rooms
• Some patient rooms adjustable to:
  • negative pressure
  • all air exhausted through HEPA
• Some ORs with a negative ante-room
  • Operating rooms capable of switching from positive to negative?
• Providing built-in options to converting patient rooms to negative pressure (similar to PIN 4)
• Possible further evaluation of circulation in triage/ED units
Potential Code Changes

- UV-C treatment at coils and/or filters
- R.H. from 40% to 60% in some spaces
- Enhanced filtration with MERV 13 or 14 as a starting point. 13 is more applicable to many spaces while 14 may induce excess pressure drop
- Measures to increase outdoor air rates (dilution)
- In-room HEPA recirculating systems
- Evaluate the application of minimum 6 total ACH where there starts to be a point of diminishing return in the reduction of Quanta within a room
- Adjustment to some negative HEPA/exhaust ICU spaces
Potential Code Changes

- Touchless operational components:
  - Water fountains
  - Water bottle fillers
  - Revolving doors
  - Elevators
  - Doors not requiring hand contact (accessibility bars, etc.)
- Disinfectant mats at entries
- Increased locations for low return/exhaust grilles
- Dedicated exhaust path for each toilet stall (partitions up to the ceiling). Possible increase to 15 ACH
B. Potential Changes to Design Team and Agency Review
Moving Forward Together - Virtual OTCs

- Design team can be in different locations
- Reduces travel for design teams
- Reduces back checks

Virtual OTC’s
OSHPD & Designer(s)
Two Contact Points

Virtual OTC’s

Multiple Contact Points
OSHPD is using information technology to the extent possible to facilitate timely performance of its duties and responsibilities
Other Technology

Smart Board Drafting Boards
Other Technology

Virtual Meetings - Videoconferencing

Webinar Productions
What Did We Learn?

• We can interact apart
  • Use of eServices Portal should be expanded
  • Use of ePlan Check should be accelerated
• Plan checks and design reviews can be virtual
Construction Protocol Changes
Emerging Successfully out of 2008 Financial Crisis - Lessons Learned

• Successful construction companies typically moved fast and hard on productivity (including cost reduction)
• Rapidly reallocated resources, and made bold moves (including early divestitures and acquisitions in recovery) to prepare for the future
• Leaders invested heavily in digital technologies
• Differentiated their portfolios and offerings, and cleaned up their balance sheets
What is the construction industry will look like after the crisis?

- leaders must first define and prepare for what the construction industry will look like after the crisis. Seven actions can help them anticipate and adapt to the next normal.

### The five horizons

**1. Resolve**
Address the immediate challenges that COVID-19 represents to institution’s workforce, customers, technology, and business partners.

**2. Resilience**
Address near-term cash-management challenges and broader resiliency issues during virus-related shutdowns and economic knock-on effects.

**3. Return**
Create detailed plan to return business to scale quickly as COVID-19 situation evolves and knock-on effects become clearer.

**4. Reimagination**
Reimagine the next normal: what a discontinuous shift looks like and implications for how institutions should reinvent.

**5. Reform**
Be clear about how regulatory and competitive environments in industry may shift.

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*McKinsey & Company*
COVID-19’s effects on supply, demand, and industry dynamics
Short- and long-term trends

• Short term: Increased digitization
  • Shifting to remote ways of working.
    • Designers and engineers are relying even more heavily on digital collaboration tools such as building-information modeling (BIM)
    • Leading engineers and contractors are using 4D and 5D simulation to replan projects and reoptimize schedules
    • Digital-twin solutions are being developed to be used end to end, from project concept to commissioning
    • Contractors are looking to monitoring their employees’ well-being through apps, ordering construction materials, managing scarce resources more accurately, and maintaining cash flow
Short- and long-term trends

• **Short term: Rebalanced supply chains toward resilience (versus efficiency)**
  • Contractors are building inventory, securing critical materials and long-lead items, and identifying alternative suppliers

• **Long term: Augmented consolidation**
  • Players are looking to consolidate to establish economies of scale and support investment in IT, talent, R&D, and technology
  • Companies and investors will increasingly look to consolidation for much-needed resilience in their balance sheets
Short- and long-term trends

- **Long term: Vertical integration.**
  - Industry players have started to vertically integrate to increase efficiency and as a route to standardization and control of design and execution
  - In a post-crisis world, vertical integration (which may include a return to greater reliance on direct labor) is a potential route to greater resilience

- **Long term: Further investments in technology or digitization and innovation of building systems**
  - Shortage of skilled labor
    - Physical-distancing measures
    - Restrictions on cross-border movement of labor
  - Digital tools have proven to increase productivity, such as 4D simulation, digital workflow management, real-time progress tracking, and advanced schedule optimization
  - Increased in R&D spending to develop new standardized building systems to speed up and automate elements of design and construction
  - Are we going to see more players investing in automation of on-site and back-office processes
Short- and long-term trends

• *Long term: Increase in off-site construction*
  • Quality and speed benefits
  • Contractors gradually push fabrication off-site
  • Manufacturers expand their range of prefabricated subassemblies.
  • Building in controlled environments is more effective and efficient in a world that requires close management of the movement and interaction of workforces

• *Long term: Acceleration toward sustainability, including designs for healthier living*
### Advanced construction technologies used on health care projects reported by all respondents

<table>
<thead>
<tr>
<th>Technology</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Building information modeling</td>
<td>25%</td>
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<tr>
<td>Prefabrication used for components (e.g., MEP racks, patient room headwalls, etc.)</td>
<td>21%</td>
</tr>
<tr>
<td>Drones</td>
<td>15%</td>
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<tr>
<td>360-degree photography</td>
<td>13%</td>
</tr>
<tr>
<td>3D projection mapping</td>
<td>12%</td>
</tr>
<tr>
<td>Modular construction used for units (e.g., bathrooms, exam rooms, etc.)</td>
<td>11%</td>
</tr>
<tr>
<td>Remote monitoring</td>
<td>8%</td>
</tr>
<tr>
<td>Radio frequency identification tags used to track equipment</td>
<td>7%</td>
</tr>
<tr>
<td>Virtual reality</td>
<td>7%</td>
</tr>
<tr>
<td>3D printing</td>
<td>7%</td>
</tr>
<tr>
<td>Augmented reality</td>
<td>6%</td>
</tr>
<tr>
<td>Radio frequency identification wearables used to track workers</td>
<td>5%</td>
</tr>
<tr>
<td>Predictive analytics software</td>
<td>5%</td>
</tr>
<tr>
<td>LiDAR (light detection and ranging)</td>
<td>1%</td>
</tr>
<tr>
<td>Robot laborers</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Top factors for using advanced construction technologies on health care projects by respondents using such technologies

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control costs</td>
<td>80%</td>
</tr>
<tr>
<td>Enhance collaboration and communication</td>
<td>53%</td>
</tr>
<tr>
<td>Shorten or maintain schedule</td>
<td>52%</td>
</tr>
<tr>
<td>Reduce changes in the field</td>
<td>47%</td>
</tr>
<tr>
<td>Improve project safety and quality</td>
<td>44%</td>
</tr>
<tr>
<td>Cost estimating</td>
<td>37%</td>
</tr>
<tr>
<td>Streamline decision making</td>
<td>35%</td>
</tr>
<tr>
<td>Monitor progress</td>
<td>23%</td>
</tr>
<tr>
<td>Improve worker safety</td>
<td>18%</td>
</tr>
<tr>
<td>Systemwide initiative to adopt new technology</td>
<td>15%</td>
</tr>
<tr>
<td>Decision driven by construction management vendor</td>
<td>10%</td>
</tr>
<tr>
<td>Mitigate labor shortages</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: *Health Facilities Management* /ASHE 2020 Hospital Construction Survey
C. Potential Changes to Construction Process
POTENTIAL CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19
POTENTIAL CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

What is the status with current construction projects?

• Varies by counties.
• “Essential” projects required owner letter.
• Financial Impacts.
• Subcontractor participation concerns.
• Monday morning impacts.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Labor Productivity Impacts
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Labor Productivity Impacts:

• Electronic Sign-In.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Labor Productivity Impacts:

• Screening/Temperature
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Labor Productivity Impacts:

• Verification.
• Temperature Checks.
• Wrist band.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Distancing during construction.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Distancing during construction.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Vertical Transportation.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Vertical Transportation.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Disinfection.

• Sanitize Tools & Equipment.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Handwashing Requirements.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Productivity Impacts:

• Masks.
• Gloves.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Material and Personal Protection Equipment (PPE) Cost Impacts
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Material Impacts:

• Material price fluctuations.
• Lead times increasing.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

PPE Cost Impacts:

• Facemasks (some N-95).
• Antifog Safety Glasses.
• Hand Sanitizer.
• Safety Officer.
• 3rd Party Audit on some projects over 20,000 sf.
CURRENT CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

Cost Impacts:

• Material Costs TBD.

• Average cost impact for labor alone is approximately 12.5% increase.
POTENTIAL CHANGES TO CONSTRUCTION PROCESS ACTIVITIES DURING COVID-19

How will construction change in the future?

• Vertical Integration to reduce risk?
  • More offsite fabrication?
  • More modular construction?
  • More elevators?
  • Material supply changes?
  • Robotic construction?
D. Potential Changes to Inspection Process
Field Staff safety measures employed

All personnel should wear the following PPE during OSHPD Field Observations during a pandemic:

- Everybody wears a mask,

**Additional** Items considered by the CDPH as PPE

- gloves
- Gowns / aprons,
- Goggles, face shields, facemasks, and
- respirators.

https://www.cdph.ca.gov/Programs/CHCQ/LCP/Pages/AFL-20-39.aspx
Field Staff safety measures employed
Jobsite visit, and Field Inspections

• Safe **meeting place** where you can maintain social distancing (>6’-0”) from each other.
• Limit **number of people** to join field inspections i.e. Field Staff, IOR, Design Prof., CM, Installing Contractors.
• Consider rotating or staggering shifts to limit the number of employees in the workplace at the same time.
• Shorten the site visit to reduce the entourage
• Site walk and Inspections should be limited to the area of work only.
• Field Staff **should not** be taken into non-construction related areas of the facility.
• If the area of construction involves Covid-19 patients, all possible measures should be taken to **avoid** the area completely.
• Limit tool sharing if possible.


Additional comments by John J. Schrenk
Job Walk Considerations
Ventilated opening Inspections

If area of inspection involves roof and/or any opening construction, the person responsible for guiding the Field staff should identify:

- Roof and opening vents
- What area of the facility the vents are exhausting i.e. COVID-19 isolation rooms, OR, ICU, Laundry, etc. steering OSHPD staff away from those areas.

The guide should provide a roof and opening plan of this information prior to accessing those areas.
Temporary modifications in response to COVID-19

• Documenting temporary COVID-19 modifications reported by Facilities or IOR or observed by OSHPD Field Staff in a Field Visit Report (FVR) to the BLD.
• Reporting COVID-19 modifications by Facilities – No project & permit required for Temporary work in response to COVID-19.
• OSHPD Projects are required to comply with the Approved Documents. Whereas, COVID-19 Temporary Emergency Measures are to be documented, but do not have to meet Code Compliance in accordance with the Governor’s Executive order.
• Place any recommendations related to the COVID-19 Temporary Measures at the top of the Field Visit Report.
• The FVRs will be provided to the facilities.
ARTICLE 20
REPAIR OF DAMAGE AFTER AN EMERGENCY

7-305. All buildings.
Where the repairs to damage caused by an emergency (COVID-19) are required, facilities may reopen, after temporary repairs, for a limited period of time subject to the following.

1. **Temporary repairs:** The hazard resulting from damage to the facility is abated and the facility is at least restored to its pre-emergency condition or its equivalent. The COVID-19 Temporary Measure removed and area restored to its pre-COVID-19 condition.

2. **Permanent repairs/retrofit:** The owner successfully negotiates with the Office a time bound plan for the permanent repairs/retrofit of the damaged facilities required by these regulations.
Permanent modifications in response to COVID-19

- Permits are required
- Request for Emergency Authorization.
  - What really is under Emergency? A cafeteria project is not considered, for example, related to COVID-19. Therefore, it is not considered emergency.
- Remodel projects requested as Emergency – Historically, emergency projects were approved in response to a failure or imminent failure of an equipment. Facilities have applied the COVID-19 response as a means to expedite work that traditionally would not be approved as an emergency project.
- Preliminary plans/TIO/Calcs/Functional Program are to be submitted prior to consideration for an emergency authorizations.
ARTICLE 20
REPAIR OF DAMAGE AFTER AN EMERGENCY
7-300. Plan review and approval.
(a) All repair projects are subject to prior plan review, plan approval and construction permit by the Office except as noted in subsection (b). (b) For emergency repairs carried out without the Office plan review and permit the aftermath of an emergency, an application for plan review must be submitted with construction documents, fees and a letter of transmittal stating the reasons for emergency repairs. Photographs, if available, and reports of damage and repairs should also be submitted with the application. Additional repairs may be required if the emergency repairs do not comply with the code. For alternate fee payment methodology, see Section 129787 of the Health and Safety Code. (c) Plan reviews for emergency damage repairs will be performed on a priority basis. The application for plan review should clearly state that the scope of the project is to repair the damage from the emergency. Where possible, reviews will be made over the counter.

Additional comments by Mickey Fong
June 15, 2020
Via email

To: All Subcontractors, Designers, Consultants, Inspectors

On Monday June 15, 2020, McCarthy Building Companies, Inc. ("McCarthy") was notified that a worker tested positive for COVID-19. The individual last worked on site on Wednesday June 10, 2020 and is currently self-quarantining in accordance with the COVID-19 safety policy of the employer. We are alerting you to this development because based on the confirmed COVID-19 infection, access to the elevator lobbies (passenger side) will be restricted until further notice.

All potential areas of exposure are being isolated and cleaned in accordance with McCarthy's COVID-19 Safety Protocol. Any individuals within prolonged contact and within 6 feet of the infected individual will be notified. Please advise if there is any immediate safety concern with the current status of your work.

McCarthy will determine when work in the affected area can resume by ensuring:
- All areas are fully cleaned as listed above.
- The project has adequate supervision.
- The project has appropriate PPE, cleaning and disinfection methods required to work safe.
- That only those who have been deemed healthy by CDC and company guidelines are allowed to return work.
Case Study

**UPDATE as of June 16, 2020** obtained

Confirmed **COVID-19 cases has increased** to two (2) infected **workers** from the same subcontractor crew.

The IOR’s have been the Field Staff’s primary contacts with close and prolonged contact with staff.

The Lead IOR reports that McCarthy has sealed the lobby area with visqueen and has contracted with a third party sanitation subcontractor. **No sanitation has occurred to date in the area where affected workers were working** and it is unknown if the HVAC system in the affected area has been secured.
No contact tracing investigation has occurred to date. Hospital has been reportedly taken over the role of main contact with the County Health Department to arrange for contact tracing investigations.

Field Staff to remain on self-monitoring isolation with no site visits to the hospital or other facilities or projects until further notice. Remote reviews from home HQ to continue.

Field Staff have reported that some entities are not disclosing infection.
Inspection Services Unit

Post COVID-19 Activities

“Covid Temporary” Construction: Not our typical Temporary Projects type

• Field Staff Actions: Staff will need to make Field Surveys based on collected job numbers / reports collected during COVID period.

• Field Staff Monitoring: Staff will need to continue to track facility progress of removing any Covid Temporary work through an undetermined grace period.

• Track Status with INV project numbers: After a grace period, INV projects will be created for all non-compliant Covid Temporary projects that have not be reconciled.
Post COVID-19 Activities

- **Consequences of Non Compliance** by Owners: Owners will be charged the time and material expense for ongoing maintenance of the Covid Temporary construction.

- Messaging to Staff and the Public: Executive Leaders will make field staff aware of how this will be implemented once the Governors Executive Order is lifted.
Post COVID-19 Activities

Covid Defined Emergency Projects that are permanent: To be treated like any other Emergency project which includes all necessary design and inspections documentation.
360° Camera Technology
360° Camera Technology
360° Camera Technology
Remote Inspection by Use of Technology

• Digital Video, Live Streaming, Digital Photos, Augmented Reality, 360 ° Camera, 3D Cameras,
Remote Inspection by Use of Technology

- Remote Inspection: IOR Not Allowed
- Remote Inspection: Special Inspectors: Not Allowed
Remote Inspection by Use of Technology

• Remote Observation: OSHPD Field Staff:

  • Mandatory Report of Observation Event

• Use of remote technology tools are not intended to replace Site Visits. Rather, they are used to augment in-person site visits.
Remote Inspection by Use of Technology

Remote Observation: Design Professionals:

- Report of Observation Event

- Use of remote technology tools are not intended to replace Site Visits required for “Personal Knowledge”. Rather, they are used to augment in-person site visits.

- A PIN should be developed clarify the issue
Current Short Term Inspection Challenges:

• Spread of Covid-19 infection to more projects
• Undetected infection spreads to contractor’s work force, inspectors, and OSHPD field staff
• Infected inspectors and OSHPD field staff carry Covid-19 to other projects until the infections are detected and they are isolated at home.
• Increased number of inspectors and OSHPD field staff become unavailable.
• Projects are delayed and/or temporarily stopped.
Current Long Term Inspection Challenges:

• IOR work force is diminishing
• Efforts to bolster the IOR work force have been hindered.
• IOR certification exam dates in April and May have been delayed indefinitely.
• IOR recertification tests are planned for August but are subject to delay.
• IOR certification exam for October and November planned but are subject to delay.

Bottom line:
IOR attrition + IOR infection + Delayed New IOR + Delayed Recert IOR = IOR Shortage
THEREFORE…

IOR Shortage = Project production slowdown
Options for Course Correction:

1. Ignore infection Issue: **Not Acceptable**
2. Accept project production slowdowns and delays: **Undesirable**
3. Change statute for permanent use of technology and inspection: **Possible**
4. Leverage Governor's Executive Order to TEMPORARILY: **Best**
   - Extend IOR recertification deadlines
   - Create a new way to administer the IOR certification exam
   - Create a policy for the use of technology to acquire personal knowledge.
Discussion
E. Technology Use, Video Conferencing, Webinars, and Remote Working Best Practices
NEXT STEPS:
CONCLUSION / DISCUSSION / Q&A
Electrical Proposals for Adoption of 2020 National Electrical Code (NEC)

Bill Gow
June 22, 2020
Adoption of 2020 NEC with California Amendments

• California Health and Safety Code Section 18928 requires that each state agency adopting or proposing adoption of a model code, national standard, or specification shall adopt or propose adoption of the most recent editions of the model codes, as amended or proposed to be amended by the adoption agency, within one-year after the date of publication of the model codes, national standards or specifications.

• August 25, 2019, has been established as the publication date of the 2020 National Electrical Code.

• OSHPD must submit initial express terms and other documents for the 2022 California Electrical Code to California Building Standards Commission by July 28, 2020.

• OSHPD will be allowed to update the initial express terms and resubmit by May 2021.

• Current changes are housekeeping items due to changes in Model Code.
Add OSHPD 5 to OSHPD Banner in Selective Coordination Definition in Article 100

Coordination, Selective (Selective Coordination). Localization of an overcurrent condition to restrict outages to the circuit or equipment affected, accomplished by the selection and installation of overcurrent protective devices and their ratings and settings [OSHPD 1, 2, 3, 4 & 5] utilizing the 0.10 second level of the overcurrent protective device from the time current curve as the basis for the lower limit of the calculation method.
Change the “Emergency System” to “Essential Electrical System” in 220.42 OSHPD 1 Amendment

220.42 General Lighting. The demand factors specified in Table 220.42 shall apply to that portion of the total branch-circuit load calculated for general illumination. They shall not be applied in determining the number of branch circuits for general illumination.

[OSHPD 1] The factors of Table 220.42 shall not be applied in the following areas: surgery suite, including recovery; emergency department, kitchen, food service, dining, critical care areas as defined in Article 517, elevator lobbies, corridors, inpatient nurse stations, and loads connected to the life safety branch or the critical branch of the emergency essential electrical system. Administrative areas shall be included in “All others” Type of Occupancy.
Revise OSHPD Amendment for Receptacles Installed Near Tubs and Shower Stalls to Align with Changes in 406.9(C) Model Code

406.9 Receptacles in Damp or Wet Locations.

…

(C) Bathtub and Shower Space. Receptacles shall not be installed within a zone measured 900 mm (3 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space directly over the tub or shower stall.

Exception: In bathrooms with less than the required zone the receptacle(s) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.

(1) [OSHPD 1, 2, 4 & 5] Receptacles shall not be installed within shower rooms or stalls or be accessible from within these areas. Receptacles shall not be installed within 5 feet (1.52 m) of the perimeter of bathtubs or shower stalls. Exception not adopted.
Revise OSHPD Amendments for Switches Installed Near Tubs and Shower Stalls in 404.4(C)

404.4 Damp or Wet Locations.

…

(C) Switches in Tub or Shower Spaces. Switches shall not be installed within tubs or shower spaces unless installed as part of a listed tub or shower assembly.

[OSHPD 1, 2, 4 & 5] Switches that are not part of a listed tub or shower assembly shall not be installed within shower rooms or stalls, or be accessible from within those areas. **Switches operating at line voltage** shall not be installed within 53 feet (1.52m900 mm) of the perimeter of bathtubs or shower stalls. **Switches powered by a Class 2 power sources shall be permitted to be installed outside the perimeter of bathtubs or shower stalls.**

*Exception: Bath station devices meeting the requirements of 517.123 shall be permitted to be installed within the tub or shower area.*
Essential Electrical Systems

Type 1

- Hospitals and Health Facilities with Critical Care Spaces
- CEC 517.29 – 517.35

Type 2

- Most Intermediate and Skilled Nursing Facilities and Other Health Facilities without Critical Care Spaces
- CEC 517.40 – 517.44
Relocation of Existing OSHPD Amendment Due to Restructuring of 517.30(C) Model Code Requirements and Delete OSHPD 5 for OSHPD Banner

517.30 Sources of Power.

...

(C) Location of Essential Electrical System Components.

Essential electrical system components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [99.6.2.4.1] [OSHPD 1 & 4 & 5] Refer to California Building Code, Section 1617A.1.40.

(1) Services....

(2) Feeders....
517.32 Branches Requiring Automatic Connection.

(A) Life Safety and Critical Branch Used in a Type 1 EES.

Those functions of patient care depending on lighting or appliances that are connected to the essential electrical system shall be divided into the life safety branch and the critical branch, as described in 517.33 and 517.34.

[OSHPD 1, 2, 3, 4, & 5] The life safety and critical branches shall be installed and connected to the alternate power source specified in 517.30(A) and (B) so that all functions specified herein for the life safety and critical branches are automatically restored to operation within 10 seconds after interruption of the normal source.

(B) Life Safety and Critical Branch Used in a Type 2 EES.

The life safety and critical branches shall be installed and connected to the alternate power source specified in 517.41(A) and 517.41(B) so that all functions specified herein for the life safety and critical branches are automatically restored to operation within 10 seconds after interruption of the normal source. [99:6.7.5.3.1]
Relocation of Existing OSHPD Amendments in 517.34(A)(4), 517.34(A)(7)j-k, & 517.34(A)(11) Due to Renumbering of Model Code

517.34 Critical Branch.

(A) Task Illumination and Selected Receptacles.

…

(4) Nurse call systems

[OSHPD 1, 2, 3, 4 & 5] Exception: Battery-powered components of wireless emergency nurse call systems complying with the latest edition of ANSI/UL 1069, Standard for Hospital Signaling and Nurse Call Equipment.

…

(7) Task illumination, select receptacles, and select power circuits for the following:

[Subsections j through k [OSHPD 1, 2, 3 (surgery clinics), 4 & 5]]

j. Food preparation areas, central supply, and utility rooms
k. Electrical and mechanical rooms

…

(4011) [OSHPD 1, 2, 3, & 4 & 5] The following equipment:…
517.44 Connection to Equipment Branch. The equipment branch shall be installed and connected to the alternate power source such that equipment described in 517.35(A)(6) is automatically restored to operation at appropriate time-lag intervals following the energizing of the life safety and critical branches. [99:6.7.5.1.4.2(A)]

The equipment branch arrangement shall also provide for the additional connection of equipment listed in 517.44(B).

Exception: For essential electrical systems under 150 kVA, deletion of the time-lag intervals feature for delayed automatic connection to the equipment branch shall be permitted.

517.44.1 [OSHPD 2, 4, & 5] Connection to Equipment Branch. The equipment branch shall be installed and connected to the alternate power source such that equipment described in 517.44(A) is automatically restored to operation at appropriate time-lag intervals following the energizing of the life safety. [99:6.7.5.1.4.2(A)]

The equipment branch arrangement shall also provide for the additional connection of equipment listed in 517.44(B).

Exception: For essential electrical systems under 150 kVA, deletion of the time-lag intervals feature for delayed automatic connection to the equipment branch shall be permitted.
OSHPD Amendment to Change “Critical Branch” to Equipment Branch” for Type 2 Essential Electrical Systems to Align with Type 2 Branch Naming Convention

517.44 Connection to Equipment Branch. …

(B) Delayed Automatic or Manual Connection to the Equipment Branch. …

…

(3) Optional Connections to the Equipment Branch. Additional illumination, receptacles, and equipment shall be permitted to be connected only to the critical branch.

(3.1) [OSHPD 2, 4, & 5] Optional Connections to the Equipment Branch. Additional illumination, receptacles, and equipment shall be permitted to be connected only to the equipment branch.
Delete 1R and Add OSHPD 5 to OSHPD Banner for Periodical Testing of Emergency System

700.3 Tests and Maintenance.

…

(B) Tested Periodically. Systems shall be tested periodically on a schedule acceptable to the authority having jurisdiction to ensure the systems are maintained in proper operating condition.

[OSHPD 1, 1R, 2 & 5] The authority having jurisdiction is Department of Public Health, Licensing and Certification.
Repeal of OSHPD Amendment Requiring Listing of ATS Rated above 1000 VAC Due to Revision in Model Code

700.5 Transfer Equipment.

(A) General. Transfer equipment shall be automatic, listed, and marked for emergency use, and approved by the authority having jurisdiction....

(C) Automatic Transfer Switches. Automatic transfer switches shall be electrically operated and mechanically held. Automatic transfer switches shall not be permitted to be reconditioned. [OSHPD 1, 1R, 2, 3, 4 & 5] Automatic transfer switches rated above 1000 VAC shall be listed for emergency system use or approved by an alternative testing and approval program acceptable to the authority having jurisdiction.
Relocation of Existing OSHPD Amendments from 700.12(B)(2) to 700.12(D)(2) and from 700.12(E) to 700.12(G) due to Renumbering of 700.12 Model Code.

700.12 General Requirements....

(D) Generator Set....

(2) Internal Combustion Engines as Prime Movers.

(a) On-Site Fuel Supply. Where internal combustion engines are used as the prime mover, an on-site fuel supply shall be provided with an on-premises fuel supply sufficient for not less than 2 hours’ operation of the system.

Exceptions [SFM, OSHPD 1, 2, 3, 4 & 5]

Exception No. 1: [SFM, OSHPD 1, 2, 3, 4 & 5] The on-premises fuel supply shall be sufficient for not less than 24 hours full-demand operation in acute general care hospitals and correctional treatment centers that provide optional services. For acute care hospital facilities required to meet NPC-5, the on-premise fuel supply shall be sufficient for no less than 72 hours full-demand operations.

Exception No. 2: [SFM, OSHPD 1, 2, 3, 4 & 5] The on-premises fuel supply shall be sufficient for not less than 6 hours full-demand operation in the following health facilities of seven or more beds: correctional treatment centers that provide only basic services, acute psychiatric hospitals, intermediate care facilities, and skilled nursing facilities.

Exception No. 3: [SFM, OSHPD 1, 2, 3, 4 & 5] The on-premises fuel supply shall be sufficient for not less than 4 hours full-demand operation in ambulatory surgical clinics.

... 

(G) Fuel Cell System. Fuel cell systems used as a source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.

Exception: [OSHPD 1, 2, 3, 4 & 5] Fuel cell system shall meet on-premises fuel requirements specified in Article 700.12 (D)(2).
Thank you
4. Comments from the Public/Committee Members on issues not on this agenda