EXPEDITING EMERGENCY CONSTRUCTION PROCUREMENTS: CASE STUDIES IN SUCCESS

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Abstract: While the law allows public transportation officials to do what it takes to resolve the emergency, they are expected to maintain an extremely careful balancing act between expeditiously resolving the crisis and abusing their authority to circumvent the routine full and open competition process using the emergency as justification. The ability to waive standard procedures comes with the requirement to use that authority both sparingly and wisely. This paper presents analysis case studies of expedited emergency projects from nine states that range from a $550,000 landslide repair to a $234 million interstate highway bridge replacement. The cases also cover emergency projects delivered by design-bid-build, construction manager/general contractor, design-build and indefinite delivery/indefinite quantity contracts. The paper finds that the major factor for successful emergency procurement is for the owner to utilize procurement processes with which it is familiar. It also finds that owners need to allow as much competition as time and circumstances permit to reduce the probability of a substantive protest. Finally, it recommends anticipating an emergency and making advance preparations is the fastest way to react to an emergency and the surest method for avoiding protest.

1 INTRODUCTION

"In both [US] federal and state law, the use of emergency procurement procedures allows for limited competition in selecting a contractor... however, this limitation must be carefully utilized and fully documented" (Perry and Hines 2007 italics added). Herein, lays the heart of the primary procurement dilemma for public officials attempting to expeditiously deliver the design and construction services necessary to resolve an infrastructure availability crisis. The law grants broad latitude regarding suspending statutory competition requirements in an the emergency situation, officials are also expected to the legal tightrope between expeditiously resolving the crisis and potentially abusing the authority to suspend full and open competition while using the emergency as justification. Emergency powers come with the requirement to use that authority both sparingly and wisely throughout the crisis. The New Mexico Department of Transportation (DOT) emergency procedures manual (2007) puts it this way: "Lack of planning does not constitute an emergency." Another author evaluating the difficulties of emergency procurement puts it this way: “Perhaps a good rule of thumb is, when in doubt, bid it out." (Houston 2011).

The primary research objective was to identify trends in successful emergency construction project delivery via the analysis of case study projects. Secondarily, the research sought to determine the impact of limiting competition during emergency procurements and identify effective practices for providing as much competition as practical that can be replicated in future emergencies.
2 BACKGROUND

Many of the studies on the deteriorating condition of the North American transportation system find that public agencies must deliver critical infrastructure projects “better, faster, cheaper” (Atzei et al. 1999; Richmond et al. 2006). However, when an emergency occurs and removes an essential piece of the infrastructure such as a major bridge, the alternatives for optimizing the procurement process narrow to the point where only one of the three previous components remain, and that one is time, i.e. “faster.” While “better” (quality) and “cheaper” (cost) are still of concern, they take a lesser priority until service is restored. Then, the public attention often switches to an analysis of value for money from a retrospective viewpoint. The attention often criticizes the procedures used by the agency to restore service as quickly as possible. The result is that public agencies have expended much time and money to develop emergency management plans supported by a preapproved set of expedited procurement procedures.

2.1 Spectrum of Emergencies

The pressing need to expedite the delivery of an emergency project normally arises unexpectedly, and the magnitude of the response can range from very little to a declaration of a national disaster. When the emergency is large enough to make national news like Hurricane Sandy on the US east coast or the Interstate 35W bridge collapse in Minnesota or the 2013 ice storm in Ontario, public officials must implement expedited procurement procedures to restore vital network links with the media scrutinizing their work every night on the evening news. While high profile emergency projects are well-known, the more typical case is a local emergency caused by flashing flooding washing out a culvert on a rural road or a freeway overpass damaged and closed from a traffic accident. These mundane local emergencies sometimes go unnoticed in the news, but are just as critical to drivers traveling through the locality and require the agency to exercise just as much speed to restore service and remove threats to life and property. The difference in the two situations can be the construction industry’s willingness to accept a change in customary rules ensuring free and open competition for construction projects. In major disasters, the publicity encourages a “do whatever it takes” attitude due to the emotions surrounding the event that are rarely present in the localized incidents. Nonetheless, agencies have found ways to successfully resolve both large and small emergency disruptions to network service. Therefore the purpose of this paper is to evaluate the collective experience with expedited procurement procedures to deliver both design and construction services for emergency highway projects.

2.2 Legal Constraints on Emergency Procurements

Based on local statutes, most public agencies are given the power to take whatever action is determined necessary to insure health, safety and welfare of the community in an emergency. For example the Florida statutes (2010) state: “The political subdivision has the power and authority to waive the procedures and formalities otherwise required of the political subdivision by law pertaining to: performance of public work and taking whatever prudent action is necessary to ensure the health, safety, and welfare of the community; entering into contracts [and] incurring obligations...” This verbiage applies to awarding emergency highway contracts by the Florida DOT. Most, if not all, US state codes provide similar authority to ignore routine statutory competition constraints in an emergency where the time it takes to follow the routine procurement process would or could exacerbate the impact to the health and safety of the community.

The United States Code (2000) authorizes public agencies to provisionally suspend its construction bidding regulations for contracts awarded for emergency situations. Normally, the Federal Highway Administration’s (FHWA) requires consultant contracts to be awarded on a competitively negotiated basis to the best qualified offeror based on the Brooks Act (23 CFR §172.5a3) and contracts for construction to be awarded on the lowest responsive and responsible bidder to be approved for federal funds. Additionally, roads designated as eligible for federal-aid are also eligible for federal funds administered by FHWA. Title 23 USC §125 authorizes emergency relief (ER) funding for the “repair or reconstruction of highways, roads, and trails, ... that the Secretary finds have suffered serious damage as a result of— (1) natural disaster over a wide area, such as by a flood, hurricane, tidal wave, earthquake, severe storm, or landslide; or (2) catastrophic failure from any external cause.”
Further complicating the mobilization of assets to cope with an emergency event is the requirement for gain approval from and coordinate with resource agencies to meet the requirements of the National Environmental Policy Act (NEPA). The Council on Environmental Quality (CEQ), which issues the implementation guidance for Federal NEPA actions, states: “Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the Federal agency taking the action should consult with the Council [on Environmental Quality] about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review.” (Perry and Hines 2007). Once the immediate threat to “the health, safety, and welfare of the community” has been resolved by interim emergency repairs, the agency must shift to conventional contracting procedures to award any remaining work (UDOT 2011).

3 METHODOLOGY

The study utilized two primary research instruments: literature review, including a content analysis of agency emergency management documents, and formal case studies of a cross-section of emergency projects. An effort was made in the review of relevant literature to not only seek the latest information but also historical information so that any change over time in emergency procurement practices could be assessed with the current state-of-the-practice. The content analysis of DOT emergency procedure documents from 38 states using a protocol proposed by Neuendorf (2002) constituted the second source of information. Both these instruments supported the third line of independent information: the case studies.

3.1 Case Study Protocol

The literature review and content analysis drove the case study data collection and the sought to identify projects from across the spectrum of emergency transportation projects with procurement aspects of specific interest to the study. The final group of case study projects highlights a specific emergency procurement issue that was address using expedited procurement procedures for emergency project delivery. The case studies were collected using a methodology detailed by Yin (2004). Yin’s approach requires that case study data be collected in conjunction with the comprehensive review of the literature. Thus, it allows the researcher to not only maintain a high level of technical rigor in the research but also follow Yin’s three principles in the process of research data collection: 1). use of multiple sources; 2). creation of a database, and 3). maintenance of a chain of evidence (Yin 2004). Thus, information gleaned from the case studies can be combined with information collected in the literature review to validate case study conclusions.

3.2 Case Study Selection

The primary objective in this paper is to analyze the value of bringing the contractor into the design process. Therefore, the following criteria for the final set of case study projects were applied:

- “Range of project delivery methods – design-bid-build (DBB), construction manager/general contractor (CMGC), design-build (DB), and indefinite delivery/indefinite quantity (IDIQ).
- Range of project types – roads and bridges
- Range of project size – typical small project to mega-project
- Range of project complexity – simple to highly complex
- Range of project location – regionally dispersed
- Range of solicitation type – Invitation for Bids (IFB) to sole source
- Range of payment provisions – lump sum (LS) to time and materials
- Use of incentive/disincentive (I/D) and bonus provisions” (Gransberg and Loulakis 2012)

Case Study Demographics
The study identified nine emergency procurement projects worth more than $290 million in nine states that represent the cross-section of variations on project types, sizes, and project delivery methods. Table 1 is a summary of the case study projects that were sampled for this research. One can see that the projects span from coast to coast and north to south. The case study projects represent the use of four different project delivery methods including a hybrid DBB project with a nested DB provision. The project types spanned the spectrum from the replacement of a washed out culvert to an emergency replacement of an eight lane interstate highway bridge over the Mississippi River.

Table 1: Emergency Procurement Case Study Projects. (adapted from Gransberg and Loulakis 2012).

<table>
<thead>
<tr>
<th>State (Agency acronym)</th>
<th>Case Study Project (Value)</th>
<th>Construction Type</th>
<th>Expedited Procurement Procedure</th>
<th>Project Delivery Method</th>
<th>Payment Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>California (Caltrans)</td>
<td>I-580/880 MacArthur Maze Replacement ($5.9 million)</td>
<td>Overpass bridge replacement after truck struck pier and burned</td>
<td>Invitation-only bids from 9 experienced contractors.</td>
<td>DBB</td>
<td>UP with time incentive</td>
</tr>
<tr>
<td>Florida (FDOT)</td>
<td>I-10 Escambia Bay Bridge Repair ($26.4 million)</td>
<td>Repair interstate bridge damaged in hurricane</td>
<td>Natural Disaster Emergency Contract - Invitation-only bids from 4 contractors.</td>
<td>DB</td>
<td>LS with time incentive</td>
</tr>
<tr>
<td>Maine (MDOT)</td>
<td>Route 27 Bridge Replacement ($2.89 million)</td>
<td>Replace two bridges destroyed by flooding</td>
<td>Use of CMGC by a DOT without routine CMGC authority.</td>
<td>CMGC</td>
<td>UP</td>
</tr>
<tr>
<td>Minnesota (MnDOT)</td>
<td>I-35W Bridge Replacement ($234 million-DB contract only)</td>
<td>Replace collapsed interstate bridge</td>
<td>Abbreviated DB procurement for mega-project and protest of award.</td>
<td>DB</td>
<td>LS + time incentive &amp; No Excuse Bonus</td>
</tr>
<tr>
<td>Missouri (MoDOT)</td>
<td>I-270 – St. Louis County Slide Repair ($550,000)</td>
<td>Emergency land slide remediation on interstate highway</td>
<td>Use of a &quot;nested&quot; DB contract provision in a DBB contract</td>
<td>DBB w/DB</td>
<td>Time &amp; Materials</td>
</tr>
<tr>
<td>Montana (MDT)</td>
<td>US -2 Rockfall Mitigation ($3.0 million)</td>
<td>Rockfall mitigation features</td>
<td>Use of a DB unit price provision without geotechnical investigation.</td>
<td>DB</td>
<td>LS with UP items</td>
</tr>
<tr>
<td>New York State (NYSDOT)</td>
<td>981G Ramapo River Bridge Replacement ($1.4 million)</td>
<td>Bridge replacement</td>
<td>Use of Statewide Emergency Bridge IDIQ Contract</td>
<td>IDIQ</td>
<td>Time &amp; Materials</td>
</tr>
<tr>
<td>Oklahoma (ODOT)</td>
<td>I-35 – Culvert Repair ($715,000)</td>
<td>Replace major box culvert washed out by flooding</td>
<td>Sole source cost plus contract for temporary shoring while expedited IFB developed</td>
<td>DBB</td>
<td>UP with hourly I/D</td>
</tr>
<tr>
<td>Utah (UDOT)</td>
<td>SR-14 Landslide Repair ($15 million)</td>
<td>Repair extensive landslide damage</td>
<td>Use of CMGC to expedite construction via 3 work packages</td>
<td>CMGC</td>
<td>GMP</td>
</tr>
</tbody>
</table>

*LS = Lump sum; GMP = Guaranteed maximum price; UP = Unit price; I/D = Incentive/disincentive clause
4 CASE STUDY ANALYSIS

Due to the page limitations for this paper, the salient details of the case studies have been synopsized in Table 2 to permit the reader the ability to easily compare any specific project against all other projects. The analysis of the case study projects shown in Tables 1 and 2 will focus on the comparison of the PDM rationale, procurement, permits, incentives, and tools used to expedite the emergency procurements. These elements are the factors that constitute the elements that must be addressed to allow the agency to expedite the procurement of an urgent or emergency project. Based on the protocol detailed in Section 3, a set of standardized categories was established for the procurement rationale information and the tools used to expedite the procurements. This permits the direct comparison of case study projects and the identification and classification of trends during cross-case analysis. Finally, it should be noted that three of the nine cases involve procurements that anticipated the emergency and put resources in place contractually to be able to rapidly react to an emergency if it occurred or to mitigate the risk that the emergency would be actualized. As can be seen in Table 2’s timeline column, this proactive approach not only provides the ability to immediately react without the need to process environmental permits or acquire right of way, but it also eliminates the risk that the award of the emergency contract will be protested on the grounds that the agency abrogated its responsibility to maintain free and open competition in all procurements.

Table 2: Case Study Project Details

<table>
<thead>
<tr>
<th>Agency</th>
<th>Scope</th>
<th>PDM Choice Rational – Procurement Procedures – Permits</th>
<th>Incentive Details</th>
<th>Expedited Procurement Tools</th>
<th>Time to Completion</th>
</tr>
</thead>
</table>
| Caltrans | Replace I-580 overpass and I-880 deck | - DBB with I/D only authorized PDM  
- Invitation only prequalified contractors  
- Emergency permit waiver | $200K/day capped at $5 million | - Limited competition  
- Standing list  
- Incentivize critical success factors | Award:  
Demo – 1 day  
New – 2 days  
Complete: 27 days |
| FDOT     | Temporarily bridge           | - Need single source of design and construction  
- Invitation only prequalified contractors  
- Used expedited award with hand-written scope  
- Emergency permit waiver | $250K/day capped at $3 million | - Limited competition  
- Abbreviated contract docs  
- Co-locate design on site  
- Use of available materials  
- Contractor design involvement  
- Incentivize critical success factors | Award:  
1 day  
Complete: 91 days |
| MDOT     | 2 new bridges                | - Need contractor input to design  
- Invitation only prequalified contractors – negotiated GMP  
- Emergency permit waiver | None | - Limited competition  
- Standing list  
- Use of available materials  
- Contractor design involvement  
- Confidential ATCs  
- Confidential one-on-one meetings | Award:  
2 days  
Complete: 82 days |
| MnDOT    | Replace I-35W bridge         | - Extensive agency DB experience; needed sophisticated contractor  
- Minimized info req’d in proposals;  
- Categorical exclusion for 10 req’d permits | $7 million & $2 million/10 day period early capped at $20 million | - Co-locate design on site  
- Contractor design involvement  
- Incentivize critical success factors  
- Abbreviated contract | Award:  
50 days  
Complete: 339 days |
<table>
<thead>
<tr>
<th>Agency</th>
<th>Scope</th>
<th>PDM Choice Rational – Procurement Procedures – Permits</th>
<th>Incentive Details</th>
<th>Expedited Procurement Tools</th>
<th>Time to Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoDOT</td>
<td>I-270 landslide repair</td>
<td>- DBB project known to be in high land-slide zone.</td>
<td>None</td>
<td>Award: none</td>
<td>Complete: 120 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Nested DB provision with specialty contractor to repair slide if req’d</td>
<td></td>
<td>- Anticipated emergency with special provision</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No permits required</td>
<td></td>
<td>- Contractor design involvement</td>
<td></td>
</tr>
<tr>
<td>MDT</td>
<td>US-2 rockfall mitigation</td>
<td>- Need single source of design and construction</td>
<td>None</td>
<td>Award: 87 days</td>
<td>Complete: 157 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Nested UP provision in LS contract</td>
<td></td>
<td>- Anticipated emergency with special provision</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Contractor pulled permits</td>
<td></td>
<td>- Contractor design involvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Confidential ATCs</td>
<td></td>
<td>- Confidential one-on-one meetings</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Anticipated emergency with special provision</td>
<td></td>
<td>- Contractor design involvement</td>
<td></td>
</tr>
<tr>
<td>NYSDOT</td>
<td>Replace 981G bridge</td>
<td>- Need stand-by contractor</td>
<td>None</td>
<td>Award: none</td>
<td>Complete: 57 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IDIQ procured before emergency</td>
<td></td>
<td>- Anticipated emergency with special provision</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Emergency permit waiver</td>
<td></td>
<td>- Contractor design involvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I-35 Culvert Repair</td>
<td>- DBB with I/D only authorized PDM</td>
<td>$16K/day capped at $100K</td>
<td>Award: 1 day</td>
<td>Complete: 15 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Invitation only prequalified contractors</td>
<td></td>
<td>- Limited competition</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Emergency permit waiver</td>
<td></td>
<td>- Standing list</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Need contractor input to design</td>
<td></td>
<td>- Use of available materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Invitation only prequalified contractors</td>
<td></td>
<td>- Incentivize critical success factors</td>
<td></td>
</tr>
<tr>
<td>UDOT</td>
<td>SR-14 landslide repair</td>
<td>- Minimized info req’d in proposals;</td>
<td>None</td>
<td>Award: 38 days</td>
<td>Complete: 360 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Contractor pulled permits</td>
<td></td>
<td>- Abbreviated proposal docs</td>
<td></td>
</tr>
</tbody>
</table>

### 4.1 Case Study Procurement Analysis

Table 2 shows that the need to have the construction contractor’s input during design drives the selection of a project delivery method for an emergency project. Agencies favor CMGC and DB since these methods involve the contractor making substantive input to the design process and purport to improve constructability and construction phasing (West et al. 2012). Caltrans and ODOT did not have the statutory authority to use DB or CMGC, and therefore, both agencies turned to adding large incentives to their DBB contracts as a means of encouraging the contractor to focus on achieving an aggressive schedule (Bai et al. 2006). Maine had authority to use DB but wanted to use in-house design assets, which is functionally impossible in a DB contract. Thus, the agency sought emergency authority to use CMGC to replace the Route 27 bridges (Pulver 2012). New York’s emergency bridge replacement IDIQ was in place when Hurricane Irene washed out the bridges over the Ramapo River (NYSDOT 2007) and as such was able to marry up in-house design assets with the IDIQ contractor that delivered the projects in exactly the same fashion as a typical CMGC project with the contractor identifying immediately available structural steel sections around which the NYSDOT engineers designed (Rueda and Gransberg 2014). This leads to the conclusion that early contractor design involvement is key to not only achieving an expedited delivery but it also facilitates the schedule by designing a project that is highly constructable.

Table 2 also shows that when an agency is unable to obtain an emergency waiver of environmental permitting requirements, the contractor can be given the responsibility for obtaining the permits based on its actual means and methods. The Montana DOT assigned the permit responsibility to its contractor.
because the permits would be specific to the means and methods that would be used in the field (MDT 2011). The Utah DOT shared the permitting responsibility with its contractor because of the need to build a temporary access road as quickly as possible to provide egress for the residents that were trapped by the landslide in the valley. A Stream Alteration Permit was required to restore the bed and banks of the creek that is located below the road as well as permits from the county, the US Fish and Wildlife Service and the Utah Department of Wildlife Resources. Lasty coordination was required with the local Native American tribe. To quantify the risk of delay due to permitting, UDOT had the contractor develop two schedules, naming them the “Fast Track” and “Slow Track” permitting packages. These planning packages included right-of-way, environmental documents, and the contractor’s site grading package, which is dependent on both. The Slow Track schedule was 60 days and the Fast Track schedule is 25 days. Permits were received in time to allow preliminary construction to start and accomplish the removal of excess material and to build the temporary access road (UDOT 2011).

Five of the case study projects limited competition to a standing list of prequalified contractors. While still limiting free and open competition, this approach provides more competition than a sole source award and essentially give all potential contractors the chance to qualify for inclusion on the prequalified list before the emergency. Thus, the risk of a protest of award based on restricting competition is reduced and the agency is encouraging as much competition as practical given the urgency of the emergency procurement.

Lastly, every case study project utilized some form of altered or streamlined version of procurement procedures to advertise, evaluate and award the contract. One end of the spectrum was the Florida project that was awarded using FDOT’s standard form modified with seven pages of hand-written “assumptions and clarifications” (Maxey 2006). Minnesota’s process reduced the size of the DB proposal for $240 million bridge project to a mere 20 pages by holding confidential one-on-one conferences to clarify issues in the solicitation and entertain alternative technical concepts (Heitpas 2008). Montana modified its routine lump sum DB contract by adding a unit price item as a means of sharing the geotechnical risk with its design-builder.

4.2 Case Study Incentives Analysis

A recent Strategic Highway Research 2 study found that on complex projects the agency should first identify critical success factors and then incentivize those aspects of project delivery that contribute to success (Gransberg et al. 2013). Table 2 shows that to be the case in only four of the nine projects included monetary incentives. To put this in perspective, three of the cases, Missouri, Montana and New York, were contracts awarded before the emergency occurred and therefore, the contracts were formed without the urgency inherent to contracts procured after an emergency event, reducing the need for incentives and quite frankly, making large incentives more difficult to justify. In these cases, the incentive is in winning the contract. Maine and Utah were other two cases without incentives and both were delivered using CMGC. In CMGC, the contractor is actively involved in forming the final design solution (West et al. 2012) and in both cases, the agency created an incentive for expeditious completion in its contractor selection scheme during procurement. Previous project delivery methods research found that contractors view the possibility of getting future work by satisfactorily completing a CMGC project as the most valuable incentive available in this method, or as stated by one author: “By far the most important incentive that an owner has is the promise of repeat work” (Thomsen 2006). Thus, one can infer that the agency can use the benefits inherent with winning new work as the incentive if it anticipates the emergency, and it can leverage the same incentive after the emergency by selecting CMGC project delivery.

4.3 Case Study Tools Analysis

Gray and Larson (2008) describe project management as “the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements” A recent study defines a procurement tool as “those things that project management practitioners use to ‘do the job’ to execute a process.” (Besner and Hobbs 2008). Thus, the term as used in this paper refers to a specific technique or approach used to expedite the procurement of either design and construction services on an urgent or emergency
basis. Table 3 consolidates the expedited procurement tools show in Table 2. One can see that involving the construction contractor in the design process is the most frequently used tool followed by the use of limited competition and incentives.

Table 3: Case Study Expedited Procurement Tools

<table>
<thead>
<tr>
<th>Expedited Procurement Tool</th>
<th>Number of Agencies</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor design involvement</td>
<td>6</td>
<td>None</td>
</tr>
<tr>
<td>Limited competition</td>
<td>4</td>
<td>Minnesota effectively limited competition by short-listing known entities</td>
</tr>
<tr>
<td>Incentivize critical success factors</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td>Anticipated emergency with special provision</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>Standing list of prequalified contractors</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>Abbreviated contract documents</td>
<td>3</td>
<td>All cases altered their routine process in some fashion.</td>
</tr>
<tr>
<td>Use of immediately available materials</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>Co-locate design team on project site</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>Confidential Alternative Technical Concepts</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>Confidential one-on-one meetings</td>
<td>2</td>
<td>None</td>
</tr>
</tbody>
</table>

The Utah DOT found that design documents developed in nonemergency CMGC contracts were released for construction much earlier due to contractor involvement (Alder 2007). Additionally, as the contractor is already under contract, the designer no longer needs to produce a full set of biddable construction documents. The agency can direct it to develop its design documents on a feature by feature basis at a point in time where the contractor declares there is sufficient detail for it to release for the trade subcontract work package bids (Alder 2007; West et al. 2012). A previous study on early contractor design involvement (ECDI) found that it yields four specific benefits useful in an emergency procurement:

1. “ECDI permits the DOT to gain access to information regarding available construction means, methods, and materials. This permits the design to be tailored to the immediate need

2. ECDI adds a reality check to the design process via the designer getting immediate feedback on the consequences of design decisions from the entity that is tasked to construct the project. This results in a more constructable project.

3. The use of time-based incentives in emergency projects focuses the contractor on executing very aggressive schedule and to devote as much effort as possible to ECDI as a means to get design packages released for construction in a timely manner.

4. While ECDI does not transfer the design liability, it does produce a higher quality set of design documents with a lower probability of the need for delay due to changes for design errors and omissions.” (Gransberg 2013).

Both Table 3 and the subsequent discussion lead one to the conclusion that the involving the construction contractor in the design process is the most effective procurement tool to expedite the completion of emergency project. Additionally, limiting competition reduces the procurement period to as little as one day and if limited to a standing list of prequalified contractors can reduce the risk of award protest. Finally, emergency projects should be recognized as inherently complex and as such, the case studies show that
aligning thoughtfully developed incentives with critical project success factors also facilitate the expedited completion of the project.

5 CONCLUSIONS

Three major conclusions are reached in this study. The first is the most obvious. The best way to expedite the reaction to an emergency is to anticipate it. The study found two approaches to ensuring that the necessary resources were available to react to an unforeseen event: Missouri’s nested DB provision and NYSDOT’s IDIQ for emergency bridge replacement. It also identified Montana’s approach to nesting a unit price provision inside a lump sum DB contract to provide a means to mitigate the risk to the infrastructure from rock slides. In each case, actions were taken in advance of an emergency in a full and open competition environment and as such did not require emergency waiver of competition statutes.

Secondly, the study finds that selecting a project delivery method like CMGC, DB, or IDIQ which is structured to permit the construction contractor to make substantive input to the emergency project’s design was the most used expedited procurement tool among the case study agencies. The lesson learned here is that the separation of designer and contractor that exists in traditional DBB construction contracts, actually works against the expeditious resolution of an emergency loss of service. Bring the contractor into the emergency project design process, allows the repair and restoration of service to be tailored to that particular contractor’s preferred means and methods and enhances the constructability of the final design solution.

Lastly, maintaining a standing list of prequalified contractors willing to bid on an emergency basis permits the agency to provide as much competition as possible while avoiding the delays associated with running a full open competition solicitation. This conclusion speaks to the political environment rather than the technical aspects of emergency procurements. As with the first conclusion, the standing list acts as an insulator against delays due to protest of award founded on the idea that competition statutes were violated.

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