TECHNICAL REPORT

of the

[redacted] **FALL INCIDENT**

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INVESTIGATION OF THE [redacted] FALL INCIDENT

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A. INTRODUCTION

On September 23, 2005, [redacted] was employed by [redacted] as a laborer on the [redacted] Parking Garage project located in Princeton, NJ. The project involved the removal and replacement of a deteriorated pour strip section located on the upper deck of the structure. [redacted] was the general contractor for the concrete restoration project and had been hired by the facility owners. [redacted] was a subcontractor to [redacted]. [redacted] role was to remove the deteriorated concrete pour strip that was going to be replaced. [redacted] in turn subcontracted to [redacted] to help in the removal of debris generated by their hydro-demolition process. While working as part of the clean up crew, Mr. [redacted] stepped onto a piece of weakened garage deck. The section of deck failed causing Mr. [redacted] to fall into the hole generated by the failed deck. He was injured as a result of the fall.

The purpose of my investigation was to determine if either [redacted] or [redacted] acted in an unsafe or unreasonable manner that resulted in the conditions that caused Mr. [redacted] to fall and be injured. I was also asked to evaluate the actions of Mr. [redacted] to determine if his actions were contributory to his fall.

B. MATERIAL AVAILABLE

1. The Complaint.
2. Defendant [redacted] Answers to Plaintiff's Interrogatories.
3. Defendant [redacted] to Plaintiff's Request for Production of Documents.
4. Defendant [redacted] Responses to Plaintiff's Request for Production of Documents.
5. [redacted] documents produced by [redacted].
6. Depositions of [redacted], [redacted] (Vols I & II), [redacted], [redacted], [redacted], [redacted] and [redacted].
7. A disc of color photographs taken by [redacted].

8. A disc containing video of a jobsite inspection of the subject parking garage.

9. A copy of [redacted] Safety Program.

10. A copy of [redacted] Safety program.

11. ICRI Guideline No. 03737 titled *Guide for the Preparation of Concrete Surfaces for Repair Using Hydrodemolition Methods*.

C. BACKGROUND AND INCIDENT DETAILS

The Director of facility maintenance at the [redacted] facility was [redacted]. He had had previous contact with [redacted] of [redacted]. [redacted] had made some product recommendations for some earlier repairs to their facility. As part of his sales effort on behalf of premier, he made a call on [redacted]. He learned of Mr. [redacted] concern about the deteriorated pour strip on the top level of the parking garage structure located at the facility. [redacted] conducted a site inspection, took photographs of the deteriorated concrete, and hired an engineer, [redacted], to make recommendations on the repair system to be used. He also helped prepare a proposal that was submitted to Mr. [redacted] to remove and replace the pour strip.

[redacted] hired [redacted] to repair the damaged concrete elements as outlined in the [redacted] proposal. In order to perform the repair work, [redacted] had to first remove the damaged concrete in the pour strip and prepare the exposed surfaces for the installation of new concrete, sealants, and waterproofing agents. [redacted] initially made a test removal using mechanical (jack hammers) removal techniques. Based on the time it took to make the test patch and the damage to the base surface, [redacted] decided to use a removal and preparation process known as hydrodemolition. This work method was to be much quicker, would remove the deteriorated concrete and prepare the remaining sound concrete surface for the repairs to be carried by the premier crew.

To perform the hydrodemolition work, [redacted] hired [redacted] to use their high pressure robot equipment that would cut swaths of concrete approximately 3 feet wide across the concrete pour strip. [redacted] in turn hired [redacted] to perform the clean up the demolished concrete. [redacted] and [redacted] had worked together on at least one job prior that involved the removal of concrete that was poured on grade. In addition, [redacted] and [redacted] had worked with [redacted] on one prior project where [redacted] had used high pressure hand lances to remove urethane coating on some balcony slabs that were going to be re-coated by [redacted].

Since the parking structure housed vehicles of workers at the [redacted] facility, the concrete removal and initial concrete preparation was scheduled to be performed over one weekend. The

work started Saturday morning, September 23, 2006. [redacted] was the only [redacted] management personnel present on site when the work started. At around noon time, [redacted] left the site and a [redacted] superintendent took over [redacted] supervisory role from noon to the end of the day when [redacted] returned. For [redacted], only two technicians, [redacted] and [redacted] were present. No management personnel were present. For the [redacted], a crew or four was present: [redacted], [redacted], [redacted], and a fourth worker, [redacted]. [redacted], the President, was also present most of the day.

Concrete removal started at one end of the pour strip and proceeded to the other end on the top deck. When the [redacted] crew started, they also performed a test patch. Upon examination, [redacted] decided that too much concrete was being removed at the nozzle setting being used by the [redacted] crew. After some discussion, [redacted] had the [redacted] crew change the setting so less concrete than in the test patch would be removed. The [redacted] crew was removing the concrete with their high pressure robot. They had to make several passes across the pour strip and create some distance between their equipment and the [redacted] workers before the [redacted] crew could begin their work. As the [redacted] crew performed their work, they observed that their removal work was not going as quickly as they anticipated. As such, they made the decision, without [redacted] input, to change back to the original orientation where, in [redacted] opinion, excessive amounts concrete were being removed.

After [redacted] finished using their robot equipment, the [redacted] crew would first use a hand lance across the areas already hydro demolished by [redacted] to push the loosened material from one side of the pour strip to the other. The material pushed up in that fashion would be picked up by a Bobcat loader and deposited into a dumpster also located on site. After the hand lance work, [redacted] would then use a pressure washer to clean out the remaining fine debris from the pour strip. According to [redacted], he received explicit instructions from Mr. [redacted] to stand in the demolished pour strip to properly perform his work. According to Mr. [redacted], the instructions were for Mr. [redacted] to stand on the un-demolished concrete and to not stand in the pour strip.

Work proceeded in this fashion for the morning and the crews broke for lunch. In the afternoon, Mr. [redacted] was performing his work as he had been instructed. While power washing, Mr. [redacted] said he was standing such that his feet were on both the un-demolished concrete and the demolished concrete. All of a sudden, he felt his footing give way. He said he fell into a hole that he estimated was about three feet square. He said both legs went into the hole and he went into the hole up to his hip level. Another account, by Mr. [redacted], who saw Mr. [redacted] in the hole and helped him after the fall, had one of Mr. [redacted] legs going into the hole and the other leg bent around on top of the concrete. Mr. [redacted] said he cut his hand, and that his back and left leg were sore.

After the fall incident, Mr. [redacted] went over to a stairway area and sat for few moments to get his wits about himself. While sitting, Mr. [redacted] came over and spoke with Mr. [redacted]. Mr.

[redacted] informed Mr. [redacted] that he was sore and doubted he work the rest of the day. Mr. [redacted] told Mr. [redacted] to operate the Bobcat equipment the rest of the day as this work allowed Mr. [redacted] to sit down. Mr. [redacted] worked in this manner the balance of the afternoon and went home with the crew.

Mr. [redacted] attempted to work the next day but was only able to perform sweeping activities and operated the Bobcat. Mr. [redacted] did not seek medical attention Saturday or Sunday as he did not have medical insurance and could not afford the cost of a doctor. Mr. [redacted] did see a doctor early the next week after Mr. [redacted] told him that the company had insurance to cover Mr. [redacted] doctor's visit.

Mr. [redacted] hired an outside safety consultant to come to the site on Sunday. This consultant recommended installing barricades and caution tape to warn others of the demolished areas and to keep others from entering or using this area.

D. ANALYSIS

1. Cause of Mr. [redacted] Fall Incident

In my opinion, a cause of Mr. [redacted] fall incident was the concealed presence of a weakened section of precast concrete tee flange that did not support his weight. The presence of weakened concrete sections and blow-throughs is known to competent supervisory personnel if certain conditions, such as deteriorated concrete , concrete sections section with different strength characteristics and cracking of concrete, exist. The area to be hydrodemolished should have been thoroughly inspected before and frequently during the demolition process to ensure these conditions were either eliminated or minimized. The failure to inspect the concrete for these conditions as well as structural integrity of the demolished areas during the hydrodemolition process allowed the weakened concrete area to remain unidentified prior to Mr. [redacted] fall incident. Due to the probability of blow-throughs and sections of weakened concrete if proper supervision of the process is not exercised, workers with the potential for being exposed to the hazards of blow-throughs and weakened concrete should have been provided with a means of fall protection. The failure to initiate and/or ensure that proper safety measures/programs, especially fall protection, were being implemented was also a cause of the fall incident.

2. Discussion of Construction Safety Duties, Obligations and Procedures

Mr. [redacted] clearly intended that [redacted] act as the general contractor and was not aware that premier intended to use subcontractors to perform portions of their work package.

The roles and responsibilities, particularly as they relate to safety, of a general contractor are described and contained in a number of different industry standards. Although some of the standards are regulatory and some are contractual, they also describe the generally accepted roles

and practices within the construction industry and are typically considered standards within the construction industry.

One such document is AIA Document A-201, titled General Conditions of the Contract for Construction. It places the following responsibilities on the general contractor:

> The Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or is authorized representative. 4.1.1
>
> The Contractor shall supervise and direct the Work using his best skill and attention. He shall be solely responsible for **all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.** 4.3.1 [Emphasis added]
>
> The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. 4.3.2
>
> The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case. 4.9.1
>
> The Contractor shall be responsible for initiating, maintaining and **supervising all safety precautions and programs in connection with the Work.** 10.1.1 [Emphasis added]
>
> The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:
>
> 1. **all employees on the Work and all other persons who may be affected thereby**; [Emphasis added]
> 2. all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and
> 3. other property at the site or adjacent thereto, including trees, shrubs, lawns, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

Another document which discusses the roles and responsibilities of contractors and subcontractors and specific safety measures as they relate to the type of work being performed is

OSHA (CFR 29 Labor Part 1926). The requirements contained in OSHA are not only regulations, but also a standard of care in the construction industry and recognized nationally.

> In no case shall the prime (general) contractor be relieved of overall responsibility for compliance with the requirements of this part for all work to be performed under the contract. 1926.16(a)
>
> **By contracting for full performance of a contract ... the prime contractor assumes all obligations prescribed as employer obligations under the standards contained in this part, whether or not he subcontracts any part of the work.** [Emphasis added] 1926.16(b)
>
> With respect to subcontracted work, the prime contractor and any subcontractor or subcontractors shall be deemed to have joint responsibility. 1926.16(c)
>
> Where joint responsibility exists, both the prime contractor and his subcontractor, regardless of tier, shall be considered subject to the enforcement provisions of the Act. 1926.16(d)
>
> ... that no contractor or subcontractor for any part of the contract work shall require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety. 1926.20(a)(1)
>
> It shall be the responsibility of the employer to initiate and maintain such programs (accident prevention) as may be necessary to comply with this part. 1926.20(b)(1)
>
> Such programs shall provide for **frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employer.** [Emphasis added] 1926.20(b)(2)
>
> *Competent person* means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. 1926.32(d)
>
> *Walking/working surface* means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers on which employees must be located in order to perform their job duties. 1926.500(b)

Work area means that portion of a walking/work surface where job duties are being performed. 1926.500(b)

This section sets forth requirements for employers to provide fall protection systems. All fall protection required by this section shall conform to the criteria set forth in section 1926.502 of this subpart. 1926.501(a)(1)

The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity. 1926.501(a)(2)

Unprotected sides and edges. Each employee on a walking /working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet or more above a lower level shall be protected by the use of guardrail systems, safety net systems, or personal fall arrest systems. 1926.501(b)(1)

Holes Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes 1926.501(b)(4)(i)

Each employee on a walking/working surface shall be protected from tripping or stepping into or through holes (including skylights) by covers. 1926.501(b)(4)(ii)

Employers shall provide and install all fall protection systems required by this subpart for an employee, and shall comply with all other pertinent requirements of this subpart before that employee begins the work that necessitates the fall protection. 1926.502(a)(2)

Training Program The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed to minimize these hazards. 1926.503(a)(1)

The employer shall assure that each employee has been trained as necessary, by a competent person qualified in the following areas: [Emphasis added] 1926.503(a)(2)

> The employer shall verify compliance with paragraph (a) of this section by preparing a **written certification record** [Emphasis added]. The written certification record shall contain the name or other identity of the employee trained, the date (s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of the actual training. 1926.503(b)(1)
>
> *Retraining* When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (a) of this section, the employer shall retrain each such employee.1926.503(c)

Another source of industry standards are publications produced by specialty trade organizations. One such organization is the International Concrete Repair Institute. It has produced a document entitled Guide for the *Preparation of Concrete Surfaces for Repair Using Hydrodemolition Methods* (Guideline 03737). It contains the following:

> This guideline is intended to provide owners, design professionals, contractors, and other interested parties with a detailed description of the hydrodemolition process; a list of the benefits and limitations of using hydrodemolition for concrete removal and surface preparation; and an understanding of other aspects to be addressed when incorporating hydrodemolition into a repair project. *Purpose Section*
>
> Water can leak through cracks in the concrete and damage occupied space below the repair area. Hydrodemolition should not be used over occupied areas due to the risk of blow-through (unanticipated full-depth removal). *Limitation Section*
>
> Depth variations occur when the concrete strength changes, cracking or delamination is present, the concrete is deteriorated or the surface has been previously repaired using a different type and strength of material. *The Hydrodemolition Process*
>
> First, if the water jet overruns the high strength repair area, it may result in a blow-through or full depth removal at the perimeter of the high strength repair area. *The Hydrodemolition Process*
>
> Potential for full-depth blow-throughs: Hydrodemolition of severely deteriorated structures may result in full-depth blow-throughs. *Considerations for Hydrodemolition Use*

As such, the hydrodemolition equipment operator must monitor the depth and quality of removal and adjust the parameters of the robot to provide consistent removal throughout the project. *Test Area*

Other industry safety standards are contained in company safety manuals or safety programs. Premier's *Health & Safety Policy and Procedures Manual* contains the following:

The Safety program will apply to **all** work sites managed by the company or where the company and all subcontractors are performing work. [Emphasis added] APPLICATION section in the Preface

Project Managers shall conduct documented safety inspections for each project under their control monthly. The results of the inspection shall be retained in the job files and distributed to the President. Section 1.B.

Project Superintendents/Foreman shall conduct weekly safety inspections of the job site. Results of the inspections shall be retained at the job site. Section 1.C.

The company shall designate a site safety coordinator. The site safety coordinator shall be capable of identifying potential sanitary, safety and health exposures to employees and is empowered to take any action required to eliminate the unsafe condition or action. [Emphasis added] Section 1.D.

Subcontractors shall designate, in writing, a site safety coordinator responsible for administration of the safety program and field compliance. The designated person must possess the ability to identify and resolve occupational safety and health issues on the site. [Emphasis added] Section 1.F.2.

Subcontractors shall designate, in writing, any employee assigned to duties of competent person as required by Federal and State Occupational Safety and Health Standards. [Emphasis added] A copy of the letter of designation shall be provided to the project manager and shall be retained as part of the job file. **The subcontractor shall assure that the designated person individual meets the qualification of competent person as outlined by Federal and State standards and is empowered with the ability to take prompt and immediate action to correct unsafe actions and conditions. The competent person shall be on site at all times during the performance of related work**. [Emphasis added] Section 1.F.3.

As discussed in Section 3.3 a Job Safety Analysis (JSA) breaks a job into basic steps, and identifies the hazards associated with each step. The JSA also prescribes controls for each hazard. A JSA is a chart listing these steps, hazards, and controls. Review the JSA during the investigation if a JSA has been conducted for the job involved in an accident. Perform a JSA if one is not available. Perform a JSA as a part of the investigation to determine the events and conditions that led to the accident. Section 1.H.

The purpose of this program is to prevent work-related injuries resulting from falls. The prevention of these incidents will be accomplished by the use of fall prevention and fall arrest methods, the training of effected employees and the aggressive enforcement by all levels of management. Section 11.1.B.

This policy applies to all company employees who may be exposed to fall hazards in the course of their daily activities. This program also applies to non-site personnel, visitors or any individual on site exposed to a fall hazard. Unless otherwise specified, fall protection is required at elevations of 6 ft. or greater for the following work activities. Section 11.1.C

Subcontractor plans will meet or exceed the requirements of this program. Plans must be submitted to the company project manager before beginning work. Plans must identify the person or persons responsible for monitoring the safety of employees (Competent person). Site-specific plans must be submitted for any specialized fall protection. Section 11.1.C.1.

The [redacted] – Safety Program does not even contain a section involving fall protection

Construction industry safety standards require:

- The general contractor to be responsible for the safe and proper completion of all the work included under the contract.
- To the extent that the general contractor subcontracts portions of the work, the general contractor retains at least joint responsibility for that work.
- Inspections must be performed by a competent person of the work with a frequency in proportion to the changes in the nature of work being performed.
- The walking/working surfaces upon which the workers are exposed to are structurally sound and capable of supporting intended loads.
- Site-specific fall protection plans be prepared, submitted and implemented for each and every project.
- All workers exposed to fall hazards be provided with fall protection and be trained to recognize the various hazards and the means to minimize the hazards.
- Training in fall protection must be documented.

3. Discussion of [redacted] Actions

Failure to Implement Their Safety Program

As the general contractor for the [redacted] facility concrete restoration project, [redacted] had a duty to implement their safety program for the subject work in order to comply with OSHA requirements as well as their own safety policy. During the deposition of Mr. [redacted], he stated that he did not have a copy of [redacted] safety program on site and had not shared or shown their safety program to their subcontractor. In addition, he had no recollection, nor has [redacted] provided any documentation, of : [redacted] having received a copy of their subcontractor's safety program, the name and qualifications of their subcontractor's competent person, the name of [redacted] on site safety representative, or having performed a JSA for the project

If [redacted] and [redacted] had actually implemented their safety plan, as they were required to do, it would have performed a JSA, which would have in turn identified the possibility of blow-throughs and weakened sections of concrete due to variations in the depth of the concrete removal. [redacted] on site safety representative and the project manager would have known the roles and responsibilities of the various personnel, particularly as they relate to safety. [redacted] would have likely used their independent safety consultant to inspect the site prior to performing any work and would have assigned various roles and responsibilities to its subcontractor and sub-subcontractor for various safety-related activities. If [redacted] had implemented their safety plan, they would have ensured that the necessary and proper controls were put in place to control the work and maintain job site safety. If [redacted] had implemented their safety program, Mr. [redacted] fall incident would have been prevented. [redacted] failure to implement its safety program did not comply with reasonable construction industry practice and resulted in the dangerous conditions that caused Mr. [redacted] fall incident.

Failure to Perform JSA for Proposed Work

As an experienced concrete restoration contractor, [redacted] knew or should have known that blow-throughs and weakened sections of concrete occurred if the proper levels of controls and observations were not put in place. [redacted] knew and should have appreciated that small variations in the depth of concrete removal would have profound adverse impacts on the structural integrity of the concrete section remaining in place. If [redacted] had performed a

proper and reasonable JSA for the project, they should have identified the technical implications and safety hazards of both blow-throughs and the thin and weak concrete sections that were not structurally sound. They would have identified that corrective measures, such as shoring and/or the use of guardrail systems, were required to minimize the hazard of falling through a structurally unsound working surface.

By performing a proper JSA, [redacted] not only would have identified the hazards and the necessary corrective measures to properly and safely control these hazards, but would have then assigned responsibility for controlling these hazards between themselves, their subcontractor, and the sub-subcontractor. By not performing the JSA, [redacted] either failed to identify or properly appreciate the hazards and the control measures that should have been implemented. In addition, by failing in the identification and/or appreciation, they also failed in assigning responsibilities to themselves, [redacted], and [redacted] subcontractor. [redacted] failure to perform JSA for their work resulted in the dangerous conditions that were a cause of Mr. [redacted] fall incident.

Failure to Perform Reasonable Inspections

Regardless of whether or not the JSA was performed, regular and frequent inspections of the work were required to be performed. [redacted] elected to not to hire Mr. [redacted] to perform inspections of the hydrodemolition work. It is my opinion that Mr. [redacted] would have identified weakened sections of concrete and made recommendations to ensure the weakened areas could be worked around safely. Instead, [redacted] performed a few inspections and did not detect the excessive concrete removal until the hydrodemolition was nearly complete and the workers had already been exposed to both blow-throughs and weakened sections of concrete.

If [redacted] had competently inspected the work in progress, it would have known the depth of the concrete being removed, identified the presence and the relevance of blow-throughs, and determined that certain areas of the concrete did not have adequate structural integrity to support the loads of the workers. When the depth of the concrete removal went below the level of the embedded reinforcing steel, the strength of the concrete was severely compromised. In some cases, pieces of concrete fell off under the pressure of the water or loads from workers. In other cases, it is likely that sections of concrete cracked and were just hanging in place. Proper inspections would have identified these areas. Identification of these areas would then have required some corrective action to reduce/eliminate the hazard. [redacted] failure to competently inspect the concrete removal process did not comply with reasonable construction practice and resulted in the dangerous conditions that caused Mr. [redacted] fall incident.

Failure to Install Shoring in Structurally Compromised Areas or Ensure Fall Protection was Provided

Once the competent inspections had been performed and the weakened concrete sections were identified, premier should have provided corrective measures to minimize or eliminate the hazard. One of the methods should have been the installation of shoring. The shoring would have been necessary as part of the forming process required for the concrete replacement at blow-through locations or at locations where the remaining concrete was too weak to support the demolition or replacement work activities. Prior to installing the shoring, some means of fall protection should have been provided to the workers who were exposed to the dangerous weak

areas and blow-through locations. Probably the most effective means of providing that protection would have the use of portable guardrail system that would span the demolished area and could have been slid along the length as needed to perform the work. If the areas below the weak areas were shored or the workers provided with reasonable fall protection, they would not have been exposed to the concealed condition of weakened concrete. [redacted] failure to provide shoring or proper fall protection resulted in the workers being exposed to the dangerous conditions that were a cause of Mr. [redacted] fall incident.

Failure to Provide Competent Supervision

Based on the above failures, it is my opinion that [redacted] did not provide competent supervision for the [redacted] project. [redacted] was obligated to provide a superintendent that was capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. Mr. [redacted] left the site during the work and left someone else in charge while he was gone. Mr. [redacted] and his replacement both failed to perform competent inspection and were not able to identify reasonably predictable hazards for the project. [redacted] and [redacted] permitted workers to be un-necessarily exposed to hazards that caused Mr. [redacted] to be injured. [redacted] supervision for the [redacted] project was not competent according to OSHA standards and this supervision resulted in the dangerous conditions that were a cause of Mr. [redacted] fall incident.

[redacted] *Exhibited a Careless Disregard for the Safety of the Workers On Site*

In my opinion the collective failures of [redacted] and its supervision exhibited a careless disregard for worker safety. [redacted] hired an outside consultant to prepare a comprehensive safety program, yet did even bring the document to the job or follow through with many of the routine tasks normally attributed to basic safety activities. When frequent inspections were required to properly control the project from both technical and safety perspectives, Mr. [redacted] took off for the better part of the afternoon and was not able to identify that [redacted] had changed the nozzle configuration contrary to his instructions. Mr. [redacted] took no measures for worker safety, but did schedule his independent consultant to come the day following Mr. [redacted] incident to help him make the parking garage suitable for the tenants. The collective failures of [redacted] and Mr. [redacted] show a careless disregard for worker safety which resulted in Mr. [redacted] fall incident.

4. Discussion of [redacted] Actions

Failure to Adhere to [redacted] *Direction with regard to Nozzle Configuration*

After the test patch was performed, it was agreed between [redacted] and [redacted] to change the nozzle configuration because excessive amounts of concrete were being removed with the original configuration. When [redacted] made that change, the operating personnel soon observed

that the job was progressing more slowly than they had projected. Rather than discuss this [redacted] or their management, the [redacted] personnel changed the nozzle configuration back to the original configuration (the one where excessive amounts of concrete were being removed). When they did this, they knew they would be removing more concrete than desired by [redacted] and would be reducing the thickness of the remaining concrete. [redacted] made this change without the knowledge of [redacted]. If [redacted] had not changed the nozzle configuration, proper amounts of concrete would have been removed and the concrete surfaces would have remained safe. [redacted] failure to comply with [redacted] instructions resulted in the dangerously thin concrete section which caused Mr. [redacted] fall incident.

Failure to Properly and Competently Inspect Concrete Removal Process

[redacted] was a subcontractor to [redacted] and was responsible for the safe removal of the concrete. Due to arrangements made with [redacted], the removal process was being performed by [redacted] robot equipment. The demolished concrete was being removed and the clean-up work was also being performed by [redacted]. [redacted] was required to perform competent, regular and frequent inspections of work under their contract. This would have included the work being performed by [redacted]. Competent inspections would have revealed the presence of blow-throughs and areas of weakened concrete, especially in areas where the depth of removal went below the reinforcing steel. Competent [redacted] personnel should have been able to identify the presence and significance of these conditions. Upon identification, [redacted] should have warned [redacted] personnel about these dangers and ensured that proper protection for these conditions was provided. [redacted] failure to competently inspect the concrete removal process did not comply with reasonable construction practice and resulted in the dangerous conditions that caused Mr. [redacted] fall incident.

Failure to Warn and to Ensure Protection from Falls was Provided

As experienced hydrodemolition contractors, [redacted] supervision knew or should have known that blow-throughs and areas of weakened concrete were a common occurrence and likely to occur on this job. [redacted] should have had discussions with both [redacted] and [redacted] about these conditions and should have come to an understanding or agreement on how these dangerous conditions were going to be handled. [redacted] personnel and their subcontractor workers should not have been allowed to work on the demolished areas until they had been competently inspected and the agreed upon protection installed, whether it be shoring or fall protection. Shoring would have provided proper support at holes and areas of weakened concrete sections. Fall protection could have been provided until the shoring was installed. [redacted] failure to coordinate with [redacted] and [redacted] about the concealed and dangerous conditions that they knew or should have known to be present deprived [redacted] of valuable information they needed to know and their failure to ensure that shoring or proper fall protection was provided resulted in the [redacted] workers being exposed to the dangerous conditions that were a cause of Mr. [redacted] fall incident.

5. Discussion of Mr. [redacted] Actions

According to Mr. [redacted], he had received no formal training regarding concrete removal. His on the job experience with [redacted] involved concrete removal for a slab on grade as opposed to the removal of concrete pour strip on precast tees that were relatively thin. Without proper training, there was no way that Mr. [redacted] could fully appreciate the dangers associated with the work environment to which he was being exposed. If [redacted] had implemented their safety program and requested documentation of training, [redacted] would have realized that Mr. [redacted] was not properly trained. Left with this knowledge, [redacted] would have either required Mr. [redacted] to not work on the project or to make sure that [redacted] received the proper training before beginning work. Apparently, others on the job site with significantly more concrete restoration experience also did not properly appreciate the dangers, otherwise appropriate protective measures would have been provided. Mr. [redacted] was not properly trained, did not fully appreciate the dangers associated with this new work environment, and did not knowingly expose himself to a known dangerous condition.

E. FINDINGS

Within the bounds of reasonable construction engineering certainty, and subject to change if additional information becomes available, it is my professional opinion that:

1. A cause of Mr. [redacted] fall incident was the concealed presence of a weakened section of tee flange that did not support his weight.
2. The existence of weakened concrete sections and blow-throughs is known by competent supervisory personnel to occur if proper controls are not implemented during the hydrodemolition process.
3. The failure to inspect the structural integrity of the demolished areas during the hydrodemolition process did not identify the weakened area prior to Mr. [redacted] fall incident.
4. If a JSA was performed for the project, the possibility of blow-throughs and sections of weakened concrete, workers would have been identified and the corrective measures for this hazard would have identified practical methods of providing fall protection. The failure to initiate and/or ensure that adequate fall protection measures were being implemented was also a cause of the fall incident.
5. Construction industry safety standards require:
    - The general contractor to be responsible for the safe and proper completion of all the work included under the contract.
    - To the extent that the general contractor subcontracts portions of the work, the general contractor retains at least joint responsibility for that work.
    - Inspections be performed by a competent person of the work with a frequency in proportion to the changes in the nature of work being performed.

- The walking/working surfaces upon which the workers are exposed to are structurally sound and capable of supporting intended loads.
- Site-specific fall protection plans be prepared, submitted and implemented for each and every project.
- All workers exposed to fall hazards be provided with fall protection and be trained to recognize the various hazards and the means to minimize the hazards.
- Training in fall protection must be documented.

6. [redacted] failure to implement its safety program did not comply with reasonable construction industry practice and resulted in the dangerous conditions that caused Mr. [redacted] fall incident.
7. [redacted] failure to perform JSA for their work resulted in the dangerous conditions that were a cause of Mr. [redacted] fall incident.
8. [redacted] failure to competently inspect the concrete removal process did not comply with reasonable construction practice and resulted in the dangerous conditions that caused Mr. [redacted] fall incident.
9. [redacted] failure to provide shoring or proper fall protection resulted in the workers being exposed to the dangerous conditions that were a cause of Mr. [redacted] fall incident.
10. [redacted] supervision for the [redacted] project was not competent according to OSHA standards and this supervision resulted in the dangerous conditions that were a cause of Mr. [redacted] fall incident.
11. The collective failures of [redacted] and Mr. [redacted] show a careless disregard for worker safety which resulted in Mr. [redacted] fall incident.
12. [redacted] failure to comply with [redacted] instructions resulted in the dangerously thin concrete section which caused Mr. [redacted] fall incident.
13. [redacted] failure to competently inspect the concrete removal process did not comply with reasonable construction practice and resulted in the dangerous conditions that caused Mr. [redacted] fall incident.
14. [redacted] failure to coordinate with [redacted] and [redacted] about the concealed and dangerous conditions that they knew or should have known to be present deprived [redacted] of valuable information they needed to know and their failure to ensure that shoring or proper fall protection was provided resulted in the [redacted] workers being exposed to the dangerous conditions that were a cause of Mr. [redacted] fall incident.
15. Mr. [redacted] was not properly trained, did not fully appreciate the dangers associated with this new work environment, and did not knowingly expose himself to a known dangerous condition.
16. The failures, above described, were a substantial contributing factor to the happening of Mr. [redacted] fall incident.

I reserve the right to supplement and/or amend this report if additional material becomes available.

Stephen E. Fournier, P.E. (PA)