

**CONDITION APPRAISAL
(FY 2020)**

**TEMPLE MEDICAL PARKING GARAGE
NEW HAVEN, CONNECTICUT**



**NEW HAVEN
PARKING
AUTHORITY**

PREPARED FOR:
NEW HAVEN PARKING AUTHORITY
232 GEORGE STREET
NEW HAVEN CONNECTICUT 06510

PREPARED BY:
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**NHPA PROJECT No. 20-001
DESMAN PROJECT No. 20-19171.00-2**

APRIL 2020



CONDITION APPRAISAL TEMPLE MEDICAL PARKING GARAGE

NEW HAVEN PARKING AUTHORITY FACILITIES
NEW HAVEN, CONNECTICUT

APRIL 2020

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1. INTRODUCTION

The Condition Appraisal of the Temple Medical Parking Garage was performed by DESMAN in accordance with the executed agreement by and between the New Haven Parking Authority and DESMAN (NHPA Project No. 20-001).

The primary objectives of this appraisal are as follows:

- A. Perform a detailed, on-site inspection and observation of the Temple Medical Parking Garage in concert with DESMAN's applicable sub-consultants.
- B. Compare the results of the inspection with those addressed in the 2019 Condition Appraisal Report prepared previously by DESMAN.
- C. Prepare a report detailing the findings of the survey including, but not limited to, an update of the estimated construction costs, along with priorities for the various repairs, and recommended capital reserves (future repair and maintenance), to allow the New Haven Parking Authority flexibility in the implementation of structural repairs, mechanical and electrical modifications, and architectural improvements.



2. EXECUTIVE SUMMARY



Photo #1

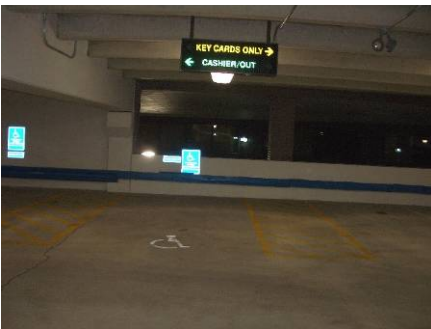


Photo #2

The Temple Medical Garage consists of 371 parking spaces. Opened on December 1, 1977, this garage consists of four (4) level of precast concrete joist framing with cast-in-place concrete decks, in excess of 141,000 gross square footage of parking area. Privately-owned parking is located below the garage and privately-owned commercial space is located above the garage. This 43 year old facility is in generally good condition.

An extensive restoration of this facility was completed in 2007 and a subsequent project completed in 2013 addressing the remaining items not included in the previous project (2007) (**Photos #1 & #2**). This restoration project included extensive concrete repair to the supported decks, as well as significant waterproofing improvements, inclusive of expansion joint replacement, crack chasing and caulking, detailing of control/construction joints and cove joints, and replacement of the facility's interior guardrail/handrail system.

Currently there are three (3) projects in design which represents a project cost of approximately \$1,835,000 (including contingencies and design/management fees). Between 2021 and 2025, an additional expenditure of approximately **\$3,118,950.00** can be expected to properly repair and maintain the Temple Medical Garage over the next five years.

Items which DESMAN recommends to be performed at this facility over the next five years are inclusive of, but not limited to the following items of work:

- Various concrete repairs and waterproofing improvements
- Various electrical repairs and mechanical improvements, such as the installation of a washdown system.

Although extensive concrete repairs and other updates have been performed on this facility, preventative maintenance should be considered an ongoing concern in order to maintain the integrity of the concrete slabs and other elements in the facility. The Capital Projects currently in progress consist of the following:

PROJECT NUMBER	PROJECT TITLE	OPINION OF COST*	STATUS
18-008	Repairs and Improvements	\$400,000	In Design
19-006	Lighting & Electrical Repairs & Improvements	\$270,000	In Design
19-020	Elevator Modernization	\$1,165,000	In Design

* Rounded, Inclusive of Contingencies, Engineering and Program Management costs.

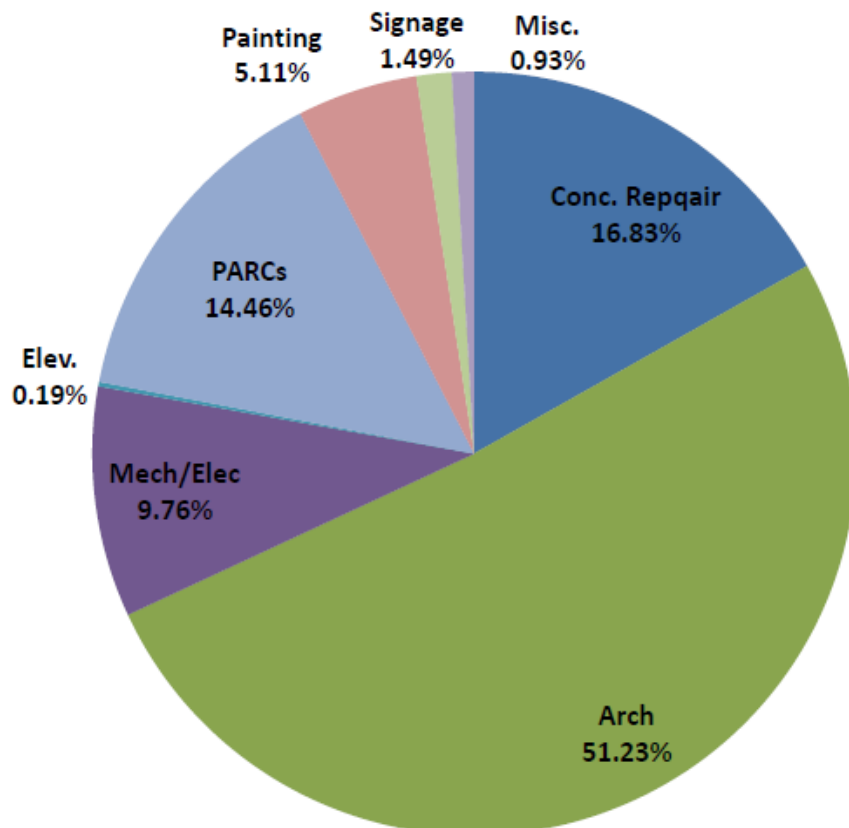
The costs associated with the implementation of future repairs and preventative maintenance for this garage is presented in more detail later in this report.

The repairs recommended to be performed over the next five years have been prioritized into three courses of action: Prioritized Repairs (FY 2021), Early Repairs (FY 2022), Programmed Repairs (FY 2023), and Long-Term Repairs (FY 2024 - 2025). The table below is a summary of Desman's estimated construction cost for each category of work.

RECOMMENDED REPAIR PROGRAM	ESTIMATED CONSTRUCTION COST
Prioritized Repairs (FY 2021)	\$0.00
Early Repairs (FY 2022)	\$495,900.00
Programmed Repairs (FY 2023)	\$320,450.00
Long-Term Repairs (FY 2024 – 2025)	\$2,302,600.00
TOTAL ESTIMATED COST	\$3,118,950.00

To further summarize, the projected costs may be split into the following discipline categories, in accordance with the associated percentages, as represented by the following pie chart:

Concrete Repair:	16.83%
Architectural:	51.23%
Mechanical/Electrical:	9.76%
Elevators:	0.19%
Painting:	5.11%
PARCs:	14.46%
Signage:	1.49%
<u>Miscellaneous:</u>	<u>0.93%</u>
	100.00%



Recommended Repairs & Improvements split into Disciplines



3. DESCRIPTION OF THE STRUCTURE



Photo #3



Photo #4



Photo #5

The Temple Medical Parking Garage, formally known as the Temple-George Parking Garage, is located near the intersection of Temple Street and George Street (reference SK-1) in downtown New Haven, Connecticut, directly adjacent to the Temple Medical Building Complex (**Photo #3**) and has various pedestrian access points in common with the medical center.

Vehicular entry and exit can be achieved directly off of George Street (**Photos #4**) and to and from Rev. Dr. Martin Luther King, Jr. Boulevard, formerly known as North Frontage Road, immediately accessed off of Route 34.

The structure is a five story split level parking facility (**Photo #5**) with an elevation difference between each half level of approximately 5'-3". The garage was originally configured with a health/fitness center and medical offices built on top of the garage making the entire facility a seven-story structure.

Basement Level:

- Private Parking (Medical Center Staff)

First Level:

- George Street Commercial Space (PNH Main Offices)
- Rev. Dr. Martin Luther King, Jr. Boulevard Commercial Space (unfinished space)
- Garage Management Office
- Self-Park Parking (monthly & transient)

Second Level:

- Self-Park Parking (monthly & transient)

Third Level:

- Self-Park Parking (monthly & transient)

Fourth Level:

- Self-Park Parking (monthly & transient)

Fifth & Sixth Level:

- Health/ Fitness Center and Medical Offices (two-stories)

***Note:** The Rev. Dr. Martin Luther King, Jr. Boulevard Commercial Space is being used as a Parking Authority storage area.*





Photo #6



Photo #7



Photo #8



Photo #9

The Temple Medical Parking Garage is rectangular in plan with a north-south dimension of approximately 308 feet and an east-west dimension of approximately 124 feet. Each corner of the facility, except the northwest corner, has an enclosed stair-tower with metal pan stairs (**Photo #6**). The facility is equipped with a combination elevator/stair-tower core with two elevators centrally located on the east side of the garage (**Photo #7**).

The two bay parking facility has one-way traffic flow with four vehicle ramps interconnecting each split level (**Photo #8**). The two outboard ramps (north & south ends) are for inbound traffic accessing the upper parking decks and the two inboard ramps are for outbound traffic. Vehicle ramps are approximately 12'-6" wide and have a relatively steep slope of 12%. The vehicle ramps have raised concrete curbs and 1 ½" diameter pipe rails along each side.

No access is currently permitted between the facility's basement and first supported level, though vehicle ramps do exist; these ramps are currently closed with barrier gates (**Photo #9**).

The structural system of this facility is a pre-cast concrete frame with a combination pre-cast concrete floor framing system and a 3 ½" thick cast-in-place concrete slab. The cast slab rests on pre-cast concrete joists spaced at 4'-7" on center that span approximately 30 feet. The joists in turn span into floor beams/girders that span the width of an entire bay (approximately 62 feet).

The following improvements and restoration work has been performed on this facility historically:



Photo #10



Photo #11

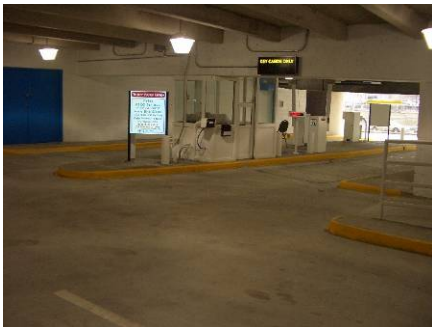


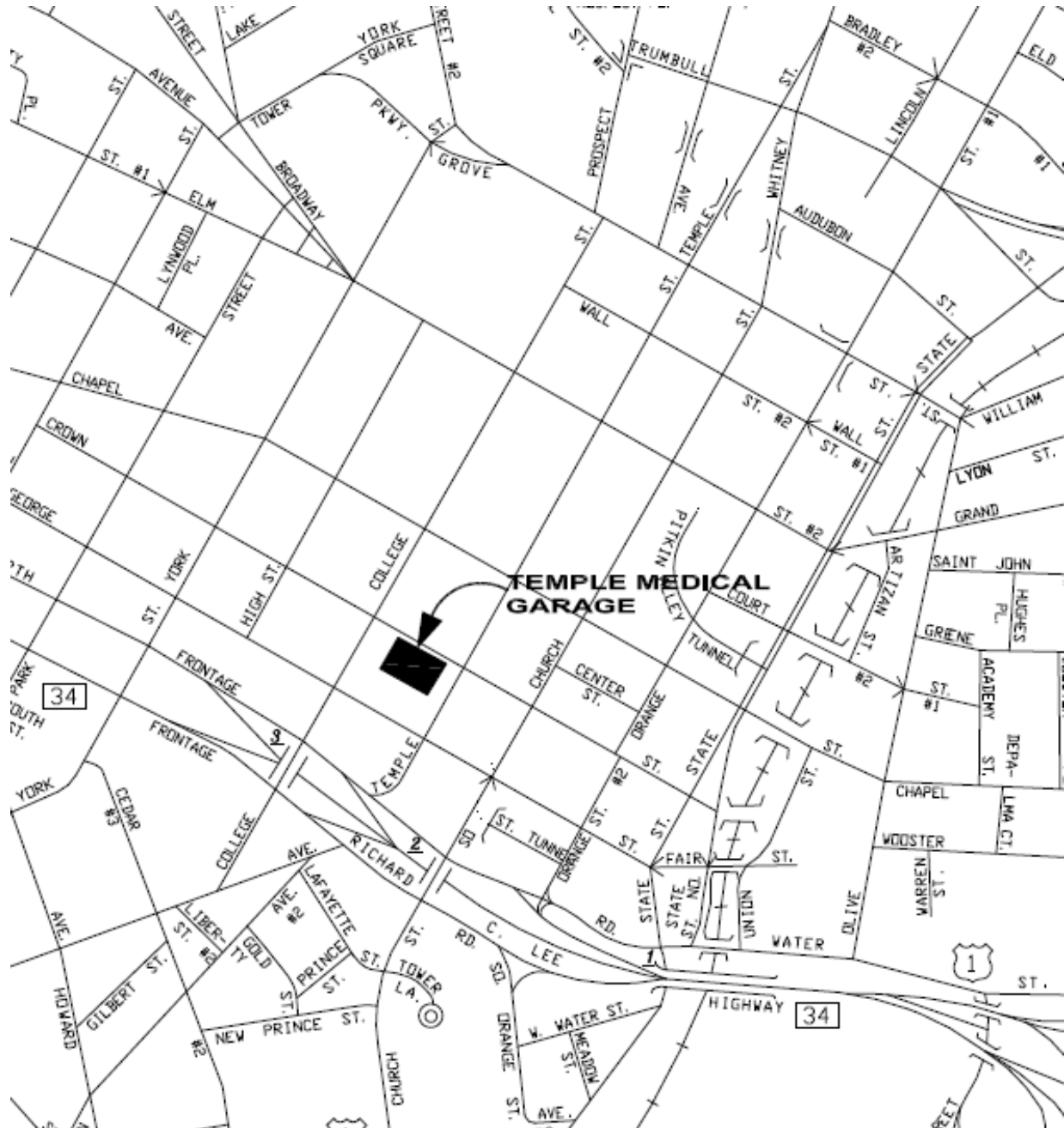
Photo #12

- 2000 Improvements were made to the facility's two elevators to improve functionality, ADA accessibility and Connecticut Building Code compliance. Prior to 2000 this facility had only minor concrete deck and structural repairs performed.
- 2001 Updates to the facility's vehicle and revenue control system were made in 2001. The new revenue control system works with other Parking Authority system-wide improvements to permit greater garage operating flexibility, revenue control and auditing.
- 2003 A variety of maintenance projects were implemented, including such items as remedial repairs to damaged ramp railings and curbing, replacement of exit signs, painting and general cleaning.
- 2007 A comprehensive restoration project was implemented which was inclusive of, but not limited to facility cleaning (interior & exterior), sidewalk repair, concrete deck repair (partial & full depth repair, surface scaling repair, overhead & vertical concrete repair, concrete curb repair, stair repair) (**Photo #10**), masonry repair, stair railing replacement, interior guardrail/handrail replacement (**Photo #11**), waterproofing work (expansion joint modification and replacement, crack repair, control/construction joint repair, cove joint installation, roofing repair, elevator sump pit negative-side waterproofing), cashier's booth repair (**Photo #12**), interior signage improvements (illuminated & non-illuminated), painting, plumbing repair (supplemental drain installation, piping repair, insulation repair, heat-trace repair), electrical work (garage lighting improvements, stairwell lighting improvements, installation of new emergency lighting and emergency exit signage, installation of new fire alarm system, provision of new electrical distribution and improved lighting and signage control).

The work described above was performed together with other assorted work necessary to address other facility deficiencies found to be necessary throughout the course of the repairs, including, but not limited to miscellaneous door repair, replacement of basement ramp access gates, demolition of George Street commercial space, installation of separate water service for the garage, garage manager's office improvements (architectural finishes, water heater, HVAC, etc.).

- 2013 Work completed as part of a comprehensive capital project at the Temple Medical Garage was inclusive of, but not limited to, application of a topically applied corrosion inhibitor, door repair & replacement, emergency pedestrian egress improvements, repair exterior signage and interior miscellaneous signage, miscellaneous electrical work, as well as miscellaneous mechanical & plumbing repairs and improvements.
- 2017 Work completed as part of a pedestrian walkway/improvement project at the pedestrian entrances from George Street and Rev. Dr. Martin Luther King, Jr. Boulevard was inclusive of, but not limited to, concrete work including the installation of a colored decorative overlay, waterproofing, storefront installation, electrical repairs and lighting installation, as well as related drainage repairs and improvements.
- 2017 Pursuant to the relocation of PNH's Offices to the Temple Medical Garage, work included, but was not limited to, selective demolition and site work, miscellaneous concrete repairs, waterproofing, construction of walls and installation of ceiling systems, installation of doors and windows, installation of flooring systems, other finishes, graphics and signage, installation of new light fixtures and electrical coordination, plumbing, HVAC improvements and mechanical coordination, and all related miscellaneous fit-out coordination.
- 2019 Work involved sanitary line repairs, including the installation of a backwater valve and alarm, as well as related drainage repairs.





Site Plan

Structural Data

Temple Medical Parking Garage New Haven, Connecticut

Legend:

- Square Feet: SF
- Pounds Per Square Inch: PSI
- Pounds Per Square Foot: PSF

Date of Completion:	1977
Age of Structure:	43 Years
Plan Dimension:	302 FT x 124 FT
Floor to Floor Height:	10'-6"
Floor Area:	
▪ Slab on Grade (Asphalt)	29,800 SF
▪ Slab on Grade (Concrete)	7,800 SF
▪ Supported Slab	139,000 SF
▪ Total	176,000 SF
Parking Capacity:	371 Vehicles
Parking Efficiency:	476 SF/Vehicle

Note: All values above are approximations of actual values

Structural System:

- Pre-cast concrete frame
- Pre-cast concrete joists and beams with conventionally reinforced composite cast-in-place concrete slab (3½" thick).

Design Loads: (Not Shown on Plans)

Material Strengths:

- Cast-in-place slabs $f_c' = 3,000$ PSI
- Pre-cast members $f_c' = 5,000$ PSI
- Reinforcing Steel $f_y = 60,000$ PSI
- Pre-stressing Strand $f_y = 275,000$ PSI

Note: Structural Information was obtained from construction documents made available for this evaluation.



4. VISUAL OBSERVATIONS & REPAIR RECOMMENDATIONS

A visual examination of the facility's structural, mechanical and electrical components was performed as part of DESMAN's review of the Temple Medical Parking Garage this year.

CONCRETE REPAIR:

Concrete Deck Repair: Repairs to the concrete deck were made in 2007 and a corrosion inhibitor was applied in 2013. Additional repairs are now needed and are included in NHPA Project No. 18-008 currently in design. Additional repair work should be anticipated in the future and therefore DESMAN recommends that the decks be monitored and NHPA budget accordingly.

Concrete Surface Scaling Repair: Upon completion of the 2007 repairs along with the installation of a topically applied corrosion inhibitor to this facility's supported concrete decks per the (2013) comprehensive capital project, concrete surface scaling repair should be anticipated in the near future, possibly in conjunction with an epoxy-based healer/sealer system that may be more appropriate to accommodate shallow cracking (**Photo #13**) in lieu of more extensive demolition and concrete repair that may not be as durable due to its shallow nature. DESMAN recommends that the decks be monitored and NHPA budget accordingly.

This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design, as well as programmed for the future as appropriate.



Photo #13

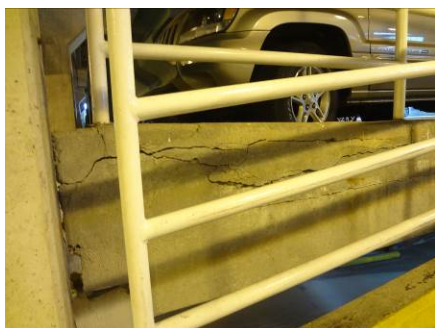


Photo #14

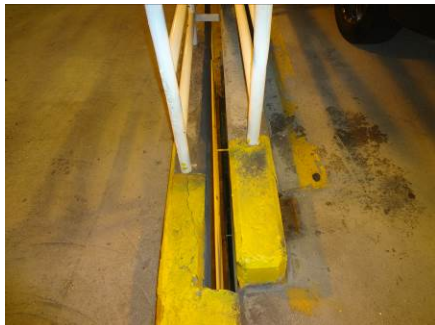


Photo #15



Photo #16



Photo #17

Miscellaneous Concrete Curb Repair: The curbing on either side of the cross-over ramps continues to be sensitive to the stresses provided by the railing systems installed in them, resulting in cracking that expands and becomes greater spalling (**Photos #14 & #15**). DESMAN suggests that this curbing be repaired, perhaps with a more substantial width or depth, although these dimensions would certainly need to consider the turn radius from the vehicles which previously contributed to the curbs being shortened. This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design. Additional repair work should be anticipated in the future and therefore DESMAN recommends that the curbing be monitored and NHPA budget accordingly.

Vertical & Overhead Concrete Repair: This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design. Additional vertical and overhead concrete repair work should be anticipated in the future and therefore DESMAN recommends that the curbing be monitored and NHPA budget accordingly.



Photo #18

Concrete Stair Repair: This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design. Additional stair repair work should be anticipated in the future and therefore DESMAN recommends that the curbing be monitored and NHPA budget accordingly. (**Photo #16**).

Concrete Rib Repair: Failure of the sealant material at the bases of the architectural ribs, followed by exposure of the metal inserts to the weather, has resulted in corrosion of the inserts and slight leaning of the ribs (**Photos #17 & #18**). Although the ribs appear to be secure, DESMAN recommends that supplemental support plates be installed as well as replacement of the sealant material. This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design.



Photo #19

Masonry Unit Repair: This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design. Additional brick repair as well as exterior repair and re-pointing work should be anticipated in the future and therefore DESMAN recommends that the masonry be monitored and NHPA budget accordingly (**Photo #19**).

Subsequent to the miscellaneous repair of the masonry, DESMAN recommends that PNH program a comprehensive cleaning of the exterior as well.

WATERPROOFING ISSUES:

Expansion Joint Repair: DESMAN suggests that repair and replacement of the expansion joints be anticipated in the near future. Any repairs required would be expected to be due to normal wear and tear (**Photos #20 & #21**). This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design.

Topically Applied Corrosion Inhibitor: Due to the levels of chloride contamination within those portions of the deck which were not repaired in 2007, the facility's supported concrete decks received a topically applied corrosion inhibitor as part of the (2013) comprehensive capital project. Corrosion inhibitors raise the chloride threshold levels necessary to support active corrosion of embedded reinforcing steel. In addition to inhibiting the corrosion process, these materials also offer the additional benefits of penetrating concrete sealers, acting as an effective moisture and chloride screen.

Because topically corrosion inhibitors are unable to bridge cracks in concrete, similar to the inability of penetrating sealers to bridge cracks, the application of corrosion inhibitors needs to be done in conjunction with a program of crack and control/construction joint repair and quite possibly combined with the application of an elastomeric traffic bearing waterproofing membrane in certain areas.

Crack Repair: Miscellaneous crack repair was addressed as part of the (2013) repair program (**Photo #22**). Additional crack repair work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design.

Control/Construction Joint Repair: Miscellaneous joint repair was addressed as part of the (2013) repair program. Additional sealant work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design.

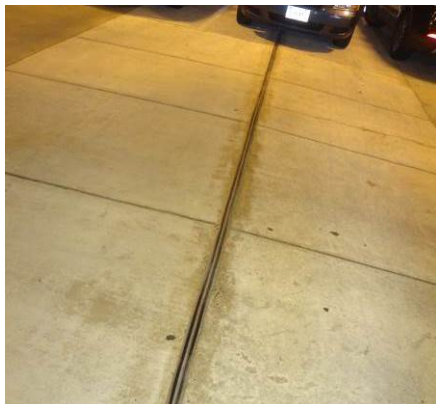


Photo #20



Photo #21



Photo #22



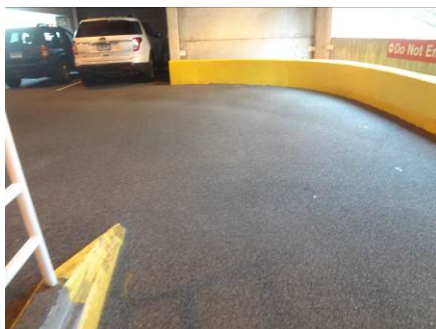


Photo #23



Photo #24



Photo #25



Photo #26

Cove Joint Repair: This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design.

Membrane Maintenance & Repair: A new traffic bearing membrane has recently been installed on Level 2, directly over the tenant space (and PNH Main Office) (**Photo #23**). DESMAN recommends that this membrane system be monitored and repaired as may be required.

ARCHITECTURAL IMPROVEMENTS AND ENHANCEMENTS:

Miscellaneous Door Repair & Replacement: As part of PNH Project No. 16-010, certain new doors were installed and other doors, related to the storage area and office space, were replaced with new ones as well. Certain of these doors have sensitive hardware, such as electric strikes, and should be maintained accordingly (**Photo #24**).

Other doors, such as related to the stair towers, were not addressed, and so should be monitored and repaired as required. While various adjustments and repairs were made to doors, doorframes, and door hardware during the most recent repair project (2013), miscellaneous repairs should be anticipated in the near future due to normal wear and tear, although DESMAN now considers it more appropriate to recommend that the door systems be replaced in their entirety, and planned accordingly.

It is DESMAN's opinion that door repair is in reality an operating expense and doors and associated door hardware should be replaced on an as-needed basis. Any public facility should be properly maintained to permit easy patron/pedestrian egress, particularly in emergency situations.

Replacement of Vehicle Wood Bumpers: the wood boards installed throughout the perimeter of the garage, acting as vehicle protection, are in various states of disrepair or are lacking completely (**Photos #25 & #26**). In order to continue to provide appropriate vehicle protection, the wood boards should all be replaced. This work is currently scheduled to be performed as part of NHPA Project No. 18-008, currently in design.



Photo #27

Update of Garage Signage: NHPA requested that there be updates made to this facility's exterior signage, designating the facility as a parking garage (**Photo #27**) and directing patrons to park in this facility, as well as to a limited number of interior signs. In conjunction with NHPA's current re-branding program, the exterior signage was refurbished and updated with new sign box materials and new graphic faces to be more in keeping with NHPA's new logo and graphic standards. This work was addressed in the (2013) comprehensive capital project.

In conjunction with NHPA's current re-branding program, the interior and/or pedestrian signage should be programmed for replacement. The signage can updated with new graphic faces to be more in keeping with NHPA's new logo and graphic standards. This work is currently being programmed for implementation.

With new development occurring within downtown New Haven, conditions can sometimes change where additional signage may be required to address changes in patron usage, or because of new building construction in close proximity to a facility; all of which may dictate the need for additional signage or updating of the older previously installed signage.

Garage Façade, approach from George Street, Enhancements:

The façade of the Temple Medical Garage has become aged (**Photo #28**). The recent and ongoing development in the immediate area continues to provide a challenge for the garage to stay current.

Recently, with NHPA's re-branding efforts fully underway, additional opportunities have developed that could assist in revitalizing the garage. Enhancements, such as installation of a super-graphic to the blank concrete side of the garage, re-finishing of the columns on the ground level to contrast the floors above, providing an architectural screen element on the brick wall, as well as updating the landscaping with new local plantings an grasses, could assist in transforming the garage (various concepts as follows).



Photo #28





Photo #29

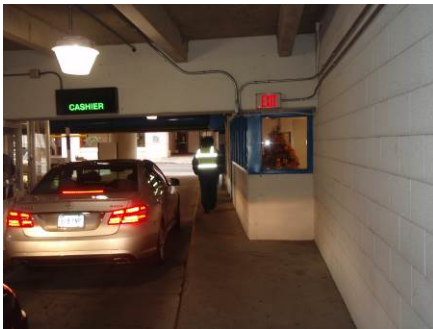


Photo #30

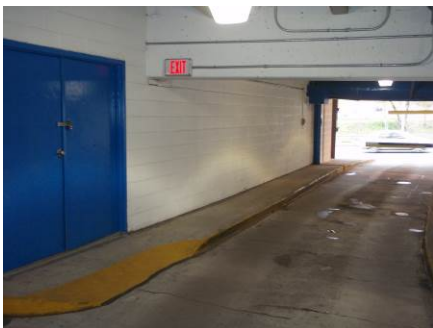


Photo #31



Photo #32



Entrances to Garage, from George Street & M.K.L. Boulevard, and Pedestrian Access Improvements:

Previously, pedestrian access into the garage from George Street required the patrons to walk along a curb adjacent to the vehicular drive lanes, simultaneously being cautious of beams and other garage elements (**Photos #29, #30 & #31**). As an effort to enhance the visitor's experience upon entering the garage, PNH Project #16-010 was initiated and various improvements were implemented. The adjacent storage areas were removed, glass storefront systems installed for security, a decorative overlay/flooring and murals were installed, and the walls painted, all with improved signage and accent lighting (**Photo #32**).

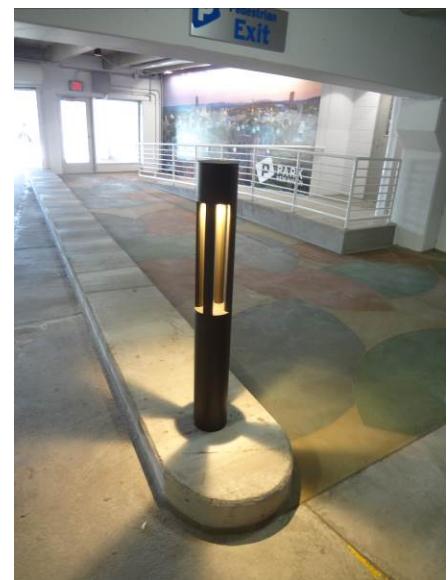
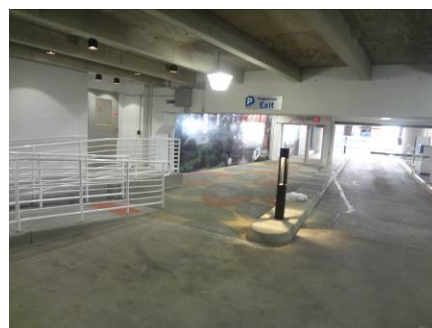




Photo #33



Photo #34

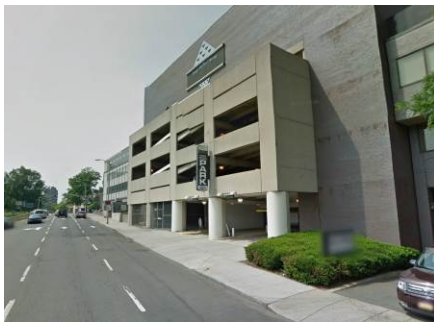


Photo #35

Tenant Space:

NHPA has relocated its offices to the ground level of the Temple Medical Garage as part of Project #16-022, (232 George Street), adjacent to the vehicular entrance from George Street (**Photos #33 & #34**).



Garage Façade, approach from M.L.K. Boulevard, Enhancements:

The façade of the Temple Medical Garage has become aged (**Photo #35**). The recent and ongoing development in the immediate area continues to provide a challenge for the garage to stay current.

Recently, with NHPA's re-branding efforts fully underway, additional opportunities have developed that could assist in revitalizing the garage. Unlike the façade on George Street, though, the M. L. K. Boulevard façade directly faces the highway and the Downtown Crossing development currently in progress, and thus this façade has a more immediate opportunity to create an updated impact on the surrounding environment. Enhancements, such as installation of a super-graphic to the blank concrete side of the garage, re-finishing of the columns on the ground level to contrast the floors above, providing an architectural screen element on the brick wall, as well as re-clad and brand the parking deck portion of the garage that is directly visible from the highway, could assist in transforming the garage (various concepts as follows).



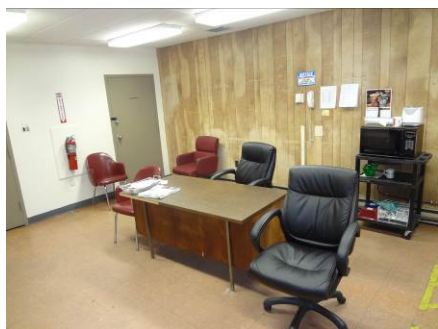


Photo #36



Photo #37



Photo #38

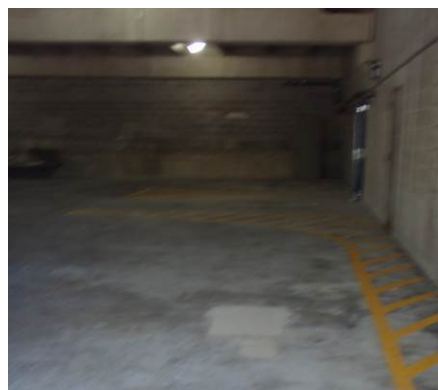


Photo #39



Manager's Office: In conjunction with the recent creation of a dedicated manager's role at the Temple-Medical Garage, the existing space being used as a Manager's Office would benefit from certain aesthetic improvements. Enhancements, such as new flooring, ceiling with lighting, painting, as well as renovations of the bathrooms, could be programmed accordingly. **(Photos #36 & #37)**

Enhancements to the Storage Area: Although the area of the garage located in the southwest corner of the facility along M.L.K. Boulevard, which had been previously used for storage of PNH equipment and materials, was converted into additional parking (designated as North Frontage Lot #009) **(Photos #38 & #39)**, NHPA has since returned it to use for maintenance use and storage. However, NHPA requests that the space be formalized with walls, a heavy-duty flooring system, enhanced lighting as appropriate, HVAC improvements, as well as a formal separation from the emergency egress corridor. These improvements may be programmed accordingly.

ELEVATOR IMPROVEMENT WORK:

In conjunction with a maintenance service contract currently in place, related HVAC improvements to the elevator machine room were implemented in FY 2014. However, due to age and wear-and-tear, modernization of the elevators is now recommended as programmed accordingly. This work is currently scheduled to be performed as part of NHPA Project No. 19-020, currently in design.

In order to assist PNH in the ongoing execution of its Maintenance Agreement with Schindler Elevator Corp., DESMAN recommends that PNH program the services of DESMAN and its elevator sub-consultant, Sterling Elevator Consultants, to oversee an elevator maintenance audit on a regular basis.

ELECTRICAL WORK:

While the (2013) comprehensive capital project addressed the majority of the electrical repairs and improvements which were required for this parking facility, the facility main electrical service was not updated. The current service was judged to be in reasonably good condition and can be expected to serve the facility well for the foreseeable future.

It should be noted that there will be a need for periodic replacement of failed garage lighting components (lamps, ballasts, etc.). This is an operational cost and has not been carried within an estimate of future capital expenditures. NHPA should implement a planned lighting maintenance schedule for the facility's lighting, whereby lamps and ballasts are replaced throughout the facility at the same time in lieu of the current practice of intermittent replacement on an as-needed basis.

No doubt there is a need to periodically replace a limited number of lamps or individual ballasts due to premature failure, but programmed replacement is typically more cost-effective.

Emergency Lighting Testing & Repair: Because emergency lighting is a life safety issue, DESMAN recommends that continued maintenance of emergency lighting be carried as an operational cost by NHPA.

Garage Lighting Replacement: The existing light fixtures were installed in 2006, lighting technology continues to improve and thus options for improvements should continually be reviewed and considered. There are a reasonable number of good quality LED garage lighting fixtures available at this time. Many of these fixtures have a proven track record of reliability and good photometric performance. Use of LED lighting will reduce energy use and maintenance expenses. Based on these factors, LED lighting should be considered for use when the existing garage fixtures near the end of their useful life. While some LED retro-fit solutions are available, these raise concerns with UL Listing and they do not typically have the same efficiency levels as dedicated LED fixtures. LED garage fixtures can be more easily controlled via occupancy sensors, daylight sensors and dimming controls. Such control enhancements



can significantly increase the energy savings realized by use of the fixtures but must be carefully evaluated during design to ensure that they are a proper fit for the facility. Most enhanced control strategies will either require the installation of separate control wiring or local controls on each fixture.

Due to the balance between ongoing maintenance costs, related to regular re-lamping and other associated expenses, and the potential savings from an improved technology, such as LED, DESMAN recommends that replacement be considered accordingly, as part of NHPA Project No. 19-006 now in design.

Surge Protection: Recent events in several of the facilities have raised concerns about surge protection for the electrical distribution system. Such protection can help prevent damage to equipment connected to the system and limit power outages. Protection can be provided at any point in the distribution system and is typically designed based on the level of protection desired at any point. Multiple levels of protection are often implemented with devices installed at the incoming service, at select subpanels and at the sensitive equipment. The Temple Medical Garage did not recently have a surge protection device on the main garage electrical service (**Photo #40**), and so additional coverage was requested. This work was addressed as part of NHPA Project No. 16-022, now complete.

Miscellaneous Repairs: As miscellaneous repair may be performed, DESMAN recommends that PNH be cognizant of new conduit passing through the floor slab; since the slab tends to be exposed to significant moisture, the metal conduit is then also exposed, thus corroding and deteriorating over time. To help extend the longevity of the conduit, DESMAN recommends that sleeves be used to protect the conduit from direct, sitting water, followed by a polyurethane cove joint as well.



Photo #40





Photo #41



Photo #42

MECHANICAL/PLUMBING WORK:

Fire Standpipe Repairs: Although the Fire Standpipe System was reviewed and repaired as part of the 2013 capital project and miscellaneous repairs were performed, multiple standpipes are now missing valve handles; DESMAN recommends that the valve handles be replaced as required on an as-needed basis. **(Photos #41 & #42)**

The State Fire Safety Code requires periodic maintenance and testing of Fire Protection Systems in accordance with the provisions of NFPA 25 – “Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems”. At a minimum, owners’ maintenance personnel should conduct a quarterly visual inspection of piping, fire department connections and hose valves to ensure that systems have not been damaged. A more thorough detailed inspection should be conducted annually to verify that all system piping and components are in proper working order which should include testing and inspection of all valves and components. Flow tests should be conducted every five years at a minimum. Additional requirements for inspection testing and maintenance of Standpipe Systems are outlined in NFPA 25.

Cleaning of Floor Drains: While this facility's drainage system was cleaned and flushed as part of the 2006-2007 repair work, this work should be performed a minimum of once a year. As part of the work implemented in the (2013) comprehensive capital project, the facility’s drainage system has been cleaned and flushed.

Accumulation of sand and debris continues to be noted in and around drains, or deposited in unused corners of various parking decks. It is important that accumulated sand be removed from the garage decks each spring as they hold concentration of chloride (road salt) and moisture in direct contact with the concrete deck; causing an increase in the amount of deterioration which could take place.

Sand carried into the storm drains can clog drains and associated drain lines. In combination with periodic garage wash down, it is imperative that the facility's drainage system be kept clean and operational. The costs associated with the flushing of the facility's drainage system have been included within DESMAN's estimated repair and preventative maintenance costs to be performed in the future. The costs associated with cleaning and flushing down the deck surfaces is an operational cost and therefore, is not included within projected repair and preventative maintenance costs.



Photo #43



Photo #44

Repair of Office Bathroom Sanitary Line: It had been reported by the garage security staff that the sanitary line had not been working properly (**Photo #43**). Although certain repair work was addressed as part of NHPA Project #16-022, additional repairs appear to be warranted to improve flow; this work is currently in progress as part of NHPA Project #16-009.

Miscellaneous Mechanical Work: DESMAN noted the following miscellaneous items of work that DESMAN considers as operational costs:

- The supply air duct providing ventilation air to the collection booth is rusting along the bottom (**Photo #44**). DESMAN recommends cleaning, painting and/or replacement of the fan and ductwork.
- It has been reported by the garage security staff that the air conditioning system serving the office area is not working. DESMAN recommends having the air conditioning system serviced by a qualified HVAC service contractor.
- DESMAN recommends inspection of the fire pump by licensed fire protection contractor.

The costs associated with the miscellaneous mechanical work are operational costs and therefore, are not included within the projected repair costs.

Installation of a New Washdown System: DESMAN recommends that installation of a new pressure washdown system be considered to remove road salt, oil and dirt from the parking decks. A pressure washdown system could be provided, consisting of a pump, regulating valve, buffer tank, controls and distribution piping; the system would be supplied with water from the domestic water system. However, the addition of a washdown system may require that a sand-oil interceptor be provided and installed (if not already existing) to prevent contaminants from washdown operations from entering the City's sewer system. DESMAN notes that installation of this system would require coordination with the owner of the Basement Level since installation of the sand-oil interceptor would most likely occur in the basement.

Mechanical Preventative Maintenance: DESMAN recommends the periodic maintenance and repair of various components of the buildings mechanical systems; the costs are considered operational costs and are therefore not included as separate and distinct items within our projected repair and preventive maintenance costs. Periodic maintenance and service of the mechanical systems should be in accordance with the O&M requirements for the individual systems and include but are not limited to the following:

- Office HVAC Equipment including Split System Air Conditioning and Toilet Exhaust Fans
- Maintenance Closet Exhaust Fan
- Elevator Machine Room HVAC Equipment
- Collection Booth HVAC Systems

SECURITY ENHANCEMENTS:

NHPA has requested that Desman review the opportunities for enhancing security at the Temple Medical Garage, including opportunities for video surveillance, access control and audio communication systems; improvements may include a control room and may be coordinated with other facilities. Desman has recommended that a study be performed first to review NHPA's needs and subsequently to provide appropriate recommendations; design and installation of the security system would follow and be programmed for implementation accordingly. A draft report of the study for NHPA Project No. 15-002 was presented for consideration.

DESMAN understands that this work would be subject to funding, and so Desman recommends that NHPA program this work accordingly.





Photo #45



Photo #46

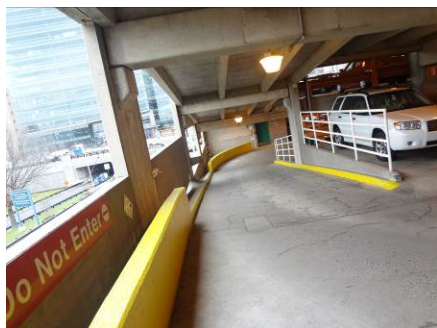


Photo #47

PAINTING AND COATINGS:

Miscellaneous Metal Surfaces: Due to age and wear, DESMAN recommends that the guardrail systems and handrails throughout the garage be programmed for full re-painting; a warranty should be in place for the coating system, so DESMAN recommends that PNH coordinate with the fabricator and coating manufacturer accordingly (**Photo #45**). Upon re-painting, DESMAN also recommends that all anchors be cold-galvanized as well.

Miscellaneous Concrete & Masonry Surfaces: As with any parking facility, periodic re-painting will be required (**Photos #46 & #47**), the cost of this periodic re-painting has been included within our projected repair costs for this facility.

Parking Stall & Lane Striping: The parking facility was re-striped in 2013. As with any parking facility, periodic re-striping will be required, the cost of this periodic re-striping has been included within our projected repair costs for this facility.

REVENUE CONTROL EQUIPMENT REPLACEMENT:

The existing revenue control and parking access equipment was replaced in 2013. However, due to new and improved technology, DESMAN recommends that PNH review the current system for potential enhancements and/or replacement, and plan accordingly.

MISCELLANEOUS CONSIDERATIONS:

Garage Cleaning: As mentioned previously, it is an important that this facility be cleaned periodically to remove accumulations of sand and other debris that is not only unsightly, but is also a hindrance to proper deck drainage. It is DESMAN's opinion that facility cleaning is in reality an operating expense which should be performed on an as-needed basis.

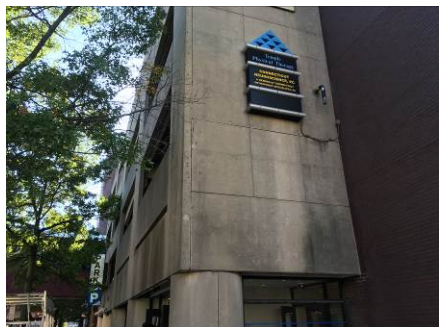


Photo #48

While the typical preventative maintenance cost associated with this work is not included within our projected five-year construction costs, subsequent to the miscellaneous masonry repairs programmed, DESMAN recommends that the exterior be comprehensively pressure-washed and cleaned accordingly as well (**Photo #48**), and has programmed this work accordingly.

Ice-Melt and Snow Removal: DESMAN notes that chloride-based ice-melt products can be detrimental to the long-term durability of the concrete matrix, and DESMAN therefore recommends that an alternative product be used. While DESMAN does not specifically endorse a specific product or manufacturer, DESMAN does suggest that in lieu of a calcium chloride product, an alternative product such as Cryotech NAAC[®], as manufactured by Cryotech Deicing Technology, of Fort Madison, IA be used.

However, we do acknowledge that use of an alternate product can be more expensive (Cryotech NAAC[®] is used frequently at airports), and many snow-removal vendors have not budgeted and are not prepared to obtain and use the alternate product. Since NHPA is performing its snow/ice removal operations in-house, NHPA may be able to find an equal product in mind by forwarding a performance-based requirement to various sources and that the source provide simply a non chloride-based product (not necessarily Cryotech NAAC[®]).

As a final option, should it be necessary that NHPA use a chloride-based ice-melt, we strongly recommend that NHPA continue to remove the ice-melt product immediately after the snow and ice is melted, and the slabs be washed clean as soon as temperatures allow.

UPDATING OF RECORD DOCUMENTS:

Given the need to perform regular maintenance and the need to correctly oversee future repair and preventative maintenance projects, NHPA will benefit from the continuous updating of a set of record drawings. Such drawings will identify the locations of previously repaired concrete, installation of membrane systems and expansion joint glands, as well as urethane sealants, so that NHPA will be able to readily determine the age of the applicable product

and the applicability of any such warranties. Such drawings will also identify the locations and ratings of all electrical distribution components, locations and manufacturers of fire alarm and security systems, and the location and circuiting of all regular lighting, emergency lighting, and exit signs. Mechanical systems (boilers, fans, HVAC equipment, pumps and sprinkler systems) would also be documented. DESMAN recommends that the record documents be updated as required.

In conjunction with the benefit of preparing Record Drawings, it is becoming more cumbersome and inefficient for NHPA to maintain a hard-copy set of the original/past documents from the garage's original construction. The documents are becoming more aged and the paper more susceptible to damage. Considering the valuable nature of the historic documentation with regards to future repair work, DESMAN recommends that NHPA arrange for the scanning of all documentation into electronic (PDF) format; converting the documents into electronic format would allow for easier sharing of documents, as well, which can then easily be transmitted via e-mail as required.

In summary, DESMAN recommends that the above outlined repair and preventative maintenance program be implemented to assure the continued safe usage and long-term durability of the structure.



5. PRIORITIZED REPAIR PROGRAMS & ESTIMATED COSTS

A revised repair and preventive maintenance program has been developed to assure the long-term durability of the Temple Medical Parking Garage. The repairs required have been prioritized into three courses of action:

- Prioritized Repairs (FY 2021)
- Early Repairs (FY 2022)
- Programmed Repairs (FY 2023)
- Long-Term Repairs (FY 2024 - 2025)

Below is a summary of the estimated construction cost for each category.

RECOMMENDED REPAIR PROGRAM	ESTIMATED CONSTRUCTION COST
Prioritized Repairs (FY 2021)	\$0.00
Early Repairs (FY 2022)	\$495,900.00
Programmed Repairs (FY 2023)	\$320,450.00
Long-Term Repairs (FY 2024 – 2025)	\$2,302,600.00
TOTAL ESTIMATED COST	\$3,118,950.00

A detailed cost estimate is provided in the table on the following page, entitled "Projected Construction Costs."

The construction costs are based on current prices in the New Haven area for labor, equipment and materials. The estimated construction costs also include a 20% contingency factor to account for uncertainties in the restoration market at the time of bidding, and a preliminary design, construction management fee and program management fee estimated at 25% of total construction cost has been provided for budgeting purpose.



Table 1
Temple Medical Parking Garage
Projected Five Year Construction Cost
(FY 2020)

Work Description		Prioritized Repairs (FY 2021)	Early Repairs (FY 2022)	Programmed Repairs (FY 2023)	Long-Term Repairs (FY 2024- 2025)
A. Concrete Repairs:					
1	Partial Depth Concrete Repair	\$ -	\$ -	\$ 10,000.00	\$ 10,000.00
2	Miscellaneous Scaling Repair/Application of Helaer/Sealer/Overlay	\$ -	\$ -	\$ 125,000.00	\$ 132,000.00
3	Miscellaneous Concrete Curb Repair	\$ -	\$ -	\$ 40,000.00	\$ 11,000.00
4	Miscellaneous Epoxy Injection	\$ -	\$ -	\$ 2,000.00	\$ 6,000.00
5	Miscellaneous Vertical & Overhead Concrete Repair	\$ -	\$ -	\$ 13,000.00	\$ 4,000.00
6	Miscellaneous Stair Tread Repair	\$ -	\$ -	\$ 7,000.00	\$ 2,000.00
7	Concrete Rib Repair	\$ -	\$ -	\$ -	\$ -
8	Miscellaneous CMU/Masonry Repair	\$ -	\$ -	\$ -	\$ -
9	Miscellaneous Exterior Brick Re-Pointing	\$ -	\$ -	\$ -	\$ -
B. Waterproofing Repairs:					
1	Expansion Joint Repair/Replacement	\$ -	\$ -	\$ -	\$ -
2	Crack Repair	\$ -	\$ -	\$ -	\$ -
3	Miscellaneous Control/Construction Joint Repair	\$ -	\$ -	\$ -	\$ -
4	Miscellaneous Cove Joint Repair	\$ -	\$ -	\$ -	\$ -
C. Architectural Enhancements:					
1	Garage Façade, approach from George Street, Enhancements	\$ -	\$ -	\$ -	\$ 210,000.00
2	Garage Façade, approach from M.L.K. Boulevard, Enhancements	\$ -	\$ -	\$ -	\$ 210,000.00
3	Manager's Office	\$ -	\$ -	\$ -	\$ 210,000.00
4	Maintenance Area Improvements (Lot #009)	\$ -	\$ -	\$ -	\$ 280,000.00
5	Replacement of Wood Bumper Guards	\$ -	\$ -	\$ -	\$ -
6	Exterior Pressure-Washing/Cleaning	\$ -	\$ 96,000.00	\$ -	\$ -
7	Replacement of Doors & Frames	\$ -	\$ 96,000.00	\$ -	\$ -
D. Electrical/Mechanical/Plumbing Work:					
1	Cleaning Floor Drains (W/ Construction)	\$ -	\$ -	\$ -	\$ -
2	Installation of Washdown System	\$ -	\$ -	\$ -	\$ 210,000.00
3	Replacement/Installation of New LED Light Fixtures	\$ -	\$ -	\$ -	\$ -
E. Elevator Upgrades and Improvements:					
1	Maintenance Audit (Bi-Ennial)	\$ -	\$ 2,000.00	\$ -	\$ 2,000.00
2	Modernization of (2) Elevators	\$ -	\$ -	\$ -	\$ -
F. Security Improvements					
	Installation of Security System (i.e. Callbox System, Cameras, and other components)	\$ -	\$ -	\$ -	\$ -
F. Revenue Control Equipment Renewal & Replacement					
1	Study for the Replacement of the Revenue Control Equipment	\$ -	\$ -	\$ 10,000.00	\$ -
2	Replacement of the Revenue Control Equipment	\$ -	\$ -	\$ -	\$ 301,000.00
G. Painting:					
1	Concrete & Masonry Surfaces (including ramp walls)	\$ -	\$ 32,000.00	\$ -	\$ -
2	Exposed Metal Surfaces (including guardrail system)	\$ -	\$ 64,000.00	\$ -	\$ -
3	Parking Stall & Lane Striping	\$ -	\$ -	\$ 14,000.00	\$ -
H. Signage Improvments:					
	Repairs and Miscellaneous Replacement of Signage Program	\$ -	\$ 32,000.00	\$ -	\$ -
I. File Management					
1	Preparation of Record Drawings	\$ -	\$ 20,000.00	\$ -	\$ -
2	Scanning of Original Drawings	\$ -	\$ -	\$ -	\$ -
Sub-Total		\$0.00	\$342,000.00	\$221,000.00	\$1,588,000.00
20% Contingencies (Unless Depicted Otherwise)		\$0.00	\$68,400.00	\$44,200.00	\$317,600.00
25% Engr. & Construction Management, incl. Program Management (Unless Depicted Otherwise)		\$0.00	\$85,500.00	\$55,250.00	\$397,000.00
Total Phased Construction Costs with contingencies:		\$0.00	\$495,900.00	\$320,450.00	\$2,302,600.00
TOTAL Construction Cost with Contingencies:					\$3,118,950.00

Note 1: Costs Presented do not Include Typical Operational & Maintenance Costs Except as Noted

Note 2: Costs include a 15% allowance for General & Special Conditions.

Note 3: Future costs incorporate a cumulative 5% inflation for all costs, to be adjusted annually



6. DETERIORATION MECHANISMS

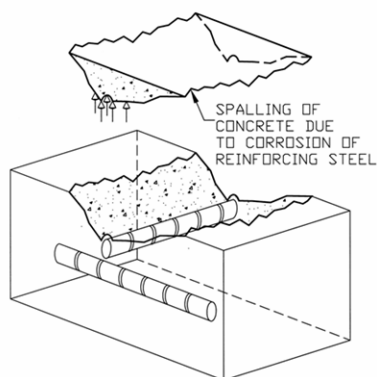


Fig. A

Reinforced concrete deterioration is typically caused by one or more factors of deterioration mechanisms including corrosion of reinforcement, water penetration, freeze-thaw cycling, volume change, or chemical attack. Any one or combination of these deterioration mechanisms can adversely affect the behavior/performance of a reinforced concrete structure. These adverse impacts include corrosion-induced distress, loss of reinforcing cross section, scaling, leaking, cracking, and delamination of concrete. The following is a brief discussion of each of the mechanisms noted above, and their effect on reinforced concrete structures.

WATER PENETRATION:

The primary cause of the majority of reinforced concrete deterioration within parking structures is directly related to the penetration of water into the concrete. Reinforcing corrosion, concrete scaling, water leakage, leaching, and concrete delamination are all caused at least partially by water penetration.

Concrete is a porous material, susceptible to water penetration which can result in increased potential for deterioration. Corrosion of reinforcing steel is an electrochemical process accelerated by the presence of water acting as an electrolyte. In addition, water penetrating into concrete (*Fig. A*) can carry water-soluble chlorides (de-icing salts) to the reinforcing. The combination of chlorides and water further accelerates this corrosion process.

Scaling is also directly related to water penetration into concrete. Scaling is a surface deterioration resulting from pressures by freeze-thaw cycling of saturated concrete. These pressures within the pore structure cause progressive failure of the cement/sand paste. This progressive failure begins with degradation of the exposed surface, advances to the exposure of coarse aggregate, and in severe cases, causes paste failure surrounding the coarse aggregate, destroying the paste/aggregate bond.

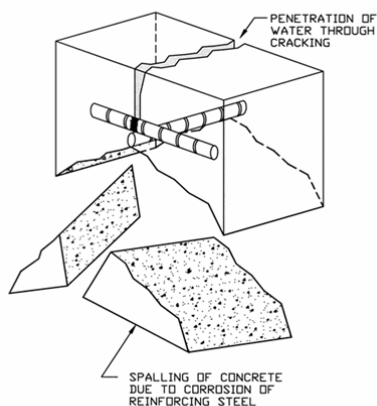


Fig. B

Water penetration through a concrete section, cracked or not, can cause leaching of minerals from within the concrete matrix. Leaking of the parking deck exposes embedded reinforcing steel and underlying structural members to water and chloride ions (road salt) resulting in structural deterioration and potentially a loss of load carrying capacity of these building elements. Leaching is the result of frequent water penetration carrying water-soluble products from within the concrete to the surface below. Leached materials that tend to collect on overhead concrete surfaces are unsightly and potentially damaging to patron's vehicles using the parking facility.

Water penetration can also cause delamination of concrete along subsurface fractures through pressures generated during freeze-thaw cycling.

CORROSION OF REINFORCEMENT:

Corrosion of reinforcing steel or other embedded ferrous items such as electrical conduit is a second major factor contributing to deterioration of reinforced concrete (Fig B).

The corrosion process is an electrochemical process, which produces iron oxide (rust) and other by-products. These by-products occupy a minimum of 250% of the volume of the parent metal. This increase in volume produces tensile stresses within the surrounding concrete.

Because concrete has poor tensile strength properties, cracking occurs within the concrete matrix allowing additional moisture and chlorides to reach the reinforcing causing acceleration of the corrosion process. The deterioration caused by this corrosion includes the reduction of cross sectional area of the reinforcing, and the delamination of concrete surrounding the reinforcement.

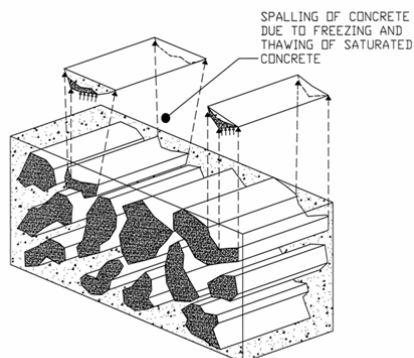


Fig. C

FREEZE-THAW DAMAGE:

Concrete deterioration caused by freeze-thaw cycles is a third major deterioration mechanism. The mechanism occurs within saturated concrete subjected to freezing and thawing due to the pressures generated within the pores of the concrete paste resulting from the volume changes of water during the freeze/thawing process. These pressures are even greater in the presence of de-icing chemicals/chlorides as these chemicals reduce the freezing point and indirectly increase the pore pressures.

As previously mentioned, these pressures can cause progressive failure of the cement paste and result in scaling of the concrete, and delamination of concrete along subsurface fracture planes (*Fig. C*).

VOLUME CHANGES:

Volume changes are a fourth major contributing factor of deterioration of reinforced concrete structures. These volume changes occur in both plastic and cured concrete. These volume changes can cause various types of cracking within the concrete member.

These cracks allow access for water and contaminants to the concrete and reinforcing, resulting accelerated deterioration to occur. The cracking most often associated with plastic concrete is shrinkage cracking produced by the reduction in volume of the concrete during curing. Improper detailing, proportioning, placement, or curing of the concrete can affect the extent of this cracking, but the primary cause is the volume change that occurs during curing.

Volume changes due to thermal movement, shrinkage, creep, and loading can also contribute to the deterioration of reinforced concrete. These volume changes will produce stress in restrained members, often resulting in cracking of the member (*Fig. D*). These cracks also provide access to water and other deterioration mechanisms to attack the member.

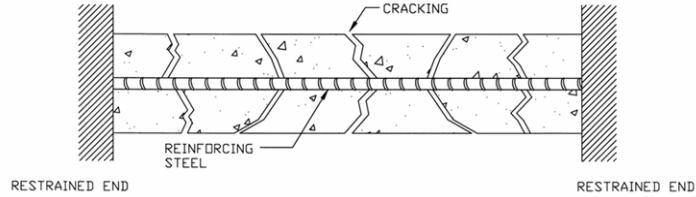


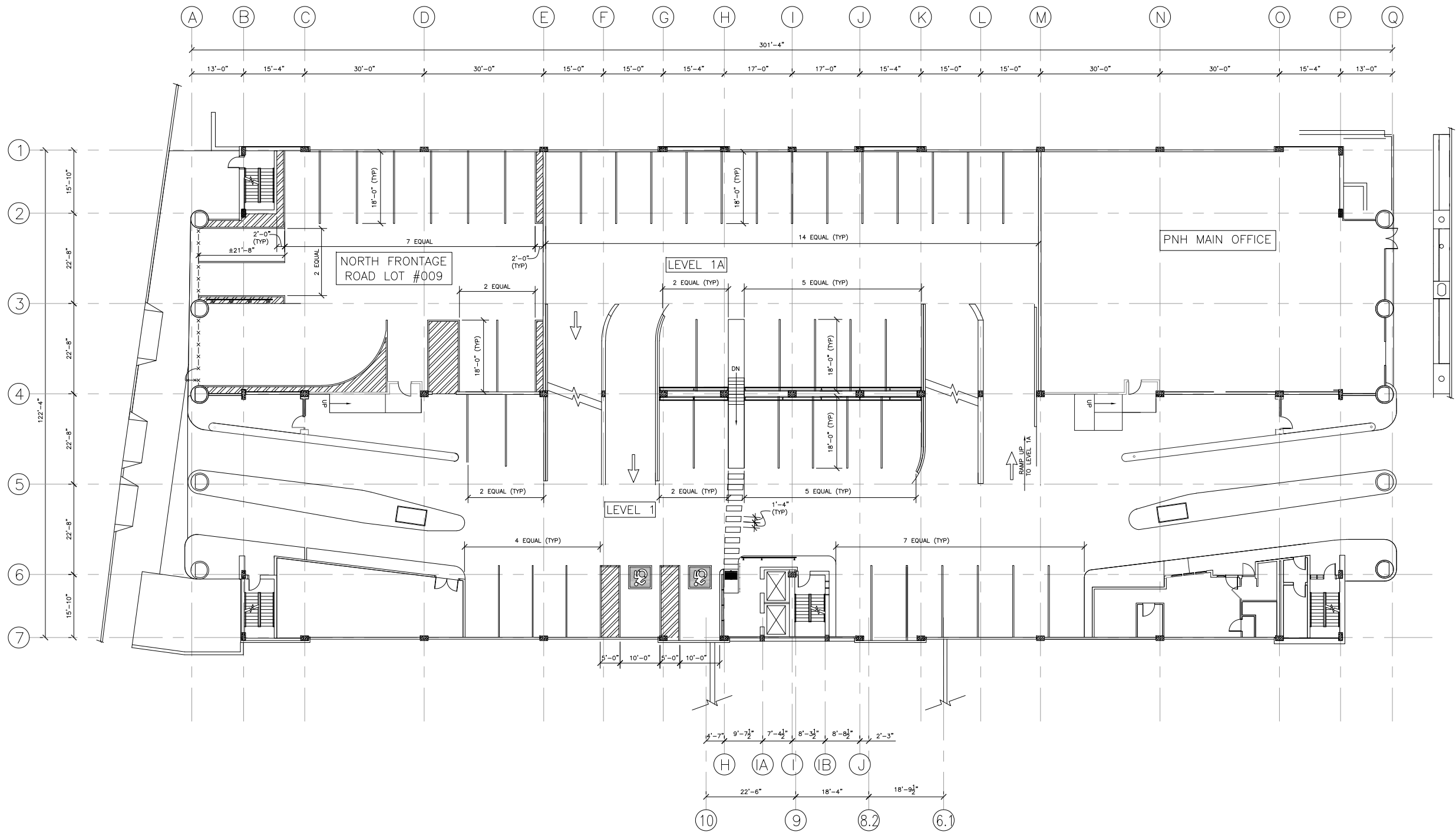
Fig. D

CHEMICAL ATTACK:

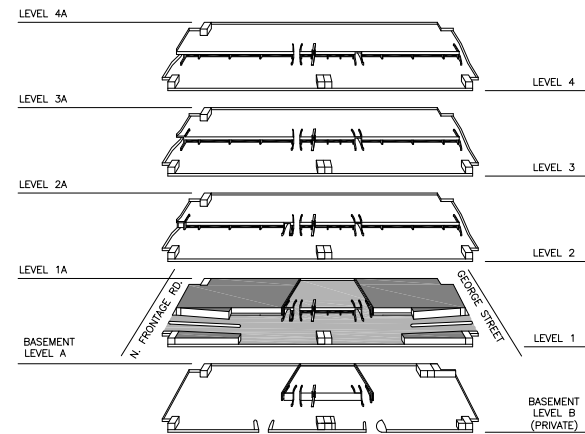
Chemical attack is a fifth major deterioration mechanism affecting the performance of reinforced concrete. The effect of de-icing chemical/chlorides upon reinforcing steel and scaling is one example of chemically influenced deterioration. Severe exposure to other chemicals, notably sulfates and acids, can also cause deterioration of cement paste, cement paste/aggregate bond, and reinforcing steel. Chemical properties occurring within certain types of aggregates can also cause an adverse reaction with the cement paste. The resulting volume changes can cause cracking of the concrete.

7. APPENDIX A – SCHEMATIC FLOOR PLANS





FIRST LEVEL STRIPING PLAN
SCALE: 3/32"=1'-0"



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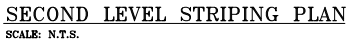
CONDITION APPRAISAL, YEAR 2020

NHPA PROJECT #20-001

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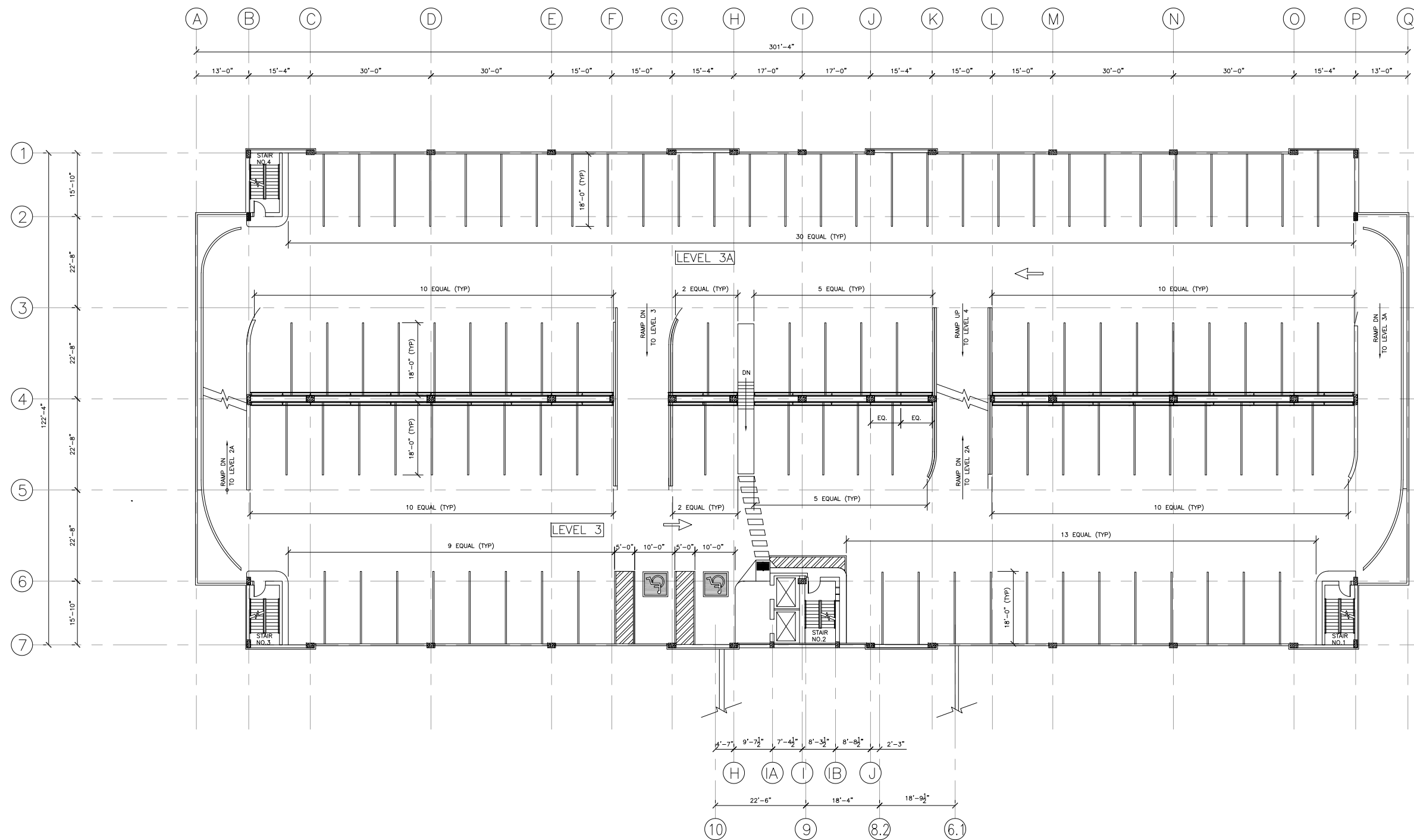
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REVISIONS		
DRAWING TITLE		
FIRST LEVEL STRIPING PLAN		
DRAWING NO.		
ST-1.1		
SCALE: NTS		
DATE: APRIL 2020		
PROJECT NO. 20-19171.00-2		
NHPA NO. 20-001		
DESIGN	DRAWN	CH'KD.
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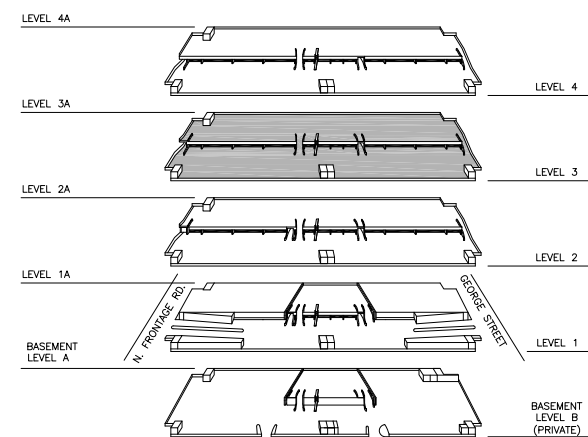


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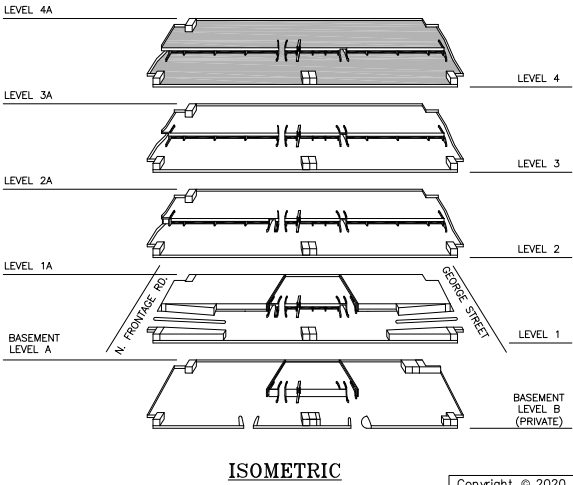


THIRD LEVEL STRIPING PLAN
SCALE: N.T.S.

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NHPA PROJECT #20-001

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8. **APPENDIX B – MAINTENANCE SCHEDULES AND CHECKLISTS**



MAINTENANCE SCHEDULE

A. Cleaning:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Sweeping - Localized	R	M					
2. Sweeping - all Areas (including curbs)		R	M				
3. Expansion Joints		R	M				
4. Empty Trash Cans	R	M					
5. Restrooms:							
a. Floors	R	M					
b. Fixtures		M					
c. Walls		R	M				
6. Cashier's Booths:	R						
a. Floors		M					
b. Fixtures		M					
c. Walls		R	M				
d. Windows	R	R	M				
7. elevators:							
a. floors	R	M					
b. Doors		R	M				
c. Door Tracks		M					
d. Windows (if glass back elevator):							
- Interior Elevator Glass		R	M				
- Exterior Elevator Glass (exterior of cab/interior of shaft)						R/M	
8. Stairs:							
a. Floors		R	M				
b. Handrails		R	M				
c. Windows:							
- Interior Window Surfaces			R	M			
- Exterior Window Surfaces (inclusive of exterior of back elevator shaft)						R/M	
9. Offices (Management/Security):							
a. Floors	R	M					
b. Windows:							
- Interior Surfaces		R	M				
- Exterior Surfaces			R	M			
10. Electrical/Mechanical Rooms							
11. Wash Down Parking Decks					*R	*M	
12. Wash Down Revenue Control Equipment		R	M				Note 3



MAINTENANCE SCHEDULE

B. Doors & Door Hardware:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Doors close & Latch Properly	R	M					
2. Mechanized Doors:							
a. Pedestrian Doors	R	M					
b. Rolling Grill Doors	R	M					
3. Panic Hardware at Security Doors	R	M					
4. Lubricate mechanized Doors:							
a. Pedestrian Doors			R		M		
b. Rolling Grill Doors			R		M		
C. Electrical System:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check Lighting Fixtures		R	M				
2. relamp Fixtures		R		M			
3. Replace Fixture Ballasts			R	M			
4. Inspect - Specialized Electrical Equipment:							
a. Time Clocks				R	M		Note 3
b. Photo Cells				R	M		Note 3
c. Lighting Control Equipment				R	M		Note 3
d. Other						R/M	Note 1
5. Electrical Distribution Panels					R	M	
6. surface Mounted conduit					R	M	
7. Sprinkler System Compressor					R	M	
8. fire alarm System				R	M		Note 2
D. Elevator Operation:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for Normal Operation	R	M					
2. Check Elevator Indicator Lights:							
a. Interior	R	M					
b. Exterior	R	M					
3. Check Audible Tones (ADA level enunciators)		R	M				
4. Elevator Service - Preventive Maintenance					R	M	Note 2
E. Heating, Ventilation & Air Conditioning:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for Proper Operation:							
a. Heating Equipment		R		M			Note 3
b. Ventilation Equipment		R	M				Note 3
c. A/C Equipment		R		M			Note 3
2. Check Filters						R/M	Note 1
3. HVAC Service - Preventive Maintenance						R/M	Note 1



MAINTENANCE SCHEDULE

F. Painting:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for repaint Failure & Rusting:							
a. Doors & Door Frames				R	M		
b. Handrails & Guardrails				R	M		
c. Steel Bollards/Pipe Guards				R	M		
d. Exposed Piping (fire suppression system & storm drainage)					R	M	
e. Other Miscellaneous Metals				R	M		
2. Check for Appearance:							
a. Striping				R	M		
b. Curbs			R		M		
c. Walls				R	M		
d. Ceilings					R	M	
e. Signs			R	M			
f. Touch-up Paint			R		M		
3. Repainting						R/M	Note 1
G. Parking/Revenue Control Equipment:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for Proper Operation	R	M					
2. Parking/Revenue Control Equip - Preventive Maintenance							Note 3
H. Plumbing/Drainage Systems:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for Proper Operation:							
a. Sanitary Facilities	R	M					
b. Portable Water System			R		M		
c. Deck Wash down System							
d. Floor Drains/Storm Risers					R	M	
e. Fire Suppression Systems:							
- Sprinkler System						R/M	Note 3
- Dry Fire Standpipe System						R/M	Note 3
2. Drain Down Systems for Winter						R/M	Note 3



MAINTENANCE SCHEDULE

I. Waterproofing:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for Leaks:							
a. Roofing			R		M		
b. Joint/Crack Sealants			R		M		
c. Expansion Joints			R		M		
d. Windows, Doors & Walls			R		M		
e. Parking Deck - Waterproofing Membrane			R		M		
2. Check for Deterioration:							
a. Roofing					R	M	
b. Joint/Crack Sealants					R	M	
c. Expansion Joints					R	M	
d. Windows, Doors & Walls					R	M	
e. Parking Deck - Waterproofing Membrane					R	M	
J. Safety Checks:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Handrails & Guardrails			R	M			
2. Emergency Exit Signs		R	M				
3. Emergency Lights		R	M				
4. Tripping Hazards:							
a. Supported Concrete Slabs	R	M					
b. Concrete Slab-on-grade	R	M					
c. Stairs (interior & exterior)	R	M					
d. Sidewalks & Curbs (interior & exterior)	R	M					
K. Pedestrian & Vehicular Signage:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check Signs:							
a. Proper Placement/Positioning		R	M				
b. Clean				R	M		
c. Legibility			R	M			
d. Illuminated Signs or Changeable Information Signs	R	M					



MAINTENANCE SCHEDULE

L. Snow & Ice Removal:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check for Icy Spots (in season)	R/M						
2. Remove Snow & Ice (in season)	R/M						
M. Structural System:	Daily	Weekly	Monthly	4 Month Interval	6 Month Interval	Yearly	Other
1. Check Structure for:							
a. Soffit (overhead) Deterioration			R	M			
b. Floor Surface Deterioration (see safety checks)				R	M		
c. Wall & Column Deterioration			R	M			
d. Cracking Concrete				R	M		
e. Water Leakage				R	M		
f. Rusting Structural Steel				R	M		
g. Rusting Embedment's within Concrete				R	M		
h. Unusual and/or Unequal Settlement					R	M	
N. Repair	As per Engineer's Recommendation						
O. Repair and/or Replace Protective Concrete Coatings	As per Engineer's Recommendation						
Notes for Maintenance Checklist:	Frequency						
	R=Recommended M=Minimum			R*=Spring & Fall M*=Spring			

1. A frequency should be selected that is appropriate for that element in the specific parking garage. Spot repairs or replacements should be performed as needed.
2. This equipment should be under a service contract for regular preventative maintenance and emergency service. The equipment manufacturer's recommendations for inspection and preventative maintenance should be followed.
3. This equipment should either be under a service contract for regular preventative maintenance and emergency service, or in-house staff should be specifically trained to provide the required service. The equipment manufacturer's recommendations for inspection and preventative maintenance should be followed.



MAINTENANCE CHECKLISTS

DAILY CHECKLIST

A. Cleaning:

1. Sweeping - Localized ☐
2. Empty Trash Cans ☐
3. Restrooms:
 - a. Floors ☐
 - b. Fixtures ☐
4. Cashier's Booths:
 - a. Floors ☐
 - b. Fixtures ☐
5. Elevators:
 - a. Floors ☐
 - c. Door Tracks ☐
6. Offices (Management/Security):
 - a. Floors ☐

B. Doors & Door Hardware:

1. Doors Close & Latch Properly ☐
2. Mechanized Doors:
 - a. Pedestrian Doors ☐
 - b. Rolling Grill Doors ☐
3. Panic Hardware at Security Doors ☐

C. Elevator Operation:

1. Check for Normal Operation ☐
2. Check Elevator Indicator Lights:
 - a. Interior ☐
 - b. Exterior ☐

D. Landscaping:

1. Remove Trash ☐
2. Water/Irrigate (*dependent upon time of year & type of planting*) ☐

E. Parking/Revenue Control Equipment:

1. Check for Proper Operation ☐

F. Plumbing/Drainage Systems:

1. Check for Proper Operation:
 - a. Sanitary Facilities ☐

G. Safety Checks:

1. Tripping Hazards:
 - a. Supported Concrete Slabs ☐
 - b. Concrete Slab-on-Grade ☐
 - c. Stairs (Interior & Exterior) ☐
 - d. Sidewalks & Curbs (Interior & Exterior) ☐

H. Security System:

1. Check for Proper Operation
 - b. Intercom System ☐
 - c. CCTV Surveillance System ☐

I. Pedestrian & Vehicular Signage:

1. Check Signs:
 - a. Illuminated Signs or Changeable Information Signs ☐

J. Snow & Ice Removal:

1. Check for Icy Spots (in season) ☐
2. Remove Snow & Ice (in season) ☐

Supervisor: _____

Date: _____



MAINTENANCE CHECKLISTS

WEEKLY CHECKLIST

A. Cleaning:

1. Sweeping - All Areas *(including curbs)* ☐
2. Expansion Joints ☐
3. Restrooms:
 - a. Walls ☐
4. Cashier's Booths:
 - a. Walls ☐
 - b. Windows ☐
5. Elevators:
 - a. Doors ☐
 - b. Windows *(if glass back elevator)*:
 - Interior Elevator Glass ☐
6. Stairs:
 - a. Floors ☐
 - b. Handrails ☐
7. Offices (Management/Security):
 - a. Windows:
 - Interior Surfaces ☐
8. Wash Down Revenue Control Equipment ☐

B. Electrical System:

1. Check Lighting Fixtures ☐
2. Relamp Fixtures ☐

C. Elevator Operation:

1. Check Audible Tones *(ADA level annunciators)* ☐

D. Heating, Ventilation & Air Conditioning:

1. Check for Proper Operation:
 - a. Heating Equipment ☐
 - b. Ventilation Equipment ☐
 - c. A/C Equipment ☐

E. Landscaping:

1. Mow Lawns ☐

F. Safety Checks:

1. Emergency Exit Signs ☐
2. Emergency Lights ☐

G. Security System:

1. Check for Proper Operation
 - a. Elevator Communication Equipment (Telephone) ☐

H. Pedestrian & Vehicular Signage:

1. Check Signs:
 - a. Proper Placement/Positioning ☐

Supervisor: _____
Date: _____



MAINTENANCE CHECKLISTS

MONTHLY CHECKLIST

A. Cleaning:

1. Stairs:
 - a. Windows:
 - Interior Window Surfaces
2. Offices (Management/Security):
 - b. Windows:
 - Exterior Surfaces

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B. Doors & Door Hardware:

1. Lubricate Mechanized Doors:
 - a. Pedestrian Doors
 - b. Rolling Grill Doors

☐☐

C. Electrical System:

1. Replace Fixture Ballasts

☐

D. Landscaping:

1. Weed Landscaping

☐

E. Painting:

1. Check for Appearance:
 - a. Curbs
 - b. Signs
 - c. Touch-up Painting

☐☐☐

F. Plumbing/Drainage Systems:

1. Check for Proper Operation:
 - a. Potable Water System

☐

G. Roofing & Waterproofing:

1. Check for Leaks:
 - a. Roofing
 - b. Joint/Crack Sealants
 - c. Expansion Joints
 - d. Windows, Doors & Walls
 - e. Parking Deck Waterproofing Membrane

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H. Safety Checks:

1. Handrails & Guardrails

☐

I. Pedestrian & Vehicular Signage:

1. Check Signs:
 - a. Legibility

☐

J. Structural System:

1. Check Structure for:
 - a. Soffit (overhead) Deterioration
 - b. Wall & Column Deterioration

☐☐

Supervisor:

Date:

APRIL 2020

CONDITION APPRAISAL
TEMPLE MEDICAL PARKING GARAGE



MAINTENANCE CHECKLISTS

QUARTERLY CHECKLIST

A. Electrical System:

1. Inspect - Specialized Electrical Equipment:
 - a. Time Clocks ☐
 - b. Photo Cells ☐
 - c. Lighting Control Equipment ☐
2. Fire Alarm System ☐

B. Painting:

1. Check for Paint Failure & Rusting:
 - a. Doors & Door Frames ☐
 - b. Handrails & Guardrails ☐
 - c. Steel Bollards/Pipe Guards ☐
 - d. Other Miscellaneous Metals ☐
2. Check for Appearance:
 - a. Striping ☐
 - b. Walls ☐

C. Pedestrian & Vehicular Signage:

1. Check Signs:
 - a. Clean ☐

D. Structural System:

1. Check Structure for:
 - a. Floor Surface Deterioration (See also Safety Checks) ☐
 - b. Cracking Concrete ☐
 - c. Water Leakage ☐
 - d. Rusting Structural Steel ☐
 - e. Rusting Embedment within Concrete ☐

Supervisor: _____
Date: _____



MAINTENANCE CHECKLISTS

6 MONTH & YEARLY CHECKLIST

	6 Month Interval	Yearly Interval
A. Cleaning:		
1. Elevators:		
a. Windows (<i>if glass back elevator</i>):		
- Exterior Elevator Glass (exterior of cab and interior of shaft)		<input type="checkbox"/>
2. Stairs:		
a. Windows:		
- Exterior Window Surfaces (<i>inclusive of exterior of elevator shaft if glass back elevator</i>)		<input type="checkbox"/>
3. Wash Down Parking Decks	<input type="checkbox"/>	
B. Electrical System:		
1. Electrical Distribution Panels	<input type="checkbox"/>	
2. Surface Mounted Conduit	<input type="checkbox"/>	
3. Sprinkler System Compressor	<input type="checkbox"/>	
C. Elevator Operation:		
1. Elevator Service - Preventive Maintenance	<input type="checkbox"/>	
D. Heating, Ventilation & Air Conditioning:		
1. Check Filters		<input type="checkbox"/>
2. HVAC Service - Preventive Maintenance		<input type="checkbox"/>
E. Landscaping:		
1. Prune Trees		<input type="checkbox"/>
2. Trim Shrubs	<input type="checkbox"/>	
3. Fertilize	<input type="checkbox"/>	
F. Painting:		
1. Check for Paint Failure & Rusting:		
a. Exposed Piping (fire suppression system & storm drainage)	<input type="checkbox"/>	
2. Check for Appearance:		
a. Ceilings	<input type="checkbox"/>	
3. Repainting		<input type="checkbox"/>
G. Plumbing/Drainage Systems:		
1. Check for Proper Operation:		
a. Floor Drains/Storm Risers	<input type="checkbox"/>	
b. Fire Suppression Systems:		
- Sprinkler System		<input type="checkbox"/>
- Dry Fire Standpipe System		<input type="checkbox"/>
2. Drain Down Systems for Winter		<input type="checkbox"/>
H. Roofing & Waterproofing:		
1. Check for Deterioration:		
a. Roofing	<input type="checkbox"/>	
b. Joint/Crack Sealants	<input type="checkbox"/>	
c. Expansion Joints	<input type="checkbox"/>	
d. Windows, Doors & Walls	<input type="checkbox"/>	
e. Parking Deck Waterproofing Membrane	<input type="checkbox"/>	
I. Structural System:		
1. Check Structure for:		
a. Unusual and/or Unequal Settlement	<input type="checkbox"/>	

Supervisor: _____

Date: _____

