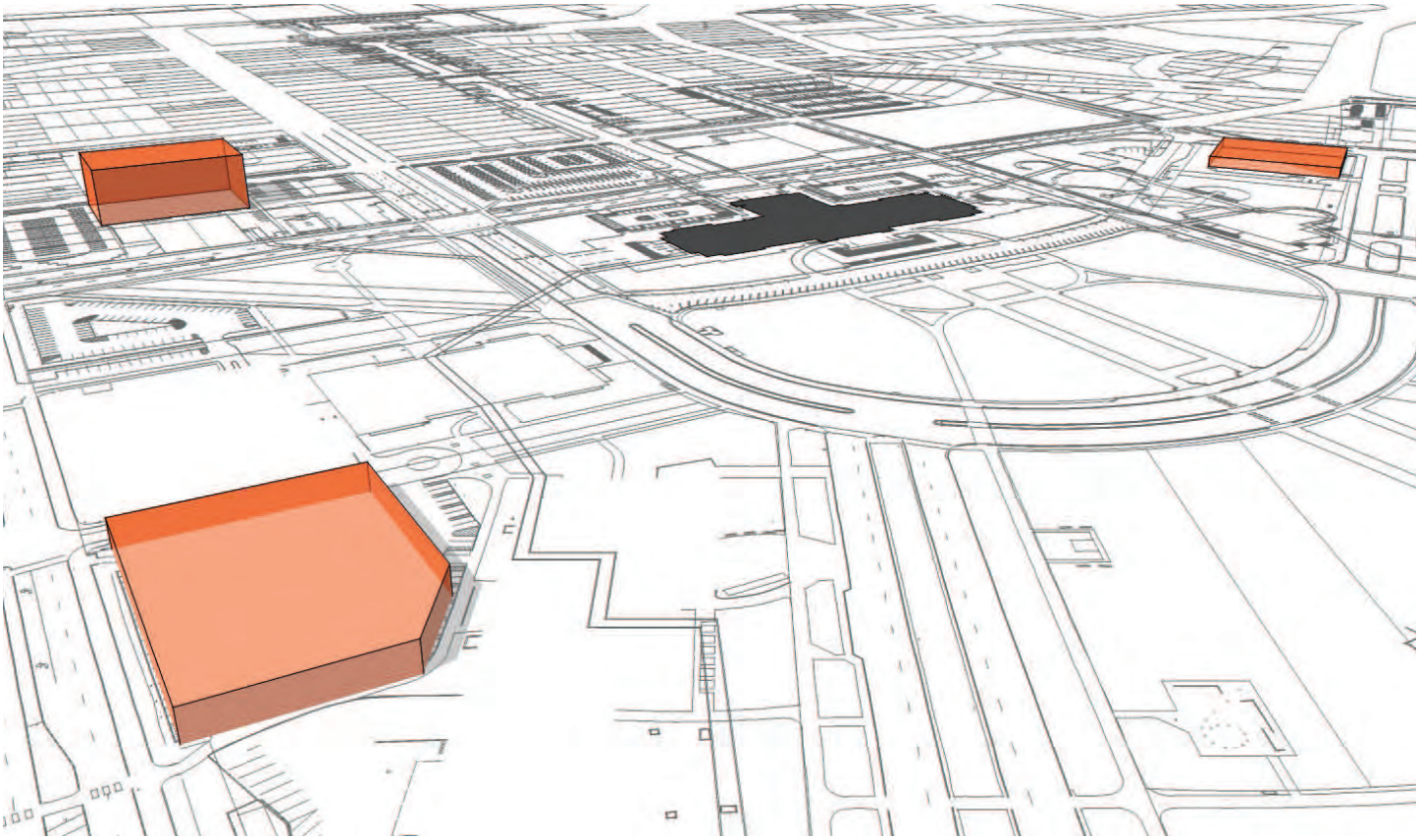
STATE OF MINNESOTA

Predesign Report
New Parking, Capitol Complex

RECS Project Number: 02CP0030
Submittal Date: 31 March 2013



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Capitol Complex Parking Predesign Report

SECTION 1

Predesign Summary Statement

The State of Minnesota's Department of Administration [Admin], through its Real Estate and Construction Services [RECS] and Plant Management Division [PMD] have commissioned this Predesign report as the initial stage in the planning of new, multi-level, structured parking facilities within the Capitol Complex. This initiative is necessary to compensate for both the imminent loss of surface parking capacity and to permit the consolidation of current parking resources. This comprehensive strategy will relocate 1,097 parking stalls within the Capitol Complex, at an architectural level compatible with the Capitol Area, while maintaining present capacities.

This represents a modest increase in the overall parking stalls of 112, however, it is a demand deficit. Parking capacity is increasing slightly, but at a slower rate that parking demand.

In keeping with the Capitol Area Comprehensive Plan and CAAP Board input, parking will be consolidated into structured facilities [as opposed to surface lots]. The replacement facilities will be located on the sites of present surface lots [whose capacity is replaced by the structures]. The conclusion of this analysis is that the capacity is best provided in a set of structures, rather than a single mega-structure. It is important to note that this is not an either-or opportunity; the construction of the identified buildings is a coordinated approach to providing the necessary capacity in an appropriate manner.

Parking Strategy Recommendation

To meet this imminent need, eight sites on the Capitol Complex [Lots AA, C, B, F, L, Q, U/W and Cass Gilbert Park] were analyzed. The following sites are both in compliance with the Comprehensive Plan and were also determined to meet the State's parking needs:

[1] Lot F - 480 car ramp [between Transportation Building and Rice St.]

[2] Lot C - 730 car ramp on the northern portion of the lot [Rice Street and Sherburne Avenue]

[3] Lot L - 200 car ramp with a single deck above parking on grade [Rev. Dr. MLK Jr. Boulevard east of Judicial Center]

These numbers reflect the need to replace existing capacity in place; the gross capacity of 1,410 spaces equates to net new spaces relocated to these sites totaling 1,097. To minimize disruption to the Capitol Complex's infrastructure and to employees' work functions, it is imperative that design work commence as soon as funding permits with an anticipated construction start in October 2013.

Preferred Sites

The three thumbnail images on this page highlight the capacity and massing of potential ramps on the three preferred sites. These are not designed images. They show proposed and viable ramp capacities, circulation solutions, and building placement on the three preferred sites.

A key factor when determining where to locate the ramps on their sites is the consideration or "allowance" for future construction of state buildings [office or commercial space]. Of the three recommend sites only one, Lot C, has this additional site capacity to allow for future construction.

Consequently, the image for Lot C shows a rectangular grey mass to the west of the ramp. This is not proposed building structure for the current project; it is a reserved setback volume for a possible future "Liner" building [a Liner building is so named as it "lines" the street front and serves as a visual buffer between the street and any ramp structure behind it]. By holding back the size and location of the ramp on Lot C, the State retains the option of adding additional future buildings to Lot C. Or if future parking demands increase, the ramp may be expanded laterally to accommodate any increased parking demand.

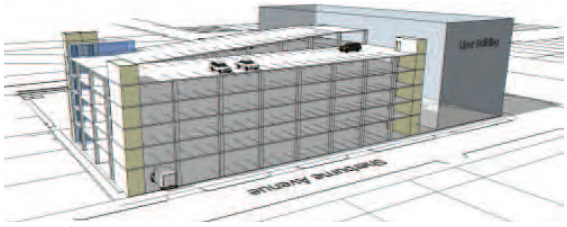
Below are general construction time lines and costs:

Total Project Schedule

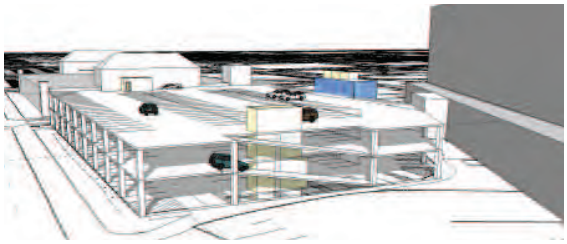
Predesign: Completed 3/2013
Funding: 6/2013
Schematic Design: 6 thru 7/2013
Design Development: 7 thru 8/2013
Construction Documents: 9 thru 12/2013
Bidding: 1/2014
Construction: 10/2013 thru 6/2015
Project Completion: 6/2015

Project Summary Information

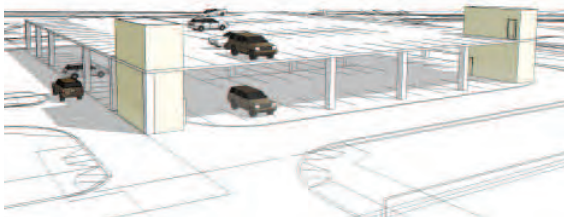
Total Project Sq. Ft.: 412,984
Total Con. Costs: $23,650,000
Cost/Sq. Ft.: $58
Cost/Stall: $16,773
Total Project Cost: $27,695,000
State of MN [% of Cost]: 100%



Lot C 730 Stalls
Sq. Ft./Plate: 29,394; Car Count/Level: 100



Lot F 480 Stalls
Sq. Ft./Plate: 44,212; Car Count/Level: 125



Lot L 100 Stalls
Sq. Ft./Plate: 44,954; Car Count/Level: 100

SECTION 1.1
Project Data Sheet

Name of Project: Capitol Complex Parking Facilities
Agency/Organization: Admin, RECS/PMD
Project/Building Location: Capitol Complex surface parking Lots F, C, and L

BUILDING OCCUPANCY TYPE
Primary Space Types: S1 - Parking Decks
Type of Construction: Type 1, Cast-in-place post tensioned concrete
Number of Stories: Lot F: 2 below grade, 3 above grade
Lot C: 1 below grade, 4 above grade
Lot L: 1 above grade
Square Feet per Floor: Lot F: 44,212 sq. ft.; Lot C: 29,394 sq. ft.; Lot L: 44,954 sq. ft.
Total Square Feet: Lot F: 221,060 sq. ft.; Lot C: 146,970 sq. ft.; Lot L: 44,954 sq. ft.
Space Efficiency: Usable v. Circulation/Mechanical etc.: N/A
Office Space: Gross Sq. Ft. per person: N/A
Typical Work Station Size: N/A
Lot Size: Lot F: 60,088 sq. ft./1.33 acres
Lot C: 77,433 sq. ft./1.71 acres
Lot L: 48,119 sq. ft./1.06 acres

CONSTRUCTION DETAILS
Type (surface or structured): Net New Stalls: 1,097
Area of Parking: Structured parking decks, below, on, and above grade
Exterior Wall Type: Masonry, Stone, Cast Stone
Structural System Type: Cast-in-place post-tensioned concrete
Mechanical System Type: Ventilation in sub-grade levels and elevators only
Fire Protection Description: Dry pipe system in limited areas
Electrical System Type: Conventional
Technology Systems: Operations and Security only
Life Expectancy of New Work: 50+ years

PROJECT COSTS

Total Project Cost: $27,695,000	Furn., Fixtures, Equip., Signs: $350,000
Predesign Cost: $99,000	Relocation Cost: N/A
Site Acquisition Cost: $0	Phasing Cost: N/A
Site Improvements Cost: $850,000	Technology Cost: $625,000
Building Cost: $18,000,000	Hazardous Materials Abatement Cost: $50,000
Parking Cost: N/A	State Funding amount: $27,695,000

NOTE: Cost Estimates are based upon the information above

SECTION 2

Basis for Need - Project Background Narrative

In keeping with their responsibilities to operate and supervise State-owned parking facilities on the Capitol Complex as directed by Minnesota Statutes 16B.58, Admin has initiated this Predesign effort.

This is a report and site selection strategy for the design and construction of new multi-level parking facilities within the Capitol Complex. These facilities will relocate and consolidate the existing parking supply. In total, there will be a slight increase in the available parking count [112 parking stalls] in the Complex as a whole.

This need for a consolidated parking strategy is in direct response to specific factors. Presently, the State leases 635 spaces from a private owner west of Rice Street [Lot X - Sears Lot]. Redevelopment plans for this area will result in lease expiration in August 2014 with little possibility of renewal. Also, increasingly unfavorable financial terms at leased ramp locations in the downtown core have introduced a further degree of pressure and uncertainty to the State's ability to accommodate the demands for visitor and employee parking.

As detailed in this report, the fully realized parking facility strategy will result in approximately 1,300 structured parking spaces. Although there is a modest increase in the parking capacity of the Capitol Complex system, the primary benefit will be the consolidation of various lots, accommodating displaced parkers from both the Sears lot, and the surface lot capacity displaced by construction of each ramp.

Present planning guidelines and long-term strategies dealing with the Capitol Area do not advocate adding overall parking capacity, and in fact anticipate a per-capita reduction in supply over time as the imminent startup of LRT and other changes to the transportation network occur. These plans also direct that parking supply be geographically consolidated when development or other factors permit.

Parking Priorities

This report addresses parking supply for employees and general public visitors. Legislative parking needs are accommodated via a separate yet parallel strategy. Parking is available to employees on a first-come, first-served basis with the following priorities, as established by the Capitol Complex Commuter Policy:

[1] Disability
[2] Van Pool
[3] Car Pool
[4] Executive Management
[5] State Agency
[6]Employees
[7]Vendors or individuals with a business need at Capitol Complex.

Parking Needs

Presently there is sufficient parking capacity in the complex, as a whole. However, there are waiting lists for parkers looking to move to preferred locations, typically closer to their place of employment. All facilities currently have waiting lists, except Lot X.

All parking is allocated on a first-come, first-served basis. As a strategy, The Department of Administration oversells 5 to 50% of capacity to help ensure high utilization. This range is dictated by size and use of facility. January through May are the busiest parking months.

Parking demand is seldom impacted by normal departmental personnel changes

[i.e. "churn"] due to normal cycle-in/cycle-out nature of the employment reservoir. Relocations of entire State departments are rare.

FUNDING STRATEGIES

The Department of Administration is obligated to secure funding/payment for ramps via user fees. It is anticipated that any new structured parking solution will be funded by an assessment raising costs for all contract parkers in the system, rather than be borne only by those using the facility.

The Department of Administration has indicated that employees have been willing to pay somewhat more for parking convenience. History has also shown that proximity to work location is of greater importance for parkers than price. Obviously, at some point a pricing threshold is reached.

PLANNING PARAMETERS AND OTHER FACTORS

For this report, the following basic assumptions have been made. These represent a "reasonable middle" and may be adjusted for the idiosyncrasies of each site as design proceeds.

1. 1st Level: 15'-0" floor-to-floor. This allows flexible space for over-height vehicles and allows possible future adaptation for other occupancies. It is more in keeping with the architectural theme of the Capitol Area, and generally allows a more appropriate architectural scale at the street or pedestrian level.

2. All upper levels are planned as 11'-0" floor-to-floor. This allows 8'-2" clear height on each level, permitting full access for handicap-accessible vans to all levels.

3. At least one below-grade level is assumed for all sites to accommodate two objectives, [1] current or future connection to the State tunnel system, and [2] to help reduce overall impacts of large building masses. For the purposes of this report, below-grade levels were limited to a this single level due to the expense of constructing and operating underground spaces, with a two notable exceptions: two sites, Lots B and F are assumed to have more than one below-grade level. Lot B would be entirely below grade, as required by Capitol Area planning standards, due to its adjacency to the Capitol building. Lot F would have two below-grade levels.

Another site, Cass Gilbert Park, may have a "terraced" parking deck solution, set into the hillside. The levels, however, may be partially open-air and not entirely contained below grade. For purposes of this report, they are not considered to be below-grade. Soil boring findings for each site indicate feasibility of additional below-grade levels should they be desired.

4. Flat plate parking [typically served by express ramps] is most desired for all sites for aesthetic reasons. Where lot size, geometry, or other factors constrain this, sloped-floor parking strategies are considered. In all cases, keeping flat floor plates on visible exterior elevations is preferred. This is more in keeping with the architectural vocabulary of the Capitol Area.

5. The project will not seek LEED certification but will comply with State B3 parameters.

6. Storm water strategies will need to be considered for all sites. These may include new or supplemented sub grade [e.g. cistern] or landscape [e.g. rain garden] strategies as appropriate to each individual candidate site.

CAPITOL COMPLEX COMMUTER POLICY

According to Minn. Statutes 16B.58, Admin is responsible for operating the parking facilities in the Capitol Complex. What follows is an excerpt from the Capitol Complex Commuter Policy outlining the role of Admin in implementing Capitol Complex parking strategies and managing parking facilities:

1. Introduction

This policy is established by the Department of Administration (Admin) to provide for orderly and safe commuting for employees, vendors and the public while working at or visiting Capitol Complex buildings under the custodial control of Admin Plant Management Division (PMD), as well as the St. Paul Armory. For the purpose of this policy, the Capitol Complex is that part of the City of St. Paul defined in Minnesota Statutes Chapter 15B.02. For the purpose of this policy, employees are employees of the State Executive, Judicial and Legislative branches and the St. Paul Armory whose primary work location is in Capitol Complex buildings that are under the custodial control of Admin PMD.

The Commissioner of Administration will annually review and, if necessary, adjust rates to ensure the recovery of anticipated expenditures.

A. Parking Facilities

In accordance with Minn. Statutes 16B.58, the Commissioner of Administration shall operate and supervise state-owned parking facilities that are under the custodial control of Admin.

1. Parking facilities administered by Admin include Lot AA, Lot C, Lot F, Lot G, Lot H, Lot I, Lot J, Lot K, Lot Q, Lot U, Lot W, Lot X, Park Street Lot, 14th Street Ramp, Admin Ramp, Cedar Street [Andersen] Ramp, and Centennial Ramp and facilities leased by Admin.

2. Parking facilities not administered by Admin include Lot B, Lot D, Lot L, Lot N, Lot 0, Aurora Street, State Office Building Ramp, Judicial Garage and Transportation Garage. Facilities not administered by Admin are exempt from the Parking Assignment Priorities of this policy.

The full *Capitol Complex Commuter Policy* is included in Section 8.F of the Appendix.

RESOURCES AND RESEARCH

The scope of this Predesign report includes the study and analysis of the following lots: Lots AA, B, C, F, L, Q, U/W, and Cass Gilbert Park. Currently, all sites are located on the Capitol Complex and serve as surface parking lots, with the exception of Cass Gilbert Park, which is has an upper level park/viewing area and a lower, terraced hillside.

EMPLOYEE SURVEY

As part of this study, a survey of Capitol Complex contract parkers was conducted to better understand employees' parking preferences, commuting patterns [origination and destination], Capitol Complex workplace distribution, and potential LRT/multi-modal impact. It was distributed only to contract parkers who use the parking facilities of the Capitol Complex.

A total of 5,449 employees were queried with 2,858 responding [52%]. The results of the survey were helpful in both confirming existing information and providing a general sense of needs and variation of habits within the parking population.

This assessment [summarized in the Appendix] gave clear data on many aspects of vehicle use and parking habits in the area. Base information verified by this effort included:

1. Most Capitol Area employees leave work between 3:30 and 5:00, with peak exiting occurring at approximately 4:00.

2. Employee arrival at work is spread over a wider time frame.

3. While staff members live broadly throughout the metro area (and beyond), a majority of the employees depart to destinations in the north and east metro area. Most of the auto traffic leaving the area travels via the interstates and their respective feeder systems. This provides information regarding likely traffic issues on the streets surrounding planned new parking facilities.

In most cases, the limiting factors for parking strategies are not in the facility proper, but in the streets outside and their ability to absorb new traffic. Any parking solution must be able to accommodate this late-day "surge" with adequate internal magazine and street/intersection queuing space.

SOIL BORINGS

To aid in the physical findings of this report, soil borings were conducted. A single, 51' deep soil boring was conducted on all candidate sites, with the exception of Lot L. Two borings for this site were available from the recent and ongoing LRT construction and were provided by PMD. These borings were deemed sufficient for the purposes of this report, and a new boring was not required. Note that these borings do not extend as deep as the standard for the new borings [31' and 39' vs. 51']. Again, for the likely use of this site this was deemed acceptable.

It was determined to be of greater and broader benefit to do a single soil boring on each candidate site rather than multiple borings on fewer sites. This allows a common level of information to be developed and available for future reference. The soil boring information considered in this report, therefore, was not exhaustive. Pending findings and the commencement of design, supplemental borings may be desired to develop a fuller picture of the underlying soil conditions that may impact structural considerations and the number of viable subterranean parking levels.

The full soil boring logs, both those provided by the State and those done as new work for this report, are listed in full in Section 8.B in the Appendix.

LAND SURVEY

In addition to soil borings, all candidate sites were freshly surveyed, with the exception of Lot L, where an existing State-supplied survey was used.

Land Survey information for each candidate site is in Section 8.A in the Appendix.

PARKING DEMAND AND CONSOLIDATION

LOT X - SEARS

The primary and key component affecting the parking situation at the Capitol Complex is the expiring lease of the surface lot at Sears [Lot X]. The potential for future lease agreements has been made tenuous due to Sears's ongoing efforts to redevelop the property for alternative, non-parking uses.

For many years, the State has provided approximately 11% of the total parking capacity of the Capitol Complex under a series of long term [five year] leases with Sears [Lot X]. These leases were recently amended to extend for a term of only one year [expiring in Fall of 2014], and at a sub-

stantial increase in cost. Effective 9/1/11, the monthly rent is $29.75 per stall plus $2,700 per month for security. Monthly rent was $17.75 per stall plus $1,700 per month for security. Sears can terminate this lease upon 90 days' notice in the event that Sears sells, leases, or assigns the property in its entirety, which appears increasingly likely. The State can terminate upon 90 days' notice for any reason, except the rental of other premises for the same use.

This change in position by Sears is an indication that the ability to negotiate future extensions to the parking lease is at risk, due principally to their interest in pursuing development opportunities, for which the Central Corridor Light Rail project is a significant catalyst.

The current Capitol Complex population is approximately 6,800 employees, with an additional 566 contract workers. As of March 2013, monthly contract volume is 6,673. Of this number, however, 302 are vendor contracts and 707 are Agency contracts, which leaves a total of 5,664 contracts for employees. Therefore, approximately 83% of Complex employees have parking contracts [5,664 of 6,800]. There are also 446 participants in PMD's MetroPass bus program.

There continues to be a strong demand for contract parking and the more popular parking ramps/lots routinely have a waiting list. The prospect of losing 635 parking spaces without replacement would reduce the State's inventory of spaces available for employee contracts to 5,029. Based on an average over-sale factor of 15%, this would limit monthly contracts to 5,783.

Therefore, without replacement of the Sears parking, 712 current employee contract parkers would not be able to park in State facilities or 12.9% of current, year-round employees.

The impact of the Central Corridor Light Rail operation on demand for vehicular parking on the Capitol Complex is difficult to quantify until operations begin. However, employee survey responses indicate that LRT is not an alternative for the majority of Capitol Complex staff due to geographic factors – they simply do not live in the service area of the new line. It is unlikely that it could represent an alternative for over 700 employees not already using other forms of public transportation.

Although Sears has indicated that the number of leased parking spaces may be gradually reduced in the short term rather than eliminated immediately, the State for planning purposes assumes the loss of all leased space at the Sears lot at the end of the current lease agreement.

Another component of the proposed Sears redevelopment affecting Capitol area parking capacity is a proposed office building with a +/-550 car ramp. This ramp would be for both the new apartments as well as to serve the additional retail capacity of the redevelopment. It would not be available to State employees. This ramp would be part of Phase 2 of the planned work and would be located near Lot AA. Planning for Lot AA must be mindful of traffic impacts of this facility.

Publicly available information on Sears' redevelopment plans gathered from the Pioneer Press website is in Section 8.C in the Appendix for reference.

Site-Specific Displaced Parking

In addition to the potential loss of parking capacity at the Sears lot, redevelopment of any present surface lot will by default cause

the loss of a substantial number of existing parking spaces. Each of the potential sites identified for a new structured parking facility currently serves as a surface lot. Therefore, a ramp at any of the potential sites will displace between 135-220 existing parking spaces.

BLOCK 19 MUNICIPAL RAMP

Currently the State is leasing 350 parking spaces in the City of St. Paul's Block 19 municipal ramp. Located in the downtown core outside the Capitol Complex at 7th & Jackson Street. Additionally, each monthly parking contract operates at a net loss to the State [due to the differential between State standard contract rates and the current lease cost] of approximately $25 per stall per month.

Additionally, development pressure in downtown St. Paul has caused the supply of parking to greatly diminish, to the point where the City is currently projecting no surplus parking capacity by 2015. Given that these physical and financial circumstances will remain unchanged, if not escalate, the ramp's long-term ability to provide State leased capacity is unlikely to be sustainable for an extended period of time.

AGENCY CONSOLIDATION

Current employment planning has the State bringing approximately 120 Department of Human Services [DHS] employees from remote sites to the Capitol Complex over the next six months. Without additional parking resources, this additional demand will put increased pressure on existing parking facilities that are already maximized.

PARKING SPACES TO BE CONSOLIDATED

Below is a compilation of the parking factors impacting the scale of a possible parking solution.

Stalls	Description
635	Lot X [Sears]
350	Block 19 Municipal Ramp
313	Site-Specific Displaced Parking
120	Relocated DHS Employees
1,418	Consolidated Parking Spaces

PARKING SUPPLY POLICY

It is the intent of the State [in its Capitol Area Comprehensive Plan] to not fully accommodate the parking needs of all Capitol Complex employees at a one-to-one level. Parking is a component of the overall transit solution and is to eventually be maximized at about 7,000 spaces in the entire complex. The identified need for approximately 1,300 replacement spaces takes this into account.

SECTION 3

Agency/Organization Planning

Plant Management Division [PMD]

Plant Management provides maintenance and management services for Minnesota state buildings, grounds and operations. PMD maintains 4.25 million gross square feet in 21 buildings under the custodial control of or maintained by PMD.

Real Estate and Construction Services [RECS]

Provides a broad range of pre-planning, acquisition, disposition, leasing, project management, relocation, and space management services to facilitate facility solutions that help Minnesota state agencies succeed.

Minnesota state agencies have extensive and diverse real estate needs. The State owns a total of 29 million square feet in more than 5,000 buildings. This real estate is managed by 20 custodial agencies, ranging from the Minnesota State Retirement System with one building containing 146,500 square feet, to the Department of Corrections with 283 buildings with more than 5,592,818 square feet and the Department of Human Services with 192 buildings with more than 3,000,000 square feet. Additionally, RECS leases over 3.5 million square feet of space for state agencies with annual rent totaling more than $60 million.

The property types include office space, storage/warehouse space, workforce centers, residential facilities, hospitals, training centers, correctional facilities, environmental monitoring sites, boat slips, laboratories, driver vehicle exam stations, communication facilities, probation offices and licensing centers.

SECTION 4

Project Description

In response to the urgent need to accommodate this displaced parking, a strategy has been formulated to develop structured parking facilities in select locations within the Capitol Area. Planning has determined that a single facility of 1,200 cars would be infeasible and disruptive to the Complex. Constraints include the enormous scale of such a structure, the impact of its generated traffic on City streets [especially given the surge nature of its activity], and its over-concentration of such a large portion of the parking resource in a single area necessarily remote from the workplaces of a majority of its users. The proposal, instead, is for three new ramps on three different sites spread across the Capitol Complex.

This plan outlines how the necessary facilities will be developed in a manner that offers the least disruption to the work of the State, provides architecturally appropriate structures, and meets the goals of the Comprehensive Plan for consolidation of resources while providing needed geographic distribution of spaces across the broader Capitol Complex.

SECTION 4.1

Architectural/Engineering [A/E] Program

As outlined in Section 1, to meet the parking needs of the State, the following three sites are proposed for future development:

[1] Lot F - 480 car ramp [between Transportation Building and Rice St.]

[2] Lot C - 730 car ramp on the northern portion of the lot [Rice Street and Sherburne Avenue]

[3] Lot L - 200 car ramp with a single deck above parking on grade [Rev. Dr. MLK Jr. Boulevard east of Judicial Center]

Site Selection Considerations

It is to be expected, when analyzing the conditions surrounding the State Capitol - confined urban sites impacted by multiple overlay and use districts, State and Federal concerns, under a governing Comprehensive Plan - that each potential site will possess unique and challenging features.

Each site has conditions which make it both a candidate for selection, as well as exclusion. There is no perfect location; there are degrees of preference. This report's charge is to catalog the full scope of relevant information and to prioritize that information. In the end, the preferred site[s] will satisfy the greatest degree of varied and, at times, conflicting development goals and Capitol Complex parking needs.

The purpose of this report is to provide Admin an evaluation of current parking conditions and the systemic implications of a new structured parking facility.

Prospective sites considered in this Predesign report are Lots AA, B, C, U/W, F, L, Q, and the hillside below Cass Gilbert Park [CGP]. All prospective sites are located within the Capitol Area and function currently as surface parking lots, with the exception of the CGP hill. No remote or satellite parking sites were considered as part of this study.

A requirement of the Capitol Area Comprehensive Plan is to substitute, whenever possible, structured parking for surface parking and so this study focuses exclusively on structured parking solutions. This report highlights the unique benefits and limitations of each potential location.

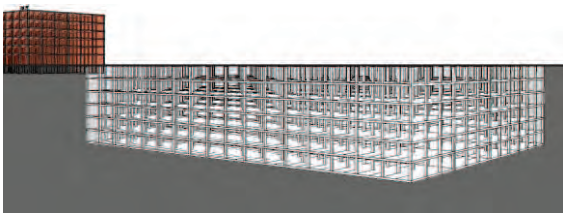
SECTION 4.2

Ramp Capacity Parking Study

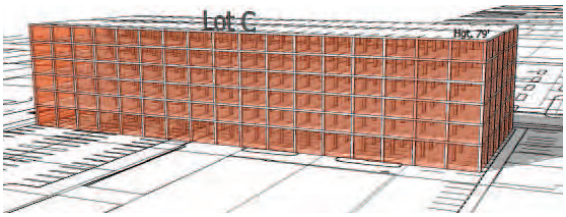
CANDIDATE SITES

The following thumbnail perspectives are of the candidate sites. It is important to note, that these are not proposed designs. They are maximum capacity studies which incorporate Capitol Area Zoning Guidelines, address commuter parking needs based on Capitol Complex employee work place distribution, and numerous site limitations and parameters. These images show a maximum allowable parking capacity, a commensurate building scale, and a preferred building placement on the site.

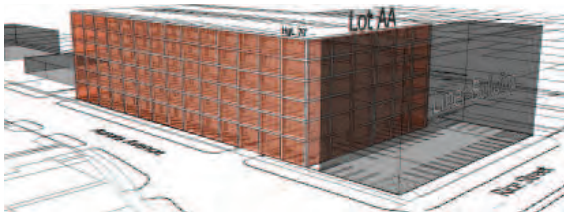
The final ramp footprint and design, construction assemblies, and circulation solutions may vary from what is shown. What is not apparent on these images [but is shown later in the report with additional graphics] is a single below-grade level at Lot C and two below grade levels at Lot F. In each ramp scenario, the below grade levels would be of similar size and capacity to the above grade levels. Lot L, however, would have no below-grade parking, only a covered surface level.



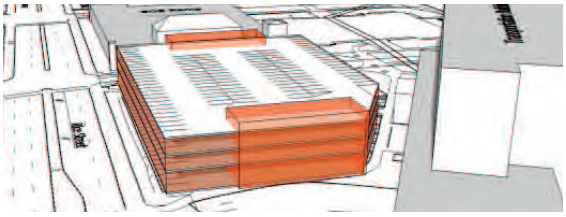
Lot B Maximum Capacity - *all sub grade decks*



Lot C Maximum Capacity - *six elevated parking decks*

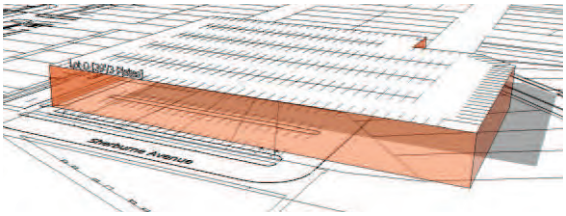


Lot AA Maximum Capacity - *six elevated parking decks. The shaded mass to the east of the ramp structure is a Liner Building volume that could be reserved for a future State building. Lot AA would also have a single below grade parking level for future tunnel access.*

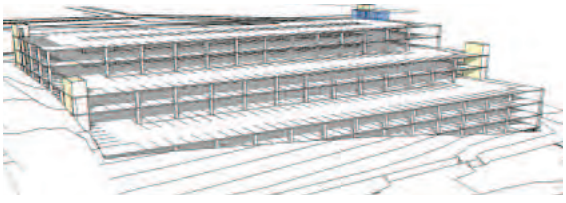


Lot F Maximum Capacity - *three elevated parking decks*

Lot L Maximum Capacity - *one elevated parking deck*



Lot Q Maximum Capacity - *three elevated parking decks*



CGP Maximum Capacity - *terraced parking decks in hillside*

PRECEDENT STUDIES

To better estimate the projected construction costs of the project, a group of recent and relevant "benchmark" structured parking projects has been collected. The details of each are highlighted in the below table.

Parking Ramp Project	Stalls	Levels	Sq. Ft.	Completion	Const. Cost
Smith Ave. Transit Center	600	6	300,000	2007	$14,500,000
Midtown Exchange Ramp	1,580	7	490,000	2005	$16,000,000
Hawthorne Transportation Center	975		520,000	2000	$20,500,000
S.W. Village Transit Center	800	3	180,000	2007	$6,500,000
Apple Valley Transit Station	950	3	360,000	2009	$14,250,000
Block 19 Parking Ramp	1,028	8	381,600	2009	$12,500,000
Rosabel Parking Ramp	126	4.5	56,000	2004	$2,500,000
Holiday Inn Ramp	285	3	102,000	2005	$2,000,000

SECTION 4.3

Technology Plan

Technology and telecommunications capabilities shall include security and building management hardware.

Preliminary technology and telecommunications specifications are as follows:

[1] Fiber optics shall be connected to rest of Capitol Complex.

[2] Each structure shall have a small room or "network closet", as described in PMD's building guidelines best practices.

[3] Each structure shall have a small dmarc for copper cables from the LEC [Century Link] allowing for lines to penetrate structure and service elevators.

[4] The number of cameras and emergency call boxes shall determine how much internal cabling will be needed.

[5] All cable shall reside in conduit.

SECTION 4.4

Sustainability, Energy Conservation, and Carbon Emissions

Minnesota Statute § 16B.325 requires that the State's Sustainable Building Guidelines be applied to this project.

BACKGROUND - B3 GUIDELINES

In 2001, the Minnesota Legislature established the goal of achieving 30% above code energy savings in existing public buildings throughout the state. This initiative is referred to as the B3 Guidelines – "Buildings, Benchmarks and Beyond."

It is the State's goal that all new, state-funded buildings meet or exceed specific energy conservation goals. This takes into account building design, the building's occupants and the building's surrounding external environment.

More specifically, these guidelines advocate the following:

[1] Exceed existing Energy Code by at least 30%

[2] Encourage continual energy conservation improvements

[3] Defining air quality

[4] Creating and maintaining a healthy environment

[5] Facilitating productivity improvements

[6] Specifying ways to reduce material costs

[7] Considering long-term operating costs of the building, including use of renewable energy sources.

The design team must analyze the life-cycle cost of various building design options. This information assists in analyzing the costs and benefits associated not only with direct building decisions, but also secondary and tertiary costs associated with effects on the environment and the building occupants.

Summary of Sustainability Goals

Parking facilities have little "inhabited" space, and at first glance seem to offer minimal options for sustainable initiatives. However, within their limited scope there are specific opportunities to achieve significant improvements over "standard" construction.

Electric Vehicle Charging Stations

The State will design options for electric charging stations for vehicles within all of the proposed parking ramps, based on future needs. Programming for those needs will take place during the design process.

Alternative Energy Source Considerations

A new State building must be designed to have two percent of its energy provided by an alternative energy source. This project's location within the Capitol Area places significant limits upon options for on-site alternative generation. Also, limitations on the State's eligibility for grants and other incentives that are sometimes available to private owners may lengthen payback windows beyond feasibility.

Heating and Cooling Systems

Geothermal service has been considered for all sites. Preliminary planning indicates that, because the sites will be fully covered by buildings, or have areas not occupied by the parking structure reserved for future building[s], it is unlikely to be feasible to install a well field to serve the facilities.

Solar Thermal [ST] has been considered for all sites. The restrictions of the Capitol Area Architectural Guidelines significantly limit the possibility of rooftop-mounted solar thermal panels. Moreover, the nature of the facilities – open ramps with elevator lobbies as the only enclosed spaces – requires minimal heating or cooling. ST is based on a thermal mass storage system, and is generally best suited to situations with significant on-site heating or cooling loads

In both cases, the feasibility of these alternative systems is significantly constrained by the relatively minimal need for heating and cooling in a parking facility. Because this equates to a dismal economy-of-scale proposition [the payback times become longer than the expected life span of the equipment] it is not deemed viable.

Electrical Generation

Stronger opportunity exists to incorporate Solar Electric or PV systems into some of the sites. Given that the electrical demands of lighting these facilities are their most

significant loads, it may prove advantageous to incorporate solar arrays on some upper levels to offset this via a "backing the meter" system.

Of the proposed facilities, Lots F and L have significant shading issues due to their close adjacencies to tall buildings (the Department of Transportation and the Judicial Center, respectively) and would not be strong candidates. Also, these sites' location near ceremonial buildings (and their visibility from the Capitol Mall) makes visible rooftop equipment undesirable.

Lot C, however, has relatively open environs and would be a good candidate for a rooftop installation. Also, prior to the construction of a liner building between the ramp and Rice Street, the western façade of the ramp may offer another location for a panel array.

A complicating factor in this discussion is that the goals of on-site alternative energy generation are somewhat at variance with the design guidelines and regulations of CAAPB regarding rooftop equipment, view corridors, and height restrictions in the Capitol Area. This project may provide a vehicle for coordination of the respective goals, including using the ramp at Lot C as a test site for evaluation of various systems' effectiveness and relative visual impacts.

It is the recommendation of this report that the facility at Lot C be designed to be "solar ready" at a minimum. During the design process, detailed discussions should take place among RECS/PMD/CAAPB and the design team to determine if a full array can be installed.

Other Alternative Energy Generation Systems

During the course of this study, the feasibility of Wind Generation was also reviewed. In similar fashion to the PV discussion, the locations of Lots F and L next to tall buildings leave them in "wind shadows" that make wind systems impractical. Wind systems also must be spread out across a relatively large area, and the small sizes of these parcels may constrain the effectiveness of any array simply due to their limited footprint.

Lot C may have potential for a wind array, pending final sampling. However, the issues regarding visible equipment, overall height, and visual distraction in the Capitol Area become particularly acute in the case of several moving wind turbines located in the visual backdrop to the Capitol building. This will be a factor even with the less obtrusive "vertical axis" style of turbine, the most likely equipment for an urban site such as this.

As mentioned in the PV discussion, this project may provide a vehicle for coordination of the respective goals, including using the ramp at Lot C as a test site for evaluation of various systems' effectiveness and relative visual impacts.

SECTION 4.5

Operations and Maintenance Requirements

The cost of debt service, as well as Operating and Maintenance costs, would be paid through parking fees. Averaging the first 5 years, annual debt service to be paid by parking fees would be $2.2 million. It is expected that all customer rates would increase by approximately 28%.

Examples of these new monthly rate increases are:

Surface Lot rates of $38.08 compared to $29.75

Ramp rates of $66.14 compared to $51.67.

SECTION 4.6

Statute Requirements for Projects Receiving State Funding

STATUTE	Required by FUNDING RECIPIENT		
	State Agency	Higher Ed	Political Subdivisions
1. §16B.241 Coordinated Facility Planning	YES (required by statute)	NO (not required by statute)	NO (not required by statute)
2. §16B.32, Subd 1 Alternative Energy Sources	YES	NO	NO
3. §16B.32, Subd 1a Renewable Energy Sources - 2% of energy use Solar or Wind	YES	NO	NO
4. §16B.32, Subd 2 Energy Conservation Goals (may participate in Program – not mandatory)	YES	YES	NO
5. §16B.325 Apply Sustainable Guidelines (B3) when project is new building, addition, renovation greater than 10,000 sf, or adds/replaces a stand alone mech. system.	YES	YES	YES
6. §16B.326 Written plan w/predesign to consider providing Geothermal & Solar Energy Heating & Cooling Systems on new or replacement HVAC systems	YES	YES	YES
7. § 15B.05, Subd. 3, Design Competitions; § 15B.10, Subd.4, Advisory Committee; § 15B.15, Subd. 15, CAAPB approved sites and design standards	YES	YES	NO
8. §16B.335, Subd 1, Notification to House & Senate Committees	YES	YES	YES
9. §16B.335, Subd 3 Predesign Submittal See Statute for exempted projects	YES	YES	YES
10. §16B.335, Subd 4 Energy Conservation Standards (Minnesota Energy Code MN Rule 7676 http://www.doli.state.mn.us/bc_energy.html)	YES	YES	YES
11. §16B.335, Subd 5 & 6 Information Tech. Review by OET	YES	NO	NO
12. §16B.335, Subd. 3c Consider the use of MINNCOR products www.minncor.com	YES	YES	YES
13. §16B.35 % for Art When considered in original legislative request; & when constn is $500K or greater	YES	YES	YES
14. §216B.241 Subd 9 Sustainable Building 2030 - Energy Conservation Goals www.mn2030.umn.edu	YES	YES	YES

SECTION 4.7

Project Procurement and Delivery Method

PROJECT DELIVERY INFORMATION

The design and construction of the identified parking facilities must be completed on a very tight schedule if capacity and service levels in the Complex are to be maintained. Due to the imminent expiration of leases, work must commence and proceed with a high level of urgency.

The Predesign team has premised the project scheduling and budget projections in this report on the use of the Construction Manager at Risk [CMR] delivery method. For this project, this method has several significant advantages over traditional design/bid/build methods. These advantages include the following aspects:

[a] The CMR can be selected at or near the time the design team is chosen. This allows active participation of the constructor team during the entire process, especially early in the design when decisions that have the largest impact on costs are made.

[b] Bid packages can be issued as they are complete, allowing construction work to begin earlier, prior to the entire project being fully designed.

[c] With construction activity dispersed on three separate sites in an extremely active Capitol campus, coordination and planning are critical. CMR offers the best method for providing a high level of oversight while achieving economies of scale.

If CMR project delivery should not be the selected method, the project schedule will expand from 18-19 months to 23 -25 months to occupancy.

SECTION 5

Site Analysis and Selection Screen

The initial Predesign RFP listed potential Capitol Complex candidate sites for consideration. As mentioned in Section 1, these sites were Lots AA, B, C, U/W. During the research and information gathering phase of the Predesign process, other potential candidate sites emerged. Those sites included Lots D, F, L, Q, and Cass Gilbert Park.

All of the compiled candidate sites are included in Section 5, with one logistical realignment, however. Lot D will be considered on a parallel track from the base candidate sites. This lot would come into play should a site for a ramp to accommodate legislative users be necessary. The other sites [Lots AA, B, C, F, U/W, Q, and CGP] are under consideration to meet the complex's everyday staff, employee, State Agency, vendor, and visitor parking needs.

Selection Criteria

The selection of suitable sites for the relocation and consolidation of parking supply on the Capitol Complex involves a number of criteria, including both objective and subjective factors. These include:

[a] Ease of access for Complex staff.

[b] Capacity – how many stalls will physically fit on the site, within established Capitol Area planning limits.

[c] Traffic logistics in the area and directness of connections to arterials.

[d] Access to the existing State Capitol Complex pedestrian tunnel system.

[e] Costs to construct, operate, and maintain a facility on the site.

[f] Design potential for appropriate image and presence. Note that because all sites are within the Capitol Area, clear expectations are defined for a high level of design and materials. Therefore, this criterion is in regards to flexibility, context, and ability to enhance surroundings.

[g] Configuration of the site – does it lend itself to a high-efficiency layout.

[h] Ease of access and way finding for visitors to the complex.

[i] Likelihood that the site would be needed for use as office or other functions at some point. In this case, a high score means few alternate uses.

[j] Ability of facility to be expanded.

[k] Transit and multi-modal access – LRT, bus, and bicycle.

[l] Soils encountered in the preliminary investigation are suitable for construction within reasonable bounds for capacity and/or costs to correct.

Each candidate site was evaluated against these concerns. Sites were rated from 1 [Very Poor], 2 [Poor], 3 [Fair], 4 [Good], to 5 [Very Good] for each topic.

Methodology - Site Selection Matrix

The scoring process used to rank sites was a weighted screening matrix. Evaluation criteria were prioritized into the following groups. Each component score subtotal was then multiplied by a weighting factor, to reflect its relative importance.

Priority A – Highest Priority

[1] Access [Staff]

[2] Capacity

[3] Traffic Logistics

[4] Tunnel Access

These criteria were determined to be of most importance and given a weighting value of 3X.

Priority B – Medium Priority
[1] Costs
[2] Design
[3] Configuration
[4] Access [Visitors]

These criteria were determined to be of medium importance, and given a weighting value of 2X.

Priority C – Lower Priority
[1] Alternate Uses
[2] Expansion
[3] Transit
[4] Suitable Soils

These criteria were determined to be of lesser concern than the other topics and given a weighting value of 1X.

Site Selection - Summary

	Priority A [Weighting Value of 3X]					
Candidate Sites	**Access** [Staff]	**Capacity**	**Traffic Logistics**	**Tunnel Access**	**Subtotal**	**Weighted Value**
Lot AA	4	4	4	3	15	45
Lot B	5	5	2	5	17	51
Lot C	3	5	4	5	17	51
Lot F	5	4	5	5	19	57
Lot L	5	2	4	4	15	45
Lot Q	2	5	2	1	10	30
Cass Gilbert Park	2	3	3	1	9	27
Lot U/W	5	5	1	5	16	48

	Priority B [Weighting Value of 2X]					
Candidate Sites	**Costs**	**Design** [Presence/Image]	**Configuration**	**Access** [Visitors]	**Subtotal**	**Weighted Value**
Lot AA	3	5	3	4	15	30
Lot B	1	1	3	3	8	16
Lot C	4	4	5	3	16	32
Lot F	3	5	4	5	17	34
Lot L	5	5	4	5	19	38
Lot Q	5	2	4	2	13	26
Cass Gilbert Park	1	3	3	1	8	16
Lot U/W	3	3	3	4	13	26

	Priority C [Weighting Value of 1X]					
Candidate Sites	**Alt. Uses** [+ = fewer]	**Expansion Potential**	**Transit** [LRT, Bus]	**Suitable Soils**	**Subtotal**	**Weighted Value**
Lot AA	4	2	5	4	15	15
Lot B	1	1	3	3	8	8
Lot C	4	5	4	4	17	17
Lot F	4	3	4	4	15	15
Lot L	5	2	3	4	14	14
Lot Q	1	3	1	4	9	9
Cass Gilbert Park	1	1	1	3	6	6
Lot U/W	1	3	4	4	12	12

Weighted Ranking

Each site's raw scores were multiplied by their respective weighting values, and the weighted scores totaled to determine the most advantageous sites for locating the parking facilities. A full summary and tally of all candidate sites can be found in the table on the previous page. Although costs were part of the site evaluation process, it is a rough estimate based on a single soil boring location. There may be unanticipated site preparation and construction costs that may surface following further soil borings on the selected site[s].

The results of this weighted ranking process determined the selected sites.

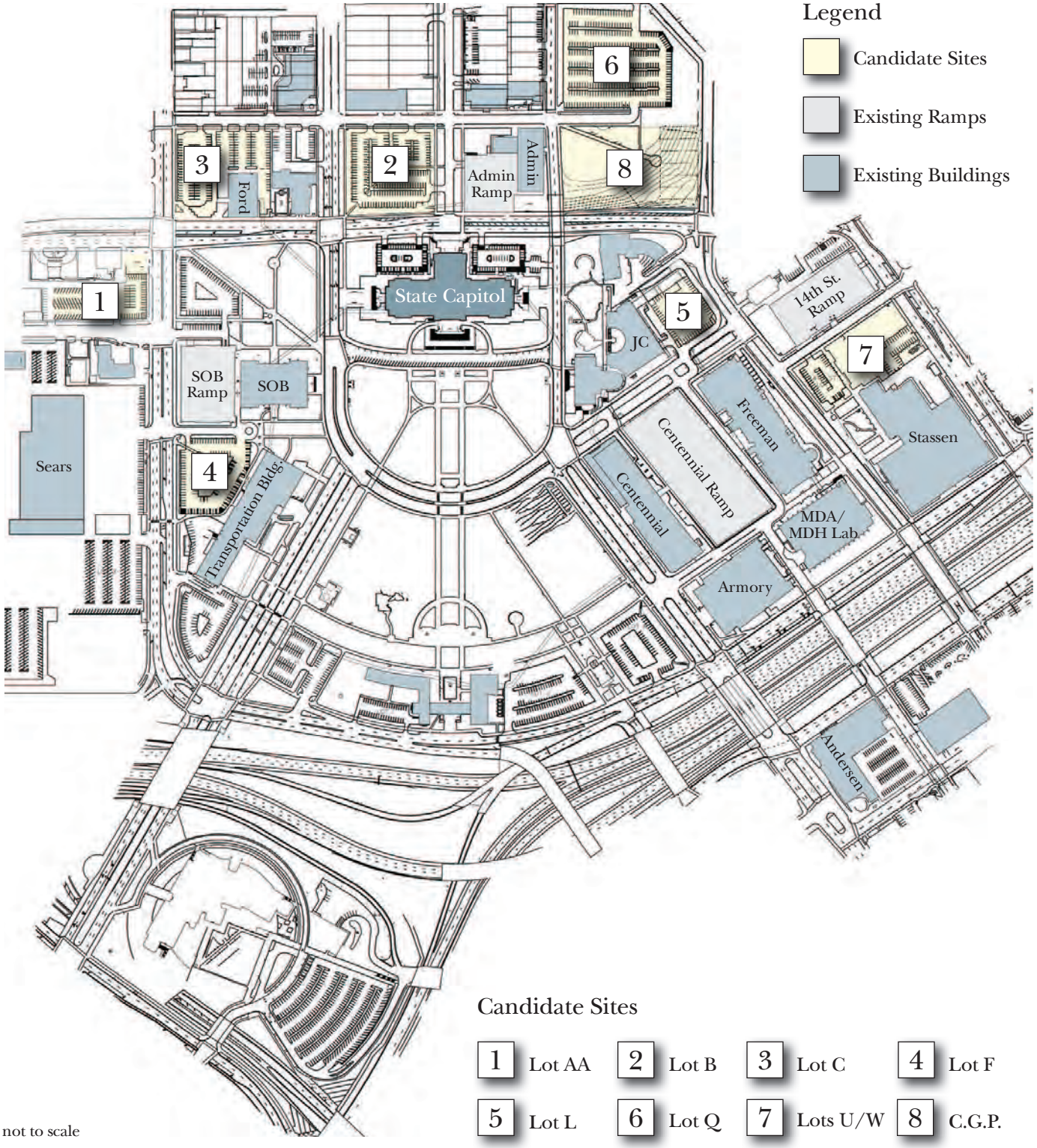
The overall results of the weighted ranking process are shown in the table below. All candidate sites were evaluated and the data was tabulated.

Site Selection - Weighted Ranking

	Parking Counts			Ranking Totals		
Candidate Sites	**Stall Count** [Exst. Stalls Replaced]	**New Stalls** [Projected Count]	**Net Stalls** [New - Exst.]	**Weighted Value**	**Preference**	**Total Relocated Stalls**
Lot F	113	480	367	106	First	367
Lot C	110	730	620	100	Second	620
Lot L	92	200	108	97	Third	108
Lot AA	132	400	268	90	Fourth	268
Lot U/W	143	350	207	86	Fifth	207
Lot B	167	900	733	75	Sixth	733
Lot Q	336	1050	714	65	Seventh	714
Cass Gilbert Park	0	700	700	49	Eigth	700

SECTION 5.1

Capitol Complex Candidate Site Map



Map not to scale

SECTION 5.2

1 Lot AA

CONSIDERATIONS

Lot AA is an 'L'-shaped parcel bounded by Aurora Avenue to the south, Rice Street to the east, University Avenue to the north, and an adjacent property to the west.

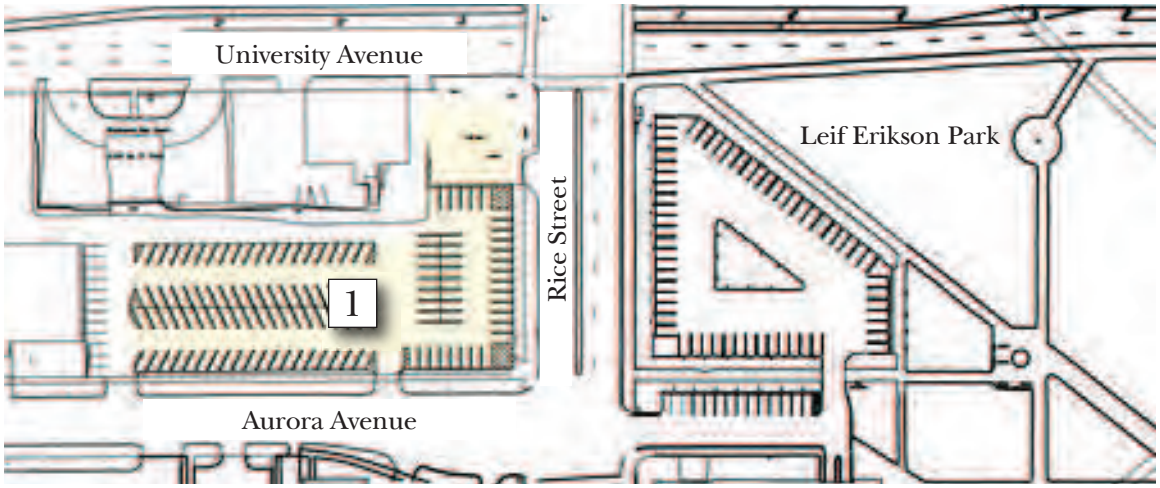
Currently, Lot AA is a surface parking lot that accommodates 132 parking spaces, 48 of which are contract. The balance of the remaining spaces are metered parking for visitors to the Capitol and State offices.

The considered structured parking solution for this site assumes an 80' liner building setback fronting Rice St. This setback distance is flexible, however, and could be reduced to allow for a greater ramp footprint. The current concept calls for fully-accessible sloped parking [5% grade] along the north edge of the ramp, facing University Ave. This would allow for flat plates to be seen from the other three primary elevations.

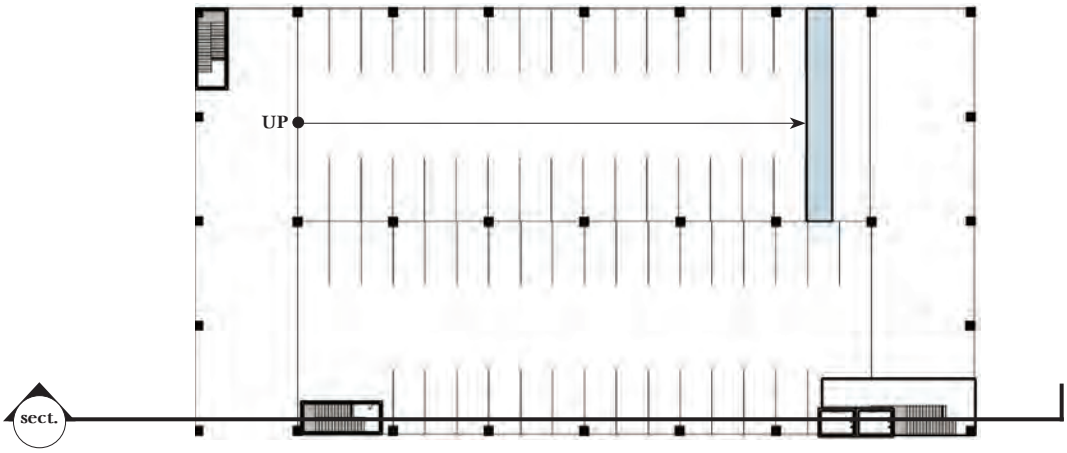
Vehicular and pedestrian circulation would all be internal to the ramp, with the physical structure extending fully to allowable property boundary setbacks.

Given a maximum allowable building height of 70'-0" and the plate to plate elevations listed earlier [15'-0" for main level and 11'-0" for elevated levels], Lot AA could support five levels of elevated parking, a surface level, and a single below grade level, each having between 80 to 100 stalls. As with all candidate sites [except Lot L], this site would allow for a below-grade level. Not only does a below-grade level allow for greater parking capacity but also for future access to the existing tunnel system.

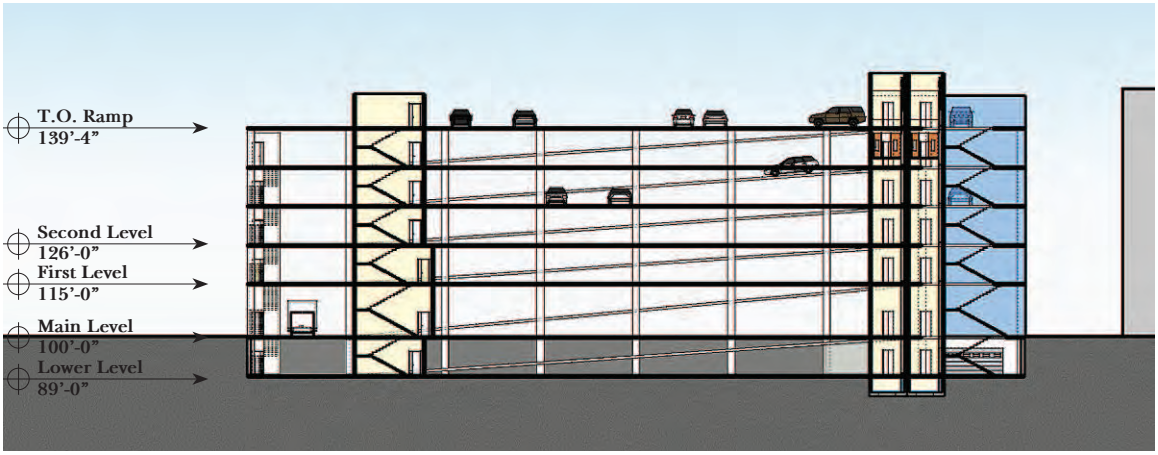
In total, seven levels of parking are possible with an estimated total parking capacity of 550 to 700 vehicles, depending on the final footprint of the ramp. A prime consideration impacting this site is an ap-



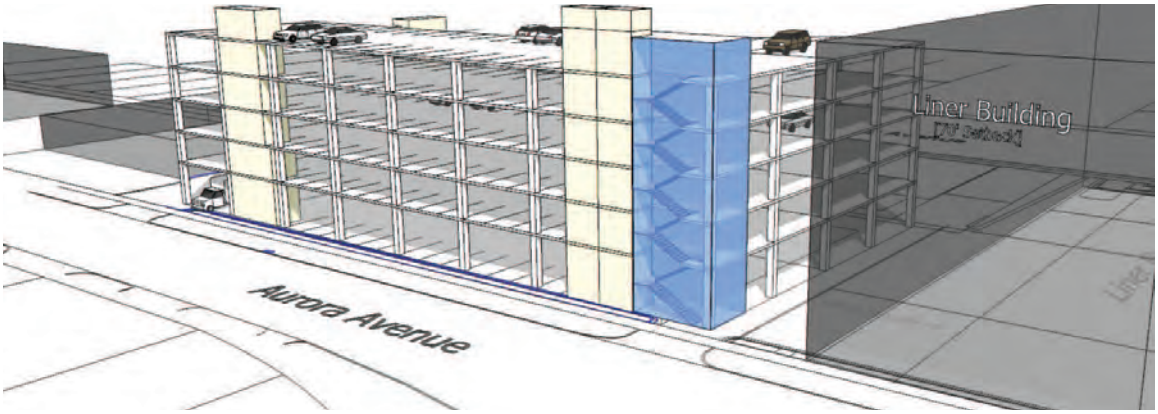
Lot AA Existing Site Plan *Existing surface lot containing 132 parking spaces.*



Lot AA *Proposed Main Level Floor Plan*



Lot AA *Building Section showing one below-grade parking level. Viewed from the south*



Lot AA *Capacity/Zoning Study of a ramp and massing of a potential liner building. Viewed from the southeast.*

propriate setback for a future liner building along Rice Street on the eastern edge of the site. At a minimum this setback distance is 60', with up to 100' being a possibility. The final setback dimension would work in concert with the footprint of the ramp. The eastern half of this lot is a prime location, given it's direct view of the Capitol and the fact it fronts Rice Street, a primary vehicular artery at the Capitol Complex.

ASSETS

Located south of the new LRT line on University Avenue, there is no need for parkers to cross the busy University Avenue/Rice Street intersection, either by foot or by car. This site would offer clear and direct access to west and north bound commuters.

The configuration of the lot allows for an efficient, rectangular ramp layout, maximizing the number of stalls per sq. ft. and minimizing the cost per stall. The possibility of a future companion liner building would be serve as an effective screen to the eastern face of the ramp.

The long stretch of Aurora Avenue aids in the queuing of cars and reducing the amount of time needed to enter and exit the ramp, a key concern for Complex parkers, given the number of other surrounding parking facilities.

The eastern face of the ramp, and the reserved liner building site, offer extraordinary views of the west front of the Capitol for any future building.

CONSTRAINTS

Lot AA has complicated internal property lines due to vacated but not re-plated alleyways. There may be a need to purchase or re-plat adjacent parcels to allow for full and complete use of this site.

With Lot AA's proximity to the Sears site [Lot X], care must be given to the impact this ramp - plus any future ramp developed by Sears - may have on street traffic. If both ramps were to be developed, upwards of 900 vehicles could be concentrated in this location. This amount of cars in this location would pose a serious challenge to traffic management strategies in this area, especially during the surge entry and exiting times before and after work.

The eastern face of the ramp, and the reserved liner building site are extremely visible from the west front of the Capitol. Given this location on the Capitol Complex, a very high level of architectural and material finish will be necessary to satisfy the Capitol Complex Zoning district requirements.

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]

MIXED USE DISTRICT [MX]

The intent of the Mixed Use District [MX] is to foster vital commercial streets that serve the needs of surrounding neighborhoods and the Capitol campus, and to encourage pedestrian-oriented and transit supportive development along these corridors.

CENTRAL CORRIDOR OVERLAY [CCO] [2400.2235]

Subp. 1. District Intent

The Central Corridor Overlay District [CCO] is established to promote development and redevelopment along the planned central corridor LRT line. It is intended to foster development that intensifies land use and economic value; to promote a mix of uses that will enhance the livability of station areas; to improve

pedestrian connections, traffic and parking conditions; and to foster high quality buildings and public spaces that help create and sustain long-term economic vitality.

SUBP. 2. N/A

SUBP. 3. RELATIONSHIP TO OTHER REGULATIONS
Where provisions of the overlay district conflict with the primary zoning district, the provisions of the overlay district shall apply.

SUBP. 4. N/A

SUBP. 5. MINIMUM INTENSITY AND FRONTAGE USE
The following standards apply to new buildings in the CCO District:

[A] A minimum floor area ratio of 1.0 is required. Public gathering spaces, landscaped areas, outdoor seating areas and areas for public art may be counted towards building square footage in calculation the minimum floor area ratio.

[B] A new building with less than the required floor area ratio may be allowed on a developed zoning lot where an existing building will remain, provided that the board determines:

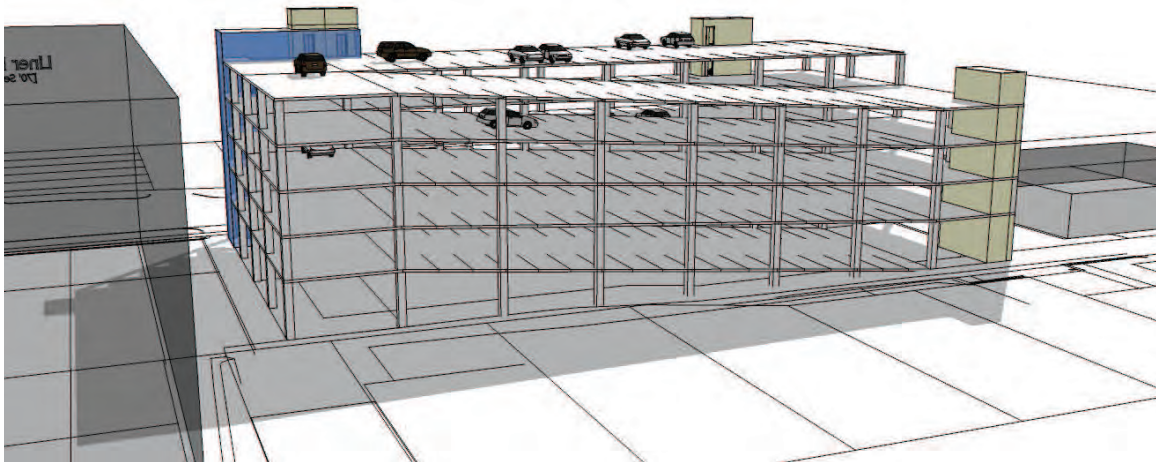
[1] total lot coverage and floor area ratio for the zoning lot are not reduced

[2] the new development provides enhanced landscaping, pedestrian realm enhancements, or building design elements that improve the aesthetic appeal of the site.

[C] New buildings shall be a minimum of two stores in height.

[D] A minimum of 50% of ground floor building frontage along University Avenue and Rice Street must be occupied by uses that encourage pedestrian activity and interest, including, but not limited to, retail and service uses, meeting rooms, eating areas, and offices serving the public. Buildings owned or lease-purchased by the state are exempt from the requirement, although active uses are encouraged on the ground floor frontage of state buildings.

SUBP. 6. PARKING STANDARDS
For non-residential uses, the number of off-street parking spaces required is a mini-



Lot AA *Capacity/Zoning Study of a ramp and liner building. Viewed from the north.*

mum of 60% to a maximum of 85% of the off-street parking standards. The maximum may be exceeded if the additional parking spaces are structured in a ramp, deck, underground or within a building. State office buildings and other state uses are exempt from the maximum parking requirement.

SUBP. 7. EXEMPTIONS
Where an existing building or its accessory parking does not conform to the CCO District requirements or serves an existing nonconforming use, the building may be expanded without fully meeting the requirements of the part as long as the expansion does not increase the nonconformity

USE DISTRICTS [2400.2205]
Surface Lot: Conditional
Underground: Permitted
Above ground: Permitted

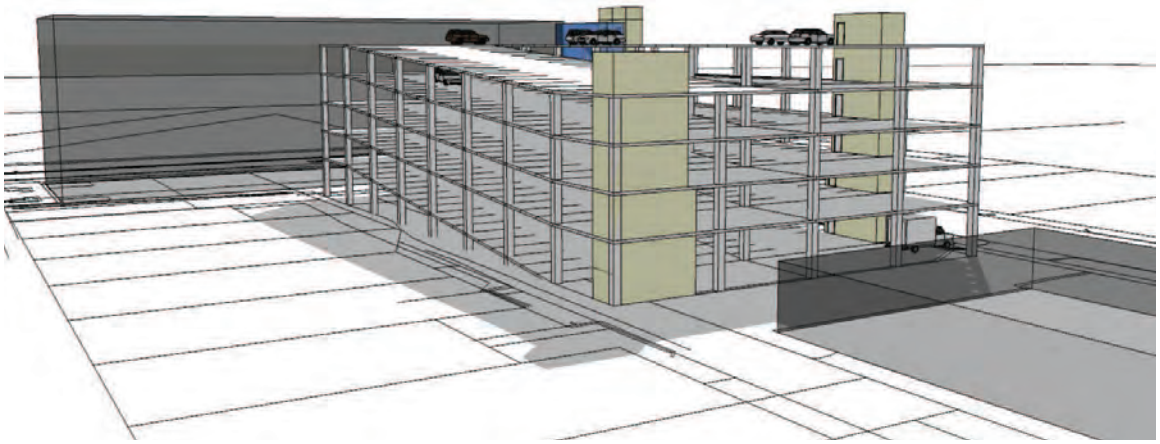
BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: 0'-20'
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: None

BUILDING HEIGHT [2400.2300]
Height District 1
944' [Above Sea Level]
249.9' [St. Paul Datum]
Min. Stories: 2

FRONTAGE TYPE [2400.2400]
University Avenue: Capitol View
Setback from street: 0'-5'
Rice Street: Flexible
Setback from street: 0'-25'

DESIGN & MATERIAL STANDARDS [2400.2405]
Design and material selections shall be based on Frontage Type. Frontage Type designation is determined by the property's location within the Capitol Complex and its proximity to the capitol building. Those properties nearer the capitol building must meet more stringent requirements and guidelines. Those farther away are allowed greater leeway in material selection, building setbacks, and use.



Lot AA *Capacity/Zoning Study of a ramp and liner building. Viewed from the northwest.*

FRONTAGE TYPE

University Avenue]

Frontage Type: **Capitol View**

The northern edge of Lot AA is located along University Avenue, which is designated as a Capitol View Frontage Type.

In the Capitol View Frontage Type, buildings must be set back a maximum of five feet from the lot line for at least 75% of their length. To preserve significant views of the Capitol Building from university Avenue, any portion of the façade above two stories in height must be stepped back at least 30 feet behind the front plane of the building façade.

REQUIREMENTS

[a] Face Materials: Cut Stone, Terracotta, Cast Stone, or equal

[b] Roof Materials: Standing Seam Metal, Slate, Ceramic or Composite Tiles

[c] Freestanding signs, poles or pylons prohibited within setback areas

[d] Mechanical and electrical equipment must not be visible within frontage setback area.

[e] New vehicular access points are prohibited from streets parallel to the designated frontage.

[f] Access and egress must be from streets other than those designated.

RECOMMENDATIONS/GUIDELINES

[a] Roof: discernible cornice line that matches cornice line of adjacent buildings.

[b] Green Roof: for reduction of energy use

[c] Landscaping within the frontage setback shall include a double row of canopy trees

[d] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along the street

[e] Visual compatibly with neighboring buildings, features, and places

[Rice Street]

Frontage Type: **Flexible**

In the Flexible Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between zero and 25 feet from the front lot line. Buildings at corner locations must be located within five feet of the front lot line on either street for a distance of 30 feet from the corner.

REQUIREMENTS

[a] Freestanding signs, poles or pylons prohibited within setback areas

[b] Mechanical and electrical equipment must not be visible within frontage setback area

RECOMMENDATIONS/GUIDELINES

[a] Face Materials: Cut Stone, brick, split-faced block or other natural materials

[b] Roof: discernible cornice line that matches cornice line of adjacent buildings

[c] Green Roof for reduction of energy use

[d] Continuity of Walls: building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[e] Visually compatibly with neighboring buildings, features, and places

SECTION 5.3

2 Lot B

CONSIDERATIONS

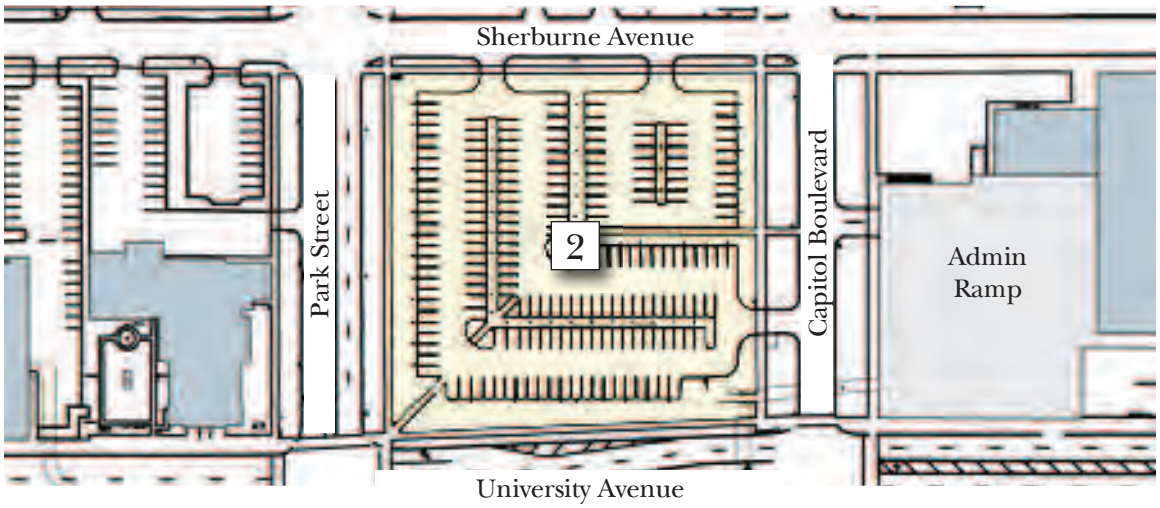
Lot B is a parcel bounded by University Avenue to the south, Capitol Blvd. to the east, Sherburne Avenue to the north, and Park St. to the west.

Currently, Lot B is covered by a surface parking lot that accommodates 167 parking spaces, 155 of which are contract. The balance of the remaining 12 spaces are public handicapped.

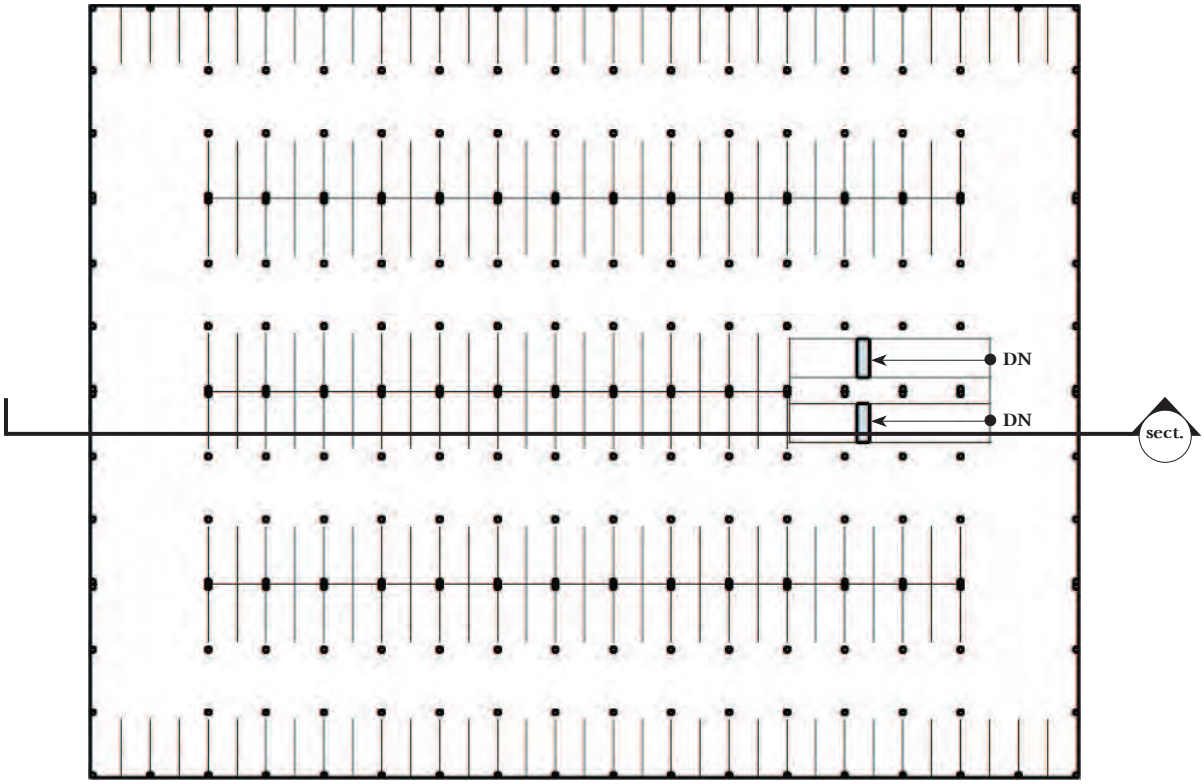
Lot B is a candidate site in the original RFP. It has been always viewed through a unique lens, however, given that the lot has long been tagged as a potential site for a future Legislative Office Building. If developed as envisioned in the Comprehensive Plan, the Legislative Office Building would be approximately 150,000 SQ. FT. Any ramp would have to accommodate for or integrate with this future building.

Lot B has also been presumed to be entirely underground, per the Comprehensive Plan. The most likely and viable scenario posits a subterranean ramp on the eastern half of the lot with a heavily landscaped plaza on top, much like the Church St. Parking Garage on the University of Minnesota's east campus. Separating the ramp's location and construction from any future building project on the western half of the lot would allow for the site to be developed on independent time lines.

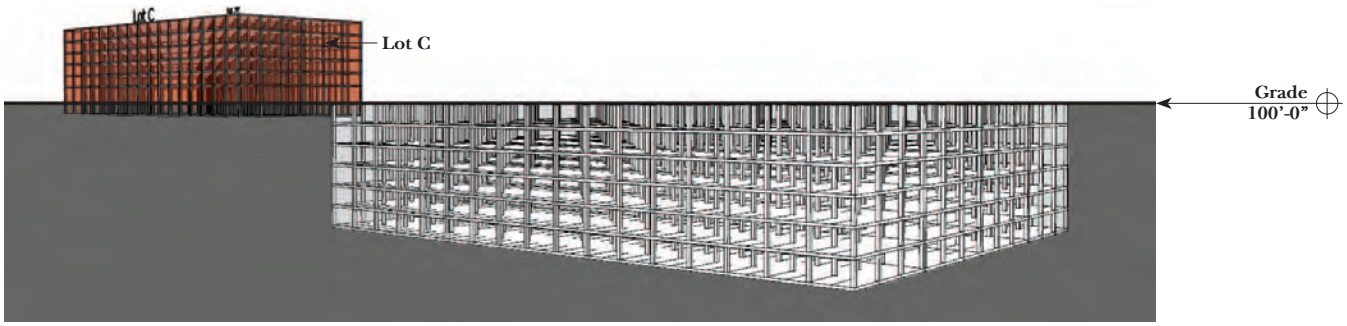
Another prong of the conversation surrounding Lot B is whether a new ramp on this site should be combined with a new ramp replacing the Admin ramp directly to the east. The Admin ramp was built in the 1970's and today requires regular and costly annual maintenance. Although still structurally sound, it may be nearing the end



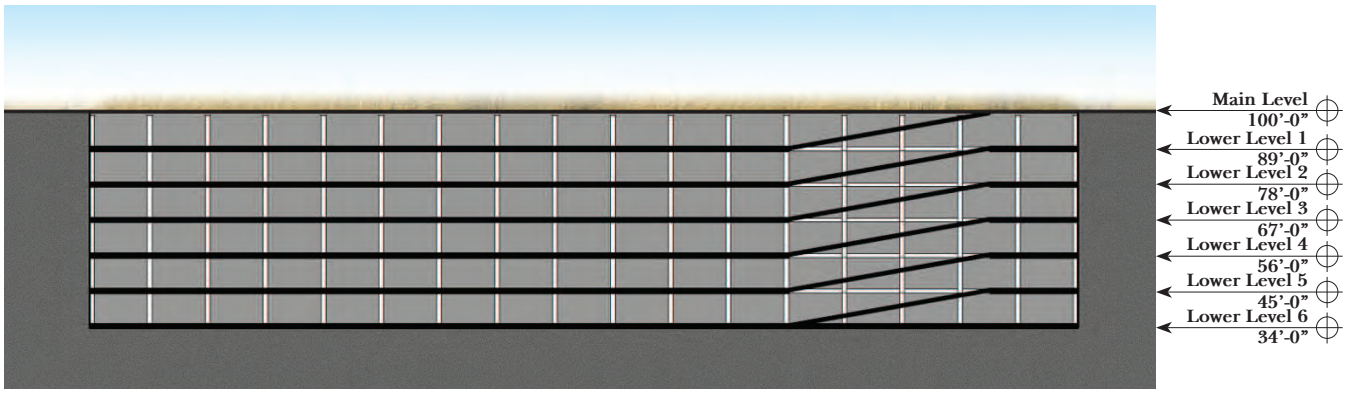
Lot B Existing Site Plan *Existing surface lot containing 167 parking spaces.*



Lot B *Proposed Main Level Floor Plan*



Lot B *Capacity/Zoning Study of an all below-grade level ramp. Viewed from the southeast.*



Lot B *Building Section showing all parking levels below-grade. Viewed from the south*

of its effective life span and may become a candidate for demolition and replacement.

If the ramp's demolition and replacement were the chosen strategy, a new ramp footprint spanning the two sites might be an option.

Currently, the Admin ramp's structural integrity, required maintenance schedule, and projected lifespan is being evaluated by Collaborative Design Group as an adjunct study.

Assets

Should Lot B be identified not only as a component of an overall parking solution, but also as the location of a Legislative Office Building, its location would become a key asset, given its close proximity to the State capitol.

Additional capacity at Lot B is dependent on the normal variables of street traffic capacity, as well as geometrics. Given that all parking levels would be below grade, per stall construction costs are higher. Theoretically, the site can accommodate as many parking stalls as may be needed. One would only need to dig deeper. However, allocated state funding would ultimately dictate the number of viable parking levels that could be built.

It is not anticipated that Legislative and Staff parking could be accommodated in an open-circulation system due to differing user requirements. A common structure with segregated circulation (two entrances/exits, etc.) and parking would work and may be considered as a viable parking solution.

Restoration planning and staging for the Capitol renovation is fully underway and it is anticipated that full-scale renovation work will begin in June 2013.

Highlights

[1] For legislative users, the location next to the Capitol is ideal.

[2] Access to the tunnel system is already on site.

[3] Because of its mandated below-grade construction, it is primarily the ability of the streets to handle its traffic that will limit the facility's capacity.

[4] Construction here may provide a resource for the potential Legislative office building on the western portion of the site.

Constraints

The Predesign planning process for a parking solution has been running ahead of planning for a future Legislative Office Building. Given the fluid timing parameters and challenging logistical considerations, Lot B has been viewed as a highly complex and difficult site upon which to develop a structured parking facility.

The parking load generated by this development would need to be accommodated in the adjoining ramp. In addition, Lots N & O, which lie adjacent to the Capitol building directly to the north will be closed during the Capitol restoration project. Combined, these two lots serve approximately 190 legislative parkers, all of whom will be displaced during the length of the restoration project. A long-term solution to this short-term problem may be to accommodate these displaced parkers in a ramp on Lot B.

Highlights

[1] The site's adjacency to the Capitol requires that all construction be sub-grade, with a highly landscaped plaza forming its top.

[2] A fully subterranean parking facility will require ventilation and other systems that will mean ongoing operation costs for the life of the facility.

[3] A fully sub grade facility will be more costly to construct.

[4] The existing loading dock facility must be planned for and protected during construction.

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
GOVERNMENT DISTRICT 1 [G-1]
The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.

CENTRAL CORRIDOR OVERLAY [CCO] [2400.2235]
See Lot AA, Section 5, for details on CCO District.

USE DISTRICTS [2400.2205]
Surface Lot: Permitted
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: 0'-20'
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: 10,000 sq. ft.

BUILDING HEIGHT [2400.2300]
Height District 1
944' [Above Sea Level]
249.9' [St. Paul Datum]
Min. Stories: 3 [4-6 Stories typical]

FRONTAGE TYPE [2400.2400]
University Avenue: Capitol Mall
Setback from street: 30'-40'
Park St.: Civic
Setback from street: 5'-15'

DESIGN & MATERIAL STANDARDS [2400.2405]
[University Avenue]
Frontage Type: **Capitol Mall**
The Capitol Mall frontage type is intended to achieve the highest standard of architectural quality for buildings fronting the Capitol mall.

REQUIREMENTS

[a] Face Materials: Cut Stone, Terracotta, Cast Stone, or equal

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Roof Materials: Standing Seam Metal, Slate, Ceramic or Composite Tiles

[d] Freestanding signs, poles or pylons prohibited within setback areas

[e] Mechanical and electrical equipment must not be visible within frontage setback area

[f] New vehicular access points are prohibited from streets parallel to the designated frontage

[g] Access and egress must be from streets other than those designated

[h] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along the street

[i] Visually compatibly with neighboring buildings, features, and places

Recommendations/Guidelines

[a] Green Roof for reduction of energy use

[b] Landscaping in the frontage setback shall include a double row of canopy trees

[Park St.]

Frontage Type: **Civic**

In the Civic Frontage type, buildings must be set back a minimum of five feet and a maximum of fifteen feet from the front lot line for at least 85% of their length. Where a new building is adjacent to existing buildings, it must maintain the average setback of those buildings.

Requirements

[a] Face Materials: Cut Stone, brick, split-faced block or other natural materials
[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings
[c] Freestanding signs, poles or pylons prohibited within setback areas
[d] Mechanical and electrical equipment must not be visible within frontage setback area

Recommendations/Guidelines

[a] Green Roof for reduction of energy use
[b] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along the street
[c] Visual compatibly with neighboring buildings, features, and places

SECTION 5.4

3 Lot C

CONSIDERATIONS

Lot C is a parcel bounded by University Avenue to the south, Park St. to the east, Sherburne Avenue to the north, and Rice St. to the west.

A large "L" shaped parcel, it is currently devoted to surface parking. It wraps around the north and west sides of the State's Ford Building, and is one of the largest sites under consideration. Currently, Lot C is a surface parking lot that accommodates 200 parking spaces, all of which are contract.

ASSETS

Below is a summary of the key features and benefits of Lot C.

[a] The site offers access to the pedestrian tunnel system, via the existing connection to the adjoining Ford Building.

[b] Capitol Area planning regulations would permit a relatively large facility to be constructed here.

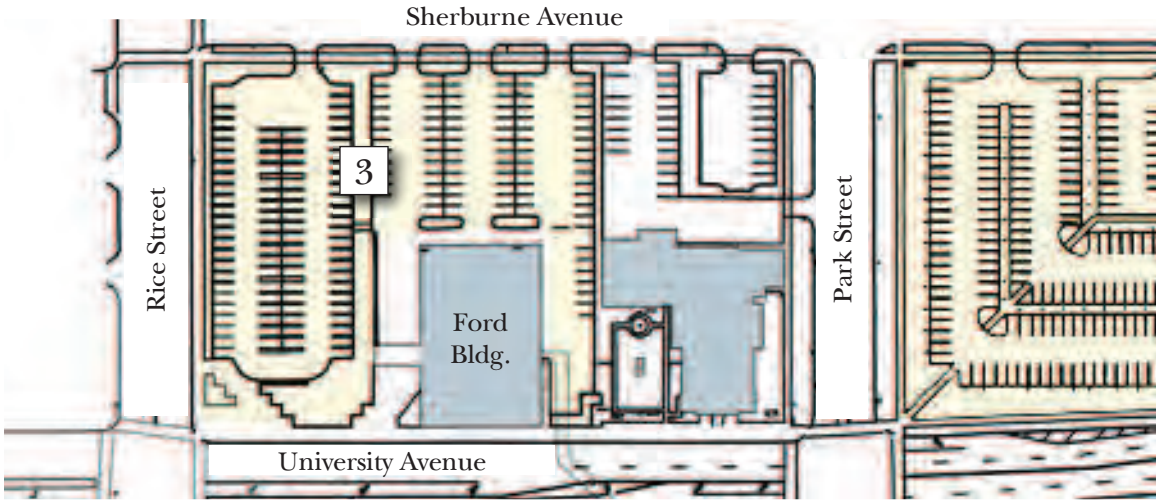
[c] The site is not adjacent to the Capitol building itself, allowing flexibility in design and massing options.

[d] Access to Rice Street offers good connections to Interstates 94 (east- and west-bound traffic), 35W (north- and south-bound) and local streets via downtown St. Paul and Como Avenue. This provides connections for drivers heading in all directions.

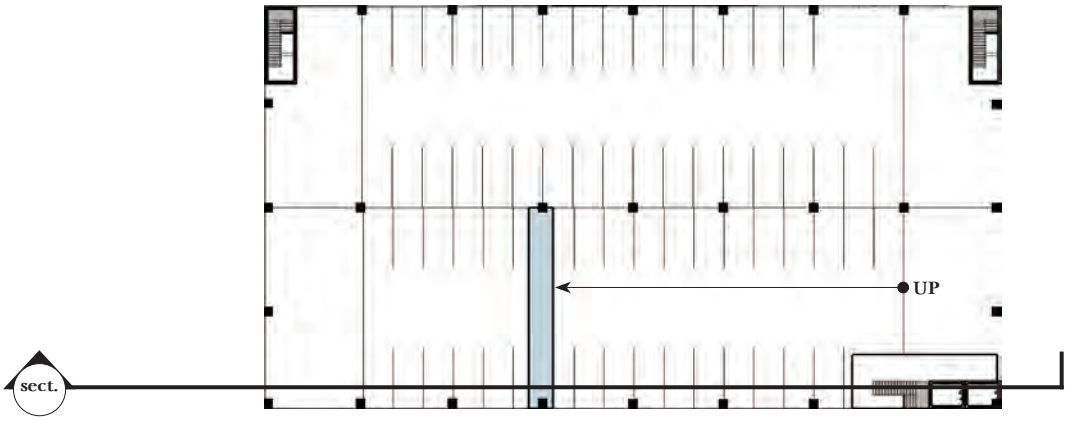
[e] The site is open and access for construction is good, and would not disrupt other Capitol area traffic.

[f] With the anticipated liner building reservations, a significant part of the site will remain as surface parking in the near term. Not all parkers currently using the surface lot will be displaced.

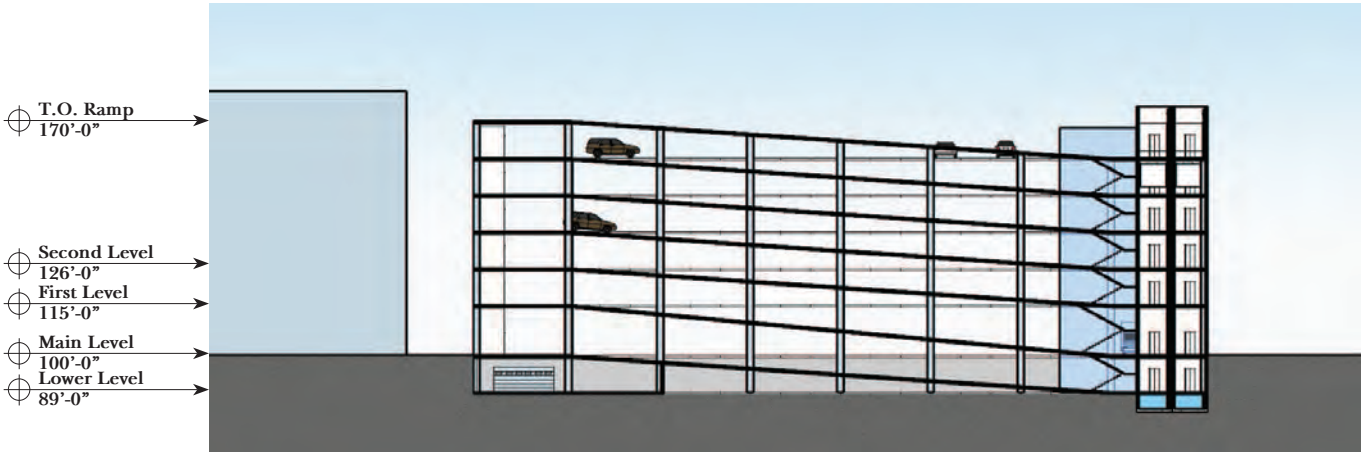
[g] Parkers here will be able to connect



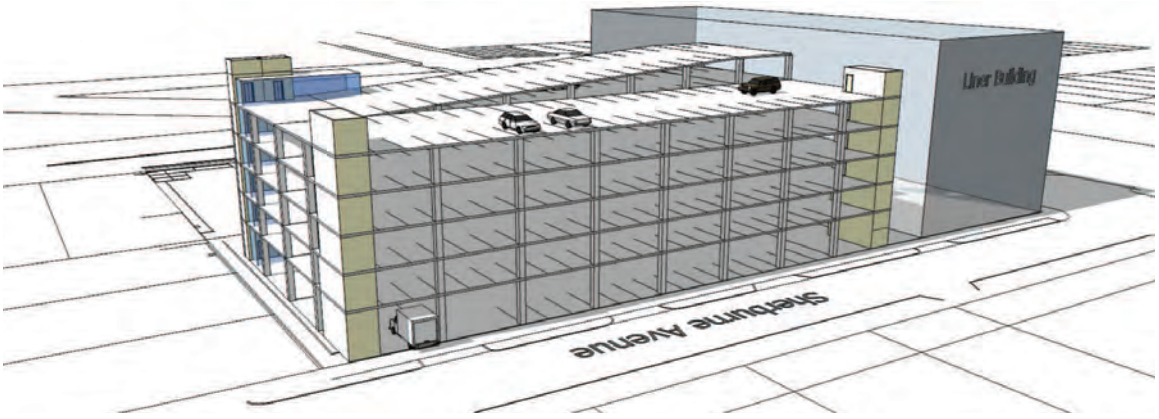
Lot C Existing Site Plan *Existing surface lot containing 200 parking spaces.*



Lot C *Proposed Main Level Floor Plan*



Lot C *Building Section showing one below-grade parking level. Viewed from the south*



Lot C *Capacity/Zoning Study of a ramp and liner building. Viewed from the north.*

to the rest of the campus and downtown locations via the LRT.

[h] The site's location on a corner of the Capitol Area would provide an appropriate architectural gateway and landmark for drivers approaching the Capitol.

CONSTRAINTS

Below is a summary of the key constraints inherent in Lot C.

[a] The University Avenue frontage of the site should be reserved for a possible liner building aligned with the Ford Building.

[b] The Rice Street frontage should be reserved for a possible liner building similar in depth to the historic (non-state) buildings to the north.

[c] Soils on this site may need correction to 24 feet, or the use of rammed aggregate piers. As planning calls for at least one sub grade parking level this is not a significant factor. It should also be noted that this observation is based on a single test boring, and the actual extents and impacts will have to be determined by a more extensive testing program prior to design.

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
Government District 1 [G-1]
The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.
CENTRAL CORRIDOR OVERLAY [CCO]
See Lot AA for details on CCO District.

USE DISTRICTS [2400.2205]
Surface Lot: Permitted
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: See Frontage Type
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: 10,000 sq. ft.

BUILDING HEIGHT [2400.2300]
Height District 1
944' [Above Sea Level]
249.9' [St. Paul datum]
Min. Stories: Capitol Mall, 3; Flexible, 2

FRONTAGE TYPE [2400.2400]
University Avenue: Capitol Mall
Setback from street: 30'-40'

Rice St.: Flexible
Setback from street: 0'-20'

Design & Material Standards [2400.2405]
[University Avenue]
Frontage Type: **Capitol Mall**
The Capitol Mall frontage type is intended to achieve the highest standard of architectural quality for buildings fronting the Capitol mall.

REQUIREMENTS

[a] Face Materials: Cut Stone, Terracotta, Cast Stone, or equal

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Roof Materials: Standing Seam Metal, Slate, Ceramic or Composite Tiles

[d] Freestanding signs, poles or pylons prohibited within setback areas

[e] Mechanical and electrical equip-

ment must not be visible in frontage setback area

[f] New vehicular access points are prohibited from streets parallel to the designated frontage

[g] Access and egress must be from streets other than those designated

[h] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[i] Visual compatibly with neighboring buildings, features, and places

Recommendations/Guidelines

[a] Green Roof for reduced energy use

[b] Landscaping within the frontage setback shall include double row of canopy trees

[Rice St.]

Frontage Type: **Flexible**

In the Flexible Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between zero and 25 feet from the front lot line. Buildings at corner locations must be located within five feet of the front lot line on either street for a distance of 30 feet from the corner.

Requirements

[a] Freestanding signs, poles or pylons prohibited within setback areas

[b] Mechanical and electrical equipment must not be visible within frontage setback

Recommendations/Guidelines

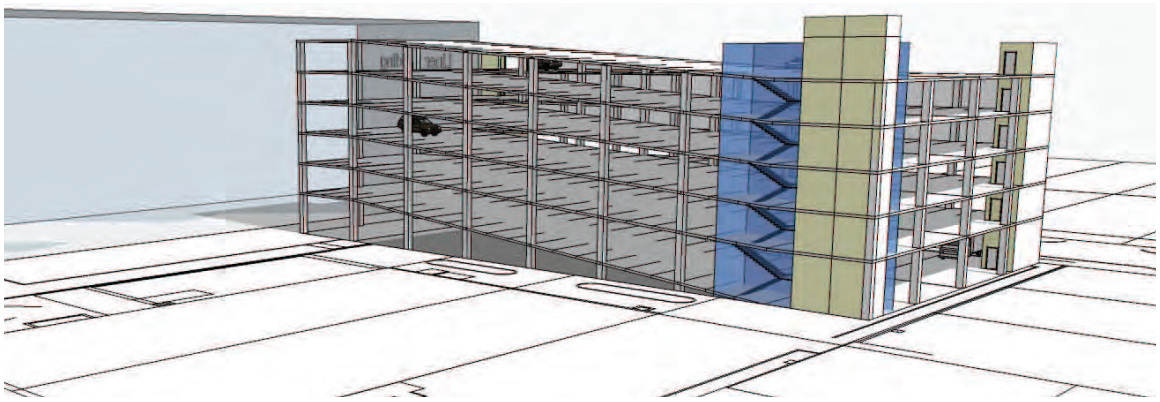
[a] Face Materials: Cut Stone, brick, split-faced block or other natural materials

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Green Roof for reduction of energy use

[d] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[e] Visual compatibly with neighboring buildings, features, and places



Lot C *Capacity/Zoning Study of a ramp and liner building. Viewed from the southeast.*

SECTION 5.5

4 Lot F

CONSIDERATIONS

Lot F is the parcel bounded by the Transportation Building to the east and south, Fuller Avenue to the north, and Rice St. to the west. At present, Lot F is a surface parking area immediately to the west of the Transportation Building that accommodates 113 parking spaces, 55 of which are contract for various handicapped/van pool stalls. The remaining 58 spaces are metered for visitors. It has access to the north on the dead-end remnant of Fuller Avenue. The State Office Building ramp is to the north.

ASSETS

[a] The site is located next to the Transportation Building, the destination of a majority of the displaced parkers from Sears [Lot X].

[b] The site has excellent access via Rice and Fuller.

[c] Access to Rice Street offers good connections to Interstates 94 [east- and west-bound traffic], 35W [north- and south-bound] and local streets via downtown St. Paul and Como Avenue. This provides connections for drivers heading in all directions.

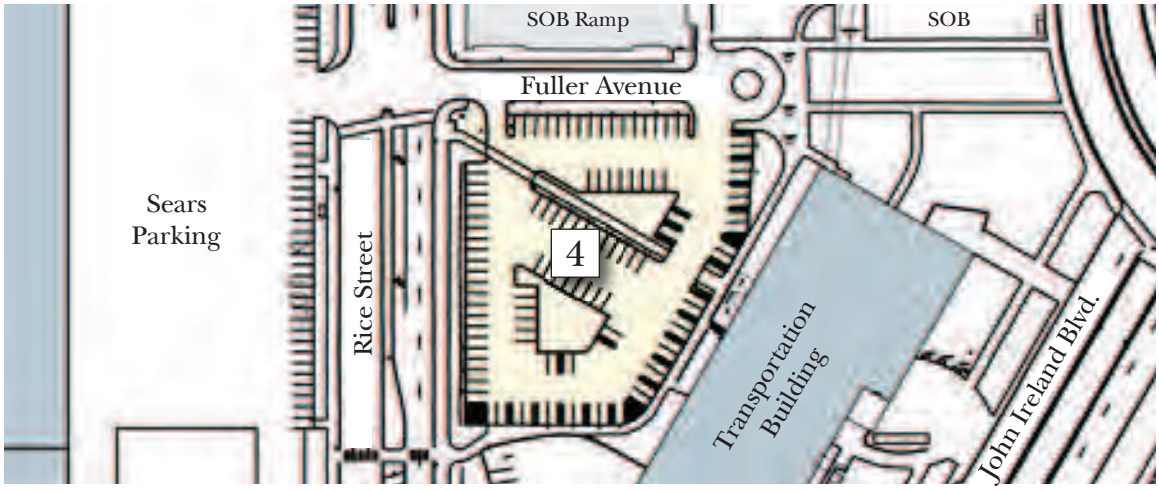
[d] A facility on this site would be able to "pair" with the State Office Building ramp, forming a distinguished border and gateway to the Capitol Complex.

[e] The site would have access into the existing tunnel system.

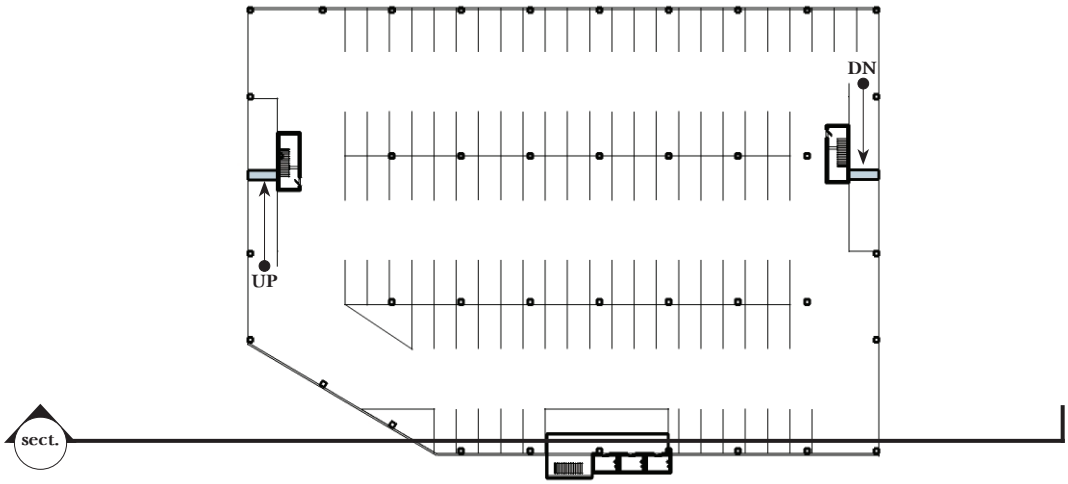
[f] Construction on this site may provide a means of partially ameliorating the sub grade water problems experienced by the Transportation Building.

CONSTRAINTS

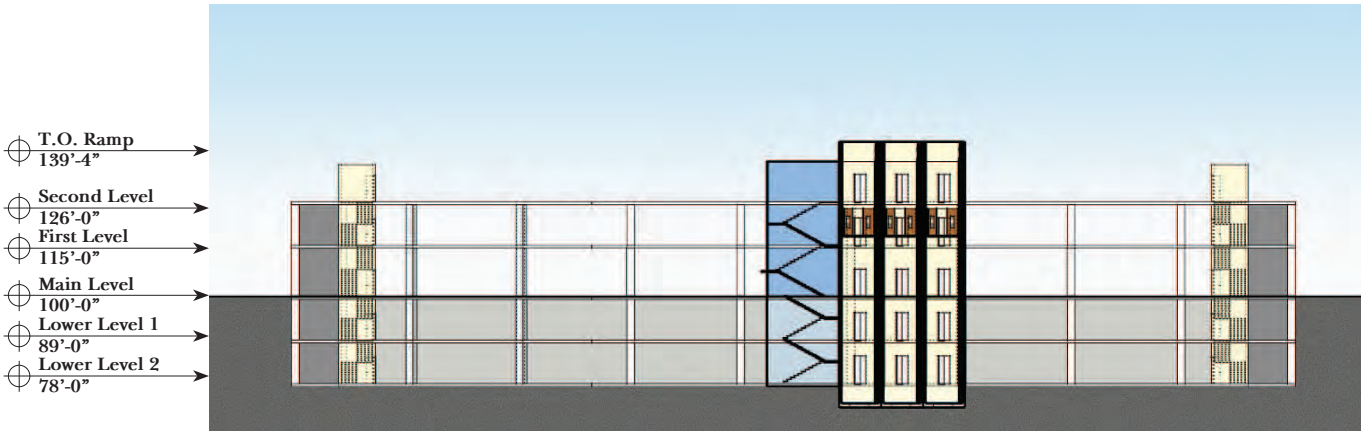
[a] The site's proximity to the Transportation Building building will require careful design to manage code-related issues [e.g. fire separation].



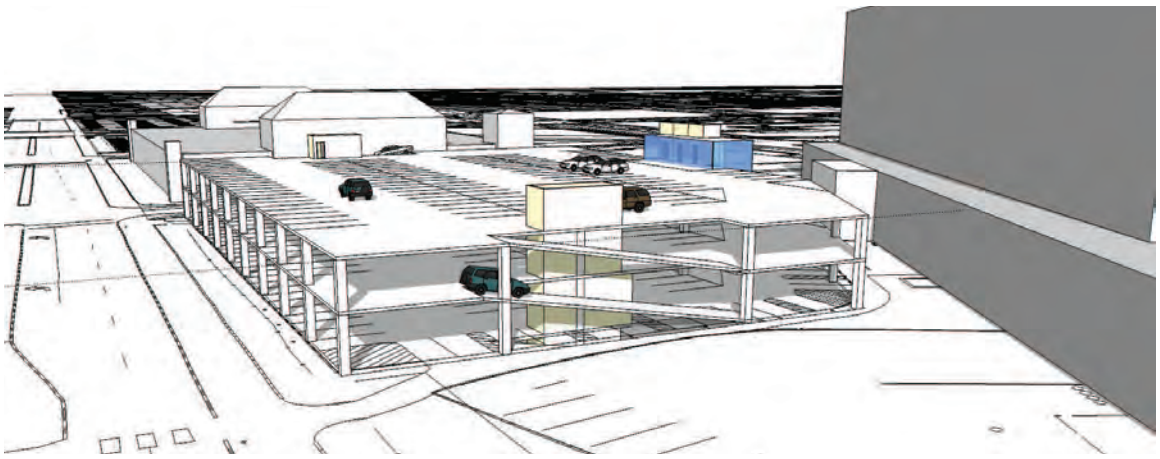
Lot F Existing Site Plan. *Existing surface lot containing 113 parking spaces.*



Lot F *Proposed Main Level Floor Plan*



Lot F *Building Section showing two below-grade parking levels. Viewed from the east.*



Lot F *Capacity/Zoning Study of a potential ramp. Viewed from the southeast.*

[b] Structural issues related to sub grade parking near the lower levels of the DOT must be recognized and planned for.

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
Government District 1 [G-1]
The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.

USE DISTRICTS [2400.2205]
Surface Lot: Permitted
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: 0'-20'
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: None

BUILDING HEIGHT [2400.2300]
Height District 1
944' [Above Sea Level]
249.9' [St. Paul Datum]
Min. Stories: 2

DESIGN & MATERIAL STANDARDS [2400.2405]
[Rice St.]
Frontage Type: **Flexible**
In the Flexible Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between zero and 25 feet from the front lot line. Buildings at corner locations must be located within five feet of the front lot line on either street for a distance of 30 feet from the corner.

REQUIREMENTS

[a] Freestanding signs, poles or pylons prohibited within setback areas

[b] Mechanical and electrical equipment must not be visible within frontage setback

RECOMMENDATIONS/GUIDELINES

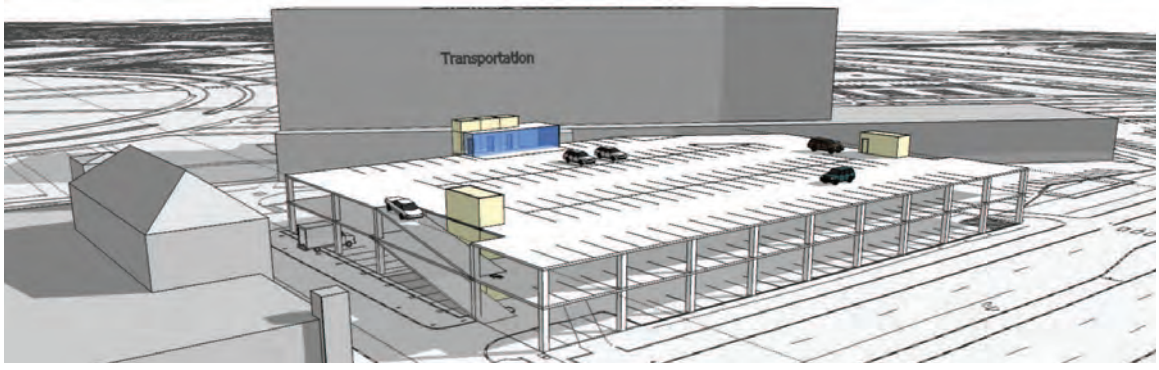
[a] Face Materials: Cut Stone, brick, split-faced block or other natural materials

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Green Roof for reduced energy use

[d] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls

[e] Visual compatibly with neighboring buildings, features, and places



Lot F *Capacity/Zoning Study of a potential ramp. Viewed from the northwest with DOT in background.*

SECTION 5.6

5 Lot L

Considerations

Lot L is a parcel bounded by the Robert St. to the east, Rev. Dr. Martin Luther King Jr. Boulevard [MLK] to the south, the Judicial Center to the west, and the Central Maintenance Building to the north. Lot L is located at the eastern end of Rev. Dr. Martin Luther King Jr. Boulevard. This street has become a dead-end with the construction of the LRT line to the east. It is presently a small surface parking lot adjacent to the Judicial Center [JC].

Currently, Lot L accommodates 92 parking spaces, all of which are contract. It shares access to MLK with the Judicial Center garage.

Assets

[a] Lot L is located in the eastern portion of the Capitol Complex. This area is nearly built to capacity and has a high density of the complex's employment.

[b] MLK presently serves as access to the JC, the upper portions of the Centennial Ramp and the Central Maintenance Building.

[c] MLK connect immediately to Cedar Street, allowing for good traffic dispersion.

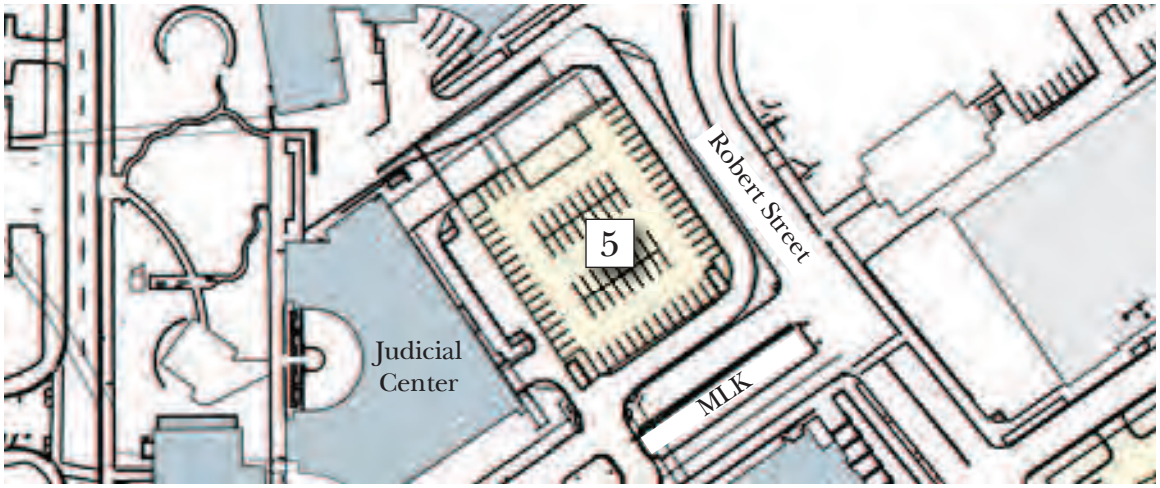
[d] The site's size and topography make it well suited for hosting a single-deck type of parking structure. This would increase the capacity of the lot without intruding on the JC's architectural character and views.

[e] The site offers an opportunity to create a tunnel access, most likely via the Centennial Building.

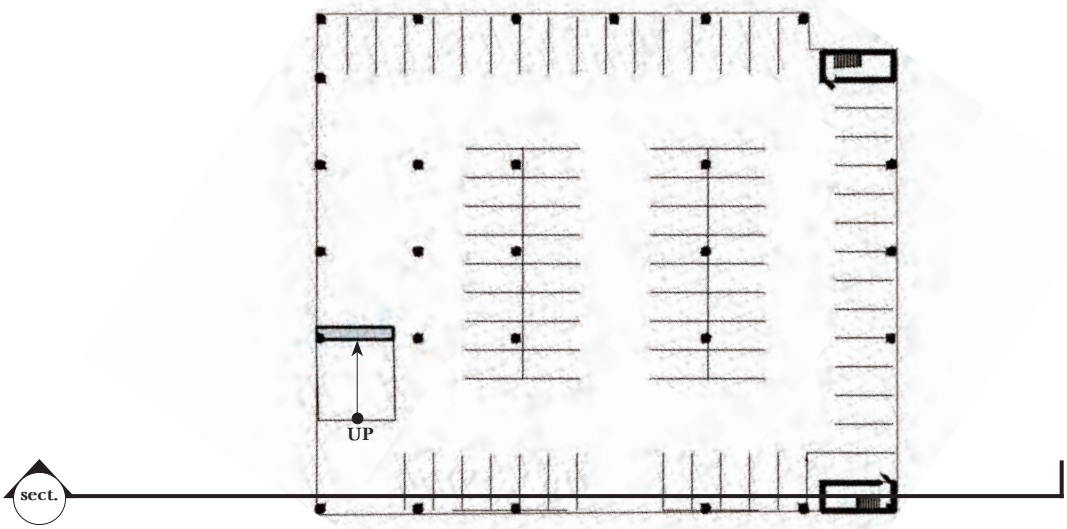
Drawbacks

[a] The lot's small footprint makes it unsuitable for a large-capacity facility, due to the inefficiency of small floor plates in a ramp structure.

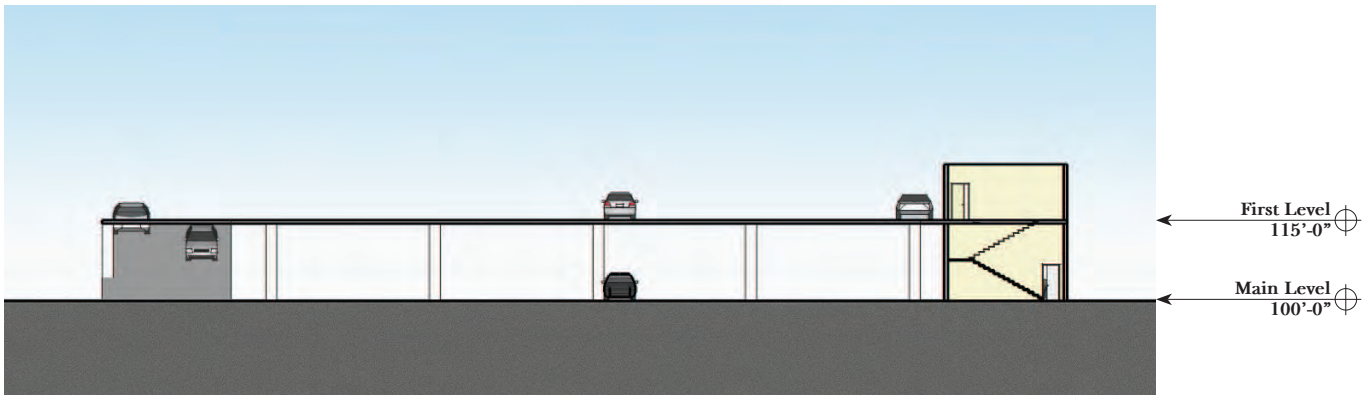
[b] The relatively short extent of MLK would not allow a large amount of queuing



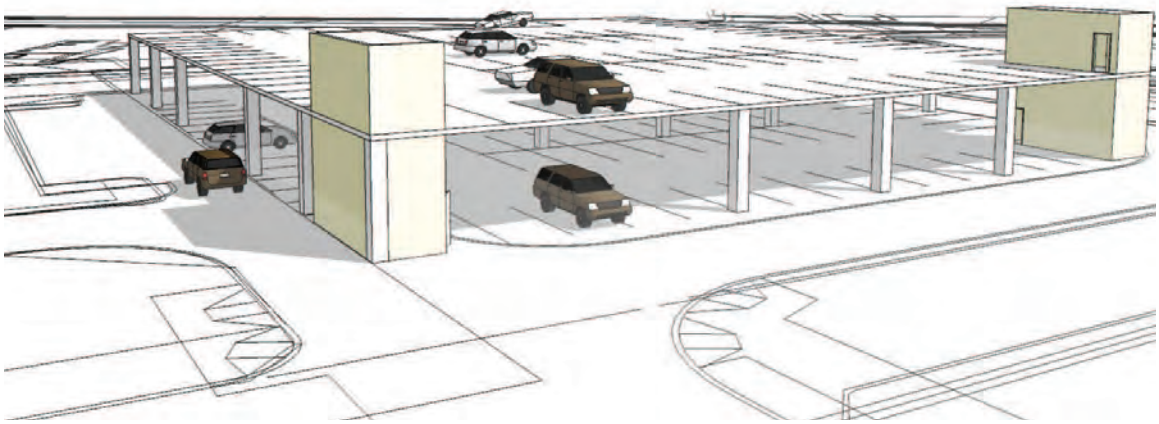
Lot L *Existing Site Plan. Existing surface lot containing 92 parking spaces.*



Lot L *Proposed Main Level Floor Plan, rotated for display*



Lot L *Building Section showing one below-grade parking level. Viewed from the south*



Lot L *Capacity/Zoning Study of a potential single level ramp. Viewed from the southeast.*

space [either entering or exiting].
[c] Because pedestrian access to the east is cut off by the LRT, users will need to enter the tunnel system or use sidewalks to the west of the site.

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
Government District 1 [G-1]
The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.

USE DISTRICTS [2400.2205]
Surface Lot: Conditional
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: 5'-15'
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: 10,000 sq. ft.

BUILDING HEIGHT [2400.2300]
Height District 1A
900.1' [Above Sea Level]
246.2' [St. Paul Datum]
Min. Stories: 3

DESIGN & MATERIAL STANDARDS [2400.2405]
Frontage Type: **Civic**
In the Civic Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between five and 15 feet from the front lot line. Buildings at corner locations must be located within five feet of the front lot line on either street for a distance of 30 feet from the corner.

REQUIREMENTS

[a] Face Materials: Cut Stone, Terra-cotta, Cast Stone, or equal

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Freestanding signs, poles or pylons prohibited within setback areas

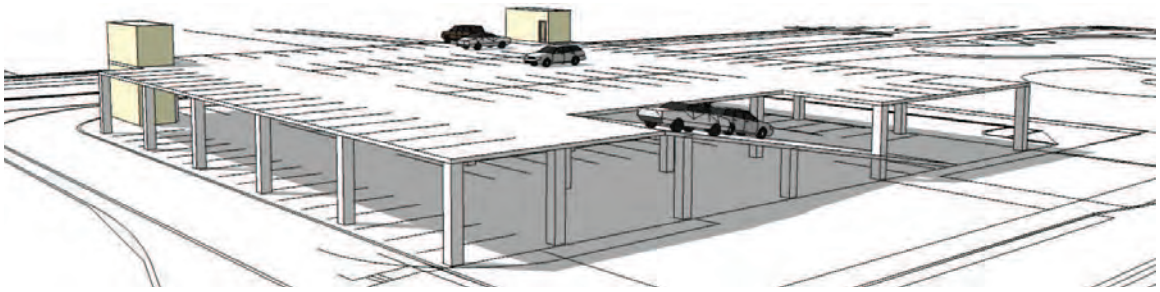
[d] Mechanical and electrical equipment must not be visible in frontage setback area

RECOMMENDATIONS/GUIDELINES

[a] Green Roof for reduced energy use

[b] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls

[c] Visual compatibly with neighboring buildings, features, and places



Lot L *Capacity/Zoning Study of a ramp. Viewed from the northeast.*

SECTION 5.7

6 Lot Q

CONSIDERATIONS

Lot Q sits atop the Cedar Street hill, to the northeast f the Capitol and Administration Building. It is a large, expansive surface lot that adjoins residential, non-state office, and park areas.

Currently, Lot Q is a surface parking lot that accommodates 336 parking spaces, 292 of which are contract and 3 are various handicapped stalls. The remaining 41 spaces are metered for the use of visitors to the Capitol and State offices.

ASSETS

[a] The site is very large.

[b] Lot Q is on the periphery of the Capitol Complex.

DRAWBACKS

[a] As the very prominent top of the Capitol hill, this site is visible from near and far throughout the City and Capitol Complex. Parking here would be very prominent from the entire Capitol Area.

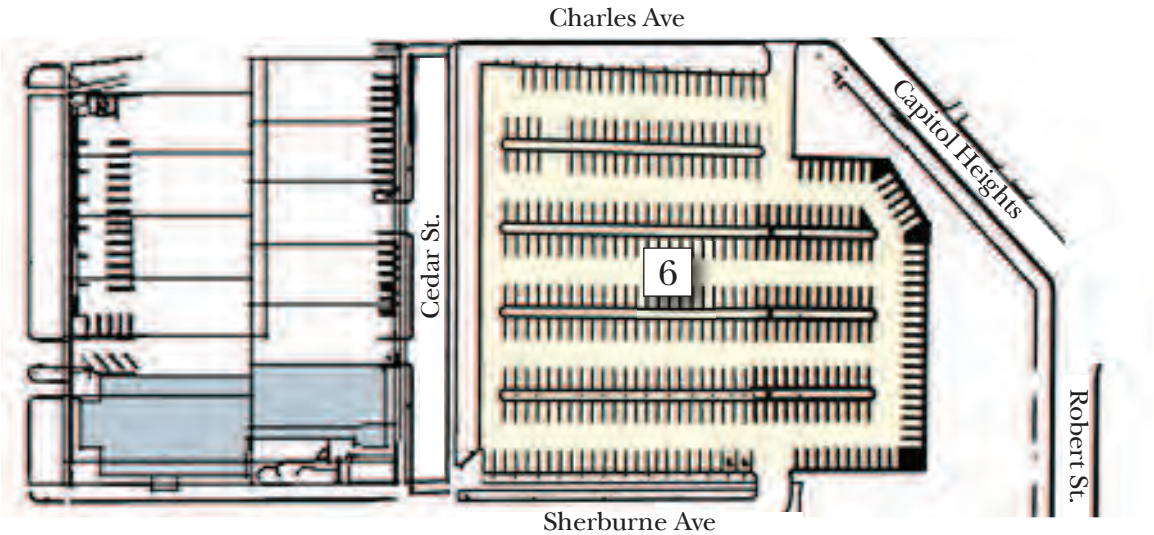
[b] The height of construction on the site is sharply constrained due to its elevation relative to the Capitol. However, its expanse somewhat mitigates this.

[c] Lot Q is distant from most employment concentrations.

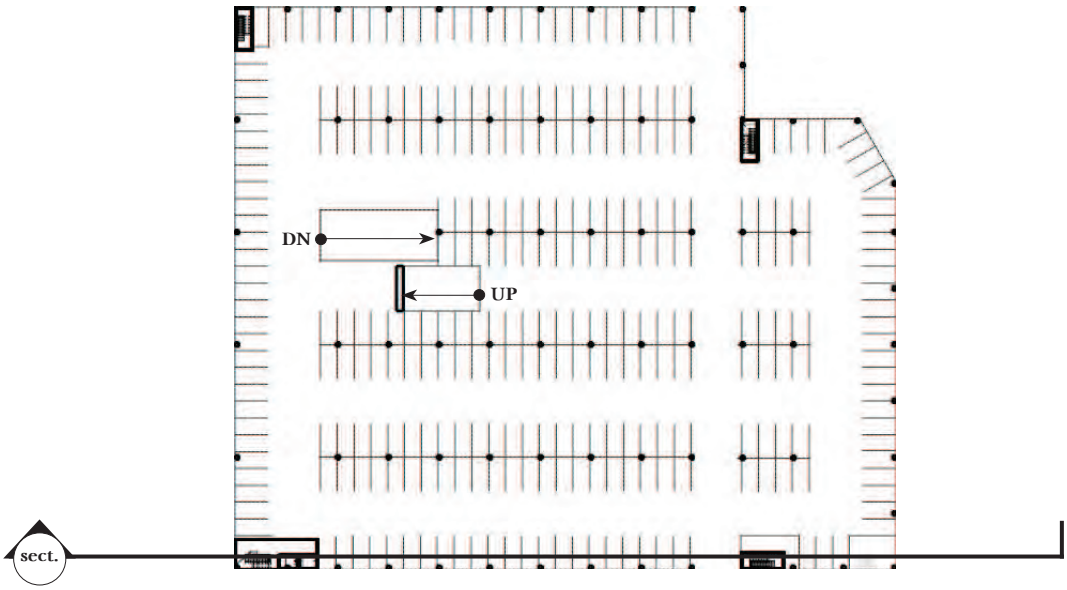
[d] A tunnel connection is unlikely.

[e] The adjoining uses are best served by this lot remaining surface parking or by conversion to other uses more in keeping with the context.

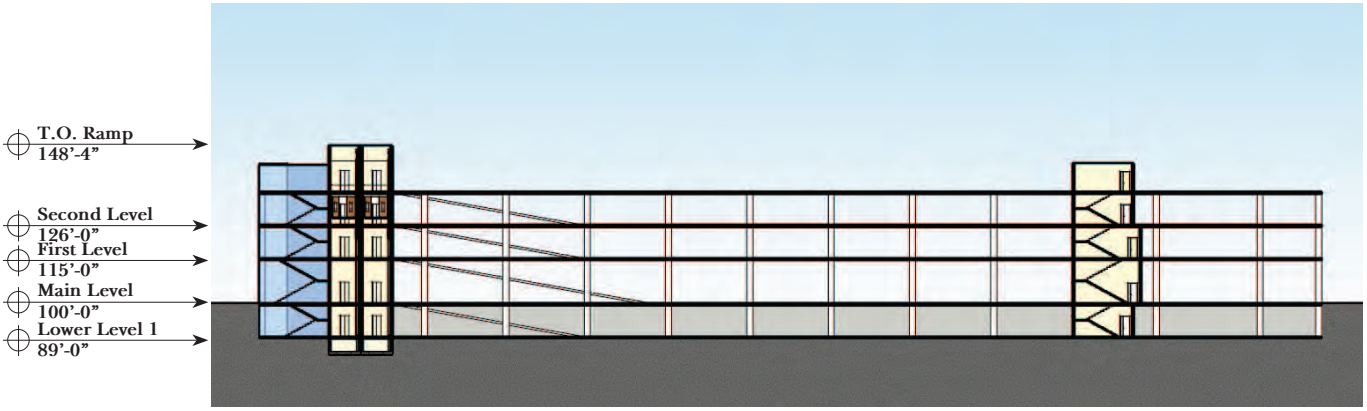
[f] Access to streets is limited here. Cedar Street provides limited access to the south, but other routes are round-a-bout at best and risk diverting significant traffic loads into the neighborhood.



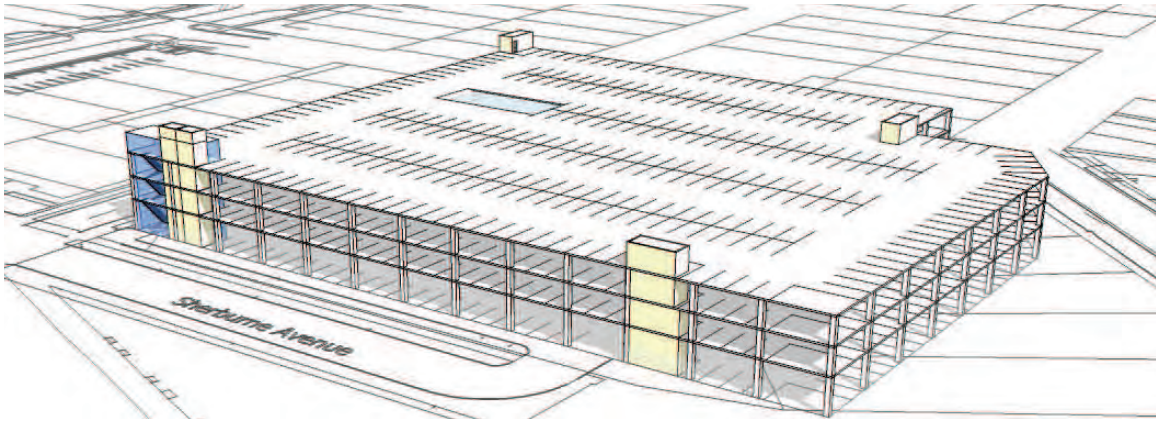
Lot Q *Existing Site Plan. Existing surface lot containing 336 parking spaces.*



Lot Q *Proposed Main Level Floor Plan*



Lot Q *Building Section showing one below-grade parking level. Viewed from the south*



Lot Q *Capacity/Zoning Study of a potential ramp. Viewed from the southeast.*

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
Government District 1 [G-1]
The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.

USE DISTRICTS [2400.2205]
Surface Lot: Permitted
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: See Frontage Type
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: 10,000 sq. ft.

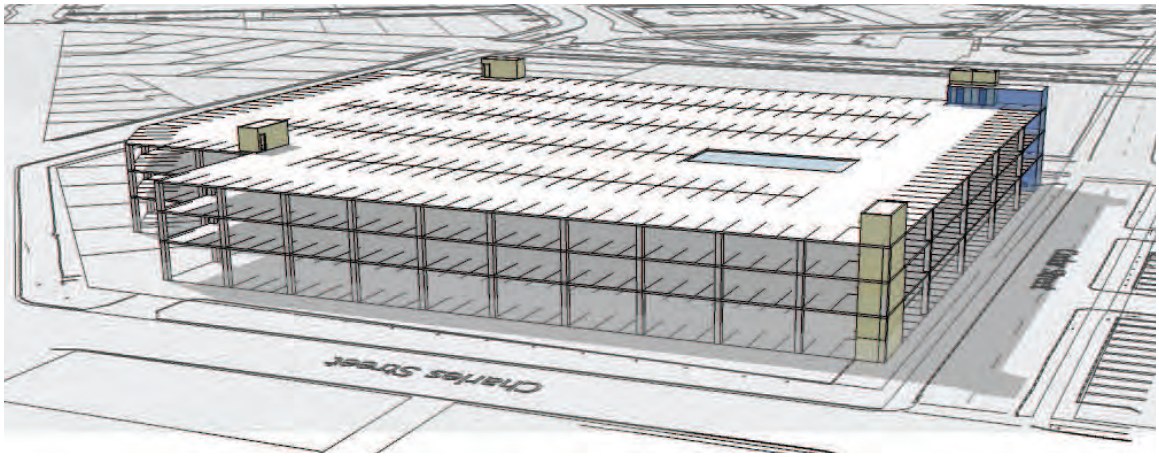
BUILDING HEIGHT [2400.2300]
Height District 1
944' [Above Sea Level]
249.9' [St. Paul datum]
Min. Stories: 2

FRONTAGE TYPE [2400.2400]
[Sherburne Avenue & Cedar Street]
Frontage Type: **Civic**
Setback from street: 5'-15'

[Charles Street & Capitol Heights]
Frontage Type: **Flexible**
Setback from street: 0'-20'

Design & Material Standards [2400.2405]
[Sherburne Avenue & Cedar Street]
Frontage Type: **Civic**
In the Civic Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between five and 15 feet from the front lot line. Buildings at corner locations must be located within five feet of the front lot line on either street for a distance of 30 feet from the corner.

REQUIREMENTS
[a] Face Materials: Cut Stone, Terra-cotta, Cast Stone, or equal
[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings
[c] Freestanding signs, poles or pylons



Lot Q *Capacity/Zoning Study of a potential ramp. Viewed from the north.*

prohibited within setback areas

[d] Mechanical and electrical equipment must not be visible in frontage setback area

Recommendations/Guidelines

[a] Green Roof for reduced energy use

[b] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[c] Visual compatibly with neighboring buildings, features, and places

Frontage Types

[Charles Street & Capitol Heights]

Frontage Type: **Flexible**

In the Flexible Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between zero and 25 feet from the front lot line. Buildings at corner locations must be located within five feet of the front lot line on either street for a distance of 30 feet from the corner.

Requirements

[a] Freestanding signs, poles or pylons prohibited within setback areas

[b] Mechanical and electrical equipment must not be visible within frontage setback area

Recommendations/Guidelines

[a] Face Materials: Cut Stone, brick, split-faced block or other natural materials

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Green Roof for reduced energy use

[d] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[e] Visual compatibly with neighboring buildings, features, and places

SECTION 5.8

7 Lots U/W

CONSIDERATIONS

Located in the heart of the eastern Capitol Complex, Lots U/W are contiguous and form a parcel bounded by the Stassen Building to the south, Jackson Street to the east, 14th Street to the north, and Robert Street to the west.

Currently, Lots U/W are a surface parking that accommodates 143 parking spaces, all of which are metered for visitors, and 5 of which are handicapped.

They are surrounded by a dense employment concentration and a high number of agencies. Sharing the site with parking is a rain garden infiltration basin, which accommodates storm water from the adjoining parcels. It is across 14th from the State's existing 900+ car 14th Street Ramp.

There is an existing storm water infiltration basin/rain garden on the site. In planning studies it was considered for relocation or expansion/augmentation as appropriate.

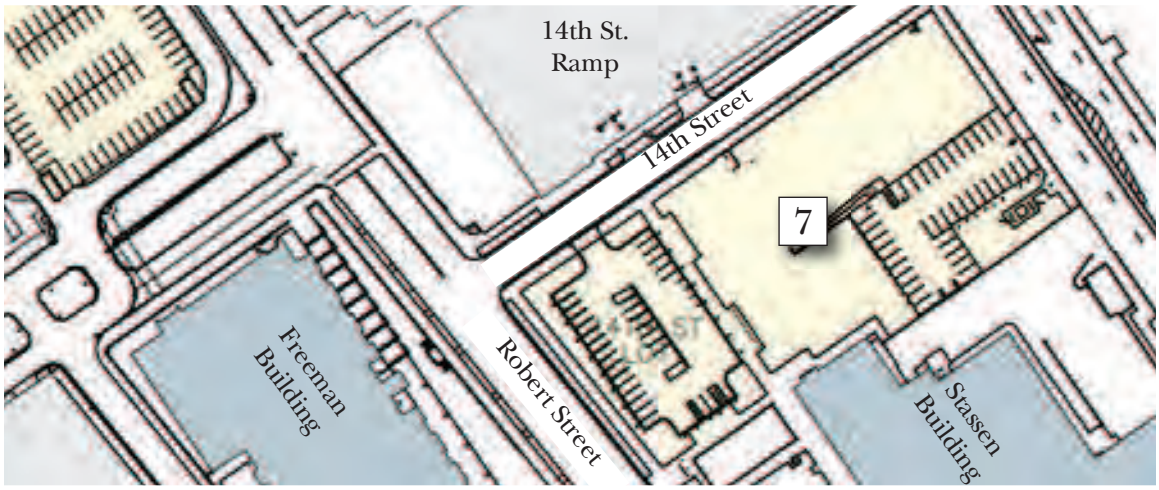
Planning analysis for Lot U/W was mindful of difficulties at existing 14th Street ramp, which has significant congestion and exit delays exceeding 15 minutes. These are in part due to the configuration of the streets serving the ramp, as well as its internal arrangements.

A significant consideration for planning on this site is to provide the necessary level of service while taking care not to exacerbate the traffic problems already occurring in the vicinity.

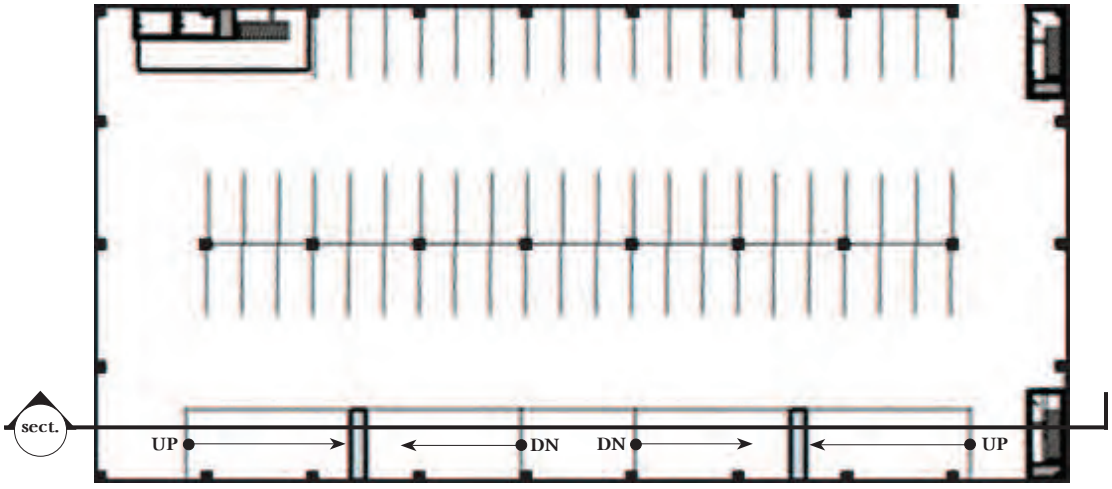
ASSETS

[a] The site's location allows significant height for new construction.

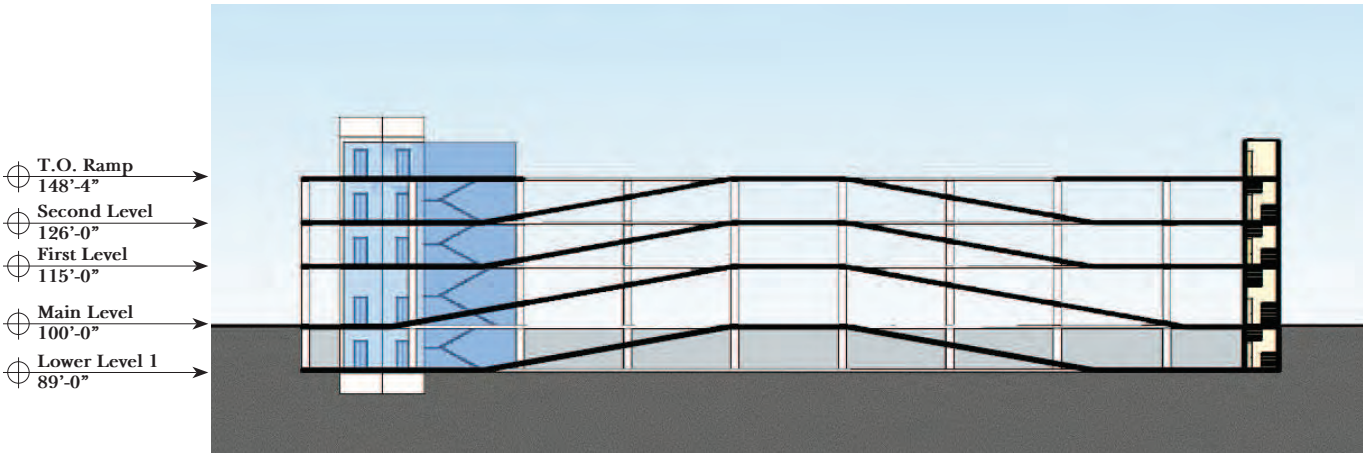
[b] The location in the heart of the eastern campus provides excellent proximity to many agencies for staff and visitors.



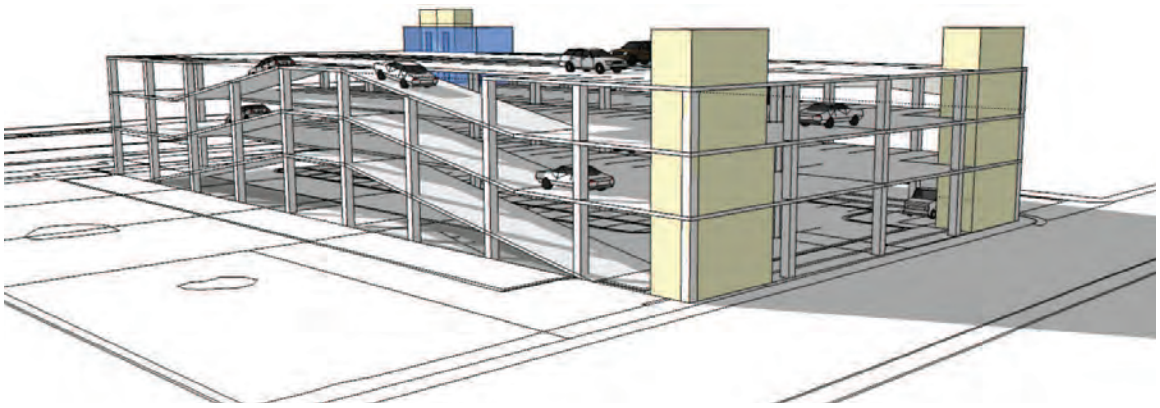
Lots U/W *Existing Site Plan. Existing surface lot containing 143 parking spaces.*



Lots U/W *Proposed Main Level Floor Plan*



Lots U/W *Building Section showing one below-grade parking level. Viewed from the south*



Lots U/W *Capacity/Zoning Study of a potential ramp. Viewed from the southeast.*

CONSTRAINTS

[a] Traffic flow in this area experiences very significant [15 minute+] congestion delays due to the inadequacy of the street network to handle the loading from the existing 14th Street ramp. Adding additional cars here before the streets are reconstructed would not be prudent.

[b] Soils on this site would require significant correction. In the test boring, no firm bottom was encountered to a depth of 51 feet. A structure here would likely require full pilings for support. While this does not preclude building on this site, it will be a cost factor. It should also be noted that this observation is based on a single test boring, and the actual extents and impacts will have to be determined by a more extensive testing program prior to design.

[c] This is the last remaining open space in the eastern portion of the Capitol Complex. It seems likely that it may have a higher value for other uses.

Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
Government District 1 [G-1]

The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.

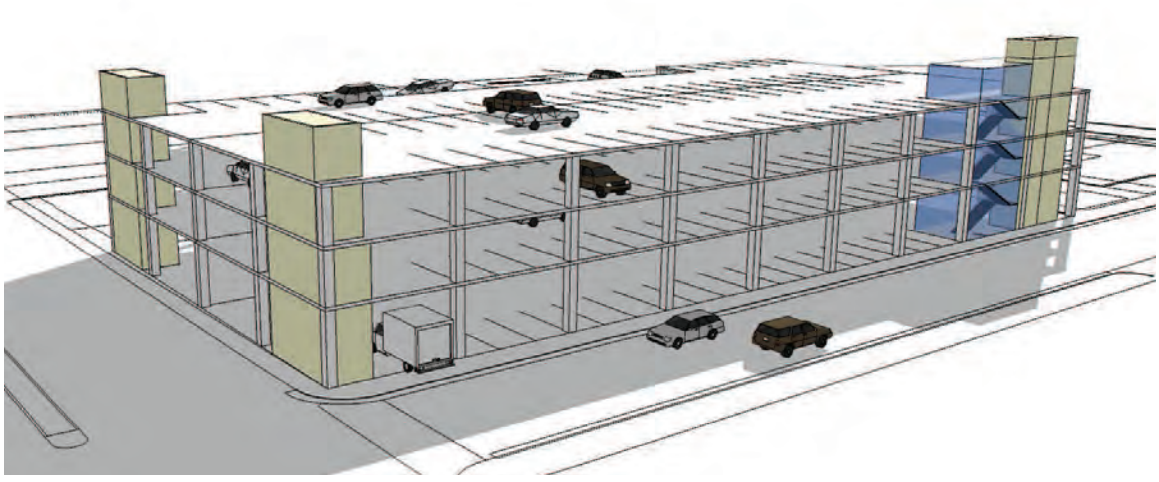
USE DISTRICTS [2400.2205]
Surface Lot: Permitted
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: See Frontage Type
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: 10,000 sq. ft.

BUILDING HEIGHT [2400.2300]
Height District 1B
881.1' [Above Sea Level]
194.0' [St. Paul datum]
Min. Stories: 3

FRONTAGE TYPE [2400.2400]
Frontage Type: Civic
Setback from street: 5'-15'



Lots U/W *Capacity/Zoning Study of a potential ramp. Viewed from the northeast.*

Design & Material Standards [2400.2405]

Frontage Type: **Civic**

In the Civic Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between five and 15 feet from the front lot line.

Requirements

[a] Face Materials: Cut Stone, Terra-cotta, Cast Stone, or equal

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Freestanding signs, poles or pylons prohibited within setback areas

[d] Mechanical and electrical equipment must not be visible in frontage setback area

Recommendations/Guidelines

[a] Green Roof for reduced energy use

[b] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[c] Visual compatibly with neighboring buildings, features, and places

Recommended/Guidelines

[d] Green Roof for reduced energy use

[e] Continuity of Walls: building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure

[f] Visually compatibly with neighboring buildings, features, and places

SECTION 5.9

8 Cass Gilbert Park

Considerations

Cass Gilbert Park [CGP] is a parcel bounded by University Avenue to the south, Robert St. to the east, Sherburne Avenue to the north, and Cedar Street to the west. CGP is adjacent to Lot Q to the north across Sherburne Ave., northeast of the Capitol and Administration Buildings.

Currently, Cass Gilbert Park has no surface or structured parking. It is composed of a plateau area with a concrete overlook [offering spectacular views of St. Paul, the Capitol, and the river valley] and a large, very steep grass-covered hillside. The hillside is too steep to be occupied; it is largely overgrown by grass and is not used. A portion of the upper plateau is currently serving as a fenced-off staging and storage area for the Capitol area renovation projects, though access to the overlook is still open. The Park forms the termination of the vista through the Complex up Robert Street.

ASSETS

[a] The site is largely unused.

[b] It is a relatively large parcel.

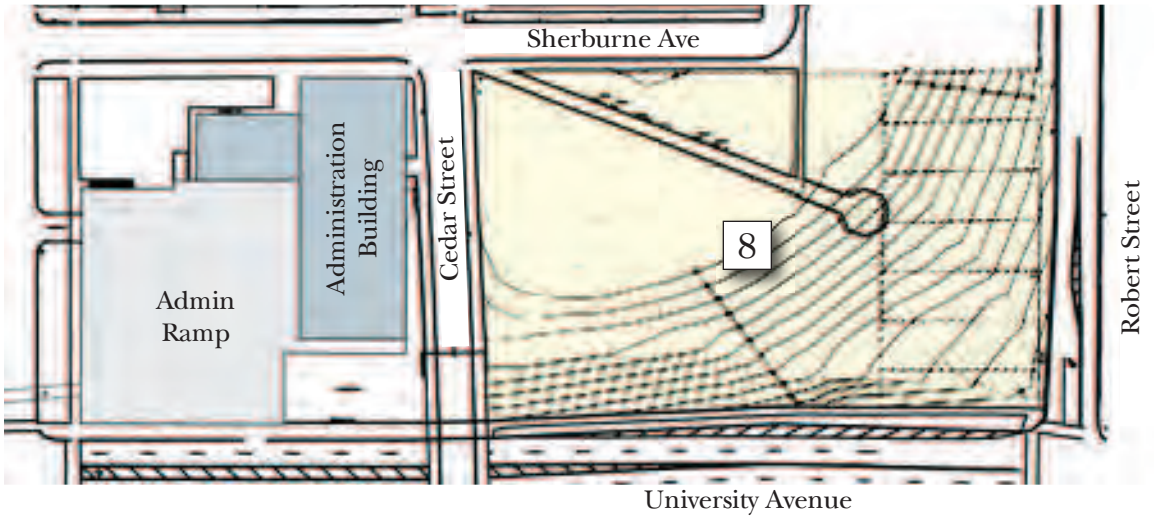
[c] If there were construction on the site, the overlook could be maintained in place or replaced in kind by new construction.

[d] A parking facility could be set or earth-sheltered into the slope of the hill.

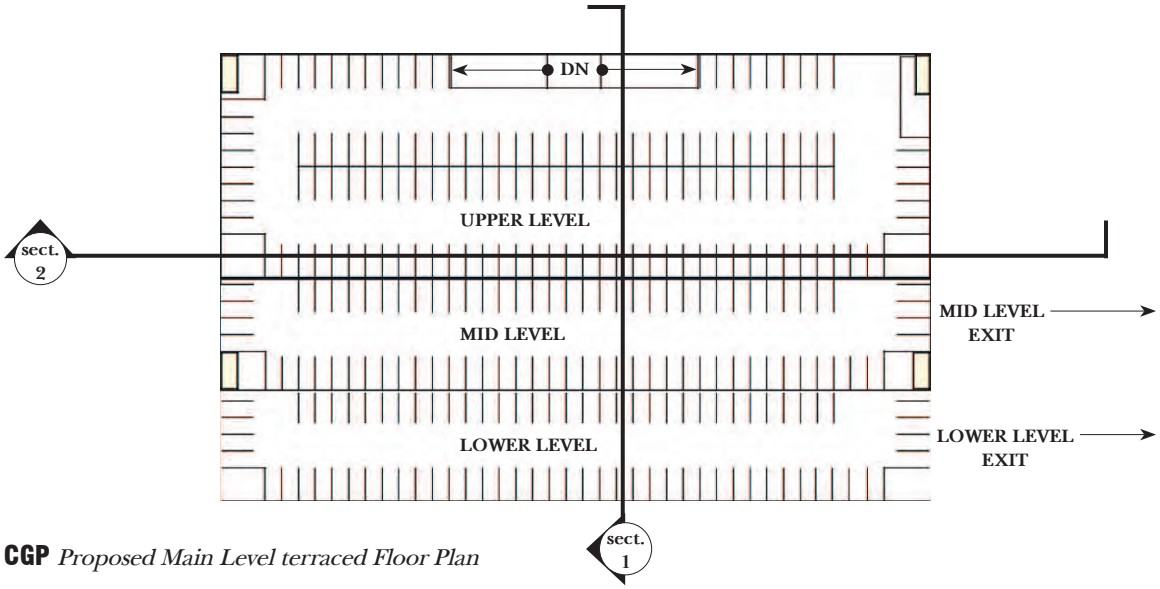
CONSTRAINTS

[a] This site is visible from a significant part of the City and Capitol Complex. Parking here would need to be very heavily landscaped and/or subgrade to avoid being disproportionately prominent from the eastern Capitol Area.

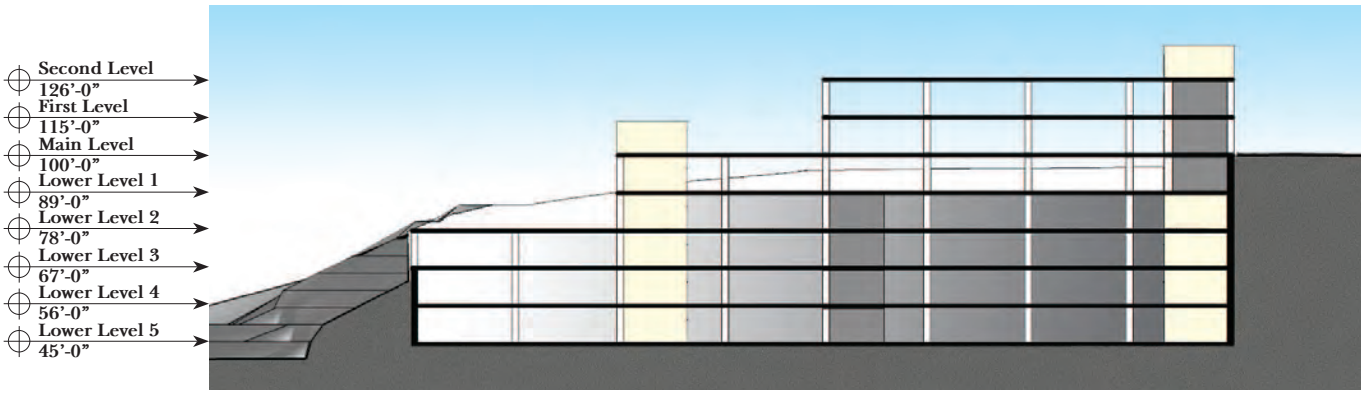
[b] The height of construction on the



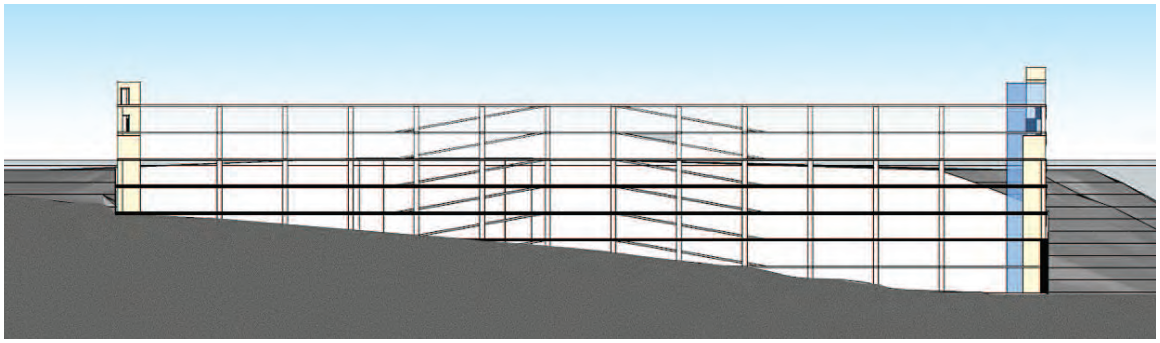
Cass Gilbert Park *Existing Site Plan. Existing surface lot containing 336 parking spaces.*



CGP *Proposed Main Level terraced Floor Plan*



CGP *Building Section 1 showing all terraced parking levels. Viewed from the east.*



CGP *Building Section 2 showing full access ramps. Viewed from the south.*

site is sharply constrained due to its elevation relative to the Capitol. However, the ability to build into the hillside largely mitigates this.

[c] This site is distant from most employment concentrations.

[d] A tunnel connection is unlikely here.

[e] Access to streets is limited here. University Avenue is sharply constrained by the LRT lines at this point, and would not offer ingress/egress. Cedar Street, and to a lesser extent Sherburne Avenue, are the only existing connections.

[f] Access could be gained to the last extent of Robert Street. However, distribution from this site is very limited as it would result in traffic coming back into the core of the capitol Complex.

[g] A pedestrian would need to ascend to Cedar Street after parking [away from most destinations] to gain access to most of the campus. There would be very limited access to University Avenue, but this route would bring users into conflict with the LRT line and so is of little benefit.

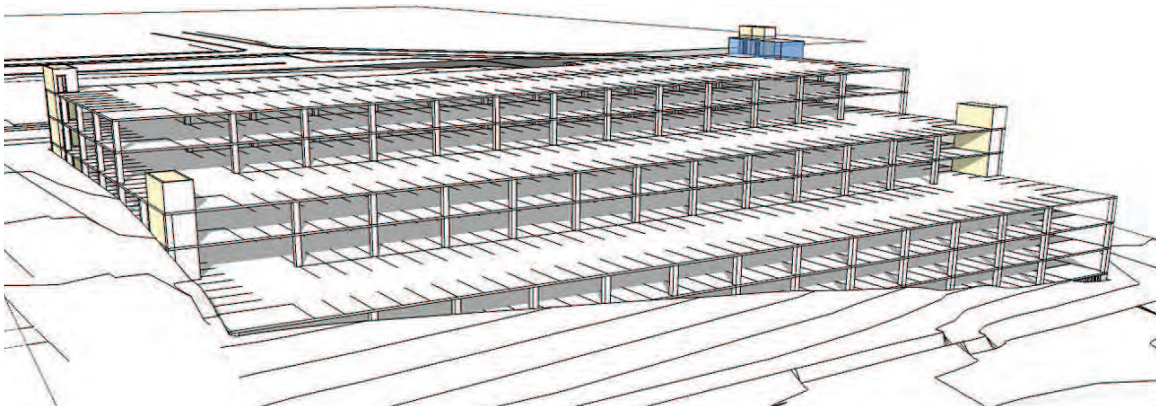
Zoning & Design Guidelines Summary [2009]

ZONING DISTRICTS [2400.2100]
Government District 1 [G-1]
The intent of the G-1 District is to provide for the orderly growth of state government and the preservation and enhancement of existing structures within the Capitol area.

USE DISTRICTS [2400.2205]
Surface Lot: Permitted
Underground: Permitted
Above ground: Permitted

BUILDING PLACEMENT [2400.2225, SUBP. 2]
Front Yard: See Frontage Type
Side Yard: 0'
Rear Yard: 0'

LOT PARAMETERS [2400.2225, SUBP. 3 & 5]
Minimum Width: 60'
Minimum Lot Area: 10,000 sq. ft.



CGP *Capacity/Zoning Study of a potential ramp. Viewed from the north east.*

BUILDING HEIGHT [2400.2300]
Height District 1
944' [Above Sea Level]
249.9' [St. Paul datum]
Min. Stories: 2
FRONTAGE TYPE [2400.2400]
Sherburne Avenue & Cedar Street: Civic
Setback from street: 5'-15'

Robert Street: Flexible
Setback from street: 0'-20'
Design & Material Standards [2400.2405]
[Sherburne Avenue, Cedar & Robert Street]
Frontage Type: **Civic**

In the Civic Frontage type, setback from the front lot line depends on building type and location. Mixed-use buildings must be set back between five and 15 feet from the front lot line.

REQUIREMENTS

[a] Face Materials: Cut Stone, Terra-cotta, Cast Stone, or equal

[b] Roof: Discernible cornice line that matches cornice line of adjacent buildings

[c] Freestanding signs, poles or pylons prohibited within setback areas

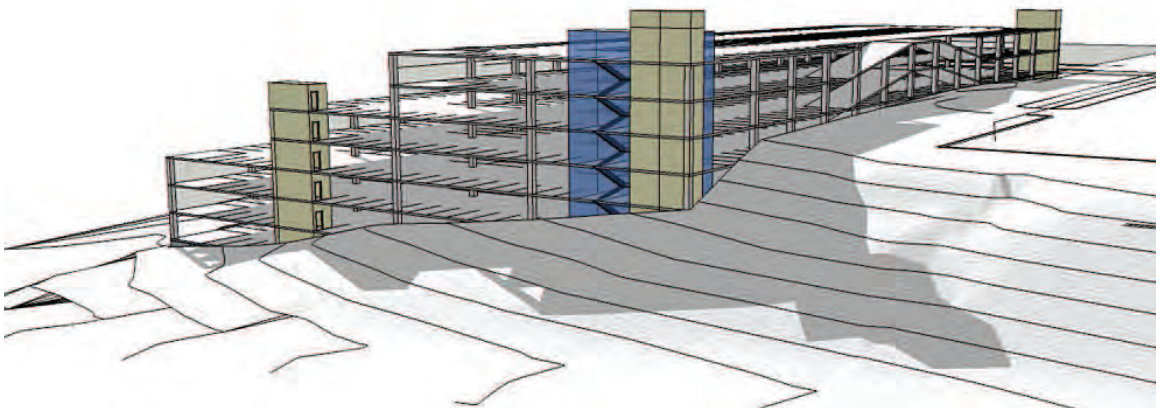
[d] Mechanical and electrical equipment must not be visible in frontage setback area

RECOMMENDATIONS/GUIDELINES

[a] Green Roof for reduced energy use

[b] Continuity of walls, building facades, fences and landscape masses must contribute to the spatial definition of the frontage and form cohesive walls of enclosure along street

[c] Visual compatibly with neighboring buildings, features, and places



CGP *Capacity/Zoning Study of a potential ramp. Viewed from the north east.*

SECTION 6

Financial Information

The following four pages outline the estimated construction costs of the project. A summary sheet compiling the costs for the project as a whole is at the beginning of Section 6. The following worksheets break out project component Lots C, F, and L, in that order.

It is important to note, however, that the summary costing assumes all three ramps are built at the same time. This scenario allows for the greatest economies of scale, pricing leverage, and construction efficiency. If only a portion of the Predesign recommendations are implemented and fewer ramps are built, cost projections must be re-evaluated. In this scenario it is likely that economies of scale will be less substantial and costs could rise 10-15% per project.

AGENCY CAPITAL BUDGET REQUEST
Fiscal Years 2013 – 2014
Dollars in Thousands ($137,500 = $138 thousand)

PROJECT COST FORM

TOTAL PROJECT COSTS All Years and All Funding Sources	**Project Costs** All Prior Years	**Project Costs** FY 2013-14	**Project Costs** FY 2014-15	**Project Costs** FY 2015-16	**Project Costs** All Years	**Project Start** (Month/Year)	**Project Finish** (Month/Year)
1. Property Acquisition							
Land, Land and Easements, Options	0	0	0	0	0		
Buildings and Land	0	0	0	0	0		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	0	0	0	0		
2. Predesign SUBTOTAL	99	0	0	0	99		
3. Design Fees						6/2013	12/2014
Schematic	0	300	0	0	300		
Design Development	0	336	0	0	336		
Contract Documents	0	545	0	0	545		
Construction Administration	0	0	400	0	400		
Other Costs	0	75	0	0	75		
SUBTOTAL	0	1256	400	0	1656		
4. Project Management							
State Staff Project Management	0	0	0	0	0		
Non-State Project Management	0	150	205	0	355		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	150	205	0	355		
5. Construction Costs						9/2013	12/2014
Site & Building Preparation	0	850	0	0	850		
Demolition/Decommissioning	0	250	0	0	250		
Construction	0	7000	11000	0	18000		
Infrastructure/Roads/Utilities	0	500	1000	0	1500		
Hazardous Material Abatement	0	50	0	0	50		
Construction Contingency	0	1000	1000	0	2000		
Other Costs	0	500	500	0	1000		
SUBTOTAL	0	10150	13500	0	23650		
6. Art SUBTOTAL	0	0	200	0	200		
7. Occupancy							
Furniture, Fixtures and Equipment	0	0	350	0	350		
Telecommunications (voice & data)	0	0	250	0	250		
Security Equipment	0	0	375	0	375		
Commissioning	0	0	250	0	250		
SUBTOTAL	0	0	1225	0	1225		
8. Inflation Midpoint of Construction						Midpoint Date:	4/2014
Inflation Multiplier						2.05%	
Inflation Cost **SUBTOTAL**	0	0	510	0	510		
9. Other SUBTOTAL	0	0	0	0	0		
GRAND TOTAL	99	11556	16040	0	27695		

****does not reflect stand-alone project cost***

AGENCY CAPITAL BUDGET REQUEST
Fiscal Years 2013 – 2014
Dollars in Thousands ($137,500 = $138 thousand)

PROJECT COST FORM

COMPONENT PROJECT COSTS – **LOT C** All Years and All Funding Sources	**Project Costs** All Prior Years	**Project Costs** FY 2013-14	**Project Costs** FY 2014-15	**Project Costs** FY 2015-16	**Project Costs** All Years	**Project Start** (Month/Year)	**Project Finish** (Month/Year)
1. Property Acquisition							
Land, Land and Easements, Options	0	0	0	0	0		
Buildings and Land	0	0	0	0	0		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	0	0	0	0		
2. Predesign SUBTOTAL	33	0	0	0	33		
3. Design Fees						6/2013	12/2014
Schematic	0	125	0	0	125		
Design Development	0	140	0	0	140		
Contract Documents	0	225	0	0	225		
Construction Administration	0	0	160	0	160		
Other Costs	0	25	0	0	25		
SUBTOTAL	0	515	160	0	675		
4. Project Management							
State Staff Project Management	0	0	0	0	0		
Non-State Project Management	0	60	80	0	140		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	60	80	0	140		
5. Construction Costs						9/2013	12/2014
Site & Building Preparation	0	350	0	0	350		
Demolition/Decommissioning	0	100	0	0	100		
Construction	0	3000	5000	0	8000		
Infrastructure/Roads/Utilities	0	200	400	0	600		
Hazardous Material Abatement	0	20	0	0	20		
Construction Contingency	0	400	400	0	800		
Other Costs	0	200	200	0	400		
SUBTOTAL	0	4270	6000	0	10270		
6. Art SUBTOTAL	0	0	85	0	85		
7. Occupancy							
Furniture, Fixtures and Equipment	0	0	150	0	150		
Telecommunications (voice & data)	0	0	100	0	100		
Security Equipment	0	0	155	0	155		
Commissioning	0	0	120	0	120		
SUBTOTAL	0	0	525	0	525		
8. Inflation Midpoint of Construction						Midpoint Date:	4/2014
Inflation Multiplier						2.05%	
Inflation Cost **SUBTOTAL**	0	0	221	0	221		
9. Other SUBTOTAL	0	0	0	0	0		
GRAND TOTAL	33	4845	7071	0	11949		

****does not reflect stand-alone project cost***

AGENCY CAPITAL BUDGET REQUEST
Fiscal Years 2013 – 2014
Dollars in Thousands ($137,500 = $138 thousand)

PROJECT COST FORM

SUBTOTAL PROJECT COSTS – **LOT F** All Years and All Funding Sources	**Project Costs** All Prior Years	**Project Costs** FY 2013-14	**Project Costs** FY 2014-15	**Project Costs** FY 2015-16	**Project Costs** All Years	**Project Start** (Month/Year)	**Project Finish** (Month/Year)
1. Property Acquisition							
Land, Land and Easements, Options	0	0	0	0	0		
Buildings and Land	0	0	0	0	0		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	0	0	0	0		
2. Predesign SUBTOTAL	33	0	0	0	33		
3. Design Fees						6/2013	12/2014
Schematic	0	125	0	0	125		
Design Development	0	140	0	0	140		
Contract Documents	0	225	0	0	225		
Construction Administration	0	0	160	0	160		
Other Costs	0	25	0	0	25		
SUBTOTAL	0	515	160	0	675		
4. Project Management							
State Staff Project Management	0	0	0	0	0		
Non-State Project Management	0	60	80	0	140		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	60	80	0	140		
5. Construction Costs						9/2013	12/2014
Site & Building Preparation	0	350	0	0	350		
Demolition/Decommissioning	0	100	0	0	100		
Construction	0	3400	5350	0	8750		
Infrastructure/Roads/Utilities	0	200	400	0	600		
Hazardous Material Abatement	0	20	0	0	20		
Construction Contingency	0	400	400	0	800		
Other Costs	0	200	200	0	400		
SUBTOTAL	0	4670	6350	0	11020		
6. Art SUBTOTAL	0	0	85	0	85		
7. Occupancy							
Furniture, Fixtures and Equipment	0	0	150	0	150		
Telecommunications (voice & data)	0	0	100	0	100		
Security Equipment	0	0	155	0	155		
Commissioning	0	0	120	0	120		
SUBTOTAL	0	0	525	0	525		
8. Inflation Midpoint of Construction						Midpoint Date:	4/2014
Inflation Multiplier						2.05%	
Inflation Cost **SUBTOTAL**	0	0	237	0	237		
9. Other SUBTOTAL	0	0	0	0	0		
GRAND TOTAL	33	5245	7437	0	12715		

****does not reflect stand-alone project cost***

AGENCY CAPITAL BUDGET REQUEST
Fiscal Years 2013 – 2014
Dollars in Thousands ($137,500 = $138 thousand)

PROJECT COST FORM

COMPONENT PROJECT COSTS – **LOT L** All Years and All Funding Sources	**Project Costs** All Prior Years	**Project Costs** FY 2013-14	**Project Costs** FY 2014-15	**Project Costs** FY 2015-16	**Project Costs** All Years	**Project Start** (Month/Year)	**Project Finish** (Month/Year)
1. Property Acquisition							
Land, Land and Easements, Options	0	0	0	0	0		
Buildings and Land	0	0	0	0	0		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	0	0	0	0		
2. Predesign **SUBTOTAL**	33	0	0	0	33		
3. Design Fees						6/2013	12/2014
Schematic	0	50	0	0	50		
Design Development	0	56	0	0	56		
Contract Documents	0	95	0	0	95		
Construction Administration	0	0	80	0	80		
Other Costs	0	25	0	0	25		
SUBTOTAL	0	226	80	0	306		
4. Project Management							
State Staff Project Management	0	0	0	0	0		
Non-State Project Management	0	25	50	0	75		
Other Costs	0	0	0	0	0		
SUBTOTAL	0	25	50	0	75		
5. Construction Costs						9/2013	12/2014
Site & Building Preparation	0	150	0	0	150		
Demolition/Decommissioning	0	50	0	0	50		
Construction	0	350	900	0	1250		
Infrastructure/Roads/Utilities	0	100	200	0	300		
Hazardous Material Abatement	0	10	0	0	10		
Construction Contingency	0	200	200	0	400		
Other Costs	0	100	100	0	100		
SUBTOTAL	0	960	1400		2360		
6. Art **SUBTOTAL**	0	0	30	0	30		
7. Occupancy							
Furniture, Fixtures and Equipment	0	0	50	0	50		
Telecommunications (voice & data)	0	0	50	0	50		
Security Equipment	0	0	65	0	65		
Commissioning	0	0	10	0	10		
SUBTOTAL	0	0	175	0	175		
8. Inflation Midpoint of Construction						Midpoint Date:	4/2014
Inflation Multiplier						2.05%	
Inflation Cost **SUBTOTAL**	0	0	52	0	52		
9. Other **SUBTOTAL**	0	0	0	0	0		
GRAND TOTAL	33	1211	1787	0	3031		

SECTION 7

Project Schedule Information

The below table reflects projected project timing for both the Design and Construction phase for all three ramps built simultaneously.

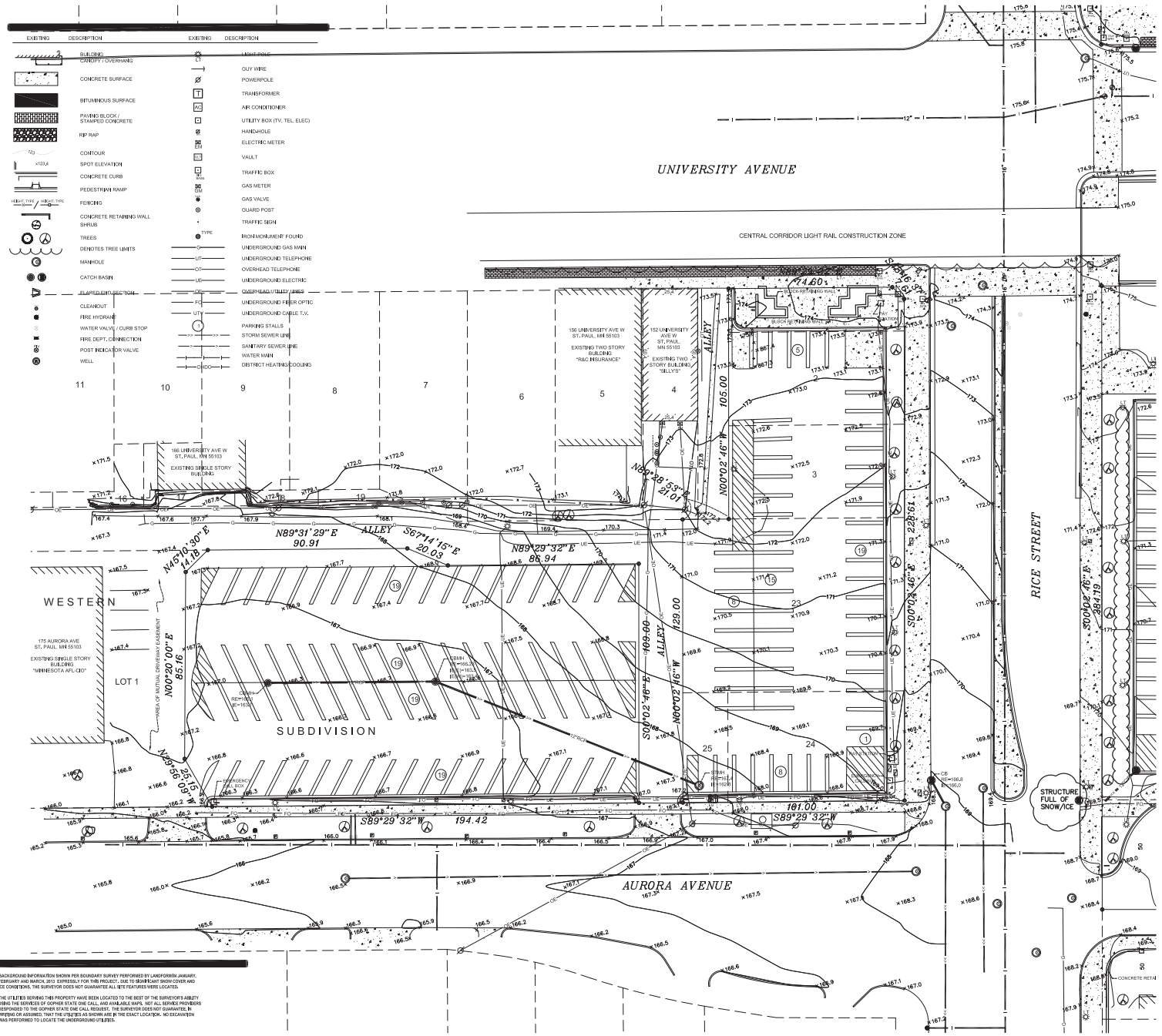
Task	Start	Complete
Funding	6/13/13	
Designer Selection	5/15/13	7/1/13
Design Start	7/1/13	12/14
Construction Manager at Risk Selection	5/15/13	7/1/13
CMR Start	7/1/13	12/14
Demo/Site Prep/Footing & Fnd. Bid Packages	9/13	11/13
Midpoint of Construction	4/14	
Substantial Completion		11/14
Occupancy and Use	12/14	
Construction Complete		12/14
Landscaping Complete	4/15	6/15
Final Project Completion		6/15
10-Month Warrantee Review	10/15	10/15

SECTION 8 Appendix

The following Appendix information is a compilation of supporting materials for the Predesign report.

SECTION 8.A **Land Surveys**

The following eight pages are Land Surveys of all the existing candidate sites. All survey information was provided by a subcontractor with the exception of the information for Lot L, which was provided by the State. Survey work was performed during Winter 2013.



EXISTING	DESCRIPTION	EXISTING	DESCRIPTION
	BUILDING		LIGHT POLE
	CANOPY / OVERHANG		GUY WIRE
	CONCRETE SURFACE		POWERPOLE
	BITUMINOUS SURFACE	T	TRANSFORMER
	PAVING BLOCK / STAMPED CONCRETE	AC	AIR CONDITIONER
	RIP RAP		UTILITY BOX (TV, TEL, ELEC)
123	CONTOUR		HAND-HOLE
x123.4	SPOT ELEVATION	EM	ELECTRIC METER
	CONCRETE CURB	EV	VAULT
	PEDESTRIAN RAMP	TRAFFIC	TRAFFIC BOX
HEIGHT, TYPE	FENCING	GM	GAS METER
HEIGHT, TYPE	CONCRETE RETAINING WALL		GAS VALVE
	SHRUB		GUARD POST
	TREES	TYPE	TRAFFIC SIGN
	DENOTES TREE LIMITS		IRON MONUMENT FOUND
	MANHOLE	UT	UNDERGROUND GAS MAIN
	CATCH BASIN	UT	UNDERGROUND TELEPHONE
	FLARED END SECTION	OT	OVERHEAD TELEPHONE
	CLEANOUT	UE	UNDERGROUND ELECTRIC
	FIRE HYDRANT	OE	OVERHEAD UTILITY LINES
	WATER VALVE / CURB STOP	FO	UNDERGROUND FIBER OPTIC
	FIRE DEPT. CONNECTION	UTV	UNDERGROUND CABLE T.V.
	POST INDICATOR VALVE	1	PARKING STALLS
	WELL		STORM SEWER LINE
			SANITARY SEWER LINE
			WATER MAIN
		DHDC	DISTRICT HEATING/COOLING

1. BACKGROUND INFORMATION SHOWN PER BOUNDARY SURVEY PERFORMED BY LANDFORM IN JANUARY, FEBRUARY AND MARCH, 2013 EXPRESSLY FOR THIS PROJECT. DUE TO SIGNIFICANT SNOW COVER AND ICE CONDITIONS, THE SURVEYOR DOES NOT GUARANTEE ALL SITE FEATURES WERE LOCATED.

2. THE UTILITIES SERVING THIS PROPERTY HAVE BEEN LOCATED TO THE BEST OF THE SURVEYOR'S ABILITY USING THE SERVICES OF GOPHER STATE ONE CALL, AND AVAILABLE MAPS. NOT ALL SERVICE PROVIDERS RESPONDED TO THE GOPHER STATE ONE CALL REQUEST. THE SURVEYOR DOES NOT GUARANTEE, IN WRITING OR ASSUMED, THAT THE UTILITIES AS SHOWN ARE IN THE EXACT LOCATION. NO EXCAVATION WAS PERFORMED TO LOCATE THE UNDERGROUND UTILITIES.

Lot AA **NOT TO SCALE**

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MINNEAPOLIS, MN 55401
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MINNESOTA CAPITOL COMPLEX PARKING

Saint Paul, Minnesota

SHEET	TITLE
SV01	OVERALL CAPITOL COMPLEX
SV02	PARKING LOT AA
SV03	PARKING LOTS B, C, E
SV04	PARKING LOT D
SV05	PARKING LOTS SW
SV06	PARKING LOT F
SV07	PARKING LOT G
SV08	PARKING LOT GARTH
SV09	PARKING LOT GOUGH

CONTACT ANDREW FOR AMENDMENT HISTORY

DATE	REVISION	REVIEW
JAN 29, 2013	PRELIMINARY SURVEY	SCT
MAR 15, 2013	FINAL DRAFT	SCT

BY: SCT DATE: 3/15/13

IF THE SIGNATURE, SEAL OR FOUR LINES DIRECTLY ABOVE ARE NOT VISIBLE, THEN THIS SHEET HAS BEEN REPRODUCED FROM ELECTRONIC FILES AND SHALL BE CONSIDERED A VALID BOUNDARY. PLEASE CONTACT THE ENGINEER TO REQUEST ADDITIONAL DOCUMENTS.

MARCH 15, 2013

LANDFORM
From Site to Finish
105 South Fifth Avenue Tel: 612-252-9070
Suite 513 Fax: 612-252-9077
Minneapolis, MN 55401 Web: landform.net

FILE NAME cabi-CDG004

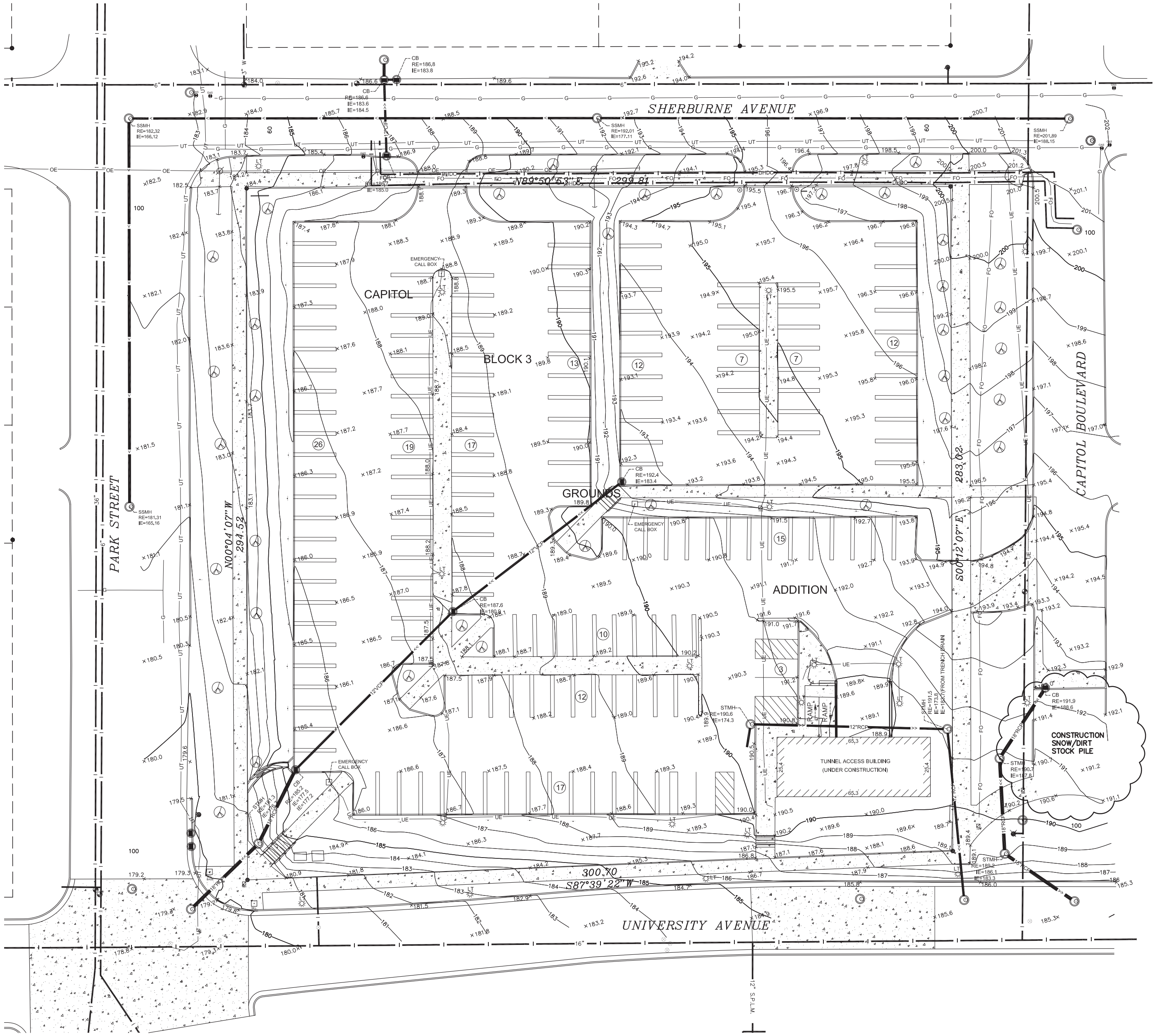
PROJECT NO. CDG12004

SHEET NO. 2/9

811 Know what's Below. Call before you dig.

NORTH

0 20 40



Lot B **NOT TO SCALE**

1. BACKGROUND INFORMATION SHOWN PER BOUNDARY SURVEY PERFORMED BY LANDFORM IN JANUARY, FEBRUARY AND MARCH, 2013 EXPRESSLY FOR THIS PROJECT. DUE TO SIGNIFICANT SNOW COVER AND ICE CONDITIONS, THE SURVEYOR DOES NOT GUARANTEE ALL SITE FEATURES WERE LOCATED.

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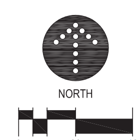
EXISTING	DESCRIPTION
	BUILDING CANOPY / OVERHANG
	CONCRETE SURFACE
	BITUMINOUS SURFACE
	PAVING BLOCK / STAMPED CONCRETE
	RIP RAP
123	CONTOUR
x123.4	SPOT ELEVATION
	CONCRETE CURB
	PEDESTRIAN RAMP
HEIGHT, TYPE	FENCING
	CONCRETE RETAINING WALL
	SHRUB
	TREES
	DENOTES TREE LIMITS
	MANHOLE
	CATCH BASIN
	FLARED END SECTION
	CLEANOUT
	FIRE HYDRANT
	WATER VALVE / CURB STOP
	FIRE DEPT. CONNECTION
	POST INDICATOR VALVE
	WELL
	LIGHT POLE
	GUY WIRE
	POWERPOLE
T	TRANSFORMER
AC	AIR CONDITIONER
	UTILITY BOX (TV, TEL, ELEC)
	HAND-HOLE
EM	ELECTRIC METER
VLT	VAULT
SIG BASE	TRAFFIC BOX
GM	GAS METER
	GAS VALVE
	GUARD POST
	TRAFFIC SIGN
TYPE	IRON MONUMENT FOUND
G	UNDERGROUND GAS MAIN
UT	UNDERGROUND TELEPHONE
OT	OVERHEAD TELEPHONE
UE	UNDERGROUND ELECTRIC
OE	OVERHEAD UTILITY LINES
FO	UNDERGROUND FIBER OPTIC
UTV	UNDERGROUND CABLE T.V.
1	PARKING STALLS
>>	STORM SEWER LINE
>	SANITARY SEWER LINE
	WATER MAIN
DHDC	DISTRICT HEATING/COOLING

Know what's **Below**. **Call** before you dig.



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MINNEAPOLIS, MN 55401
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MINNESOTA CAPITOL COMPLEX PARKING
Saint Paul, Minnesota

SHEET	TITLE
SV01	OVERALL CAPITOL COMPLEX
SV02	PARKING LOT AA
SV03	PARKING LOT C
SV04	PARKING LOT B
SV05	PARKING LOTS U-W
SV06	PARKING LOT F
SV07	PARKING LOT D
SV08	PARKING LOT Q-NORTH
SV09	PARKING LOT Q-SOUTH

CONTACT ENGINEER FOR ANY PRIOR HISTORY

DATE	REVISION	REVIEW
JAN 21, 2013	PRELIMINARY SURVEY	SCT
MAR 15, 2013	FINAL DRAFT	SCT

BY SCT DATE 03/15/13

IF THE SIGNATURE, SEAL OR FOUR LINES DIRECTLY ABOVE ARE NOT VISIBLE, THIS SHEET HAS BEEN REPRODUCED BEYOND INTENDED READABILITY AND IS NO LONGER A VALID DOCUMENT. PLEASE CONTACT THE ENGINEER TO REQUEST ADDITIONAL DOCUMENTS.

MARCH 15, 2013

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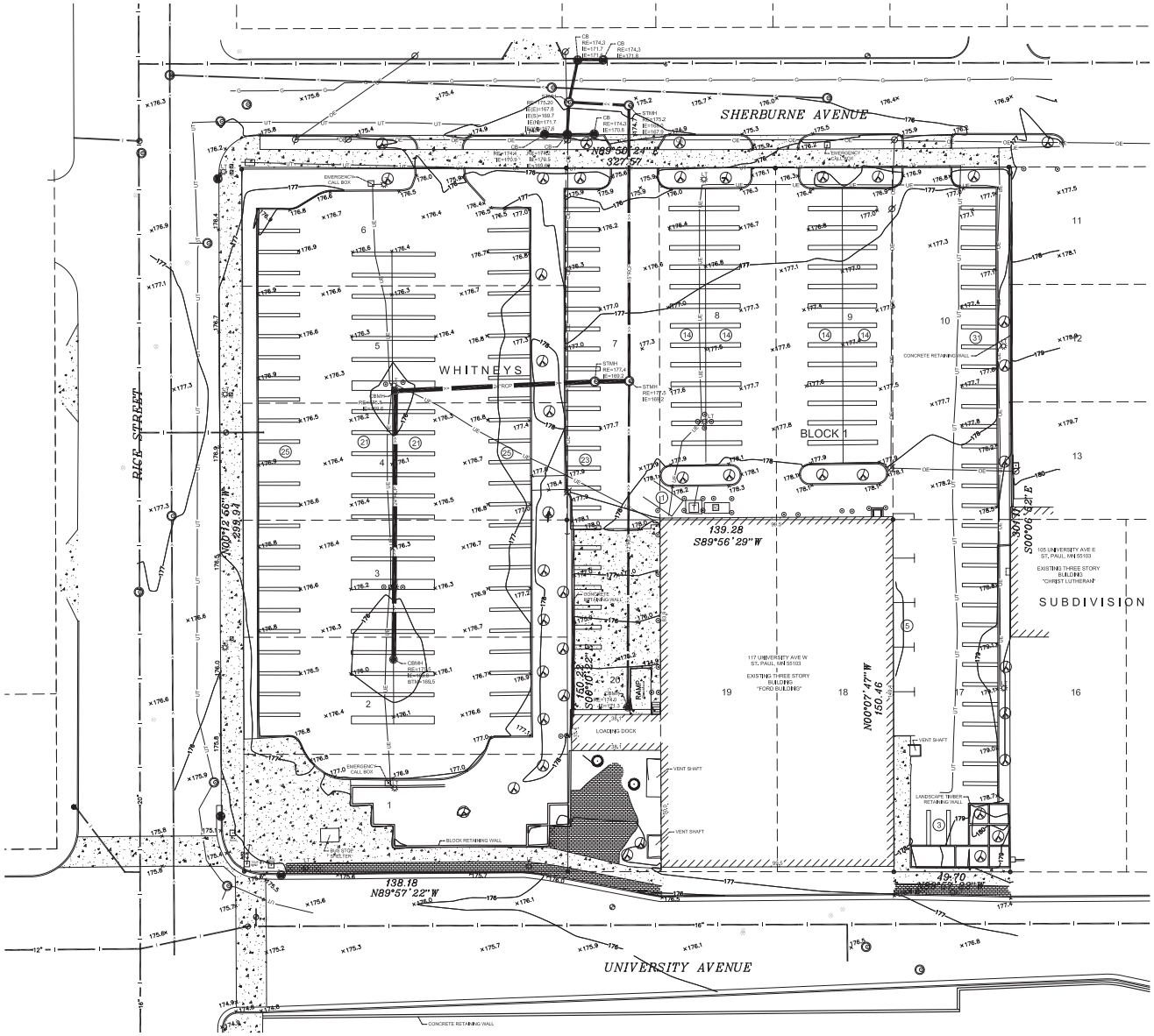
Suite 513
Minneapolis, MN 55401

Tel: 612-252-9070
Fax: 612-252-9077
Web: landform.net

FILE NAME	cebk-CDG004
PROJECT NO.	CDG12004

SHEET NO. 4/9



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EXISTING	DESCRIPTION
	BUILDING CANOPY / OVERHANG
	CONCRETE SURFACE
	BITUMINOUS SURFACE
	PAVING BLOCK / STAMPED CONCRETE
	RIP RAP
729	CONTOUR
x123.4	SPOT ELEVATION
	CONCRETE CURB
	PEDESTRIAN RAMP
	FENCING
	CONCRETE RETAINING WALL
	SHRUB
	TREES
	DENOTES TREE LIMITS
	MANHOLE
	CATCH BASIN
	FLARED END SECTION
	CLEANOUT
	FIRE HYDRANT
	WATER VALVE / CURB STOP
	FIRE DEPT. CONNECTION
	POST INDICATOR VALVE
	WELL
	LIGHT POLE
	GUY WIRE
	POWERPOLE
T	TRANSFORMER
AC	AIR CONDITIONER
	UTILITY BOX (TV, TEL, ELEC)
	HAND-HOLE
ELEC	ELECTRIC METER
VLT	VAULT
TRAFFIC	TRAFFIC BOX
GAS	GAS METER
	GAS VALVE
	GUARD POST
	TRAFFIC SIGN
TYPE	IRON MONUMENT FOUND
G	UNDERGROUND GAS MAIN
UT	UNDERGROUND TELEPHONE
OT	OVERHEAD TELEPHONE
UE	UNDERGROUND ELECTRIC
OE	OVERHEAD UTILITY LINES
FO	UNDERGROUND FIBER OPTIC
UTV	UNDERGROUND CABLE T.V.
1	PARKING STALLS
	STORM SEWER LINE
	SANITARY SEWER LINE
	WATER MAIN
DHDC	DISTRICT HEATING/COOLING

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NORTH

0 20 40

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MINNESOTA CAPITOL COMPLEX PARKING

Saint Paul, Minnesota

SHEET	TITLE
SV01	OVERALL CAPITOL COMPLEX
SV02	PARKING LOT A
SV03	PARKING LOT D
SV04	PARKING LOT B
SV05	PARKING LOTS G-W
SV06	PARKING LOT C
SV07	PARKING LOT D
SV08/PARKING LOT G-NORTH	
SV09	PARKING LOT G-SOUTH

CONTACT LANDFORM FOR ANY PRIOR SURVEY

DATE	ISSUED	REVISED
JAN 31, 2013	PRELIMINARY SURVEY SCT	
MAR 15, 2013	FINAL DRAFT	SCT

BY SCT DATE 3/15/13

IF THIS DRAWING SEAL OR FOUR LINES DIRECTLY ABOVE ARE NOT VISIBLE, THIS SHEET HAS BEEN REPRODUCED BEYOND ORIGINAL INTENT AND IS NOT AN OFFICIAL DOCUMENT. CONTACT THE ENGINEER TO REQUEST ADDITIONAL DOCUMENTS.

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Suite 513 Fax: 612-252-9077
Minneapolis, MN 55401 Web: landform.net

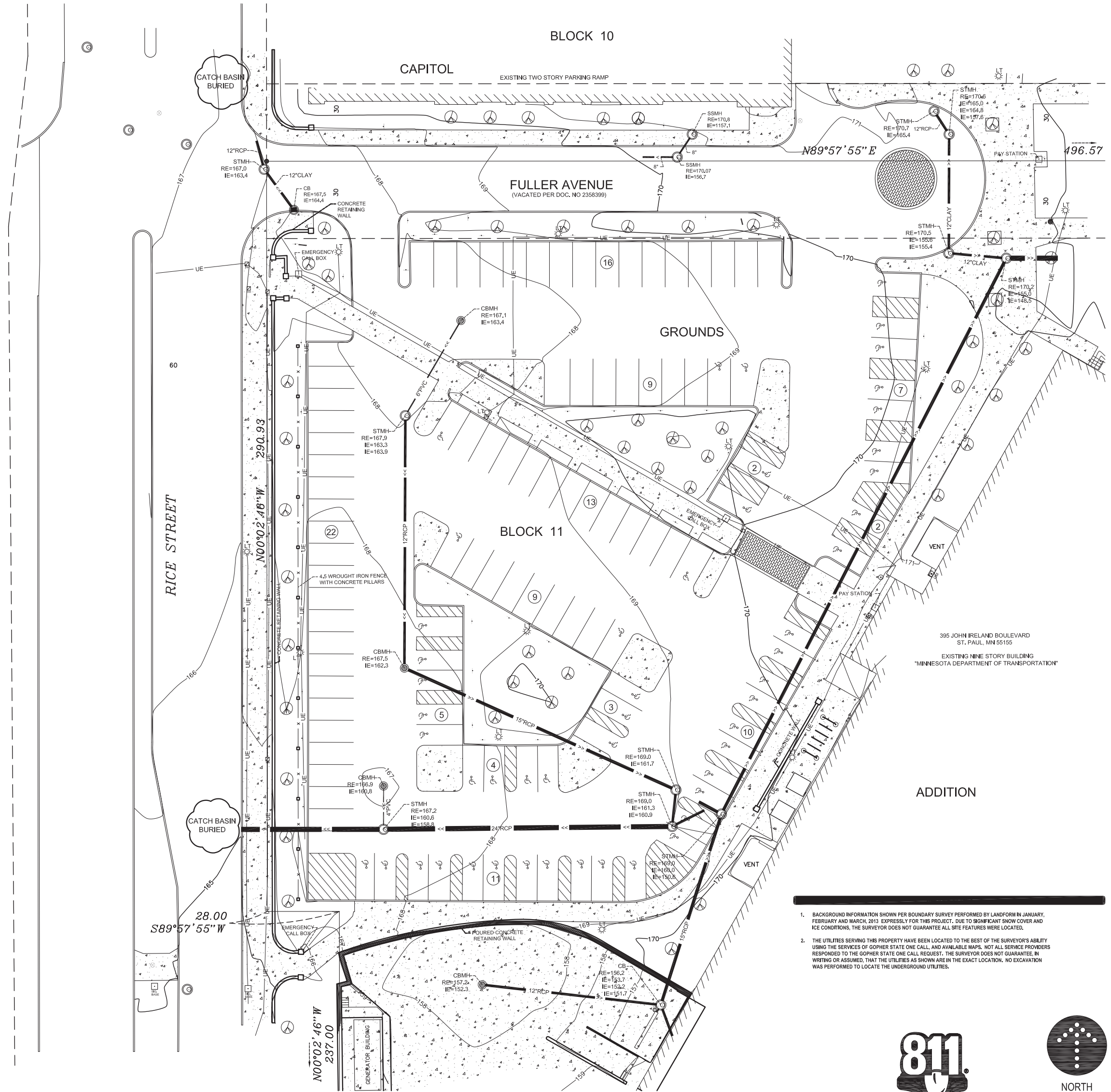
FILE NAME cebk-CDG004

PROJECT NO. CDG12004

SHEET NO. 3/9

Lot C **NOT TO SCALE**

EXISTING	DESCRIPTION	EXISTING	DESCRIPTION
	BUILDING CANOPY / OVERHANG		LIGHT POLE
	CONCRETE SURFACE		GUY WIRE
	BITUMINOUS SURFACE		POWERPOLE
	PAVING BLOCK / STAMPED CONCRETE		TRANSFORMER
	RIP RAP		AIR CONDITIONER
	CONTOUR		UTILITY BOX (TV, TEL, ELEC)
	SPOT ELEVATION		HANDHOLE
	CONCRETE CURB		ELECTRIC METER
	PEDESTRIAN RAMP		VAULT
	FENCING		TRAFFIC BOX
	CONCRETE RETAINING WALL		GAS METER
	SHRUB		GAS VALVE
	TREES		GUARD POST
	DENOTES TREE LIMITS		TRAFFIC SIGN
	MANHOLE		IRON MONUMENT FOUND
	CATCH BASIN		UNDERGROUND GAS MAIN
	FLARED END SECTION		UNDERGROUND TELEPHONE
	CLEANOUT		OVERHEAD TELEPHONE
	FIRE HYDRANT		UNDERGROUND ELECTRIC
	WATER VALVE / CURB STOP		OVERHEAD UTILITY LINES
	FIRE DEPT. CONNECTION		UNDERGROUND FIBER OPTIC
	POST INDICATOR VALVE		UNDERGROUND CABLE T.V.
	WELL		PARKING STALLS
			STORM SEWER LINE
			SANITARY SEWER LINE
			WATER MAIN
			DISTRICT HEATING/COOLING



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MINNESOTA CAPITOL COMPLEX PARKING

Saint Paul, Minnesota

SHEET	TITLE
SV01	OVERALL CAPITOL COMPLEX
SV02	PARKING LOT AA
SV03	PARKING LOT C
SV04	PARKING LOT B
SV05	PARKING LOTS U-W
SV06	PARKING LOT F
SV07	PARKING LOT D
SV08	PARKING LOT Q-NORTH
SV09	PARKING LOT Q-SOUTH

CONTACT ENGINEER FOR ANY PRIOR HISTORY

DATE	REVISION	REVIEW
JAN 21, 2013	PRELIMINARY SURVEY SCT	
MAR 15, 2013	FINAL DRAFT	SCT

BY SCT DATE 03/15/13

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MARCH 15, 2013

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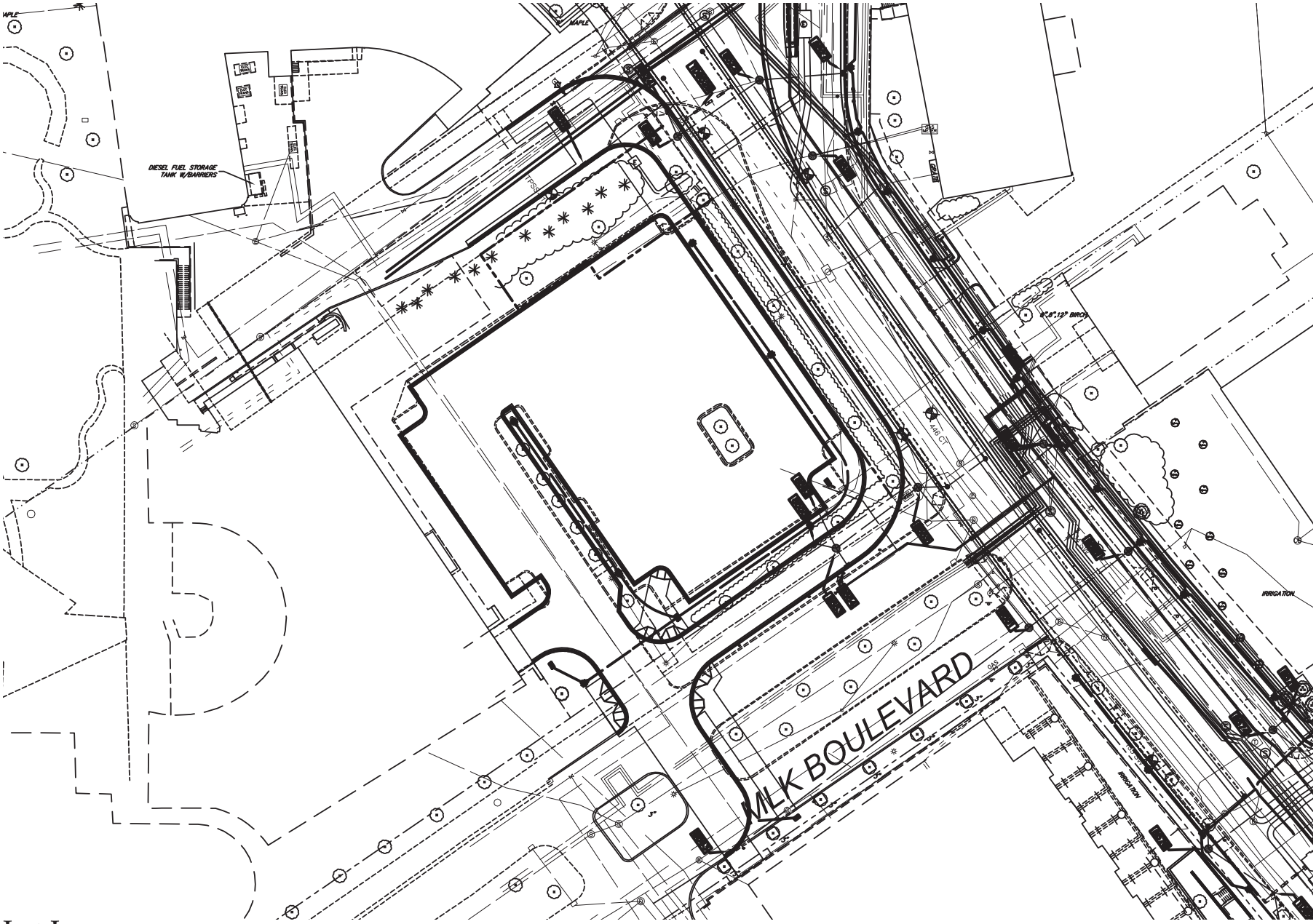
Suite 513
Minneapolis, MN 55401
Tel: 612-252-9070
Fax: 612-252-9077
Web: landform.net

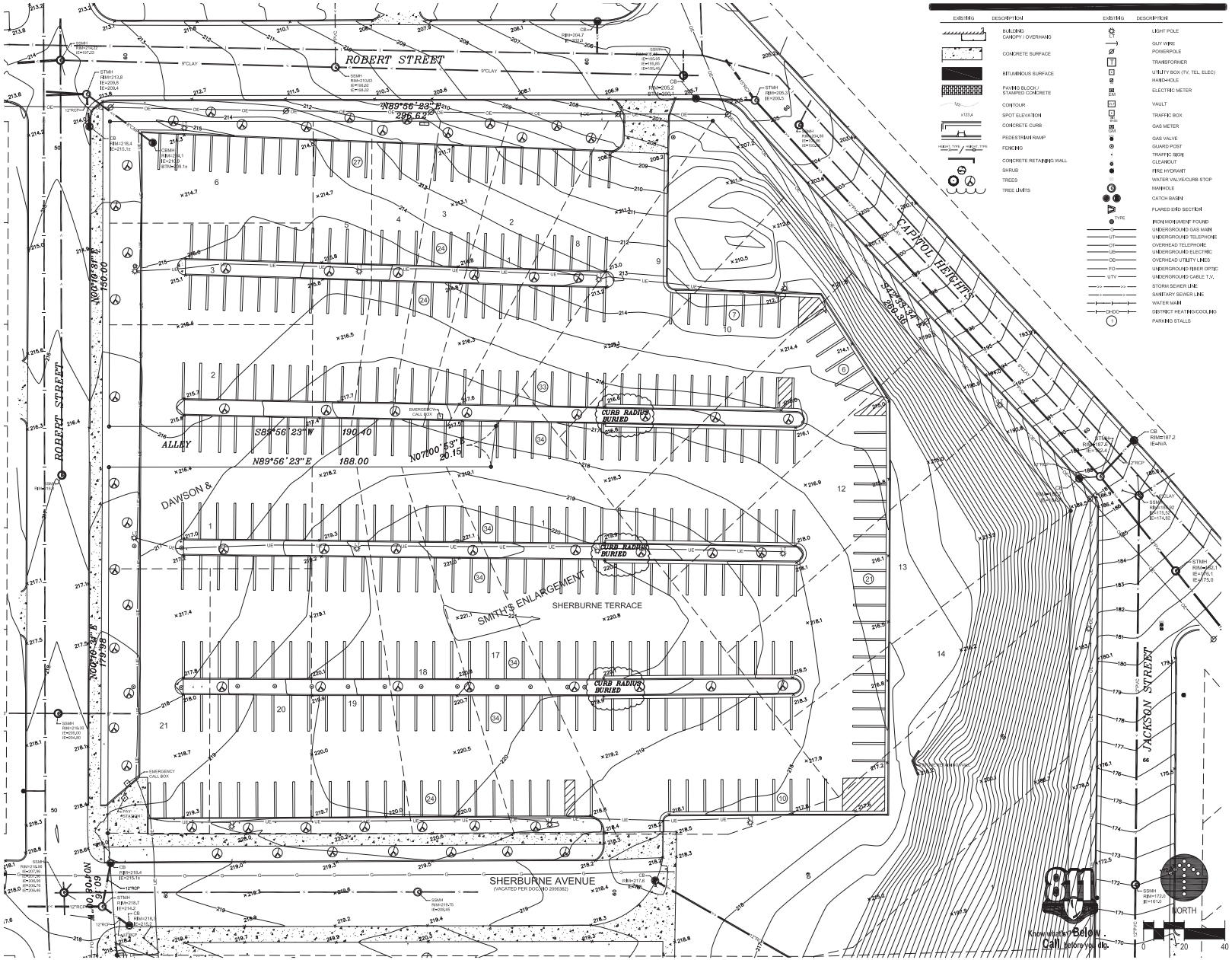
FILE NAME cebl-CDG004

PROJECT NO. CDG12004

Lot F **NOT TO SCALE**



Lot L **NOT TO SCALE**



Lot Q **NOT TO SCALE**

EXISTING	DESCRIPTION	EXISTING	DESCRIPTION
	BUILDING CANOPY / OVERHANG		LIGHT POLE
	CONCRETE SURFACE		GUY WIRE
	BITUMINOUS SURFACE		POWERPOLE
	PAVING BLOCK / STAMPED CONCRETE		TRANSFORMER
	CONTOUR		UTILITY BOX (TV, TEL, ELEC)
	SPOT ELEVATION		HANDHOLE
	CONCRETE CURB		ELECTRIC METER
	PEDESTRIAN RAMP		VAULT
	FENCING		TRAFFIC BOX
	CONCRETE RETAINING WALL		GAS METER
	SHRUB		GAS VALVE
	TREES		GUARD POST
	TREE LIMITS		TRAFFIC SIGN
			CLEANOUT
			FIRE HYDRANT
			WATER VALVE/CURB STOP
			MANHOLE
			CATCH BASIN
			FLARED END SECTION
			IRON MONUMENT FOUND
		UGG	UNDERGROUND GAS MAIN
		UT	UNDERGROUND TELEPHONE
		OT	OVERHEAD TELEPHONE
		UE	UNDERGROUND ELECTRIC
		OE	OVERHEAD UTILITY LINES
		FO	UNDERGROUND FIBER OPTIC
		UTV	UNDERGROUND CABLE T.V.
			STORM SEWER LINE
			SANITARY SEWER LINE
			WATER MAIN
		DHCO	DISTRICT HEATING/COOLING
			PARKING STALLS

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MINNEAPOLIS, MN 55401
TEL (612)332-3084 • FAX (612)332-2023

MINNESOTA CAPITOL COMPLEX PARKING

Saint Paul, Minnesota

SHEET	TITLE
8V01	OVERALL CAPITOL COMPLEX
8V02	PARKING LOT A
8V03	PARKING LOTS B-D,F,G
8V04	PARKING LOT E
8V05	PARKING LOTS I,J,K
8V06	PARKING LOT H
8V07	PARKING LOTS L,M,N,P,Q
8V08	PARKING LOT OVERVIEW
8V09	PARKING LOT DETAILS

CONTACT DESIGNER FOR USE PERMISSIONS

DATE	ISSUANCE	AUTHOR
JULY 5, 2012	PRE-SUPPLY SURVEY	SCT
MAR 15, 2013	FINAL DRAFT	SCT

BY SCT DATE 03/15/13

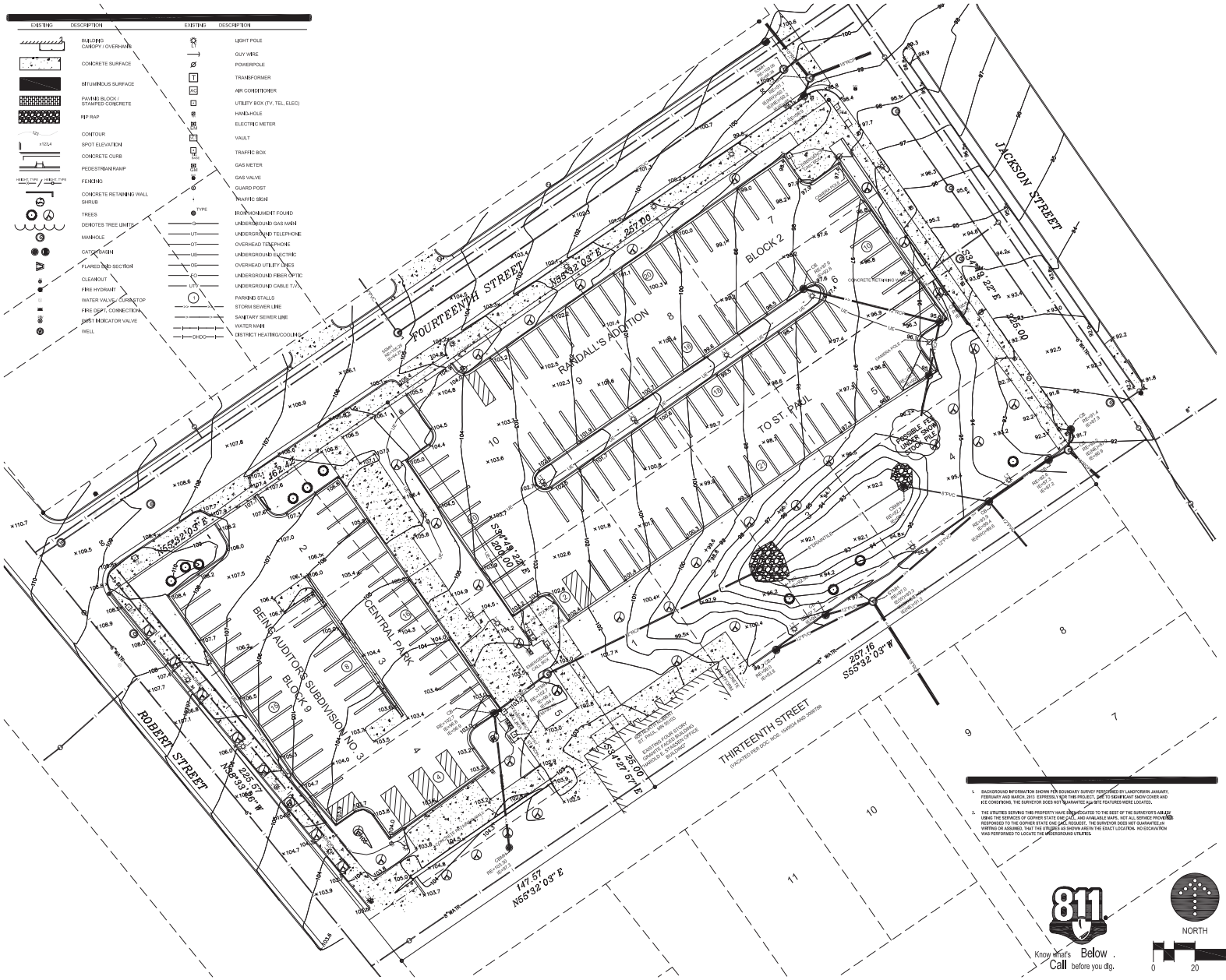
MARCH 15, 2013

LANDFORM
Preserve Alter or Flourish
105 South Fifth Avenue Tel: 612-252-9070
Suite 513 Fax: 612-252-9077
Minneapolis, MN 55401 Web: landform.net

FILE NAME cadd-CDG004

PROJECT NO. CDG12004

SHEET NO. 8/9



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Lots U/W **NOT TO SCALE**

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MINNEAPOLIS, MN 55401
TEL (612)333-3654 • FAX (612)333-3023

MINNESOTA CAPITOL COMPLEX PARKING

Saint Paul, MInnesota

SHEET	TITLE
SV01	OVERALL CAPITOL COMPLEX
SV02	PARCELS LOT U
SV03	PARCELS LOT C
SV04	PARCELS LOT B
SV05	PARCELS LOTS U-W
SV06	PARCELS LOT F
SV07	PARCELS LOT D
SV08	PARCELS LOT W
SV09	PARCELS LOT U-SOUTH

CONTACT PERSON FOR INFORMATION HISTORY

DATE	SUBMITTAL	BY
JAN 31, 2013	PRELIMINARY SURVEY	SCT
MAR 15, 2013	FINAL DRAFT	SCT

BY: SCT DATE: 03/15/13

MARCH 15, 2013

LANDFORM
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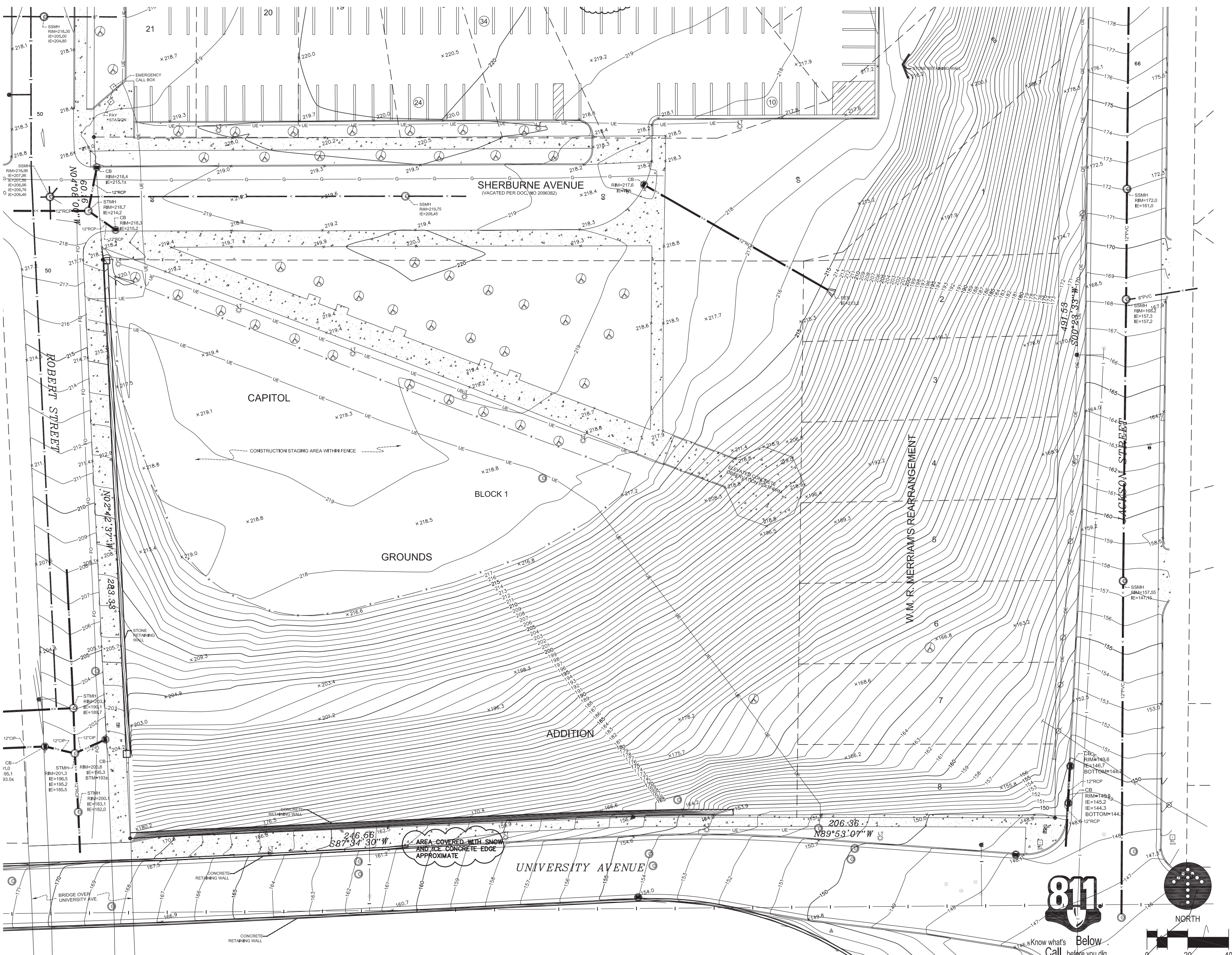
FILE NAME: cebh-CDG004
PROJECT NO.: CDG12004

SHEET NO. 5/9



Cass Gilbert Park **SCALE: 1" = 20'**

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MINNESOTA CAPITOL COMPLEX PARKING

Saint Paul, Minnesota

MARCH 15, 2013

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FILE NAME cebk-CDG004
PROJECT NO. CDG12004

AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
- ENVIRONMENTAL
- GEOTECHNICAL
- MATERIALS
- FORENSICS

REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION AND REVIEW

Proposed Parking Garage – Capital Complex

St. Paul, Minnesota

Report No. 01-05729

Date:

March 8, 2013

Prepared for:

Collaborative Design Group, Inc.
100 Portland Avenue South, Suite 100
Minneapolis, MN 55401

www.amengtest.com

AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
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• FORENSICS

March 8, 2013

Collaborative Design Group, Inc.
100 Portland Avenue South
Suite 100
Minneapolis, MN 55401

Attn: Mr. Bill Hickey

RE: Preliminary Geotechnical Exploration and Review
Proposed Parking Garage – Capital Complex
St. Paul, Minnesota
Report No. 01-05729

Dear Mr. Hickey:

American Engineering Testing, Inc. (AET) is pleased to present the results of our subsurface exploration program and geotechnical engineering review for your proposed parking garage project at the Capital Complex in St. Paul, Minnesota. These services were performed according to our proposal to you dated February 7, 2013.

We are submitting two copies of the report to you, along with a pdf.

Please contact me if you have any questions about the report. I can also be contacted for arranging construction observation and testing services during the earthwork phase.

Sincerely,
American Engineering Testing, Inc.

Steven D. Koenes
Principal Engineer
Phone: (651) 659-1304
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SDK/sm

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Authored by:

Steven D. Koenes, PE
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Reviewed by:

Jay P. Brekke, PE
Project Engineer

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under Minnesota Statute Section 326.02 to 326.15

Date: 3/11/13 **License #:**

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1.0 INTRODUCTION

You are proposing to construct a new parking garage at one of seven possible sites in the Capital Complex in St. Paul, Minnesota. To assist planning and design, you have authorized American Engineering Testing, Inc. (AET) to conduct a preliminary subsurface exploration program at the site, conduct soil laboratory testing, and perform a preliminary geotechnical engineering review for the project. This report presents the results of the above services, and provides our engineering recommendations based on this data.

2.0 SCOPE OF SERVICES

AET's services were performed according to our proposal to you dated February 7, 2013, which you authorized on February 13, 2013. Two additional sites were added and a revised cost was sent to you on February 21, 2013. The authorized scope consists of the following:

- Seven (7) standard penetration test borings to depths of about 51 feet.
- Soil laboratory testing.
- Preliminary geotechnical engineering analysis based on the gained data and preparation of this report.

These services are intended for geotechnical purposes. The scope is not intended to explore for the presence or extent of environmental contamination. These recommendations are preliminary and additional exploration will need to be performed on the selected site to further evaluate site conditions prior to construction.

3.0 PROJECT INFORMATION

We understand the project will include a new parking garage on one of seven sites. We understand the garage will have one level below grade and multiple levels above grade. At this time, we have no information regarding the size and configuration of the proposed garage. We

also have no information regarding building loads, but assume column loads could be on the order of 1,000 kips. We assume the lowest floor elevation will be about 10 feet below existing site grade.

This exploration is preliminary in nature and we understand once a site is selected there will be a more complete geotechnical exploration program performed on that site.

Our foundation design assumptions include a minimum factor of safety of 3 with respect to localized shear or base failure of the foundations. We assume the structure will be able to tolerate total settlements of up to 1 inch, and differential settlements over a 30 foot distance of up to ½ inch.

The above stated information represents our understanding of the proposed construction. This information is an integral part of our engineering review. It is important that you contact us if there are changes from that described so that we can evaluate whether modifications to our recommendations are appropriate.

4.0 SUBSURFACE EXPLORATION AND TESTING

4.1 Field Exploration Program

The subsurface exploration program conducted for the project consisted of seven (7) standard penetration test borings. The logs of the borings and details of the methods used appear in Appendix A. The logs contain information concerning soil layering, soil classification, geologic description, and moisture condition. Relative density or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value).

The boring locations are shown on Figure 1 in Appendix A. The borings were spotted in the field by AET personnel and coordinates of the boring were determined and are included on the logs. Surface elevations were measured in the field by AET personnel using an engineer's level. The benchmark reference was the top nut of hydrant at the southeast corner of University Avenue and Capital Boulevard for Boring 3, the top nut of hydrant about 200 feet east of the intersection of John Ireland and 12th Street for Borings 5 and 6, the top nut of hydrant at Capital Heights and Charles Avenue for Borings 4 and 7, the top nut of hydrant at Park and University Avenue for Boring 2, the top nut of hydrant at 14th Street and Robert Street for Boring 5, and the top nut of hydrant at University Avenue between Rice Street and Park Street for Boring 1. The elevation of these hydrants was taken from the City of St. Paul Survey Department website.

4.2 Laboratory Testing

The laboratory test program included water content and sieve analysis tests. The test results appear in Appendix A on the individual boring logs adjacent to the samples upon which they were performed, or on the data sheets following the logs.

5.0 SITE CONDITIONS

5.1 Surface Observations

All of the proposed garage sites are existing surface parking lots at this time, except the Cass Gilbert site (Boring 4). The surface elevations at the boring locations ranged from 103.4 at Boring 5 to 212.4 at Boring 4.

5.2 Subsurface Soils/Geology

The site geology generally consists of 2 to 21½ feet of fill underlain by alluvial soils and glacial till. Borings 2 and 5 also encountered a layer of swamp deposit generally between the fill and native site soils. Boring 5 also encountered St. Peter Sandstone at a depth of about 43 feet below

grade. Boring 5 had a surface elevation at 103.4 (lowest elevation of all the borings) and was the only boring to encounter bedrock.

5.3 Ground Water

Ground water was present at three of the seven boring locations during drilling. The ground water elevations generally varied from 141.5 feet at Boring 6 to 149.7 feet at Boring 1. Boring 2 encountered two ground water levels. The upper ground water level (which is present within the fill above the swamp deposit) is at a depth of 14.6 feet below grade, elevation 161.3 feet represents a perched ground water level. We encountered an additional ground water level in this boring at a depth of 31 feet below grade, elevation 144.9 feet. At Boring 5, we terminated the boring at a depth of 49.9 feet below grade within the St. Peter Sandstone. No water was present in the boring at the time of the initial drilling. We left the hollow stem auger in the ground overnight and performed a water level recheck in the morning. No water entered the borehole overnight.

Ground water levels fluctuate due to varying seasonal and annual rainfall and snow melt amounts, as well as other factors.

5.4 Review of Soil Properties

5.4.1 Fill

The existing fill is low to high strength material. The fill in several of the borings contain miscellaneous materials such as concrete, bituminous, brick, and clay tile. The N-values recorded in the fill are quite variable suggesting that the fill was likely not placed as engineered fill with the intent of supporting a structure. The fill materials have variable drainage properties with the sand and sand with silt generally being moderate to fast draining and the remaining soil types being moderate to slow draining. The fill soils classified as sand and sand with silt are judged to

have low frost heave potential and the remaining silty/clayey soils are judged to be at least moderately frost susceptible.

5.4.2 Swamp Deposit

The swamp deposit is low strength material and is judged to be significantly compressible under additional fill and structure loads. The swamp deposit is slow draining and is judged to be at least moderately frost susceptible.

5.4.3 Fine Alluvium

The fine alluvial clays are mostly low to moderate strength materials. The fine alluvial silts present in Boring 3 are moderate to high strength materials. The clayey fine alluvial soils are moderate to slow draining and the fine alluvial silts are moderate draining. The fine alluvial clays are at least moderately frost susceptible and the fine alluvial silts are judged to be highly frost susceptible, but are present below a depth of 18 feet and likely not be within the anticipated depth of frost penetration. The fine alluvial fat clay encountered at a depth of about 34 feet below grade in Boring 5 has the potential to shrink and swell with changes in water content. However, at the depth encountered, we do not anticipate significant changes in water content should occur.

5.4.4 Coarse Alluvium

The coarse alluvium is moderate to high strength material and is not judged to be significantly compressible under anticipated structure loads. The coarse alluvial soils are moderate to fast draining. The coarse alluvial sand and sand with silt are not judged to be significantly frost susceptible. The coarse alluvial silty sands are judged to be at least moderately frost susceptible.

5.4.5 St. Peter Sandstone

The St. Peter sandstone is moderate to very high strength material and is not judged to be significantly compressible under anticipated structure loads. Drainage properties of the St. Peter sandstone can be significantly influenced by the amount of fracturing and weathering within the bedrock, but it is generally considered to be moderate to slow draining. The St. Peter sandstone at the depth encountered is significantly below the depth of anticipated frost penetration.

6.0 RECOMMENDATIONS

6.1 Approach Discussion

Generally the most economical means of supporting a proposed a proposed parking garage structure would be on spread footing foundations. Based on the soil conditions encountered, it should be feasible to support the garage structures on spread footing foundations with the exception of Lot C (Boring 2) and Lot U&W (Boring 5). Although it should be feasible to utilize spread footings at the Cass Gilbert lot (Boring 4), there appears to be fill to a depth of 18 feet below grade and a soil correction will be needed for support of the structure unless the lowest floor level is lowered.

At Lot C (Boring 2), there is a swamp deposit layer beneath the fill and soil correction to a depth of 24 feet below grade will be needed. At this boring, there is a perched ground water level within the fill at a depth of 14.6 feet below grade. The presence of this water would make performing the soil correction more difficult. Also, existing buildings are adjacent to this site and the excavation may need to extend down deeper than foundations and floor slabs of the existing buildings. This would require installation of a retention system to enable the soil correction to be performed. Because of this, it may be more economical to support the parking garage at this location on a deep foundation system consisting of driven pile or on soils improved with rammed aggregate piers.

At Lot U&W (Boring 5), the poor soils extended to a depth of 39 feet below grade. Due to the considerable depth of poor soil, it is our judgment a parking garage at this location should be supported on a deep foundation system consisting of driven pile.

The remainder of this report will provide preliminary recommendations for spread footing foundations, driven pile foundation and information on rammed aggregate piers.

6.2 Building Grading

6.2.1 Excavation

To prepare the building areas for foundation and slab support, we recommend complete excavation of the fill, topsoil, swamp deposits and fine alluvial clays. Additional excavation to up to 5 feet below top of slab is also recommended to remove frost susceptible soils in the lower floor slab area unless the garage will be heated. This would result in excavation depths at the boring locations as shown in Table A.

Table A – Recommended Excavation Depths

Boring Location	Surface Elevation (ft.)	Excavation Depth (ft.)	Approximate Bottom of Excavation Elevation (ft.)	Water Elevation (ft.)
1	173.4	10	163	149.7
2	175.9	24	151½	Perched 161.3 Static 144.9
3	189.2	2-6½*	187-182½*	
4	212.4	14-18*	198-194*	
5	103.4	Deep foundation needed		
6	168.6	4	164½	141.5
7	211.6	2	209½	

**The excavation should extend to the greater depth/low elevation if the exposed soils are judged to be fill.*

Note #1: Additional excavation of frost susceptible soils to 5 feet below top of slab is recommended in the lower floor slab area unless the garage will be heated.

The depth/elevation indicated in Table A is based on the soil condition at the specific boring location. Since conditions will vary away from the boring location, it is recommended that AET geotechnical personnel observe and confirm the competency of the soils in the entire excavation bottom prior to new fill or footing placement.

Where the excavation extends below foundation grade, the excavation bottom and resultant engineered fill system must be oversized laterally beyond the planned outside edges of the foundations to properly support the lateral loads exerted by that foundation. This excavation/engineered fill lateral extension should at least be equal to the vertical depth of fill needed to attain foundation grade at that location (i.e., 1:1 lateral oversize).

6.2.2 Fill Placement and Compaction

Fill placed to attain grade for foundation support should be compacted in thin lifts, such that the entire lift achieves a minimum compaction level of 98% of the standard maximum dry unit weight per ASTM:D698 (Standard Proctor test) for foundation loadings up to 4000 psf and 100% for loading of 4001 to 6000 psf. Fill placed which supports the floor slab only (outside of the 1:1 oversize zone below footings) can have a reduced minimum compaction level of 95% of the standard maximum dry unit weight.

Soils placed for fill within the proposed parking garage area for foundation and floor slab support should consist of granular soil containing less than 12% passing the #200 sieve. Fill placed in wet excavations should contain less than 5% passing the #200 sieve and be medium to coarse grained.

If there are areas where fill is placed on slopes, we recommend benching the sloped surface (benches cut parallel to the slope contour) prior to placing the fill. Benching is recommended where slopes are steeper than 4:1 (H: V).

6.3 Foundation Design

6.3.1 Spread Footings

The structure can be supported on conventional spread foundations placed on the new compacted fill or competent coarse alluvial soils at all borings except Boring 5 (Lots U&W) and possibly Boring 2 (Lot C) depending on ramp proximity to existing structures and foundations supporting those structures. We recommend perimeter foundations for heated building space is placed such that the bottom is a minimum of 42 inches below exterior grade. We recommend foundations for unheated building space be extended to a minimum of 60 inches below slab grade.

Based on the conditions encountered, it is our opinion the building foundations can be designed based on a net maximum allowable soil bearing pressure of 3000 to 4000 psf at Boring 1, 4000 to 6000 at Boring 3, 4,500 to 6,000 psf at Boring 6, and 4000 to 5000 psf at Boring 7. At Boring 2 the bearing pressure would be dependent on the level of compaction of the fill. Please note that higher bearing pressures may be possible on this site pending a more complete exploration and additional in-situ testing to evaluate settlement under these higher loads. It is our judgment this design pressure will have a factor of safety of at least 3 against localized shear or base failure. We judge that total settlements under this loading should not exceed 1 inch. We also judge that differential settlements of conditions depicted by the borings should not exceed ½ inch.

6.3.2 Pile Foundation

It is our judgment a parking garage constructed in Lot U&W (Boring 5) should be supported on a pile foundation. The boring encountered St. Peter Sandstone at a depth of about 43 feet below

grade. Heavy wall steel pipe piles or H-piles driven to refusal on the underlying St. Peter Sandstone can generally attain pile capacities in the range of 100 tons to 125 tons per pile. Due to the presence of significant fill and swamp deposits on the site, the pile may also be subject to negative load. This would reduce the amount of structure load that could be carried by each pile. At this time, we anticipate potential negative load/down drag at this site would generally not exceed about 25% of the working load capacity of the pile, based on the limited amount of information available at this time.

Due to the significant amount of fill and compressible soil, both the building structure and lower floor slab should be structurally supported on pile.

To attain pile capacities in the range of 100 to 125 tons per pile, piles should be driven with a hammer having a manufacturer's rated energy in the range of 40,000 to 60,000 foot-pounds.

Installation of driven pile on this site will result in significant amounts of vibration and noise. A preconstruction survey should be performed in adjacent structures prior to the start of construction in addition to base level vibration monitoring prior to the start of construction. We also recommend vibration levels be monitored during the installation of the piles. In the event vibration levels are deemed to be excessive, it will be necessary to modify the driving system to reduce vibration levels

6.3.3 Rammed Aggregate Piers

It is our judgment it should be feasible to support the parking garage structure on rammed aggregate piers at Lot C (Boring 2). The aggregate piers should extend through the existing fill, swamp deposit and fine alluvium to bear within the underlying coarse alluvial soils. A rammed aggregate pier-supported foundation is a specialty foundation and is designed and constructed by

a specialty contractor. A rammed aggregate pier contractor should be provided with the preliminary soils information and building information to judge whether this type of foundation is feasible and economical for the proposed parking garage structures at these two locations. For more information, we recommend you contact Charles Allgood at Ground Improvement Engineering at callgood@groundimprovementeng.com or (763) 416-2136.

Rammed aggregate piers are constructed by augering 24 inch to 36 inch diameter holes to depths extending through the existing fill, swamp deposit and softer fine alluvial soils and backfilling the holes with thin lifts of compacted aggregate. Compaction densifies the aggregate and increases lateral stress in the soil matrix. The system serves to reduce settlement by replacing the compressible soils in the upper part of the borings with a stiffer composite soil matrix. Typically maximum depth of improvement is about 30 feet.

Rammed aggregate pier elements typically cover approximately 30% of the footing footprint area. Ground Improvement Engineering typically recommends a net allowable bearing pressure for shallow spread footings of 5,000 psf or more where rammed aggregate pier elements are used to modify the subsurface conditions. Rammed aggregate pier elements are typically spaced further apart in a grid system to improve floor slab support.

6.4 Floor Slab Design

For concrete slab design, we estimate the coarse alluvial sands and recommend granular fill should provide a Modulus of Subgrade Reaction (k-value) of at least 240 pci.

For recommendations pertaining to moisture and vapor protection of interior floor slabs, we refer you to the attached standard sheet entitled "Floor Slab Moisture/Vapor Protection."

Where pile are driven for support of the structure, the floor slab should also be supported on pile. If rammed aggregate pier are installed for support of structure, the floor slab should also be supported on rammed aggregate piers.

6.5 Basement Backfilling/Water Control

Our recommendations for backfilling the basement walls and other retaining walls (if there are any) appear on the attached standard sheet entitled "Basement/Retaining Wall Backfill and Water Control." To avoid water intrusion issues into the below grade level, it will be very important that these details be incorporated into the design, and that construction monitoring be performed to assure that proper materials and construction is implemented.

6.6 Exterior Building Backfilling

Many of the on-site soils are at least moderately frost susceptible. Because of this, certain design considerations are needed to mitigate these frost effects. For details, we refer you to the attached sheet entitled "Freezing Weather Effects on Building Construction."

6.7 Pavements

6.7.1 Subgrade Preparation

Since the majority of these sites are currently paved bituminous areas, we do not anticipate significant additional improvement in pavement subgrade areas will be needed. Preparation of pavement subgrade areas outside of the proposed parking garages should include removal of any surface vegetation, bituminous pavement and topsoil from below all new bituminous-paved areas. Softer clays in the upper 3 foot of the pavement subgrade should also be removed. After stripping these soils, the exposed soils should be scarified to a depth of about 12 inches, moisture conditioned and then recompacted to a minimum of 100% of Standard Proctor maximum dry density.

After moisture conditioning/compaction and before additional fill is placed to final grades, the subgrade should be test rolled to delineate any areas of soft or unstable soils. If softer unstable soils are found in the upper 3 foot of subgrade, they should either be subcut and replaced with drier fill or aerated, dried and recompacted back into place if weather conditions permit. Additional fill should then be placed and compacted to reestablished final pavement subgrade elevations.

We recommend all fill placed within the top 3 feet of pavement subgrade be compacted to a minimum of 100% of Standard Proctor maximum dry density. If fill is required below the top 3 feet, it should be compacted to at least 95%. Some of the on-site silty/clayey soils may be used as fill for the pavement subgrade. If they are used, it is critical that they are placed and compacted at a proper moisture condition to achieve a stable subgrade. Silty and clayey soils should be placed and compacted at moisture contents at or below their optimum moisture contents, as determined by their Standard Proctor. Read the standard data sheet "Bituminous Pavement Subgrade Preparation and Design" for general information on pavement stability and design. For better performance, we recommend a minimum 12 inch sand subbase in the pavement design.

6.8 Infiltration Properties

We understand a infiltration practice may be utilized in conjunction with a new parking garage. At this time, we are not aware of the type of practice but have assumed that it may be a practice installed below the lowest level of the parking ramp and we have also assumed that there may be pervious pavements utilized around the exterior of the ramp. To better evaluate infiltration properties of some of the soils in these areas, we have performed a few sieve analysis tests to aid in classifying the soil types and determining their infiltration properties. The natural soils shown on the soil boring logs are classified per the Unified Soil Classification System. We recommend you utilize infiltration rates presented in Table 12.INF.7 (Design Infiltration Rates) of the

Minnesota Storm Water Manual to estimate infiltration rates for soils encountered at this site. In general, the coarse alluvial soils present at these sites are the fastest draining materials present. Considerable thickness of coarse alluvial soils are present at many of the site locations, possible exceptions would be in the area of Borings 2, 3 and 5, where slower draining materials are present below anticipated lower slab elevation.

Determining infiltration properties of surface fill materials is much more difficult because of the more variable nature of the fill soils encountered. In general, soils classified as sand and sand with silt have more preferable infiltration properties whereas silty sands and clayey soils have poorer infiltration properties.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Potential Difficulties

7.1.1 Runoff Water in Excavation

Water can be expected to collect in the excavation bottom at Boring 2 and possibly other boring locations during times of inclement weather or snow melt. To allow observation of the excavation bottom, to reduce the potential for soil disturbance, and to facilitate filling operations, we recommend water be removed from within the excavation during construction. Based on the soils encountered, we anticipate the ground water can be handled with conventional sump pumping.

7.1.2 Disturbance of Soils

The on-site silty/clayey soils can become disturbed under construction traffic, especially if the soils are wet. If soils become disturbed, they should be subcut to the underlying undisturbed soils. The subcut soils can then be dried and recompacted back into place, or they should be removed and replaced with drier imported fill.

7.1.3 Cobbles and Boulders

The soils at this site can include cobbles and boulders. This may make excavating procedures somewhat more difficult than normal if they are encountered.

7.2 Excavation Backsloping

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce sideslope erosion or running which could require slope maintenance.

7.3 Observation and Testing

The recommendations in this report are based on the subsurface conditions found at our test boring locations. Since the soil conditions can be expected to vary away from the soil boring locations, we recommend on-site observation by a geotechnical engineer/technician during construction to evaluate these potential changes. Soil density testing should also be performed on new fill placed in order to document that project specifications for compaction have been satisfied.

The intent of this preliminary exploration program was to provide general soil information at seven proposed parking garage sites and very preliminary foundation design information. We understand an additional exploration program will be performed at the site chosen for construction of the new parking ramp. The final exploration program will be much more complete and should be utilized for design and construction of the parking ramp project.

8.0 LIMITATIONS

Within the limitations of scope, budget, and schedule, our services have been conducted according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, either expressed or implied, is intended.

Important information regarding risk management and proper use of this report is given in Appendix B entitled "Geotechnical Report Limitations and Guidelines for Use".

FLOOR SLAB MOISTURE/VAPOR PROTECTION

Floor slab design relative to moisture/vapor protection should consider the type and location of two elements, a granular layer and a vapor membrane (vapor retarder, water resistant barrier or vapor barrier). In the following sections, the pros and cons of the possible options regarding these elements will be presented, such that you and your specifier can make an engineering decision based on the benefits and costs of the choices.

GRANULAR LAYER

In American Concrete Institute (ACI) 302.1R-04, a "base material" is recommended over the vapor membrane, rather than the conventional clean "sand cushion" material. The base layer should be a minimum of 4 inches (100 mm) thick, trimmable, compactable, granular fill (not sand), a so-called crusher-run material. Usually graded from 1½ inches to 2 inches (38 to 50 mm) down to rock dust is suitable. Following compaction, the surface can be choked off with a fine-grade material. We refer you to ACI 302.1R-04 for additional details regarding the requirements for the base material.

In cases where potential static water levels or significant perched water sources appear near or above the floor slab, an under floor drainage system may be needed wherein a draintile system is placed within a thicker clean sand or gravel layer. Such a system should be properly engineered depending on subgrade soil types and rate/head of water inflow.

VAPOR MEMBRANE

The need for a vapor membrane depends on whether the floor slab will have a vapor sensitive covering, will have vapor sensitive items stored on the slab, or if the space above the slab will be a humidity controlled area. If the project does not have this vapor sensitivity or moisture control need, placement of a vapor membrane may not be necessary. Your decision will then relate to whether to use the ACI base material or a conventional sand cushion layer. However, if any of the above sensitivity issues apply, placement of a vapor membrane is recommended. Some floor covering systems (adhesives and flooring materials) require installation of a vapor membrane to limit the slab moisture content as a condition of their warranty.

VAPOR MEMBRANE/GRANULAR LAYER PLACEMENT

A number of issues should be considered when deciding whether to place the vapor membrane above or below the granular layer. The benefits of placing the slab on a granular layer, with the vapor membrane placed **below** the granular layer, include **reduction** of the following:

- Slab curling during the curing and drying process.
- Time of bleeding, which allows for quicker finishing.
- Vapor membrane puncturing.
- Surface blistering or delamination caused by an extended bleeding period.
- Cracking caused by plastic or drying shrinkage.

The benefits of placing the vapor membrane over the granular layer include the following:

- A lower moisture emission rate is achieved faster.
- Eliminates a potential water reservoir within the granular layer above the membrane.
- Provides a "slip surface", thereby reducing slab restraint and the associated random cracking.

If a membrane is to be used in conjunction with a granular layer, the approach recommended depends on slab usage and the construction schedule. The vapor membrane should be placed above the granular layer when:

- Vapor sensitive floor covering systems are used or vapor sensitive items will be directly placed on the slab.
- The area will be humidity controlled, but the slab will be placed before the building is enclosed and sealed from rain.
- Required by a floor covering manufacturer's system warranty.

The vapor membrane should be placed below the granular layer when:

- Used in humidity controlled areas (without vapor sensitive coverings/stored items), with the roof membrane in place, and the building enclosed to the point where precipitation will not intrude into the slab area. Consideration should be given to slight sloping of the membrane to edges where draintile or other disposal methods can alleviate potential water sources, such as pipe or roof leaks, foundation wall damp proofing failure, fire sprinkler system activation, etc.

There may be cases where membrane placement may have a detrimental effect on the subgrade support system (e.g., expansive soils). In these cases, your decision will need to weigh the cost of subgrade options and the performance risks.

BASEMENT/RETAINING WALL BACKFILL AND WATER CONTROL

DRAINAGE

Below grade basements should include a perimeter backfill drainage system on the exterior side of the wall. The exception may be where basements lie within free draining sands where water will not perch in the backfill. Drainage systems should consist of perforated or slotted PVC drainage pipes located at the bottom of the backfill trench, lower than the interior floor grade. The drain pipe should be surrounded by properly graded filter rock. A filter fabric should then envelope the filter rock. The drain pipe should be connected to a suitable means of disposal, such as a sump basket or a gravity outfall. A storm sewer gravity outfall would be preferred over exterior daylighting, as the latter may freeze during winter. For non-building, exterior retaining walls, weep holes at the base of the wall can be substituted for a drain pipe.

BACKFILLING

Prior to backfilling, damp/water proofing should be applied on perimeter basement walls. The backfill materials placed against basement walls will exert lateral loadings. To reduce this loading by allowing for drainage, we recommend using free draining sands for backfill. The zone of sand backfill should extend outward from the wall at least 2', and then upward and outward from the wall at a 30° or greater angle from vertical. As a minimum, the sands should contain no greater than 12% by weight passing the #200 sieve, which would include (SP) and (SP-SM) soils. The sand backfill should be placed in lifts and compacted with portable compaction equipment. This compaction should be to the specified levels if slabs or pavements are placed above. Where slab/pavements are not above, we recommend capping the sand backfill with a layer of clayey soil to minimize surface water infiltration. Positive surface drainage away from the building should also be maintained. If surface capping or positive surface drainage cannot be maintained, then the trench should be filled with more permeable soils, such as the Fine Filter or Coarse Filter Aggregates defined in Mn/DOT Specification 3149. You should recognize that if the backfill soils are not properly compacted, settlements may occur which may affect surface drainage away from the building.

Backfilling with silty or clayey soil is possible but not preferred. These soils can build-up water which increases lateral pressures and results in wet wall conditions and possible water infiltration into the basement. If you elect to place silty or clayey soils as backfill, we recommend you place a prefabricated drainage composite against the wall which is hydraulically connected to a drainage pipe at the base of the backfill trench. High plasticity clays should be avoided as backfill due to their swelling potential.

LATERAL PRESSURES

Lateral earth pressures on below grade walls vary, depending on backfill soil classification, backfill compaction and slope of the backfill surface. Static or dynamic surcharge loads near the wall will also increase lateral wall pressure. For design, we recommend the following ultimate lateral earth pressure values (given in equivalent fluid pressure values) for a drained soil compacted to 95% of the Standard Proctor density and a level ground surface.

	Equivalent Fluid Density	
Soil Type	Active (pcf)	At-Rest (pcf)
Sands (SP or SP-SM)	35	50
Silty Sands (SM)	45	65
Fine Grained Soils (SC, CL or ML)	70	90

Basement walls are normally restrained at the top which restricts movement. In this case, the design lateral pressures should be the "at-rest" pressure situation. Retaining walls which are free to rotate or deflect should be designed using the active case. Lateral earth pressures will be significantly higher than that shown if the backfill soils are not drained and become saturated.

FREEZING WEATHER EFFECTS ON BUILDING CONSTRUCTION

GENERAL

Because water expands upon freezing and soils contain water, soils which are allowed to freeze will heave and lose density. Upon thawing, these soils will not regain their original strength and density. The extent of heave and density/strength loss depends on the soil type and moisture condition. Heave is greater in soils with higher percentages of fines (silts/clays). High silt content soils are most susceptible, due to their high capillary rise potential which can create ice lenses. Fine grained soils generally heave about 1/4" to 3/8" for each foot of frost penetration. This can translate to 1" to 2" of total frost heave. This total amount can be significantly greater if ice lensing occurs.

DESIGN CONSIDERATIONS

Clayey and silty soils can be used as perimeter backfill, although the effect of their poor drainage and frost properties should be considered. Basement areas will have special drainage and lateral load requirements which are not discussed here. Frost heave may be critical in doorway areas. Stoops or sidewalks adjacent to doorways could be designed as structural slabs supported on frost footings with void spaces below. With this design, movements may then occur between the structural slab and the adjacent on-grade slabs. Non-frost susceptible sands (with less than 12% passing a #200 sieve) can be used below such areas. Depending on the function of surrounding areas, the sand layer may need a thickness transition away from the area where movement is critical. With sand placement over slower draining soils, subsurface drainage would be needed for the sand layer. High density extruded insulation could be used within the sand to reduce frost penetration, thereby reducing the sand thickness needed. We caution that insulation placed near the surface can increase the potential for ice glazing of the surface.

The possible effects of adfreezing should be considered if clayey or silty soils are used as backfill. Adfreezing occurs when backfill adheres to rough surfaced foundation walls and lifts the wall as it freezes and heaves. This occurrence is most common with masonry block walls, unheated or poorly heated building situations and clay backfill. The potential is also increased where backfill soils are poorly compacted and become saturated. The risk of adfreezing can be decreased by placing a low friction separating layer between the wall and backfill.

Adfreezing can occur on exterior piers (such as deck, fence, or other similar pier footings), even if a smooth surface is provided. This is more likely in poor drainage situations where soils become saturated. Additional footing embedment and/or widened footings below the frost zones (which include tensile reinforcement) can be used to resist uplift forces. Specific designs would require individual analysis.

CONSTRUCTION CONSIDERATIONS

Foundations, slabs and other improvements which may be affected by frost movements should be insulated from frost penetration during freezing weather. If filling takes place during freezing weather, all frozen soils, snow and ice should be stripped from areas to be filled prior to new fill placement. The new fill should not be allowed to freeze during transit, placement or compaction. This should be considered in the project scheduling, budgeting and quantity estimating. It is usually beneficial to perform cold weather earthwork operations in small areas where grade can be attained quickly rather than working larger areas where a greater amount of frost stripping may be needed. If slab subgrade areas freeze, we recommend the subgrade be thawed prior to floor slab placement. The frost action may also require reworking and recompaction of the thawed subgrade.

DEFINITIONS RELATING TO PAVEMENT CONSTRUCTION

Top of subgrade: Grade which contacts the bottom of the aggregate base layer.

Sand subbase: Uniform thickness sand layer placed as the top of subgrade which is intended to improve the frost and drainage characteristics of the pavement system by increasing drainage of excess water in the aggregate base and subbase, by reducing and "bridging" frost heaving, and by reducing spring thaw weakening effects.

Critical subgrade zone: The subgrade portion beneath and within three vertical feet of the top of subgrade. A sand subbase, if placed, would be considered the upper portion of the critical subgrade zone.

Suitable Grading Material: Mineral soil materials, typically from the project site, excluding the following: 1) soils which have an organic content exceeding 3%, 2) cohesive soils having a Liquid Limit exceeding 50%, 3) soils which include debris, cobbles, and/or boulders, and 4) soils which are considered acceptable from an environmental standpoint. The soil must also be capable of attaining the specified compaction level at its current water content or at a water content that can be reasonably scarified, blended, and moisture conditioned to a uniform water content in order to uniformly meet compaction requirements.

Granular Material: Soils meeting Mn/DOT Specification 3149.2B1. This refers to granular soils which, of the portion passing the 1" sieve, contain less than 20% by weight passing the #200 sieve.

Select Granular Material: Soils meeting Mn/DOT Specification 3149.2B2. This refers to granular soils which, of the portion passing the 1" sieve, contain less than 12% by weight passing the #200 sieve.

Modified Select Granular Material: Clean, medium grained sands which, of the portion passing the 1" sieve, contain less than 5% by weight passing the #200 sieve and less than 40% by weight passing the #40 sieve.

Compaction Subcut: Construction of a uniform thickness subcut below a designated grade to provide uniformity and compaction within the subcut zone. Replacement fill can be the materials subcut, although the reused soils should be blended to a uniform soil condition and re-compacted per the Specified Density Method (Mn/DOT Specification 2105.3F1).

Test Roll: A means of evaluating the near-surface stability of subgrade soils (usually non-granular). Suitability is determined by the depth of rutting or deflection caused by passage of heavy rubber-tired construction equipment, such as a loaded dump truck, over the test area. Yielding of less than 1" is normally considered acceptable, although engineering judgment may be applied depending on the equipment used, soil conditions present, and/or depth below final grade.

Unstable Soils: Subgrade soils which do not pass a test roll. Unstable soils typically have water content exceeding the *standard optimum water content* defined in ASTM:D698 (Standard Proctor test).

Organic Soils: Soils which have sufficient organic content such that the soils engineering properties are negatively affected (typically more than 3% organic content). These soils are usually black to dark brown in color.

Appendix A

Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Figure 1 – Boring Locations
Subsurface Boring Logs
Sieve Analysis Tests

A.1 FIELD EXPLORATION

The subsurface conditions at the site were explored by drilling and sampling seven (7) standard penetration test borings. The locations of the borings appear on Figure 1, preceding the Subsurface Boring Logs in this appendix.

A.2 SAMPLING METHODS

A.2.1 Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2-inch O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30 inches. The sampler is driven a total of 18 inches into the soil. After an initial set of 6 inches, the number of hammer blows to drive the sampler the final 12 inches is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

The most recent drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30 inches. The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviation of the N-values using this method is significantly better than the standard ASTM Method.

A.2.2 Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

A.2.3 Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

Determining the thickness of "topsoil" layers is usually limited, due to variations in topsoil definition, sample recovery, and other factors. Visual-manual description often relies on color for determination, and transitioning changes can account for significant variation in thickness judgment. Accordingly, the topsoil thickness presented on the logs should not be the sole basis for calculating topsoil stripping depths and volumes. If more accurate information is needed relating to thickness and topsoil quality definition, alternate methods of sample retrieval and testing should be employed.

A.3 CLASSIFICATION METHODS

Soil descriptions shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil descriptions shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

Visual-manual judgment of the AASHTO Soil Group is also noted as a part of the soil description. A chart presenting details of the AASHTO Soil Classification System is also attached.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

A.4 WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

A.5 LABORATORY TEST METHODS

A.5.1 Water Content Tests
Conducted per AET Procedure 01-LAB-010, which is performed in general accordance with ASTM: D2216 and AASHTO: T265.

A.5.2 Atterberg Limits Tests
Conducted per AET Procedure 01-LAB-030, which is performed in general accordance with ASTM: D4318 and AASHTO: T89, T90.

A.5.3 Sieve Analysis of Soils (thru #200 Sieve)
Conducted per AET Procedure 01-LAB-040, which is performed in general conformance with ASTM: D6913, Method A.

A.5.4 Particle Size Analysis of Soils (with hydrometer)
Conducted per AET Procedure 01-LAB-050, which is performed in general accordance with ASTM: D422 and AASHTO: T88.

A.5.5 Unconfined Compressive Strength of Cohesive Soil
Conducted per AET Procedure 01-LAB-080, which is performed in general accordance with ASTM: D2166 and AASHTO: T208.

A.5.6 Laboratory Soil Resistivity using the Wenner Four-Electrode Method
Conducted per AET Procedure 01-LAB-090, which is performed using Soil Box apparatus in the laboratory in general accordance with ASTM: G57

A.6 TEST STANDARD LIMITATIONS

Field and laboratory testing is done in general conformance with the described procedures. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

A.7 SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

BORING LOG NOTES

DRILLING AND SAMPLING SYMBOLS

Symbol	Definition
AR:	Sample of material obtained from cuttings blown out the top of the borehole during air rotary procedure.
B, H, N:	Size of flush-joint casing
CAS:	Pipe casing, number indicates nominal diameter in inches
COT:	Clean-out tube
DC:	Drive casing; number indicates diameter in inches
DM:	Drilling mud or bentonite slurry
DR:	Driller (initials)
DS:	Disturbed sample from auger flights
DP:	Direct push drilling; a 2.125 inch OD outer casing with an inner 1½ inch ID plastic tube is driven continuously into the ground.
FA:	Flight auger; number indicates outside diameter in inches
HA:	Hand auger; number indicates outside diameter
HSA:	Hollow stem auger; number indicates inside diameter in inches
LG:	Field logger (initials)
MC:	Column used to describe moisture condition of samples and for the ground water level symbols
N (BPF):	Standard penetration resistance (N-value) in blows per foot (see notes)
NQ:	NQ wireline core barrel
PQ:	PQ wireline core barrel
RDA:	Rotary drilling with compressed air and roller or drag bit.
RDF:	Rotary drilling with drilling fluid and roller or drag bit
REC:	In split-spoon (see notes), direct push and thin-walled tube sampling, the recovered length (in inches) of sample. In rock coring, the length of core recovered (expressed as percent of the total core run). Zero indicates no sample recovered.
SS:	Standard split-spoon sampler (steel; 1.5" is inside diameter; 2" outside diameter); unless indicated otherwise
SU	Spin-up sample from hollow stem auger
TW:	Thin-walled tube; number indicates inside diameter in inches
WASH:	Sample of material obtained by screening returning rotary drilling fluid or by which has collected inside the borehole after "falling" through drilling fluid
WH:	Sampler advanced by static weight of drill rod and hammer
WR:	Sampler advanced by static weight of drill rod
94mm:	94 millimeter wireline core barrel
▼:	Water level directly measured in boring
▽:	Estimated water level based solely on sample appearance

TEST SYMBOLS

Symbol	Definition
CONS:	One-dimensional consolidation test
DEN:	Dry density, pcf
DST:	Direct shear test
E:	Pressuremeter Modulus, tsf
HYD:	Hydrometer analysis
LL:	Liquid Limit, %
LP:	Pressuremeter Limit Pressure, tsf
OC:	Organic Content, %
PERM:	Coefficient of permeability (K) test; F - Field; L - Laboratory
PL:	Plastic Limit, %
q_p:	Pocket Penetrometer strength, tsf (approximate)
q_c:	Static cone bearing pressure, tsf
q_u:	Unconfined compressive strength, psf
R:	Electrical Resistivity, ohm-cms
RQD:	Rock Quality Designation of Rock Core, in percent (aggregate length of core pieces 4" or more in length as a percent of total core run)
SA:	Sieve analysis
TRX:	Triaxial compression test
VSR:	Vane shear strength, remolded (field), psf
VSU:	Vane shear strength, undisturbed (field), psf
WC:	Water content, as percent of dry weight
%-200:	Percent of material finer than #200 sieve

STANDARD PENETRATION TEST NOTES

(Calibrated Hammer Weight)

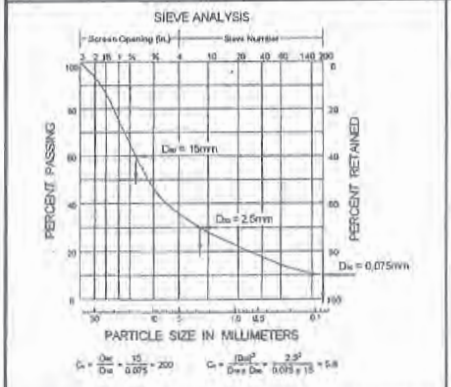
The standard penetration test consists of driving a split-spoon sampler with a drop hammer (calibrated weight varies to provide N_{60} values) and counting the number of blows applied in each of three 6" increments of penetration. If the sampler is driven less than 18" (usually in highly resistant material), permitted in ASTM: D1586, the blows for each complete 6" increment and for each partial increment is on the boring log. For partial increments, the number of blows is shown to the nearest 0.1' below the slash.

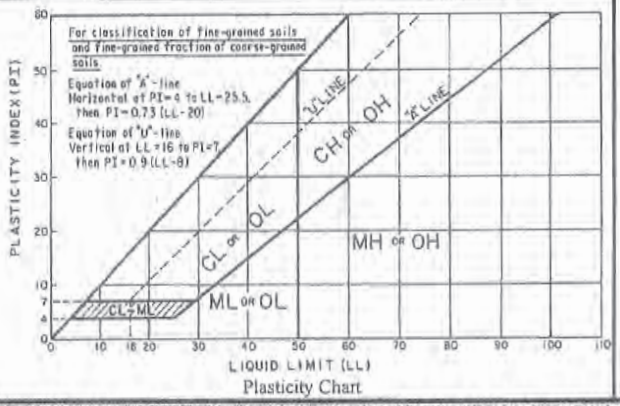
The length of sample recovered, as shown on the "REC" column, may be greater than the distance indicated in the N column. The disparity is because the N-value is recorded below the initial 6" set (unless partial penetration defined in ASTM: D1586 is encountered) whereas the length of sample recovered is for the entire sampler drive (which may even extend more than 18").

UNIFIED SOIL CLASSIFICATION SYSTEM
ASTM Designations: D 2487, D2488

AMERICAN ENGINEERING TESTING, INC.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]	GW	Well graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines more than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]	SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3$[E]	SP	Poorly-graded sand[I]
		Sands with Fines more than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve (see Plasticity Chart below)	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI<4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried < 0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried < 0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soil			Primarily organic matter, dark in color, and organic in odor	PT	Peat[R]





Plasticity Chart

Notes

[A] Based on the material passing the 3-in (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D] Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$, $Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot is hatched area, soils is a CL-ML silty clay.

[K] If soil contains 15 to 29% plus No. 200 add "with sand" or "with gravel", whichever is predominant.

[L] If soil contains ≥30% plus No. 200, predominantly sand, add "sandy" to group name.

[M] If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI≥4 and plots on or above "A" line.

[O] PI<4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.

[R] Fiber Content description shown below.

ADDITIONAL TERMINOLOGY NOTES USED BY AET FOR SOIL IDENTIFICATION AND DESCRIPTION

Grain Size

Term	Particle Size
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	#4 sieve to 3"
Sand	#200 to #4 sieve
Fines (silt & clay)	Pass #200 sieve

Gravel Percentages

Term	Percent
A Little Gravel	3% - 14%
With Gravel	15% - 29%
Gravelly	30% - 50%

Consistency of Plastic Soils

Term	N-Value, BPF
Very Soft	less than 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	Greater than 30

Relative Density of Non-Plastic Soils

Term	N-Value, BPF
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Greater than 50

Moisture/Frost Condition

(MC Column)

- D (Dry): Absense of moisture, dusty, dry to touch.
- M (Moist): Damp, although free water not visible. Soil may still have a high water content (over "optimum").
- W (Wet/ Waterbearing): Free water visible intended to describe non-plastic soils. Waterbearing usually relates to sands and sand with silt.
- F (Frozen): Soil frozen

Layering Notes

- Laminations: Layers less than ½" thick of differing material or color.
- Lenses: Pockets or layers greater than ½" thick of differing material or color.

Peat Description

Term	Fiber Content (Visual Estimate)
Fibric Peat:	Greater than 67%
Hemic Peat:	33 – 67%
Sapric Peat:	Less than 33%

Organic Description (if no lab tests)

Soils are described as *organic*, if soil is not peat and is judged to have sufficient organic fines content to influence the Liquid Limit properties. *Slightly organic* used for borderline cases.

Root Inclusions

- With roots: Judged to have sufficient quantity of roots to influence the soil properties.
- Trace roots: Small roots present, but not judged to be in sufficient quantity to significantly affect soil properties.

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Legend

Boring

N

1:4,800

400 200 0 400

Feet

FIGURE 1

Boring Locations

Proposed Parking Garage
Capital Complex
St. Paul, Minnesota

DRAWN BY: DRK	CHECKED BY:
DATE: 3/11/2013	AET NO. 01-05729

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 1 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 173.4 Co. Coordinates: N 159925.662 E 571674.597

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	2½" Bituminous	FILL		F	SU						
1	8" Gravelly sand with silt, pieces of concrete, brown and dark brown			F	SU						
2	FILL, mostly sand with silt, a little gravel, brown, frozen		50/.3	M	SS	6					
3											
4	FILL, mostly silty sand with gravel, pieces of concrete, brick, dark brown										
5			11	M	SS	12	17				
6	FILL, mostly clayey sand, a little gravel, pieces of brick, dark brown										
7	LEAN CLAY, slightly organic, black, soft (CL)	FINE ALLUVIUM	3	M	SS	14	30				
8											
9	LEAN CLAY, gray, a little brown, stiff (CL)										
10	SAND WITH SILT AND GRAVEL, fine to medium grained, dark brown, moist, loose to medium dense (SP-SM)	COARSE ALLUVIUM	10	M	SS	12	26				
11											
12			16	M	SS	12					
13											
14	SAND WITH SILT, a little gravel, fine to medium grained, brown, moist, medium dense (SP-SM)										
15			11	M	SS	14					2
16	SAND, a little gravel, fine to medium grained, brown, moist, medium dense (SP)										
17											
18											
19	SAND WITH SILT AND GRAVEL, fine to medium grained, dark brown, a little brown, moist, medium dense, a lens of clayey sand (SP-SM)										
20			14	M	SS	2					
21											
22											
23	SAND, a little gravel, medium to fine grained, brown, waterbearing, loose (SP)			▼							
24											
25			9	W	SS	12					
26											
27											
28	SAND, a little gravel, medium grained, brown to dark brown, waterbearing, loose to medium dense (SP)										
29											
30			10	W	SS	14					
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-49½' 3.25" HSA	3/1/13	8:30	26.0	24.5	24.5		23.7	
BORING COMPLETED: 3/1/13								
DR: GH LG: TM Rig: 85								

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/1/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 1 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 159925.662 E 571674.597

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33	SAND, a little gravel, medium grained, brown to dark brown, waterbearing, loose to medium dense (SP) *(continued)*	COARSE ALLUVIUM *(continued)*									
34											
35			11	W	SS	14					
36											
37											
38											
39											
40			19	W	SS	18					
41											
42											
43	SAND WITH SILT, a little gravel, medium grained, brown, waterbearing, medium dense (SP-SM)										
44											
45			21	W	SS	18					
46											
47											
48	CLAYEY SAND, a little gravel, dark brown, very stiff (SC)	TILL									
49											
50			17	W	SS	14	13				
51	**END OF BORING**										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 2 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 175.9 Co. Coordinates: N 160453.713 E 572032.667

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	2" Bituminous pavement	FILL		F	SU						
1	FILL, mostly silty sand with gravel, dark brown, frozen			F	SU						
2											
3	FILL, mostly sand with silt, a little gravel, brown, frozen		17	M	SS	12					
4	FILL, mostly sand, a little gravel, light brown										
5			5	M	SS	14					
6											
7	FILL, mostly sand, a little clayey sand with gravel, brown										
8			8	M	SS	6					
9											
10			17	M	SS	12					
11											
12	FILL, mostly sand, a little gravel, light brown										
13			7	M	SS	12					
14	FILL, mostly sand with silt, a little sand, brown			▼							
15			2	W	SS	1					
16											
17											
18	ORGANIC CLAY, black, firm, laminations of waterbearing sand (OL/OH)	SWAMP DEPOSIT									
19											
20			6	W	SS	14	27				
21											
22											
23					TW	18					
24	SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense (SP-SM)	COARSE ALLUVIUM									
25			23	M	SS	6					
26											
27											
28	SAND, a little gravel, medium grained, brown, waterbearing, loose (SP)										
29											
30			8	M/W	SS	12					
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-49½' 3.25" HSA	2/28/13	9:20	16.0	14.5	14.9		14.6	
	2/28/13	10:48	51.0	49.5	50.8		31.0	
BORING COMPLETED: 2/28/13								
DR: GH LG: TM Rig: 85								

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 2 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 160453.713 E 572032.667

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33		COARSE ALLUVIUM *(continued)*									
34	SAND, a little gravel, medium grained, brown, waterbearing, loose, a lens of fine sand around 35½' (SP)										
35			10	W	SS	14					
36											
37											
38											
39											
40			10	W	SS	14					
41											
42											
43	SAND WITH GRAVEL, medium to coarse grained, brown, waterbearing, medium dense (SP)										
44											
45			18	W	SS	16					
46											
47											
48	CLAYEY SAND, a little gravel, brown, very stiff (SC)	TILL									
49											
50			19	W	SS	6	15				
51	**END OF BORING**										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 3 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 189.2 Co. Coordinates: N 160405.457 E 572594.69

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	3" Bituminous pavement	FILL		F	SU						
1	FILL, mostly sand with silt and gravel, light			F	SU		10				
2	grayish brown, frozen										
3	FILL, mostly clayey sand, a little gravel, dark brown, frozen	COARSE ALLUVIUM OR FILL		F	SS	16					
4	SILTY SAND, a little gravel, fine to medium										
5	grained, brown, frozen (SM) (possible fill)		7	M	SS	14					
6	SAND, fine to medium grained, light brown, a little brown, moist, loose, lenses of clayey sand										
7	around 5' (SP) (possible fill)	COARSE ALLUVIUM									
8	SAND, fine to medium grained, light brown, moist, loose (SP)		9	M	SS	16					
9											
10	SAND, fine grained, light brown, moist, medium dense, laminations of fine silty sand (SP)		12	M	SS	18					2
11											
12											
13			17	M	SS	18					
14											
15	SAND, fine grained, light brown, a little brown, moist, medium dense, a lens of silt (SP)		18	M	SS	18					
16											
17											
18											
19	SILT, brown, moist, medium dense, laminations of waterbearing fine sand (ML)	FINE ALLUVIUM									
20			18	M/W	SS	18	24				
21	SAND, fine grained, light brown, moist, medium dense, laminations of silt (SP)	COARSE ALLUVIUM									
22											
23											
24											
25	SILT, brown, a little light brown, moist, medium dense to dense, laminations of fine sand (ML)	FINE ALLUVIUM	29	M	SS	18					
26											
27											
28											
29											
30			37	M	SS	18	15				
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-49½' 3.25" HSA	3/2/13	9:19	51.0	49.5	50.9		None
	3/2/13	9:30	51.0	49.5	50.9		None
BORING COMPLETED: 3/2/13							
DR: GH LG: JJ Rig: 85							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W:COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 3 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 160405.457 E 572594.69

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33	SILT, brown, a little light brown, moist, medium dense to dense, laminations of fine sand (ML) *(continued)*	FINE ALLUVIUM *(continued)*									
34											
35			33	M	SS	18	9				
36											
37											
38											
39											
40			36	M	SS	18	11				
41											
42											
43											
44											
45			39	M	SS	18	20				
46											
47											
48											
49											
50			42	M	SS	18	10				
51	**END OF BORING**										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 4 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 212.4 Co. Coordinates: N 160461.237 E 573289.755

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	FILL, mostly silty sand with organic fines, trace roots, dark brown, frozen	FILL		F	SU						
3	FILL, mostly sandy silt, trace roots, dark brown, frozen to around 3'		14	F/M	SS	6					
5	FILL, mostly silty sand, a little gravel and sandy silt with organic fines, pieces of concrete, trace roots, dark brown		2	M	SS	4					
7	FILL, mostly sand with gravel, light brown		4	M	SS	6					
10	FILL, mostly sand, a little gravel and silty sand, light brown, a little dark brown		7	M	SS	12					
13	FILL, mostly gravelly sand with silt, brown		11	M	SS	3					
15	SAND, a little gravel, medium to fine grained, light brown, moist, loose (SP) (possible fill)	COARSE ALLUVIUM OR FILL	6	M	SS	14					
20	GRAVELLY SAND WITH SILT, medium to fine grained, brown, moist, medium dense (SP-SM)	COARSE ALLUVIUM	27	M	SS	4					
24	SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP)		14	M	SS	14					
28	SAND WITH GRAVEL, medium grained, light brown, moist, medium dense (SP)		24	M	SS	12					

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-49½' 3.25" HSA	2/27/13	9:20	51.0	49.5	51.0		None
BORING COMPLETED: 2/27/13							
DR: GH LG: TM Rig: 85							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 4 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 160461.237 E 573289.755

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33		COARSE ALLUVIUM *(continued)*									
34	SAND WITH SILT, fine grained, light brown, a little brown, moist, dense, laminations of silt (SP-SM)										
35			47	M	SS	16					
36											
37											
38	SAND, fine grained, light brown, a little brown, moist, medium dense, laminations of silt (SP)										
39											
40			23	M	SS	16					
41											
42											
43											
44											
45			30	M	SS	16					
46											
47											
48	SAND, fine to medium grained, light brown, a little brown, moist, dense, laminations of silt (SP)										
49											
50			32	M	SS	16					
51	**END OF BORING**										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 5 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 103.4 Co. Coordinates: N 159792.89 E 574151

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	3" Bituminous pavement	FILL			SU						
1	21" FILL, mostly gravelly sand with silt, pieces of concrete, brown, frozen (apparent recycled gravel base)			F	SU						
2											
3	FILL, mostly sand with silt and gravel, brown		59	M	SS	14					
4	FILL, mostly gravelly sand, light brown										
5			33	M	SS	12					
6											
7	FILL, mostly sand with silt, a little gravel, brown										
8			19	M	SS	14					
9											
10	FILL, mostly sand, a little gravel and clayey sand, light brown, a little brown		20	M	SS	12					
11											
12	FILL, mostly sand with silt, a little clayey sand with gravel, pieces of clay tile, brown, a little dark brown										
13			15	M	SS	12					
14											
15	FILL, mostly sandy lean clay, a little gravel, brown		9	M	SS	6	16				31
16											
17	FILL, mostly clayey sand with gravel, brownish gray										
18			9	M	SS	10	24				
19											
20	FILL, mostly clayey sand, a little gravel and organic clay, pieces of brick, brownish gray, a little black		11	M	SS	6	35				
21											
22	SAND WITH SILT, a little gravel, brownish gray, moist, medium dense, a lens of clayey	COARSE ALLUVIUM									
23	sand (SP-SM)		14	M	SS	12	36				
24	LEAN CLAY, slightly organic, trace roots, brownish gray, stiff (CL)	FINE ALLUVIUM									
25	HEMIC PEAT, black (PT)	SWAMP DEPOSIT	13	M	SS	14	246				
26											
27											
28					TW	24					
29	ORGANIC CLAY, trace roots, brownish gray, stiff (OL/OH)										
30			13	M	SS	16	68				
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-49½' 3.25" HSA	2/27/13	2:40	49.9	49.5	49.9		None	
	2/28/13	8:00	49.9	49.5	49.9		None	
BORING COMPLETED: 2/27/13								
DR: GH LG: TM Rig: 85								

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 5 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 159792.89 E 574151

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33	ORGANIC CLAY, trace roots, brownish gray, stiff (OL/OH) *(continued)*	SWAMP DEPOSIT *(continued)*	12	M	SS	16	38				
34											
35	FAT CLAY, brownish gray, a little light gray, stiff, laminations of silt (CH)	FINE ALLUVIUM	15	M	SS	16	46				
36											
37											
38											
39											
40	SILTY SAND, fine grained, brownish gray, moist, very dense (SM)	COARSE ALLUVIUM	56	M	SS	16					
41											
42											
43											
44	SANDSTONE, light gray, a little brownish gray	ST. PETER FORMATION									
45			50/.4	M	SS	4					
46											
47											
48											
49			100/.4	M	SS	6					
	END OF BORING										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 6 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 168.6 Co. Coordinates: N 159333.226 E 572009.546

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	5" Bituminous pavement	FILL		F	SU						
1	FILL, mostly gravelly silty sand, dark brown, frozen			F	SU						
2				F	SU						
3	FILL, mostly silty sand, a little gravel and clayey sand, dark brown, frozen		15	M	SS	16					
4	FILL, mostly sand with silt, a little gravel and silty sand, dark brown	COARSE ALLUVIUM									
5			6	M	SS	12					
6	SAND, a little gravel, medium to fine grained, light grayish brown, moist, loose (SP)										
7	GRAVELLY SAND, medium to fine grained, brown, moist, medium dense (SP)		17	M	SS	10					
8											
9	SAND, a little gravel, medium grained, brown, moist, medium dense (SP)										
10			16	M	SS	16					2
11											
12											
13			15	M	SS	16					
14	SAND, a little gravel, fine to medium grained, light brown, a little brown, moist, medium dense (SP)										
15			24	M	SS	16					
16											
17											
18	SAND, a little gravel, medium to fine grained, light brown, a little brown, moist, dense, laminations of fine sand (SP)										
19											
20			26	M	SS	16					
21											
22											
23	SAND WITH GRAVEL, fine to medium grained, light brown, a little brown, moist, medium dense, a lens of medium sand (SP)										
24											
25			23	M	SS	18					
26											
27				▼							
28	SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP)										
29											
30			12	W	SS	16					
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29½' 3.25" HSA								
29½-49½' RD w/DM	3/2/13	11:17	31.0	29.5	29.2		27.7	
	3/2/13	11:27	31.0	29.5	29.0		27.2	
BORING COMPLETED: 3/2/13	3/2/13	11:37	31.0	29.5	28.7		27.1	
DR: GH LG: JJ Rig: 85								

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 6 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 159333.226 E 572009.546

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33		COARSE ALLUVIUM *(continued)*									
34	SAND WITH SILT, a little gravel, fine to medium grained, grayish brown, moist, dense, a lens of silt (SP-SM)										
35			37	M	SS	16					
36											
37											
38	SANDY SILT, grayish brown, moist, dense (ML)	FINE ALLUVIUM									
39											
40			35	M/W	SS	18	18				
41											
42											
43	CLAYEY SAND, a little gravel, brown, very stiff (SC)	TILL									
44											
45			24	M	SS	18	14				
46											
47											
48											
49											
50			23	M	SS	18	12				
51	END OF BORING										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05729 LOG OF BORING NO. 7 (p. 1 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

SURFACE ELEVATION: 211.6 Co. Coordinates: N 160771.344 E 573291.944

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	3" Bituminous	FILL			SU						
2	FILL, mostly sand with silt and gravel, brown, frozen				SU						
3	FILL, mostly gravelly sand with silt, brown, frozen	COARSE ALLUVIUM	59	M	SS	12					
4	SAND WITH GRAVEL, mostly medium grained, light brown, moist, very dense to dense (SP)				SU						
5			24	M	SS	14					2
6											
7	GRAVELLY SAND, medium grained, light brown, moist, medium dense, a lens of fine to medium sand around 10' (SP)		14	M	SS	6					
8											
9											
10			14	M	SS	12					
11											
12	SAND, fine grained, light brown, moist, medium dense (SP)		14	M	SS	12					
13											
14	SAND WITH GRAVEL, medium grained, brown, a little light brown, moist, medium dense, a lens of fine sand around 15½' (SP)										
15			12	M	SS	12					
16											
17											
18											
19											
20			32		SS	NR					
21											
22											
23											
24											
25			14	M	SS	12					
26											
27											
28	SAND WITH GRAVEL, fine to medium grained, light brown, moist, medium dense, a lens of fine sand (SP)										
29											
30			21	M	SS	12					
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-49½' 3.25" HSA	2/27/13	11:45	51.0	49.5	51.0		None	
BORING COMPLETED: 2/27/13								
DR: GH LG: TM Rig: 85								

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

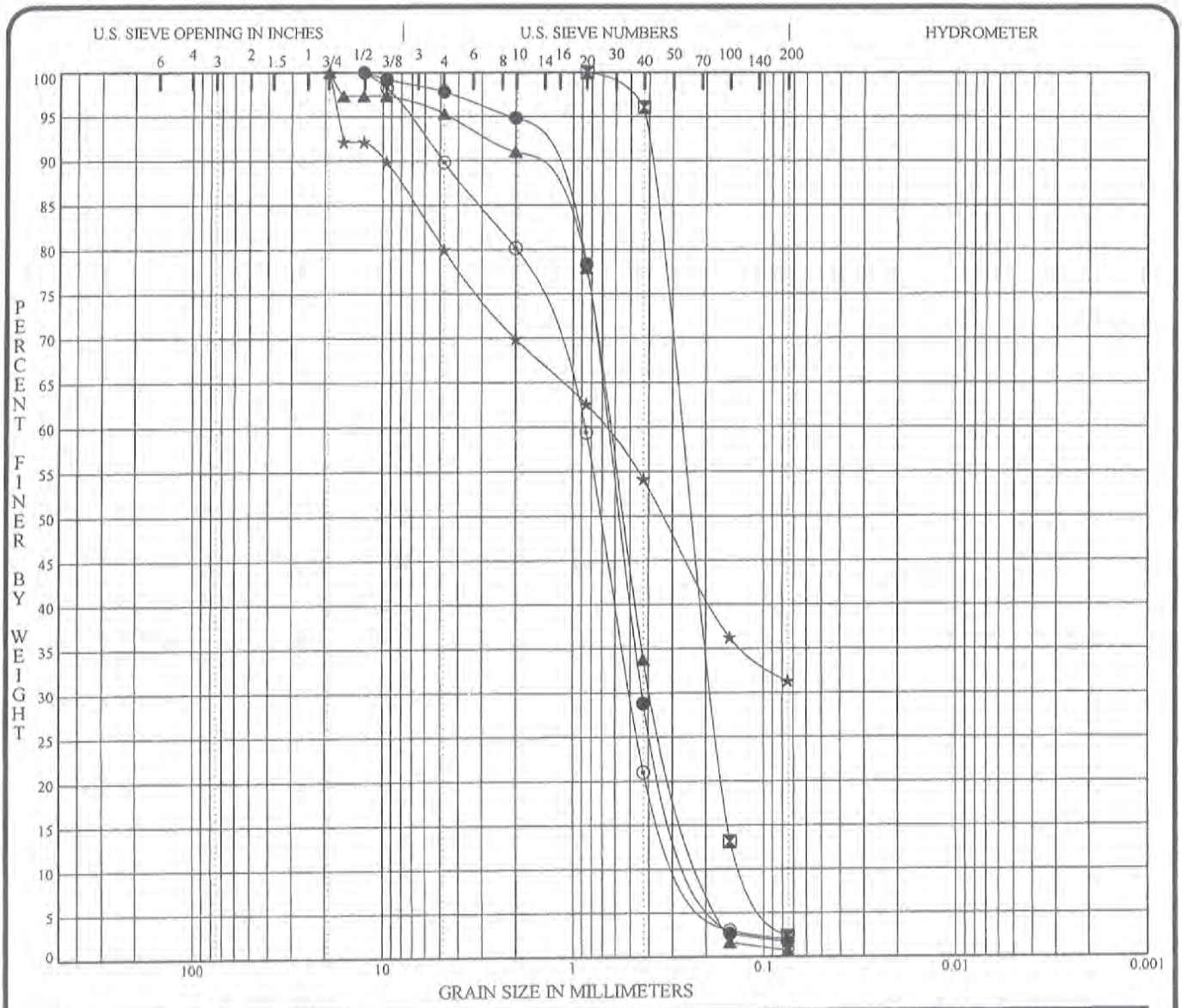
AET JOB NO: 01-05729 LOG OF BORING NO. 7 (p. 2 of 2)

PROJECT: Proposed Parking Garage-Capital Complex; St. Paul, MN

Co. Coordinates: N 160771.344 E 573291.944

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
33		COARSE ALLUVIUM *(continued)*									
34	SAND WITH GRAVEL, medium to fine grained, light grayish brown, moist, medium dense (SP)										
35	SAND, fine to medium grained, light grayish brown, moist, medium dense (SP)		29	M	SS	14					
36											
37											
38	SAND, fine grained, light grayish brown, a little brown, moist, medium dense (SP)										
39											
40			30	M	SS	14					
41											
42											
43	SAND, fine grained, light brown, a little brown, moist, dense, laminations of fine sand with silt (SP)										
44											
45			33	M	SS	14					
46											
47											
48											
49											
50			31	M	SS	16					
51	**END OF BORING**										

AET_CORP W-COORDINATES 01-05729.GPJ AET+CPT+WELL.GDT 3/11/13



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	1	14.5'	SAND (SP)					1.41	3.3
⊠	3	9.5'	SAND (SP)					1.04	2.2
▲	4	14.5'	SAND (SP)					1.12	3.3
★	5	14.5'	SILTY SAND with GRAVEL (SM)	16					
⊙	6	9.5'	SAND (SP)					1.28	3.9

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1	14.5'	12.50	0.66	0.432	0.2011	2.2	96.2	1.7	
⊠	3	9.5'	0.85	0.27	0.185	0.1227	0.0	97.7	2.3	
▲	4	14.5'	19.00	0.64	0.376	0.1967	4.7	94.6	0.7	
★	5	14.5'	19.00	0.69			20.0	48.7	31.3	
⊙	6	9.5'	12.50	0.87	0.500	0.2248	10.2	87.9	2.0	

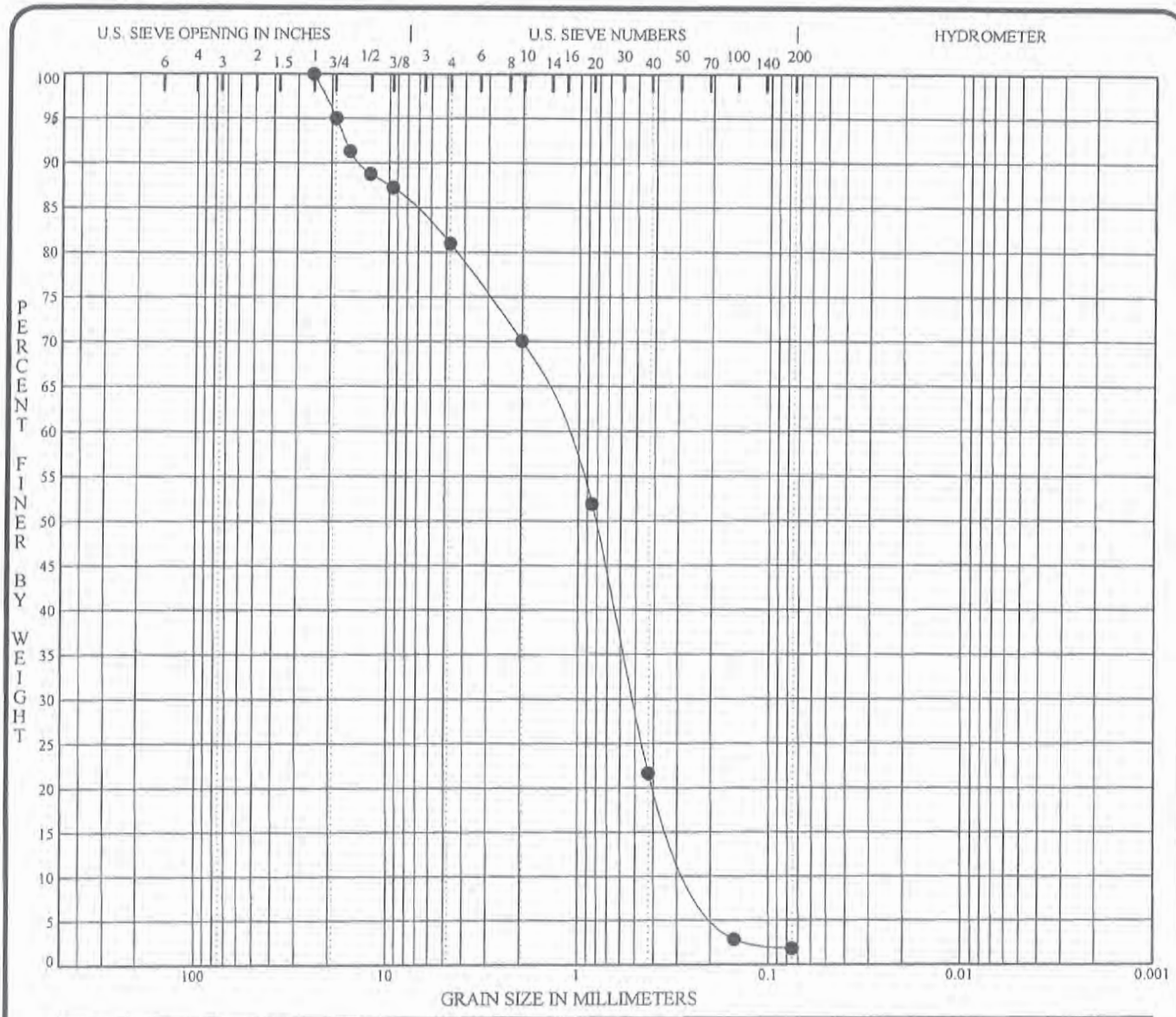
PROJECT **Proposed Parking Garage- Capital Complex; St. Paul, MN**

AET JOB NO. **01-05729**

DATE **3/2/13**

AMERICAN ENGINEERING TESTING, INC.

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	7	4.5'	SAND (SP)					0.95	5.6

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	7	4.5'	25.00	1.24	0.515	0.2231	19.0	79.2	1.8	

PROJECT **Proposed Parking Garage- Capital Complex;-St. Paul, MN**

AET JOB NO. **01-05729**

DATE **2/27/13**

AMERICAN ENGINEERING TESTING, INC.

GRADATION CURVES

Appendix B

Geotechnical Report Limitations and Guidelines for Use

Appendix B
Geotechnical Report Limitations and Guidelines for Use
Report No. 01-05729

B.1 REFERENCE

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by ASFE[1], of which, we are a member firm.

B.2 RISK MANAGEMENT INFORMATION

B.2.1 Geotechnical Services are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. And no one, not even you, should apply the report for any purpose or project except the one originally contemplated.

B.2.2 Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

B.2.3 A Geotechnical Engineering Report is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typically factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, always inform your geotechnical engineer of project changes, even minor ones, and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

B.2.4 Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

1 ASFE, 8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733: www.asfe.org

B.2.5 Most Geotechnical Findings Are Professional Opinions
Site exploration identified subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

B.2.6 A Report's Recommendations Are Not Final
Do not overrely on the construction recommendations included in your report. Those recommendations are not final, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

B.2.7 A Geotechnical Engineering Report Is Subject to Misinterpretation
Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

B.2.8 Do Not Redraw the Engineer's Logs
Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognizes that separating logs from the report can elevate risk.

B.2.9 Give Contractors a Complete Report and Guidance
Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In the letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

B.2.10 Read Responsibility Provisions Closely
Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their report. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

B.2.11 Geoenvironmental Concerns Are Not Covered
The equipment, techniques, and personnel used to perform a geoenvironmental study differ significantly from those used to perform a geotechnical study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated environmental problems have led to numerous project failures. If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. Do not rely on an environmental report prepared for someone else.

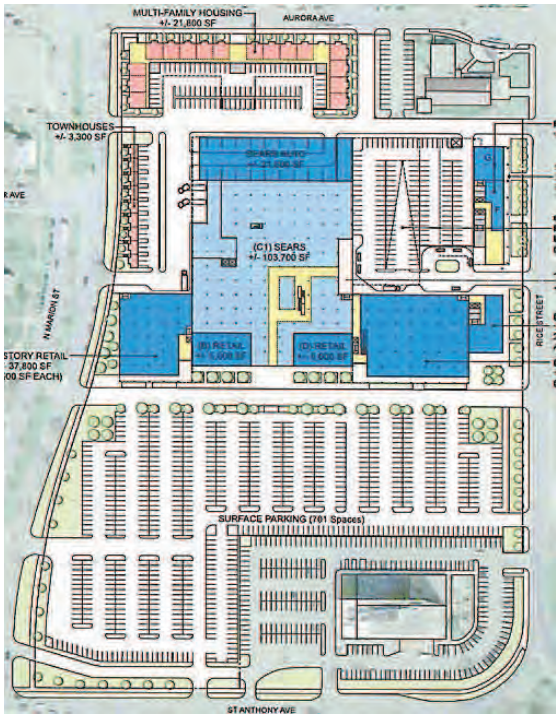
SECTION 8.C
Proposed Sears Re-Development Summary

St. Paul Sears site eyed for redevelopment; homes, offices might join store

By Frederick Melo and Tom Webb
Pioneer Press, twincities.com
Posted: 01/04/2013

Developers have unveiled a plan to redevelop the area surrounding the St. Paul Sears store near the State Capitol, preserving the store and its operations while adding housing and retail space.

The Rice Street location includes large parking lots, and these would be transformed into higher-density uses including more retail, town homes and office space, according to the plan.



Sears *Site Plan of proposed Sears redevelopment*

Sears confirmed that they are in "the early stages of discussion regarding a project on the Rice Street property that will continue to have a Sears store presence," said Howard Riefs, spokesman for Sears Holding Corp. "We will have additional information to share in the coming weeks."

The redevelopment plan would include plans for:

– Another 111,700 square feet of retail space, including two retail buildings on the southeast side of the existing store and two more to the southwest.

– A four-story office building on the northeast corner of the site.

– 121 apartments and 18 town homes in the northwest corner of the property. Some of that land is now occupied by the Sears Auto Center, which would be relocated to the Sears store itself.

The site also provides parking for many state workers, so the plan includes a proposed four-level, 586-space parking garage. Another 700 parking spaces would remain after the remodeling.

The site also is near the new light-rail line going in along University Avenue.

City Planning and Economic Development Director Cecile Bedor put the project into perspective on Friday, Jan. 4, noting that

Sears continued

the most concrete thing for now is that the Sears store is staying.

"We don't have anything that has been formally submitted," Bedor said. "Sears has identified about 10 sites across the country that they believe are ripe for redevelopment, and this is one of them. And when I say redevelopment, they mean keeping the store. This is a good site for them."

On Thursday, Macy's Inc. announced that it is closing its landmark downtown St. Paul department store, which had been open for 50 years. Macy's is expected to close in March, and there are no firm plans for its large building. After that, Sears will be one of the last remaining department stores in St. Paul.

"The light rail is a billion-dollar investment, and the hope for all light rail is it will be a catalyst for new development," Bedor said. The Macy's site also is along the light rail line.

As for the14-acre Sears site, "It's a sea of parking right now. This is in the planning stages. It will continue to change," Bedor said.

Melissa Martinez-Sones, director of the Capitol River Council, said its 35-member board received general details of the Sears site plan last month but has yet to take a formal position on the plan. The council is an advisory group for the area surrounding the state Capitol.

"Sears came to our December board meeting and presented high-level plans, more conceptual," she said. "They are coming back with more detailed information on Tuesday, and that's to our Development Review Committee meeting. Those are open, public meetings, and anybody who might be interested in that is welcome to come and listen to what Sears has planned."

The committee meeting is scheduled for 7:30 a.m. Tuesday, Jan. 8, at the U.S. Bank Center's first floor conference room at 5th and Minnesota streets.

The plan also will go before the state's Capitol Area Architectural and Planning Board for design concept approval on Jan. 16. Director Nancy Stark said plans will be presented at that meeting, set for 1:30 to 3:30 p.m. in the Capitol building. Lt. Governor Yvonne Prettner Solon chairs the board.

Sears *Perspective of proposed Sears redevelopment*

SECTION 8.D

Employee Parking Survey Summary

The following excerpt of the Employee Parking Survey is an edited display highlighting the pertinent information relevant to the Predesign report.

Which building is your main work location?
Which Agency do you work for?

691 Robert:

- Administration, Department of = 18

Administration Building:

- Administration, Department of = 82
- Capitol Area Architectural and Planning Board = 4
- Governor's Office = 1
- Minnesota Management and Budget =8
- Sentencing Guidelines = 4

Agriculture/Health Building:

- Agriculture, Department of = 42
- Health, Department of = 59

Andersen Building:

- Enterprise Technology, Office of (OET)/MN.IT Central = 44
- Human Services, Dept. of (include DHS MN.IT) = 479

Armory:

- Military Affairs, Department of = 4

Centennial Building:

- Administration, Department of (include Admin MN.IT) = 43
- Asian Pacific Minnesotans Council = 0
- Campaign Finance and Public Disclosure Board = 5
- Enterprise Technology, Office of (OET)/MN.IT Central = 136
- Legislative Auditor, Office of = 34
- Minnesota Management and Budget (include MMB MN.IT) = 120

Freeman Building:

- Agriculture, Department of = 98
- Animal Health, Board of = 9
- Health, Department of = 244
- Human Rights, Department of = 11

Judicial Center:

- Court of Appeals = 27
- Guardian ad Litem Board = 0
- Law Library = 7
- Lawyers Professional Responsibility Board = 6
- State Court Administrator = 65
- Supreme Court = 14
- Tax Court = 2
- Workers Compensation Court of Appeals = 6

Stassen Building:

- Administrative Hearings, Office of = 22
- Revenue, Department of = 510

State Capitol Building:

- Administration, Department of = 5
- Attorney General's Office = 0
- Governor's Office = 4
- Historical Society = 3
- House of Representatives = 15
- Media = 1
- Public Safety, Department of = 5
- Senate = 49

State Office Building:

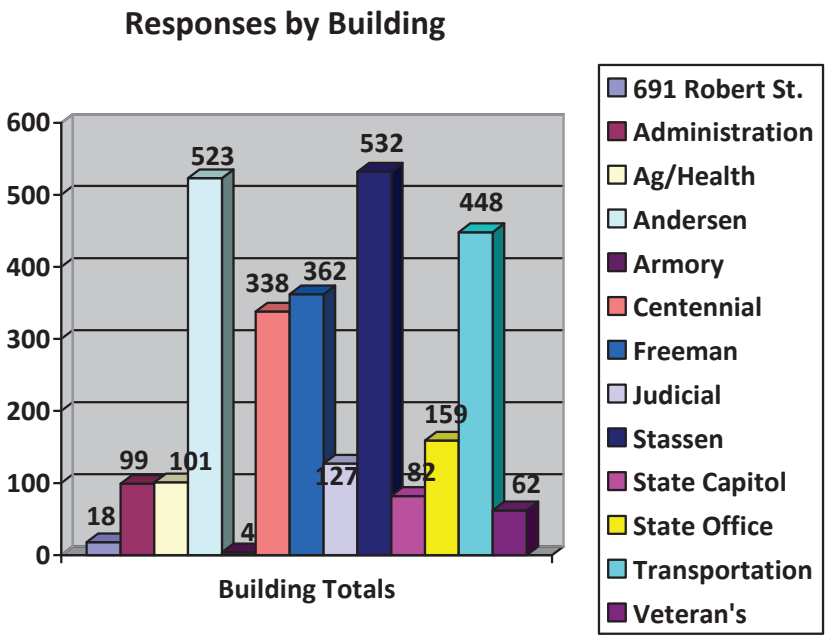
- House of Representatives = 113
- Legislative Commissions = 5
- Legislative Reference Library = 5
- Revisor of Statutes = 17
- Secretary of State = 11
- Senate = 8

Transportation Building:

- Administration, Department of = 7
- Transportation, Department of = 441

Veteran's Building

- Military Affairs, Department of = 47
- Veterans Affairs, Department of = 15
- Veterans Organization (VFW, AM-Vets, etc.) = 0



Which major roadways do you take during the last mile to work?

	I94	I35E	52	Rice St.	Summit Ave.	Cedar St.	Como Ave.	Robert St.	University Ave.	City/ Local Roads
North Metro	204	588	20	204	13	155	135	96	225	343
South Metro	117	384	185	59	31	142	4	127	45	244
East Metro	496	74	17	57	30	104	29	79	83	333
West Metro	331	70	6	51	36	72	31	38	62	159

Which major roadways do you take to go home after work?

	I94	I35E	52	Rice St.	Summit Ave.	Cedar St.	Como Ave.	Robert St.	University Ave.	City/ Local Roads
North Metro	225	589	23	218	12	146	155	79	144	382
South Metro	131	363	224	53	34	132	4	118	42	254
East Metro	485	77	17	63	34	106	28	64	79	332
West Metro	352	73	6	49	36	64	31	37	38	158

What time do you usually arrive at your parking lot at work in the morning?

Before 6:00 am	162
6:00 am – 6:30 am	347
6:31 am – 7:00 am	520
7:01 am – 7:30 am	488
7:31 am – 8:00 am	597
8:01 am – 8:30 am	427
8:31 am – 9:00 am	236
After 9:00 am	71

What time do you usually leave work in the afternoon?

Before 3:00 pm	75
3:00 pm – 3:30 pm	279
3:31 pm – 4:00 pm	580
4:01 pm – 4:30 pm	817
4:31 pm – 5:00 pm	482
5:01 pm – 5:30 pm	318
5:31 pm – 6:00 pm	192
After 6:00 pm	69

When Light Rail becomes available in 2014, how frequently would you use that for your commute?

1-5 days/week	246
less than 1x a week	151
Never	1685
Don't know	776

Please indicate your preferences for using the following commuting options if the parking facility you currently use becomes unavailable.

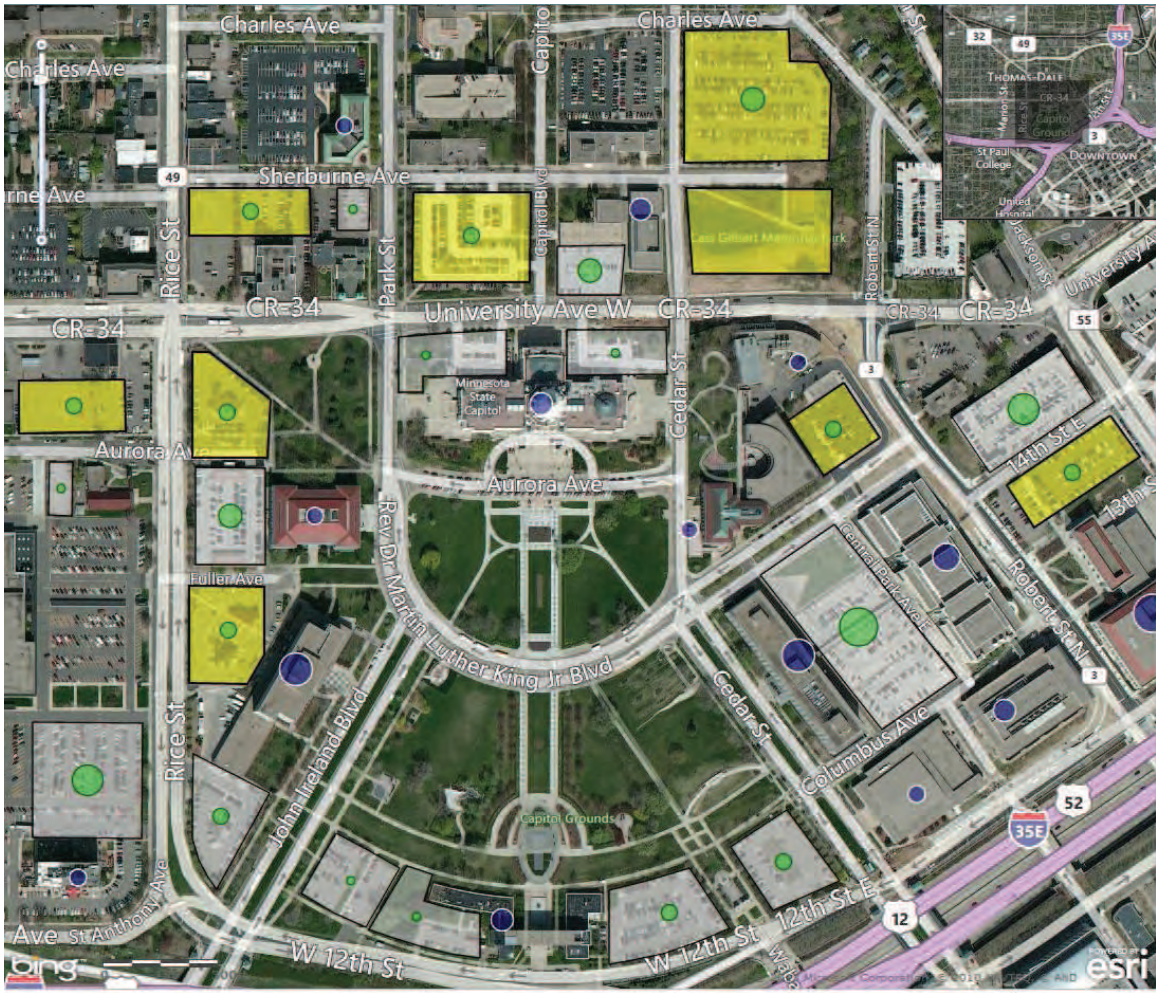
	1st	2nd	3rd	4th	5th	6th
Express bus	684	370	227	340	117	194
Non-express bus	76	303	238	245	533	311
Ridesharing (pick up home)	517	339	341	233	182	224
Rideshare (Park & Ride)	144	499	395	302	199	231
Shuttle	618	275	330	226	276	213
Bicycle or walk	146	92	90	86	81	1132

To what extent would the following transit incentives interest you in trying new ways to commute to work?

	Definitely Interested	Interested	Somewhat Interested	Somewhat Disinterested	Disinterested	Definitely not interested
More convenient transit service	754	473	491	116	185	595
Available transit and/or Park and Ride info	223	367	560	241	320	750
Discounted transit pass (Metropass)	481	385	474	203	280	713
Transit passes sold at work	326	342	500	222	311	768
Shuttle from a remote lot	221	301	569	276	365	792

SECTION 8.E

Existing Capitol Complex Employment and Parking Locations Map



Drawing not to scale

Legend

Candidate Sites

Existing Parking Facilities

CAPITOL COMPLEX COMMUTER POLICY

I. INTRODUCTION

This policy is established by the Department of Administration (Admin) to provide for orderly and safe commuting for employees, vendors and the public while working at or visiting Capitol Complex buildings under the custodial control of Admin Plant Management Division (PMD) and the St. Paul Armory. For the purpose of this policy, the Capitol Complex is that part of the City of St. Paul defined in Minnesota Statutes Chapter 15B.02. For the purpose of this policy, employees are employees of the State Executive, Judicial and Legislative branches and the St. Paul Armory whose primary work location is in Capitol Complex buildings that are under the custodial control of Admin PMD.

The Commissioner of Administration will annually review and, if necessary, adjust rates to ensure the recovery of anticipated expenditures.

Commuter information is available on the PMD web site, www.admin.state.mn.us/pmd.

A. Parking Facilities

In accordance with Minn. Statutes 16B.58, the Commissioner of Administration shall operate and supervise state-owned parking facilities that are under the custodial control of Admin.

1. Parking facilities administered by Admin include the 14th Street Lot, Lot AA, Lot C, Lot F, Lot G, Lot H, Lot I, Lot J, Lot K, Lot Q, Lot X, 14th Street Ramp, Admin Ramp, Cedar Street Ramp and Centennial Ramp and facilities leased by Admin.
2. Parking facilities not administered by Admin include Lot B, Lot D, Lot L, Lot N, Lot O, Aurora Street, State Office Building Ramp, Judicial Garage and MnDOT Garage. Facilities not administered by Admin are exempt from the Parking Assignment Priorities of this policy.

In accordance with Minnesota Statutes 16B.58, Subd. 6, the Legislature at the start of each legislative session determines its parking needs, which could affect the availability of parking facilities listed under Item 1, above.

B. Commuter Options

Admin supports and encourages a wide range of commuter options, including mass transit, car pools and van pools, motorcycling, bicycling and walking, for Capitol Complex commuters. The benefits of commuting options include decreased demand for new parking facilities, improved air quality and reduced traffic congestion.

C. Safety and Security

The Department of Public Safety/Capitol Security provides parking facility monitoring, security and escort services in the Capitol Complex through an inter-agency agreement with Admin. These services also include, but are not limited to, parking rule and speed limit enforcement; vehicle towing; and misuse, abuse and fraud investigation and prosecution.

D. Payment

Payment for parking services must be made through automatic payroll deduction for employees of entities that use the state SEMA4 payroll system, unless the employee elects to forego the pre-tax benefit.

Invoice customers can pay on a monthly or quarterly basis. Customers who are revoked for non-payment will be ineligible for services covered by this policy and placement on waiting lists for six months for the first incident and one (1) year for the second incident. In all cases, the suspension commences on the date the account has been paid in full to PMD.

II. COMMUTING OPTIONS

A. Single-Occupancy Vehicles

Single-occupancy vehicles are passenger-type vehicles in which the operator is typically the only occupant when parking in the contract holder's designated parking facility. Only one contract is allowed per person, and the contract holder cannot be a registered participant in a Capitol Complex car or van pool.

When a single-occupancy vehicle contract holder is on an unpaid leave of absence, excluding military leave, of up to one (1) year, the parking stall will be re-assigned. The contract holder can retain parking privileges during their absence by continuing the terms of the parking contract, including payment. In the case of military leave, parking contracts will be placed on hold for employees assigned to military active duty for at least one (1) month and up to two (2) years. Upon the employee's return from military leave, the parking contract will be reinstated.

B. Metropass

The Admin Metropass is a non-transferable picture identification bus card for unlimited trips on any Metro Transit regional bus route, including peak, express and downtown fare zones. Admin Metropass is available only to State Executive, Judicial and Legislative branch employees working in buildings under the custodial control of Admin PMD. Many suburban lines also honor the Metropass.

C. Van Pools

1. All van pool members must be registered with Metro Commuter Services.
2. A van pool consists of at least five (5) people, including the driver.
3. At least three (3) van pool members must be employees as defined in this policy.
4. The van must be leased from Van Pool Services Inc. (VPSI) or its successor.
5. The driver and alternate driver must be at least 25 years of age.
6. The driver and alternate driver must have current valid drivers' licenses.
7. Only one (1) parking contract is allowed per van pool. All other van pool members are ineligible for a parking contract.
8. Van pool members must renew with Metro Commuter Services every six (6) months.
9. The parking service contract will be cancelled if eligibility is not maintained or if Metro Commuter Services identifies non-compliance with one or more of the requirements of registered van pools.
10. All Metro Commuter Services decisions are final.

If the van pool contract holder is on a leave of absence, the contract may be reassigned to an alternate member of the van pool. The alternate member's parking application form must be

completed prior to the effective date of the leave of absence of the original contract holder. Failure to follow this procedure will result in the loss of the van pool parking stall.

D. Commuter Van Pools

1. The Minnesota Legislature in 1984 authorized the creation of a state employee commuter van program for the purpose of conserving energy and alleviating traffic congestion around state offices. Admin's Travel Management Division administers the Commuter Van Pool program.
2. A Commuter Van Pool must have at least seven (7) passengers but no more than 15 passengers.
3. Only state employees designated as van pool drivers may use the van for personal purposes after working hours. Vans cannot be used at any time for partisan political activities.
4. Non-state employees may participate in this program if the driver and substitute driver are state employees and if a majority of the riders in the van are state employees.
5. This program is limited to geographic areas with limited public transportation between the residences of state employees and others and their employment locations.
6. All Travel Management Division decisions are final.

For more information, visit the TMD web site, www.tmd.state.mn.us.

E. Car Pools

1. A car pool consists of at least two (2) people, including the driver.
2. At least two (2) members must be employees as defined in this policy.
3. Only one (1) parking contract is allowed per car pool. All other car pool members are ineligible for parking contracts.
4. All car pool members must be registered with Metro Commuter Services.
5. Member registrations must be renewed every six (6) months through Metro Commuter Services.

6. The parking service contract will be cancelled if eligibility is not maintained or if Metro Commuter Services identifies non-compliance with one or more of the requirements of registered car pools.
7. All Metro Commuter Services decisions are final.

If the car pool contract holder is on a leave of absence, the contract may be reassigned to an alternate member of the car pool. The alternate member's parking application form must be completed prior to the effective date of the leave of absence of the original contract holder. Failure to follow this procedure will result in the loss of the car pool parking stall.

F. Bicycles

Admin provides bicycle racks and bicycle locker rentals at several facilities. Bicycle lockers are available on an annual contract basis on a space-available basis and are located at several parking facilities. Facilities with bicycle lockers include the Cedar Street Ramp, Centennial Ramp, State Office Ramp, Judicial Garage, 14th Street Ramp, Lot F and Lot G.

G. Motorcycles

Admin provides designated areas for contract motorcycle parking at several facilities, including Lot F, Lot G and the 14th Street Ramp. Motorcycle parking for parking contract holders is also permissible at lots and ramps with authorization from PMD.

H. Motorized Personal Transit (MPT)

Motorized personal transit typically involves a compact, electric-powered vehicle, such as a Segway™, intended for one person. MPT operators can use free bicycle racks, rent a bicycle locker or contract for a Segway™ space.

III. PARKING ASSIGNMENT PRIORITIES

Parking contract assignments in the Capitol Complex are based on these priorities:

1. Persons with disabilities who have been issued a Department of Public Safety Disability Parking Certificate card or a Disability license plate.
2. Recognized van pool as defined in Section IIC or Section IID in this policy.
3. Recognized car pool as defined in Section IIE in this policy.

4. Executive management parking is individual contract parking for the following entities whose main offices are located in the Capitol Complex: State Agency Commissioner offices; Congressionally chartered veterans' organizations; Constitutional officers; and state councils, boards and commissions. Parking contracts will be allocated to individuals as follows:
    a. Congressionally chartered veterans' organizations – one (1) contract.
    b. Constitutional offices – the total number of contracts in force on the effective date of this policy as determined by PMD.
    c. State Agency Commissioner offices – up to five (5) contracts for cabinet-level agencies and up to three (3) contracts for non-cabinet-level agencies.
    d. State Councils, Boards and Commissions – one (1) contract.
5. State agencies for the conduct of official state business in the Capitol Complex. PMD will review the number of state agency parking contracts every six (6) months.
6. Employees, as defined in this policy, who are typically the only occupant of their vehicle when parking in the Capitol Complex.
7. Vendors with a business need in the Capitol Complex.

IV. WAITING LISTS

PMD will maintain facility-specific waiting lists as necessary. Parking will be assigned based on the priorities established in this policy in the order in which waiting list applications are received. Waiting list criteria are:

- An employee or vendor ***without*** a parking facility contract is eligible for placement on three (3) parking facility waiting lists. If the individual declines an offer for parking, that person's name will be removed from that waiting list.
- An employee or vendor ***with*** a parking facility contract is eligible for placement on two (2) parking facility waiting list. If the individual declines an offer for parking, that person's name will be removed from that waiting list.

Car pools and van pools – When a vacancy exists, the individual first on the van pool/car pool waiting list will have five (5) business days to provide a verifiable list of pool members to Metro Commuter Services. If the individual cannot present a verifiable pool list, that individual's name

will be removed from the waiting list and the next individual on the list will have five (5) business days to present a verifiable list of pool members to Metro Commuter Services. The Commuter Van Pool Program operated by Travel Management Division is exempt from this provision. Once that individual receives notification, the individual must advise Parking Services within three (3) business days whether they will or will not contract for the stall.

Single occupancy vehicles – When a vacancy exists, PMD will notify the individual first on the list. Once that individual receives notification, the individual must advise Parking Services within three (3) business days whether they will or will not contract for the stall.

V. VISITOR AND SHORT-TERM PARKING

Visitor parking is available at several facilities throughout the Capitol Complex. Admin maintains more than 500 meter-controlled parking spaces for Capitol Complex visitors.

1. **Daily or Short-Term Permit Parking** – Parking that is available on a first-come, first-served basis by permit issued through PMD. Daily or Short-Term Permit Parking is not a substitute for monthly contract parking. Abuse of Daily or Short-Term Permit Parking will result in the denial of daily or short-term parking permits. Permits are non-refundable and are limited to two (2) weeks in duration. Permits may be requested up to six (6) months in advance.
2. **Metered Parking** – Parking at meters located at state-owned parking facilities intended for temporary public parking, including public parking for persons with disabilities.
3. **Multi-Meter Parking** – Contract parking for vendors with frequent business in multiple buildings in the Capitol Complex. A Multi-Meter Parking Permit allows parking at designated state-owned meters in the Capitol Complex on a space-available basis.

VI. PARKING CONTRACT TRANSFER BETWEEN INDIVIDUALS IS PROHIBITED

This policy prohibits sub-letting an Admin-managed Capitol Complex parking contract.

VII. CONTRACT ABUSE, MISUSE AND FRAUD

Violations of this policy and/or contract misuse, abuse or fraud will result in the suspension of service availability for one (1) year for the first incident and two (2) years for the second incident. The individual's name will also be removed from all waiting lists. Misuse, abuse or fraud could also result in criminal charges and an order for restitution and/or a report to the individual's employer, which could result in dismissal.

SECTION 8.G

Capitol Complex Parking Stall Inventory

Location	Contract Stalls	Contract Disabled	Van/Car Pools	PMD	Meter	Public Disabled	Total Stalls
14th Street Ramp	865	27	1	3			896
Administration Ramp	247	3		3			253
Andersen Ramp	401	40	18		14	11	484
Aurora Ave [S. of Capitol]	86					2	88
Capitol-East Plaza	3						3
Capitol-West Plaza	3						3
Centennial Ramp	1372	35			80	2	1489
Lot AA	48				83	1	132
Lot B	155					12	167
Lot BB	30						30
Lot C	200						200
Lot D	88						88
Lot F		45	1		58	9	113
Lot G	83						83
Lot H	59				7		66
Lot I	36						36
Lot J	142					5	147
Lot K					79	3	82
Lot L	92						92
Lot N	42						42
Lot O	46			3			49
Lot Q	289	1		3	41	2	336
Lot U	0				39	5	44
Lot W					97	2	99
Lot X	615		20				635
Judicial Garage	127	1		1			129

SECTION 8.H

Predesign Process Meeting Minutes and Notes

The following documents summarize the Meeting Minutes and Notes from the weekly Predesign meetings.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**8 January 2013**	**Time:**	**11:00 AM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #1 Minutes**		
Copy of Memo To:	**Attendees**		

PROJECT DIRECTORY

Present	Distributed	Name	Agency / Firm	Phone	Email
X		Paul Gannon	RECS	651.201.2396	paul.gannon@state.mn.us
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X		Bruce Dzieweczynski	PMD	651.201.2329	bruce.dzieweczynski@state.mn.us
X		Kari Suchy	PMD	651.201.2333	kari.suchy@state.mn.us
X		Anne Johnson	PMD	651-201-2330	anne.johnson@state.mn.us
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X		Bill Hickey	Collaborative	612-371-6414	bhickey@collaborativedesigngroup.com

NEW BUSINESS

Item	Description	Responsibility
1	**Communication:** Consultant to be center of communication: Lead Contact/PM: **Bill Hickey** RECS PM to be copied on communication: **Paul Gannon** PM: Agency primary contact: **Bruce Dzieweczynski** PMD: all communications should be sent to the entire team. Not all will attend all meetings.	INFO

2	Schedule: Schedule with Predesign milestones issued and discussed. Overall schedule seems appropriate – CDG to expand and update for each project meeting.	CDG
3	Consultant / Department responsibilities as outlined in the original project RFP were reviewed and discussed.	INFO
4	2009 Capital Access Study was discussed in general terms. Group feels study's conclusions are still valid, and will help form basis for present parking study.	INFO / CDG
5	Need for parking is driven by impending loss of spaces at Sears lot (351 immediate, 630 total) and potential loss of Block 19 (251) spaces. Present leases in B19 do not have full recovery, adding urgency.	INFO
6	Funding process was reviewed. Due to urgency of finding replacement for Sears spaces, project will pursue expedited funding (design and construction) and approval process. CDG will provide updates at project milestones for use in legislative discussions.	INFO / CDG
7	Overall intent and strategy of study was reviewed. It was the group's consensus that there will be a master plan-type aspect to this study, to determine if needs are best met with a large single location or with multiple, but smaller, facilities. This consideration will be part of the initial programming, and will inform site selection efforts.	CDG
8	Conceptual cost information will be part of site selection, with the normal detailed predesign-level cost study being completed for final site(s).	CDG
9	Need for optional traffic study will be determined once site(s) have been selected.	CDG
10	Origins and destinations of parking users will be important in site selection. DOT will develop survey of likely users to obtain information.	DOT
11	Admin ramp was discussed. Ramp may need substantial maintenance in the near future. Further discussion may indicate that the Lot B site could be expanded to include this site as well if replacement becomes likely. This will be determined in the initial stages of the predesign study.	CDG
12	Federal participation in funding is not expected at this time. DOT will monitor opportunities and advise if any are foreseen.	DOT
13	PMD will forward information / forms for consultants to apply for security clearances. CDG team to submit names and birthdates to PMD.	PMD / CDG
14	Impact of site selection on visitor parking will need to be assessed. Consideration of LRT and bike impacts will also be important.	CDG
15	Present ramp ant 14th (Anderson) experiences significant congestion when exiting. CDG will consider issues here when considering new structure.	CDG
16	The ramp at the State Office Building is well liked and could be considered an example of the desired level of service and finish.	CDG
17	CDG should be mindful of setback requirements and opportunities for liner buildings during site study. Lot B site is presumed to be a full underground facility due to proximity to Capitol and reservation as future office building site.	CDG
18	CDG should plan on a workshop presentation to get CAAPB input as soon as practicable.	CDG

19	Since all sites are presently surface lots, study should also assess interim needs for displaced parkers during construction.	CDG
20	The development proposal for the Sears lot will be presented to the CAAPB on the 16th. CDG will attend this meeting.	CDG
21	Present budget placeholders use $15,000 - $20,000 per stall and $26M total project costs. CDG will compile a matrix of benchmark / comparable ramp projects for comparison and information during the initial stages of the project, before final pricing analysis is available.	CDG
22	Any media inquiries should be directed to Paul Gannon at RECS.	INFO
23	CDG received site DWG files from RECS. CDG will review and determine accuracy.	CDG

Next meeting will be January 15th at 1:00 PM. This is anticipated to be a small-group work session.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**15 January 2013**	**Time:**	**1:00 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #2 Minutes**		
Copy of Memo To:	**Attendees**		

PROJECT DIRECTORY

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X		Bill Hickey	Collaborative	612-371-6414	bhickey@collaborativedesigngroup.com

NEW BUSINESS

Item	Description	Responsibility
1	Open questions from CDG Program Review memo were discussed. Following items reflect this discussion and additional comments.	INFO
2	Lot AA may have unusual property line issues (sub parcels with gaps). CDG / landform will verify once survey work is complete.	CDG / LANDFORM
3	Ramp(s) should accommodate necessary on-site janitorial and grounds equipment storage. Provision for garage / service space for larger equipment and vehicles is not anticipated at this time.	CDG

4	CDG noted that lowest cost / highest efficiency parking is on sloped floor (5%). However, the sloped floors can result in elevations that may not be appropriate in the Capitol Area. Ramps will likely be flat floor with express ramps.	CDG
5	Soil borings are desired for each candidate site (one per site). Pending findings, additional borings may be desired for final sites but this is not in the present scope.	CDG
6	Access to lots for soil boring work needs to be coordinated via PMD with hours of use. Weekends or President's Day are preferred time to work. If possible, borings will be done in locations that minimize patching extent and visibility.	CDG
7	Present State ramps use Honeywell Access Control system.	CDG
8	Proposed Ramps are not adding new capitol ground parking capacity, rather replacing lost parking anticipated by new development: Sears 635 Block #19 251 (potentially up to 300) DHS 120 Displaced by new ramp 200 (TBV with final site selection) Anticipated need 1206	INFO / CDG
9	DOT, MMB's OET (MN.IT), and PMD to identify where current state employees are coming from and what will be the situation once LRT is available. For example: will new parking demand be offset by alternative modes of transportation.	DOT / PMD / MN IT
10	RECS will obtain cost information on 14th St Ramp, SOB ramp, Anderson Ramp, etc.	RECS
11	14th St. Ramp and Anderson Ramp are not liked by State employees because of the length of time needed to exit ramp at end of work day.	INFO / CDG
12	Predesign study needs to include plan for interim site for displaced parkers.	CDG
13	League of Cities may be contemplating expansion. RECS / CDG to verify for impacts on streets and parking in district, and to assess potentials for shared use.	RECS / CDG
14	CDB will schedule a preliminary / early presentation of project to CAAPB.	CDG
15	Information on underground water / rivers near DOT or other locations is sought. RECS / DOT to research available documents.	RECS / DOT
16	Discussion with City of St. Paul will likely expand to include the St. Paul on the Mississippi Design Center.	INFO / CDG
17	City discussions will include carrying capacity of streets. This may have some influence on one- or two-site strategy.	CDG
18	Possible Supplemental Agreements; CDG is to provide proposal for including lot Q in study w/ survey and boring. CDG to also provide proposal for assessment of Admin ramp, for base data and for possible strategic combination with Lot B. . CDG must have competed SA to move forward with additional work.	CDG

Next meeting will be January 22nd at 1:00 PM.
This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**22 January 2013**	**Time:**	**1:00 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #3 Minutes**		
Copy of Memo To:	**Attendees**		

PROJECT DIRECTORY

Present	Distributed	Name	Agency / Firm	Phone	Email
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X		Kari Suchy	PMD	651.201.2333	kari.suchy@state.mn.us
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X		Gene Peterman	PMD	651-201-2332	Gene.peterman@state.mn.us
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X		Chris Guevin	PMD	651-201-2350	chris.guevin@state.mn.us
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X		Bill Hickey	Collaborative	612-371-6414	bhickey@collaborativedesigngroup.com

OLD BUSINESS

Item	Description	Responsibility
1	DOT, MMB's OET (MN.IT), and PMD to identify where current state employees are coming from and what will be the situation once LRT is available. ▪ *DOT and PMD are coordinating information sourcing with other agencies* ▪ *Survey will proceed – questions drafted prior to the next meeting (Monday 28th) should be distributed for review and discussion at meeting.*	DOT / PMD / MN IT
2	RECS will obtain cost information on 14th St Ramp, SOB ramp, Anderson Ramp, etc. ▪ *RECS has requested information from agencies and companies involved in these facilities. Cost information from BWBR:* ▪ *SOB ramp: no information available* ▪ *Anderson ramp: construction cost $7.2 million, 468 stalls, date 2003 – note*	RECS

	architect did not bid ramp separately from building. Ramp was part of overall building cost.	
3	League of Cities may be contemplating expansion. RECS / CDG to verify for impacts on streets and parking in district, and to assess potentials for shared use. ▪ *RECS to verify that Tom Grundhofer is appropriate person for CDG to contact.*	RECS / CDG
4	CDB will schedule a preliminary / early presentation of project to CAAPB Architectural Advisors. ▪ *CDG will forward a list of available dates to Paul Mandell.*	CDG
5	Information on underground water / rivers near DOT or other locations is sought. RECS / DOT to research available documents. ▪ *RECS / DOT to verify what data may exist.*	RECS / DOT
6	City discussions will include carrying capacity of streets. This may have some influence on one- or two-site strategy. ▪ *CDG will schedule meeting with City when initial planning evaluations have reached a point appropriate for feedback.*	CDG

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	Property Survey drafts were reviewed. Field work at sites AA, B, C, U/W has been completed. Many new corner monuments were set to replace missing ones. Topo information is currently being drafted and will be in place soon.	INFO / LANDFORM
2	Lot AA may have unusual property lines due to un-vacated but no longer defined alleyways. CDG / Landform will continue research and discuss with City. RECS to inquire status of properties to the north – do they require alleys, are they land locked?	CDG / LANDFORM / RECS
3	Proposed Ramps are not adding new Capitol grounds parking capacity, rather replacing lost parking (1,200 spaces) anticipated to be displaced by new development:. Care is to be taken to stress that this is not adding capacity but rather relocating existing parkers. Survey and other planning work may indicate that replacement does not need to be one-for-one if use of LRT or other modes will decrease demand.	CDG
4	Parking is available to employees on a first-come, first-serve basis with the following priorities as established by the Capitol Complex Commuter Policy: 1. Disability (with a Public Safety Disabled Placard) 2. Van Pool (registered with Metro Commuter Services) 3. Car Pool (registered with Metro Commuter Services) 4. Executive Management (as defined by agency head) 5. State Agency 6. Employees (includes federal employees located in the St Paul Armory) 7. Vendors or individuals with a business need in the Capitol Complex.	INFO / CDG
5	Presently there is sufficient parking capacity in the complex as a whole. However, there are waiting lists for parkers looking to move to preferred locations. All lots except Q and X currently have waiting lists.	INFO / CDG
6	Reference plans of the Capitol Area will be expanded to show the Regions Hospital ramps and other likely factors impacting the function of traffic in the Capitol Area proper.	CDG
7	Current draft information and formatting was reviewed. CDG presented site factors matrix and other components that will be used in the Report. Stakeholders will review and bring comments to next meeting.	CDG / ALL
8	Phasing: massing of options will determine if structures have ability to be expanded in the future to accommodate additional parking. CAAPB felt existing parking requirements will already max out height restrictions.	CDG

9	CDG noted that flat plate parking with speed ramp is most likely for all sites for functional and aesthetic reasons, and is incrementally more expensive than sloped plate ramp. Height of Handicap vans to be considered in height of ramp(s). Present plan is for all levels to accommodate vans (8'2" clear).	CDG
10	Regular meeting time is changed to Mondays 1:30 – 3:0o. President's Day holiday will displace one meeting to Tuesday (19th).	INFO
11	Possible Supplemental Agreements were delivered to RECS for consideration (Lot Q and Admin ramp review).	RECS

Next meeting will be January 28th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc.

ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**28 January 2013**	**Time:**	**1:30 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #4 Minutes**		
Copy of Memo To:	**Attendees**		

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	X	Bruce Dzieweczynski	PMD	651.201.2329	bruce.dzieweczynski@state.mn.us
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X		Mike Schadauer	DOT		Mike.Schadauer@state.mn.us
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X		Bill Hickey	Collaborative	612-371-6414	bhickey@collaborativedesigngroup.com

OLD BUSINESS		
Item	**Description**	**Responsibility**
1	League of Cities may be contemplating expansion. RECS / CDG to verify for impacts on streets and parking in district, and to assess potentials for shared use. ▪ *RECS to verify that Tom Grundhofer is appropriate person for CDG to contact.*	RECS / CDG
2	CDB will schedule a preliminary / early presentation of project to CAAPB Architectural Advisors. ▪ *CDG will forward a list of available dates to Paul Mandell.* ▪ *Meeting set for February 6th at 1:00.*	CDG
3	Information on underground water / rivers near DOT or other locations is sought. RECS / DOT to research available documents. ▪ *RECS / DOT to verify what data may exist.*	RECS / DOT
4	City discussions will include carrying capacity of streets. This may have some influence on one- or two-site strategy. ▪ *CDG will schedule meeting with City when initial planning evaluations have reached a point appropriate for feedback.*	CDG

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	Discussion of potential questions for parking user survey: ▪ Where are people coming from? Zip codes from MMB / OET may provide appropriate information for immediate applications. ▪ "Closest intersection" will be asked so survey doesn't need home address (privacy). ▪ What building or destination will be asked. ▪ "Would you consider alternative transportation?" will be question to gauge anticipation of LRT and Express Bus service changes.	DOT / PMD
2	Most Capitol area employees leave between 3 and 5, with approximate peak around 4 PM.	INFO
3	Survey time frame – draft survey due next week. Survey results are needed no later than 3rd week of February in order to be incorporated into final report. Basic assumptions will be made for interim planning use.	DOT / PMD
4	DOT believes that interim parking strategies may have longer-term impact on parking needs, if solution is successful enough to change habits. Long term impact on parking demand will be estimated.	INFO / DOT / CDG
5	PMD is sourcing current site plan information for LRT station area for CDG reference use.	PMD
6	PMD discussed funding / payment for ramps. New ramps will likely raise costs for all employees. PMD indicated that to date employees have been willing to pay more for parking convenience.	INFO
7	Parking demand is seldom impacted by normal departmental personnel changes ("churn") due to normal cycle-in/cycle-out nature of employment reservoir. Relocations of entire State departments is rare.	INFO / CDG
8	CDG discussed design / planning assumptions for ramp dimensions. Floor-to-floor levels used for planning are: ▪ 1st level: 15' floor-to-floor. This allows flexible space for office or other occupancies, and generally allows a more appropriate architectural scale to the street level. ▪ All upper levels are planned as 11' floor-to-floor. This allows 8'2" clear permitting full access for accessible vans to all levels.	INFO / CDG

	▪ These dimensions will be re-evaluated for continuing logistical value and cost impact as part of the refinement process. ▪ All ramps will be assumed to have at least one level below grade to allow future connection to tunnel system. This will be re-evaluated based on soil boring results. Lot B is presumed to be entirely underground per comprehensive planning.	
9	CDG presented massing diagrams for all sites, reflecting CAAPB zoning limits as well as setback and liner building assumptions. ▪ Discussion noted that many sites would reach maximum height under a one-ramp scenario at or before reaching 1,200 car capacity, with some variation based on number of below-grade floors assumed. ▪ CDG will establish preliminary level numbers and car counts for review at next meeting.	CDG
10	Lot U/W: Site should expand to include entire contiguous open area for analysis, not just 'L' shape previously indicated. ▪ Existing raingarden may be considered for relocation or expansion / augmentation as appropriate. ▪ CDG will assess impact of changing site boundary on property survey work.	CDG
11	Planning for Lot U/W must be mindful of difficulties at existing 14th Street ramp, and take care not to exacerbate traffic problems already occurring.	CDG
12	Storm water strategies will need to be considered for all sites. These may include new or supplemented subgrade (e.g. cistern) or landscape (e.g. raingarden) strategies as appropriate to each individual site.	CDG
13	Proposed Sears redevelopment will include office building with +/-550 car ramp in Phase 2 near to Lot AA. Planning for Lot AA must be mindful of traffic impacts of this facility. ▪ CDG will include publicly available information on the Sears development in an appendix for reference.	CDG
14	CDG workshop with CAAPB Architectural Advisors is scheduled for February 6th at 1:00. After this session, CDG will set up initial meeting with City of St. Paul staff.	CDG
15	RECS is reviewing proposed contract amendments for Lot Q addition and for Admin ramp condition assessment.	INFO

Next meeting will be February 4th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**4 February 2013**	**Time:**	**1:30 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #5 Minutes**		
Copy of Memo To:	**Attendees**		

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X		Bill Hickey	Collaborative	612-371-6414	bhickey@collaborativedesigngroup.com

OLD BUSINESS		
Item	**Description**	**Responsibility**
1	League of Cities may be contemplating expansion. RECS / CDG to verify for impacts on streets and parking in district, and to assess potentials for shared use. ▪ *RECS to verify that Tom Grundhofer is appropriate person for CDG to contact.*	RECS / CDG
4	City discussions will include carrying capacity of streets. This may have some influence on one- or two-site strategy. ▪ *CDG will schedule meeting with City when initial planning evaluations have reached a point appropriate for feedback.*	CDG

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	Draft plans and massing diagrams of all sites were reviewed. All concepts need stairs / elevators and mechanical equipment which will reduce efficiency. Concepts show maximum capacity possible to fit on each site under "one ramp" scenario.	INFO
2	**Lot AA:** ▪ Preliminary capacity +/-100 stalls / floor plate. ▪ 900 stalls max – 9 levels (1 underground 8 above.) ▪ Future tunnel connection possible with lower level. ▪ Presumes internal bay sloped – flat floors at perimeter bays. ▪ Layout reserves 70' liner building site along Rice Street facing west façade of Capitol, across present surface lot and Leif Erikson Park.	INFO / CDG
3	**Lot B:** ▪ Preliminary capacity +/-248 stalls / floor plate. ▪ If 1200 stalls – 6 levels (all underground) needed. ▪ Existing Loading Dock would be preserved and accommodated. ▪ Planning questions will include whether to structure to accommodate building in the future (and if so size and design of future building will need to be estimated), place ramp outside of anticipated future building footprint, or hybrid strategy. ▪ Layout could be full flat floor plates with express ramps or helix, or sloped and flat bays in combination. ▪ This concept would require full 24/7 HVAC for ventilation. ▪ Surface would be devoted to intense landscape and plaza development – no cars visible. ▪ Tunnel connection possible at existing Loading Dock.	INFO / CDG
4	**Lot C:** ▪ Preliminary capacity -+/-124 stalls / floor plate. ▪ 992 stalls max – 8 levels (1 underground 7 above.) ▪ Presumes internal bay sloped – flat floors at perimeter bays. ▪ This site could connect to existing tunnel access from Ford Building. ▪ Layout reserves corner of Rice / University for future liner building of similar size footprint to Ford Building.	INFO / CDG
5	**Lot U/W:** ▪ Preliminary capacity -+/-120 stalls / floor plate. ▪ If 1200 stalls max – 10 levels (1 underground 9 above.) ▪ Though a structure on this site could accommodate the full number of cars within the zoning limits, this site would not support 1200 due to existing congestion from 14th Street Ramp (900 cars) and significant street constraints in area. ▪ As few as 600 cars would pose traffic challenges. Restrictions of exiting directions may be required to be functional. ▪ Flat plates with express ramps proposed.	INFO / CDG

	▪ Layout preserves open space at Robert Street for adjusted existing stormwater retention pond and green space feature.	
6	**Lot Q:** ▪ Large footprint of lot in this area allows preliminary capacity -+/-350 stalls / floor plate. ▪ Three levels up / one down would reach 1200 car goal. ▪ Height restrictions here will limit structure to three floor plates above ground, but footprint size compensates. ▪ Lot Q is remote from all user destinations. ▪ This is the highest site in the complex and offers panoramic views – may not be most effectively used by parking ramp. ▪ Structure here will be visible from most of Capitol complex, including Mall. ▪ Previous planning has been more oriented to smaller scale development here due to remoteness and proximity to residential areas. ▪ Street access and capacity is limited for this site. Lot is remote from all freeway access points.	INFO / CDG
7	Draft ramp circulation options were discussed. Diagrams are attached. ▪ In general, users are more comfortable with two way circulation ▪ One-way circulation works well for contract users, when drivers know specific stalls where they are going and can use cut-offs.	INFO / CDG
8	CDG's preliminary findings are that a two-ramp scenarios will be most feasible at this point. ▪ Traffic constraints, exiting logistics, and likely destinations of users are all contributing factors. ▪ A smaller physical size will allow more efficient of ramp function. ▪ Dispersing ramps will allow smaller masses more in keeping with scale of Capitol complex.	INFO / CDG
9	Draft survey reviewed - survey comments included: ▪ 20 question survey is not too large. ▪ Arrival and departure questions to be local streets/ highways. ▪ Effect of cost of parking increase (surface to ramp) will be assessed. ▪ Survey assesses broad Capitol complex issues like telecommuting. ▪ Specific location of parking loss is speculative at this point, so survey should maintain general nature of questions.	PMD / DOT
10	No MMB person has been identified to provide existing information – survey group moving forward.	PMD / DOT
11	RECS is reviewing proposed combined contract amendments for Lot Q addition and Lot F.	INFO

Next meeting will be February 11th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc.

ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**11 February 2013**	**Time:**	**1:30 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #6 Minutes**		
Copy of Memo To:	**Attendees**		

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OLD BUSINESS		
Item	**Description**	**Responsibility**
1	League of Cities may be contemplating expansion. RECS / CDG to verify for impacts on streets and parking in district, and to assess potentials for shared use. ▪ *RECS to verify that Tom Grundhofer is appropriate person for CDG to contact.*	RECS / CDG
4	City discussions will include carrying capacity of streets. This may have some influence on one- or two-site strategy. ▪ *CDG will schedule meeting with City when initial planning evaluations have reached a point appropriate for feedback.* ▪ *CDG is waiting for confirmation from City for meeting date. Meeting expected week of 18th.*	CDG

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	Draft plans and massing diagrams of all sites were reviewed. Discussion included all sites currently under study as well as Lot F, newly identified as a candidate site.	INFO
2	Discussion and review of preliminary comments from CAAPB Architectural Advisors.	INFO
3	Final review of User Survey questions and status. Survey will be issued ASAP this week.	DOT / PMD

Next meeting will be February 19th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**19 February 2013**	**Time:**	**1:30 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #7 Minutes**		
Copy of Memo To:	**Attendees**		

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OLD BUSINESS		
Item	**Description**	**Responsibility**
1	League of Cities may be contemplating expansion. RECS / CDG to verify for impacts on streets and parking in district, and to assess potentials for shared use. ▪ *RECS to verify that Tom Grundhofer is appropriate person for CDG to contact.*	RECS / CDG
4	City discussions will include carrying capacity of streets. This may have some influence on one- or two-site strategy. ▪ *CDG will schedule meeting with City when initial planning evaluations have reached a point appropriate for feedback.* ▪ *CDG is waiting for confirmation from City for meeting date. Meeting expected week of 18th.*	CDG

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	Draft plans and massing diagrams of sites F, AA, and C were reviewed. Discussion included all sites currently under study.	INFO
2	Due to ongoing developments with the Capitol restoration project (including the loss of Lots N & O (190 spaces)), RECS requested CDG to add Lots L, B (with conditions), and lot D to their review. B is in contract now and has been surveyed, but due to low priority had not been scheduled for soil boring. RECS will provide office building planning footprint for B to guide parking study work. PM requested written proposal from CDG reflecting cost and time implications. RECS will expedite but PMD said do not delay report – issue with added lot in process. Soil borings and survey will be confirmed with available State documents.	CDG
3	CDG discussed preliminary assessment of Lot L: • Small size precludes effective ramp development here. • Dead end street access has traffic implications. • Structured parking if multilevel would obstruct views from and of the Judicial Center. It was agreed that Lot L should be considered for a single elevated deck, approximately doubling the parking capacity on this site. This would work well with the adjoining uses and access constraints.	CDG
4	CDG previewed preliminary strategy to meet parking replacement and consolidation need: • Lot F – 450 to 500 cars max. • Lot C – 400 cars. • Lot U/W – 350 cars max. • Lot L – deck adding 100 cars (total 200 on site).	CDG / INFO
5	Final car count will be dependent on locations selected and amount of existing surface parking to be replaced due to ramp construction. The 1,200 target includes some allowance for this but will need to be adjusted for final tally. Some sites (AA, C) will not lose all their present surface capacity under current scenarios.	CDG / INFO
6	CDG discussed potential for three-ramp strategy (rather than 2) due to supply distribution needs and traffic constraints. It was agreed that this could be pursued if warranted.	CDG
7	CDG will discuss feasibility and any possible application of automated parking systems (mechanical parking) in report, in particular as pertains to Lot B.	CDG
8	Preliminary review of User Survey information. Response has been substantial (approaching 50%) but some confusion may exist based on respondent's apparent confusion with lot names and locations. Survey will close at the end of this week.	DOT / PMD
9	Schedule was discussed. CDG is on track to meet original schedule of draft report issue on March 4th. Some boring and survey information may be issued as addendum to March 4th	CDG
	draft. CAAPB meeting on March 12th was noted. CDG will attend this meeting to present and discuss study findings.	

Next meeting will be February 25th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**25 February 2013**	**Time:**	**1:30 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #8 Minutes**		
Copy of Memo To:	**Attendees**		

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OLD BUSINESS		
Item	**Description**	**Responsibility**

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	PMD noted that DHS currently runs a shuttle to the B19 parking ramp, and is anticipated to continue shuttle service for future parking sites. It was observed that as a DHS endeavor, other State employees are allowed to ride but that the route is not planned for non-DHS riders.	INFO
2	Draft of data mapping provided by MNIT was reviewed (attached).	CDG
3	CDG discussed three-ramp strategy (or 2 + deck) due to supply distribution needs and traffic constraints. Study will likely recommend ramps on Lots F & C, and single deck at L.	CDG
4	Future development factors in the vicinity of Lot AA were discussed.	CDG
5	CDG reviewed counts meet parking replacement and consolidation need: • Lot F – 500 cars. • Lot C – 500 cars. • Lot L – 200 cars (single deck). It was noted that some adjustment to each site's tally will be necessary to account for existing surface parking to be displaced, and that the total at Lot C may vary to reflect this.	CDG
6	Review of User Survey information. Discussion of which information from the survey will be used in the predesign report. It was agreed that any comments will be summarized rather than listed verbatim in the predesign report, to best preserve anonymity of responses.	INFO / CDG
7	All material issued as part of the draft document will be watermarked "DRAFT" and indicated as not-for-distribution.	CDG
	Schedule was discussed. CDG is on track to meet original schedule of draft report issue on March 4th.	CDG

Next meeting will be March 4th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Meeting Minutes

COLLABORATIVE DesignGroup, inc. ARCHITECTURE ENGINEERING INTERIORS PLANNING

Date:	**4 March 2013**	**Time:**	**1:30 PM**
Project:	**Capitol Complex Parking Predesign**	**Project #:**	**13002.00**
Memo By:	**Bill Hickey**	**RECS #:**	**02CP0030**
Subject:	**Meeting #9 Minutes**		
Copy of Memo To:	**Attendees**		

PROJECT DIRECTORY

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OLD BUSINESS		
Item	**Description**	**Responsibility**

NEW BUSINESS		
Item	**Description**	**Responsibility**
1	Draft report was issued and overviewed. Agency comments are due back by March 11th meeting.	INFO
2	Final report issue planned for March 15th.	CDG

Next meeting will be March 11th at 1:30 PM.

This is the writer's interpretation of the items discussed; please inform immediately of any discrepancies.

Memo

COLLABORATIVE DesignGroup, inc.

ARCHITECTURE ENGINEERING INTERIORS PLANNING

Attention:	Chris Guevin	Date:	3/18/13
From:	Bill Hickey	Project No:	13002.00
Re:	Solar PV Costs at Lot C	Project Name:	Capitol Complex Parking Predesign
Distribution:	Paul Gannon		

Photo Voltaic (PV) Solar Panels at Capitol Complex Parking Lot C – feasibility evaluation

For planning and discussion purposes, we have developed this general outline of a solar PV panel installation for the ramp at Lot C. This is an order-of-magnitude discussion and must be carried to a more detailed level of design and planning for specific cost and payback information. All numbers and factors are shifted to the more conservative side of available data.

1. The Ramp at Lot C will have a gross area of 26,400 Square feet. Allowing for structural limits, necessary superstructure, snow handling, etc. we project a maximum area of 13,000 sq. ft. (+/- 50%) available for solar panels.
2. For planning purposes, we assume 200 W base panels that take up 20 sq. ft. each.
3. This means the maximum possible generation at the Lot C site will be 125 kW (650 panels).
4. A fixed solar array will cost approximately $25,000 per 5/KW before incentives or grants are applied.
5. Therefore, assuming no incentives, the estimated raw cost for a 125 kW array at Lot C will be $625,000. Additional costs for superstructure, etc. may be applicable depending on final design. The predesign budget carries the costs for a “solar ready” installation, meaning empty conduit and structural capacity, but the physical structure to hold up the panels varies by manufacturer and by design of the installation and will likely add cost.
6. Power generated at this installation is assumed to be net metered or used to “run the meter backward”. At an estimated power cost of $0.079/kWh, the annual output for this facility would create an income of $12,695.14. This is a simple payback of 49 years. Without incentives or other ways to reduce the capital expenditure, this exceeds the lifespan of the PV panels and is deemed not a feasible installation.

Other considerations:

- Another strategy for the PV arrays would be for the State could lease the air rights to a private company or to utility for the installation of an array. This would allow the “tenant” to be eligible for many more of the incentive programs and bring the cost of the setup down. This would also allow the harvesting of renewable energy without the State needing to develop in-house expertise in maintenance and operations of the equipment.
- Included with this memo are representative panel cutsheets for reference. These are typical products presented as “typical” only and are not specifically endorsed for use on the project. The “Solar Tree” product is an integrated unit (structure and PV cells in one “plug-and-play” assembly)) the others are typical panels-only systems that need some sort of support structure (roof or other framework).

- Thinking of future electric car charging stations, it may be that that need will offer an opportunity to introduce PV on at least a limited scale – the Solar Tree comes with a direct-to-vehicle option for up to 6 cars, for instance. This could happen at the ramps or at other, stand-alone or remote sites.
- Some products (e.g. Sharp systems) meet the ARRA "Buy American" criteria, should that become a factor.
- At present, the US Department of Energy's *DSIRE* (Database of State Incentives for Renewables & Energy) site lists only the Xcel Renewable Development Fund (RDF) as applicable for a State installation. However, this fund is presently in limbo and so not considered available for the purposes of this report. Link:

http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MN09R&re=1&ee=1

- The raw calculation of output and income is as follows. Minneapolis is the closest default location in most available references, but the values will be the same for a St. Paul site.

Station Identification		Results			
City:	Minneapolis	Month	Solar Radiation (kWh/m^2/day)	AC Energy (kWh)	Energy Value ($)
State:	Minnesota	1	3.85	12544	990.98
Latitude:	44.88 N	2	4.72	13419	1060.10
Longitude:	93.22 W	3	4.97	15144	1196.38
Elevation:	255 m	4	4.91	13616	1075.66
PV System Specifications		5	5.74	15817	1249.54
DC Rating:	125.0 kW	6	5.91	15361	1213.52
DC to AC Derate Factor:	0.770	7	5.89	15794	1247.73
AC Rating:	96.2 kW	8	5.64	15171	1198.51
Array Type:	Fixed Tilt	9	5.21	13981	1104.50
Array Tilt:	44.9	10	4.28	12349	975.57
Array Azimuth:	180.0	11	2.95	8473	669.37
		12	2.85	9029	713.29
Assumed Cost of Electricity: 7.9 ¢/kWh		**Year**	**4.74**	**160,698**	**$12,695.14**

ENVISION SOLAR℠
SOLAR TREE® STRUCTURE

transforming parking lots and parking structures into clean power plants

Envision Solar Solar Grove® Array

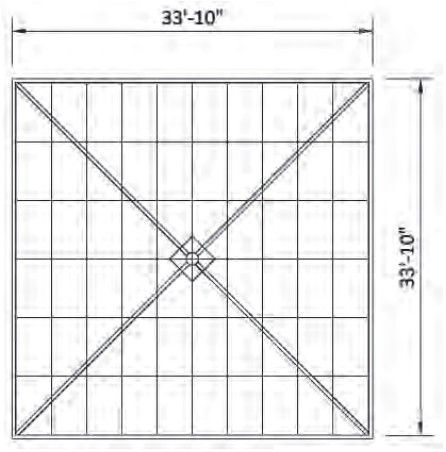
University of California, San Diego Gilman Parking Structure Solar Grove® Array.
(Inset from left to right) Centocor Solar Grove® Array, UCSD Hopkins Parking Structure Solar Grove® Array.
(Bottom right) EcoTech Institue Solar Tree® Array

Turn-key Photovoltaic Shade System
Delivered On-Site For Easy Installation

Solar Tree® arrays are the ideal solution to create distinguished, sustainable real estate. The Solar Tree® structure is designed to meet the needs of a wide variety of applications, shading vehicles from the sun, reducing carbon footprints through the production of renewable energy, and advancing the infrastructure for electric vehicles. Envision Solar's Solar Tree® arrays are the ideal combination of form, function and sustainability.

- Each Solar Tree® structure shades six standard parking spaces
- Each Solar Tree® structure generates enough energy to fully charge six electric vehicles each day, making them truly emissions-free.
- Iconic design suitable for a wide variety of properties
- System supports a variety of module types
- Easily deployed on existing structures or new construction
- Integrated Wire Management System
- Tilted at 15° to optimize aesthetics, energy production and shade, and to minimize maintenance
- Available for shipment worldwide

envision solar℠

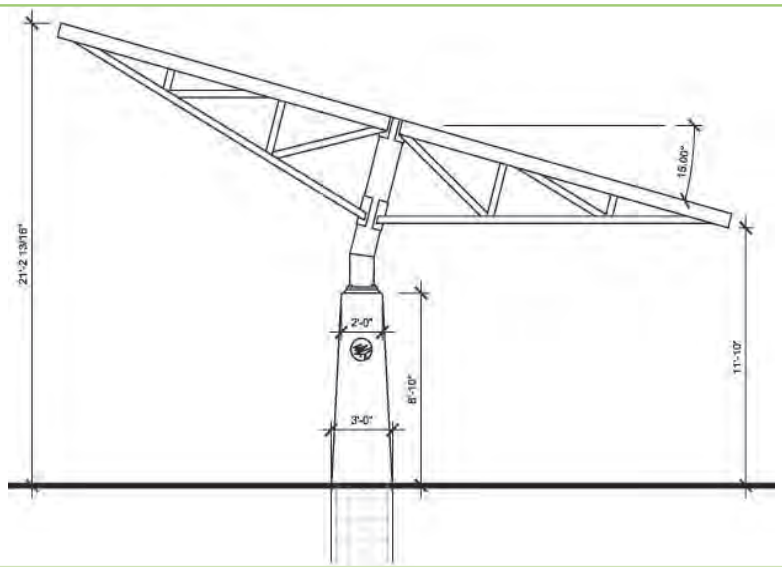


1 | PV SYSTEM

PV System Size Per Tree:
14.40 kW DC (STC)

Module Type and Model Number:
MAGE Powertech® Plus 240/6MF

Tilt Angle:
15°



2 | DIMENSIONS

Canopy:	33'-10" x 33'-10" (10.31m x 10.31m)
Base Plate Dimensions:	20" x 20" x 1-1/2" (50.8cm x 50.8cm x 3.81cm)
Concrete Column Dimensions:	Tapered height: 8'-10" (Standard; Can Vary) (2.69m) 24" at top; 36" at base (60.96cm); (91.44cm)
Typical Anchor Bolt Dimension:	1" dia. x (Depth Varies) (2.54cm)

3 | FOUNDATION (Below Grade)

Material: Reinforced concrete (caisson) foundation, structurally designed for each location. Depth of caisson varies per soil conditions.

NOTE: Structural foundation design is not included. Additional engineering services available in select locations upon request.

4 | ELECTRICAL SYSTEM INTEGRATION

Lighting: Optional lighting fixtures can be mounted to column or canopy, providing indirect ambient light or direct downlighting. Energy-efficient LED's are recommended.

Electric Vehicle Charging Station (Optional): Accommodates a variety of charging station configurations.

NOTE: All Solar Tree® structures are pre-fit with spare conduits for future devices such as communication, security, or flat-screen advertising panels.

5 | SHIPPING CHARACTERISTICS

Shipping Dimensions (L x W x H):
Purlins – 34' x 3' x 2' (10.36m x .91m x .61m)
Edge Beams – 35' x 2' x 1' (10.67m x .61m x .3m)
Column – 15' x 4' x 3' (4.57m x 1.22m x .91m)
Trusses – 24' x 3' x 4' (7.32m x .91m x 1.22m)
Modules – 6' x 6' x 3' (1.83m x 1.83m x .91m)

Weight:	6,500 lbs (2,948.35 kg)
Size of Container:	40' or 60' Truck
Packing Configuration:	Individually packaged, by component type
Pallet Quantity:	5 Pallets of Modules, 4 Additional Pallets

6 | ASSEMBLY INFORMATION

Equipment Requirements:
Light Crane, Forklift, Manlifts, Hand Tools
(Backhoe/Drill Rig if being installed on-grade)

Labor Requirements:
Envision Solar or other skilled supervision
3 Skilled Workers

Contractor License Requirements:
B, C (Varies by State)

Finishes:

Tapered Column:	Concrete
Steel Column:	ASTM-123 Hot-Dipped Galvanized Steel
Purlins:	G-90 Galvanized Steel
Trusses:	ASTM-123 Hot-Dipped Galvanized Steel

7 | CODE COMPLIANCE

Each Solar Tree® array exceeds code requirements in any jurisdiction in the United States with certain site specific modifications.

7675 Dagget Street, Suite 150, San Diego, CA 92111
T 866.746.0514 | F 858.799.4592 | E info@envisionsolar.com

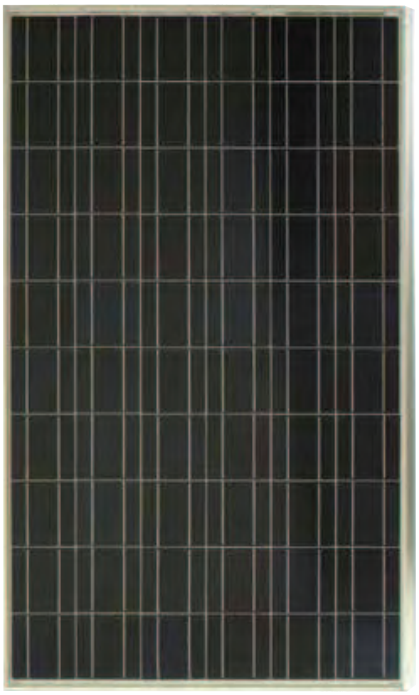
envision solar™

SHARP

solar electricity

235 WATT

MULTI-PURPOSE MODULE



ND-235QCJ

MULTI-PURPOSE 235 WATT MODULE FROM THE WORLD'S TRUSTED SOURCE FOR SOLAR.

Using breakthrough technology, made possible by nearly 50 years of proprietary research and development, Sharp's ND-235QCJ solar module incorporates an advanced surface texturing process to increase light absorption and improve efficiency. Common applications include commercial and residential grid-tied roof systems as well as ground mounted arrays. Designed to withstand rigorous operating conditions, this module offers high power output per square foot of solar array.

This module is ideal for large commercial applications, demonstrating financial astuteness and environmental stewardship.

ENGINEERING EXCELLENCE

High module efficiency for an outstanding balance of size and weight to power and performance.

5% POSITIVE POWER TOLERANCE

Count on Sharp to deliver all the watts you pay for with a positive-only power tolerance of +5%.

RELIABLE

25-year limited warranty on power output and 10-year limited warranty on materials or workmanship.

HIGH PERFORMANCE

This module uses an advanced surface texturing process to increase light absorption and improve efficiency.

Sharp multi-purpose modules offer industry-leading performance for a variety of applications.

Tempered glass, EVA lamination and weatherproof backskin provide long-life and enhanced cell performance.

SHARP: THE NAME TO TRUST

When you choose Sharp, you get more than well-engineered products. You also get Sharp's proven reliablity, outstanding customer service and the assurance of both our 10-year warranty on materials or workmanship as well as the 25-year limited warranty on power output. With over 50 years experience in solar and over 4.3 GW of installed capacity, Sharp has a proven legacy as a trusted name in solar.

BECOME POWERFUL

235 WATT

ND-235QCJ

Module output cables: 12 AWG PV Wire (per UL Subject 4703)

ELECTRICAL CHARACTERISTICS

Maximum Power (Pmax)*	235 W
Tolerance of Pmax	+5%/-0%
PTC Rating	211.8 W
Type of Cell	Polycrystalline silicon
Cell Configuration	60 in series
Open Circuit Voltage (Voc)	37.2 V
Maximum Power Voltage (Vpm)	29.3 V
Short Circuit Current (Isc)	8.60 A
Maximum Power Current (Ipm)	8.02 A
Module Efficiency (%)	14.4%
Maximum System (DC) Voltage	600 V (UL)/1000V (IEC)
Series Fuse Rating	15 A
NOCT	47.5°C
Temperature Coefficient (Pmax)	-0.485%/°C
Temperature Coefficient (Voc)	-0.36%/°C
Temperature Coefficient (Isc)	0.053%/°C

*Illumination of 1 kW/m² (1 sun) at spectral distribution of AM 1.5 (ASTM E892 global spectral irradiance) at a cell temperature of 25°C.

MECHANICAL CHARACTERISTICS

Dimensions (A x B x C to the right)	39.1" x 64.6" x 1.8"/994 x 1640 x 46 mm
Cable Length (G)	43.3"/1100 mm
Output Interconnect Cable	12 AWG with *SMK Locking Connector
Hail Impact Resistance	1" (25 mm) at 52 mph (23 m/s)
Weight	41.9 lbs / 19.0 kg
Max Load	50 psf (2400 Pascals)
Operating Temperature (cell)	-40 to 194°F / -40 to 90°C

*Intertek recognized for mating with MC-4 connectors (part numbers PV-KST4; PV-KBT4)

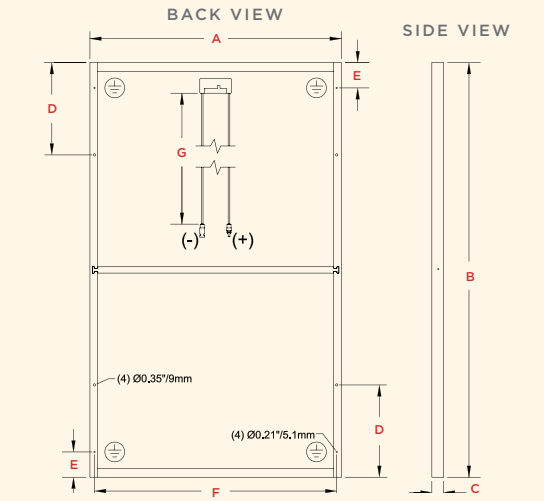
CERTIFICATIONS

UL 1703, ULC/ORD-C1703, IEC 61215, IEC 61730, CEC, FSEC

WARRANTY

25-year limited warranty on power output
Contact Sharp for complete warranty information

DIMENSIONS



A	B	C	D	E
39.1"/994 mm	64.6"/1640 mm	1.8"/46 mm	14.4"/365 mm	3.9"/100 mm

F	G
37.7"/958 mm	43.3"/1100 mm

Contact Sharp for tolerance specifications

ISO QUALITY & ENVIRONMENTAL MANAGEMENT

Sharp solar modules are manufactured in ISO 9001:2000 AND ISO 14001:2004 certified facilities.

"BUY AMERICAN"

Sharp solar modules are manufactured in the United States and Japan, and qualify as "American" goods under the "Buy American" clause of the American Recovery and Reinvestment Act (ARRA).

SHARP

SHARP ELECTRONICS CORPORATION
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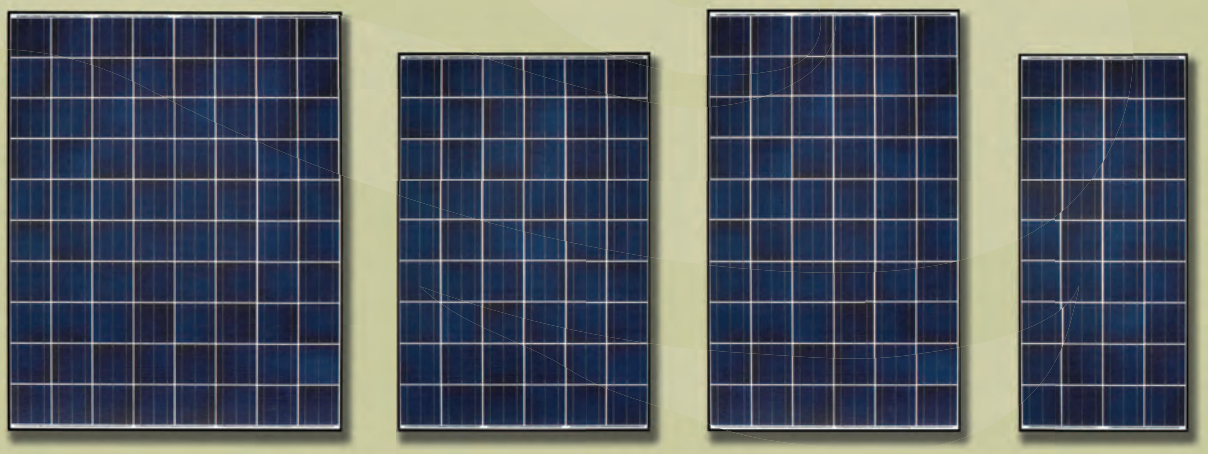
1-800-SOLAR-06 • Email: sharpsolar@sharpusa.com
www.sharpusa.com/solar

Printed in U.S.A. on recycled paper. 12F-108*PC-08-12

KYOCERA

KD F Series Family



KYOCERA KD MODULES

Kyocera multicrystal photovoltaic KD Modules utilize a larger, more powerful, high efficiency 156mm x 156mm solar cell and produce higher output per module.

- Quality locking plug-in connectors to provide safe and quick connections
- UV stabilized, heavy duty, and aesthetically pleasing black anodized aluminum frame
- Easily accessible grounding points on all four corners for fast installation
- Proven junction box technology with 12 AWG PV wire to work with transformerless inverters

RELIABLE

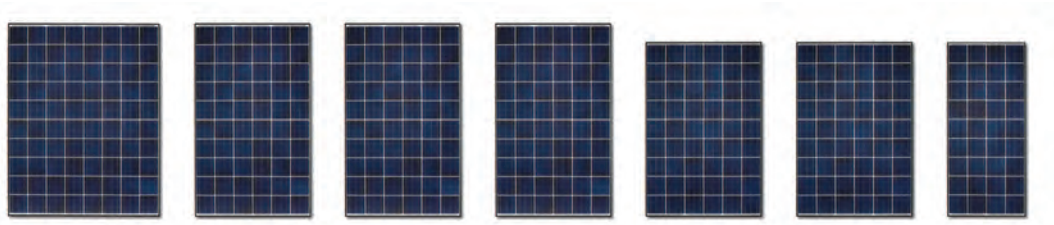
- Proven superior field performance
- Tight power tolerance
- First module to pass rigorous long-term testing performed by TÜV Rheinland

TÜV

KYOCERA EMPOWERS YOUR FUTURE

Kyocera began research and development of solar energy back in 1975. Since then, we have been leading the solar industry with the development of the most efficient and cost effective systems available. With over 35 years of experience in solar, Kyocera is a natural industry leader. Our modules are ideal for a wide range of applications from utility-scale to on-grid commercial and residential, providing superior field performance among the competition. Kyocera stands behind its products and has a proven reputation within the solar industry for quality and reliability.

SPECIFICATIONS



	Standard Test Conditions (STC) *STC = 1000 W/M² irradiance, 25°C module temperature, AM 1.5 spectrum**						
	KD320	**KD250**	**KD245**	**KD240**	**KD220**	**KD215**	**KD140**
Maximum Power	320W	250W	245W	240W	220W	215W	140W
Number of Cells	80	60	60	60	54	54	36
Tolerance	+5% / -3%	+5% / -3%	+5% / -3%	+5% / -3%	+5% / -0%	+5% / -0%	+7% / -0%
Maximum System Voltage	600V	600V	600V	600V	600V	600V	600V
Maximum Power Voltage	40.1V	29.8V	29.8V	29.8V	26.6V	26.6V	17.7V
Maximum Power Current	7.99A	8.39A	8.23A	8.06A	8.28A	8.09A	7.91A
Open Circuit Voltage	49.5V	36.9V	36.9V	36.9V	33.2V	33.2V	22.1V
Short Circuit Current	8.60A	9.09A	8.91A	8.59A	8.98A	8.78A	8.68A
Series Fuse Rating	15A	15A	15A	15A	15A	15A	15A
Length	65.4"	65.4"	65.4"	65.4"	59.1"	59.1"	59.1"
Width	52.0"	39.0"	39.0"	39.0"	39.0"	39.0"	26.3"
Depth	1.8"	1.8"	1.8"	1.8"	1.8"	1.8"	1.8"
Weight	60.6 lbs	46.3 lbs	46.3 lbs	46.3 lbs	41.0 lbs	41.0 lbs	28.4 lbs
Termination Method	Locking Plug-in Connectors						

* Subject to simulator measurement uncertainty of +/- 3%.
KYOCERA reserves the right to modify these specifications without notice.
For more detailed specifications, visit www.kyocerasolar.com

NEC 2008 COMPLIANT
UL 1703 LISTED
CERTIFIED IEC61215 ED2 IEC61730 BY JET

WARNING: Read the instruction manual in its entirety prior to handling, installing & operating Kyocera Solar modules.

012113

SECTION 8.J **Admin. Parking Ramp, Structural Condition Survey**

MINNESOTA DEPARTMENT OF ADMINISTRATION PARKING RAMP

MINNEAPOLIS, MINNESOTA

STRUCTURAL CONDITION SURVEY

PREPARED BY

COLLABORATIVE DesignGroup, inc.

100 PORTLAND AVENUE SOUTH, SUITE 100

MINNEAPOLIS, MINNESOTA 55401

PHONE: 612.332.3654 FAX: 612.332.3626

CONTACT: CRAIG A. MILKERT, PE

PROJECT NUMBER 13002.00

MARCH 22, 2013

COLLABORATIVE DesignGroup, Inc.

Architecture
Engineering
Interiors
Planning

March 22, 2013

Mr. Paul Gannon
State of Minnesota Real Estate and Construction Services
Department of Adminstration
50 Sherburne Avenue – Room 309
Saint Paul, MN 55155

Re: Minnesota Department of Administration Parking Ramp
CDG Project 13002.00

Dear Paul:

We have completed the Parking Garage Condition Survey for this parking garage as proposed. This report summarizes our evaluation procedures along with our observations, conclusions regarding structural integrity, and recommendations for repairs and maintenance.

The services performed in evaluating the structure and in preparing this report have been in accordance with the level of skill and care normally used in engineering practice. The conclusions and recommendations discussed in this report are our best professional opinions based on our knowledge of current design and repair of parking structures. No warranties are expressed or implied.

It has been a pleasure to perform this service for you. If you have any questions, or if we can be of further assistance, please feel free to call.

Very truly yours,
Collaborative Design Group, Inc.

Craig Milkert, P.E.
Principal

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Engineer under the laws of the State of Minnesota.

_____ Date 3/22/13
Craig Milkert, PE License #18360

100 Portland Avenue South, Suite 100
Minneapolis, Minnesota 55401
t 612.332.3654 f 332.3626
www.collaborativedesigngroup.com

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MINNESOTA DEPARTMENT OF ADMINISTRATION PARKING RAMP




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REPORT SUMMARY

Field observations of the Minnesota Department of Administration Parking Ramp were performed in March 2013 to determine the current structural condition, the extent of structural repairs required, and prioritize the repairs to assist the owner in maintaining the structural integrity of the ramp. The intent of this summary is to provide an overview of the following report. The report must be reviewed in its entirety for a complete understanding of our conclusions and recommendations.

Overall, the Minnesota Department of Administration Parking Ramp is in average structural condition at this time. The structural systems discussed in this report are capable of supporting the loads required by the Minnesota Building Code for parking ramps. While there is deterioration throughout the ramp, the defects noted in this report do not appear to be detrimental to the load carrying capacity at this time.

It is understood that the owner desires a restoration and maintenance program that will provide a long-term life expectancy to the structure. Future maintenance and repairs shall maintain the life safety requirements, structural integrity of the ramp, and also the owner's investment in the building.

Typically, the main concern with the structural elements, such as precast single tees, channels, slabs, beams and columns in any ramp is deterioration of the concrete due to corrosion of the reinforcing steel. This corrosion process can be accelerated due to the common use of de-icing salts on our roads.

Most of the obvious deterioration appears in the form of water seepage and cracks and spalls of single tees, channels, beams and columns. Two spalled and cracked channel stems with exposed reinforcing were observed. Beams, columns and walls have some minor cracking and spalling. In order to extend the useful life of the structure, the rate of water infiltration into the concrete must be slowed.

The issue of highest structural priority is preventing water seepage through the joints between single tees and channels. As water seeps through these joints, reinforcing steel will corrode, leading to more cracks and spalls. Sealing of the joints, and installation of a high quality waterproof traffic coating on the joints is the best long term solution to prevent water infiltration. Such a coating has been installed in this ramp, and appears to be performing well. Coating on the top level shows signs of wear. Repair and maintenance of this coating is the best way to preserve the owner's investment in the structure. Other recommended repairs are discussed in this report. Annual repairs will prevent required repairs from becoming more severe and expensive in the future.

The structural condition of the ramp should be re-evaluated on an annual basis. A periodic maintenance plan should be developed to avoid having minor issues become major expenditures. Periodic maintenance should include inspecting and maintaining the waterproof coating, cleaning of all surfaces, and maintenance of the drain system. Cleaning of the slab surfaces should include power washing on at least an annual basis, preferably in the spring to remove accumulated road salts.

INTRODUCTION

The ramp is located adjacent to the Capitol Administration Building and is permit parking only. It appears to have been built in 1967 according to a posting by the northeast stairwell. Entrance to the ramp is via North Capitol Blvd. An entrance off of University Avenue is not currently in use. There are 255 stalls available. Vehicular traffic is two way with speed ramps between levels. Pedestrian traffic between levels is achieved via two stairwells. There is no elevator present.

The ramp consists of four supported levels and two levels of slab on grade. The supported levels consist of precast concrete members. The uppermost levels are precast pre-tensioned single tees and the lower supported levels are precast pre-tensioned channels. The precast tees and channels bear on precast pre-tensioned inverted tees and precast pre-tensioned L-beams.

SCOPE OF WORK

The following is a summary of the work performed:

Review of Documents

Existing plans, construction documents, maintenance records, and previous inspection records are typically reviewed to determine any previous findings or modifications to the structure. Review of the drawings will indicate the method of construction used and design assumptions. Review of inspection reports will indicate what has been observed in the past, and what repairs have been recommended.

No existing plans, maintenance records or previous inspection reports were made available by the owner for review. 2013 construction documents prepared Palanasami & Associates, Inc. (PAI) were reviewed. Work indicated on these drawings indicated the following:

1. Partial depth slab repair.
2. Precast channel-to-channel connection repair.
3. Waterproof deck coating.
4. Restriping.
5. Repair beam ledge – overhead.
6. Repair channel stem – overhead.
7. Epoxy inject cracks in channel stem – overhead.

Non-Destructive Testing

Limited Non-Destructive testing was included as part of this condition survey in order to determine approximate quantities of slab delaminations. Delaminations are horizontal separations in the concrete slab and are common in most aging concrete structures exposed to water and salt, but are typically not noticed by visual observations. The method used to detect areas of delaminated concrete is called chain dragging. This procedure involves dragging a heavy chain over the concrete surface. When the chain is dragged over solid concrete, a ringing sound is heard. However, when the chain is dragged over delaminated concrete, a distinct hollow sound is generated. Chain dragging should be performed by the contractor prior to partial depth slab repairs to determine locations and predict quantities. Based on our limited chain dragging, we believe that the partial depth slab repair quantities shown on 2013 PAI construction documents are reasonable.

Destructive Testing

No destructive testing was included in this Condition Survey. It is our opinion that destructive testing is not currently required for this structure.

Chloride Ion Testing – Discussion

The American Concrete Institute publication, ACI 222, explains that research has determined that the rate at which steel corrodes is reduced as the pH of the surrounding material is increased. Generally speaking, concrete provides excellent corrosion protection to embedded steel because it has a pH usually greater than 12. When concrete is poured around bare steel reinforcing bars, a protective coating is formed around the steel, which greatly reduces the rate of corrosion.

The main problem in parking ramps is that the de-icing salts that are used on the roads are deposited on the slab surfaces of the ramp by the entering cars. This chloride penetrates the concrete through the natural voids in the concrete, or directly through cracks and other defects. The chloride reduces the pH of the concrete and eventually destroys the protective coating that was originally formed by the concrete.

Research has shown that the protective coating is destroyed and corrosion begins when the concrete contains a certain amount of chloride, known as the chloride threshold level. Both ACI 201 and ACI 222 report that the chloride threshold level is as low as 0.15% water soluble chloride, which represents the percentage of chlorides by weight of cement. The chloride threshold level can also be expressed as 0.90 lb./cu. yd. of concrete for a typical concrete mix containing approximately 600 lb. of cementitious material.

The concrete in this ramp was not tested to determine the current level of chloride during this evaluation. Given the type of construction, type of concrete used, and lack of waterproof topping, it is likely that the chloride threshold level has been exceeded. Once the threshold level has been exceeded, it does not matter how much chloride is present, since the protective coating has been destroyed. Assuming that the concrete is no longer providing corrosion protection to the embedded steel, other methods of reducing the rate of corrosion should be investigated.

Observations

Visual observations of the slabs, beams, columns, walls, and expansion joints are recorded below. These observations include noting water seepage and drainage patterns, indications of movement of the structural elements, location and extent of deteriorated reinforcing, and locations and size of cracks, spalls, and delaminations in the concrete surface.

The following rating system was used in assessing the building condition:

- Good: The building component is new, with no apparent defects.
- Average: The building component is able to perform its originally intended function in its current condition. Any defects are minor and do not affect the performance of the building component.
- Poor: The building component is unable to perform its originally intended function in its current condition. The component has major defects, but is repairable.
- Unacceptable: The building component is unable to perform its originally intended function in its current condition, and cannot be economically repaired. Replacement of the building component is required.

OBSERVATION	REFERENCE PHOTO
SINGLE TEES AND CHANNELS / SLABS Supported slabs are constructed of precast concrete single tees at the upper two levels and precast inverted channels below. A concrete topping is present at all supported levels. Supported slabs are in average condition overall.	No Photo
Concrete topping is cracked throughout. Many of these cracks are routed and sealed.	

OBSERVATION	REFERENCE PHOTO
Slab delaminations have occurred throughout the ramp, particularly on the upper level.	
Previous partial depth slab repairs have been performed. Partial depth slab repairs have been coated with a waterproof coating. Coating is worn.	

OBSERVATION	REFERENCE PHOTO
Some single tee slabs have spalls at the joints.	
Some single tee slab overhead repairs have occurred.	

OBSERVATION	REFERENCE PHOTO
Some channel slab spalls are present, with exposed and corroded steel.	
Some corroded slab steel is visible around drain pans.	
Single T and channel stems have minor cracking throughout, but are in overall average condition.	No Photo

OBSERVATION	REFERENCE PHOTO
Spalled channel stems with exposed and corroded pre-tensioning tendons were observed at two locations.	
Lower two levels are concrete slab on grade, in overall average condition. Cracking and small spalls are present. No trip hazards were observed. Some standing water was present.	
BEAMS Precast concrete inverted T and L beams support single tees and channels, and are in average condition overall.	No Photo

OBSERVATION	REFERENCE PHOTO
Beam cracking is present throughout the ramp.	No Photo
Severe cracking is present at column cantilever and is in unacceptable condition. This area has been repaired in the past, and currently has temporary shoring installed.	
Steel brackets have been installed at several column cantilever locations.	

OBSERVATION	REFERENCE PHOTO
Beam spalls with exposed and corroded steel are present.	
Partial depth beam repairs have occurred in the past.	
COLUMNS Columns are conventionally reinforced precast concrete. Columns are in average condition overall.	No Photo

OBSERVATION	REFERENCE PHOTO
Column cracking is present at locations throughout the ramp	
WALLS	
Walls below grade are conventionally reinforced cast in place concrete. Walls are in average condition overall.	No Photo
Minor cracking is present in the walls throughout the ramp. This is considered normal.	No Photo

OBSERVATION	REFERENCE PHOTO
Upper mechanical roof spandrel walls have had cracks and minor spalls repaired.	
Some water infiltration through the foundation walls was observed.	

OBSERVATION	REFERENCE PHOTO
Steel angles have been bolted into the wall at some locations to provide additional channel stem support.	
Wall haunches have been reinforced with additional concrete at some locations.	

OBSERVATION	REFERENCE PHOTO
WATERPROOF TRAFFIC COATING	
A high quality traffic coating has been installed on all supported levels. Coating is in average to poor condition overall.	No Photo
Coating at top level has areas of high wear. In some cases bare concrete is exposed.	
Some coating wear is visible in the drive and turn lanes at the lower levels.	No Photo
EXPANSION JOINTS & SEALANTS	
Expansion joints and sealants are present at the top of the speed ramps, around the perimeter of the levels, and around the crane pit. Joints are in average condition overall.	No Photo

OBSERVATION	REFERENCE PHOTO
Joint nosing is cracked and spalled at some locations.	
Several expansion joints were filled with debris.	

OBSERVATION	REFERENCE PHOTO
Crane pit expansion joint sealant has debonded from the slab edge at some locations.	

DISCUSSION

Overall, the Minnesota Department of Administration Parking Ramp is in average structural condition at this time. The structural systems discussed in this report are capable of supporting the loads required by the Minnesota Building Code for parking ramps. While there is some deterioration throughout the ramp, the defects noted in this report do not appear to be detrimental to the load carrying capacity at this time.

The single tees, channels and beams in this structure are constructed with precast prestressed concrete. Prestressing is a method of adding strength to the concrete, allowing for long spans. The basic theory is that since concrete is strong in compression and weak in tension, the concrete can be strengthened by applying compressive stresses to counteract the tension stresses. Prior to casting the concrete single tees, channels, and beams, high strength steel cables are carefully placed in the formwork at precise locations as determined by the structural engineer. Prior to casting the concrete, the cables are stretched with approximately 27,000 pounds of force, and bonded to the concrete. This force provides uplift to the concrete members to counteract the gravity loads on the structure, as well as applying compression to the concrete to counteract tension stresses.

Prestressing tendons are comprised of seven, high strength steel wires, twisted together to produce a 1/2" diameter strand. The tendons are left uncoated, and bond with the concrete during the curing period. Because the tendons are stressed to such high levels, a small amount of corrosion is sufficient to reduce the cross sectional area of the wires, causing them to break. When the tendons break, they lose their force and ability to reinforce the structure at that location. However, because the tendon is bonded to the concrete, compression is maintained in the concrete away from the break location. Eventually, however, as more of these local area failures occur, the structure can be compromised. Because the prestressing provides the primary reinforcing for the concrete double tees and beams, and deterioration of the system is not always

obvious, it is crucial that the structure is maintained properly to slow water and chloride infiltration.

The location where this type of precast system is most vulnerable to water seepage and deterioration is at the joints between the double tees throughout the ramp. Water seeping through these joints can run across the underside of slabs, down or across tee stems and eventually to the beams and columns as water finds and follows the path of least resistance. Water seepage through these joints causes deterioration of the concrete and corrosion of the reinforcing steel. It is critical that these joints be protected from water seepage. Preventing water seepage through the slabs should be considered a priority at this time. Repair and replacement of the waterproof coating is the most effective means of achieving this goal.

Precast Single Tees / Channels / Slabs

The supported slabs are formed using precast prestressed single tees and channels with a concrete topping. Typically, the main concern with the slabs in any ramp is deterioration of the concrete due to corrosion of the reinforcing steel. This corrosion process can be accelerated due to the common use of de-icing salts on our roads. High chloride levels, combined with water and oxygen can cause corrosion of the steel reinforcing and subsequent deterioration of the concrete structure.

Most of the obvious deterioration in this ramp appears in the form of cracks and spalls. Cracks will allow water and chlorides to have a direct path to the reinforcing steel, which will cause corrosion. It is the corrosion of the steel that causes further deterioration of the concrete such as spalling and delaminations. As the concrete deteriorates, more water and chlorides are allowed access to the reinforcing steel, and the deterioration cycle continues.

The cracks we observed appear to be normal for this type of structure. However, the cracks allow water into the slab, tee stems and channel stems where it corrodes the reinforcing steel.

This corrosion is evident from rust stains and by spalling of the top and under sides of the slabs. Previous partial depth and overhead slab repairs have been performed in the past. The primary source of water infiltration is from the joints between the double tees. This is typical for this type of construction. Maintenance of the sealant at these joints is critical to decrease repair costs and increase the lifespan of the ramp. The waterproof traffic coating has significantly reduced water seepage through the slab, and should be repaired and maintained as necessary.

Two spalled channel stems were observed. These spalls exposed lightly corroded pre-tensioning tendons. As discussed previously, the strands of the tendons are highly stressed, so a relatively small amount of section loss can lead to breakage. Because of this, it is important to protect the tendon from further corrosion. Any loose or weak concrete in the spall are should be removed, and all surface rust on the tendon should be carefully cleaned off. Once this is completed, to concrete should be patched back with an appropriate patching material.

There is some minor cracking of the single tee and channel stems throughout the ramp. Some more significant cracking has occurred at the bearing locations. Steel angle supports for the channel stems have been bolted into the face of wall or wall haunches at several locations throughout the ramp. Typically this additional support has been introduced at areas with cracked stems, or areas of previous repairs. These repairs appear to be performing well.

Some corroded steel is visible around the drain pans. No severe cracks or spalls are currently present. This is not a structural issue at this time, but should be monitored.

The concrete slab on grade on Levels 1 & 2 is in overall average condition with some localized cracks and spalls. This condition is not a structural issue, and should be repaired if a tripping hazard is created. Currently, no tripping hazards were observed in the slab on grade.

Beams

The beams are precast prestressed concrete inverted tee beams. Overall the beams are in average condition, but there are areas where repair is needed. The single tees and channels bear on the beam haunch and are welded down with embed plates. There is minor cracking at some of these locations. Spalls with exposed and corodded reinforcing steel were observed at several locations. Partial depth beam repairs have been performed in the past. Cracks and spalls allow water to infiltrate the beam and corrode the rebar, further damaging the concrete.

The worst of the cracking has occurred at locations adjacent to speed ramps where the beams cantilever over the top of the column. At one location the cracking was observed to be severe, and temporary shoring has been installed at this location. At many of these other conditions, supplemental steel brackets have been installed to provide additional support for the precast beam. These repairs appear to be performing adequately, with minimal new cracks observed.

Columns

Columns are conventionally reinforced precast concrete columns in average condition overall at this time. Cracking is typically minimal, but is present throughout. One severe crack/minor spall was observed.

Walls

Walls below grade are conventionally reinforced cast-in-place concrete. Minor cracking of the walls was observed throughout the ramp, but this is considered normal for this type of construction. Spandrel panels at the upper mechanical roof have had some cracks and minor spalls repaired. Some water seepage through the walls was observed, but no indication of corroding steel was observed at this time. Steel angles have been bolted into the wall or wall haunches at several locations to provide additional support for Channel stems. These repairs appear to be performing adequately at this time.

Waterproof Coatings

The most cost-effective method of protecting concrete slabs is to install a high quality, heavy-duty urethane waterproof coating over the entire surface of the slabs. This type of membrane is flexible and can bridge over the small cracks that will continue to form in the concrete slabs. A waterproof membrane will not eliminate the need for future repairs to the concrete and reinforcing steel. However, it is currently the best and most cost effective solution for slowing water penetration and extending the useful life of a parking structure. Annual maintenance includes repair of torn or worn areas. High traffic areas may require a re-coating after approximately 5 years. This type of protection has proven to be the least expensive method of protection in the long term, when all factors including structural repairs are included.

A waterproof coating has already been installed on all supported parking levels of this ramp, and is in average to poor condition overall. There is damage to the coating at the top level with some tears and scrapes. In some areas the coating has deteriorated to the point where bare concrete is exposed. These areas of deterioration will allow water to seep into the structural system, causing deterioration of the concrete.

Expansion Joints and Sealants

Expansion joints and sealants are present at the top of the speed ramps, around the perimeter of the ramp and at the crane pit. Expansion joints are in average condition overall with some deterioration present. Nosing material at the expansion joint has cracking and spalling throughout the ramp. Several expansion joints were filled with debris. This debris can prevent the gland from expanding and contracting properly, and may cause premature wear of the gland.

Sealant at the crane pit appears to be performing adequately at this time, however, there is some debonding of the sealant from the slab edge.

RECOMMENDATIONS

It is understood that the owner desires a restoration and maintenance program that will provide a long-term life expectancy to the structure. Future maintenance and repairs shall maintain the life safety requirements, structural integrity of the ramp, and also the owner's investment in the building.

The issue of highest structural priority is preventing water seepage into the concrete structure. As water seeps through cracks in the single tees, channels, beams and columns, reinforcing steel will corrode, leading to more cracks and spalls.

Other areas of the ramp require maintenance and repair to prevent further deterioration, and are discussed below. The structural condition of the ramp should be re-evaluated on an annual basis.

Precast Single Tees / Channels / Slabs

Partial delaminations and overhead spalls in the slabs should have loose concrete removed, steel cleaned and concrete patched back.

Channel tee stem spalls should have loose concrete removed, tendons cleaned, and concrete patched back.

Beams

Severely cracked cantilever beam at column with temporary shoring installed should have loose concrete removed, steel cleaned and concrete patched back. Following this repair a galvanized steel bracket should be installed, as has been done at similar locations throughout the ramp.

Beam spalls should have loose concrete removed, steel cleaned and concrete patched back.

Columns

Severe crack at column corner should have loose concrete removed, steel cleaned and concrete patched back.

Walls

No repairs are necessary at this time.

Waterproof Coatings

Top level of ramp should have a full coating system installed over the entire surface.

Lower supported levels should have a new top coat installed over the drive lanes and turn areas.

Expansion Joints and Sealants

Cracked and spalled joint nosing should be repaired.

Expansion joints should be cleared of debris.

Periodic Maintenance

A periodic maintenance plan should be developed to avoid having minor issues become major expenditures. Periodic maintenance should include inspecting and maintaining the waterproof coating, cleaning of all surfaces, and maintenance of the drain system. Cleaning of the slab surfaces should include power washing on at least an annual basis, preferably in the spring to remove accumulated road salts.

REPAIR PRIORITIES

The following is a list of priorities to be used for phasing of work. Items are prioritized with 1 being the highest priority. This priority list should be re-evaluated annually. It appears that the work shown on the 2013 construction documents prepared by PAI addresses the issues of highest priority, except for one channel stem repair, one column spall repair and one beam repair and steel haunch installation.

Priority	Work Item	Quantity	Unit Cost	Item Cost
1	Channel stem spall repair.	40 sf	$85.00	$3,400.00
1	Cantilever beam repair and steel haunch installation.	1 ea	$5,000.00	$5,000.00
2	Partial depth and overhead slab repairs.	50 sf	$85.00	$4,250.00
2	Repair joint nosing.	40 lf	$85.00	$3,400.00
2	Install waterproof coating on top level.	25,000 sf	$3.50	$87,500.00
3	Repair spalled column.	20 lf	$85.00	$3,400.00
3	Install waterproof coating on lower supported level drive lanes and turn areas.	16,000 sf	$3.50	$56,000.00
3	Clear expansion joint of debris.	2,500 lf	$0.40	$1,000.00