13i3L, Department of Natural Resources Southeast Regional Headquarters Building Study

1027 W St Paul Ave, Milwaukee, WI

Prepared for the State of Wisconsin Division of Facilities Development

Final Report
2-7-14 (rev 2-27-14)
Volume 1

WISCONSIN DEPARTMENT OF ADMINISTRATION
Divisions
FACILITIES DEVELOPMENT

WISCONSIN DNR
Department of Natural Resources

eua
eppstein uhen : architects

Index

13i3L, DNR SER Headquarters Building Study

Executive Summary
Section 1

DIVISION OF FACILITIES DEVELOPMENT
101 East Wilson Street, 7th Floor
Post Office Box 7866
Madison, WI 53707

February 7, 2014 (rev 2-27-14)

DNR SER Headquarters Building Study
1027 W St. Paul / Department of Natural Resources
Milwaukee

Project Number:	13i3L
For the:	Department of Natural Resources
Project Manager:	Beth Reid
Architect/Engineer:	Eppstein Uhen Architects Madison, WI 608-442-5350

Type of Project:
Study (New Construction and Major Remodeling)

1. **Project Description:**
This study provides information on the scope of work, estimated costs, and regulatory parameters related to accommodating the Department of Natural Resources Southeast Regional Headquarters (DNR SER HQ) in a building currently owned and occupied by the State of Wisconsin Department of Transportation (DOT) at 1027 W St. Paul Avenue in Milwaukee, Wisconsin. Scope of work includes a gut renovation of a 2 story office building built in 1977 including use of adjacent existing paved parking, and construction of a service and storage garage with associated parking on an adjacent site. Other sites for the storage/repair garage building are also being considered.

This Study does not include determination of space needs for WisDOT. However, WisDOT does have long-term space needs in the Downtown Milwaukee area for staffing of large freeway and bridge projects. The 10-year projection of space needs for WisDOT ranges between 20,000 SF and 40,000 SF. A collocation concept could accommodate both agency space needs, but would require additional building level(s). It is surmised that the building was designed for additional levels.

2. **Authorized Budget and Funding Source:**
$26,000 Agency Funds (for study)

3. **Space Summary:**

Remodeled Building Gross Area:	56,200 GSF	Assignable Area: 42,650 ASF	Building Efficiency: 68%
New Storage Building Gross Area:	4,620 GSF	Assignable Area: 4,200 ASF	Building Efficiency: 90%
Total Gross Area:	60,820 GSF	Assignable Area: 46,850 ASF	Building Efficiency: 77%

(DFD goal for efficiency for a 2-4 story office building is 70% min)

4. **Schedule:**

A/E Services: Posting to Contracting Contract for A/E Services	Oct 2014
Complete/Review Design Report	Jul 2015
State Building Commission Review:	Sept 2015
Submission of Documents for Final Review:	Jan 2016
Bid Opening:	Apr 2016
Start of Construction:	Jne 2016
Substantial Completion / Occupancy:	Jne 2018

5. Budget Summary:

	Per Program	Per Study
Construction:	$ 12,666,500	$ 9,685,315
AE fee:	$	$ 631,390
DFD Mgmt:	$	$ 422,280
Contingency:	$	$ 871,680
Equipment:	$	$ 1,248,180
Other Fees:	$	$ 187,500
Total Project Cost:	$ 16,415,100	$ 13,046,345
Constr. Cost / GSF	$ 278	$ 159
Total Cost / GSF	$ 360	$ 215

Budget Notes:

a. "Other Fees" includes Survey/Soils Engineer, Asbestos/Environmental Consultant, Level 2 Commissioning, Expenses include city building code plan review fees, WasteCap (Construction and Demolition Waste Management Services), EIA, and LEED online registration.
b. These project costs do not include the cost of land or building purchases
c. Per draft 15-17 CBCEG, NEW (air conditioned): 2-4 story office bldg cost should be $137-148/GSF [and larger 25,000-30,000gsf lab costs: Dry $214-266 (incl eqpt $10/), Wet 236-475 (incl eqpt $18/), Research $302-475 (incl eqpt $18/), Comp $178-210]
d. Per draft 15-17 CBCEG, NEW Storage Buildings: Metal Frame (5000 GSF) cost goal is $60-65/GSF [and larger 15,000gsf Heated Warehouse costs: $71-84]

6. Additional Comments:

a. See Appendix b, 12D2W New Facility Study, Southeast Regional Headquarters, Department of Natural Resources, October 10, 2012 for information on prior options for accommodating the DNR SER Headquarters building needs
b. See Appendix d, A DNR SER HQ new building project was enumerated for a $17,012,900 total project cost (and $12,833,300 construction cost) in the 2013-15 biennium budget (2013 Wisconsin Act 20).
c. Cost comparison between 12D2W Study and 13i3L Study:

Estimated Cost (including escalation for 2016 bidding)	10/10/2012 12D2W	12D2W $	12D2W GSF	1/31/13 13i3L Update:	13i3L $	13i3L GSF
1. Const Cost shelled space for DOT tenant				**$75 /GSF**	$727,608	9,760
2. Const Cost renovation only (office + lab), DNR			41,000	**$126 /GSF**	$5,829,292	46,436
3. Const Cost new storage bldg only, DNR			4,620	**$122 /GSF**	$565,835	4,620
4. Const Cost, special foundations, demo,roof, lab equip					$1,508,805	
5. Const Cost total, DNR renov spaces and stor bldg only (2+3+4)			45,620	**$170 /GSF**	$7,903,932	46,436
6. Const Cost building total (shell/renovation/new) DNR + DOT (1+5)				**$142 /GSF**	$8,631,540	60,816
7. Const Cost site, 1027 W St Paul					$56,196	
8. Const Cost site, new storage building					$285,710	
9. Const Cost Telecom					$581,869	
10. Const Cost Abatement					$130,000	
11. Const Cost all constr and site	**$278 /GSF**	**$12,666,500**	45,620	**$159 /GSF**	**$9,685,315**	**60,816**
12. Total Project Cost all constr w/ site, fees, equip etc.	**$360 /GSF**	**$16,415,088**	45,620	**$215 /GSF**	**$13,046,345**	**60,816**

d. For the purposes of this study, it is estimated that additional floors 3 and 4, if required, would have a construction cost of approximately $4,496,000 per floor, and would add approximately 5 months per floor to the project construction duration.

Introduction
Section 2

13i3L, DNR SER Headquarters Building Study

Eppstein Uhen Architects was hired by the State of Wisconsin Division of Facilities Development (DFD) to study accommodating the Department of Natural Resources Southeast Regional Headquarters (DNR SER HQ) in a building currently owned and occupied by the State of Wisconsin Department of Transportation (DOT) at 1027 W St. Paul Avenue in Milwaukee, Wisconsin. The following is the scope of work for this Study:

1. The DNR reps stated that the 12D2W 2012 Study space list and project goals are still substantially valid and do not need to be re-created. There would be no space planning for DOT uses in the building other than indicating any unused space that would be available for DOT use.
2. DOA and DOT provided a limited amount of original drawings of the existing 1001 W St Paul Building. The A/E team toured the building and review these drawings to determine the suitability of the building layout, structure, floor to floor heights, vertical circulation, and toilet rooms for accommodating the DNR SER HQ program.
3. The A/E used the space blocks from the 12D2W Study to create general departmental block space fit plans showing options for accommodating the DNR SER HQ space program into the 1027 W St Paul Building.
4. The A/E met with the DFD PM and User Agency Reps to review the space plan. The A/E made adjustments based on feedback.
5. The A/E created a written recommendation for code compliance strategy, structural capabilities, and MEP System upgrades for one selected block space fit plan option.
6. The A/E created an opinion of probable construction cost for the one selected block space fit plan option. This is a simple cost opinion based on general parameters, not a highly detailed quantity take off.
7. The A/E met with the DFD PM and User Agency to discuss the Report findings and recommendations.
8. The A/E finalized the Report document.

See the Study Index Page, especially the appendices, for additional in-depth information on this project.

The subject building is also known as 1001 W St. Paul, the Falk Building, and the Aldrich Chemical Building. This building was built by the Falk Company in 1977 as an engineering and office building. The DOT acquired the building in 2006 for use as a field office for the Marquette Interchange project, and continues to use the building for office purposes at present.

The existing office building is in good condition, but has 10 year old roofing, its original mechanical/electrical/plumbing/fire protection systems, and much of its original interior partitioning and finishes. The building has received some new floor and wall finishes during its use by the DOT. The parking lot was re-paved, re-lit and re-striped by the DOT.

In general, the zoning, construction and layout of this 56,190 gsf office building and adjacent site could accommodate the 41,093 gsf DNR SER HQ program and 4620 outbuilding outlined in the 12D2W 10-10-12 New Facility Study. The preferred option shown in this study includes the DNR office, lab, and customer service functions in the remodeled office building, and the storage/repair garage building and additional parking on a separate site across the street. Other sites for the storage/repair garage building are also being considered.

For the purposes of this study and its associated budget estimates, space allocations are based on the 41,093 gsf DNR SER HQ program and 4620 outbuilding program outlined in the 12D2W 10-10-12 New Facility Study. It was

assumed that the entire existing building would be completely gutted, including removal of existing obsolete mechanical, electrical, plumbing, and fire protection systems, and all new interior partitions, finishes and MEPFP systems will be provided. Minimal work is needed on the existing masonry building shell. The existing entry canopy will remain, but canopy metal ceiling panels will be replaced and canopy painted surfaces will be prepped and re-painted. Existing windows will remain, and new windows will be added to the west side of the building. The existing roof and roof insulation will be replaced. Existing stairs will remain in place, with enclosure modifications needed to accommodate the DNR program. The existing elevator will be refurbished. The existing connector to the Gaslight Gallery building to the west will be removed.

The 12D2W DNR Southeastern Regional Headquarters program includes offices, customer service areas, labs, and storage needs, and a 4620 gsf stand alone storage and repair garage, with a partially heated zone.

The remodeling will be designed to LEED v4 ID+C Silver standards and comparable DFD Sustainability Standards and the standalone building will be designed to LEED v4 BD+C Silver standards and comparable DFD Sustainability Standards. Neither project will seek certification. See Appendix g for DFD and LEED v4 detailed spreadsheets.

The existing asphalt parking lot provides an environmental cap to the site. The existing chain link fence around the site, the existing parking lot striping, and the existing parking lot lighting will remain as is. Project work includes striping and asphalt repairs needed in areas used by contractors for staging. The feasibility of a geothermal system will be investigated if this project proceeds, but system costs will be higher than average due to soils contamination and restricted amount of site area available due to site easements and underground utilities.

Per original building drawings, this building is founded on pile caps and pilings. The first floor slab is a 2 way structural slab with perimeter beams. The upper superstructure is comprised of steel columns, girders, and beams. The second floor slab is concrete on metal deck. The roof deck is metal. Exterior walls are CMU with face brick (no air space) and 2 ½" metal studs with batt insulation in the cavity. Existing exterior windows are insulated glass in aluminum frames and will remain in place.

It has been surmised that this building was designed for one or two additional vertical levels, based on the columns stubbed through the roof, the roof framing matching the second floor framing, the two extra buttons on the elevator, and the future elevator shaft adjacent to the existing elevator, but no hard evidence of the structural capacity of the building for vertical expansion has been found. In order to confirm whether or not a vertical expansion is possible, either a load test of the existing piles is needed ($45,000 cost, 4 month duration, several testing stations in place in an occupied building) or pile driving logs need to be found (the original piling contractor, Gillen, is no longer in business. No records were on file for pilings at city records.) The scope of work of this Study does not include determination of space needs for WisDOT. However, WisDOT does have long-term space needs in the Downtown Milwaukee area for staffing of large freeway and bridge projects. The 10-year projection of space needs for WisDOT ranges between 20,000 SF and 40,000 SF. In concept and given preliminary space needs, the collocation concept could accommodate both agency space needs, but would require adding an additional level(s). More analysis is required to confirm the feasibility and cost of adding an additional level(s). For the purposes of this study, it is estimated that each additional floor would have a construction cost of approximately $4,496,000 per floor, and would add approximately 5 months per floor to the project construction duration.

The subject site has many encumbrances from underground and overhead easements. This Study includes options for a site configuration and boundary needed to accommodate the DNR's program needs. The purchase price of the sites and building are not included in the A/E's estimated project budget.

This Study only performs a conceptual analysis, budget, and test fit for the 12D2W program in the subject building and site. If DFD and DNR decide to proceed with this project an A/E team needs to be hired, and design, CD and CA services need to be provided.

Zoning and Building Code Summary
Section 3

13i3L, DNR SER Headquarters Building Study

Zoning: Also see Appendix e

1. These properties are zoned IH, Industrial Heavy under the city of Milwaukee Zoning Code CH295 and associated zoning maps. Office use is a permitted limited use in this district, and since this building has been used as an office prior to 2002 its continued use as an office is allowed as "continuing non-conforming".
2. The 4620 gsf separate garage outbuilding is allowed under IH zoning.
3. Setbacks are zero feet for all site edges in IH zoning.
4. 59 parking stalls are required for this building per the IH zoning requirements. Type "A" Landscaping (Standard Parking Lot Landscaping) is required at parking lot edges (trees at 25' o.c. and continuous 2.5' high shrubs in a 5' wide planting strip).
5. Large portions of this site are encumbered by an overhead easement for the Marquette Interchange and underground utility easements. This will severely limits the choices for location of the garage building and parking.
6. According to the FEMA National Flood Insurance Flood Insurance Rate Map this parcel is located in Zone X, which is outside the 0.2% annual chance floodplain zone.

Building Code: Also see Appendix f

A. In simple terms for the existing building portion of this project, the International Existing Building Code (IEBC) as modified by State of Wisconsin Department of Safety and Professional Services SPS Chapter 362 applies to existing elements that will remain in place, and the International Building Code (IBC) will apply to all new elements.
B. The International Building Code (IBC) as modified by State of Wisconsin Department of Safety and Professional Services SPS Chapter 362 will be applicable to the new standalone service and storage garage.
C. Both the IEBC and IBC refer to ADAAG and ANSI A117 for accessibility requirements.
D. This is building has a substantial fireproofed steel superstructure and a complete automatic fire sprinkler system. Anecdotally, this building was designed to accommodate 2 more vertical levels, but that has not been definitively confirmed (records on pilings would need to be found, or pile load testing would need to be preformed to confirm this.)
E. This project would not be classified as a "change of use" since the occupancy type would remain the same.
F. This project would be classified as a "Level 3 Alteration" per the IEBC. In simple terms, this means that elements that remain must conform to IEBC requirements, and new construction needs to conform to IBC requirements. A Level 3 Alteration also requires analysis of structural elements for current code required lateral load resistance, which can be accommodated by tying the existing CMU exterior walls to the steel frame. If there is a vertical addition constructed on this building lateral load compensation will likely require stiffening of column connections to beams and floor slabs (K bracing).

G. The IEBC applies to those portions of the building that remain (stairs, elevator, superstructure, exterior envelope.) These elements do not need to be modified to conform to new code regulations (rise & run of stairs, railings design), but can't be made less compliant during the remodeling. It is EUA's recommendation that the project include modification or replacement of the existing stair railings to conform with current codes for opening size limits and heights. Number of exits and exit widths provided by the current stairs are compliant with current IBC requirements for an office use in the 2 story building, and would be compliant for an office use for a 4 story building. The existing southwest exit stair meets the requirements of an enclosed exit to grade. The northeast open stair can remain open if desired per IEBC 703.2.1 Exceptions 1 & 5.

H. The existing 4000# capacity elevator size is sufficient in size to comply with ADAAG and ANSI A117 requirements for an accessible route to the second floor. Controls need to be modified to comply with ADAAG and ANSI A117.

I. The existing exterior accessible parking stalls and accessible route to the building will meet the requirements for an accessible route to this building.

J. The unmodified existing building thermal envelope does not need to be modified to conform to current code per IEBC Section 808. It is EUA's recommendation to leave the exterior walls as is so as to not create greater thermal stress on the existing brick.

K. Roof insulation installed with the re-roofing would be required to be compliant with the current International Energy Conservation Code.

L. Approximately 75' around the southwest corner of the building does not meet the IFC section 503.1.1 Fire Apparatus Access Road rule for the 150' distance. It is likely that the City of Milwaukee would be willing to discuss means for meeting the Exceptions to the 150' rule at the area in question given the existing conditions.

M. The existing canopy will need to be sprinklered per NFPA 13 given that it extends more than 4' from the building. This can be accomplished via a dry system extension to the wet system in the building.

Building Condition Overview
Section 4

13i3L, DNR SER Headquarters Building Study

The following is a summary of the physical conditions for the existing building at 1027 W. St. Paul Ave., Milwaukee, WI. The building was constructed in 1977 as an office building for the Falk Company. There are physical indications and anecdotal stories suggesting that the building was designed for one or two additional levels, but nothing definitive has been found on the building drawings to confirm this.

See also Appendix h for ACM Report

PHYSICAL CONDITION ASSESSMENT

No severe signs of structural damage or distress were observed during our field observations. The building superstructure appears to be sound, plumb, true, and is not exhibiting noticeable signs of settlement or distress. Overall building structure appears to be in fair condition as far as a visual observation can determine.

A10 FOUNDATIONS

A1020 – Building foundations consist of concrete grade beams supported by concrete pile caps on steel driven piles. The slab at grade is a structural reinforced two-way concrete slab that spans between pile caps.

B10 SUPERSTRUCTURE

B1010 - The structure consists of steel columns, beams, and girders with spray applied fireproofing. The second floor slab is concrete on metal deck with spray applied fireproofing. At the roof, building columns extend through the roof and have been capped for future vertical expansion. Based on existing structural plans, it appears that the building may have been originally designed to support a minimum of one vertical story addition. Additional investigation of the existing deep foundation pile system would need to be performed to determine how much load capacity is available in existing piles. In addition, the building lateral system would need to be updated and additional reinforcement added if a new vertical addition was to be considered.

B1020 - The roof structure consists of metal deck over steel beams with spray applied fireproofing.

B20 EXTERIOR VERTICAL ENCLOSURE

B2010 - Exterior enclosure walls consist of solid brick and CMU infilled between steel columns and beams. There is an insulated wall on the inside face of the CMU consisting of 2 ½" metal studs with batt insulation and a drywall facing. Brick appears in acceptable condition. Exposed aggregate finish between windows has random bulging and cracking due to water infiltration and should be removed and replaced with new exterior façade material. Sealant between brick and exposed aggregate is showing signs of deterioration and should be replaced. The main entrance canopy soffit is showing signs of deterioration and rusting in several locations.

B2020 - Exterior anodized window frames have some oxidation and streaking. Insulated glazing units are in good condition.

C10 INTERIOR CONSTRUCTION

The interior build-out is generally in good condition, but is not configured to efficiently accommodate the DNR space needs, and will be gutted.

The existing toilet and locker rooms will be replaced because they are obsolete. The layouts don't meet ADAAG or ANSI accessibility requirements. The configuration of the rooms doesn't meet the DNR's programmatic needs. The existing toilet rooms and locker rooms have the original 1977 layout, fixtures, and finishes. Floors and wainscot are ceramic tile. Partitions are painted CMU. The plumbing fixtures aren't low water use.

C3010 - Existing interior walls are a combination of drywall & metal stud partitions, demountable partitions, and CMU partitions.

C3030 – Existing ceilings are a variety of 2' x 4' tile styles in suspended metal grid. None of the ceiling tile or grid has value for re-use.

C3020 - There is a 70' x 90' area on the first floor that has a raised "computer floor", which will be removed. There is a wide variety of carpet in this building, ranging from existing 1977 broadloom to recently installed carpet tile. None of the carpet has value for re-use. The existing quarry tile at the main lobby floor and main stair is in good condition, but may not be located where needed for the remodeled building, and therefore will need modification or replacement.

B30 ROOFING

B3010 – The built up roof on this project was installed in 2009, and has a 10 year warranty. The roof warranty will run out at approximately the time the construction is completed if this project proceeds, but DFD feels that it will likely have another 20 years of life if no significant patching is needed (current patching scope includes work needed for removal of existing cooling tower, installation of a new cooling tower, and four 2' x 4' mechanical duct openings

thru the roof.). The A/E recommends that this roof be replaced as part of the significant construction investment in this building.

D10 CONVEYING

D1010 – Elevators and Lifts. The existing 4000# capacity hydraulic elevator appears to be original to the building. It is in need of an upgrade to its controls and systems in order to provide reliable, accessible service for the ongoing use of the building.

D20 PLUMBING

The Plumbing systems serving the existing building appear to be, for the most part, original building equipment, installed in approximately 1977.

The building Plumbing equipment and fixtures appear to be close to exceeding or have already exceeded their life expectancy. Furthermore, the location of the existing water service room, toilet rooms, sinks, etc. are not in ideal locations and are being relocated.

The building water service is original and the water meter appears to have been replaced and updated in the past 15 – 20 years. An existing water heater is serving sinks and lavatories throughout the building.

The building toilet room plumbing fixtures appear to have been updated since the original construction, and look to be within 15 years of age.

D30 HVAC

The HVAC systems serving the existing building appear to be, for the most part, original building equipment, installed in approximately 1977.

General building heating and cooling is generated by a heat pump chiller utilizing R22 refrigerant, (2) base mounted chilled water pumps, (2) base mounted hot water pumps, (2) base mounted condenser water pumps, 15,000 gallon (approximate) water storage tank, electric shell/tube heat exchanger and false load heating valves.

Building heating/cooling airflow and ventilation is provided by a single built-up air handler with variable speed supply fan, cooling coil and roll filters. The system does not include an air handler heating coil or return fan. It also appears that the unit has had stratification issues (outside air vs. return air) as the existing outside air duct is blocked and a ceiling mounted destratification fan is hung in the mixed air plenum.

Space temperature control is provided by variable air volume terminals located above the ceiling. Terminals serving exterior portions of the building include hot water coils (terminals serving interior portions of the building do not).

Portions of the second floor exterior zones also include hot water radiant ceiling panels.

There are several remote mounted exhaust fans in the facility providing exhaust for such spaces as toilet rooms, janitor closets, etc.

The building also includes a large data center that is current not used. The cooling system for the data center included multiple small tonnage rotary chillers (R22) with associated chilled water pumps. The cooling equipment is still installed in the facility but has not operated in a number of years. It appears that the heat rejection equipment has been previously removed.

With the exception of the existing build-up air handler casing, the building HVAC equipment appears to have exceeded its useful life and is not recommend for reuse. The existing air handler casing, could be reused, in its existing location with renovation, provided there are no ACM's associated with the unit. (an existing ACM Investigation dated March 2006 listed no ACM's associated with the unit, but this should be verified). However, the location of the existing unit does not integrate well with building renovation space planning. Additionally, the user agency (DNR) does not have an interest in reusing any of the existing building HVAC equipment.

D40 FIRE PROTECTION

The Fire Protection systems serving the existing building appear to be, for the most part, original building equipment, installed in approximately 1977.

The building water service and sprinkler control valves appear to be original.

The building is protected with pendant sprinkler heads in areas with ceilings, and upright sprinkler heads in areas without ceilings.

The building Fire Protection equipment and valves appear to be functioning properly. The location of the existing water service room and valves are not in ideal locations and are being relocated. Fire protection mains, branches, drops and head locations are likely not in locations or sizes appropriate to the new building layout and for the purposes of this study are budgeted to be replaced.

D50 ELECTRICAL

The Electrical service and distribution throughout the existing building appears to be, for the most part, original building equipment, installed in approximately 1977. On the Ground Floor, approximately one-third of the floor, along the west side of the building, has been provided with a raised floor and it appears that additional electrical panels were provided as part of this remodeling to service this raised floor area.

With the exception of the existing underfloor "Walkerduct" style system, the building Electrical equipment appears to have exceeded its useful life and is not recommended for reuse. Some existing Square D electrical panels in the raised floor area might be suitable for reuse, however, the locations of the existing panels may not integrate well with building renovation space planning. Additionally, the user agency (DNR) does not have an interest in reusing any of the existing building Electrical equipment.

The building is currently provided with two lineups of switchboards located in the main electrical room in the northwest corner of the building. One lineup is an 800A, 480/277V, 3PH, 4W board which feeds the electrical distribution panels throughout the building. The second lineup is a 2000A, 480/277V, 3PH, 4W board which feeds the existing motor control center in the mechanical room and the existing chiller. No other loads appear to be fed from this board.

The balance of the electrical distribution in the building, outside of the panels in the raised floor area, are confined to electrical rooms. Some electrical panels have been de-energized and identified appropriately.

The entire building, outside of the mechanical spaces on the north side of the Ground Floor, is provided with an underfloor "Walkerduct" style system. This system appears to be reusable and could be advantageous for supporting an "open office" occupancy.

The building is currently provided with a Simplex fire alarm system throughout that appears to be original to the building.

An existing Dukane sound system exists within the building. The head end is located in the main electrical room in the northwest corner of the building.

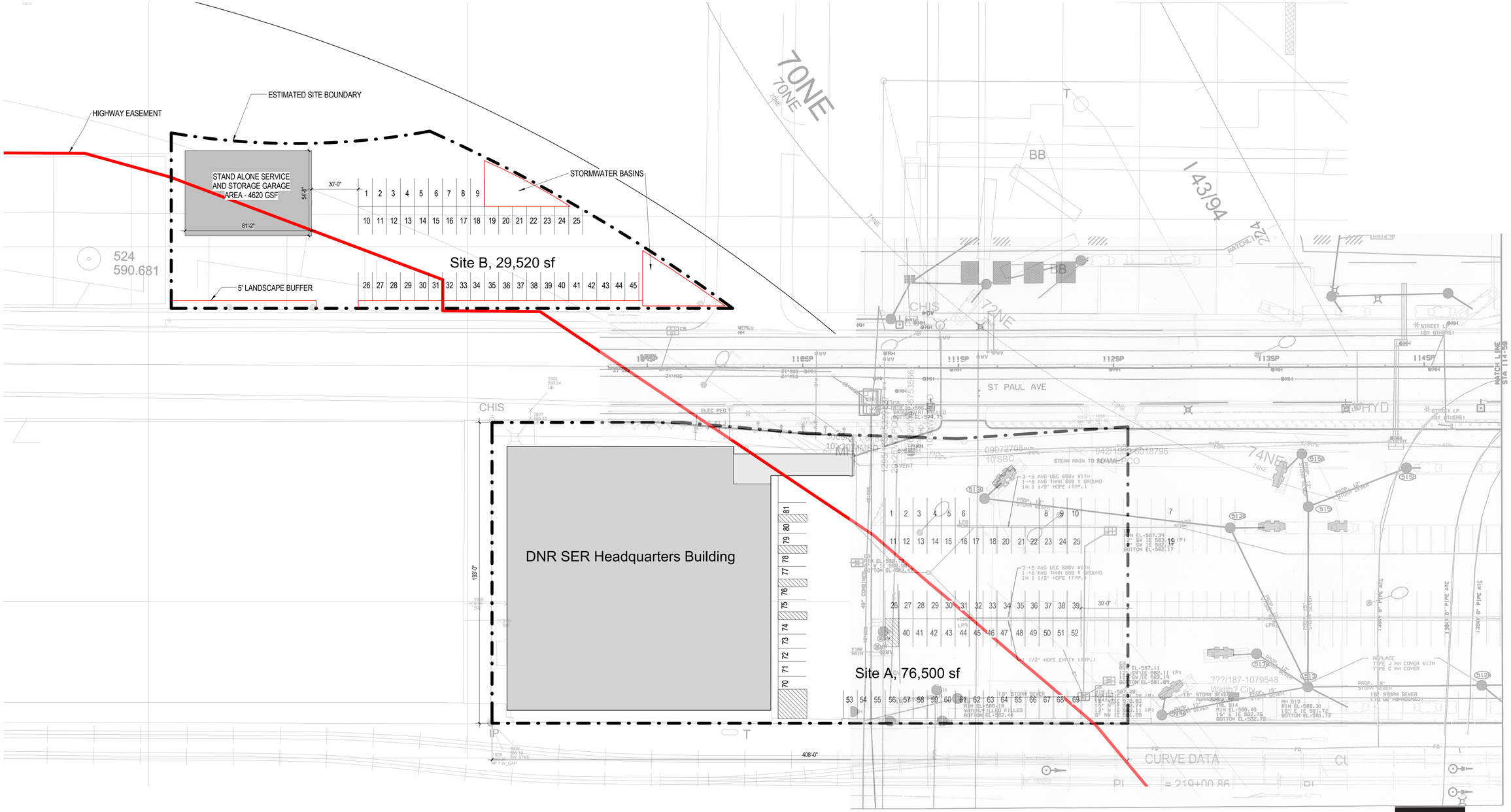
Existing lighting throughout the facility consists primarily of 2x4 parabolic troffers with T8 lamping.

G20 Site Improvements

It appears that the existing site was re-paved with asphalt paving over a stone base, re-striped, had new storm drainage installed, had new site lighting installed, and had a new perimeter fence installed shortly after the building was purchased by the DOT in 2006. The asphalt paving provides an "environmental cap" over the site. These site elements are in good condition and do not need any re-working to accommodate the DNR's functions.

Site Plan and Space Plans
Section 5

13i3L DNR SER Headquarters Building Study



DNR HEADQUARTERS

TWO SITE OPTION

0' 15' 30' 60'

SCALE: 1" = 30'

eppstein uhen : architects

01/28/14 000000-00

1 LEVEL 1 FLOOR PLAN
3/32"=1'-0"

PROGRAM:

LEVEL 1:

PRIVATE OFFICE (144 SF)	0
PRIVATE OFFICE (120 SF)	2
PRIVATE OFFICE (96 SF)	0
SHARED OFFICE	0
WORKSTATION (96 SF)	0
WORKSTATION (72 SF)	0
WORKSTATION (64 SF)	44
WORKSTATION (48 SF)	10
CONFERENCE ROOM (420 SF)	0
CONFERENCE ROOM (144 SF)	1

LEVEL 2:

PRIVATE OFFICE (144 SF)	1
PRIVATE OFFICE (120 SF)	4
PRIVATE OFFICE (96 SF)	4
SHARED OFFICE	1
WORKSTATION (96 SF)	18
WORKSTATION (72 SF)	16
WORKSTATION (64 SF)	31
WORKSTATION (48 SF)	13
CONFERENCE ROOM (420 SF)	2
CONFERENCE ROOM (144 SF)	3
FUTURE TENANT:	9,760 SF

These floor plans are preliminary, and while they show the spaces requested in the space program, these plans need further refinement, including switching the lobby and license sales area and the community conference room. The public meeting room has to be separated from the rest of the office for after-hours meetings, and the cash room should be accessible from the main lobby.

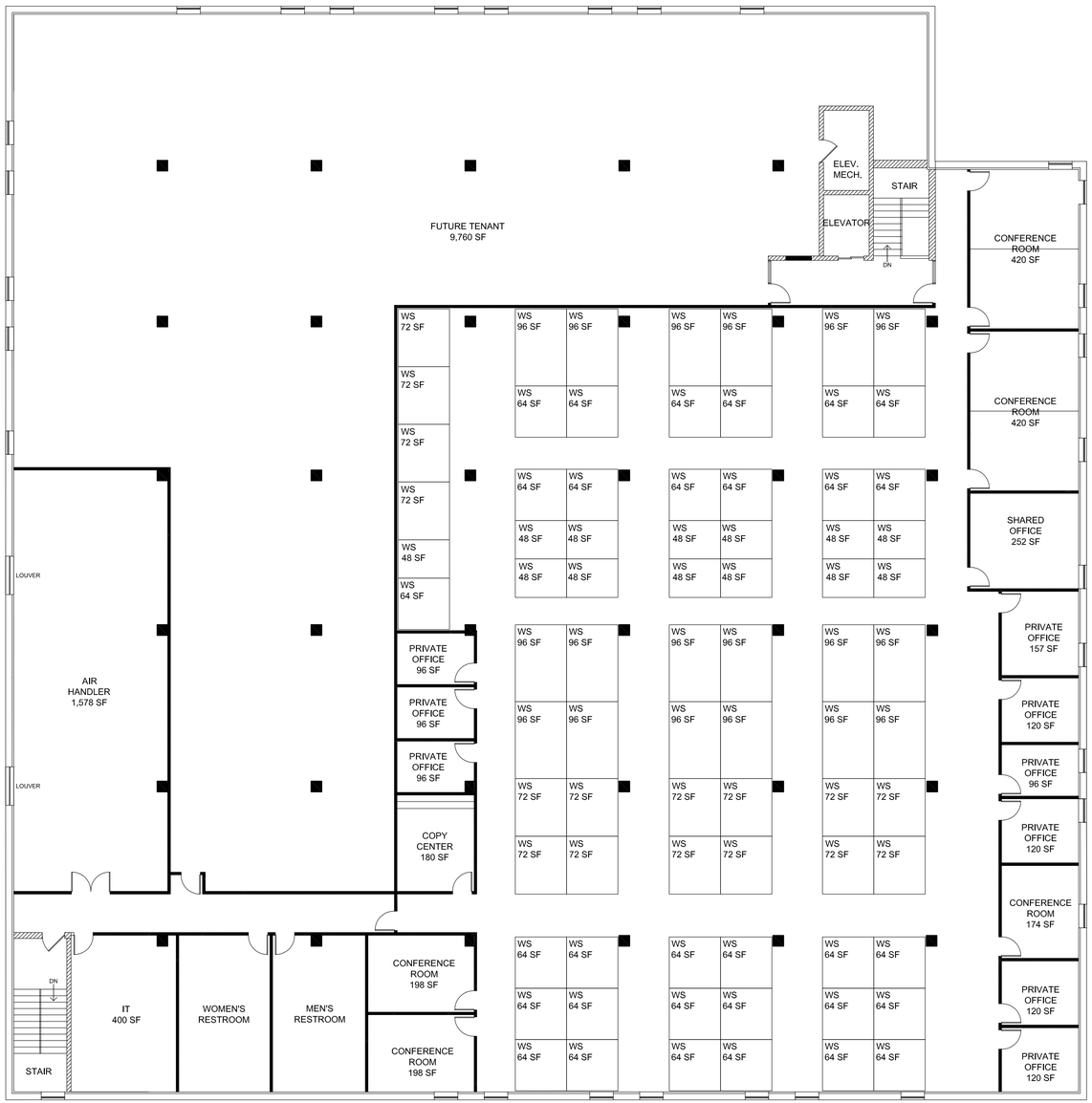
13i3L DNR SER Headquarters Building Study

1027 W ST PAUL - TEST FIT 3

Section 5, Site and Space Plans

eppstein uhen : architects

EUA PROJECT # 713450-01



1 **LEVEL 2 FLOOR PLAN**
3/32"=1'-0"

PROGRAM:

LEVEL 1:

PRIVATE OFFICE (144 SF)	0
PRIVATE OFFICE (120 SF)	2
PRIVATE OFFICE (96 SF)	0
SHARED OFFICE	0
WORKSTATION (96 SF)	0
WORKSTATION (72 SF)	0
WORKSTATION (64 SF)	44
WORKSTATION (48 SF)	10
CONFERENCE ROOM (420 SF)	0
CONFERENCE ROOM (144 SF)	1

LEVEL 2:

PRIVATE OFFICE (144 SF)	1
PRIVATE OFFICE (120 SF)	4
PRIVATE OFFICE (96 SF)	4
SHARED OFFICE	1
WORKSTATION (96 SF)	18
WORKSTATION (72 SF)	16
WORKSTATION (64 SF)	31
WORKSTATION (48 SF)	13
CONFERENCE ROOM (420 SF)	2
CONFERENCE ROOM (144 SF)	3
FUTURE TENANT:	9,760 SF

These floor plans are preliminary, and while they show the spaces requested in the space program, these plans need further refinement, including showing the shafts needed on the 2nd floor to get lab exhaust air from below up through the roof. Depending on final design layout, the vertical riser could be located in a second floor mechanical room or a separate chase could be provided. Shaft enclosure provisions should not be required as the building is a 2-story structure.

13i3L DNR SER Headquarters Building Study

1027 W ST PAUL - TEST FIT 3 Section 5, Site and Space Plans

eppstein uhen : architects

EUA PROJECT # 71345b-01

Construction Scope Recommendations
Section 6

13i3L, DNR SER Headquarters Building Study

General Scope of Work Description: For the purposes of this study and its associated budget estimates are based on the 41,093 gsf DNR SER HQ program and 4620 outbuilding program outlined in the 12D2W 10-10-12 New Facility Study. It was assumed that the entire existing building would be completely gutted, including removal of existing obsolete mechanical, electrical, plumbing, and fire protection systems, and all new interior partitions, finishes and MEPFP systems will be provided. Minimal work is needed on the existing masonry building shell. The existing entry canopy will remain, but canopy metal ceiling panels will be replaced and canopy painted surfaces will be prepped and re-painted. Existing windows will remain, and new windows will be added to the west side of the building. The existing roof and roof insulation will be replaced. Existing stairs will remain in place, with enclosure modifications needed to accommodate the DNR program. The existing elevator will be refurbished. The existing connector to the Gaslight Gallery building to the west will be removed.

Additionally, a 4620 gsf stand alone storage and repair garage, with a partially heated zone, will be constructed on a separate site across the street from the Headquarters Building (other sites are also being considered). This standalone building will have 10' wide x 10' high overhead doors, and will have 16' to the bottom of the roof deck. Roof framing will be steel bar joints, exterior walls are DFD compliant brick & CMU insulated cavity bearing walls, interior walls are CMU bearing walls. Foundations are augured concrete piers and pile caps, grade beams, and a structural slab on grade. Site construction includes a new asphalt parking lot, site lighting, site stormwater drainage, stormwater detention basins, and perimeter fence. It is assumed that this adjacent site has the same soil conditions at the existing site.

The existing asphalt parking lot provides an environmental cap to the site. The existing chain link fence around the site, the existing parking lot striping, and the existing parking lot lighting will remain as is.

Per original building drawings, this building is founded on pile caps and pilings. The first floor slab is a 2 way structural slab with perimeter beams. The upper superstructure is comprised of steel columns, girders, and beams. The second floor slab is concrete on metal deck. The roof deck is metal. Exterior walls are CMU with face brick (no air space) and 2 ½" metal studs with batt insulation in the cavity. Existing exterior windows are insulated glass in aluminum frames and will remain in place.

It has been surmised that this building was designed for one or two additional vertical levels, based on the columns stubbed through the roof, the roof framing matching the second floor framing, the two extra buttons on the elevator, and the future elevator shaft adjacent to the existing elevator, but no hard evidence of the structural capacity of the building for vertical expansion has been found. In order to confirm whether or not a vertical expansion is possible, either a load test of the existing piles is needed ($45,000 cost, 4 month

duration, several testing stations in place in an occupied building) or pile driving logs need to be found (the original piling contractor, Gillen, is no longer in business. No records were on file for pilings at city records.) This investigative work is outside the scope of this initial study, and the DNR does not need this additional space to meet their program in this building, but the DOT has expressed an interest in possibly constructing and occupying this additional space. General order of magnitude cost and scope information for infrastructure and testing for a vertical expansion is included in this study as an optional additional cost for general informational purposes.

The remodeling will be designed to LEED v4 ID+C Silver standards and comparable DFD Sustainability Standards and the standalone building will be designed to LEED v4 BD+C Silver standards and comparable DFD Sustainability Standards. Neither project will seek certification.

1.01 DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

A. 00 2113 - Instructions to Bidders: This project will follow DOA/DFD bidding, contracting, construction, and closeout procedures

2.01 DIVISION 01 -- GENERAL REQUIREMENTS

A. 01 3514 – Sustainability Guidelines Credit Summary: This project will use the DFD 01 81 13 Sustainability Guidelines to establish the project sustainability objectives. This project will not seek LEED Certification, but will be designed to a LEED silver level and follow DFD requirements 01 81 13.13 LEED for New Construction and Major Renovations.

B. 01 5213 - Field Offices and Sheds: This building will be vacant during the construction activities, and contractors have the option of creating temporary field offices within the building, or having them external. A standard DFD compliant job sign will be provided.

C. 01 5500 - Vehicular Access and Parking: The western 2/3rds of the site will be vacated during construction, and the contractors will have use of this portion of the site for parking, laydown, and staging. The contractor will be expected to leave the paving in an "as-found" condition, and will make repairs if necessary to comply with this. The Eastern 1/3 of the site will remain occupied by the DOT for parking lot use.

D. 01 7419 - Construction Waste Management and Disposal: This project will follow DFD requirements for Construction waste management, recycling and disposal. 75% of waste shall be recycled

E. 01 91 02 - General Commissioning Requirements: This project will follow DFD Level 2 Commissioning procedures.

2.02 DIVISION 02 -- EXISTING CONDITIONS

A. 02 4100 – Demolition: All interior finishes, partitions, ceilings, and MEP systems will be completely removed. Aggregate and mortar decorative facing on CMU above and below windows will be removed.

B. 02 32 1300 – Remediation: DFD Project 11i1M will define remediation scope for this project. Scope includes addressing material in and on the building. Soils outside the footprint of the building are considered to be contained by an environmental cap provided by the paving, and

therefore the soils and cap must be maintained and handled appropriately, and recapped if disrupted.

2.03 DIVISION 03 -- CONCRETE

A. 03 08 00 - Cast-in-Place Concrete: Piers, pile caps, grade beams, and slabs on grade at the separate garage/storage building will be cast in place concrete.

2.04 DIVISION 04 -- MASONRY

A. 04 0100 - Maintenance of Masonry: Existing face brick at the existing facility will be tuckpointed.

B. 04 08 00 - Cavity Wall Unit Masonry: Exterior walls at the separate garage/storage building will have face brick and unit masonry insulated cavity walls for durability and low maintenance.

2.05 DIVISION 05 -- METALS

A. 05 2100 - Steel Joist Framing: The separate garage/storage building will have steel bar joist roof framing with 05 3100 - Steel Decking.

B. 05 5000 - Metal Fabrications:

   A. The separate garage/storage building will have an internal steel ladder for roof access.

   B. Existing aluminum stair railings in the office building will be replaced to conform with current building code requirements.

   C. A Level 3 Alteration requires analysis of structural elements for current code required lateral load resistance. Currently, the existing CMU walls will address lateral load requirements. If the upper floors are added this will require stiffening of beam connections to columns and column connections to the structural first floor slab (K bracing).

2.06 DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

A. 06 1054 - Wood Blocking and Curbing: Both buildings will have wood blocking and curbing at the roof for parapets and mechanical equipment.

B. 06 4100 - Architectural Casework: There will be architectural casework at the Headquarters building

C. 06 6105 - Solid Plastic Vanity Counters and Lavatories: There will be solid surface material vanity counters with integral lavatories in the new toilet rooms at the headquarters building. The Customer Service Transaction Counter will be solid surface material.

2.07 DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

A. 07 08 00 DFD Cx for new storage bldg (and option for vert expansion)

B. 07 4264 - Metal Composite Material Wall Panels: Metal composite material wall panels and 1" rigid insulation will be installed where the aggregate and mortar wall facing will be removed.

C. 07 5323 - Ethylene-Propylene-Diene-Monomer Roofing (EPDM): The existing built up roof was replaced in 2009, and has a 10 year warrantee, which will expire shortly after this building project is completed, so this project will remove the existing roofing, insulation, and sheet metal flashings and copings, and install a new DFD compliant fully adhered black 60 mil EPDM roofing membrane over mechanically fastened tapered polyisocyanurate insulation with an average r value of 25 on

type X gyp board on 6 mil poly vapor barrier over existing metal deck. Flashing and copings will be new prefinished aluminum material. An identical system will be installed at the new separate garage/storage building.

D. 07 7200 - Roof Accessories: A roof hatch will be provided at the separate garage/storage building.

E. 07 7601 - Roof Pavers: Roof pavers will be provided at each building to create a route from the roof hatches to mechanical equipment.

F. 07 8000 – Fire and Smoke Protection: Existing spray fiber fire protection on steel elements will need to be patched where column/beam stiffener steel is installed, and where partitions, MEP systems, or other elements are removed from structural elements during demolition and construction.

G. 07 9005 - Joint Sealers: All exterior joint sealant at the existing building will be replaced.

2.08 DIVISION 08 -- OPENINGS

A. 08 08 00 DFD Cx

B. 08 1113 - Hollow Metal Doors and Frames, 08 1213 - Hollow Metal Frames, and 08 1416 - Flush Wood Doors, 08 7100 - Door Hardware: Each building will receive new frames, doors, and hardware. Sidelites will be provided at all offices and conference room doors.

C. 08 3313 - Coiling Counter Doors: Coiling counter doors will be provided at service counters.

D. 08 3613 - Sectional Doors: Electrically operated sectional overhead doors will be provided at the separate garage/storage building.

E. 08 4313 - Aluminum-Framed Storefronts: Existing aluminum framed storefronts and windows with insulated glass will remain in place. New aluminum windows with insulated frames will be installed at the first floor north wall openings in existing mechanical rooms where louvers are currently installed, and a cost option is included to provide new windows on the west wall in size and location to match the windows on the east face of the building.

F. 08 8300 – Mirrors: Mirrors will be provided in each bathroom

G. 08 9100 – Louvers: New louvers will be provided in the west wall where needed for new mechanical equipment.

2.09 DIVISION 09 -- FINISHES

A. 09 0561 - Common Work Results for Flooring Preparation: Existing flooring and adhesives will be removed in preparation for installing new flooring.

B. 09 2116 - Gypsum Board Assemblies, 09 2216 - Non-Structural Metal Framing: New partitions will be gyp board on metal stud framing. All partitions will be constructed full height to deck to reduce sound transfer. Cavities will be insulated to reduce sound transfer. Toilet room ceilings will be gyp board. There will be some gyp board soffits in the lobby areas.

D. 09 3000 – Tiling: Toilet room and locker room floors and wet walls will have ceramic tile installed.

E. 09 5100 - Acoustical Ceilings: Offices, conference rooms, storage rooms, and corridors will receive 2 x 2 tegular lay in tile in 9/16" grid. Labs will receive 2 x 4 vinyl covered gyp lay in ceilings.

F. 09 6500 - Resilient Flooring: Storage Rooms will receive 12 x 12 VCT flooring and vinyl cove base. Labs will receive "Medintech" type sheet vinyl flooring with welded seams and integral cove base.

G. 09 6813 - Tile Carpeting: Offices, conference rooms, and corridors will receive carpet tile and vinyl straight base.

H. 09 9000 - Painting and Coating: Gyp board walls, ceilings, & soffits will be painted. Exterior steel lintels will have rust removed, a zinc rich primer applied, and a high performance top coat applied.

2.10 DIVISION 10 -- SPECIALTIES

A. 10 1400 – Signage: 12 x 12 subsurface graphic laminated acrylic room identification signs will be provided for each room on both buildings. An illuminated metal monument sign will be provided on a concrete base at the north side of the building. A cast metal project information plaque conforming to DFD standards will be provided.

B. 10 2113.19 – Toilet Compartments: Stainless Steel overhead mounted partitions will be installed in all toilet rooms. Tolerance limitations for panel bending/warping (to be less than ¼" in 5' feet).

C. 10 2213 - Wire Mesh Partitions: Wire mesh partitions and gates will be installed in storage rooms that require partitions.

D. 10 2601 - Corner Guards: 48" high acrovyn covered metal corner guards will be provided at internal corridors leading to lab and storage areas.

E. 10 2624 - High Impact Wall Covering: High impact wall covering will be installed in storage rooms.

F. 10 2813 - Toilet Accessories: Hand dryers, paper towel dispensers, soap dispensers, toilet tissue dispensers, and sanitary napkin dispensers will be installed in all toilet rooms. Baby changing tables will be provided at public toilet rooms near the main entrance

G. 10 5129 - Lockers: Stainless Steel lockers and solid wood benches will be provided at each locker room. Tolerance limitations for panel bending/warping (to be less than ¼" in 5' feet).

H. 10 5523 - Mail Boxes: Mail sorting compartments will be provided at the mail room

I. 10 5613 - Metal Storage Shelving: Metal storage shelving will be provided at storage rooms.

J. 10 7500 – Flagpoles: The existing flagpole will remain

2.11 DIVISION 11 -- EQUIPMENT

A. 11 08 00 DFD Cx for fume hoods

B. 11 1319.13 - Loading Dock Levelers: A scissor lift type dock leveler will be provided at the separate garage/storage building.

C. 11 4000 - Modular Walk-In Freezers: Modular walk in freezers will be provided where indicated on the drawings.

D. 11 5300 - Laboratory Equipment, and 11 5313 - Laboratory Fume Hoods: Laboratory equipment and laboratory fume hoods will be provided at laboratory rooms.

2.12 DIVISION 12 -- FURNISHINGS

A. 12 2113 - Horizontal Louver Blinds: Horizontal louver blinds will be installed at all windows.

B. 12 3553.13 - Metal Laboratory Casework. Metal laboratory casework and chemical resistant tops will be provided at laboratory rooms.

C. 12 4813 - Entrance Floor Mats and Frames: New surface mounted entrance floor mats and frames will be installed at all vestibules.

2.14 DIVISION 14 -- CONVEYING EQUIPMENT

A. 14 08 00 DFD Cx for elevators

B. 14 2010 - Passenger Elevator Refurbishment: The existing hydraulic elevator will receive a complete mechanical, controls, and finish refurbishment in compliance with DFD standards.

2.15 DIVISION 21 -- FIRE SUPPRESSION

Utility Service

The existing water service currently enters the building on the north side, which is in an area of "prime" office space. The existing water service and sprinkler valves will be demolished, and a new water service will enter the building on the west side. A new double check valve, sprinkler riser, and control valves will be provided to serve the building.

General

The fire sprinkler systems shall be designed and installed in conformance with NFPA 13 (NFPA 13R is not applicable), Wisconsin Building Code and Fire Code for City of Milwaukee.

Section 21 05 00 Common Work Results for Fire Protection

Operation and Maintenance Manuals

Provide operation and maintenance manuals for all Fire Protection systems.

Owner Training

Provide multiple owner training periods (substantial completion, three months post occupancy and six months post occupancy). All training sessions shall be digitally recorded.

Record Drawings

Provide accurate as-built record drawings.

Section 21 08 00 Commissioning of Fire Suppression

All Fire Suppression systems will be commissioned to DFD Level Two Standards.

Section 21 10 00 Water-Based Fire Suppression Systems

Description

Demolish existing sprinkler risers, valves, mains, branch lines, and sprinkler heads complete. All new sprinkler piping and components shall be installed for this remodel. The existing fire department connection will be reused and tied into the new system.

Provide a full building wet sprinkler system conforming to NFPA 13. Connection to water service located in mechanical room and install double

check valve and sprinkler zone riser for first floor. Locate second floor sprinkler control valve on second floor as required. Building square footage is approximately 56,200 sf. Provide a dry sprinkler system to protect the canopy.

Provide semi-recessed chrome plated sprinkler heads and exposed upright sprinkler heads as required in the building.

Provide dry-pipe sprinkler system for entrance canopy area. Locate dry valve and air compressor in mechanical room and coordinate auxiliary drain locations with Owner.

Pipe and Fittings

Carbon steel pipe, black, thickness per NFPA 13, conforming to ASTM A53, A135, A795. No light wall pipe less than Schedule 10 shall be used.

Hot dipped zinc coated (galvanized) finish on piping and fittings shall be used in drypipe systems, piping exposed to weather and piping exposed to corrosive environment. Thread or cut groove hot dipped zinc coated pipe ends for fitting connections.

Provide pipe hangers or strut connected to structural elements to support piping. Space Hangers per NFPA 13.

Testing

In accordance with the Standard for Inspection, Testing, and Maintenance of Water Based Sprinkler Systems as defined in NFPA. No compressed air or gas shall be used in testing CPVC piping and fittings.

Hydro-statically pressure test the fire sprinkler system piping as required in NFPA 13. Keep records of all testing for submission in Operation and Maintenance Manuals.

Sprinklers

Manufacturers: Central Sprinkler, Grinnell, Reliable, Star Sprinkler, Victaulic, or Viking.

Fusible link or glass bulb type, cast brass or bronze construction. Provide heads with nominal 1/2" discharge orifice except where greater than normal density requires large orifice.

Select fusible link or glass bulb temperature rating to not exceed maximum ambient temperature rating allowed under normal conditions at installed location. Provide ordinary temperature (165 degree) fusible link or glass bulb type except at skylights, sealed display windows, unventilated attics and roof spaces, over cooking equipment, adjacent to diffusers, unit heaters, uninsulated heating pipes or ducts, mechanical rooms, storage rooms, or where otherwise indicated.

Finished Areas: Semi-recessed, sprinkler heads in common spaces and living areas. Coordinate color of heads with architect, do not field paint.

Unfinished Areas: Plain bronze, upright or pendant sprinkler with solder link or glass bulb. Use higher temperature rated sprinkler heads in areas near heat sources, elevator equipment rooms, and elevator shafts.

Densities and hazard levels to be determined based on space usage.

Locate sprinklers maintaining clearances from obstructions, ceilings, and walls. Install sprinklers level in locations not subject to spray pattern interference.

Fire protection piping shall be fully coordinated with all trades and building components.

Fire protection piping cannot interfere with building function.

Sprinklers shall be centered in ceiling panels and tiles where applicable.

2.16 DIVISION 22 -- PLUMBING

Utility Service

The existing water service currently enters the building on the north side, which is in an area of "prime" office space. The existing water service and water meter will be demolished, and a new water service will enter the building on the west side. A new water meter will be provided to serve the building.

The existing sanitary and storm sewers entering the building under the slab will remain and be reused.

General

The plumbing systems shall be designed and installed in conformance with Wisconsin Uniform Plumbing Code (Wisconsin Administrative Code, Chapters SPS 382 and SPS 384.), along with meeting all DFD design guidelines.

Section 22 05 00 Common Work Results for Plumbing

Operation and Maintenance Manuals

Provide operation and maintenance manuals for all Plumbing systems.

Owner Training

Provide multiple owner training periods (substantial completion, three months post occupancy and six months post occupancy). All training sessions shall be digitally recorded.

Record Drawings

Provide accurate as-built record drawings.

Section 22 05 23
General Duty Valves for Plumbing Piping

Valves

Shutoff Valves:
Ball valve, bronze body, two piece, conventional port, Nibco, Series 580. All metallic valves shall be used for all pipe materials.

Balancing Valves:
Bell & Gossett "Circuit Setter" bronze body balancing valve with sweat or threaded ends, calibrated brass orifice, integral adjustment knob with calibrated scale, memory stop indicator, drain tapping and differential pressure metering connections.

Check Valves:
Swing check, bronze body, resilient seat, Nibco, Series 413.

Valve Installation
All valves with screwed ends shall be installed using "Teflon" tape applied on male portion of piping fitting.

Each individual fixture or piece of equipment shall have an independent shut-off valve adjacent to fixture in addition to the required branch shut-off. Where valves are installed in walls an access panel shall be provided.

Valve shut-off full size of branch tank-off to supply stack or fixture group.

Provide valved drains at low points of systems as required or directed. All piping shall be arranged to drain through valved drains.

Section 22 07 00
Plumbing Insulation

Insulation
Fiberglass with kraft-paper jacket. Insulate horizontal storm and all domestic water pipes above ground. Note that plenum wrap is required on piping not rated for plenum spaces.

Minimum Insulation Thickness:

	PIPE SIZE			
SYSTEMS	1″ or less	1-1/4″ to 2″	2-1/2″ to 4″	5″ and up
Storm Drain	---	---	1″	1″
Domestic Cold Water	1/2″	1/2″	1″	1″
Domestic Hot Water	1″	1″	1-1/2″	1-1/2″
Domestic Hot Water Return	1″	1″	1-1/2″	1-1/2″

Section 22 08 00
Commissioning of Plumbing

All Plumbing systems will be commissioned to Level Two DFD standards.

Section 22 10 00
Facility Water Distribution

Water Distribution

Existing Office Building:

Demolish existing water service at the north side of the building complete. The new water service will be relocated to the west side of the building.

A new combined domestic water and fire protection water service shall be brought to within 5 feet of the existing Office Building by the site utility contractor. Provide connection to water service and enter the building in the new mechanical room. Install a water meter and distribute cold hard water in the ceiling space to the water softener and plumbing fixtures requiring cold water.

Provide a water softener to feed cold soft to the water heater, and provide a sealed combustion gas-fired water heater. Gas water heater shall be a minimum of 95% efficient. Distribute hot water in the ceiling space to serve all fixtures requiring hot water.

Provide cross connection prevention devices for all connections to equipment.

New Storage Garage:

A new domestic water service shall be brought to within 5 feet of the New Storage Garage by the site utility contractor. Provide connection to water service and enter the building in the mechanical room. Install water meter and distribute cold hard water in the ceiling space to the water softener and fixtures requiring cold water.

Provide a water softener to feed cold soft to the water heater, and provide an electric water heater. Distribute hot water in the ceiling space to serve all fixtures requiring hot water.

Provide cross connection prevention devices for all connections to equipment.

Hot Water Re-Circulation System

Install return system including check valves, balancing valves, and pumps. Pitch and grade all lines as required to ensure satisfactory circulation.

Balance return flow to provide continuous circulation throughout entire system. Test and demonstrate to A/E upon request.

Pipe and Fittings

Water Service:

Ductile iron pipe, mechanical or push on joint, thickness class 53 conforming to AWWA C-151 with standard thickness cement mortar lining

AWWA C-104; ductile iron or gray iron mechanical joint cement mortar lined fittings, Class 250, AWWA C110; ductile iron restrained joint compact fittings, class 350, AWWA C-153; rubber gasket joints with non-toxic gasket lubricant, AWWA C-111. Joints shall have ASTM A506 steel clamps and straps for restraints with ASTM A307 steel bolts and ASTM A575 steel rods.

Valves for Water Service:
Valves for water service shall be provided by site utility contractor.

Interior Above Ground:
Copper tube, Type L, hard temper, ASTM Specification B88, Wrought copper sweat fittings and 95/5 solder joints tin-antimony, or other lead free solder.

Wrought copper or cast bronze fittings, grooved ends, joined with mechanical couplings, rubber gasket seal, Victaulic style 606.

Install a union or flange, as required, at each automatic control valve and at each piping specialty or piece of equipment which may require removal for maintenance, repair, or replacement. Where a valve is located at a piece of equipment, locate the flange or union connection on the equipment side of the valve. Concealed unions or flanges are not acceptable.

Testing
Test water piping before connecting fixtures with hydrostatic pressure of 100 psi without loss of pressure for at least two hours.

Upon completion of the water distribution system, test all valves to insure their full opening and flush out the system progressively by opening drain valves and building outlets and permitting the flow to continue from each until the water runs clear.

Disinfecting
Provide chlorine disinfecting. Test for presence of disinfecting agent at remote locations to ensure the disinfecting agent has reached throughout the domestic water systems. Other approved disinfecting methods may be used with prior approval of the Architect and local authorities.

Test for bacteria after disinfecting complete and domestic water system flushed.

Section 22 13 00
Facility Sanitary Sewerage

Sanitary Drain and Vent
Demolish existing waste and vent piping complete except for existing locations of vents through the roof. The existing sanitary sewer under the slab will need to be inspected by camera and determined if suitable for remodel.

Provide a gravity drainage system for waste discharge from plumbing fixtures and floor drains. The drain and vent piping serving the new fixtures will tie into the existing gravity sewer under the floor slab.

Provide a sanitary vent system to protect the traps. The vents shall connect to a header pipe and terminate through the roof at the existing locations.

Changes in direction of drainage piping shall be made by the appropriate use of 45 degree wyes, long or short sweep 1/4 bends, 1/6, 1/8, 1/16 bends or combination.

Fittings shall be installed to make for the least possibility of stoppage. All horizontal drainage piping less than 3 inches shall be pitched a minimum of 1/4 inch per foot or run. Piping 3" to 10" shall be pitched a minimum of 1/8" per foot of run.

The space above suspended ceilings may be return plenum to move air to the Air Handling Units. Properly protect plastic and other combustible materials installed in the plenum space, or use all metallic piping.

Pipe and Fittings

Cast iron, soil or no-hub, service weight, ASTM A74 or CISPI 301, with rubber gasket ASTM C564.

PVC, Schedule 40, ASTM D-1784 PVC-DWV socket fittings, ASTM D-2665 with PVC solvent cement, ASTM D-2564. Protect with plenum rated wrap where applicable.

Pipe Joints

Install cast iron pipe and fittings, hubless pattern, as recommended by CISPI in their publication "Installation Suggestions for Cast Iron No-Hub Pipe and Fittings".

Prepare PVC pipe ends as recommended by manufacturer. Use a P-70 type primer (for PVC) and a PVC solvent cement appropriate to the pipe size and temperature range.

Drains and Cleanouts

By ACO, Josam, J.R. Smith, Sioux Chief, Wade, Watts, or Zurn.

Floor Drain (finished areas): Provide cast iron body, combination membrane clamp (for above grade), adjustable collar, and nickel bronze strainers for all floor drains and cleanouts in finished areas. 5" round strainer in floors without tile, 5" square strainer in floors with tile; Zurn ZN415-B.

Floor Drain (unfinished areas): Provide cast iron body, combination membrane clamp (for above grade), nickel bronze iron strainers for all floor

drains in mechanical rooms. 9" heavy duty deep flange round strainer; Zurn ZN508.

Cleanouts:
Provide and install cleanouts as required by Code.

Testing
Hydrostatic test sanitary piping to 10 feet water column or with compressed air with no leaks per the Wisconsin Plumbing Code.

Vent Termination
All vent pipes passing through roof shall be covered with sheet lead weighing not less than 4 pounds per square foot. Same to be well flashed onto the roof, 12" all around pipe. Vent pipes to extend 12" above roof.

Section 22 14 00
Facility Storm Drainage

Storm Drainage and Clearwater Drain and Vent
Existing Office Building:
Demolish existing roof drain storm piping and Clearwater waste and vent piping complete except for existing locations of vents through the roof. The existing storm sewer under the slab will need to be inspected by camera and determined if suitable for remodel.

Provide a gravity drainage system for storm drainage from existing roof drain locations. Provide a clearwater waste system and drains serving cooling coil condensate from HVAC equipment. Connect clearwater waste drainage to storm drainage main at one location.

Provide a clearwater vent system to protect the traps. The vents shall connect to a header pipe and terminate through the roof at the existing locations.

Changes in direction of drainage piping shall be made by the appropriate use of 45 degree wyes, long or short sweep 1/4 bends, 1/6, 1/8, 1/16 bends or combination.

Fittings shall be installed to make for the least possibility of stoppage. All horizontal drainage piping less than 3 inches shall be pitched a minimum of 1/4 inch per foot or run. Piping 3" to 10" shall be pitched a minimum of 1/8" per foot of run.

The space above suspended ceilings may be return plenum to move air to the Air Handling Units. Properly protect plastic and other combustible materials installed in the plenum space, or use all metallic piping.

Pipe and Fittings
Cast iron, soil or no-hub, service weight, ASTM A74 or CISPI 301, with rubber gasket ASTM C564.

PVC, Schedule 40, ASTM D-1784 PVC-DWV socket fittings, ASTM D-2665 with PVC solvent cement, ASTM D-2564. Protect with plenum rated wrap where applicable.

Pipe Joints

Install cast iron pipe and fittings, hubless pattern, as recommended by CISPI in their publication "Installation Suggestions for Cast Iron No-Hub Pipe and Fittings".

Prepare PVC pipe ends as recommended by manufacturer. Use a P-70 type primer (for PVC) and a PVC solvent cement appropriate to the pipe size and temperature range.

Drains and Cleanouts

By Josam, J.R. Smith, Sioux Chief, Wade, Watts, or Zurn.

Floor Drain (finished areas): Provide cast iron body, combination membrane clamp (for above grade), adjustable collar, and nickel bronze strainers for all floor drains and cleanouts in finished areas. 5" round strainer in floors without tile, 5" square strainer in floors with tile; Zurn ZN415-B.

Floor Drain (unfinished areas): Provide cast iron body, combination membrane clamp (for above grade), nickel bronze iron strainers for all floor drains in mechanical rooms. 9" heavy duty deep flange round strainer; Zurn ZN508.

Cleanouts:

Provide and install cleanouts as required by Code.

Testing

Hydrostatic test sanitary piping to 10 feet water column or with compressed air with no leaks per the Wisconsin Plumbing Code.

Vent Termination

All vent pipes passing through roof shall be covered with sheet lead weighing not less than 4 pounds per square foot. Same to be well flashed onto the roof, 12" all around pipe. Vent pipes to extend 12" above roof.

Section 22 42 00
Commercial Plumbing Fixtures

Plumbing Fixtures

Fixtures shall be low flow type as follows:

- Lavatory Faucets: 0.5 gpm
- Sink Faucets: 1.5 gpm
- Water Closets: 1.28 gpf
- Urinals: 0.125 gpf
- Showers Heads: 1.5 gpm

Solid Surface Material Lavatories:
Provided by Division 6.

Faucet Fittings:
American Standard, Chicago Faucet, Kohler, Moen Commercial, Speakman, Symmons, T&S Brass, or Zurn.

Stainless Steel Sinks:
Advance, Elkay, Just, or Kohler.
Acid Resistant Lab Sinks:
Durcon, Orion, Hemco, Epoxyn.

Mop Basins:
Mustee, Crane/Fiat, or equal.

Flush Valves:
Delany, Sloan, or Zurn.

Electric Water Coolers:
Elkay, Halsey-Taylor, Haws, Oasis, or Sunroc.

Showers:
Fixture: Solid surface material base and wall panels.

Valve and Trim: American Standard, Chicago Faucet, Kohler, Leonard, Powers, Speakman, or Symmons.

Drains, Traps, Stops, and Supplies:
Brass Craft, Chicago Faucet, Dearborn, EBC, Keeney, Kohler, McGuire, or Zurn.

Hose Bibbs & Water Hydrants:
Interior faucet or exterior hydrant with hose connection. Include hose applied back flow device, ASSE 1011 or ASSE 1019. Chicago, J.R. Smith, Woodford, or Zurn.

Section 22 30 00
Plumbing Equipment

Plumbing Equipment
Provide commercial grade high efficiency plumbing equipment.

Water Softeners:
If the relative hardness of treated City of Milwaukee water is not acceptable to the User Agency and Water softening systems are desired, equipment, and components shall be manufactured by Bruner, Culligan, Diamond, Hellenbrand, North Star, or Marlo.

Mineral/Resin Tank: Fiberglass reinforced tank, cation exchange resin, automatic regeneration, meter actuated, internal bypass, flow control backwash, 150 psi operation, N.S.F. approved, U.L. listed.

Valve: Solid brass type, with hydraulically balanced piston valves, dual drive motors, backwash flow control, automatic bypass and sample clock.

Brine/Salt Storage Tank: Polyethylene tank construction, float system to limit brine, with salt platform and separate well for brine valve. Include cover on tank assembly.

Regeneration Control: Delayed regeneration system set to regenerate on off hours. 120 volt, A.C. with 3-prong plug and cord. Set regeneration for early a.m. operation.

Domestic Water Heaters

High Efficiency Commercial Gas Fired Water Heater:
Manufacturers: A.O. Smith, Bradford White, Lochinvar, Phoenix, Rheem.

Gas Fired, storage type, gas-fired, sealed combustion, insulated and jacketed, 96% minimum efficiency, T&P relief valve, drain valve.

Gas-fired water heaters shall be sealed combustion, with PVC intake and exhaust. Route intake and exhaust through roof or out sidewall of building in location where not to cause a nuisance.

Commercial Electric Water Heater:
Manufacturers: A.O. Smith, American, Bradford White, Lochinvar, Rheem, Ruud, State.

Type: Electric storage domestic water heater. Design to be UL listed with 3 year commercial use tank warranty and 1 year parts warranty.

Efficiency:	20 gallons and <12 kW	0.94 Minimum Energy Factor
	>30 gallons and <12 kW	0.93 Minimum Energy Factor

Tank: Steel glass lined tank rated for 150 psig complete with removable magnesium anode rod, plastic diffuser type dip tube, inlet and outlet heat trap fittings, minimum R-20 polyurethane foam insulation, painted steel jacket, drain valve and temperature and pressure relief valve.

Elements: Dual heating elements to be replaceable threaded low watt density incoloy sheath with adjustable thermostat control, energy cutoff and wired for non-simultaneous operation.

Domestic Water Circulating Pump

Pump shall be manufactured by Armstrong, Bell & Gossett, Taco, or Thrush.

Pump shall be 120 volt, single phase, 3450 RPM, in-line bronze pump, with brass impeller.

Time Control: Time controls shall be manufactured by Paragon Electric Co. or approved equivalent. Provide a 120 VAC electronic programmable time controller to control each circulating pump. Unit shall include seven day, 365 day per year programmable features and rechargeable battery backup; Paragon Electric Co. model number EC72.

Motor Starter: Starters shall be manufactured by Allen-Bradley, Cutler-Hammer, G.E., or Square D. Provide a single phase manual motor starter switch for starting and controlling each pump, with internal overload protection, general purpose enclosure, neon pilot light and HAND-OFF-AUTO selector switch; Allen-Bradley Model 600-TAX142.

Elevator Sump Pump (Simplex)
Equal to Weil model 1409, 1/3 HP, 30 gpm @ 20' HD.

Include Alderon model 7001 high water alarm w/ dry contacts for connection to the building management system.

2.17 DIVISION 23 -- HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

Utility Service

The feasibility of a geothermal system will be investigated if this project proceeds, but system costs will be higher than average due to soils contamination and restricted amount of site area available due to site easements and underground utilities. There are (2) conventional utility options for providing building heating:

A. An upgraded natural gas service could be provided for the building. The HVAC contractor will be required to pay all required utility connection fees and costs associated with the new utility service.

B. WE Energies does have a high pressure steam service in close proximity to the building. High pressure steam from WE Energies could be routed to the building for building heating purposes.

Ventilation

The building will be ventilated to Wisconsin Department of Safety and Public Services Requirements and Wisconsin Department of Administration Division of Facilities Development standards.

If the project pursues LEED certification, building ventilation shall also comply with ASHRAE Standard 62 Standards.

Energy Conservation

Equipment efficiencies and designs shall meet the latest edition of ASHRAE 90.1.

Heat Generation

The conceptual building heating load is approximated at 2,500 MBH. There are (2) options for providing building heating:

A. Hot Water Heating Boilers
Utilize multiple high efficiency natural gas fired condensing boilers to provide building heating.

B. WE Energies Steam Utility
Utilize a high pressure steam utility provide by WE Energies for building heating. High pressure steam would be brought into the building, reduced to low pressure and used for building heating.

Low pressure steam would be pipe directly to building air handlers for heating purposes.

Steam would be converted to hot water and distributed to the building (terminal heating devices, VAV terminals, etc.) via base-mounted centrifugal pumps.

Steam condensate would be cooled by building domestic cold water and wasted into the sanitary drain.

During the next phase of the project, a life cycle cost analysis should be completed for both options to determine the economic feasible solution while maintaining the intent of both the Division of Facilities Development and User Agency.

It should also be noted that WE Energies does not have a condensate return main near the building. All steam consumed for building heating will need to be cooled (via domestic cold water) and wasted down the sanitary drain.

Based on User Agency discussions and for study estimating purposes, it is assumed that a new hot water boiler system will be installed for building heating.

Cooling Generation

Building cooling will be provided by a water or refrigerant cooled rotary chiller located inside the building. The conceptual cooling load is approximated at 175 tons.

Cooling Heat Rejection:

As the building is in very close proximity to a major interstate and interstate interchange, the following methods of chiller heat rejection should closely be reviewed.

A. Open Cooling Tower
An open loop condenser water system could be installed with cooling tower on the roof. Consideration should be taken on maintaining the cleanliness of the open loop system based on the location of the building and adjacent interstate.

B. Closed Loop Fluid Cooler
A closed loop condenser water system could be installed with the fluid cooler on the roof. This option would keep the condenser water clean, but would be less efficient than the open loop cooling tower. The fluid cooler evaporative water would still be "open" and subject to a dirt contamination.

C. Closed Loop Refrigerant Condenser
A remote refrigerant condenser could be installed on the roof to provide chiller heat rejection via a refrigerant loop. This option would be more efficient than the closed loop fluid cooler, but would result in more use of refrigerant on the project. Additionally, there should be close attention paid to the location of the chiller vs. location of the condensing unit on the roof in regards to acceptable refrigerant piping practices and installation.

For purposes of this study, a closed loop fluid cooler is assumed to be installed.

Building Heating, Ventilation and Air Conditioning

Air Handlers - Variable Air Volume System
The building would include either one (one air handler services the entire building) or two (two air handlers serve the building in a possible first floor/second floor arrangement or manifold arrangement) indoor air handling systems to provide building heating, cooling and ventilation.

Conceptual total building airflow is approximated at 50,000 cfm.

The systems would include return fans.

The air handling units would be located on the Second Floor.

Steel fire proofing should be investigated to determine if a return air plenum can/should be used since the air will be exposed to the fire proofing and that the fireproofing is not flaking or putting dust into the air stream.

Zone Temperature Control - Variable Air Volume Zones
Zone temperature control would be provided by new VAV air terminals with hot water reheat coils. Each hot water reheat coil shall have an access panel up and downstream of the heating coil. Heating coils shall be sized for use with low temperature (140F – 150F) hot water supply. Each thermal zone will include a 2-way DDC temperature control valve.

Energy Recovery Ventilation
An air to air energy recovery ventilator would be provided to recover energy from general building exhaust if proven to be economically viable.

Laboratories

Laboratories to include fume exhaust hoods, general space exhaust and associated exhaust fan(s) as required by the final building program. Exhaust fans should be evaluated for type and redundancy based upon final building program.

If enough laboratory exhaust is present and used continuously, a run around glycol heat recovery loop could be used if economically viable.

Humidification

The need for humidification for laboratory areas that are humidity sensitive should be reviewed carefully. Humidifiers add maintenance cost and energy costs. Building wide humidification is not required.

Heating of Non-Ventilated Areas: These areas are generally entries, corridors, storage rooms, mechanical rooms and similar areas. These areas of the building will be heated by hot water cabinet unit heaters, convectors, unit heaters.

GENERAL HVAC SYSTEM DESCRIPTION FOR STORAGE GARAGE

Description The storage garage will consist of both heated maintenance space and unheated storage garage.

Utility Service Provide a natural gas service for the building. The HVAC contractor will be required to pay all required utility connection fees and costs associated with the new utility service.

Building Ventilation The building will be ventilated to Wisconsin Department of Safety and Public Services Requirements and Wisconsin Department of Administration Division of Facilities Development standards for vehicle storage or repair building, as determined by the final design.

If the project pursues LEED certification, building ventilation shall also comply with ASHRAE Standard 62 Standards.

Ventilation (both general exhaust air and make-up air) will be provided to the building.

Make-up air provided to the heated portion of the building will be tempered via natural gas heating (either direct or indirect fired make-up air unit).

Building Heating A portion of the storage building will be heated by either natural gas fired infra-red overhead heaters or gas fired forced air unit heaters. The remaining building will be unheated.

Building Cooling

The storage building will not be mechanically cooled.

EQUIPMENT DESCRIPTIONS

All equipment and equipment installations shall be consistent with Wisconsin Department of Administration (DOA), Division of Facilities Development (DFD) guidelines, standards and expectations.

Section 23 05 00
Common Work Results

Operation and Maintenance Manuals
Provide operation and maintenance manuals for all HVAC systems.

Owner Training
Provide multiple owner training periods (substantial completion, three months post occupancy and six months post occupancy). All training sessions shall be digitally recorded.

Record Drawings
Provide accurate as-built record drawings.

Section 23 05 14
Variable Frequency Drives

Variable frequency drives shall be provided for all supply and return air fans and all chilled water and hot water building distribution pumps.

Section 23 05 15 / 23 05 23
Hydronic System Accessories

Systems to include bladder expansion tank, make-up water, air separator and pressure relief valve.

Section 23 05 93
Testing, Adjusting and Balancing

The heating, ventilating and air conditioning systems will be tested, adjusted and balanced in accordance with AABC or NEBB Standards.

An independent third party, with AABC and NEBB certification shall perform all testing and balancing.

Section 23 07 00
Insulation

Hot water, condensate piping, ductwork and equipment shall be insulated to minimum ASHRAE 90.1-2007 standards including:

- Heating Hot Water: 1.5" Rigid Fiberglass with All Service Jacket.
- Chilled Water: 1.5" Polyisocyanurate with All Service Jacket
- Glycol Water: 1.5" Polyisocyanurate with All Service Jacket on interior piping.
- Outside Air Ducts: 2" Rigid Fiberglass with FSJ.
- Mixed Air Ducts: 2" Rigid Fiberglass with FSJ.
- Concealed Supply Ducts: 1½" Flexible Fiberglass with FSJ.

Section 23 08 00
Commissioning

All HVAC systems will be commissioned to Level Two DFD standards.

Section 23 09 23
Control System Description

The building will use a full Direct Digital Building Automation system (BAS) with electronic actuation. The control system includes:

- Installation of all control wiring and conduit.
- Airflow monitoring stations.
- Motorized dampers and actuators.
- Temperature control valves and actuators.
- Sensors.

The building will use a web-based direct digital control (DDC) system with electronic actuation for all valves and dampers.

The system will have electronic room sensors with local setpoint adjustment ability within the parameters set through the DDC system computer terminal. The system will have the ability to "lockout" local user adjustment.

The DDC system will also have the ability to adjust setpoints of the system equipment and report alarm conditions to the system computer terminal and to send alarms to remote locations thru a modem or internet connection.

The DDC system will also be specified to provide control of corridor lighting and exterior lighting. The number of zones and areas of lighting control will be determined as the design progresses.

Section 23 11 00
Facility Fuel Piping

Provide all gas piping, regulators and venting. Regulators to be provided to reduce pressure. Provide shut off valves and direct legs at each appliance. Appliances include:

- Hot water heating boilers
- Domestic hot water heater
- Gas fired humidifiers (including gas for future humidifier).

2" and Smaller: ASTM A53, type E or S, standard weight (schedule 40) black steel pipe with ASTM A197/ANSI B16.3 class 150 black malleable iron threaded fittings or ASTM A234 grade WPB/ANSI B16.9 standard weight, seamless, carbon steel weld fittings.

2-1/2" and Larger: ASTM A53, type E or S, standard weight black steel pipe with ASTM A234 grade WPB/ANSI B16.9 standard weight, seamless, carbon steel weld fittings.

Section 23 21 13
Hydronic Piping

<u>Hot Water Distribution</u>

All hot water piping shall be metallic with soldered, threaded or welded joints.

The use of mechanically coupled joints will not be allowed.

Chilled Water Distribution
All chilled water piping shall be metallic with soldered, threaded or welded joints.

The use of mechanically coupled joints will not be allowed.

Section 23 21 23
Hydronic Pumps

Hot Water Distribution
Two base mounted hot water pumps, each sized for 100 percent of the required hot-water flow shall be installed to distribute hot water to air handler coils, reheat coils and terminal heating units.

Chilled Water Distribution
Two base mounted chilled water pumps, each sized for 100 percent of the required chilled-water flow shall be installed to distribute chilled water to air handler cooling coils.

Glycol/Condenser Water Distribution
Two base mounted chilled water pumps, each sized for 100 percent of the required chilled-water flow shall be installed to distribute glycol water from the fluid cooler to chiller.

Note that no condenser water pumps would be required with the use of a remote refrigerant condenser.

Section 23 22 13
Steam Piping

Steam Distribution
All steam piping shall be metallic schedule 40 with threaded or welded joints.

The use of mechanically coupled joints will not be allowed.

Section 23 23 00
Refrigerant Piping

Refrigerant Piping
All refrigerant piping shall be ASTM B88Type L hard drawn and marked ACR for refrigerant use.

Provide all required refrigerant piping accessories.

Section 23 25 00
Chemical Treatment Systems

Provide water filters and chemical treatment systems for chilled water, hot water and glycol water hydronic systems.

Glycol systems shall include a glycol management system.

Section 23 31 00
HVAC Ducts and Casings

All above ground ductwork shall be galvanized sheetmetal manufactured in accordance with SMACNA and DFD guidelines.

Ductwork in high moisture areas shall be aluminum.

Ductwork will be internally lined only were needed for noise attenuation if attenuators can't be used.

All annular spaces around ductwork shall be filled and sealed with escutcheon plate.
All ductwork shall be sealed and pressure tested.

Section 23 33 00
Air Duct Accessories

Sound Attenuators
Sound attenuators to be provided in air handler discharge, return fan inlets and exhaust fan inlets.

Roof Hoods
Provide roof hoods to be used for either air handler economizer exhaust or air handler fresh air intake.

Louvers
Provide wall louvers for either air handler economizer exhaust or air handler fresh air intake.

Balance Dampers
All air devices shall have a balance damper.

Section 23 34 00
HVAC Fans

Provide ventilation fans for electrical room (inline) chiller room (inline) and laboratory/fume hood exhaust (laboratory exhaust fan).

Section 23 36 00
Air Terminal Units

Supply Air Terminals
Supply air terminals (VAV terminals) shall be insulated with foil scrim jacket and include hot water reheat coil.

All terminals will be DDC controlled.

Exhaust Air Valves
Exhaust air valves shall be venturi type with DDC controls. Valves shall be installed at fume hoods and laboratory exhaust.

Section 23 37 13
Grilles Registers & Diffusers

Supply diffusers shall be linear plenum style.

Return, transfer and exhaust grilles shall be louvered style.

Section 23 52 00
Hydronic Heating Boilers

Multiple natural gas fired modular direct vent sealed combustion hot water condensing boilers

Combustion air will be piped directly to each boiler. Each boiler shall be separately vented.

Each boiler shall have an inline circulation pump.

Section 23 57 00
Heat Exchangers

Provide shell and tube steam to hot water heat exchanger if WE Energies steam utility is used for building heating.

Section 23 64 15
Water Cooled Chillers

Provide rotatory (screw or scroll) chiller for building cooling. Chiller efficiencies shall meet the latest edition of ASHRAE 90.1 and FEMP requirements. Provide sound attenuation option for chiller to minimize chiller sound.

Provide additional four (4) year material and labor warranty extension for compressor motor, compressor assembly and unit controls.

Provide service of factory-trained technician employed by the chiller manufacturer for initial start-up, one fall shutdown and on additional spring startup.

Chiller controls shall be integrated into the building automation system via open protocol.

Provide refrigerant monitoring system in chiller mechanical room with ventilation and make-up air.

One chiller required with no redundancy.

Section 23 65 13
Heat Rejection

Provide open cooling tower, closed loop fluid cooler or refrigerant condensing unit for chiller heat rejection.

No redundancy is required.

Section 23 72 00
Energy Recovery Ventilator

Provide packaged energy recovery ventilator with integral supply fan, exhaust fan and energy recovery wheel for general building exhaust if economically viable.

Section 23 73 13
Modular Air Handlers

Air Handlers

Air handlers will be provided with double wall construction and the following components: Supply fan, chilled water cooling coil, access section, heating coil (hot water or steam) and filter section. The unit supply fan will be controlled thru a variable frequency drive.

Filtration provided for the unit will include minimum 2", MERV 8 pre-filters and MERV 14 final filters. Filter effectiveness and velocities shall be closely coordinated and matched with the ambient environment and adjacency to the Interstate and Marquette Interchange.

A variable air volume (VAV) return fan, controlled thru a variable frequency drive, will be provided for return air.

Systems shall have air side economizer cooling capability.

Air handler controls will include variable air volume system static pressure control, freezestat controls on hot water coils and controls to limit the mixed air temperature (low limit). All water valves and air damper actuators shall fail in the "SAFE" position.

Airflow monitoring stations will be included to monitor minimum outside air (duct mounted) and supply air (fan inlet mounted) flows.

Provide motorized dampers on outside air (minimum), outside air (economizer), return air and relief air ductwork.

Section 23 82 00
Heating and Cooling
Terminal Units

Unit Heaters
Hot water unit heaters to be provided in mechanical spaces. Units to have DDC control valves with control integrated into the BAS.

Convectors / Cabinet Unit Heaters
Hot water convectors and cabinet unit heaters to be provided in transient spaces such as toilet rooms, vestibules, etc. Units to have DDC control valves with control integrated into the BAS.

Fin Tube Radiation
Hot water fin tube radiation to be provided as required in select exterior spaces that experience high heat loss, such as corner offices, etc. Units to have DDC control valves with control integrated into the adjacent air terminal and BAS.

Section 23 84 13
Humidifiers

The building may include humidification for laboratories that are humidity sensitive. Either electric or gas humidification systems would be used.

Steam distribution tubes to be located in adjacent supply duct.

Humidification systems shall include drain coolers for proper condensate drain cooling.

Additional Notes

Equipment Sizing Note:
Where equipment sizes are indicated, they are CONCEPTUAL only.

2.18 DIVISION 26 -- ELECTRICAL

2.19 DIVISION 27 -- COMMUNICATIONS

2.20 DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

26 08 00 DFD cx (DFD Level 2)
27 08 00 DFD cx (DFD Level 2)
28 08 00 DFD cx (DFD Level 2)

27 1005 - Structured Cabling for Voice and Data
27 5117 - Public Address Systems

28 1300 - Access Control
28 1600 - Intrusion Detection
28 2300 - Video Surveillance
28 3100 - Fire Detection and Alarm
28 3105 - Fire Alarm System Equipment

Utility Service

A new 1600A, 480/277V, 3PH, 4W electrical service is anticipated for the renovated building. The service would enter the building from a Wisconsin Electric Power Company pad mounted utility transformer on the west exterior of the building and a new 20'x20' (approximate) main electrical service room would be provided on the Ground Floor to house the main electrical switchboard.

Distribution

Electrical distribution throughout the building would be provided through 480/277V, 3PH, 4W branch panels with 208/120V, 3PH, 4W branch panels fed from local step-down transformers. The 480/277V panels would primarily feed lighting and mechanical equipment, while the 208/120V panels would feed receptacles and the balance of the electrical loads. All panels and transformers would be located within electrical rooms/closets or would be provided with locking covers.

Life Safety Systems

Egress lighting and fire alarm systems will be provided with integral battery backup in lieu of providing a standby emergency generator within the building.

LEED Certification

Project shall be designed to meet LEED Silver requirements, however, the project will not be seeking certification.

Lighting

Lighting throughout the building will conform to the most current DFD guidelines. Lighting levels shall meet IES lowest range of lighting level recommendations, to insure no spaces are overlit. The design shall also meet the Governor's Executive Order 145.

In general, lighting throughout shall consist of 2x4 volumetric troffers with 32W, SP50, T8 lamps. LED technology will be utilized for any exterior lighting and will be considered for certain interior applications, such as downlighting.

All lighting will operate at 277 volts.

Lighting Controls

All lighting will be controlled locally with a combination of manual switches and occupancy sensors. All spaces shall utilize multi-level switching schemes to allow the lighting to be reduced depending on need within the space and all lighting within daylit spaces shall be controlled as required by the DFD.

Fire Alarm

A fully addressable fire alarm system with voice communications, consisting of notification throughout and detection where required, shall be provided in the building.

Telecommunications

A new Telecommunications Entrance Room will be provided on the west side of the building on the Ground Floor.

Cabling within the building will be provided as required by the DFD.

In general, Data cable shall be Plenum Rated Category 6 (Belden or equivalent) with matching data terminations (T568A) and testing. Voice cable shall be Plenum Rated Category 6 (Belden or equivalent) cabling with proper voice terminations (T568A), testing to Cat 6 standards.

A grounding Bus Bar will be provided within the Telecommunications Entrance Room per the DFD standards.

GENERAL ELECTRICAL SYSTEM DESCRIPTION FOR STORAGE GARAGE

Utility Service

A new 225A, 208/120V, 3PH, 4W electrical service is anticipated for the building. The service would enter the building from a Wisconsin Electric Power Company pad mounted utility transformer on the exterior of the building and a new service panel would be provided in the building.

Distribution

All building loads will be fed from the 208/120V, 3PH, 4W service panel.

Life Safety Systems

Egress lighting and fire alarm systems (if required) will be provided with integral battery backup in lieu of providing a standby emergency generator within the building.

Lighting

Lighting throughout the building will conform to the most current DFD guidelines. Lighting levels shall meet IES lowest range of lighting level recommendations, to insure no spaces are overlit. The design shall also meet the Governor's Executive Order 145.

In general, lighting throughout shall consist of 4' industrial type fixtures with LED technology.

All lighting will operate at 120 volts.

Lighting Controls

All lighting will be controlled locally with a combination of manual switches and occupancy sensors.

Fire Alarm

No fire alarm system is anticipated for this building.

Telecommunications

Cabling within the building will be provided as required by the DFD.

In general, Data cable shall be Plenum Rated Category 6 (Belden or equivalent) with matching data terminations (T568A) and testing. Voice cable shall be Plenum Rated Category 6 (Belden or equivalent) cabling with proper voice terminations (T568A), testing to Cat 6 standards.

A grounding Bus Bar will be provided within the Telecommunications Entrance Room per the DFD standards.

EQUIPMENT DESCRIPTIONS

All equipment and equipment installations shall be consistent with Wisconsin Department of Administration (DOA), Division of Facilities Development (DFD) guidelines, standards and expectations, specifically the "Electrical System Standards & Design Guidelines" available on the DFD website.

Section 26 05 19
Low-Voltage Electrical Power Conductors and Cable

All conductors shall be copper. Aluminum conductors size #1/0 and larger may be substituted for copper and used for phase and neutral conductors for transformer feeders, switchboard feeders, and panelboard feeders. All ground conductors shall be copper.

Section 26 05 33
Raceway and Boxes for Electrical Systems

All wiring shall be in ¾" EMT conduit at a minimum. Refer to DFD conduit installation requirements for all minimum conduit requirements. In general, all conduit shall be concealed except where noted on the drawings or approved by the Architect/Engineer.

Section 26 05 53 Identification for Electrical Systems	All electrical wiring, devices, junction boxes, and electrical panels/equipment shall be labeled as required by the DFD.
Section 26 05 73 Short Circuit/Coordination Study and Arc Flash Hazard Study	The electrical contractor shall retain the services of an independent third party firm to perform a short circuit/coordination study and arc flash hazard study as outlined in the DFD master specifications.
Section 26 22 00 Low-Voltage Transformers	Transformers shall meet the energy efficiency requirements of the Energy Policy Act of 2005. Efficiency shall be no less than the Class 1 efficiency levels listed in Table 4-2 of NEMA Standard TP-1-2002.
Section 26 27 26 Wiring Devices	All switches and receptacles shall be rated 20-amps, heavy-duty, specification grade.
Section 26 27 28 Disconnects	All electrical, mechanical, and plumbing equipment shall be provided with code required disconnecting means. All disconnects shall be heavy-duty rated.
Section 26 29 00 Low-Voltage Controllers	In general, all three-phase electrical, mechanical, or plumbing equipment shall be provided with combination starters including Hand-Off-Auto controls and auxiliary contacts.
Section 26 43 13 Surge Protective Devices For Low-Voltage Electrical Power Circuits	A single Surge Protective Device shall be installed on the load side of the main service disconnect, at the service entrance switchboard.
Section 26 51 13 Interior Lighting Fixtures, Lamps, and Ballasts	Lighting throughout shall consist of 2x4 volumetric troffers with 32W, SP50, T8 lamps. LED technology will be utilized for any exterior lighting and will be considered for certain interior applications, such as downlighting.

2.21 DIVISION 31 -- EARTHWORK

A. 31 22 00 – Grading (sites have a special environmental cap)
B. 31 23 16 – Excavation (sites have a special environmental cap)
C. 31 63 16 - Auger Cast Grout Piles (sites have a special environmental cap)

2.22 DIVISION 32 -- EXTERIOR IMPROVEMENTS

A. 33 08 00 - DFD Cx
B. 32 12 16 - Asphalt Paving (sites have special environmental cap)
C. 32 13 13 - Concrete Paving (sites have special environmental cap)
D. 32 17 13 - Parking Bumpers
E. 32 17 23.13 - Painted Pavement Markings
F. 32 17 26 - Tactile Warning Surfacing
G. 32 31 13 - Chain Link Fences and Gates
H. 32 92 23 – Sodding (sites have special environmental cap)
I. 32 93 00 – Plants (sites have special environmental cap)

2.23 DIVISION 33 -- UTILITIES

A. 33 0513 - Manholes and Structures
B. 33 1116 - Site Water Utility Distribution Piping
C. 33 3111 - Site Sanitary Utility Sewerage Piping
D. 33 4111 - Site Storm Utility Drainage Piping
E. 33 5111 - Site Natural-Gas Distribution
F. 33 7119 - Electrical Underground Ducts and Manholes

Project Schedule
Section 7

13i3L, DNR SER Headquarters Building Study

Based on DFD GUIDE FOR DETERMINING TIME REQUIRED TO DESIGN, BID, AND CONSTRUCT

Total Project Cost[1]	$ estimated	$10,000,000 to $30,000,000
Phase of Project Development		
A/E Services: Posting to Contracting	Oct 2014	*5 Months
Develop/Review Budget	Feb 2015	4 Months
Develop Preliminary Plans	May 2015	3 Months
Complete/Review Design Report	Jul 2015	2 Months
Complete Bid Documents	Nov 2015	4 Months
Review Bid Documents (DFD)	Jan 2016	2 Months
Bid Posting to Contracting	June 2016	5 Months
Complete Construction	June 2018	24 – Months[2]

Estimated Total Time 51 - Months

The above guide is based upon average conditions with no unusual delay in delivery of materials or time lost to poor weather or other condition. Extrapolate to determine total time within dollar limits. [2]

1. This time does not include time necessary to prepare documents to be acceptable for use. This Guide uses the start dates for these processes and it is incumbent on the Agency to factor what they believe is the necessary time to get requests for A/E services into an acceptable format, that includes language, for DFD to post.
2. Construction completion time includes that the 2 year construction duration is based on DFD historical data for a project of this size, and includes pre-construction activities, mobilization, construction, punchlist completion, closeout, and post construction follow up, not just the time that construction crews are in the building working.

* The project needs to be publicly advertised for A/E Services.

A/E to Construction Contracting			25 Months	

DSF PROJECT BUDGET WORKSHEET (page 1) DATE: 2/7/14

BY: MCC, JP

PROJECT TITLE: 13i3L Southeast Regional Headquarters

AGENCY: DNR LOCATION: Milwaukee

NEW BLDG AREA: 4620 (GSF New Const)

(ASF New Const) (% Efficiency)

REMODELING AREA: 56,196 (GSF Remodeling)

56,196 (GSF Total Bldg) (% Remodeling)

ESTIMATED BID DATE: Jul-15 PROJECTED ENR INDEX: (7/2015)/5500(1/2014)=1.065

CURRENT ENR: 5500

SPACE	GSF	UNIT COST	INFLATION	SIZE/COST ADJUSTMENT	BUDGET
Office Space	40,936	$111	1.065	0	$4,856,947
Lab Space	5,500	$166	1.065	0	$972,345
Shelled TI Space	9,760	$70	1.065	0	$727,608
Storage Building	4,620	$115	1.065	0	$565,835
	60,816	$115		SUBTOTAL:	$7,122,735

SEE DETAILED COST ESTIMATE FOR SPACE/COST SUMMARY BREAKDOWN FOR THE CATEGORIES BELOW:

TRADE	REMOD SF	UNIT COST	INFLATION	SIZE/COST ADJUSTMENT	BUDGET
GENERAL					
-MINOR					
-PARTIAL					
-COMPLETE					
PLUMBING					
-MINOR					
-PARTIAL					
-COMPLETE					
-SPECIAL NEEDS					
HVAC					
-MINOR					
-PARTIAL					
-COMPLETE					
AC ONLY					
ELECTRICAL					
-MINOR					
-PARTIAL					
-COMPLETE					
-SPECIAL NEEDS					
ELEVATOR					
				SUBTOTAL:	$ -
TOTAL BASE BUILDING/REMODELING COST >>>>>>>>>>>>>>>>>>>					$ 7,122,735

WORKSHEET (Page 2)

TOTAL BASE BUILDING/REMODELING COST (From Page 1)			$7,122,735
ADDITIONAL BUILDING CONSTRUCTION/REMODELING COSTS:			
1. Special Foundations/Site Preparation			$254,885
- Selective Demolition	$	139,000.00	
- Demolition (entire structure)	$	-	
- Site Excavation/Site Preparation	$	71,560.00	
- Pilings	$	44,325.00	
- Dewatering	$	-	
2. Special Design Features/Other Construction			$423,920
- Plaza	$	-	
- Special Exterior/Interior Finishes	$	-	
- Window/Exterior Door Replacement	$	38,000.00	
- Remove Architectural Barriers	$	-	
- Interface with Existing Building	$	-	
- Roof Replacement	$	385,920.00	
- Other (specify)	$	-	
3. Built-in Architectural Equipment			$830,000
- Food Service/Equipment	$	-	
- Dry/Cold Rooms	$	-	
- Library Shelving/Fixed Seating/Stage Rigging	$	70,000.00	
- Prison Security	$	-	
- Parking/Loading Dock/Waste Handling	$	-	
- Signage (ADA)	$	10,000.00	
- Other (specify) Lab Equipment	$	750,000.00	
4. Special Mechanical/Electrical Systems			$0
- HVAC Source Equipment	$	-	
- Heat Recovery/Refrigeration	$	-	
- Chemical Fire Suppression	$	-	
- Energy Management	$	-	
- Electronic Surveillance	$	-	
- Lighting Controls	$	-	
- Service to Owner's Equipment	$	-	
- Testing & Balancing	$	-	
5. Building Complexity Cost Factors			$0
- Irregular Shape/Story Height	$	-	
- Floor Loading/Structural Details	$	-	
- HVAC/Electric Loads	$	-	
- Multi-Story Building	$	-	
- Design Life	$	-	
- Other (specify)_____	$	-	
TOTAL ADJUSTED BUILDING/REMODELING COST >>>>>>>>>>>>>			$8,631,540

Continue on Page 3--

WORKSHEET (Page 3)

TOTAL ADJUSTED BUILDING/REMODELING COST (from Page 2; Rounded)			$8,631,540	
UTILITIES/SITE DEVELOPMENT/LOCATION COSTS:				
1. Utilities/Service Extensions			$139,604	
- Water		$72,245		
- Sewer		$10,000		
- Gas		$5,000		
- Electric		$52,359		
- Steam/Chilled Water		$0		
2. Site Development			$202,302	
- Parking/Roads/Walks/Curbs		$99,053		
- Stormwater Management		$0		
- Site Lighting		$24,900		
- Storm Sewer		$23,349		
- Landscaping		$50,000		
- Exterior Signage		$5,000		
- Other (specify)_____		$0		
- Other (specify)_____		$0		
3. Location/Site Conditions Cost Factors			$0	
- Time for Construction		$0		
- Restricted or Remote Site/Limited Access		$0		
- Occupied/Secure Site		$0		
- Market Conditions/Location Factor		$0		
- Other (specify)_____		$0		
4. Telecommunications			$581,867	
		$581,867		
5. Asbestos Abatement/Environmental Clean-up			$130,000	
TOTAL CONSTRUCTION COST			$9,685,313	
	Total GSF	60,816		
	$/GSF	$159		
DESIGN/CONTINGENCY/ALLOWANCES:		%		
1. Design			$631,393	
Architect/Engineer, (7.5% of const cost for remodelling; 9.5% of const cost for storage/service garage; $50,000 predesign)				
2. Other Design Fees			$141,000	
- Survey/Soils Engineer		$25,000		
- Miscellaneous Fees (sust design & reg, const schedl'g)		$21,000		
- Audio/Visual Consultant		$0		
- Asbestos/Environment Consultant		$45,000		
- Commissioning		$50,000		
3. Project Contingency, 9% of construction			$871,678	
4. DFD Management, 4% of const & cont			$422,280	
5. Work by Owner			$0	Abatement, see above
6. Movable Equipment Allowance (4% of const)			$1,237,530	from 12D2W Report adj for inflation
7. Special Equipment			$10,650	from 12D2W Report adj for inflation
8. Other Allowances (city building code plan review fees, WasteCap (Construction and Demolition Waste Management Services), EIA, and LEED online registration.)			$46,500	
9. Land Purchase			$0	Land and building purchase not incl
10. Percent for the Arts			$0	
TOTAL PROJECT BUDGET ESTIMATE >>>>>>>>>>>>>			**$13,046,343**	**plus land and bldg cost**
	Total GSF	**60,816**		
	$/GSF	**$215**		

MIDDLETON CONSTRUCTION CONSULTING

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Wisconsin DOA
DNR SE Regional HQ Building Study

Project # 13i3L

January 28, 2014

Based upon
Milwaukee WI Wage Rates

Prepared For:

Eppstein Uhen Architects
222 W. Washington Ave. Suite 650
Madison, WI 53703

NOTES REGARDING PREPARATION OF ESTIMATE

This estimate was prepared based on the following documents provided by Mead and Hunt Inc.

1. Schematic Design Drawings prepared by Eppstein Uhen Inc. on 1/14/14

2. Information regarding the project was also obtained via meetings, phone conversations, and email messages that clarified the project scope.

BIDDING PROCESS - MARKET CONDITIONS

This document is based on the measurement and pricing of quantities wherever information is provided and/or reasonable assumptions for other work not covered in the drawings or specifications, as stated within this document. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. All unit rates relevant to subcontractor work include the subcontractors overhead and profit unless otherwise stated.

Pricing reflects probable construction costs obtainable in the Milwaukee, WI area on the bid date. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors with a minimum of 3 bidders for all items of subcontracted work and a with a minimum of 3 bidders for a general contractor. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since Middleton Consulting has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, this statement of probable construction cost is based on industry practice, professional experience and qualifications, and represents Middleton Consulting's best judgment as professional construction cost consultants familiar with the construction industry. However, Middleton Consulting cannot and does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

ASSUMED CONSTRUCTION PARAMETERS

The pricing is based on the following project parameters:

1. A construction start date of Summer 2016
2. Construction Costs have been adjusted to anticipated start dates.
3. The contract will be competitively bid to multiple general contractors.
4. All contractors will be required to pay prevailing wages.
5. The general contractors will have full access to the site during normal working hours
6. Estimate includes pricing as of January 2014
7. Owner's communication and security plug in equipment is not included in the construction costs.
8. Sitework and roadwork not shown on the civil plans

EXCLUSIONS

The following are excluded from the cost of this estimate:

1. Professional Design Fees
2. Testing Fees
3. Owner Contingencies/Scope Changes
4. Premium Time / Restrictions on Contractor Working Hours
5. Finance and Legal Charges
6. Environmental Abatement Costs-other than noted
7. Contaminated Soil Removal-other than noted
8. Lead and Radio Frequency Shielding
9. Temporary Facilities
10. Loose Furniture
11. Equipment (Owner Furnished/Installed)
12. Artwork
14. Phased Work

	COST SUMMARY	54,710 GSF	$/SF	BUILDING TOTAL
01000	TEMP. REQUIREMENTS-ASBESTOS ABATEMENT		$0.00	$130,000
02000	EXISTING CONDITIONS-SITE PREPARATION		$2.54	$139,048
03000	CONCRETE & PRECAST		$0.00	$0
04000	MASONRY		$0.26	$14,237
05000	METALS		$0.55	$30,278
06000	WOODS, PLASTICS & COMPOSITES		$2.02	$110,270
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$8.87	$485,302
08000	OPENINGS		$3.71	$203,237
09000	FINISHES		$14.12	$772,242
10000	SPECIALTIES		$2.28	$124,510
11000	EQUIPMENT-LAB		$19.19	$1,049,811
12000	FURNISHINGS-BLINDS		$0.06	$3,521
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$0.63	$34,435
21000	FIRE SUPPRESSION-ALTERNATE		$3.27	$178,837
22000	PLUMBING		$8.18	$447,347
23000	HEATING, VENTILATING & AIR CONDITIONING		$30.40	$1,663,266
26000	ELECTRICAL		$22.10	$1,208,869
27000	COMMUNICATIONS		$7.16	$391,826
28000	ELECTRONIC SAFETY AND SECURITY		$3.47	$190,041
31000	EARTHWORK		$0.00	$0
32000	EXTERIOR IMPROVEMENTS		$0.90	$49,275
33000	UTILITIES		$1.75	$95,596
	SUBTOTAL		**$133.83**	**$7,321,947**
	GENERAL CONDITIONS/BOND/INSURANCE	5.0%	$6.69	$366,097
	CONTRACTOR'S FEES	5.0%	$7.03	$384,402
	DESIGN CONTINGENCY	0.0%	$0.00	$0
	ESCALATION TO START OF CONSTRUCTION	6.5%	$9.59	$524,709
	TOTAL ESTIMATED BID		**$157.14**	**$8,597,155**
	CONSTRUCTION CONTINGENCY-In DFD #'s	0.0%	$0.00	$0
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$157.14**	**$8,597,155**

	COST SUMMARY	4,600 GSF	$/SF	BUILDING TOTAL
01000	TEMP. REQUIREMENTS-HAZARDOUS WASTE REMOVAL		$0.00	$5,000
02000	EXISTING CONDITIONS-SITE PREPARATION		$0.00	$0
03000	CONCRETE & PRECAST		$15.03	$69,158
04000	MASONRY		$45.56	$209,592
05000	METALS		$9.18	$42,218
06000	WOODS, PLASTICS & COMPOSITES		$0.74	$3,418
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$12.69	$58,366
08000	OPENINGS		$9.50	$43,678
09000	FINISHES		$5.73	$26,356
10000	SPECIALTIES		$0.48	$2,190
11000	EQUIPMENT-Fireplace		$0.00	$0
12000	FURNISHINGS-Blinds		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$0.00	$0
21000	FIRE SUPPRESSION-ALTERNATE		$0.00	$0
22000	PLUMBING		$12.72	$58,523
23000	HEATING, VENTILATING & AIR CONDITIONING		$3.34	$15,374
26000	ELECTRICAL		$18.40	$84,645
27000	COMMUNICATIONS		$incl'd in main bldg costs	$0
28000	ELECTRONIC SAFETY AND SECURITY		$incl'd in main bldg costs	$0
31000	EARTHWORK		$26.35	$121,214
32000	EXTERIOR IMPROVEMENTS		$27.42	$126,143
33000	UTILITIES		$11.33	$52,133
	SUBTOTAL		**$199.57**	**$918,010**
	GENERAL CONDITIONS/BOND/INSURANCE	6.0%	$11.97	$55,081
	CONTRACTOR'S FEES	5.0%	$10.58	$48,655
	DESIGN CONTINGENCY	0.0%	$0.00	$0
	ESCALATION TO START OF CONSTRUCTION	6.5%	$14.44	$66,413
	TOTAL ESTIMATED BID		**$236.56**	**$1,088,158**
	CONSTRUCTION CONTINGENCY-In DFD #'s	0.0%	$0.00	$0
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$236.56**	**$1,088,158**

Milwaukee WI Wage Rates

COST SUMMARY	59,310 GSF	$/SF	BUILDING TOTAL
Base Bid	54,710 GSF	$157.14	$8,597,155
Storage Building	4,600 GSF	$236.56	$1,088,158
TOTAL ESTIMATED CONSTRUCTION COSTS		$163.30	$9,685,313
TOTAL ESTIMATED CONSTRUCTION COSTS W/ALTERNATES		$163.30	$9,685,313

Potential Alternates

Deduct New Windows/Openings at West Side	($62,000)
Deduct Roof Replacement at Office Building	($413,676)
Add- Finish Shelled space to white box level	$458,720
Add third floor (28,100 sqft.) to exisiting building	$4,496,000

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
03 STORAGE BUILDING				
01100 Administrative Requirements				
Hazardous Soils- Dump fees	1	LS	5,000.00	5,000
SUBTOTAL: Administrative Requirements				**$5,000**
03100 Concrete Formwork				
Formwork for grade beams	1,308	SQFT	8.05	10,526
Formwork for Pile caps	484	SQFT	8.40	4,065
SUBTOTAL: Concrete Formwork				**$14,591**
03200 Concrete Reinforcement				
Reinforcement in grade beams, avg 200 lbs/cy	5	TONS	2,392.40	11,603
Reinforcement in Pile caps, avg 200 lbs/cy	2	TONS	2,505.28	5,011
Premium for epoxy coated rebar	7	TONS	396.00	2,713
SUBTOTAL: Concrete Reinforcement				**$19,326**
03300 Cast in Place Concrete				
Concrete in grade beams, 4,000 psi	49	CUYD	152.88	7,415
Concrete in Pile caps, 4,000 psi	18	CUYD	173.00	3,079
Concrete slab on grade, 8" thk, with W6x6-2.9x2.9	4,429	SQFT	5.59	24,747
SUBTOTAL: Cast in Place Concrete				**$35,241**
04100 Exterior Masonry				
Brick facade, modular, 2-2/3"x8"x4" thk	4,974	SQFT	24.09	119,819
8" CMU backup	4,974	SQFT	13.47	67,018
SUBTOTAL: Exterior Masonry				**$186,836**
04300 Interior Masonry				
8" CMU partition	1,620	SQFT	14.05	22,756
SUBTOTAL: Interior Masonry				**$22,756**
05100 Structural Steel				
Structural steel beams,	7	TONS	2,723.61	20,155
Structural steel channels @ doors	1	TONS	3,055.60	2,139
Structural steel angles-Bridging	1	TONS	3,179.79	3,180
Metal roof deck, galvanized, 1-1/2" thk, 18 ga	4,486	SQFT	2.20	9,880
SUBTOTAL: Structural Steel				**$35,354**
05400 Metal Fabrications				
Bollards	12	EACH	443.48	5,322
Aluminum ladder for roof acess	16	LNFT	96.42	1,543
SUBTOTAL: Metal Fabrications				**$6,864**
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	4,486	SQFT	0.76	3,418
SUBTOTAL: Rough Carpentry				**$3,418**
07200 Thermal Insulation				
2" rigid insulation @ wall Cavity	4,974	SQFT	2.15	10,689
40lb felt	4	SQS	32.39	145
5" polyisocyanurate insulation	4,486	SQFT	3.85	17,270

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
		SUBTOTAL: Thermal Insulation		**$28,104**
07400 Roofing				
Mineral aggregate (Perlite) roof coverboard	4,486	Sqft	1.90	8,543
EPDM roofing- Fully adhered	45	SQS	298.00	13,368
Aluminum flashing	552	SQFT	8.18	4,518
		SUBTOTAL: Roofing		**$26,429**
07500 Roofing Specialties				
Roof hatch-Garage	1	EACH	690.84	691
		SUBTOTAL: Roofing Specialties		**$691**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	4,486	SQFT	0.11	490
		SUBTOTAL: Caulking & Sealants		**$490**
07900 Miscellaneous Thermal & Moisture Protection				
Vapor barrier at slab	4,429	SQFT	0.60	2,652
		SUBTOTAL: Miscellaneous Thermal & Moisture Protection		**$2,652**
08000 OPENINGS				
HM door	8	EACH	327.73	2,622
Grout filled HM frame	8	EACH	384.78	3,078
Hardware set, single	8	EACH	668.60	5,349
		SUBTOTAL: OPENINGS		**$11,049**
08600 Special Doors, Frames, & Hardware				
Elect operated OH door	6	EACH	5,438.26	32,630
		SUBTOTAL: Special Doors, Frames, & Hardware		**$32,630**
09200 Floor Finishes				
VCT-Toilet Room	60	SQFT	2.70	162
Vinyl base, 4" high	40	LNFT	1.68	67
Concrete sealer	4,329	SQFT	0.90	3,886
		SUBTOTAL: Floor Finishes		**$4,116**
09400 Ceiling Finishes				
ACT system, 2'-0" x 2'-0"	60	SQFT	4.32	259
		SUBTOTAL: Ceiling Finishes		**$259**
09600 Paints & Coatings				
Paint exterior door	8	EACH	101.97	816
Paint door frame	8	EACH	57.94	464
Paint exposed structure	4,486	SQFT	1.23	5,534
Paint masonry/concrete 3 coats	8,214	SQFT	1.85	15,167
		SUBTOTAL: Paints & Coatings		**$21,981**
10100 Visual Display Units				
Sign and graphic allowance	1	LSUM	600.00	600
		SUBTOTAL: Visual Display Units		**$600**
10400 Toilet Accessories				
Toilet paper dispenser, double roll	1	EACH	103.10	103
Paper towel dispenser, surface mounted	1	EACH	87.15	87

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Napkin disposal, stainless steel, surface mounted	1	EACH	112.15	112
Soap dispenser	1	EACH	77.15	77
Mirror	1	EACH	190.86	191
Coat hook	1	EACH	18.02	18
Grab bar set, three piece	1	EACH	241.45	241
SUBTOTAL: Toilet Accessories				**$830**
10900 Miscellaneous Specialties				
Fire extinguisher & cabinet, wall mounted	3	EACH	253.46	760
Fixed metal storage shelving-By Owner	160	LNFT	0.00	0
SUBTOTAL: Miscellaneous Specialties				**$760**
22200 Plumbing Fixtures				
Water closet, wall hung, manual flush valve	1	EACH	1,953.17	1,953
Lavatory, wall hung, manual faucet	1	EACH	1,735.36	1,735
SUBTOTAL: Plumbing Fixtures				**$3,689**
22300 Plumbing Equipment & Specialties				
Domestic water heater, electric, 50 gal., 36 kW	1	EACH	4,392.63	4,393
Double check valve backflow preventer, 3/4"	1	EACH	288.18	288
Floor drains	1	EACH	467.77	468
Floor drains - heavy duty @ storage	6	EACH	636.36	3,818
Cleanouts - floor	3	EACH	357.77	1,073
Roof drains	2	EACH	658.76	1,318
SUBTOTAL: Plumbing Equipment & Specialties				**$11,358**
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				
Domestic water pipe, fittings, and supports, 1" type L copper	40	LNFT	33.64	1,346
Domestic water pipe, fittings, and supports, 3/4" type L copper	100	LNFT	23.71	2,371
Pipe insulation, 1" domestic water piping	40	LNFT	7.57	303
Pipe insulation, 3/4" domestic water piping	100	LNFT	7.15	715
Vent pipe, fittings, and supports, CI no-hub, AG, 1-1/2"	40	LNFT	42.27	1,691
Sanitary/waste pipe, fittings, and supports, PVC, AG, 2"	80	LNFT	42.75	3,420
Storm drainage pipe, fittings, and supports, CI hub and spigot, AG, 2"	120	LNFT	53.08	6,369
Sanitary/waste pipe, fittings, and supports, PVC, AG, 3"	200	LNFT	57.64	11,527
Storm drainage pipe, fittings, and supports, CI hub and spigot, AG, 4"	200	LNFT	63.63	12,725
Natural gas piping, std. weight blk. steel, w/fittings and supports, threaded, 3/4"	140	LNFT	21.49	3,009
SUBTOTAL: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$43,477**
23200 Ventilation & Exhaust				
Exhaust fan, rooftop, w/curb, backdraft damper, 1/4 hp	3	EACH	1,152.34	3,457
HVAC Heated side Only	1,402	SQFT	8.50	11,917
SUBTOTAL: Ventilation & Exhaust				**$15,374**
26200 Main Power Distribution				
Service and distribution - Pull from existing Building	4,486	SQFT	0.76	3,398
Service and distribution - Branch panelboards and associated feeders	4,486	SQFT	1.56	6,991
SUBTOTAL: Main Power Distribution				**$10,389**
26500 Lighting				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Floodlights, exterior, high pressure sodium, 400 Watt, including ballast and lamp, excl pole	16	EACH	645.70	10,331
Pole Bases	8	EACH	570.80	4,566
Light poles, anchor base, aluminum, 16' high, excl concrete bases	8	EACH	1,110.55	8,884
Lighting System - Light fixtures including installation and hook up	4,486	SQFT	5.17	23,211
Lighting System - Emergency and Exit Light fixtures including installation and hook up	4,486	SQFT	0.59	2,662
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	4,486	SQFT	1.80	8,084
			SUBTOTAL: Lighting	**$57,738**
26600 Branch Power Distribution & Devices				
Branch Power - Miscellaneous receptacles and electrical equipment hook up	4,486	SQFT	2.37	10,629
Branch Power - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	4,486	SQFT	1.31	5,889
			SUBTOTAL: Branch Power Distribution & Devices	**$16,518**
31200 Site Grading				
Cut for lot	619	CUYD	3.24	2,007
Rough grading, small area	29,925	SQFT	0.39	11,808
Fine grading, small area	5,000	SQFT	0.53	2,661
			SUBTOTAL: Site Grading	**$16,476**
31300 Foundation Excavation & Fill				
Excavate for foundations	307	CUYD	11.94	3,666
Backfill with excavated material	264	CUYD	7.51	1,984
Haul off excavated material to Subtitle D landfill	619	CUYD	75.42	46,684
Haul off excavated material	66	CUYD	41.65	2,749
			SUBTOTAL: Foundation Excavation & Fill	**$55,083**
31500 Special Foundations				
Augered Concrete Piers- (3) per Pile. 36 total 30' depth	1,080	LNFT	35.02	37,825
Mobilization for Piers	1	LS	4,000.00	4,000
Testing for Piers	1	LS	2,500.00	2,500
			SUBTOTAL: Special Foundations	**$44,325**
31600 Erosion & Sedimentation Control				
Tracking Pad	1	LS	1,800.00	1,800
Silt fence w/wire mesh, filter fabric and stakes	200	LNFT	1.91	382
Silt fence w/wire mesh, filter fabric and stakes	200	LNFT	1.91	382
Job fence	400	LNFT	6.91	2,765
			SUBTOTAL: Erosion & Sedimentation Control	**$5,329**
32100 Site Demolition				
Remove asphalt paving	4,800	SQFT	0.67	3,216
Remove curb and gutter	40	LNFT	7.13	285
Saw cut asphalt, 5" thk	400	LNFT	5.25	2,100
			SUBTOTAL: Site Demolition	**$5,601**
32200 Pavement				
CA-6 base, 6" thk at concrete paving	21	CUYD	29.09	611
CA-6 base, 6" thk at SOG	90	CUYD	29.09	2,625

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
CA-6 base, 8" thk at asphalt paving	680	CUYD	27.40	18,631
Asphalt pavement, 2" surface course, on 2" binder course	24,925	SQFT	2.46	61,276
Stripe parking space, standard	25	EACH	26.01	650
Concrete curb & gutter, hand formed, curved	15	LNFT	29.34	440
Concrete pavement, 8" w/ 6"x6" W4xW4 WWF	1,306	SQFT	6.26	8,169
			SUBTOTAL: Pavement	**$92,402**
32400 Fencing & Walls				
Security fence	600	LNFT	30.23	18,140
			SUBTOTAL: Fencing & Walls	**$18,140**
32600 Landscaping				
Landscaping allowance	1	LSUM	10,000.00	10,000
			SUBTOTAL: Landscaping	**$10,000**
33200 Site Water Service				
Domestic water service pipe and fittings, type K copper, 2"	200	LNFT	20.42	4,084
Gate valve, 2"	1	EACH	495.62	496
Incoming service, 2", w/meter & backflow preventers	1	EACH	2,251.24	2,251
Thrust blocks	1	LSUM	1,307.16	1,307
Trench excavation, pipe bedding, and backfill (<=18" pipe)	200	LNFT	25.97	5,194
Trench excavation, pipe bedding, and backfill (<=18" pipe) Gas Service	80	LNFT	25.97	2,078
Trench excavation, pipe bedding, and backfill (<=18" pipe) Storm and Sanitary	200	LNFT	25.97	5,194
Line flushing, cleaning, and testing	1	LSUM	1,641.12	1,641
			SUBTOTAL: Site Water Service	**$22,245**
33300 Site Sanitary & Storm Sewer				
Storm Sewer Revisions	1	LS	20,000.00	20,000
Connect new sewer to existing	2	EACH	741.90	1,484
Line flushing, cleaning, and testing	1	LSUM	1,641.12	1,641
			SUBTOTAL: Site Sanitary & Storm Sewer	**$23,125**
33800 Site Electrical				
Underground conduit, GRC, 1" , excludes excavation, backfill and cast in place concrete	600	LNFT	3.49	2,093
Excavating and back filling trench, sand and gravel, 1' wide .excavator, 20' to 24' deep	600	LNFT	7.78	4,671
			SUBTOTAL: Site Electrical	**$6,763**
TOTAL: STORAGE BUILDING				**$918,010**
04 OFFICE SPACE				
01100 Administrative Requirements				
Asbestos Abatement	1	LS	130,000.00	130,000
			SUBTOTAL: Administrative Requirements	**$130,000**
02100 Selective Demolition				
Remove exposed agrregat panels at window openings	1,700	SQFT	6.67	11,340
Remove louvers	289	SQFT	6.15	1,779
Remove overhead doors and grilles	1	EACH	547.04	547
Remove masonry partition	8,710	SQFT	1.84	16,022

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Remove drywall metal stud partition	11,761	SQFT	1.25	14,751
Remove acoustical ceiling system	44,480	SQFT	0.48	21,533
Remove office furniture	56,000	SQFT	0.65	36,238
Remove flooring	44,880	SQFT	0.55	24,554
SUBTOTAL: Selective Demolition				**$126,762**
02300 Building Demolition				
Remove drywall on perimeter walls	9,474	SQFT	1.02	9,681
Remove railings	248	LNFT	4.56	1,131
Cut-out masonry walls for window openings	177	SQFT	8.33	1,474
SUBTOTAL: Building Demolition				**$12,286**
04200 Exterior Masonry Restoration				
Remove and rebuild brick facade at window openings	177	SQFT	35.76	6,329
SUBTOTAL: Exterior Masonry Restoration				**$6,329**
04300 Interior Masonry				
8" CMU partition @ Dock Area	563	SQFT	14.05	7,908
SUBTOTAL: Interior Masonry				**$7,908**
05100 Structural Steel				
Place Lintels at new Window Openings	9	Ea	1,252.82	11,275
SUBTOTAL: Structural Steel				**$11,275**
05400 Metal Fabrications				
Steel railing system, painted	124	LNFT	114.76	14,231
Steel handrail, 1-1/2" dia, wall mounted, painted	124	LNFT	38.49	4,772
SUBTOTAL: Metal Fabrications				**$19,003**
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	44,880	SQFT	0.92	41,177
SUBTOTAL: Rough Carpentry				**$41,177**
06300 Millwork				
Architectural woodwork	44,880	SQFT	1.54	69,093
SUBTOTAL: Millwork				**$69,093**
07200 Thermal Insulation				
1" rigid insulation-Behind Panels	1,700	SQFT	1.19	2,021
1" fiberboard roof insulation	28,096	SQFT	1.75	49,241
30lb felt	281	SQS	28.38	7,974
4" polyisocyanurate	28,096	SQFT	3.85	108,181
SUBTOTAL: Thermal Insulation				**$167,416**
07400 Roofing				
Remove gravel, built-up roof and insul	28,906	SQFT	2.10	60,815
Remove flashing and sheetmetal, avg 24" wide	676	LNFT	3.77	2,550
5/8" coverboard	28,096	Sqft	2.21	61,954
EPDM roofing-Fully Adhered	281	SQS	298.00	83,738
.020 aluminum sheetmetal	1,352	SQFT	5.58	7,542
SUBTOTAL: Roofing				**$216,600**
07500 Roofing Specialties				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Roof walkway	400	SQFT	4.76	1,904
SUBTOTAL: Roofing Specialties				**$1,904**
07600 Metal Panel Systems				
Metal Panels	1,700	SQFT	44.42	75,511
SUBTOTAL: Metal Panel Systems				**$75,511**
07700 Fireproofing & Firestopping				
Patch Fireproofing	1	LS	7,243.10	7,243
SUBTOTAL: Fireproofing & Firestopping				**$7,243**
07800 Caulking & Sealants				
Cut and recaulk Exterior Caulking	2,100	LNFT	5.58	11,723
Miscellaneous caulking & sealants	44,880	SQFT	0.11	4,905
SUBTOTAL: Caulking & Sealants				**$16,628**
08000 OPENINGS				
HM frame	79	EACH	318.17	25,136
aluminum glass door	10	EACH	1,127.07	11,271
SC wood door	79	EACH	342.73	27,076
Hardware set, exterior	10	EACH	768.60	7,686
Hardware set, single	79	EACH	668.60	52,819
SUBTOTAL: OPENINGS				**$123,988**
08200 Curtainwall & Storefront				
Interior storefront	200	SQFT	39.96	7,993
Fixed windows	466	SQFT	77.96	36,329
SUBTOTAL: Curtainwall & Storefront				**$44,322**
08600 Special Doors, Frames, & Hardware				
Elect operated OH door	1	EACH	5,938.26	5,938
Auto Openers	10	EACH	2,898.91	28,989
SUBTOTAL: Special Doors, Frames, & Hardware				**$34,927**
09100 Plaster & Gypsum Board				
Dryall Perimeter	9,474	SQFT	4.38	41,543
Gypsum board soffit,	1,800	SQFT	13.39	24,103
3-5/8" 25 ga metal studs, 5/8" type x gypboard each side, 3" mineral fiber blanket insulation, full-height	29,164	SQFT	7.61	221,868
SUBTOTAL: Plaster & Gypsum Board				**$287,513**
09200 Floor Finishes				
Ceramic tile floor, 12"x12"	1,933	SQFT	12.15	23,491
Ceramic tile base, 4-1/2" high	240	LNFT	16.13	3,871
Quarry tile floors, 6" x 6" x 1/2" thk	712	SQFT	15.58	11,096
Quarry tile base, 5" high x 1/2" thk	200	LNFT	18.79	3,758
Floor surface installation preparation	34,697	SQFT	0.26	9,136
VCT	5,696	SQFT	3.10	17,683
Vinyl base, 4" high	4,900	LNFT	1.68	8,249
Rubber stair tread, 12" wide	432	LNFT	20.71	8,947
Rubber flooring at stair landings	280	SQFT	14.86	4,162
Carpet flooring	26,898	SQFT	4.42	118,803

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
		SUBTOTAL: Floor Finishes		**$209,195**
09300 Wall Finishes				
Ceramic wall tile, 12"x12"	2,400	SQFT	13.57	32,576
Lobby Finish Upgrades	1	LS	20,000.00	20,000
		SUBTOTAL: Wall Finishes		**$52,576**
09400 Ceiling Finishes				
ACT system, 2'-0" x 2'-0"	48,800	SQFT	4.32	211,045
		SUBTOTAL: Ceiling Finishes		**$211,045**
09600 Paints & Coatings				
Stain interior door	79	EACH	92.85	7,335
Paint door frame	79	EACH	57.94	4,577
		SUBTOTAL: Paints & Coatings		**$11,912**
10300 Movable Partitions				
Folding partition	300	SQFT	49.60	14,880
		SUBTOTAL: Movable Partitions		**$14,880**
10400 Toilet Accessories				
Toilet paper dispenser, double roll	14	EACH	103.10	1,443
Paper towel dispenser, surface mounted	16	EACH	87.15	1,394
Napkin disposal, stainless steel, surface mounted	7	EACH	112.15	785
Baby diaper changing station	2	EACH	747.37	1,495
Soap dispenser	16	EACH	77.15	1,234
Electric hand dryer	10	EACH	534.30	5,343
Mirrors	10	EACH	168.69	1,687
Utility mop holder & shelf, stainless steel	2	EACH	183.10	366
		SUBTOTAL: Toilet Accessories		**$13,748**
10900 Miscellaneous Specialties				
Locker, two tier	60	EACH	232.15	13,929
Locker bench	40	LNFT	36.39	1,455
Fire extinguisher & cabinet, recessed	12	EACH	399.80	4,798
Mailbox	120	EACH	47.50	5,700
Movable Storage/Filing	1	EACH	70,000.00	70,000
		SUBTOTAL: Miscellaneous Specialties		**$95,882**
12000 FURNISHINGS				
Entrance mats	40	SQFT	17.04	681
Blinds	460	SQFT	6.17	2,840
		SUBTOTAL: FURNISHINGS		**$3,521**
14000 CONVEYING EQUIPMENT				
Upgrade and Modernize Elevator	1	EACH	34,434.67	34,435
		SUBTOTAL: CONVEYING EQUIPMENT		**$34,435**
21200 Fire Sprinkler Equipment & Specialties				
Dry Sprinkler System Add at Canopy	1,260	SQFT	6.27	7,895
Reconfigure existing wet sprinkler system for renovation/buildout	54,710	SQFT	3.01	164,611
		SUBTOTAL: Fire Sprinkler Equipment & Specialties		**$172,506**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
21900 Special Fire Suppression				
Dry pipe valve assembly, 4", w/trim & compressor	1	EACH	6,330.58	6,331
SUBTOTAL: Special Fire Suppression				**$6,331**
22100 Selective Demolition				
Remove Existing Plumbing	54,710	SQFT	0.18	9,667
SUBTOTAL: Selective Demolition				**$9,667**
22200 Plumbing Fixtures				
Plumbing systems	54,710	SQFT	8.00	437,680
SUBTOTAL: Plumbing Fixtures				**$437,680**
23100 Selective Demolition				
Remove existing HVAC Systems	54,710	SQFT	0.40	21,966
SUBTOTAL: Selective Demolition				**$21,966**
23200 Ventilation & Exhaust				
HVAC VAV System	54,710	SQFT	30.00	1,641,300
SUBTOTAL: Ventilation & Exhaust				**$1,641,300**
26100 Selective Demolition				
Demolish Electrical	54,710	EACH	0.32	17,551
SUBTOTAL: Selective Demolition				**$17,551**
26200 Main Power Distribution				
Service and distribution - Main switchboard, distribution panels, transformers and associated feeders	54,170	SQFT	2.68	145,289
Service and distribution - Branch panelboards and associated feeders	54,710	SQFT	1.66	90,901
SUBTOTAL: Main Power Distribution				**$236,190**
26300 Emergency Power Distribution				
Emergency Service and distribution - Emergency generator and associated feeders	54,710	SQFT	0.78	42,915
Emergency Service and distribution - Distribution panels, ATSs and associated feeders	54,710	SQFT	0.90	49,266
SUBTOTAL: Emergency Power Distribution				**$92,181**
26500 Lighting				
Lighting System - Light fixtures including installation and hook up	54,710	SQFT	7.16	391,505
Lighting System - Emergency and Exit Light fixtures including installation and hook up	54,710	SQFT	0.65	35,589
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	54,710	SQFT	1.92	105,169
SUBTOTAL: Lighting				**$532,263**
26600 Branch Power Distribution & Devices				
Branch Power - Miscellaneous receptacles and electrical equipment hook up	54,710	SQFT	3.42	187,327
Branch Power - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	54,710	SQFT	1.92	105,169
SUBTOTAL: Branch Power Distribution & Devices				**$292,496**
26700 Mechanical Equipment Connections & Feeders				
Motors connection, disconnect switches and associated feeders	44,880	SQFT	0.85	38,188

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
SUBTOTAL: Mechanical Equipment Connections & Feeders				**$38,188**
27200 Tele/Data Systems				
Telecommunication/Data & Television System, complete	54,710	SQFT	4.99	273,238
SUBTOTAL: Tele/Data Systems				**$273,238**
27300 Intercom & Public Address Systems				
Intercommunication System, complete	54,710	SQFT	1.80	98,587
SUBTOTAL: Intercom & Public Address Systems				**$98,587**
27600 Audio/Visual & Television System				
Audio/visual System, Confernec Rooms	1	LS	20,000.00	20,000
SUBTOTAL: Audio/Visual & Television System				**$20,000**
28200 Fire Alarm Systems				
Fire alarm System, complete	54,710	SQFT	1.87	102,395
SUBTOTAL: Fire Alarm Systems				**$102,395**
28300 Intrusion Detection & Access Control Systems				
Intrusion Detection System, complete	54,710	SQFT	1.60	87,645
SUBTOTAL: Intrusion Detection & Access Control Systems				**$87,645**
32200 Pavement				
Patch Asphalt	2,000	SQFT	2.77	5,537
Deck at Front of Building	300	SQFT	12.46	3,738
SUBTOTAL: Pavement				**$9,275**
32600 Landscaping				
Landscaping Allowance	1	LSUM	40,000.00	40,000
SUBTOTAL: Landscaping				**$40,000**
33200 Site Water Service				
Replace water mains, and storms to city tie ins	1	LS	50,000.00	50,000
SUBTOTAL: Site Water Service				**$50,000**
33800 Site Electrical				
Site Electrical - Incoming service	54,710	SQFT	0.71	38,871
Site Electrical - Exterior lighting	14,000	SQFT	0.48	6,724
SUBTOTAL: Site Electrical				**$45,596**
TOTAL: OFFICE SPACE				**$6,272,136**
05 LABS				
09200 Floor Finishes				
Sheet Vinyl Flooring at Labs	4,674	SQFT	9.96	46,547
Vinyl base, 4" high	800	LNFT	1.68	1,347
VCT flooring, dissapating tile	912	SQFT	7.30	6,656
SUBTOTAL: Floor Finishes				**$54,550**
09300 Wall Finishes				
Vinyl wall covering	2,000	SQFT	2.44	4,872
SUBTOTAL: Wall Finishes				**$4,872**
09600 Paints & Coatings				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Paint Soffits	1,800	SQFT	1.11	1,999
Prime & paint drywall walls, 3 coats	60,952	SQFT	1.11	67,858
SUBTOTAL: Paints & Coatings				**$69,857**
10100 Visual Display Units				
Directories	1	EACH	790.00	790
Exterior signage	1	LS	5,000.00	5,000
Interior signage	60	EACH	110.15	6,609
SUBTOTAL: Visual Display Units				**$12,399**
10400 Toilet Accessories				
Toilet partition, accessible	6	EACH	1,068.60	6,412
Toilet partition, standard	8	EACH	834.88	6,679
Urinal screen	2	EACH	392.69	785
SUBTOTAL: Toilet Accessories				**$13,876**
10700 Wall & Door Protection				
Corner guards, , 48" high	40	EACH	53.10	2,124
SUBTOTAL: Wall & Door Protection				**$2,124**
10900 Miscellaneous Specialties				
Miscellaneous specialties allowance	1	LSUM	5,000.00	5,000
SUBTOTAL: Miscellaneous Specialties				**$5,000**
11300 Food Service Equipment				
Walk-In frezzers	2	EACH	14,000.00	28,000
SUBTOTAL: Food Service Equipment				**$28,000**
11500 Laboratory Equipment				
Laboratory equipment allowance	1	LSUM	700,000.00	700,000
Laboratory fume hood (3' long)	10	EACH	4,505.92	45,059
SUBTOTAL: Laboratory Equipment				**$745,059**
23100 Selective Demolition				
Addiitonal HVAC Requirements at Lab Areas	4,750	SQFT	24.02	114,074
SUBTOTAL: Selective Demolition				**$114,074**
TOTAL: LABS				**$1,049,811**

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