PHASE II REPORT: CONCEPTUAL & SCHEMATIC DESIGN

Nakoosa Trail Public Works Facility

City of Madison
Madison Wisconsin

March 18, 2015

FINAL

RNL

Maintenance Design Group

STRAND ASSOCIATES

Middleton Construction Consulting

BROADWING advisors

arnold & o'sheridan consulting engineers

Table of Contents

Section One - Project Overview

Introduction 1.1

Purpose of Report 1.7

Methodology 1.7

Report Overview 1.8

Section Two – Concept Design Workshop

Concept Design Workshop 2.1

Section Two A - Appendices

- Appendix A: Introductory Powerpoint Presentation
- Appendix B: Charrette Drawings

Section Three - Conceptual / Schematic Design Drawings

Introduction 3.1

Key Design Issues 3.1

Section Three A - Drawings

- Appendix C: Conceptual Design Drawings
- Appendix D: UDC Powerpoint Presentation
- Appendix E: Progress Architectural Concepts
- Appendix F: FIRE ONLY Programming Document
- Appendix G: Nakoosa Trail Space Needs Programming Document (full program)

Section Four – Conceptual / Schematic Design Narratives

Introduction 4.1

Architectural 4.2

Stormwater 4.7

Site Grading 4.18

Structural 4.22

Water 4.24

Mechanical 4.25

Plumbing 4.32

Fire Supression 4.36

Sanitary 4.37

Electric and Natural Gas 4.38
Traffic 4.40

Section Five – Conceptual Equipment List

Introduction 5.1
Equipment List Phase IA – Fire Only 5.3
Equipment List Phase IB – Fleet Services 5.11
Equipment List Phase IB – Radio Communications 5.19

Section Six - LEED

Introduction 6.1
LEED Checklist 6.2

Section Seven - Schedule

Introduction 7.1
Preliminary Design and Construction Schedule 7.2

Section Eight - Financial

Introduction 8.1
Preliminary Site & Building Cost Estimates 8.2

Section 1 – Project Overview

Introduction

The City of Madison, Wisconsin is located on an isthmus between Lakes Mendota and Monona. This geographical characteristic creates a naturally strong corridor which has served as both a blessing and a curse to the City of Madison. The isthmus creates a bottle-neck effect on movement into the city which presented a challenge to the various public service groups at the City of Madison.

New facilities will improve the operational efficiencies.

New facilities for the City of Madison Fleet Service, Fire Apparatus and Emergency Equipment Maintenance, and Communications operations have been proposed in order to improve the operational efficiencies of providing maintenance services. The new facilities will enhance the customer experience of City employees who require vehicle and equipment maintenance and repair. In addition to an immediate need for the relocation of Fleet Service, Fire Apparatus and Emergency Equipment Maintenance, and Communications, the City of Madison wishes to include a satellite facility for Metro Transit bus operations, maintenance, and storage functions, a Biodigester System, and operations and maintenance facilities for the State Fleet Services.

The site selected and purchased by the City of Madison for these new facilities was that of a former Cub Foods grocery store, located four miles northeast of downtown, near WI-30 and US 51. The 15.36 acre site is located at the corner of Commercial Avenue and Nakoosa Trail and shares a corner parcel of land with a BP Franchise commercial gas station and convenience store.

Former grocery store building is approximately 76,715 square feet.

The detailed programmatic requirements for the new facilities have been organized as a part of the Phase I report. Use the Phase I report as a reference for the basis of design and programming documentation.

Site Description

The Nakoosa Trail Site is located on the corner of Commercial Avenue and Nakoosa Trail. There is an existing building and parking lot on the site that formerly served as a grocery store.

This former grocery store building is approximately 76,715 square feet with offices on the second floor and five loading docks in the rear. The building exterior is constructed with decorative CMU block and is in fairly good condition. The roof has required a

steady amount of maintenance since the City of Madison acquired the property and it needs to be replaced. HVAC systems are also old and failing.

An internal access road that runs through the site on the south side, adjacent to the parking lot, served as a frequently traveled short cut for commuters. On the southeast corner there is a significant grade change and the slope raises to the industrial buildings Commercial Avenue. The entire wooded southeast corner is on a fairly steep grade and there is a naturally depressed area that occurs in the northeast corner of the site where the woods meet Nakoosa Trail. There is a corner parcel of land with the commercial gas station and convenience store. This site has a retail building, underground storage tanks, and a canopy above the dispensers.

Purpose of Report

As a part of the planning and design process, this report has been developed to document our knowledge of the program, the needs of the users and to develop an architectural aesthetic for the facility.

The RNL/MDG Planning Team

City of Madison selected and contracted with a Concept Design Team lead by RNL and supported by Maintenance Design Group

The most successful facility projects begin with the RNL/MDG Planning Team gaining an understanding of your needs.

(RNL/MDG Planning Team) to provide comprehensive planning and conceptual design services.

Methodology

The RNL/MDG Planning Team's programming, planning, and design methodology has a single common denominator - client involvement. The RNL/MDG Planning Team believes that the most successful facility planning projects begin with the gaining of an understanding of the functions or operations to be performed within the facility through interaction with the users. Therefore, this RNL/MDG Concept Design Team began this Phase of this project in the same manner as Phase I, kicking off Concept Design Phase with an the interactive Charrette process.

The goal of the RNL/MDG Design Team is to develop detailed floor plans for Fleet Service, Fire Apparatus and Emergency Equipment Maintenance, and Communications facilities. By participating in this time-tested charrette process, the resulting plans and associated probable cost information will ultimately be more accurate and more useful.

Report Overview

This Programming Report prepared by the RNL/MDG Planning Team consists of eight sections and six appendices. The following is a brief description of the contents of each section.

Section One - Project Overview

Describes the background of the project and gives an overview of the complete report.

Section Two – Concept Design Workshop

This section describes the three-day Design Charrette run my RNL and MDG in conjunction with the client user groups.

Section Two A – Appendices

- Introductory Powerpoint Presentation
- Charrette Drawings

Section Three – Conceptual / Schematic Design Drawings

Presents detailed floor plans documenting this project at the 30% milestone

Section Three A – Drawings

- Appendix C: Conceptual Design Drawings
- Appendix D: UDC Powerpoint Presentation
- Appendix E: Progress Architectural Concepts
- Appendix F: FIRE ONLY Programming Document

Section Four – Conceptual / Schematic Design Narratives

A compilation of narratives and conceptual approaches to other components of the development of the preferred site and floor plans, including site work, utility connections, and various city department reviews.

Section Five – Conceptual Equipment List

This section is comprised of a comprehensive list of proposed equipment to be supplied for the new facility.

Section Six - LEED

A narrative of our LEED practices and how they have been incorporated into this project, and a preliminary LEED checklist

Section Seven – Schedule

This section is a proposed schedule for design and construction.

Section Eight – Financial

This section contains cost estimates for Phase I and Phase1B design.

Section 2 – Concept Design Workshop

"Increase our flexibility to maintain our viability."

Bill Vandenbrook

Charrette workshop

Concept Design Workshop

Day One | Review Meeting (10/01/2014)

The Concept Design Team reviewed the final Phase I report with the City of Madison staff, and went through a schedule for the next steps after the charrette.

- Finish concept design before Christmas, present to UDC board
- Construct building by 2016, while Phase 1B in 2019
- Operating Budget at 12.5%

The group discussed the Option H site plan and square footages for Phase 1A and Phase 1B.

Phase 1A core: 90' x 170' (shop, support and offices)

Phase 1A Fire: 8 heavy bays 85's x 130'l

Phase 1B: Fleet Maintenance and Radio Communication with light duty repair bays

The team encouraged that the room used for the charrette be welcoming in nature to all staff at any time in order to obtain a comprehensive understanding of the needs of every individual and the operation(s) as a whole. The Concept Design team worked that afternoon to develop concepts using the information gathered in Phase I.

Day Two | Initial Concepts (10/02/2014)

The Concept Design Team presented initial floor plan concepts to the user group team.

Detailed floor plans were developed showing the relationships between all departments. Each space listed in the facility program is identified and given a square footage. The floor plans were then placed onto the site plan to show how circulation of vehicles and traffic would navigate around the facility.

The design team developed plans for Phase 1A and Phase 1B, in an effort to explain how the facility would grow over time and expands to include Fleet Services and Radio Communication departments.

Initial Concepts General Comments

- Dave – parking in front of the building, is there enough. Identify visitor and accessible spaces.
- Verify turning radius for vehicles in front of the building (northwest corner)
- Reminder to be conscious of functionality versus design aesthetics.
- Zoned Commercial District. The materials will have to reflect that rather than a metal pre-manufactured building.
- Want solid / durable materials
- Using hardi-board panels at the current Radio Communications shop, they look nice and hold up well to environmental conditions.
- Phase 1A: extend to include all of admin space, not just what is needed for fire admin only.

MEP discussion with Mead & Hunt engineers and Kay (COM)

Mechanical:

- Place mechanical equipment indoors (how much space is required for this?)
- Radiant floor heat a good idea but pricey
- Heating plan consists of boilers and heat pumps
- CMG is Class I Div II requirements.
- Need emergency generator backup

Plumbing:

- Multiple compressors / dryers
- LEED Silver is goal
- Transformer 480V: 25’ from electrical to transformer
- Would the City consider PV panels?
- Would the City consider grey water or a rain water collection system?

Day Three | Final Recap (10/03/2014)

Based on the comments during the day two presentations, the concept design team presented revised site and floor plans.

Final Concepts General Comments

Radio Communications:

- Lynn – unisex restroom in or near breakroom. Would like one in near conference room and customer waiting area.
- Dave – need room for growth for future techs

- Move IT to mezzanine where there is more storage. Add 2 additional tech workstations.
- Lead – visual connection to the repair side / Supervisor – visual connection to the install side

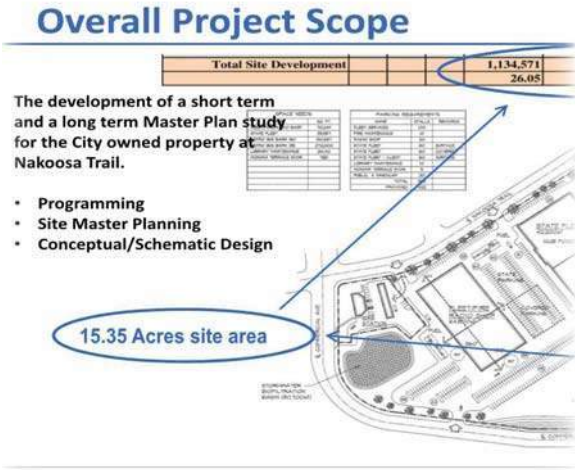
Fleet:

- Robin checks in vehicles. She needs to be on the ground floor
- Where do customers to and check their vehicles in
- Ron has to have a walled in office, tweak corner to add a private office.
- Modify northwest corner of Phase I to create loading dock area.
- Bill – "we have gotten away without a dock, but ultimately we will need one"
- More support area to second floor (IT, custodial, electrical, storage)
- Ron / Ken: unload indoors and forklift to parts room from delivery trucks is an option
- Overhead doors in the open position = cold disgruntled employees.
- UPS / uniform and back up to the loading area if necessary.
- How much site should be allocated to a loading dock that will not be regularly used.
- Bill – event trigger may force EOC. Value of spaces allows the facility to 'light on their feet'
- Art – don't have the space for lunch-n-learns. Would like a large space for large group meetings.
- Bill – current facility mechanical units have lasted 56 years.
- Systems: in floor heating (HVAC make-up air) and AC.
- Need to review life cycle costs
- Will radiant floor heating will evaporate snow and leave puddles?
- Backup generator power: think about Phase II, which offices and bays will need to be on generator power.

General:

- Bill – has a tenant floor product may want to look at using again in new facility.
- ADD 100 ton drill press in to welding shop area.

- Need to verify jib crane height requirements
- Need a 3’ to 4’ wide door into fire storage area.



Appendix A – Introductory Powerpoint Presentation

City of Madison
Nakoosa Trail Master Plan

Phase II Kick-Off
10-01-14

RNL

City of Madison Project Team

Core Team User Groups

Fleet Services & Fire Maintenance
Bill Vandenbrook
Art Meyer
Ron Janowski
Randy Koch
Gary Kramer

Radio Shop
Lynn Christoph
Dave Nachreiner

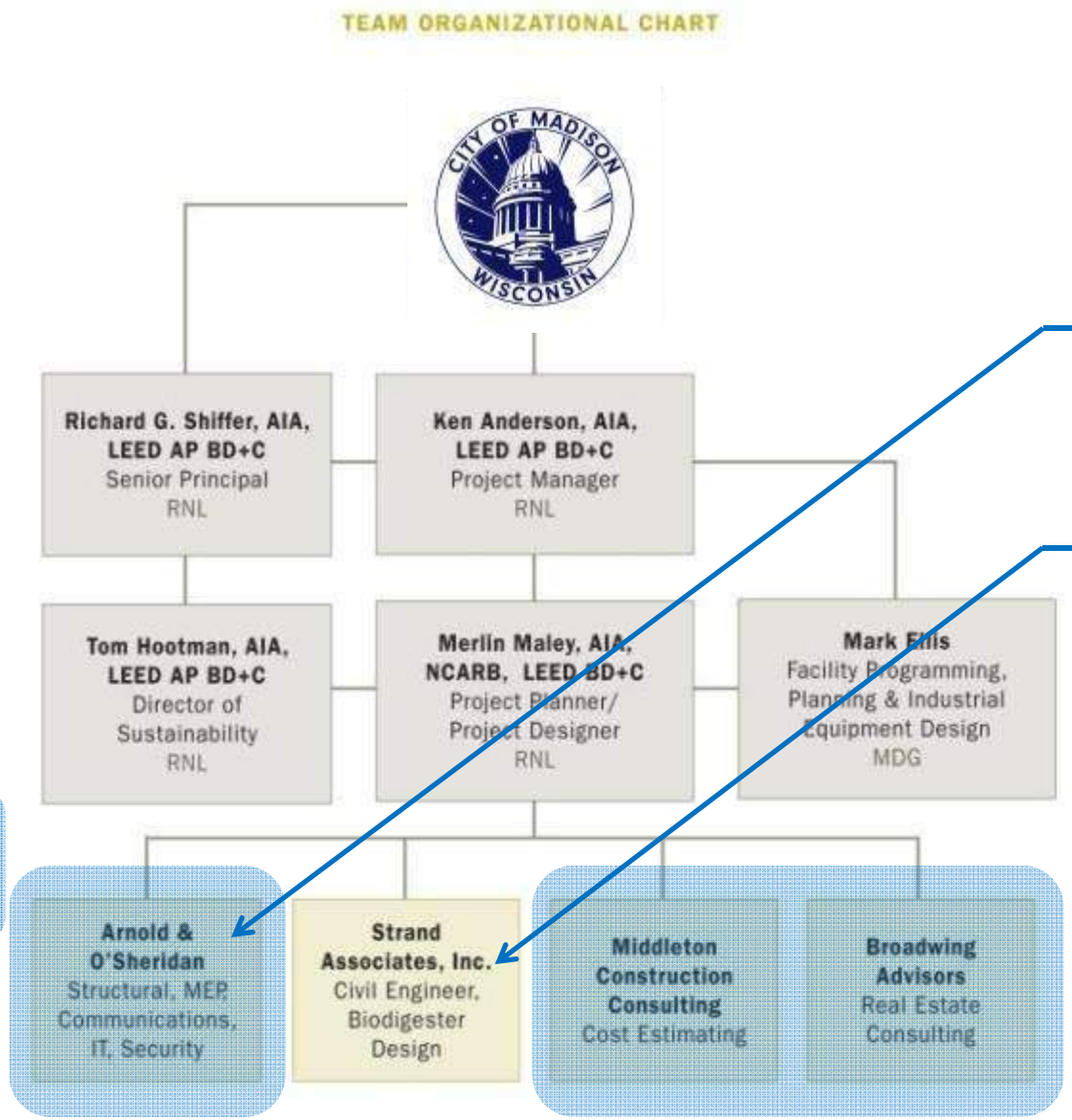
Streets Recycling
George Dreckman
Brynn Bemis

Metro Transit
Chuck Kamp
Ann Gullickson
Jeff Butler

Facilities Management
Jeanne Hoffman
Jim Whitney
Kay Schindel

State Fleet
Nick Zavos (Mayor's Office)

RNL Project Team



RNL

Maintenance Design Group

STRAND ASSOCIATES

arnold & o'sheridan consulting engineers

BROADWING advisors

Mead & Hunt
Doug Van Leuven
Mech, Plumbing, Structural

Strand
Electrical

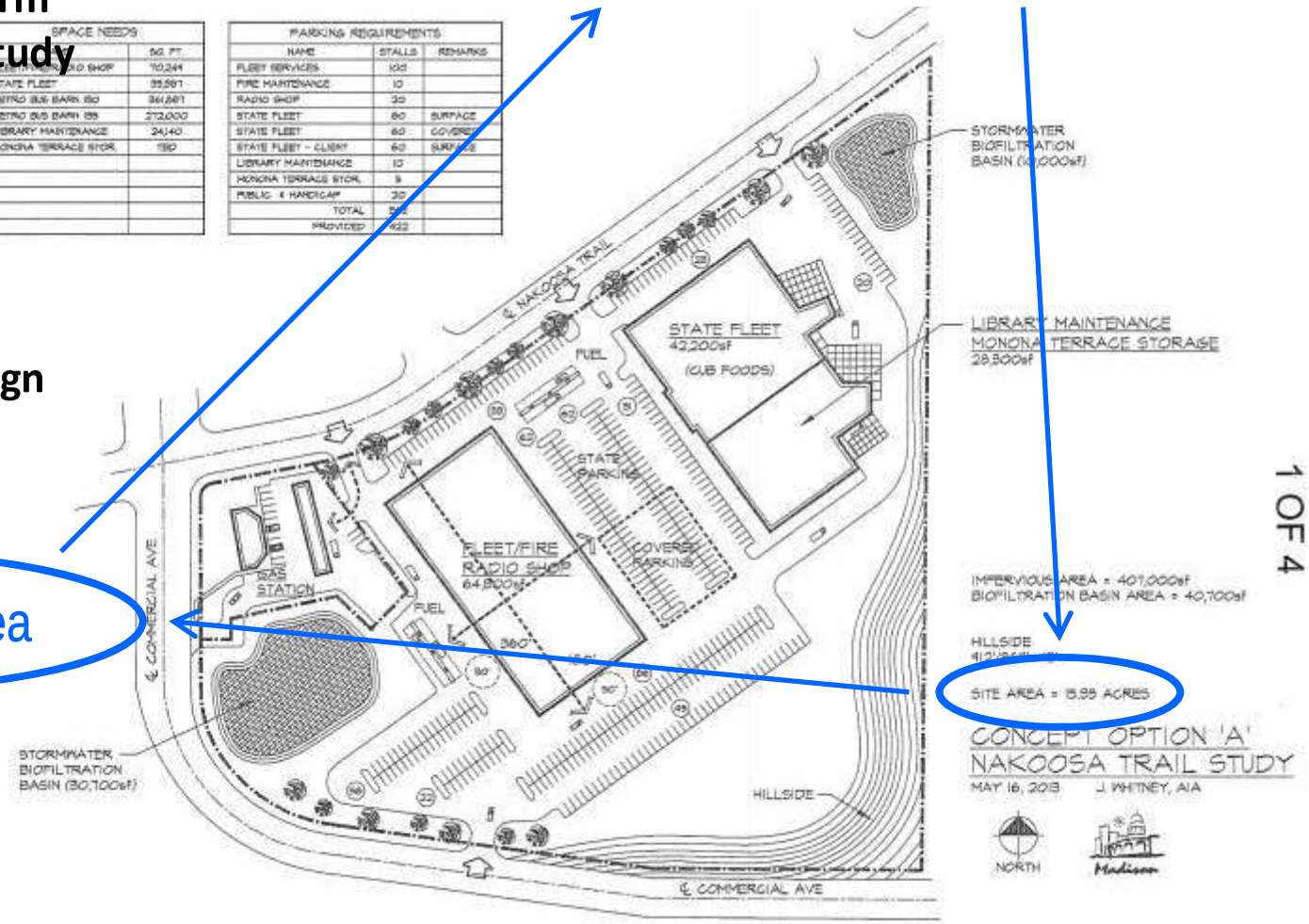
Overall Project Scope

Total Site Development				**1,134,571**		**square feet**
				26.05		**minimum acres required**

The development of a short term and a long term Master Plan study for the City owned property at Nakoosa Trail.

- **Programming**
- **Site Master Planning**
- **Conceptual/Schematic Design**

15.35 Acres site area



Short-Term Plan

Fleet, Fire, Radio, Shared Building

88,300 sf Building SF

34,100 sf Site SF

Repurposing Cub Foods Building

70,300 sf = 1.6 AC

State? Metro? Biodigester?

35,500 sf Building SF

55,300 sf Site SF

Actual:

Fleet, Fire, Radio, Shared Building

94,425 sf Building SF

5.3ac Site SF

Short-Term Plan

Fleet, Fire, Radio, Shared Building

94,425 sf Building SF

5.3ac Site SF

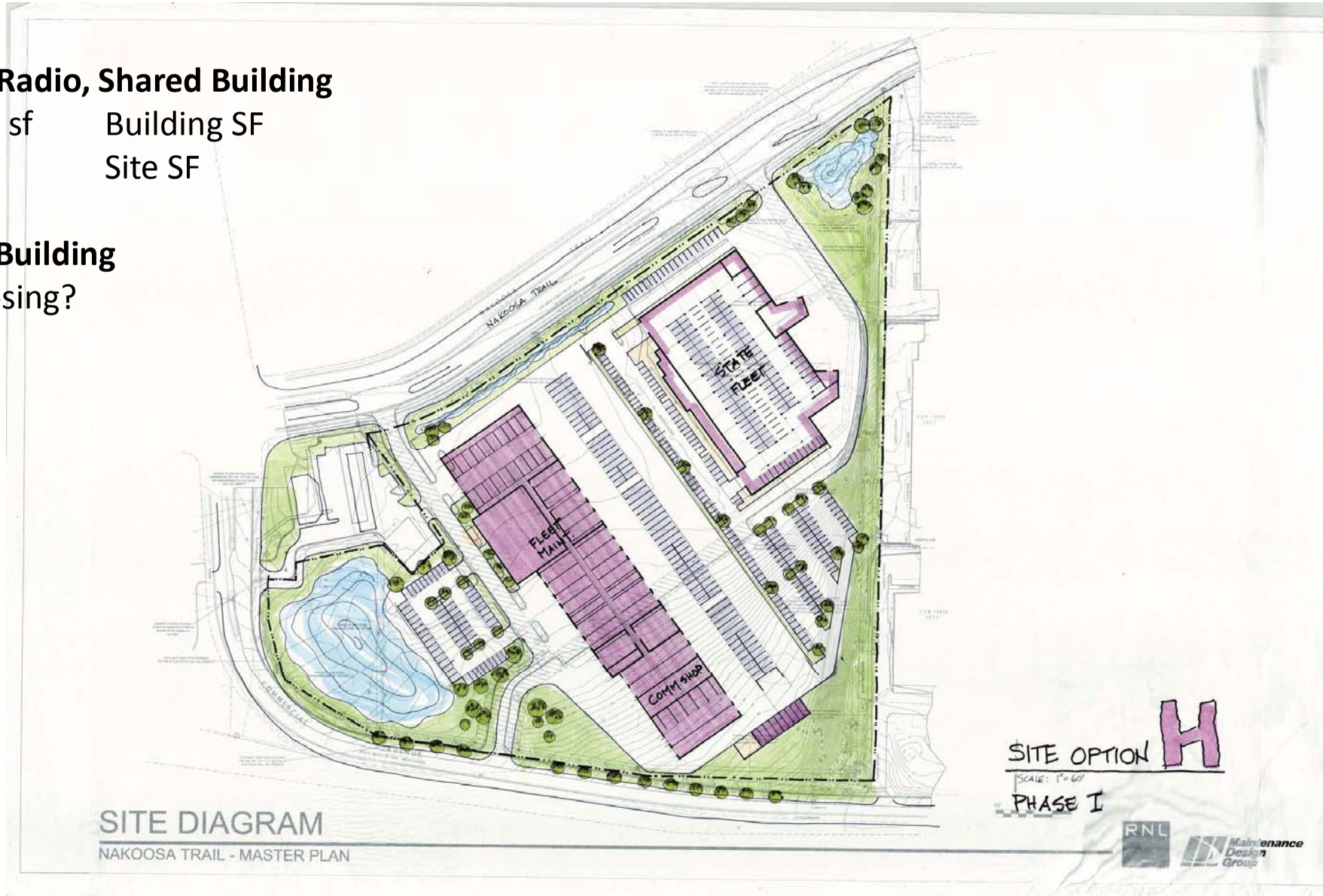
Short-Term Plan

Fleet, Fire, Radio, Shared Building

94,425 sf	Building SF
5.3ac	Site SF

Cub Foods Building

- Repurposing?



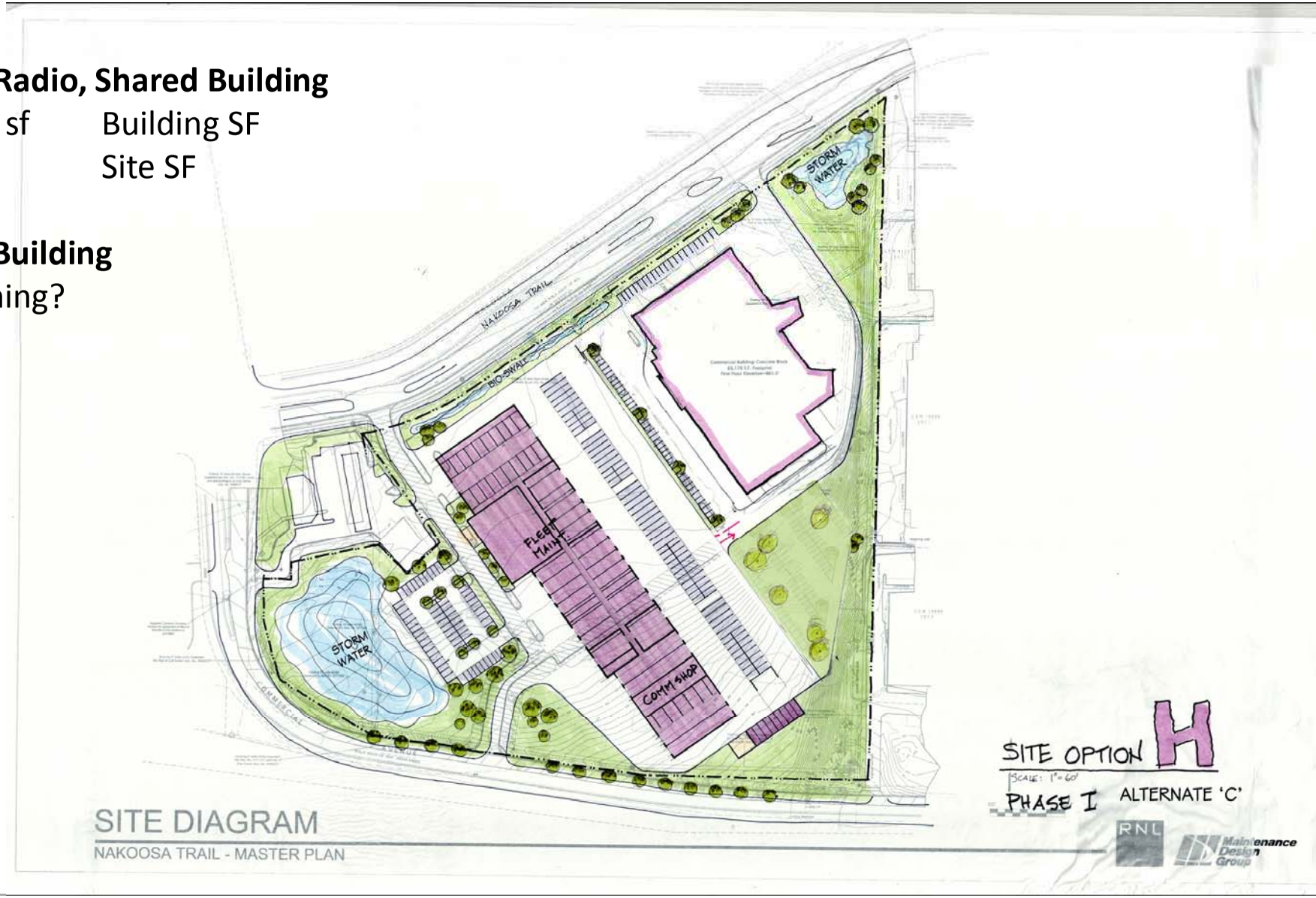
Short-Term Plan

Fleet, Fire, Radio, Shared Building

94,425 sf	Building SF
5.3ac	Site SF

Cub Foods Building

- Maintaining?



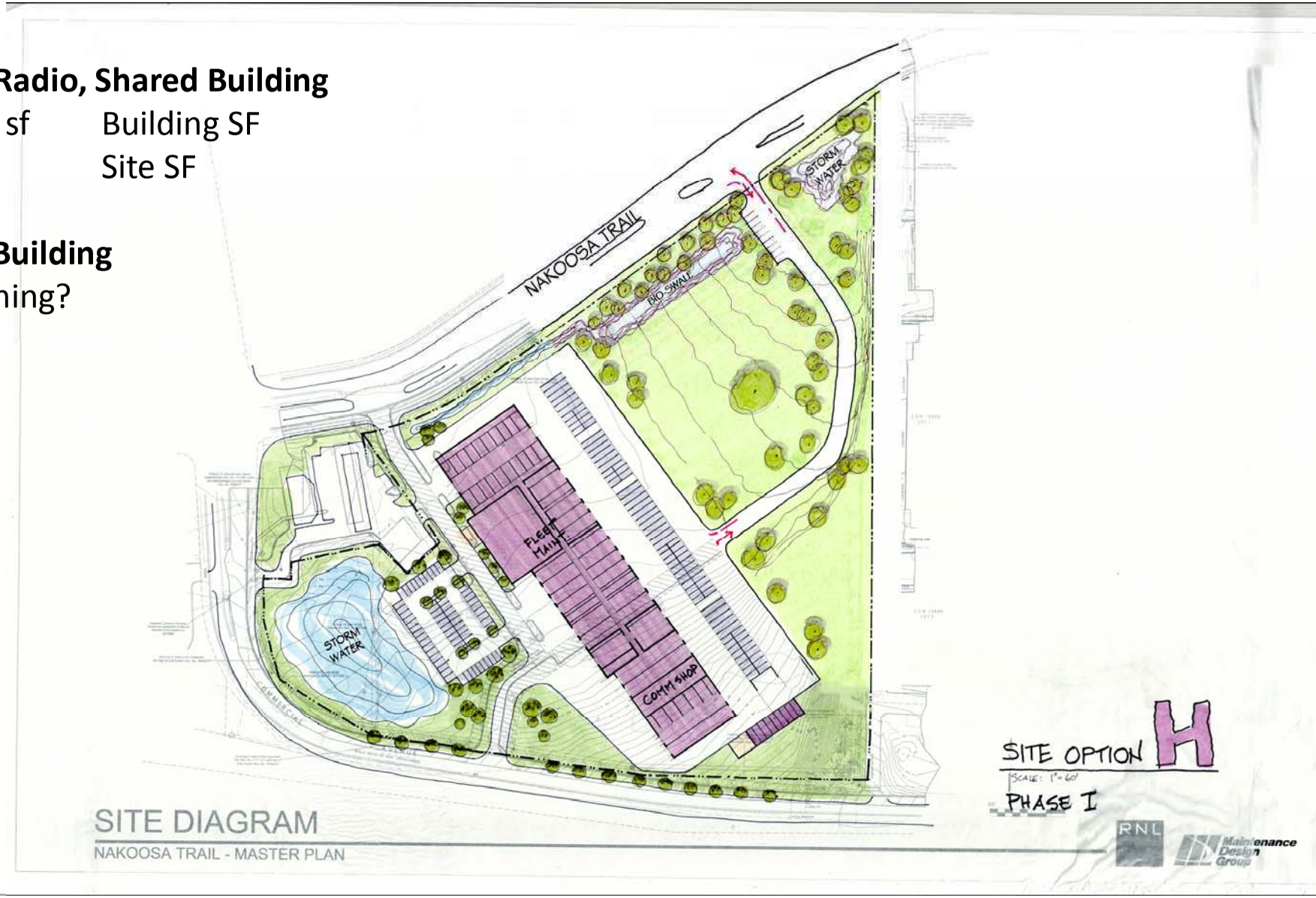
Short-Term Plan

Fleet, Fire, Radio, Shared Building

94,425 sf	Building SF
5.3ac	Site SF

Cub Foods Building

- Demolishing?



Short-Term Plan

Fleet, Fire, Radio, Shared Building

94,425 sf Building SF

5.3ac Site SF

Cub Foods Building

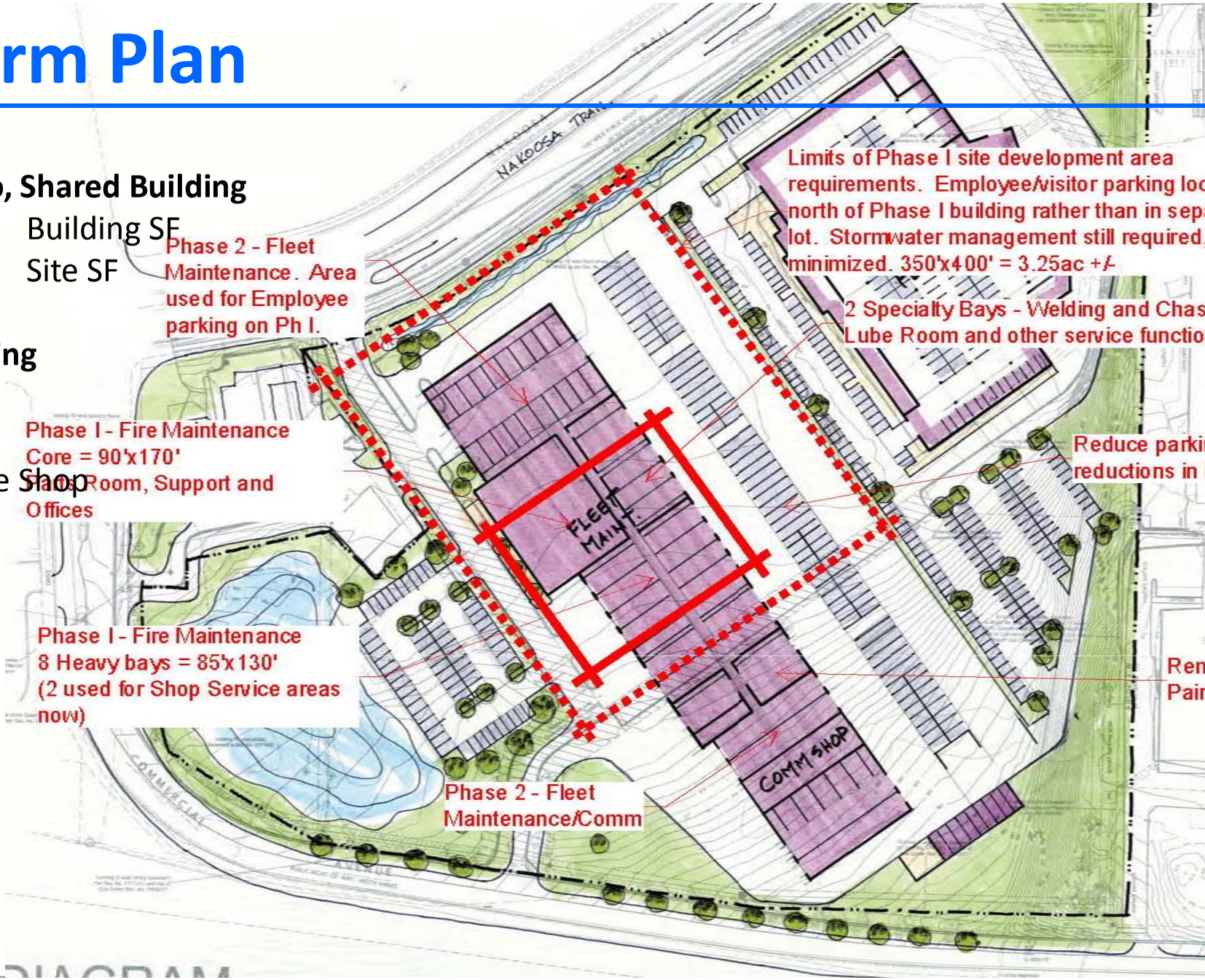
Phasing Phase I

Fire Maintenance Shop

26,921 sf

Site Area

3.5 acres



Long-Term Plan – not part of Phase II

Fleet, Fire, Radio, Shared Building

94,425 sf Building SF
5.3ac Site SF

Repurposing Cub Foods Building

70,300 sf = 1.6 AC

State? Other?

35,500 sf Building SF
55,300 sf Site SF

Metro Satellite Facility

362,000 sf Building SF
91,400 sf Site SF

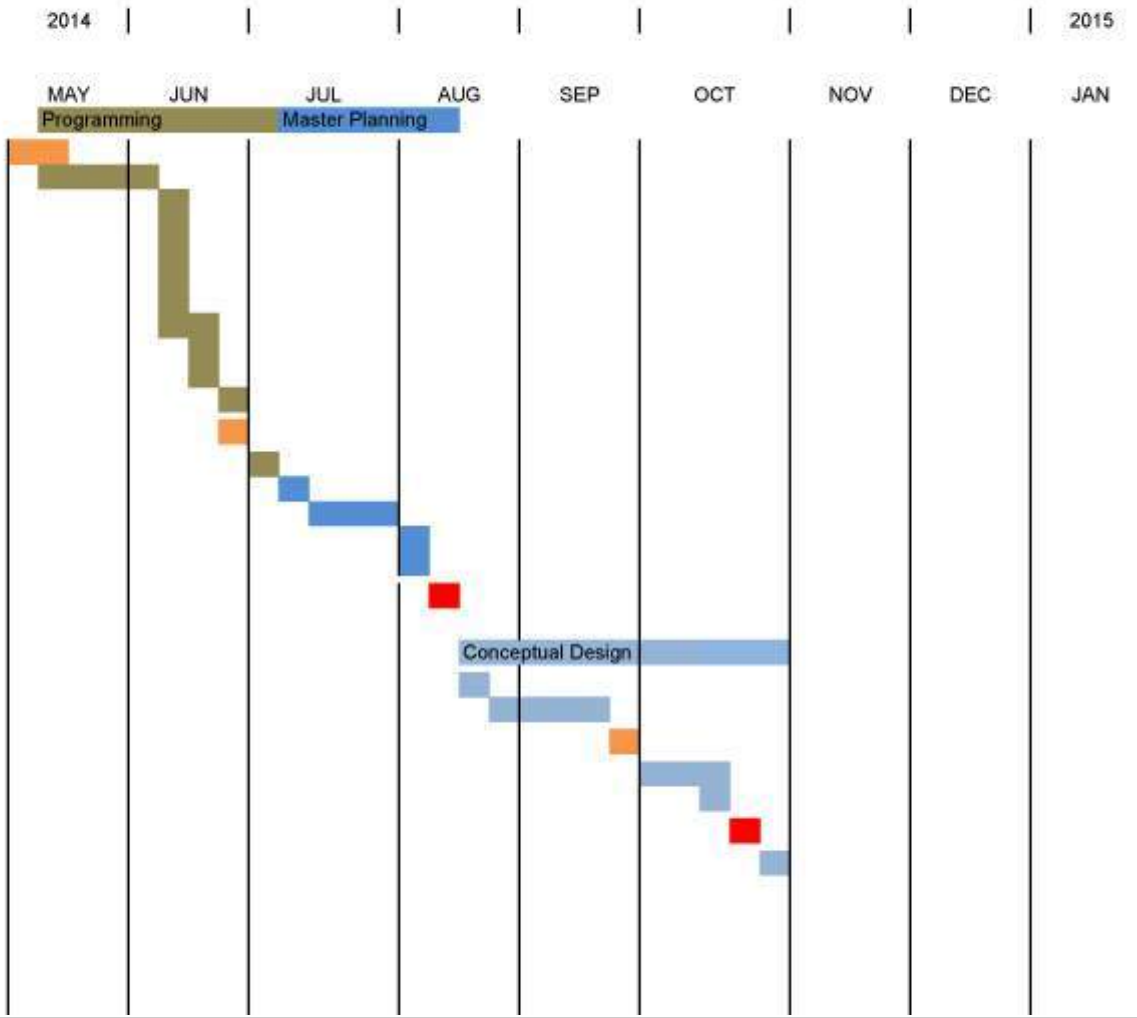
Biodigester

217,800 sf = 5.0 AC (could be 8 AC ?)

Project Schedule - original

Bar Schedule
Programming
Master Planning
Conceptual Design
City/Agency Reviews
S - State Fleet Input re Cub Foods (Nick Zavos)
AD - Anaerobic Digester Input (George Dreckman)
all - All other user group representatives, including AD input

		Duration (working days)	Begin	End
	Phase I - Programming/Master Planning	70	05/12/14	08/18/14
	Contract Signature / NTP	10	05/05/14	05/16/14
all	Programming Questionnaires	20	05/12/14	06/06/14
AD	Review Biodigester Feasibility Study	2	06/09/14	06/10/14
all/S	Project Kick-Off Meeting	1	06/11/14	06/11/14
all	Programming Workshop	3	06/11/14	06/13/14
all	Site Tours, Department Interviews	2	06/11/14	06/12/14
AD	Biodigester Meeting (George Dreckman)	1	06/13/14	06/13/14
AD	Biodigester Evaluations-Programming	8	06/11/14	06/20/14
AD	Develop Biodigester Design Criteria & Summary Text	2	06/19/14	06/20/14
	Development of Program Doc	5	06/16/14	06/20/14
	Submit Program Document	1	06/23/14	06/23/14
all	COM/Agency Review	5	06/23/14	06/27/14
	Refine Program Document	4	06/30/14	07/03/14
all	Master Plan Workshop (& Program Review)	4	07/08/14	07/11/14
	Refine Master Plan	15	07/14/14	08/01/14
all/S	Phase I Presentation	1	08/04/14	08/04/14
	Develop & Submit Phase 1 Summary Report	4	08/05/14	08/08/14
all	COM/Agency Review	5	08/11/14	08/15/14
	Phase II - Conceptual Design	55	08/18/14	10/31/14
all	Site Tours; Conceptual Design Charrette	5	08/18/14	08/22/14
	Refine Conceptual Design	20	08/25/14	09/19/14
all	COM/Agency Mid-Phase Review	5	09/22/14	09/26/14
	Refine Conceptual Design	15	09/29/14	10/17/14
all/S	Phase II Final Presentation	1	10/17/14	10/17/14
all	COM/Agency Review	5	10/20/14	10/24/14
	Final Document Development & Submittal	5	10/27/14	10/31/14



Review the previously developed Anaerobic Digester Feasibility Study prepared by others.

Project Schedule – R1

Bar Schedule
Programming
Master Planning
Conceptual Design
City/Agency Reviews
S *- State Fleet Input re Cub Foods (Nick Zavos)*
AD *- Anaerobic Digester Input (George Dreckman)*
all *- All other user group representatives, including AD input*

		Duration (working days)	Begin	End
	Phase I - Programming/Master Planning	70	05/12/14	08/18/14
	Contract Signature / NTP	10	05/05/14	05/16/14
all	Programming Questionnaires	20	05/12/14	06/06/14
AD	Review Biodigester Feasibility Study	2	06/09/14	06/10/14
all/S	Project Kick-Off Meeting	1	06/11/14	06/11/14
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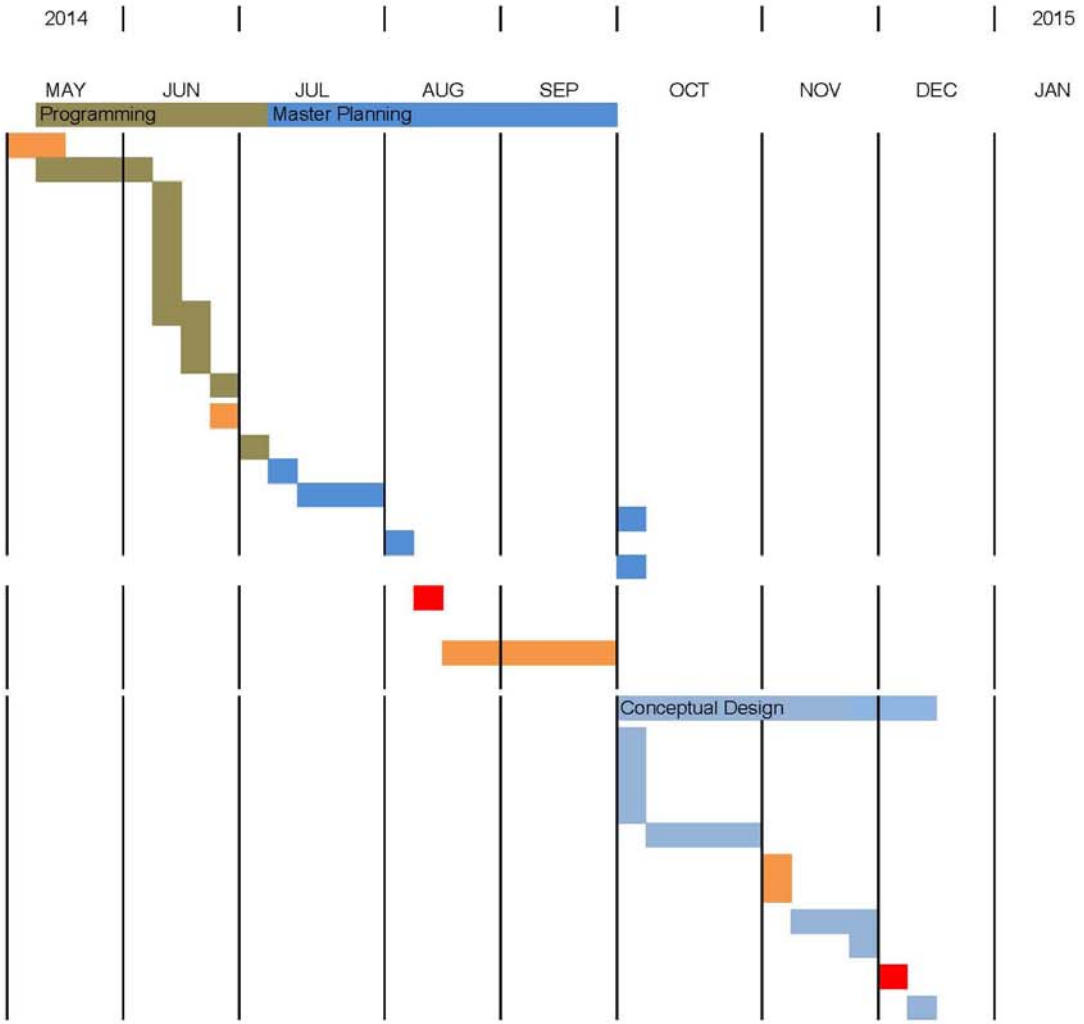
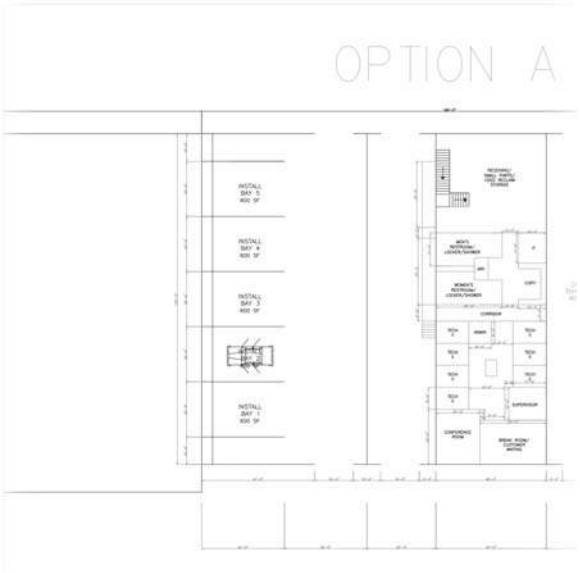
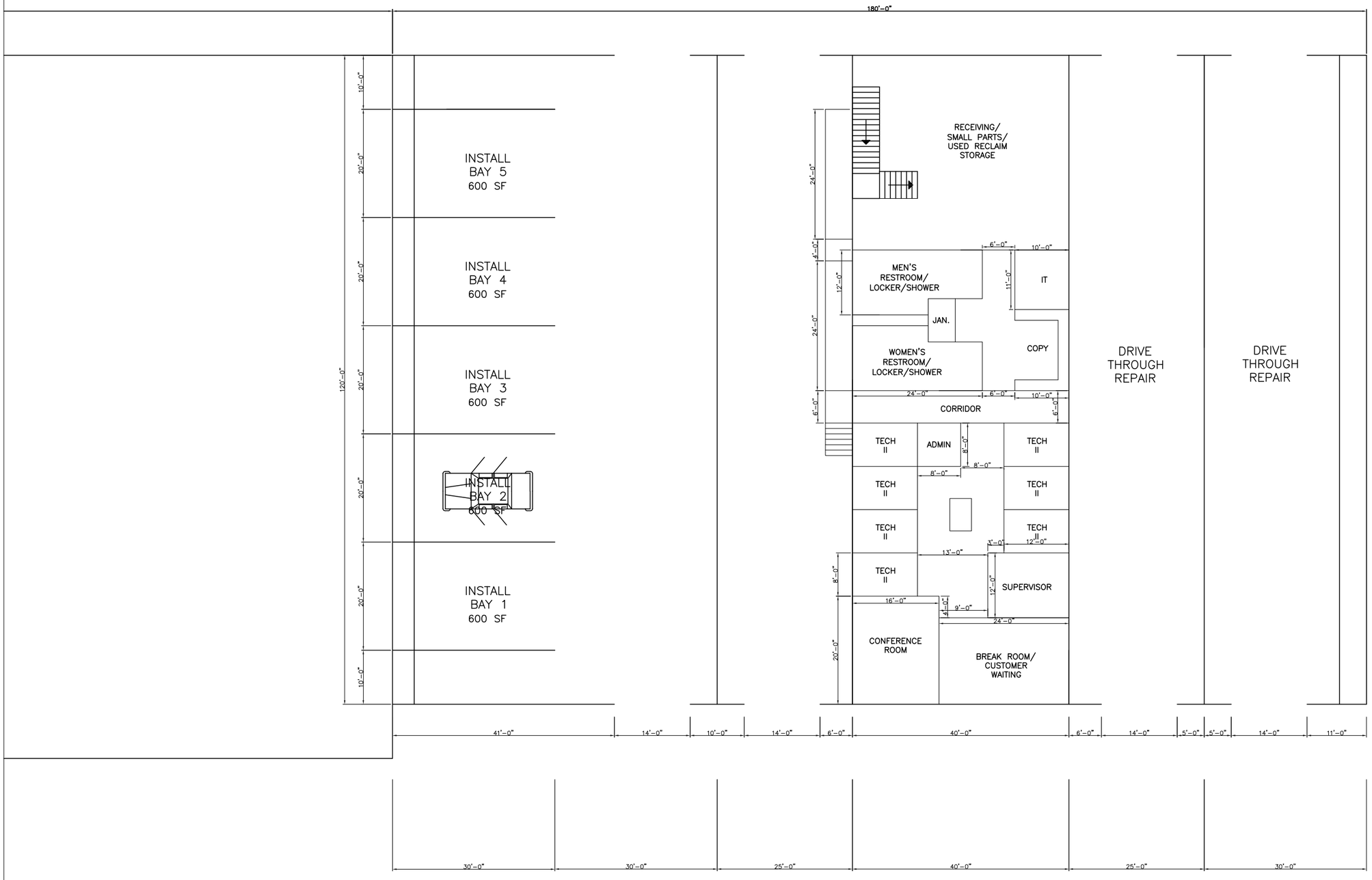
	Submit Program Document	1	06/23/14	06/23/14
all	COM/Agency Review	5	06/23/14	06/27/14
	Refine Program Document	4	06/30/14	07/03/14
all	Master Plan Workshop (& Program Review)	4	07/08/14	07/11/14
	Refine Master Plan	15	07/14/14	08/01/14
all/S	Phase I Presentation	1	10/03/14	10/03/14
	Develop & Submit Phase 1 Summary Report	4	08/05/14	08/08/14
	Submit Phase 1 Summary Report	1	10/06/14	10/06/14
all	COM/Agency Review	5	08/11/14	08/15/14
	City of Madison Budgeting & Evalutaion Process	30	08/18/14	09/26/14
	Phase II - Conceptual Design	55	10/01/14	10/31/14
all	Start-Up; Conceptual Design Charrette	5	10/01/14	10/03/14
	Site/Stormwater Review	1	10/01/14	10/01/14
	Zoning Review	1	10/02/14	10/02/14
	Systems	1	10/02/14	10/02/14
	Refine Conceptual Design	20	10/06/14	10/31/14
all	COM/Agency Mid-Phase Review	5	11/03/14	11/07/14
	Urban Design Commission Meeting	1	11/05/14	11/05/14
	Refine Conceptual Design	15	11/10/14	11/28/14
all/S	Phase II Final Presentation	1	11/28/14	11/28/14
all	COM/Agency Review	5	12/01/14	12/05/14
	Final Document Development & Submittal	5	12/08/14	12/12/14





Appendix B – Charrette Drawings

OPTION A


180'-0"
INSTALL BAY 5 600 SF
INSTALL BAY 4 600 SF
INSTALL BAY 3 600 SF
INSTALL BAY 2 600 SF
INSTALL BAY 1 600 SF
120'-0"
10'-0"
20'-0"
20'-0"
20'-0"
20'-0"
20'-0"
10'-0"
RECEIVING/ SMALL PARTS/ USED RECLAIM STORAGE
24'-0"
4'-0"
MEN'S RESTROOM/ LOCKER/SHOWER
12'-0"
6'-0"
10'-0"
IT
11'-0"
JAN.
COPY
24'-0"
WOMEN'S RESTROOM/ LOCKER/SHOWER
DRIVE THROUGH REPAIR
DRIVE THROUGH REPAIR
6'-0"
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CORRIDOR
TECH II
ADMIN
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3'-0"
12'-0"
13'-0"
8'-0"
TECH II
SUPERVISOR
12'-0"
16'-0"
4'-0"
9'-0"
24'-0"
20'-0"
CONFERENCE ROOM
BREAK ROOM/ CUSTOMER WAITING
41'-0"
14'-0"
10'-0"
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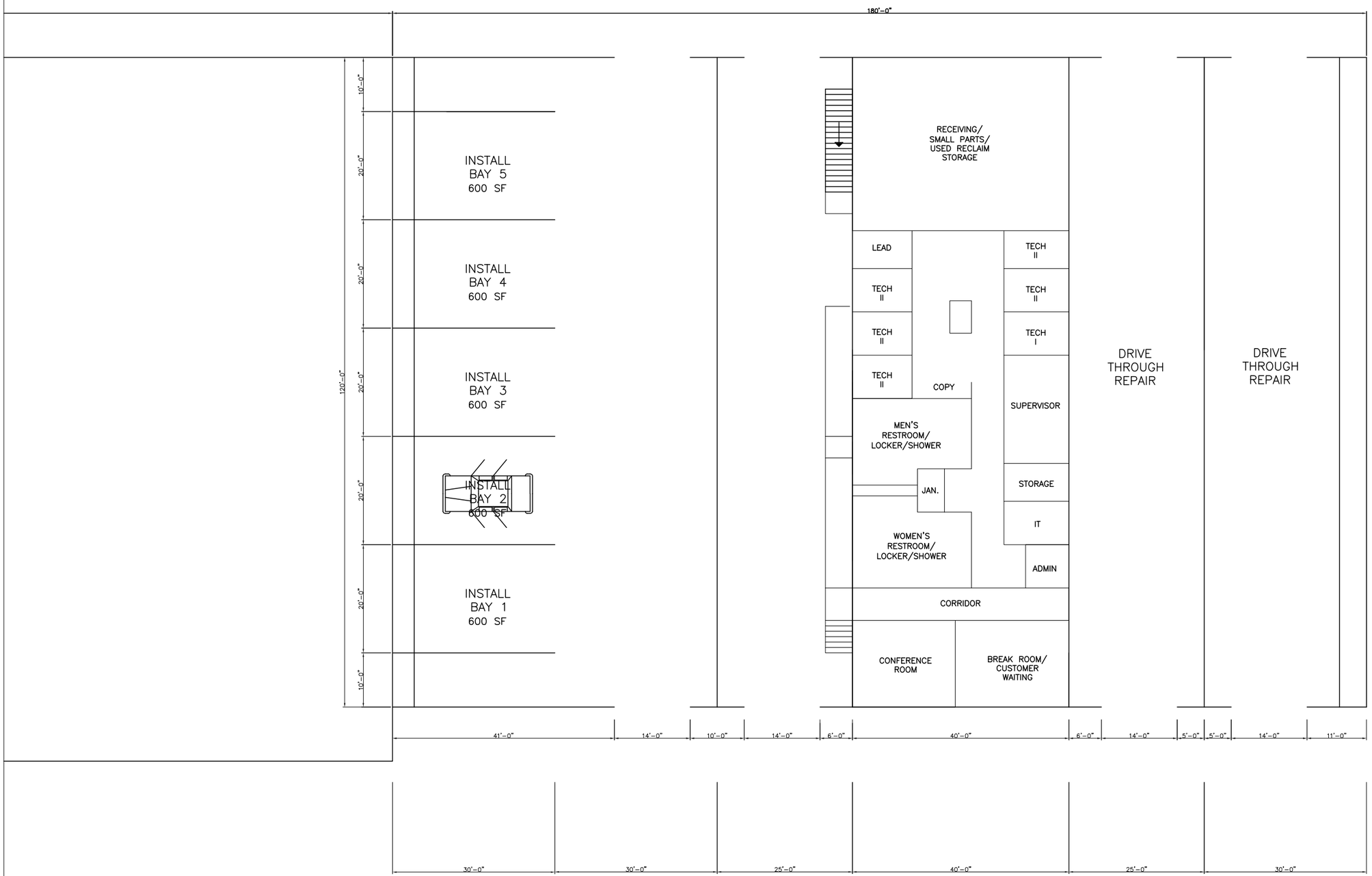
OPTION B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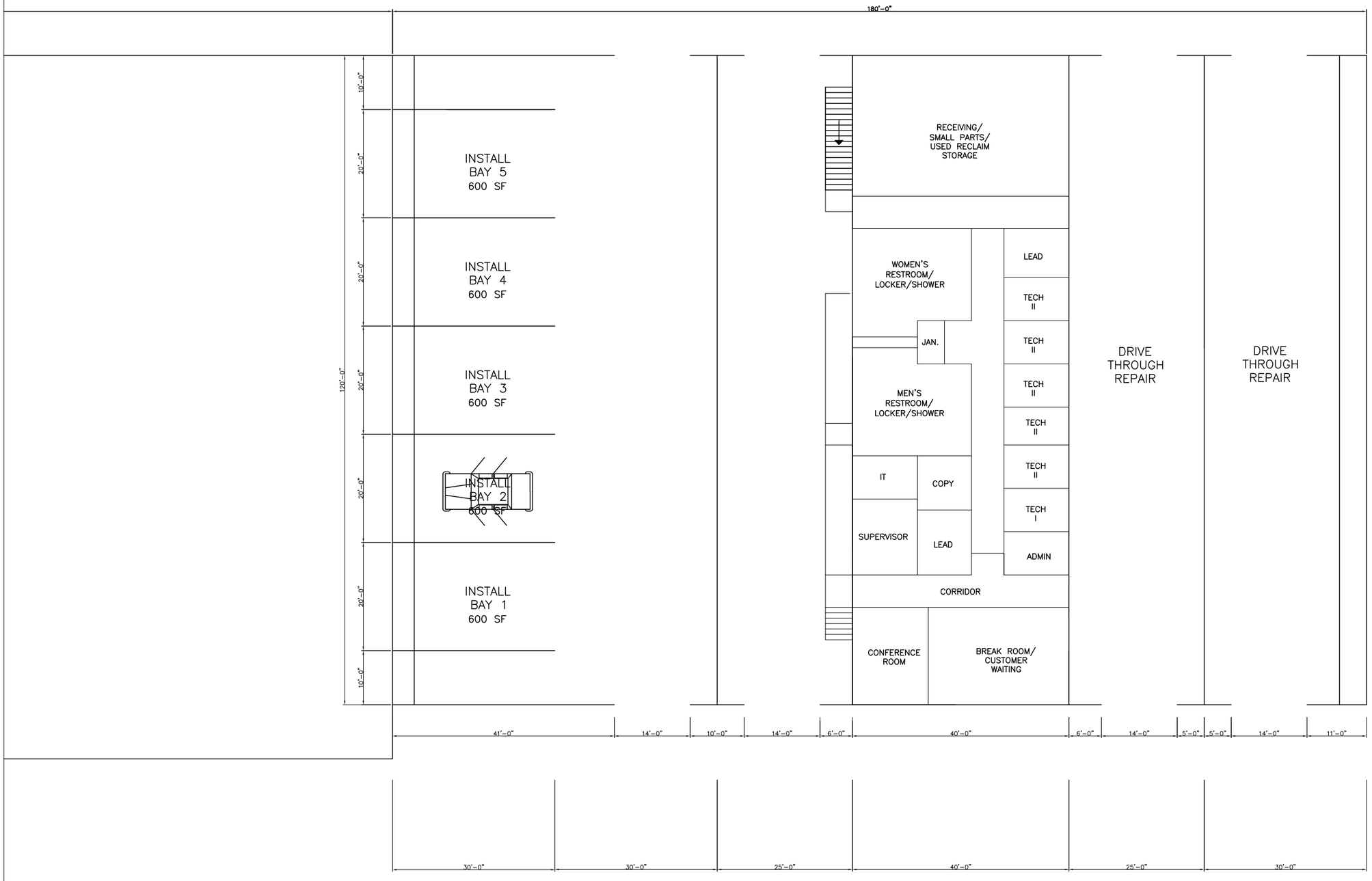
OPTION C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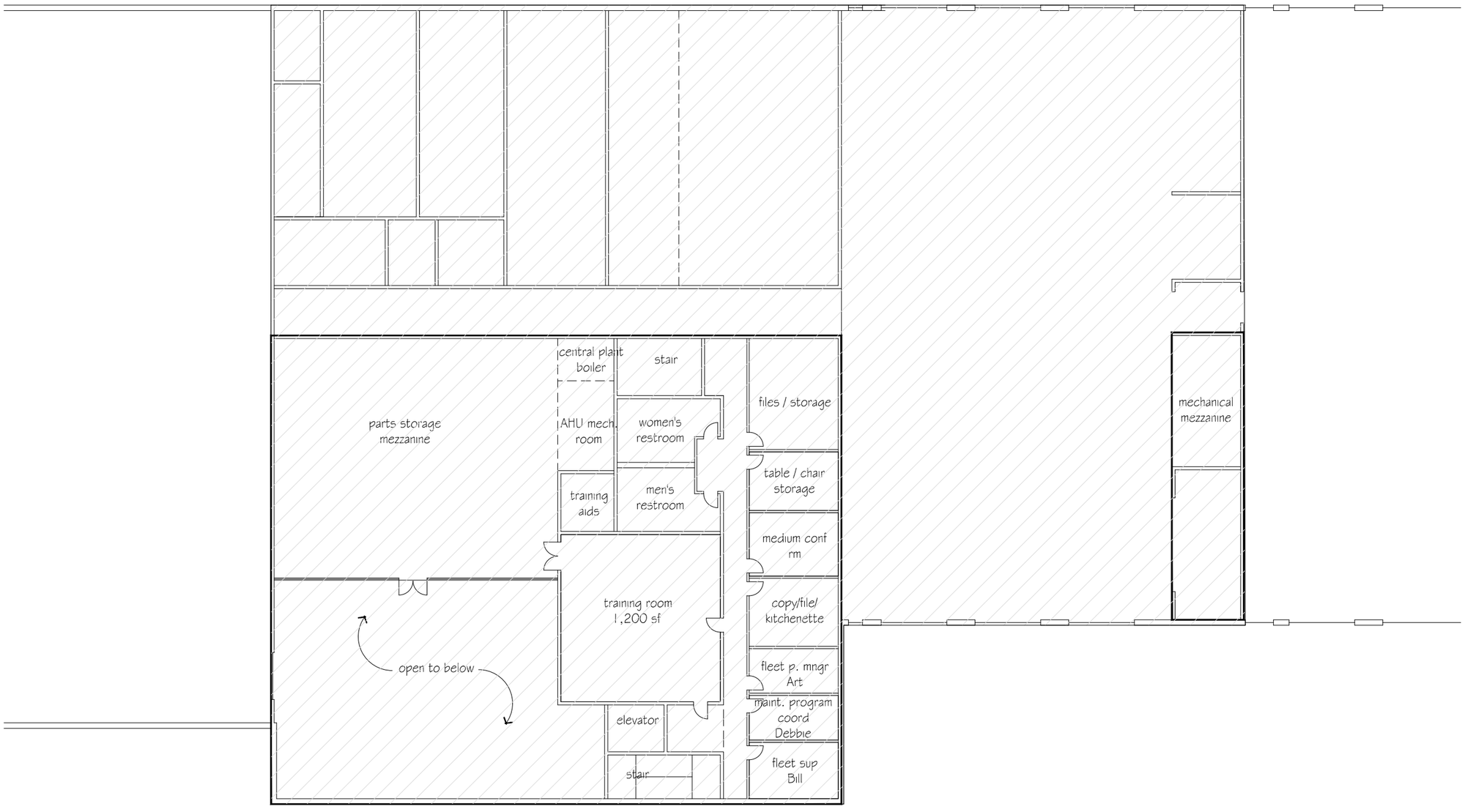
TECH II
TECH II
TECH I
ADMIN
CORRIDOR
CONFERENCE ROOM
BREAK ROOM/ CUSTOMER WAITING
DRIVE THROUGH REPAIR
DRIVE THROUGH REPAIR
41'-0"
14'-0"
10'-0"
14'-0"
6'-0"
40'-0"
6'-0"
14'-0"
5'-0"
5'-0"
14'-0"
11'-0"
30'-0"
30'-0"
25'-0"
40'-0"
25'-0"
30'-0"


PORTABLE EQUIPMENT STORAGE 20X35
MEDIUM DUTY / EMERGENCY AMBULANCE BAY 16X35
GW
GL
LIGHT DUTY BAY 15X35
COMMON WORK AREA 20X34
10' OVERHEAD DOOR
PORTABLE EQUIPMENT STORAGE 20X35
10' WIDE RAMP
COMP
ELEC.
MASK SHOP
LUBE
CHASSIS WASH
WELDING SHOP
WELDING
STORAGE
CUSTODIAL
I.T.
PARTS MNGR.
TECH 6X6
WASH 6X8'
PARTS ROOM
STAIR
WOMENS LOCKER RM
KITCHEN/ VENDING
BREAK ROOM
ELEVATOR
CONF RM
RON
GARY
RANDY
ROBIN
COPY
KATHY
WAITING/ RECEPT
WORK BAY 20' X 60'
TIRE SHOP TIRE STORAGE
TB TOOLS CRIB
HAND WASH
EYE WASH
PES
CWA
HEAVY INSPECTION
HEAVY REPAIR BAYS
PAINT
PAINT BODY SHOP


central plant
boiler
stair
files / storage
parts storage
mezzanine
AHU mech.
room
women's
restroom
table / chair
storage
training
aids
men's
restroom
medium conf
rm
training room
1,200 sf
copy/file/
kitchenette
open to below
fleet p. mngr
Art
maint. program
coord
Debbie
elevator
stair
fleet sup
Bill
mechanical
mezzanine

central plant
boiler

stair

files / storage

parts storage
mezzanine

AHU mech.
room

women's
restroom

table / chair
storage

training
aids

men's
restroom

medium conf
rm

training room
1,200 sf

copy/file/
kitchenette

open to below

fleet p. mngr
Art

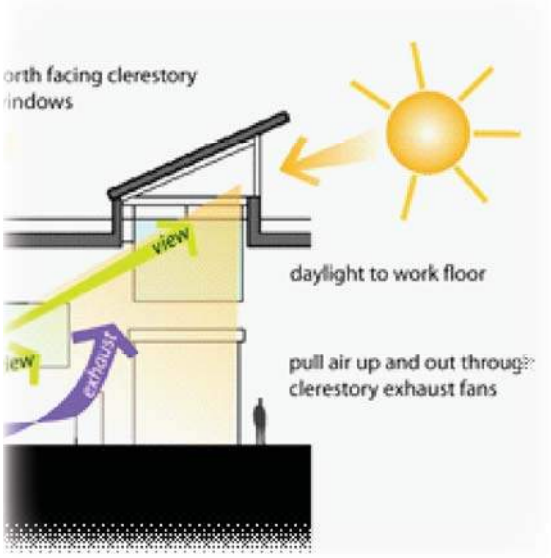
maint. program
coord
Debbie

elevator

fleet sup
Bill

stair

mechanical
mezzanine



Section 3 – Concept /Schematic Design Drawings

Introduction

The purpose of Section Three – Schematic Design Drawings is to document the development of the project at the 30% milestone.

Key Design Issues

The following key design issues were considered during the planning and design of the facilities architectural aesthetic.

- Design the facility to fit into its current surroundings. *"Be a Good Neighbor"*
- Develop an aesthetic appropriate for its time and place. Be site and functionally specific.
- Use sustainable concepts and ideas to inform the architecture.

Wisconsin prairie-style architecture

The history of the region is deeply influenced by Frank Lloyd Wright, the most well-known American architect. He was instrumental in the establishment of prairie-style architecture. Some of these principles have informed the design of this facility.

- Deep overhangs and canopy elements
- Color is minimal, used in appropriate locations to focus attention on special features.
- Maximize daylighting opportunities
- Windows grouped in horizontal bands
- Repetitive elements not too over stylish

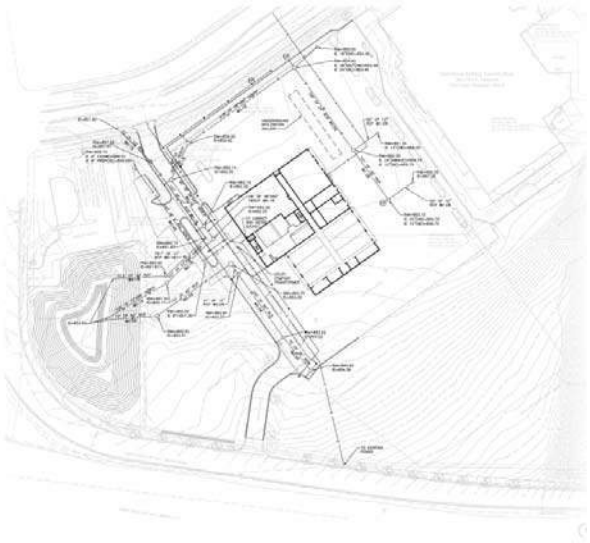
Local contemporary architecture

The concepts of Frank Lloyd Wright are timeless, in many ways. The use of natural light, views and color, and his sensitivity to the environment on place are valid still. But our ability to build and construct has been greatly expanded by the advent of new materials and the ways we can put them together. That leads to a contemporary aesthetic examples of which can also be seen in Madison and on the University of Wisconsin campus today. Our design approach takes these tested principles and articulates

them in a form that is of its time and its place. These relationships are described in detail in the architectural narrative, section four.

Sustainable concepts also inform the massing, siting, amount and types of fenestration, and the overall form of a building. The relationship between the environment and the architectural look of the building is a symbiotic one. As architects we strive to create a balance between how a building performs, environmentally, and how the building's aesthetics contribute in a positive way to the community it is part of and the users of the facility.

Local contemporary architecture



Appendix C – Schematic Design Drawings

NAKOOSA TRAIL PUBLIC WORKS FACILITY

SCHEMATIC DESIGN SUBMITTAL
16 JANUARY 2015

MADISON, WISCONSIN

RNL
1451 DOLLEY MADISON BLVD
SUITE 200
MCLEAN, VA 22101
703 720 0303 t
703 903 9755 f

Maintenance Design Group
MDG
1600 Stout Street Suite 940
Denver, CO 80202
P: 303.302.0266

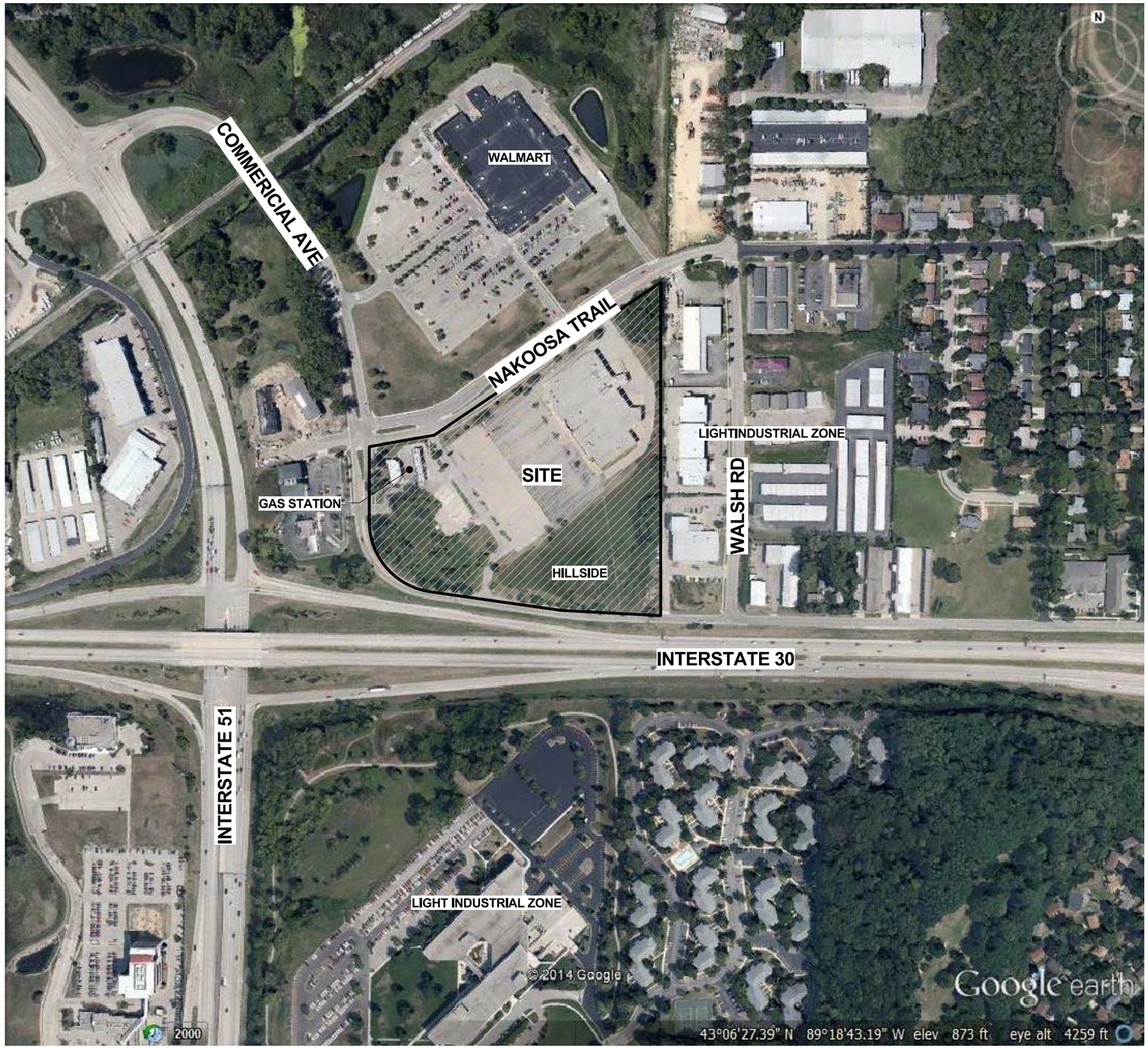
STRAND ASSOCIATES
STRAND
910 West Wingra Drive
Madison, WI 53715
P: 608.251.4843
F: 608.251.8655

MEAD & HUNT
MEAD & HUNT
1743 Wazee Street Suite 400
Denver, CO 80202
P: 303.825.8844

INDEX OF DRAWINGS

SHEET NO.	SHEET NAME
GENERAL INFORMATION	
G-000	COVER
G-001	VICINITY MAP
G-101	LIFE SAFETY EGRESS OCCUPANCY PLAN
G-102	LIFE SAFETY EGRESS OCCUPANCY PLAN
CIVIL	
AS-101A	ARCH SITE UTILITY PLAN
AS-101B	ARCH SITE UTILITY PLAN
AS-102A	ARCH SITE GRADING PLAN
AS-102B	ARCH SITE GRADING PLAN
ARCHITECTURE	
AS-100	SITE PLAN PHASE 1A
AS-101	SITE PLAN PHASE 1B
A-100	PHASE 1A OVERALL FLOOR PLAN
A-101	PHASE 1A AREA FLOOR PLANS
A-102	PHASE 1A AREA FLOOR PLANS
A-103	PHASE 1A AREA FLOOR PLANS
A-105	PHASE 1B OVERALL FLOOR PLAN
A-106	PHASE 1B AREA FLOOR PLANS
A-107	PHASE 1B AREA FLOOR PLANS
A-108	PHASE 1B AREA FLOOR PLANS
A-109	PHASE 1B AREA FLOOR PLANS
A-110	PHASE 1B AREA FLOOR PLANS
A-111	PHASE 1B AREA FLOOR PLANS
A-112	PHASE 1B MEZZANINE FLOOR PLANS
A-113	PHASE 1B MEZZANINE FLOOR PLANS
A-200	PHASE 1A BUILDING ELEVATIONS
A-201	PHASE 1B BUILDING ELEVATIONS
A-202	PHASE 1B BUILDING ELEVATIONS
A-300	PHASE 1B BUILDING SECTIONS
A-400	PHASE 1A PERSPECTIVES
A-401	PHASE 1B PERSPECTIVES
A-402	PHASE 1B PERSPECTIVES

DRAWN BY: CHECKED BY:



VICINITY MAP

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

MDG
STRAND
MEAD & HUNT

NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

UDC SUBMITTAL	12/17/14

No	REVISION/SUBMISSION	DATE

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1/4" = 1'-0"

VICINITY MAP

G-001

OCCUPANCY CLASSIFICATION: S-1
BUILDING TYPE: TYPE II-B, FULLY SPRINKLERED
OVERALL S.F. PHASE 1A: 35,276 (includes mezz.)

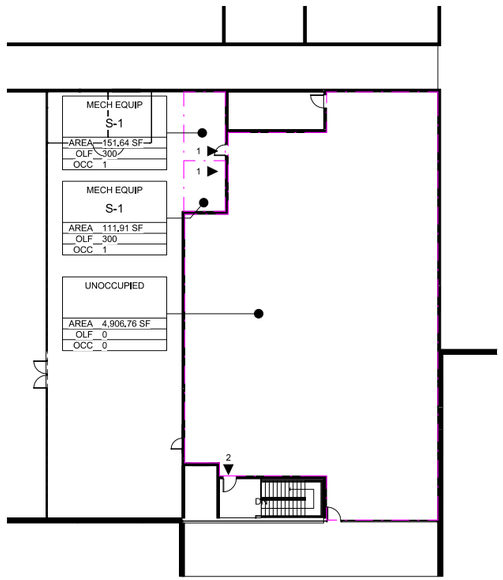
SECTION 2902 MINIMUM PLUMBING FACILITIES: PROVIDE PER IBC TABLE 2902.1.

TABLE 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES:

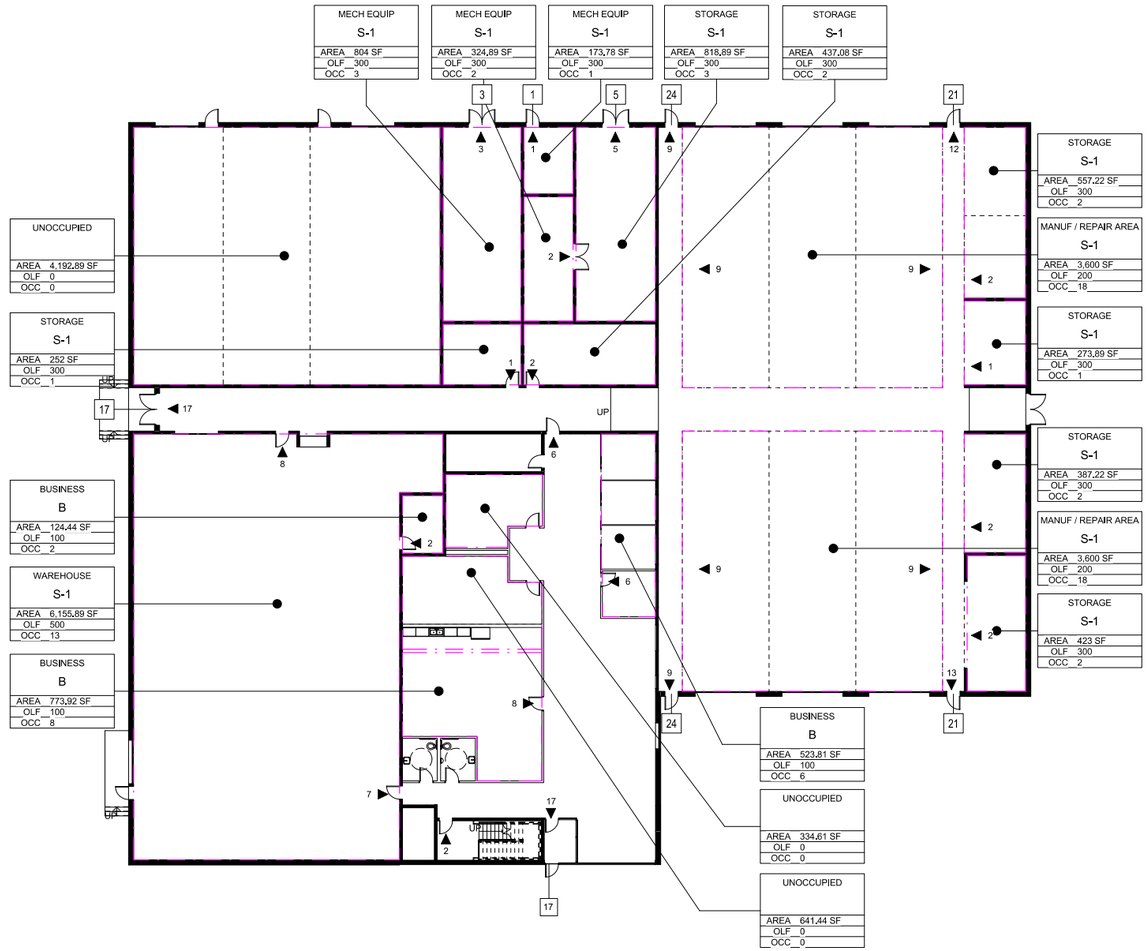
OCCUPANCY	WC- MALE	WC- FEMALE	LAV	SHOWERS	DF
S-1 86	1/100	1/100	1/100	IPC 411	1/1,000
	1	1	1	-	1
REQUIRED:	1	1	1	-	1
PROVIDED:	1	1	1	-	

CODE LEGEND

- 1 HOUR FIRE BARRIER
- 2 HOUR FIRE BARRIER
- 3 HOUR FIRE BARRIER
- 4 HOUR FIRE BARRIER
- ROUTE A — TRAVEL PATH TO EXIT
- EXTINGUISHER ROUTE — TRAVEL PATH TO EXTINGUISHER
- MAX BLDG DIAG — BUILDING DIAGONAL
- ASSEMBLY A-3 — OCCUPANCY CLASSIFICATION
- AREA 528 SF — AREA
- OLF 15 — OCCUPANCY LOAD FACTOR
- OCC 36 — NUMBER OF OCCUPANTS



A3 MEZZANINE LEVEL - PHASE 1A
1/16" = 1'-0"



A8 PHASE 1A LEVEL 1 LIFE SAFETY PLAN
1/16" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

MDG
STRAND
MEAD & HUNT

No	REVISION/SUBMISSION	DATE
	SD SUBMITTAL	12/17/14

PROJECT No: 376601
DATE: 12/17/2014
SCALE: As indicated

LIFE SAFETY EGRESS OCCUPANCY PLAN

G-101

CODE LEGEND

- 1 HOUR FIRE BARRIER
- 2 HOUR FIRE BARRIER
- 3 HOUR FIRE BARRIER
- 4 HOUR FIRE BARRIER
- ROUTE A — TRAVEL PATH TO EXIT
- EXTINGUISHER ROUTE — TRAVEL PATH TO EXTINGUISHER
- MAX BLDG DIAG — BUILDING DIAGONAL

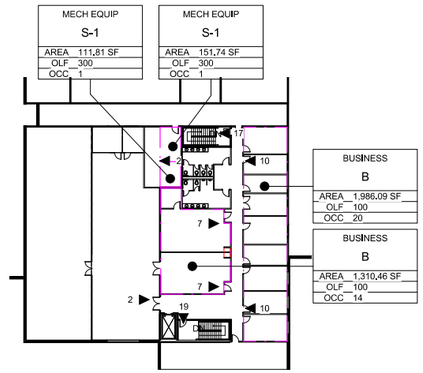
ASSEMBLY	A-3	OCCUPANCY CLASSIFICATION
AREA	528 SF	AREA
OLF	15	OCCUPANCY LOAD FACTOR
OCC	36	NUMBER OF OCCUPANTS

SECTION 2902 MINIMUM PLUMBING FACILITIES: PROVIDE PER IBC TABLE 2902.1.

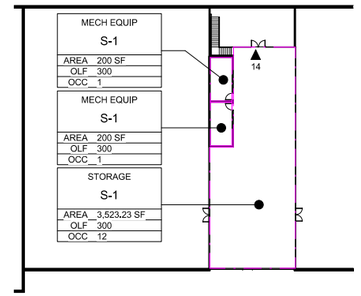
TABLE 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES:

OCCUPANCY	WC- MALE	WC- FEMALE	LAV	SHOWERS	DF
A-3 (RIO) 63	1/125 1	1/65 1	1/200 1	- -	1/500 1
B 99	1/25-50 + 1/50 3	1/25-50 + 1/50 3	1/40-80 + 1/80 3	- -	1/100 1
S-1 335	1/100 4	1/100 4	1/100 4	IPC 411 -	1/1,000 1
REQUIRED:	8	8	8		3
PROVIDED:	11	11	10	2	

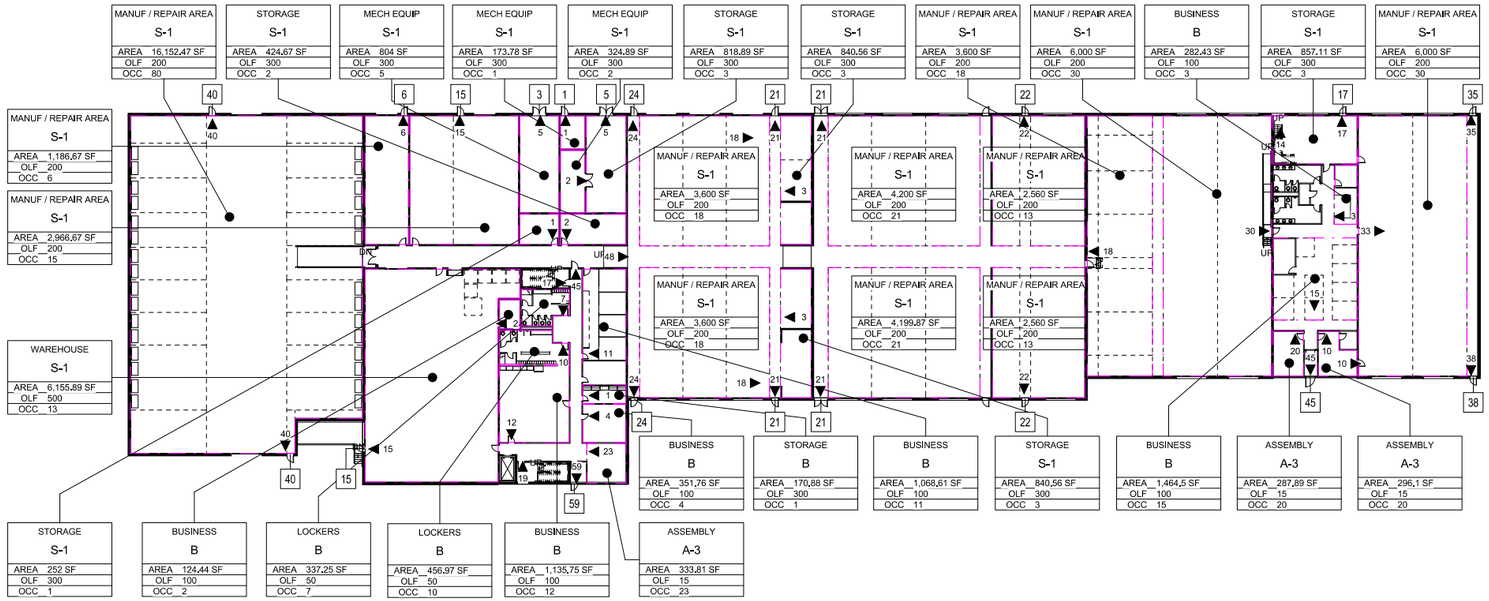
OCCUPANCY CLASSIFICATION: S-1
BUILDING TYPE: TYPE II-B, FULLY SPRINKLERED
OVERALL S.F. PHASE 1B: 101,527 (includes mezzanine & Phase IA)



F7 ADMIN MEZZANINE LEVEL
1/32" = 1'-0"



F12 COMM MEZZ LEVEL
1/32" = 1'-0"



A5 PHASE 1B LEVEL 1 LIFE SAFETY PLAN
1/32" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

MDG
STRAND
MEAD & HUNT

No	REVISION/SUBMISSION	DATE
	SD SUBMITTAL	12/17/14

PROJECT No: 376601
DATE: 12/17/2014
SCALE: As indicated

LIFE SAFETY EGRESS OCCUPANCY PLAN

G-102

A5 SITE PLAN - PHASE 1A
1" = 60'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

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STRAND
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NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

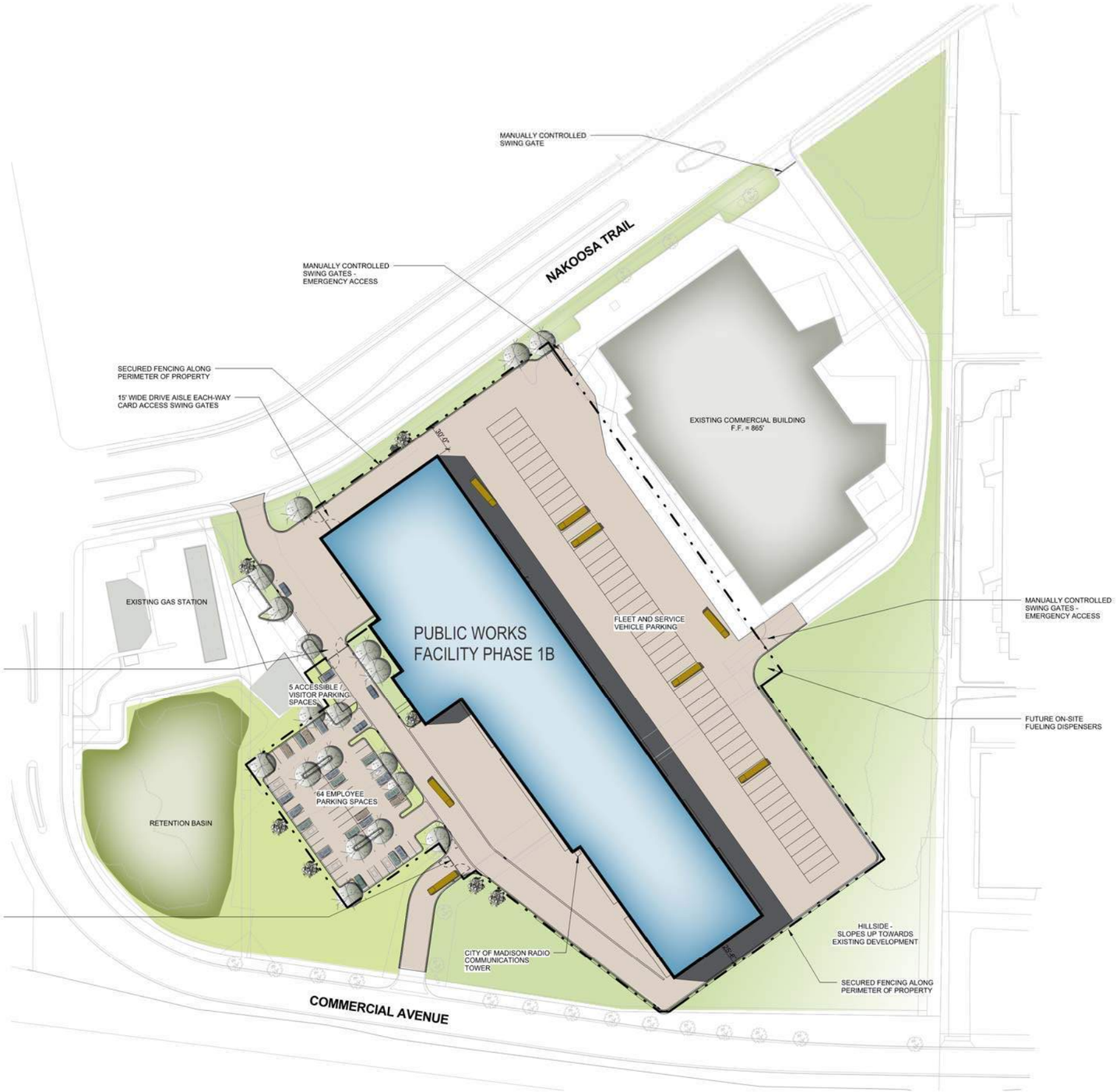
UDC SUBMITTAL	12/17/14

No	REVISION/SUBMISSION	DATE

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1" = 60'-0"

SITE PLAN PHASE 1A

AS-100



A5 SITE PLAN - PHASE 1B
1" = 60'-0"

RNL
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SUITE 200
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NAKOOSA TRAIL PUBLIC WORKS FACILITY
MADISON, WISCONSIN
SCHEMATIC DESIGN

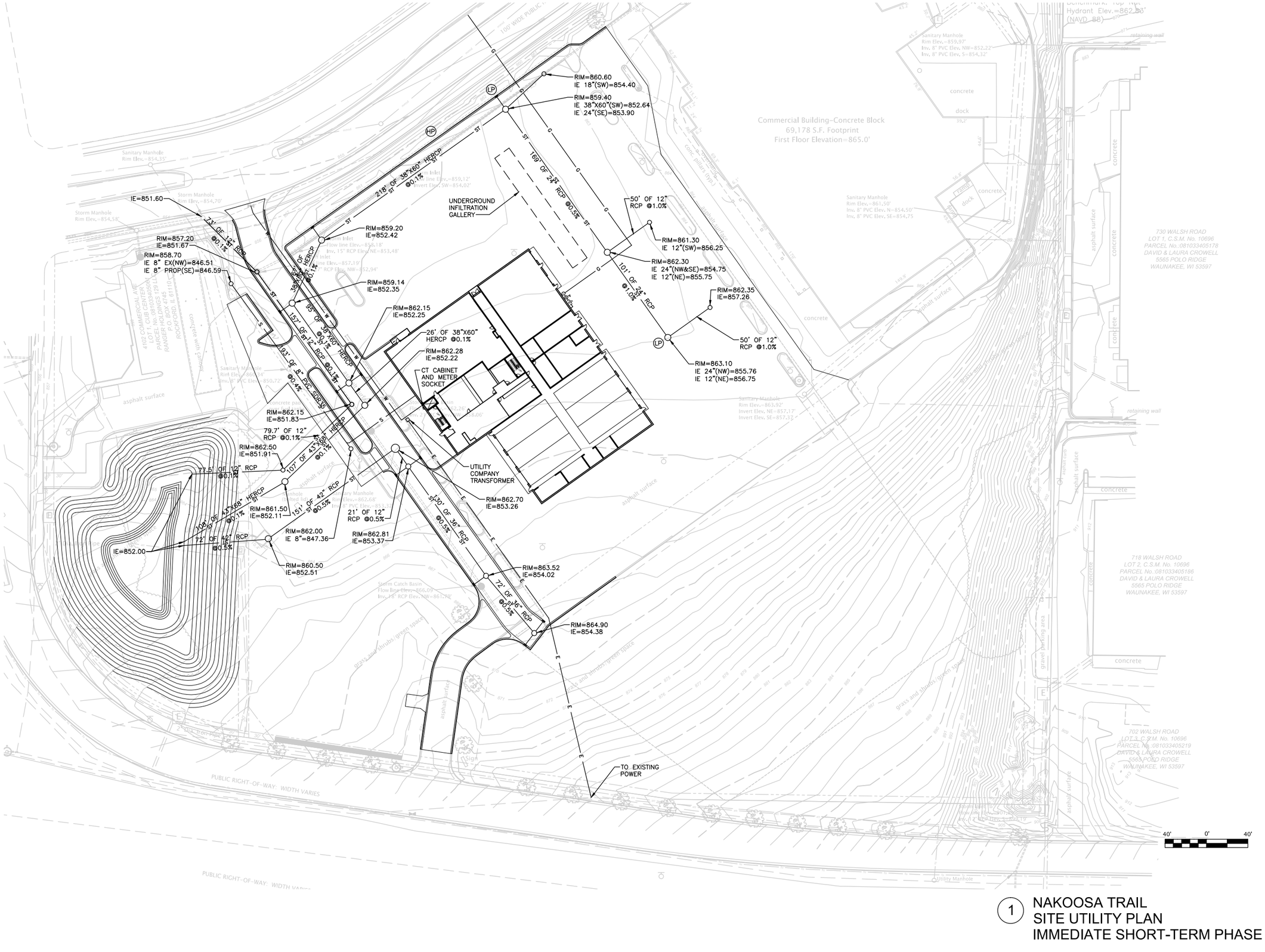
UDC SUBMITTAL	12/17/14

No	REVISION/SUBMISSION	DATE

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1" = 60'-0"

SITE PLAN PHASE 1B

AS-101



1 NAKOOSA TRAIL
SITE UTILITY PLAN
IMMEDIATE SHORT-TERM PHASE - 1A

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

NAKOOSA TRAIL
MADISON, WISCONSIN
SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE

PROJECT No: 76601
DATE: 12/1/14
SCALE: 1" = 40'-0"

ARCH SITE
UTILITY PLAN

AS-101A

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

NAKOOSA TRAIL
MADISON, WISCONSIN
SCHEMATIC DESIGN

RIM=860.60
IE 18"(SW)=856.00±
RIM=859.40
IE 38"X60"(SW)=852.64
IE 24"(SE)=853.90
168' OF 24" RCP @0.5%
UNDERGROUND INFILTRATION GALLERY
RIM=861.30
IE 12"(SW)=856.25
50' OF 12" RCP @1.0%
RIM=862.30
IE 24"(NW&SE)=854.75
IE 12"(NE)=855.75
101' OF 24" RCP @1.0%
RIM=862.35
IE=857.26
50' OF 12" RCP @1.0%
RIM=863.10
IE 24"(NW)=855.76
IE 12"(NE)=856.75
RIM=862.70
IE=858.45
RIM=863.90
IE 36"(SE)=857.95
IE 18"(NE)=858.20
166' OF 36" RCP @0.5%
RIM=864.00
IE=859.75
RIM=865.10
IE=857.12
84' OF 12" RCP @1.0%
111' OF 36" RCP @0.5%
RIM=867.10
IE=856.56
77' OF 36" RCP @0.5%
125' OF 36" RCP @0.5%
RIM=881.00
IE=863.00
RIM=867.65
IE=855.55
235' OF 36" RCP @0.5%
TO EXISTING POWER
RIM=864.90
IE=854.38
130' OF 36" RCP @0.5%
RIM=863.52
IE=854.02
72' OF 36" RCP @0.5%
RIM=859.20
IE=852.42
218' OF 38"X60" HERCP @0.1%
IE=851.60
73' OF 8" @0.1%
RIM=857.20
IE=851.67
RIM=858.70
IE 8" EX(NW)=846.51
IE 8" PROP(SE)=846.59
38"X60" HERCP @0.1%
RIM=859.14
IE=852.35
95' OF 38"X60" HERCP @0.1%
157' OF 12" RCP @0.1%
RIM=862.15
IE=852.25
26' OF 38"X60" HERCP @0.1%
RIM=862.28
IE=852.22
CT CABINET AND METER SOCKET
19' OF 8" PVC SDR35 @0.4%
RIM=862.15
IE=851.83
79.7' OF 12" RCP @0.1%
RIM=862.50
IE=851.91
RIM=861.50
IE=852.11
77.5' OF 12" RCP @0.1%
107' OF 43"X68" HERCP @0.1%
108.5' OF 43"X68" HERCP @0.1%
72' OF 48" RCP @0.5%
IE=852.00
RIM=860.50
IE=852.51
151' OF 12" RCP @0.5%
RIM=862.00
IE 8"=847.36
21' OF 12" RCP @0.5%
RIM=862.81
IE=853.37
UTILITY COMPANY TRANSFORMER
RIM=862.70
IE=853.26
301' OF 36" RCP @0.5%
Commercial Building-Concrete Block
69,178 S.F. Footprint
First Floor Elevation=865.0'
730 WALSH ROAD
LOT 1, C.S.M. No. 10696
PARCEL No.:081033405178
DAVID & LAURA CROWELL
5565 POLO RIDGE
WAUNAKEE, WI 53597
718 WALSH ROAD
LOT 2, C.S.M. No. 10696
PARCEL No.:081033405186
DAVID & LAURA CROWELL
5565 POLO RIDGE
WAUNAKEE, WI 53597
702 WALSH ROAD
LOT 3, C.S.M. No. 10696
PARCEL No.:081033405219
DAVID& LAURA CROWELL
5565 POLO RIDGE
WAUNAKEE, WI 53597
PUBLIC RIGHT-OF-WAY: WIDTH VARIES
40' 0' 40'

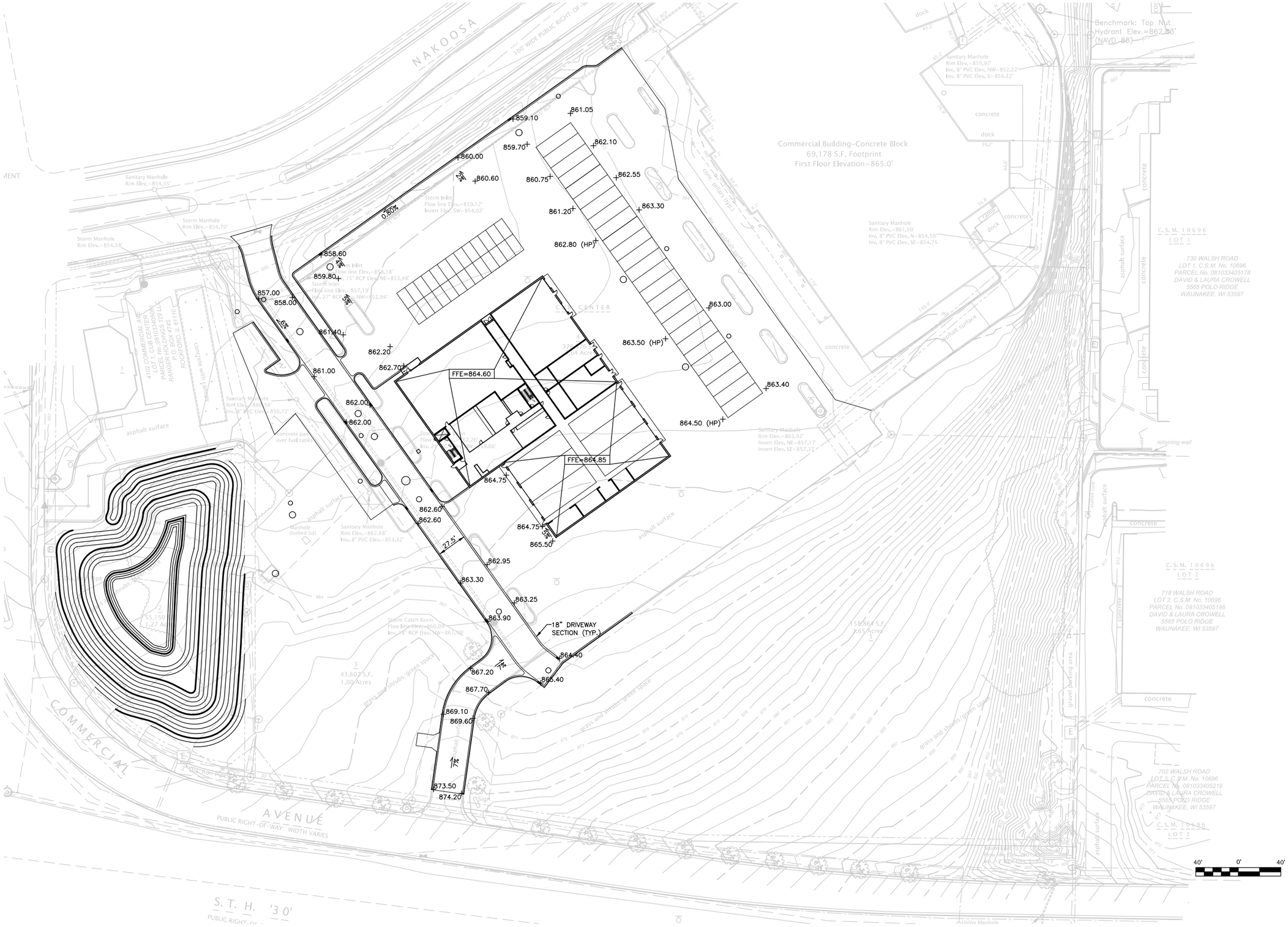
1 NAKOOSA TRAIL
SITE UTILITY PLAN
INTERMEDIATE SHORT-TERM PHASE - 1B

No REVISION/SUBMISSION DATE

PROJECT No: 76601
DATE: 12/1/14
SCALE: 1" = 40'-0"

ARCH SITE
UTILITY PLAN

AS-101B



1 NAKOOSA TRAIL
SITE GRADING PLAN
IMMEDIATE SHORT-TERM PHASE - 1A

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

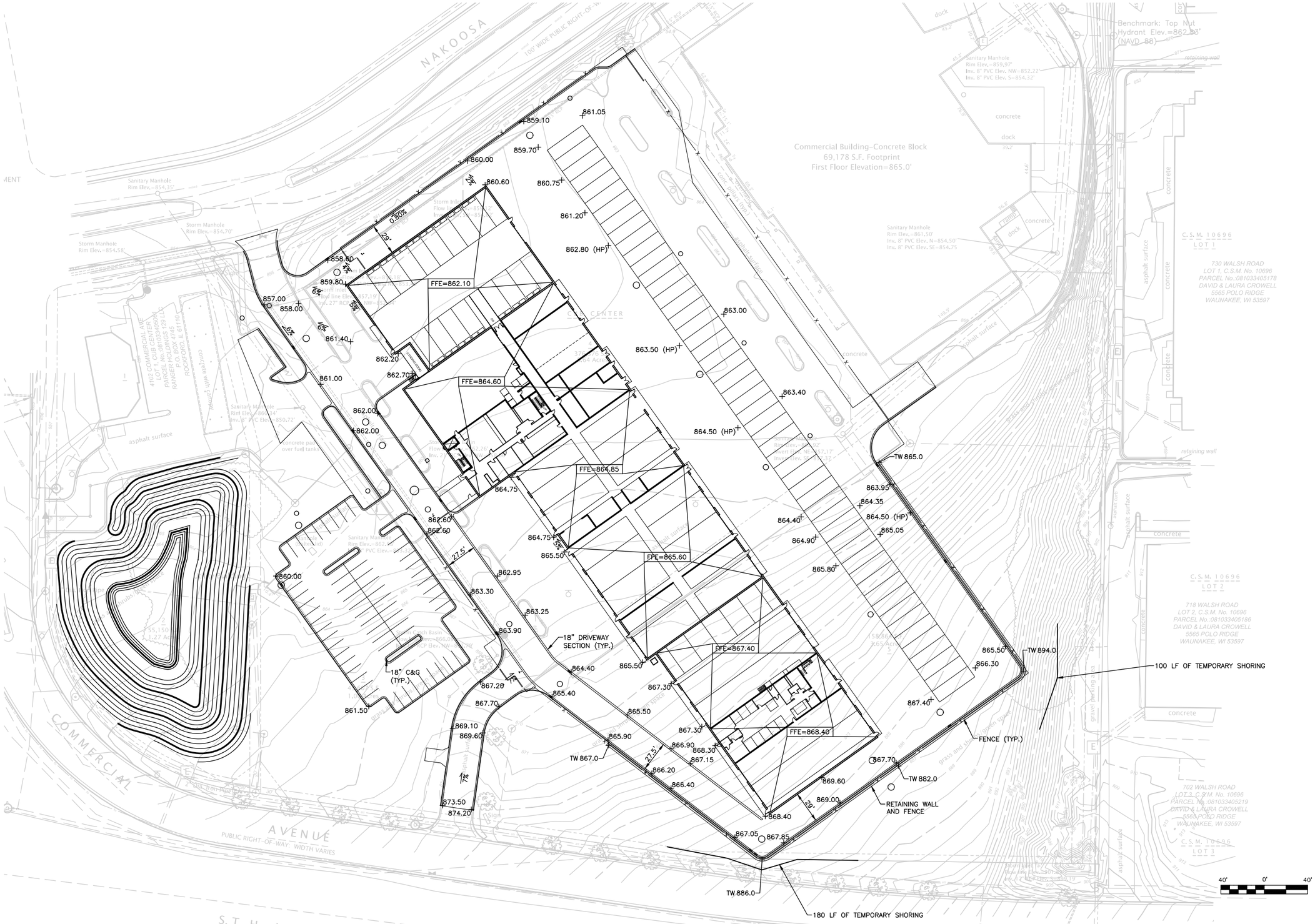
NAKOOSA TRAIL
MADISON, WISCONSIN
SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE

PROJECT No: 76601
DATE: 12/1/14
SCALE: 1" = 40'-0"

ARCH SITE
GRADING PLAN

AS-102A



1 NAKOOSA TRAIL
SITE GRADING PLAN
INTERMEDIATE SHORT-TERM PHASE - 1B

RNL

1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

NAKOOSA TRAIL

MADISON, WISCONSIN

SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE

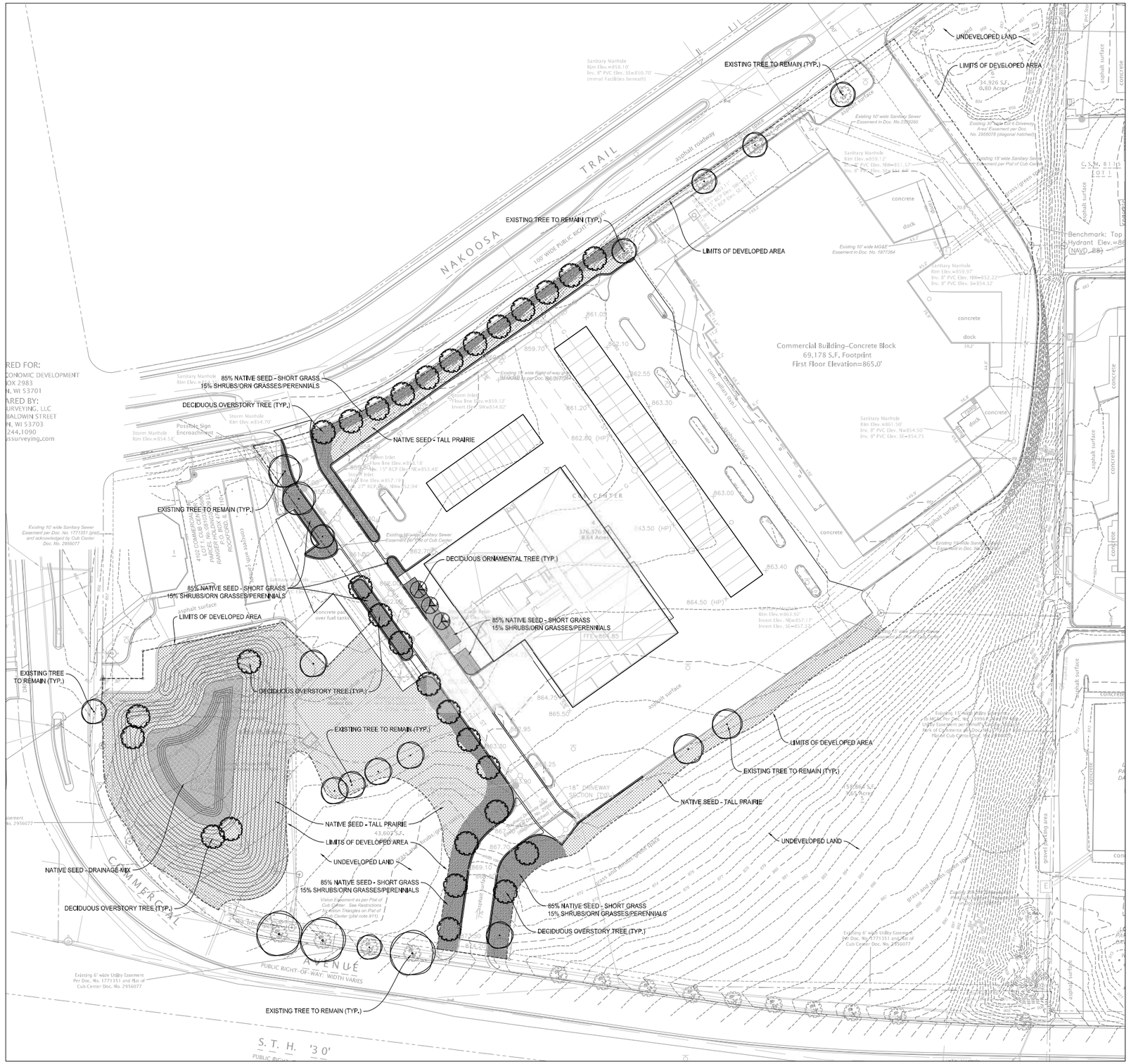
PROJECT No: 76601

DATE: 12/1/14

SCALE: 1" = 40'-0"

ARCH SITE
GRADING PLAN

AS-102B



1 SITE LANDSCAPE PLAN - IMMEDIATE SHORT-TERM PHASE 1A
1" = 40'-0"

0' 25 50 100
SCALE: 1" = 50'-0"

SITE LANDSCAPE DATA TABLE

SITE	
ZONING (PROPOSED)	INDUSTRIAL - LIMITED
SITE AREA	668,923 SF (15.36 AC)

DEVELOPED AREA	
AREA WITHIN SITE BOUNDARY	668,923 SF
BUILDING FOOTPRINT(S)	(101,466 SF)
UNDEVELOPED LAND	(232,853 SF)
CALCULATED TOTAL DEVELOPED AREA	**334,604 SF**

REQUIRED LANDSCAPE POINTS	
PER SEC. 28.142 (4) (a) (2)	ONE (1) POINT SHALL BE PROVIDED PER ONE HUNDRED (100) SQUARE FEET(101,466 SF) OF DEVELOPED AREA.
TOTAL SQUARE FOOTAGE OF DEVELOPED AREA	334,604 SF
TOTAL LANDSCAPE POINTS REQUIRED	3,346 LANDSCAPE POINTS

TABULATION OF POINTS AND CREDITS

PLANT TYPE / ELEMENT	MINIMUM SIZE AT INSTALLATION	POINTS	EXISTING LANDSCAPE		PROPOSED LANDSCAPE	
			QUANTITY	POINTS	QUANTITY	POINTS
OVERSTORY DECIDUOUS TREE	2½" CALIPER	35			31	1,085
TALL EVERGREEN TREE	5' - 6' TALL	35				
ORNAMENTAL TREE	1½" CALIPER	15			3	45
UPRIGHT EVER-GREEN SHRUB	3' - 4' TALL	10				
SHRUB, DECIDUOUS	3 GAL. CONTAINER, MIN 12" - 24"	3			88	264
SHRUB, EVERGREEN	3 GAL. CONTAINER, MIN 12" - 24"	4			44	176
ORN, GRASSES / PERENNIALS	1 GAL. CONTAINER, MIN 8" - 18"	2			219	438
DECORATIVE FENCING / WALL	N/A	4 PER 10 LF				
EXISTING SIG. SPECIMEN TREE	2½" CALIPER MIN.	14 PER CAL. INCH	104 CAL. INCHES	1,338		
LANDSCAPE FURNITURE	N/A	5 PER SEAT				
SUBTOTALS				1,338		2,008
TOTAL NUMBER OF POINTS PROVIDED			**3,346**			

SITE LANDSCAPE LEGEND

- EXISTING TREE TO REMAIN
- PROPOSED DECIDUOUS OVERSTORY TREE 2½" CALIPER
- PROPOSED DECIDUOUS ORNAMENTAL TREE 1½" CALIPER
- 85% NATIVE SEED - SHORT-GRASS MIX 15% SHRUBS / ORNAMENTAL GRASSES / PERENNIALS
- NATIVE SEED - PRAIRIE MIX
- NATIVE SEED - RIPARIAN MIX
- PROPERTY BOUNDARY
- LIMITS OF DEVELOPED AREA

RNL
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SUITE 200
MCLEAN, VA 22101

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MADISON, WISCONSIN
SCHEMATIC DESIGN

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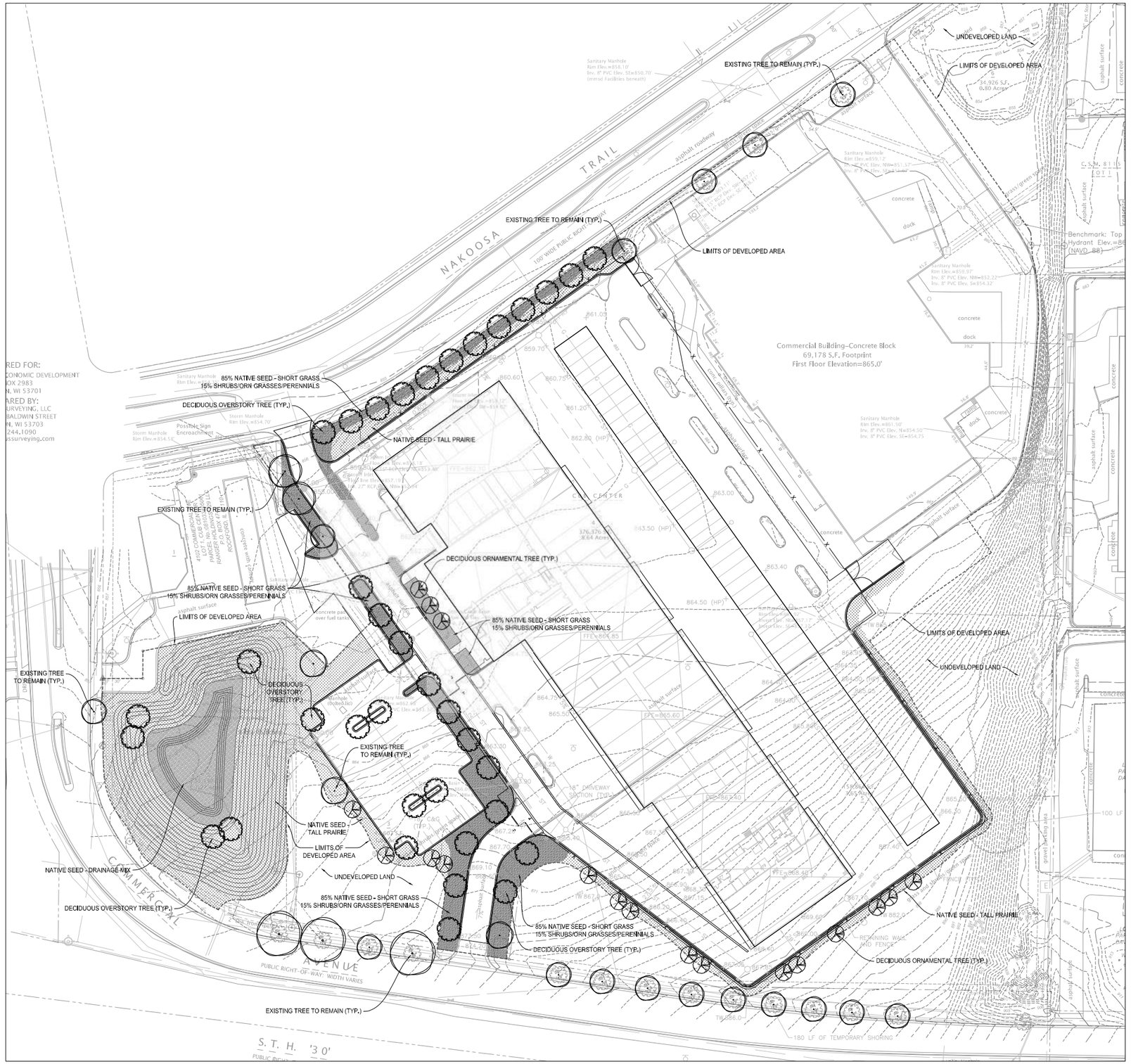
PROJECT No: 76601
DATE: 12/5/14
SCALE: 1" = 50'-0"

ARCH SITE LANDSCAPE PLAN

L-100A



1 SITE LANDSCAPE PLAN - INTERMEDIATE SHORT-TERM PHASE 1B
1" = 40'-0"

0' 25 50 100
SCALE: 1" = 50'-0"

SITE LANDSCAPE DATA TABLE

SITE	
ZONING (PROPOSED)	INDUSTRIAL - LIMITED
SITE AREA	668,923 SF (15.36 AC)

DEVELOPED AREA	
AREA WITHIN SITE BOUNDARY	668,923 SF
BUILDING FOOTPRINT(S)	(156,931 SF)
UNDEVELOPED LAND	(145,920 SF)
CALCULATED TOTAL DEVELOPED AREA	**366,072 SF**

REQUIRED LANDSCAPE POINTS	
PER SEC. 28.142 (4) (a) (2)	ONE (1) POINT SHALL BE PROVIDED PER ONE HUNDRED (100) SQUARE FEET(101,466 SF) OF DEVELOPED AREA.
TOTAL SQUARE FOOTAGE OF DEVELOPED AREA	366,072 SF
TOTAL LANDSCAPE POINTS REQUIRED	3,661 LANDSCAPE POINTS

TABULATION OF POINTS AND CREDITS

PLANT TYPE / ELEMENT	MINIMUM SIZE AT INSTALLATION	POINTS	EXISTING LANDSCAPE		PROPOSED LANDSCAPE	
			QUANTITY	POINTS	QUANTITY	POINTS
OVERSTORY DECIDUOUS TREE	2 ½" CALIPER	35			36	1,260
TALL EVERGREEN TREE	5' - 6' TALL	35				
ORNAMENTAL TREE	1 ½" CALIPER	15			18	270
UPRIGHT EVER-GREEN SHRUB	3' - 4' TALL	10				
SHRUB, DECIDUOUS	3 GAL. CONTAINER, MIN 12" - 24"	3			103	309
SHRUB, EVERGREEN	3 GAL. CONTAINER, MIN 12" - 24"	4			52	208
ORN, GRASSES / PERENNIALS	1 GAL. CONTAINER, MIN 8" - 18"	2			258	516
DECORATIVE FENCING / WALL	N/A	4 PER 10 LF				
EXISTING SIG. SPECIMEN TREE	2½" CALIPER MIN.	14 PER CAL. INCH	99 CAL. INCHES	1,098		
LANDSCAPE FURNITURE	N/A	5 PER SEAT				
SUBTOTALS				1,098		2,563
TOTAL NUMBER OF POINTS PROVIDED			**3,661**			

SITE LANDSCAPE LEGEND

- EXISTING TREE TO REMAIN
- PROPOSED DECIDUOUS OVERSTORY TREE 2½" CALIPER
- PROPOSED DECIDUOUS ORNAMENTAL TREE 1½" CALIPER
- 85% NATIVE SEED - SHORT-GRASS MIX 15% SHRUBS / ORNAMENTAL GRASSES / PERENNIALS
- NATIVE SEED - PRAIRIE MIX
- NATIVE SEED - RIPARIAN MIX
- PROPERTY BOUNDARY
- LIMITS OF DEVELOPED AREA

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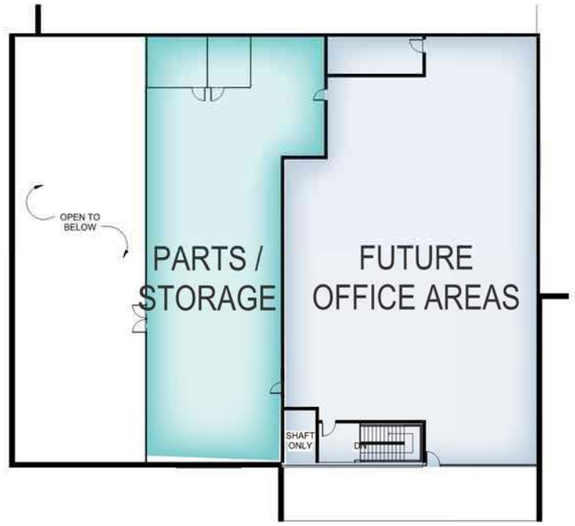
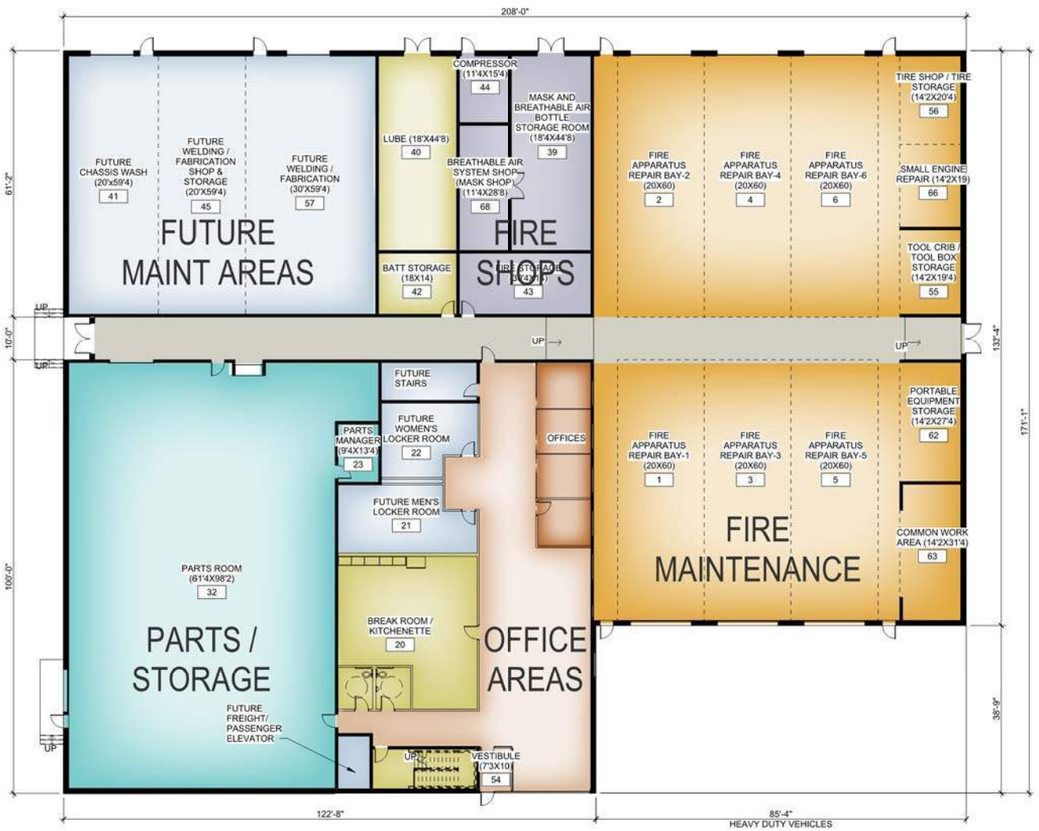
ARCH SITE LANDSCAPE PLAN

L-100B



2 ADMIN MEZZANINE LEVEL - PHASE 1A (3,093 gross sf)
1/16" = 1'-0"



1 OVERALL FLOOR PLAN PHASE 1A (32,183 gross sf)
1/16" = 1'-0"

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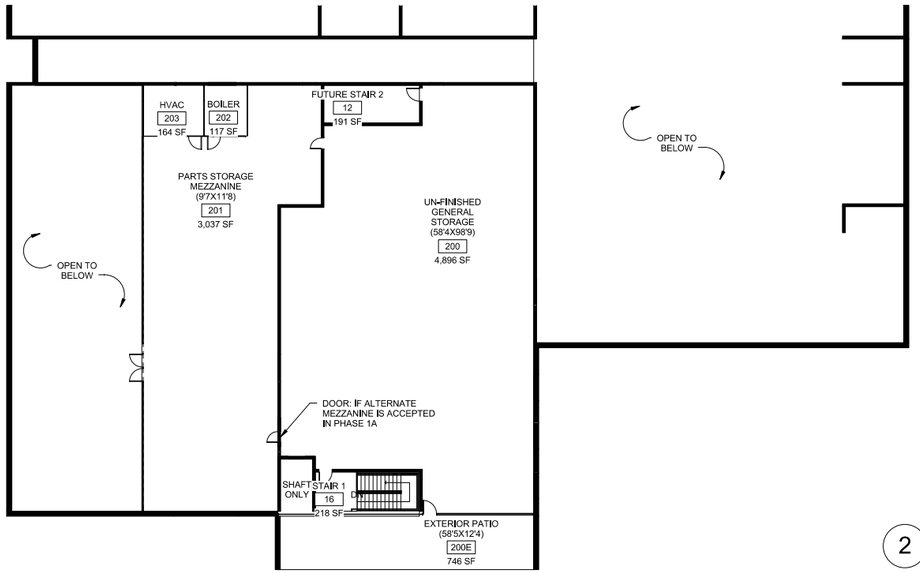
SCALE: 1/16" = 1'-0"

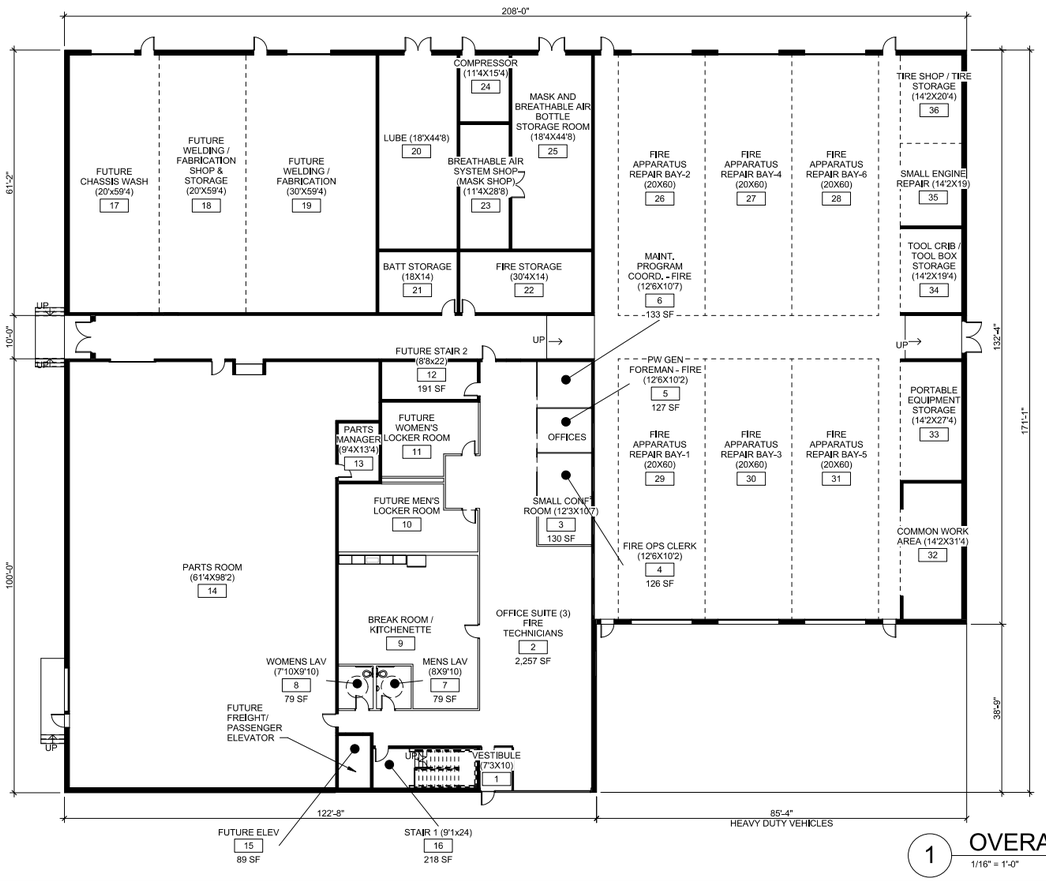
PHASE 1A OVERALL FLOOR PLAN

A-100



2 PARTIAL PLAN - ADMIN MEZZANINE LEVEL - PHASE 1A

1/16" = 1'-0"



1 OVERALL FLOOR PLAN PHASE 1A

1/16" = 1'-0"

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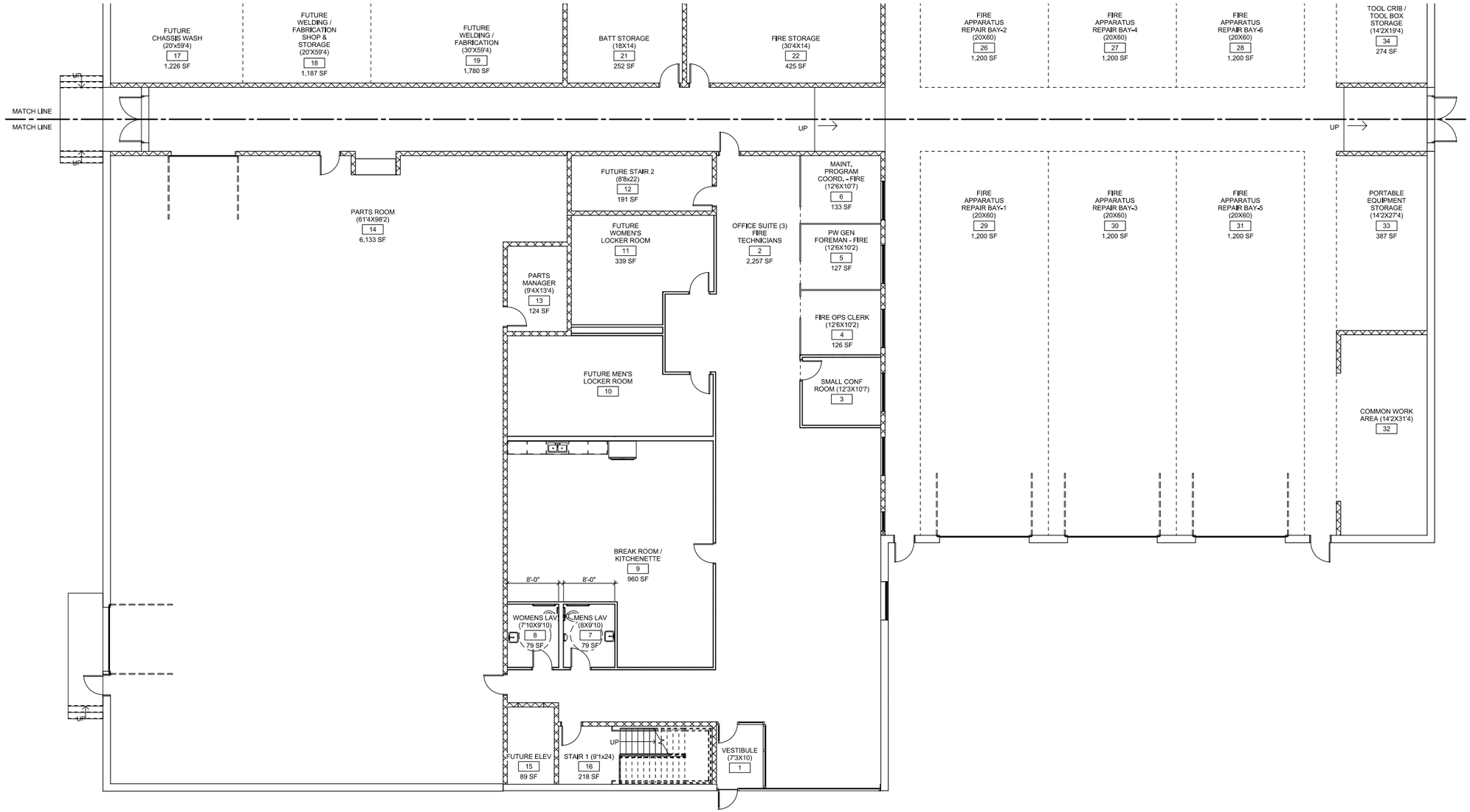
SCALE: 1/16" = 1'-0"

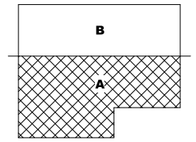
PHASE 1A OVERALL FLOOR PLAN

A-100



A2 AREA-A - ADMIN LEVEL 1 - PHASE 1A

1/8" = 1'-0"



PHASE 1A BUILDING KEY PLAN

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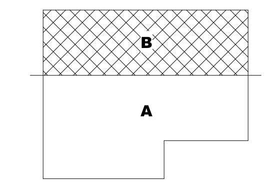
SCALE: 1/8" = 1'-0"

PHASE 1A AREA FLOOR PLANS

A-101



PHASE 1A BUILDING KEY PLAN

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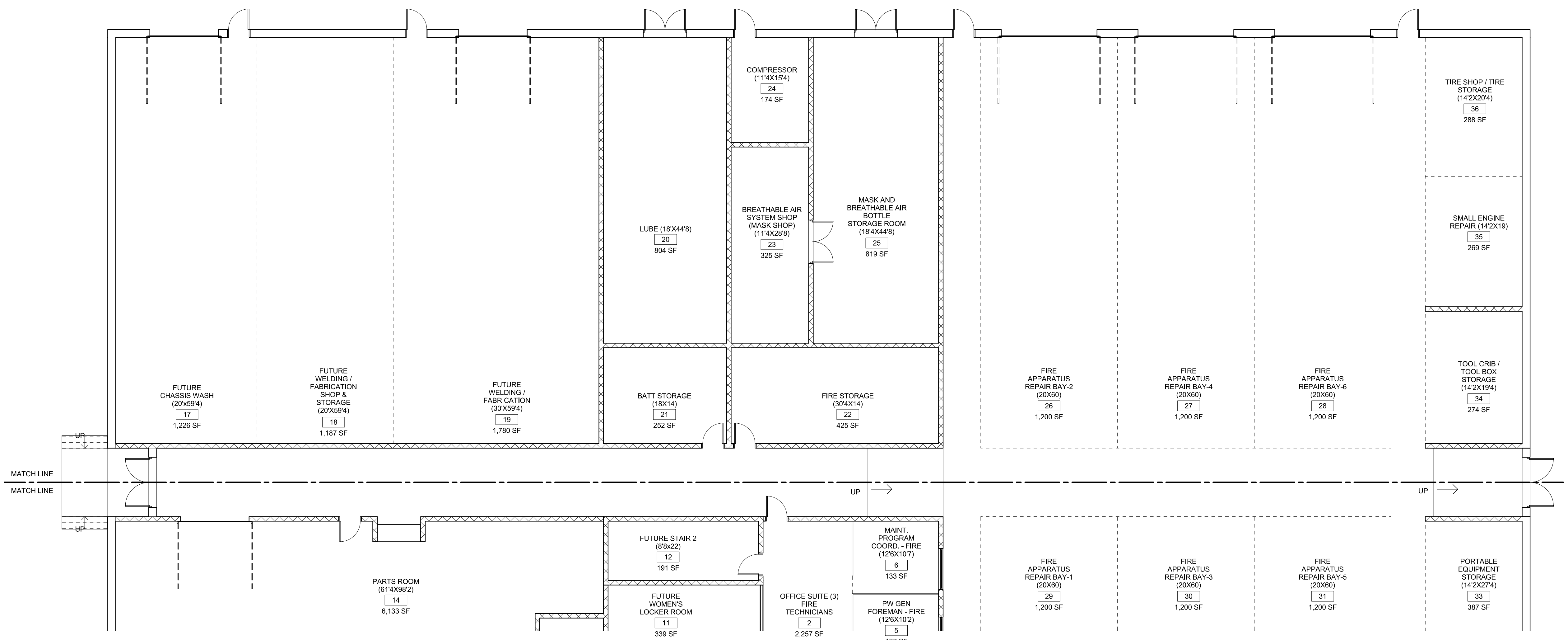

A2 AREA-B - ADMIN LEVEL 1 - PHASE 1A
1/8" = 1'-0"

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	SD SUBMITTAL	12/17/14

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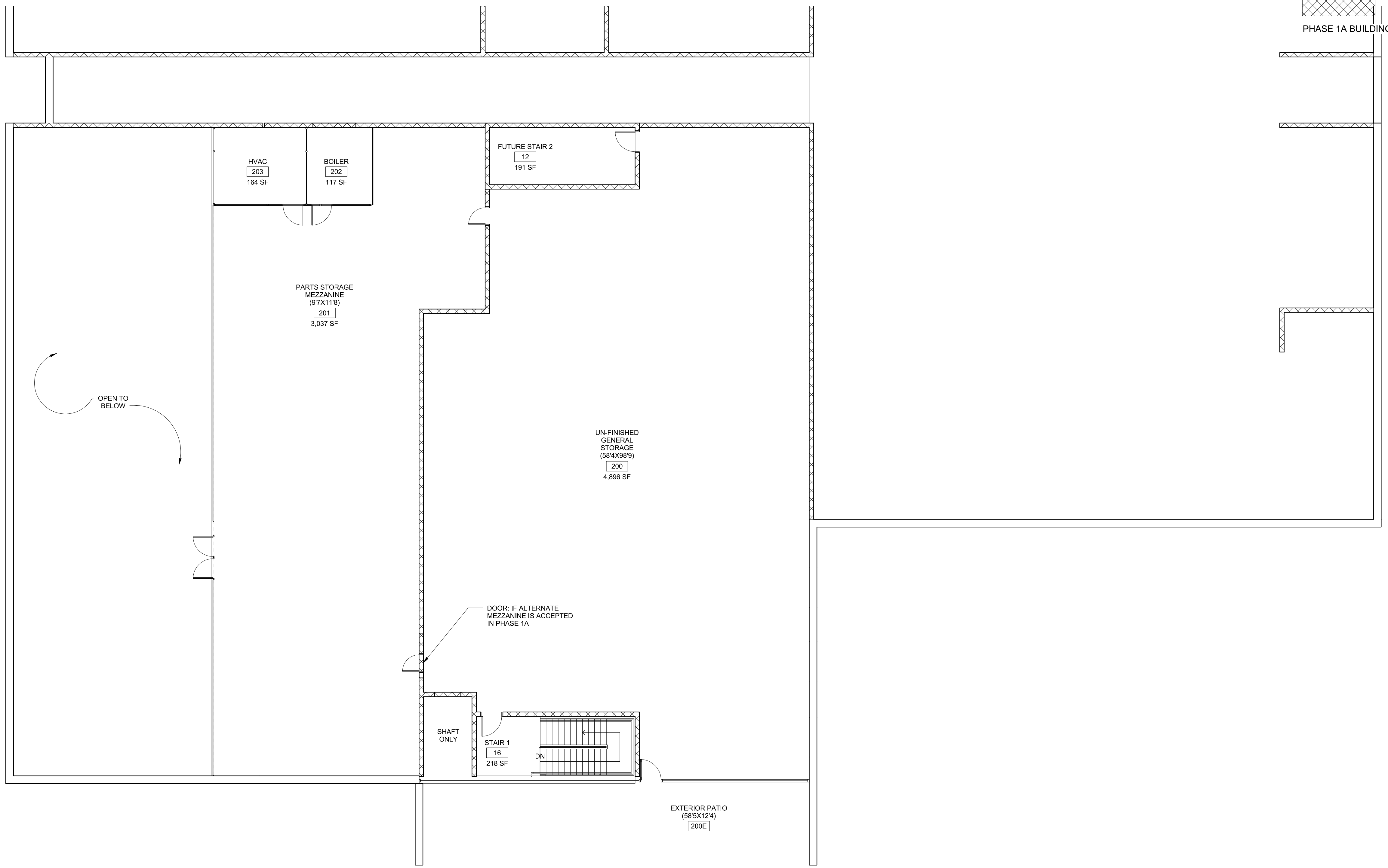
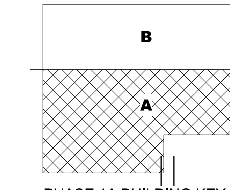
DATE: 12/17/2014
SCALE: 1/8" = 1'-0"

PHASE 1A AREA FLOOR PLANS

A-102





PHASE 1A BUILDING KEY PLAN

A2 AREA-A - ADMIN MEZZANINE LEVEL - PHASE 1A

1/8" = 1'-0"

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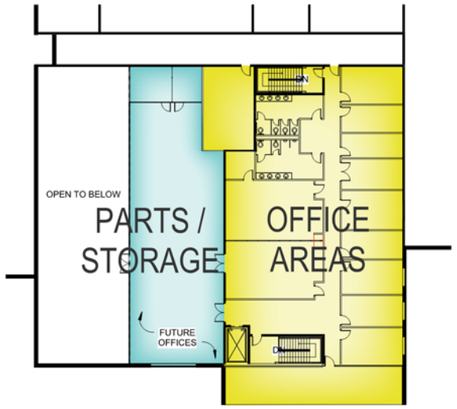
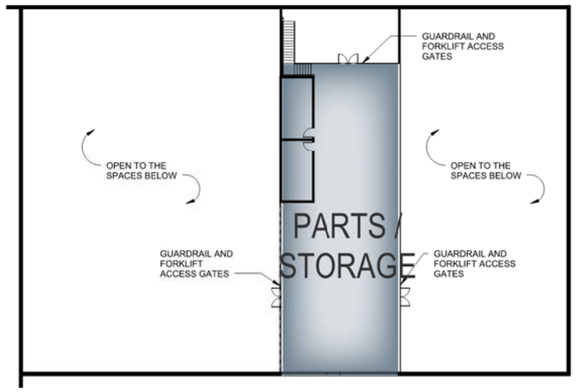
SCALE: 1/8" = 1'-0"

PHASE 1A AREA
FLOOR PLANS

A-103



3 ADMIN MEZZANINE LEVEL - PHASE 1B
1 : 275
(9,100 gross sf)



2 COMM MEZZANINE LEVEL - PHASE 1B
1 : 275
(4,072 gross sf)

(17,062 gross sf) (20,940 gross sf) (11,243 gross sf) (16,622 gross sf) (22,488 gross sf)

1 OVERALL FLOOR PLAN PHASE 1B
1 : 275
(101,527 gross sf includes both mezzanines)

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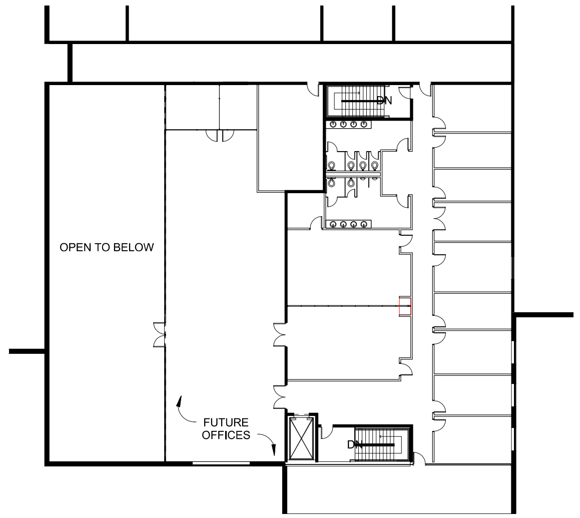
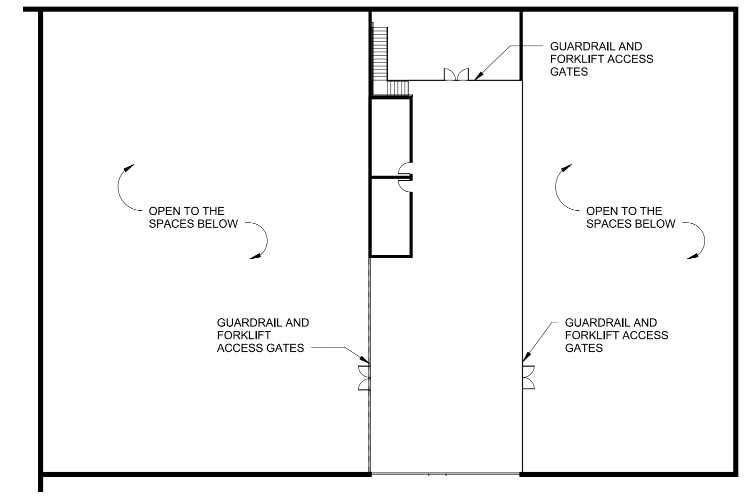
PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1 : 275

PHASE 1B OVERALL FLOOR PLAN

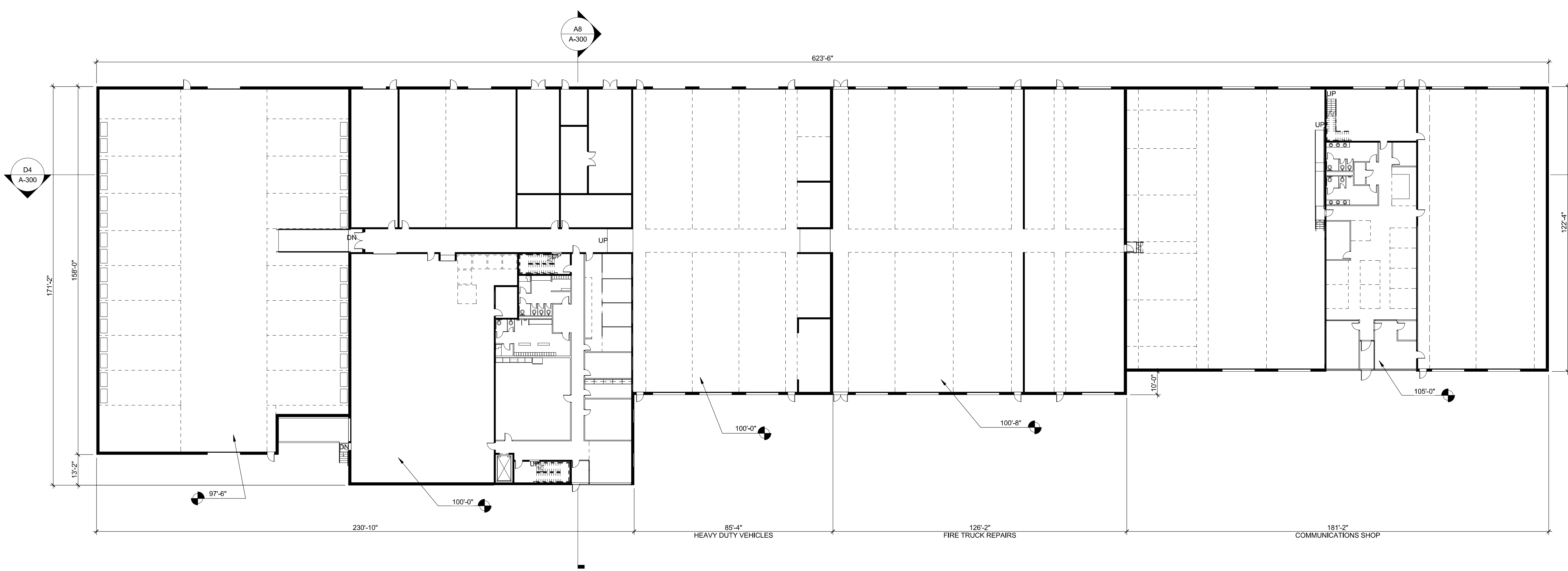
A-105



3 ADMIN MEZZANINE LEVEL - PHASE 1B
1 : 275



2 COMM MEZZANINE LEVEL - PHASE 1B
1 : 275



1 OVERALL FLOOR PLAN PHASE 1B
1 : 275

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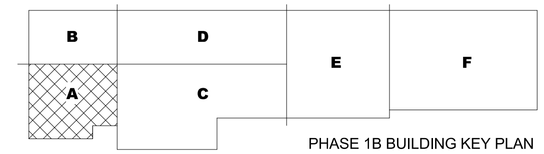
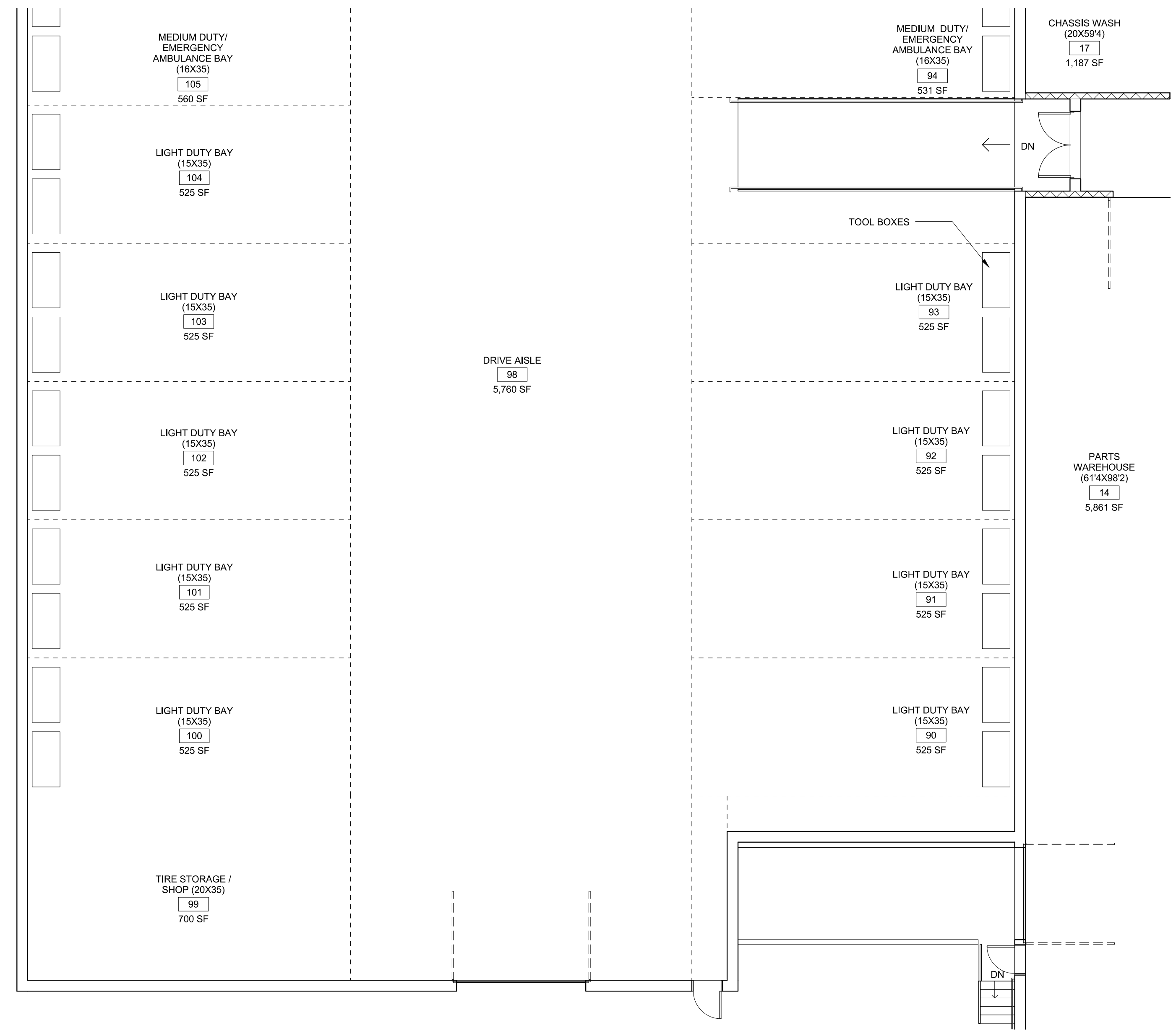
SCALE: 1 : 275

PHASE 1B OVERALL FLOOR PLAN

A-105





A7 AREA-A - ADMIN LEVEL 1 - PHASE 1B

1/8" = 1'-0"

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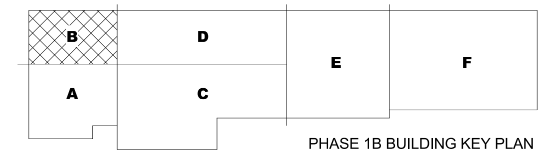
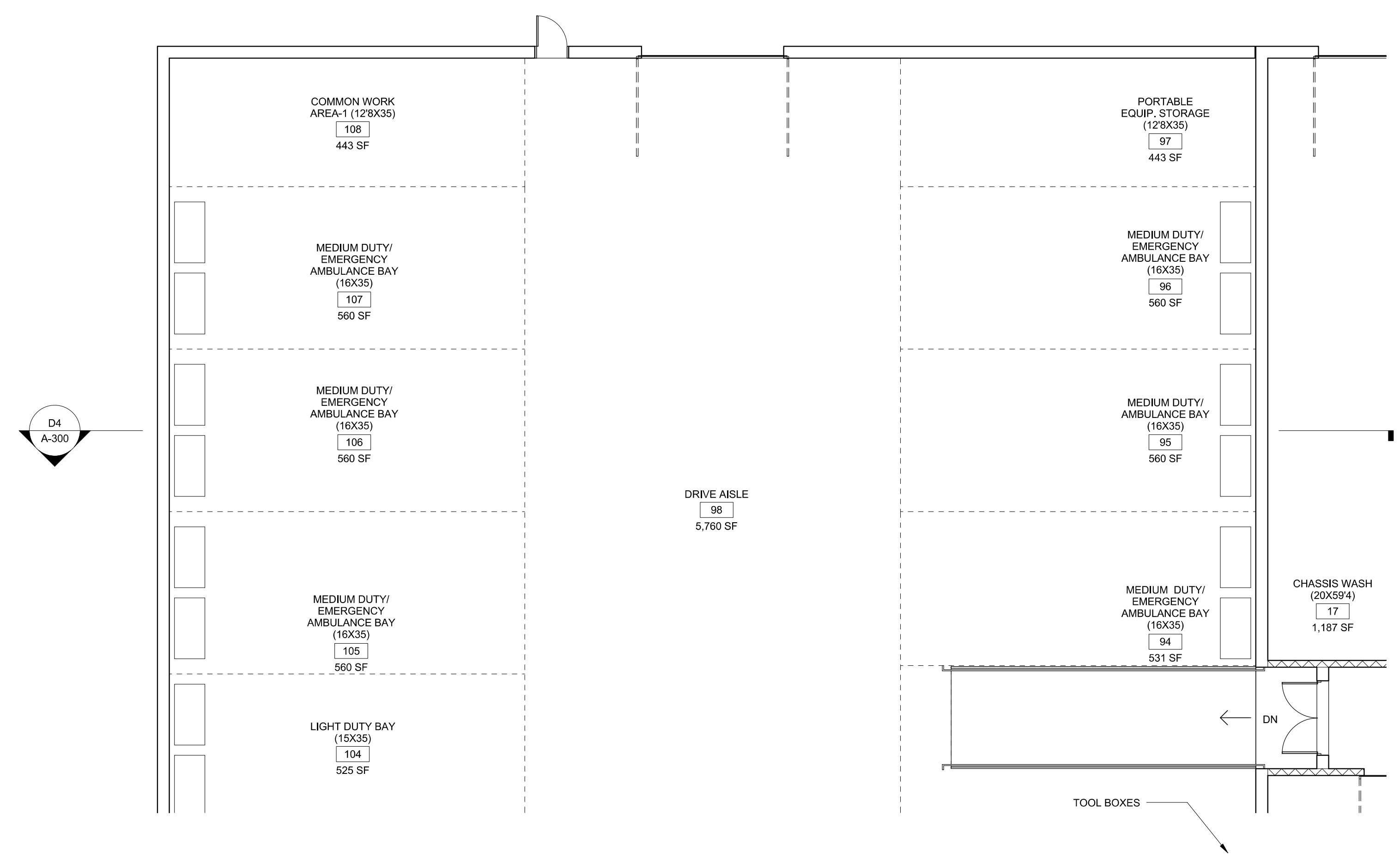
SCALE: 1/8" = 1'-0"

PHASE 1B AREA FLOOR PLANS

A-106





A7 AREA-B - ADMIN LEVEL 1 - PHASE 1B

1/8" = 1'-0"

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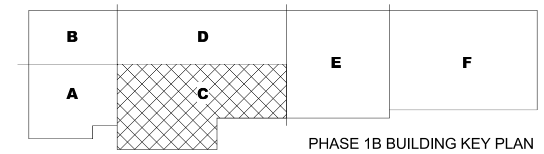
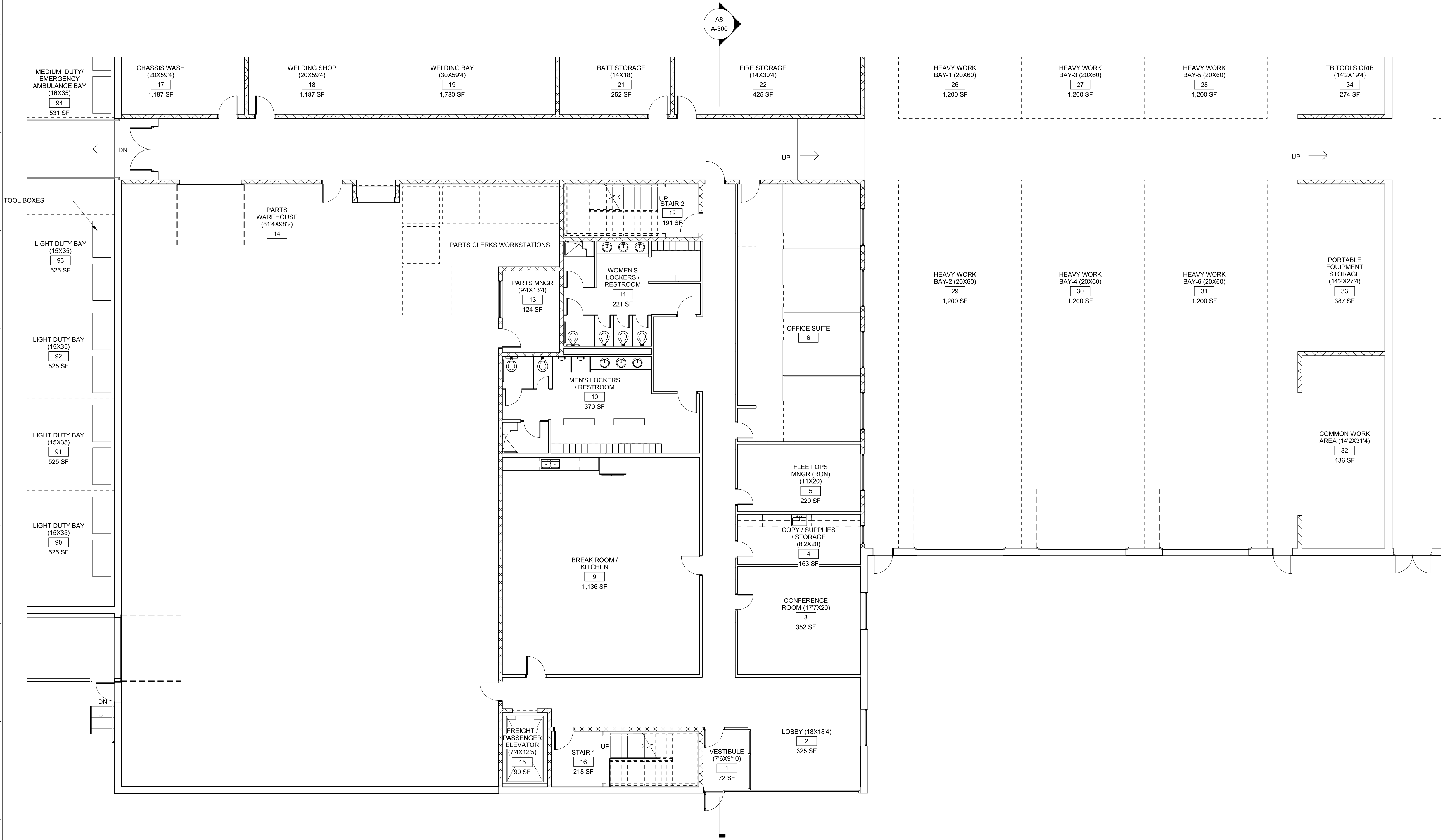
DATE: 12/17/2014
SCALE: 1/8" = 1'-0"

PHASE 1B AREA FLOOR PLANS

A-107



PHASE 1B BUILDING KEY PLAN



A1 AREA-C - ADMIN LEVEL 1 - PHASE 1B

1/8" = 1'-0"

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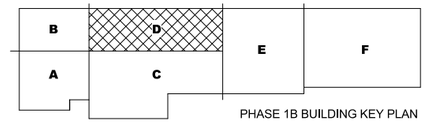
SCALE: 1/8" = 1'-0"

PHASE 1B AREA FLOOR PLANS

A-108



PHASE 1B BUILDING KEY PLAN

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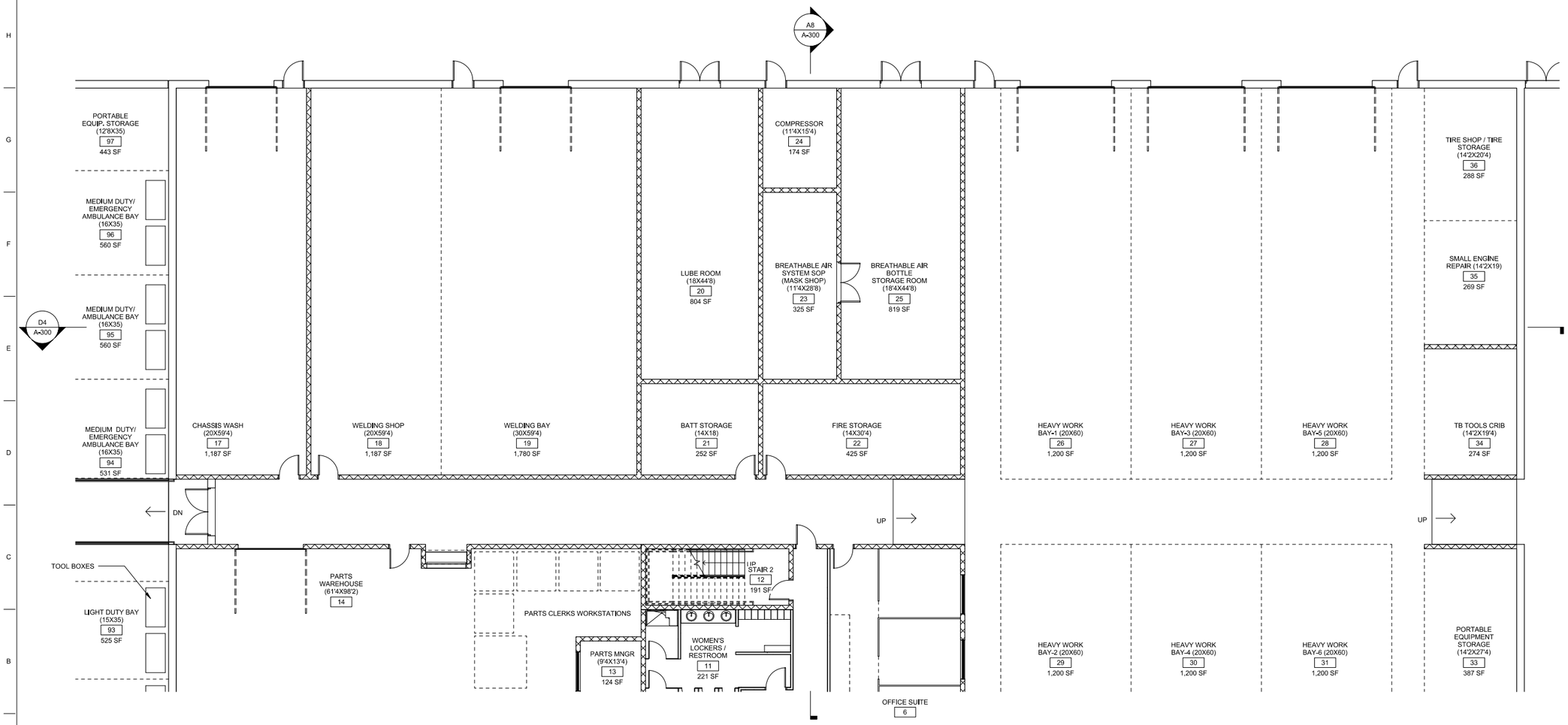

A1 AREA-D - ADMIN LEVEL 1 - PHASE 1B

1/8" = 1'-0"

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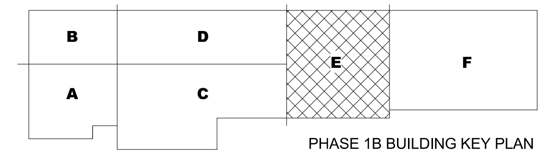
SCALE: 1/8" = 1'-0"

PHASE 1B AREA FLOOR PLANS

A-109



A5 AREA-E - ADMIN LEVEL 1 - PHASE 1B

1/8" = 1'-0"

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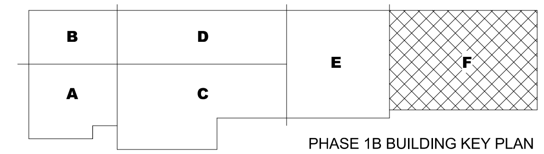
DATE: 12/17/2014

SCALE: 1/8" = 1'-0"

PHASE 1B AREA FLOOR PLANS

A-110



PHASE 1B BUILDING KEY PLAN

A3 AREA-F - ADMIN LEVEL 1 - PHASE 1B

1/8" = 1'-0"

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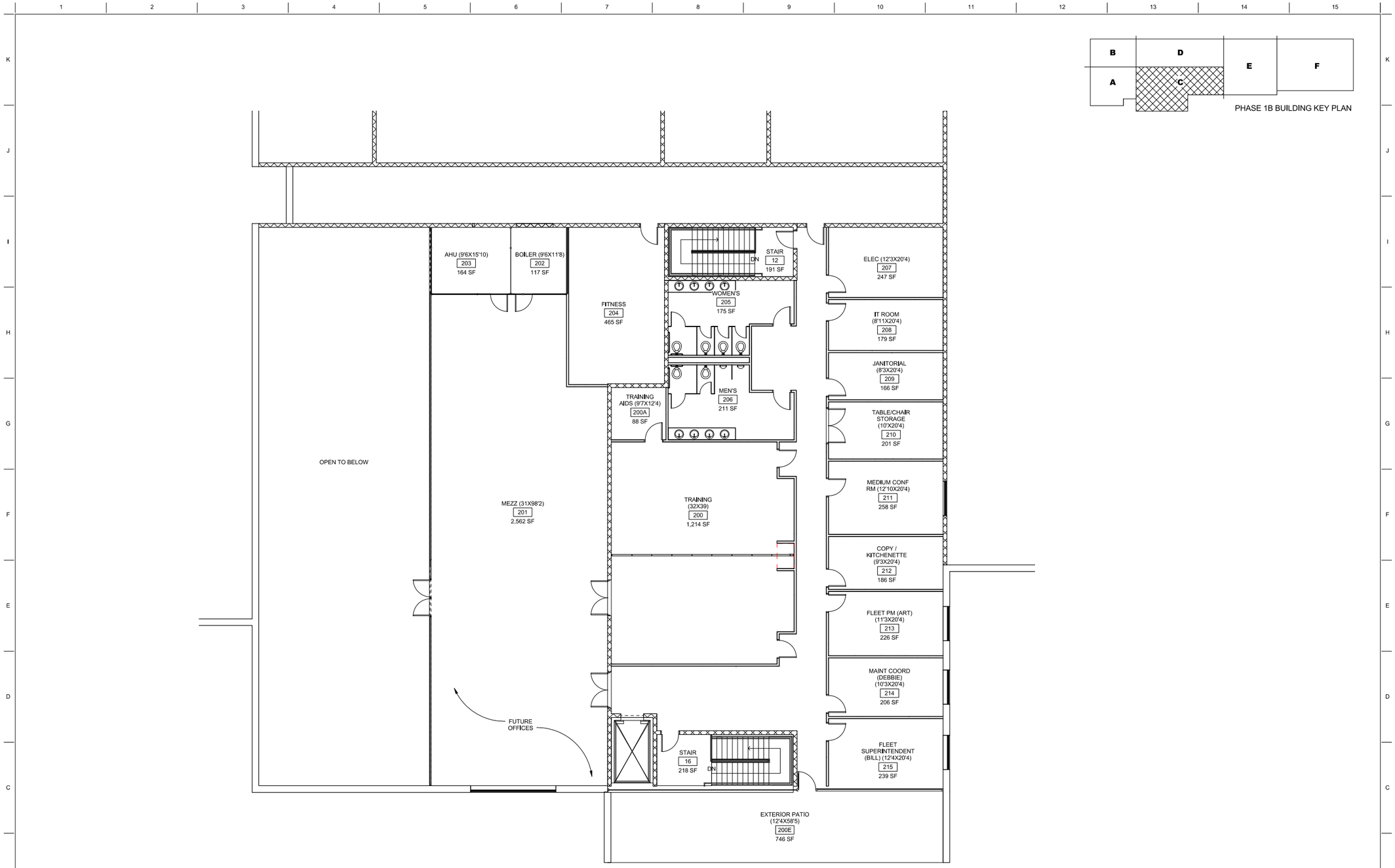
SCALE: 1/8" = 1'-0"

PHASE 1B AREA FLOOR PLANS

A-111



PHASE 1B BUILDING KEY PLAN

1 AREA B ADMIN MEZZANINE LEVEL - PHASE 1B

1/8" = 1'-0"

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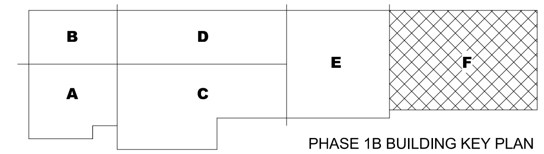
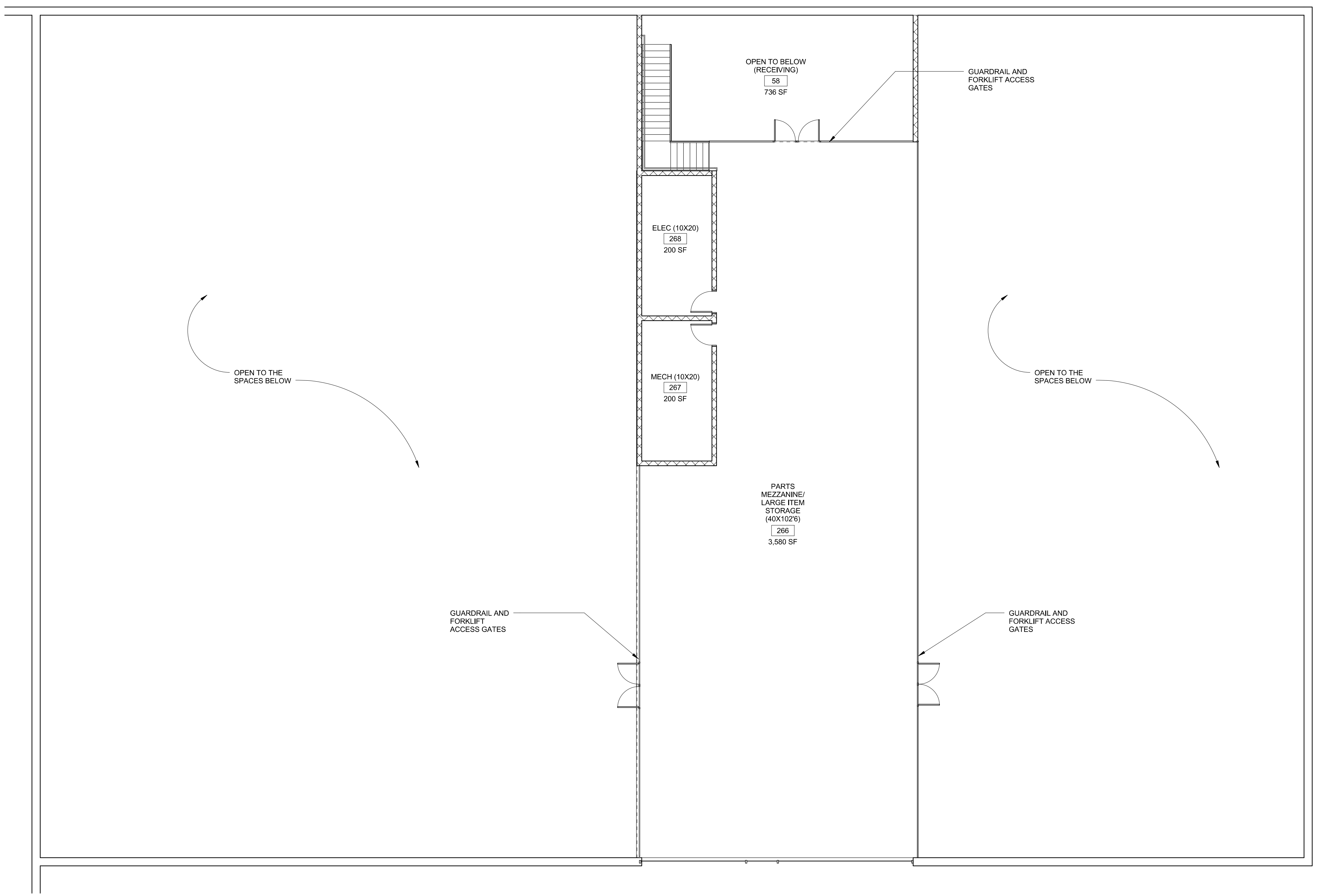
PHASE 1B MEZZANINE FLOOR PLANS

A-112





1 AREA F COMM MEZZANINE LEVEL - PHASE 1B

1/8" = 1'-0"

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DATE: 12/17/2014

SCALE: 1/8" = 1'-0"

PHASE 1B MEZZANINE FLOOR PLANS

A-113

C:\Users\bberastegui\Documents\376601_NAKOOSA_ARCH_bberastegui.rvt
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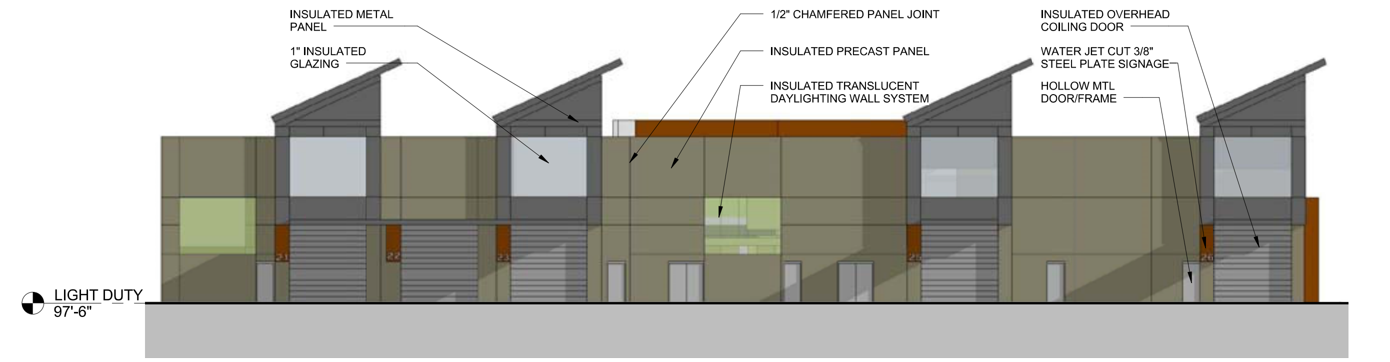
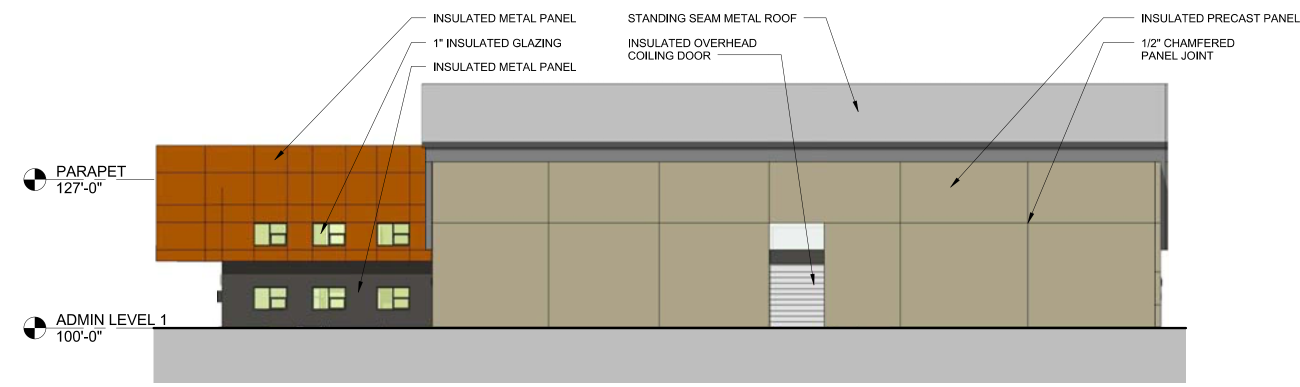
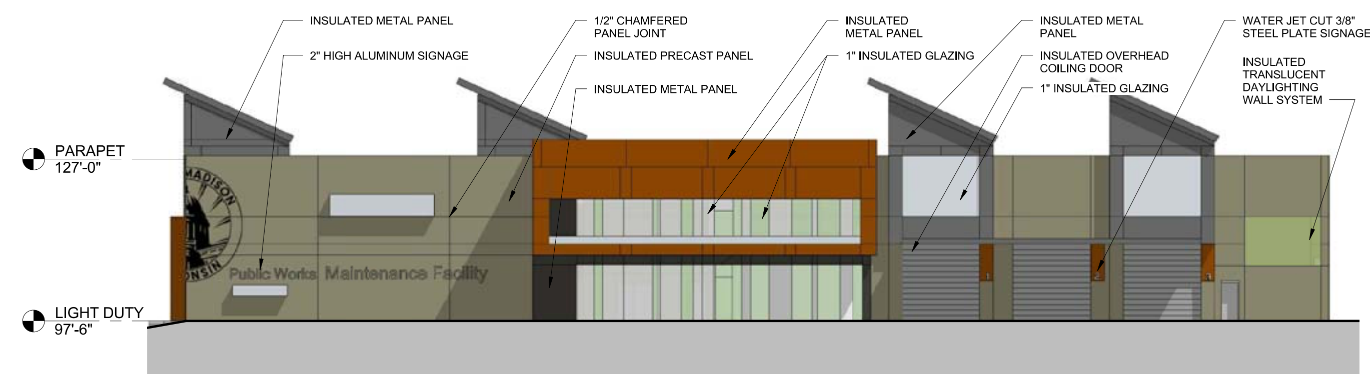
3/5/2015 11:47:23 AM



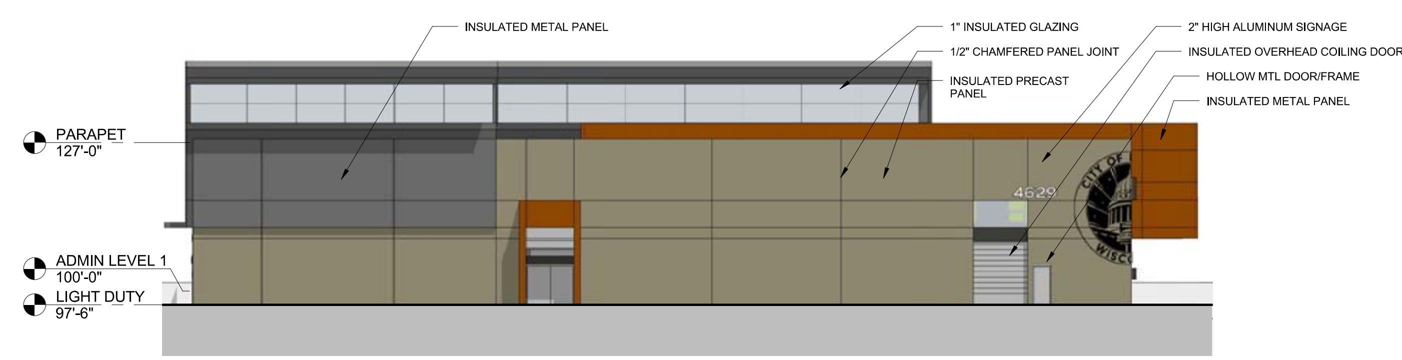
I8 PHASE 1A NORTHEAST ELEVATION
1/16" = 1'-0"



F8 PHASE 1A SOUTHEAST ELEVATION
1/16" = 1'-0"



D8 PHASE 1A SOUTHWEST ELEVATION
1/16" = 1'-0"



A8 PHASE 1A NORTHWEST ELEVATION
1/16" = 1'-0"

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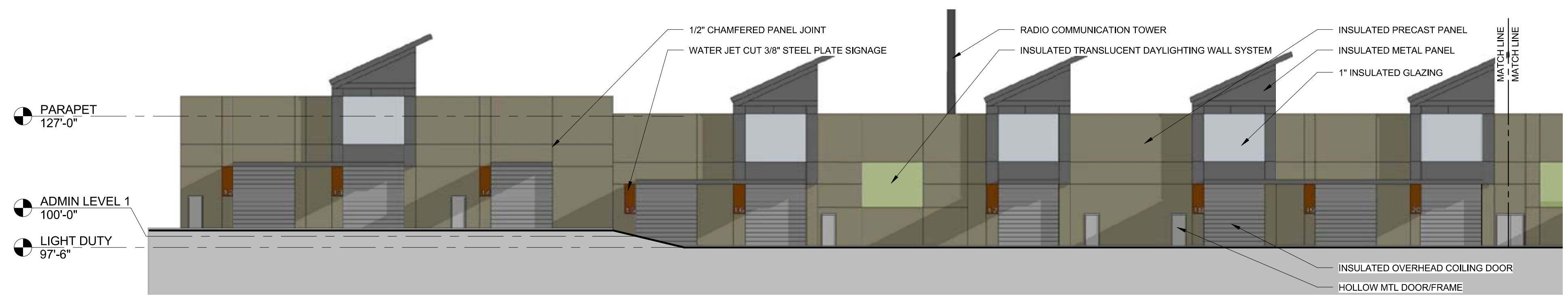
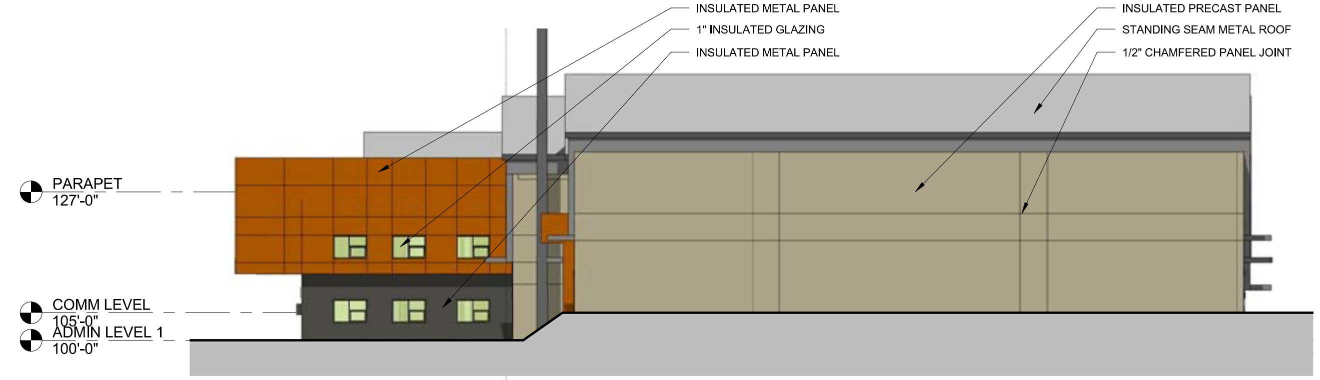
PHASE 1A BUILDING ELEVATIONS

A-200



G4 PHASE 1B NORTHEAST ELEVATION
1/16" = 1'-0"

D4 PHASE 1B NORTHEAST ELEVATION
1/16" = 1'-0"



A8 PHASE 1B SOUTHEAST ELEVATION
1/16" = 1'-0"

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MADISON, WISCONSIN
SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE
	UDC SUBMITTAL	12/17/14

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1/16" = 1'-0"

PHASE 1B BUILDING ELEVATIONS

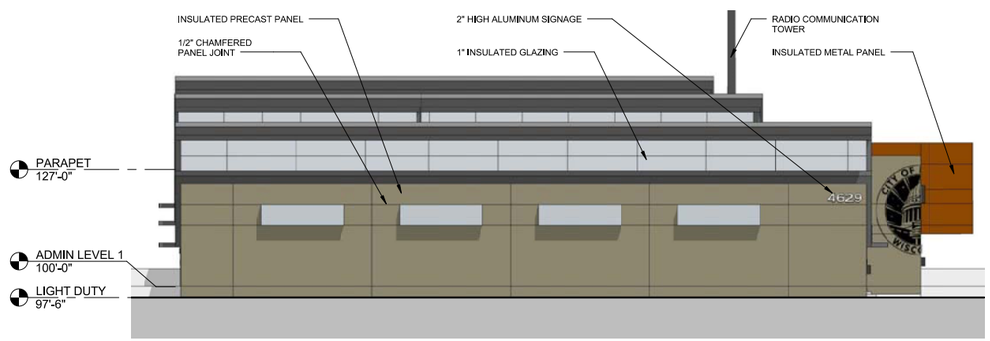
A-201

G4 PHASE 1B SOUTHWEST ELEVATION

1/16" = 1'-0"

D4 PHASE 1B SOUTHWEST ELEVATION

1/16" = 1'-0"



A8 PHASE 1B NORTHWEST ELEVATION

1/16" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

Maint Design Group
MEAD & HUNT
STRAND ASSOCIATES

MDG
STRAND
MEAD & HUNT

NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE
	UDC SUBMITTAL	12/17/14

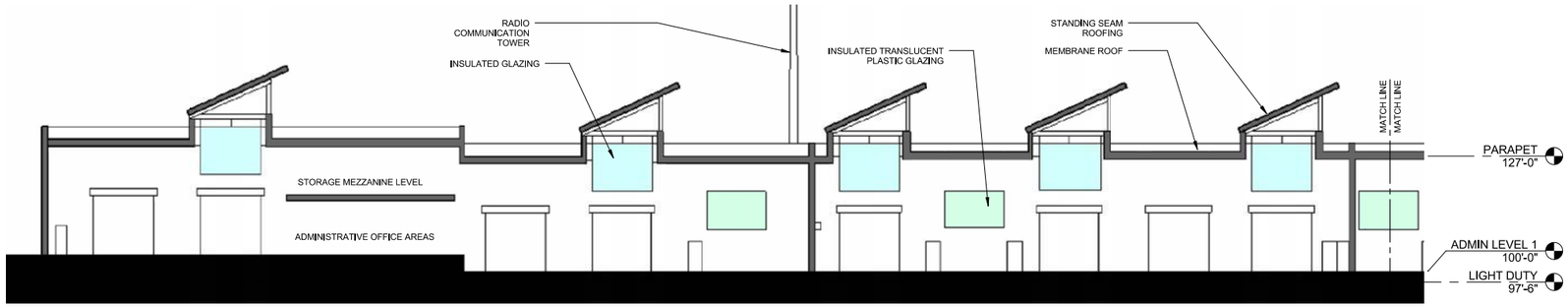
PROJECT No: 376601

DATE: 12/17/2014

SCALE: 1/16" = 1'-0"

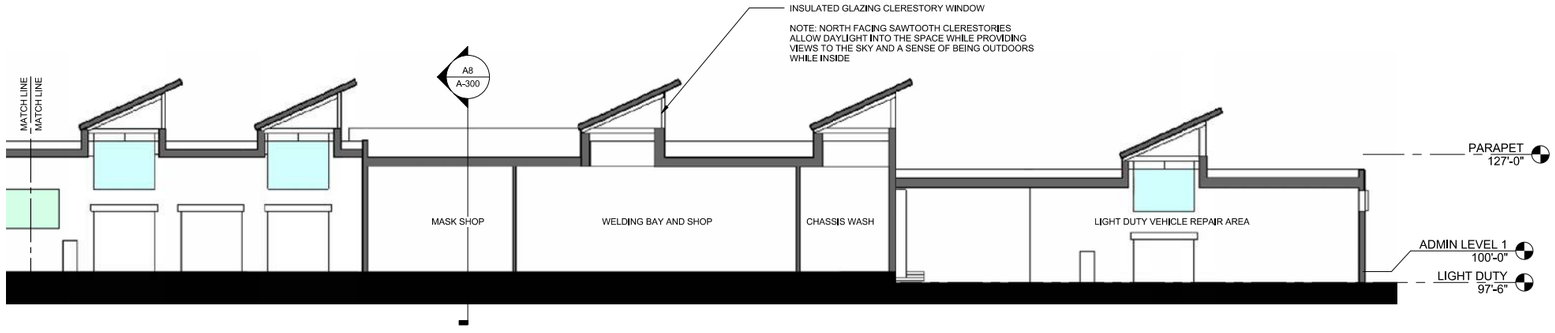
PHASE 1B BUILDING ELEVATIONS

A-202



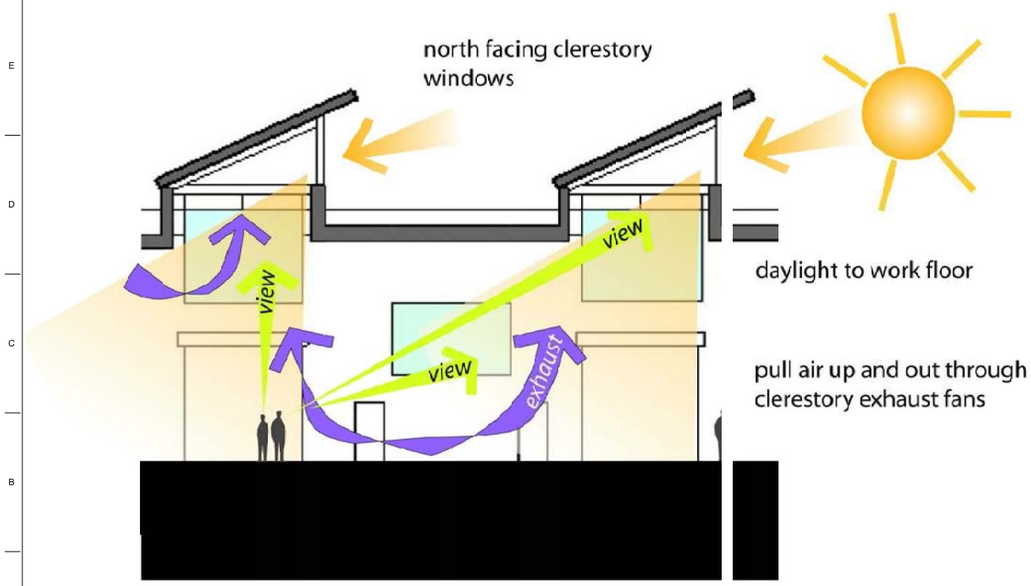
G4 PHASE 1B - LONGITUDINAL SECTION

1/16" = 1'-0"

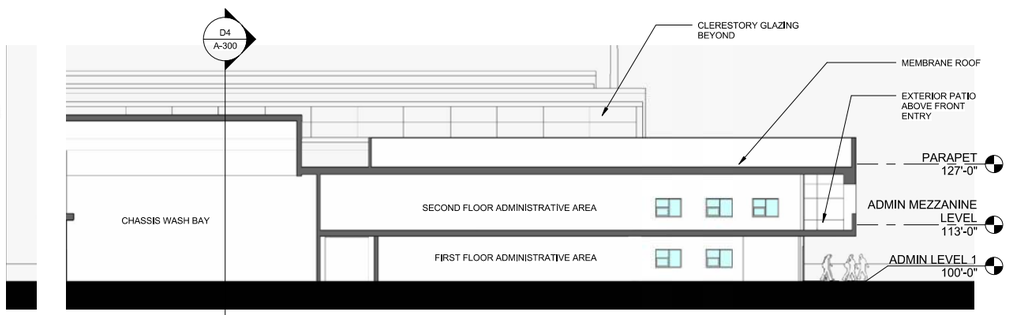


D4 PHASE 1B - LONGITUDINAL SECTION

1/16" = 1'-0"



DIAGRAMMATIC SECTION CONCEPT



A8 PHASE 1B - CROSS SECTION

1/16" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

Maint Design Group

MEAD & HUNT

STRAND ASSOCIATES

MDG
STRAND
MEAD & HUNT

NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE
	UDC SUBMITTAL	12/17/14

PROJECT No: 376601

DATE: 12/17/2014

SCALE: 1/16" = 1'-0"

PHASE 1B BUILDING SECTIONS

A-300

H7 PHASE 1A NORTHEAST PERSPECTIVE
1" = 1'-0"

D7 PHASE 1A NORTHWEST PERSPECTIVE
1" = 1'-0"

A7 PHASE 1A SOUTHWEST PERSPECTIVE
1" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

Maintenance Design Group
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STRAND ASSOCIATES

MDG
STRAND
MEAD & HUNT

NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE
	UDC SUBMITTAL	12/17/14

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1" = 1'-0"

PHASE 1A PERSPECTIVES

A-400

E5 PHASE 1B NORTHEAST PERSPECTIVE
1 1/2" = 1'-0"

A5 PHASE 1B NORTHWEST PERSPECTIVE
1 1/2" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

Maintenance Design Group
MEAD & HUNT
STRAND ASSOCIATES

MDG
STRAND
MEAD & HUNT

NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE
	UDC SUBMITTAL	12/17/14

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1 1/2" = 1'-0"

PHASE 1B PERSPECTIVES

A-401

F6 PHASE 1B NORTHWEST PERSPECTIVE
1 1/2" = 1'-0"

A4 PHASE 1B SOUTHWEST PERSPECTIVE
1 1/2" = 1'-0"

RNL
1451 DOLLY MADISON BLVD
SUITE 200
MCLEAN, VA 22101

Maintenance Design Group
MEAD & HUNT
STRAND ASSOCIATES

MDG
STRAND
MEAD & HUNT

NAKOOSA TRAIL PUBLIC WORKS FACILITY

MADISON, WISCONSIN

SCHEMATIC DESIGN

No	REVISION/SUBMISSION	DATE
	UDC SUBMITTAL	12/17/14

PROJECT No: 376601
DATE: 12/17/2014
SCALE: 1 1/2" = 1'-0"

PHASE 1B PERSPECTIVES

A-402

Appendix D – UDC Powerpoint Presentation

Nakoosa Trail Fleet Services Facility

December 17, 2014

UDC Presentation

RNL

Maintenance Design Group

MEAD & HUNT

SA STRAND ASSOCIATES®

Walmart across Nakoosa

**the site is currently zoned Commercial Center District (Retail), but is in the process of being rezoned to Industrial Limited*

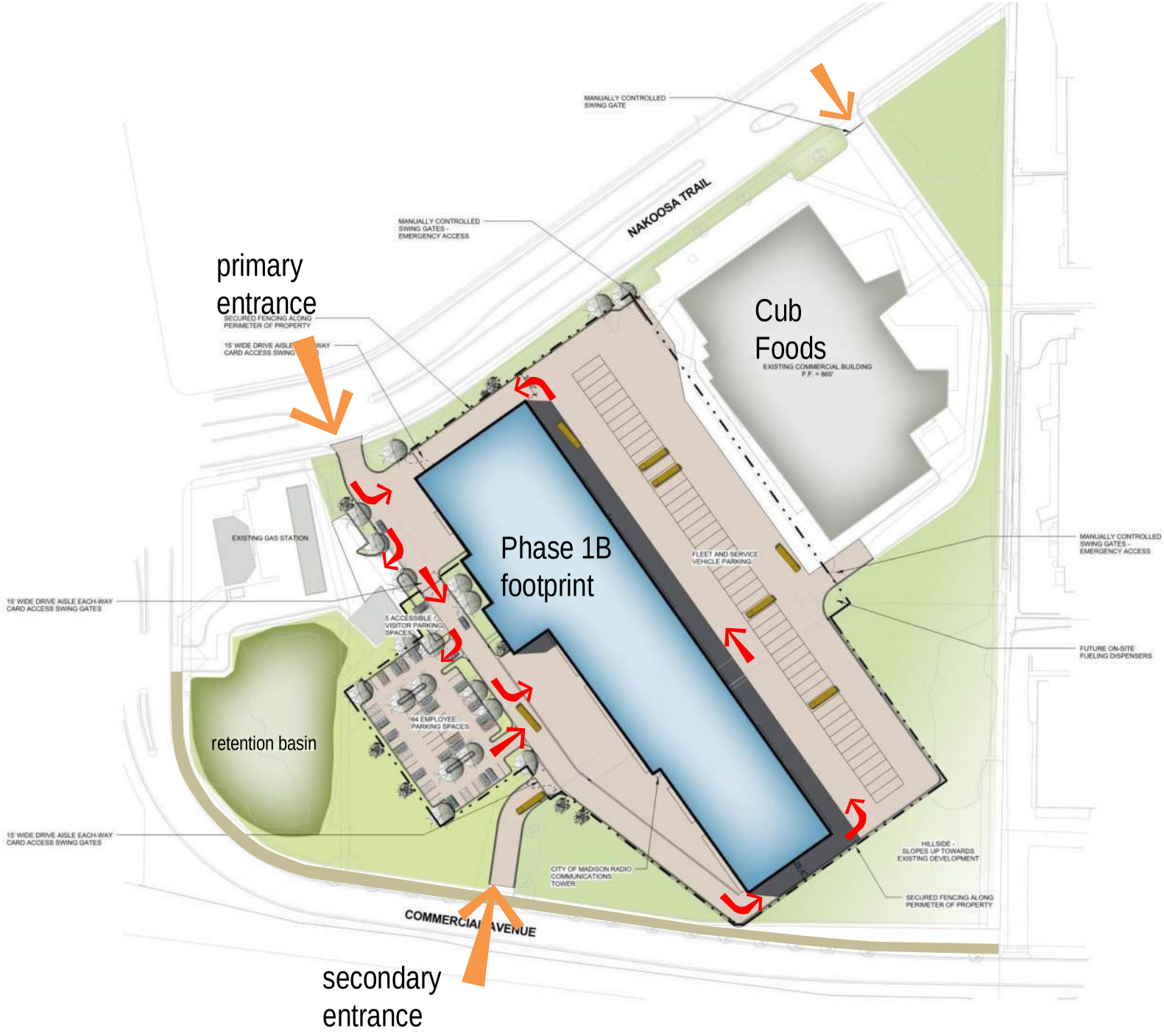
Cub Foods front facade

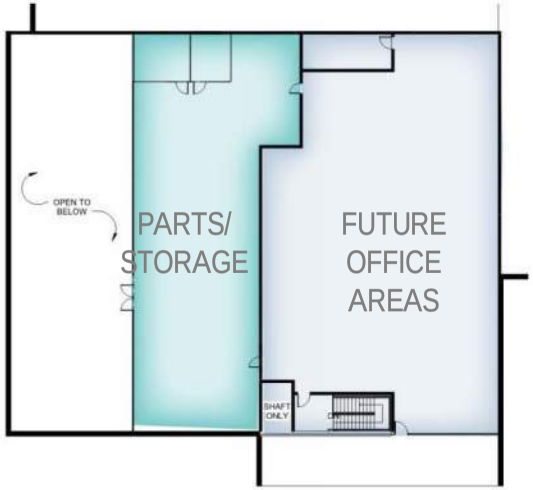
view looking down to site

view from Commercial / Nakoosa corner looking back to Cub Foods

view looking up hillside


emergency
ingress/egress
MANUALLY OPERATED
STEEL ARM GATE
NAKOOSA TRAIL
primary
entrance
Cub
Foods
26 EMPLOYEE /
ACCESSIBLE AND
VISITOR PARKING
SPACES
CARD ACCESSED
EMPLOYEE
ENTRANCE
FLEET AND SERVICE
VEHICLE PARKING
EXISTING GAS STATION
Phase 1A
footprint
CARD ACCESS UPWARD
SWINGING GATES
EMPLOYEE AND VISITOR
ENTRANCE
retention basin
CARD ACCESS UPWARD
SWINGING GATES
HILLSIDE -
SLOPES UP TOWARDS EXISTING
DEVELOPMENT
new sidewalk at Commercial
Avenue along property
frontage
COMMERCIAL AVENUE
secondary
entrance


primary entrance
secondary entrance
Phase 1B footprint
Cub Foods
EXISTING COMMERCIAL BUILDING F.F. = 865'
NAKOOSA TRAIL
COMMERCIAL AVENUE
MANUALLY CONTROLLED SWING GATE
MANUALLY CONTROLLED SWING GATES - EMERGENCY ACCESS
SECURED FENCING ALONG PERIMETER OF PROPERTY
15' WIDE DRIVE AISLE EACH-WAY CARD ACCESS SWING GATES
EXISTING GAS STATION
5 ACCESSIBLE / VISITOR PARKING SPACES
64 EMPLOYEE PARKING SPACES
FLEET AND SERVICE VEHICLE PARKING
FUTURE ON-SITE FUELING DISPENSERS
retention basin
CITY OF MADISON RADIO COMMUNICATIONS TOWER
HILLSIDE - SLOPES UP TOWARDS EXISTING DEVELOPMENT

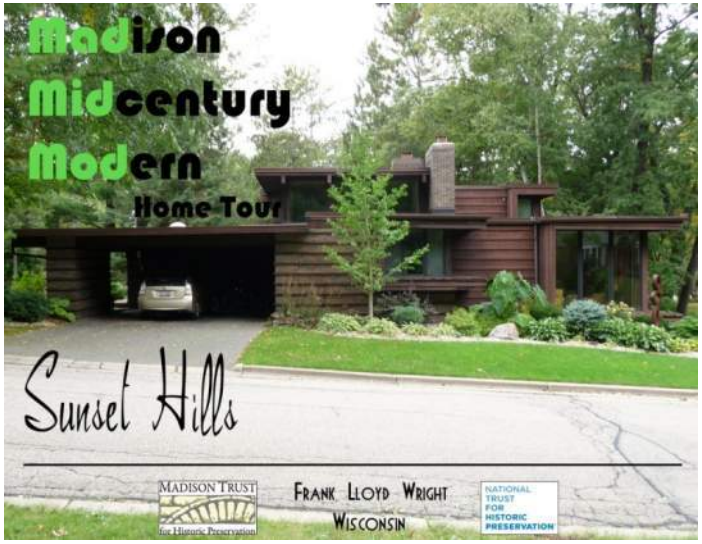


mezzanine floor plan

ground floor plan


OPEN TO BELOW
PARTS/
STORAGE
OFFICE
AREAS
FUTURE
OFFICES
GUARDRAIL AND
FORKLIFT ACCESS
GATES
OPEN TO THE
SPACES BELOW
OPEN TO THE
SPACES BELOW
GUARDRAIL AND
FORKLIFT
ACCESS GATES
PARTS/
STORAGE
GUARDRAIL AND
FORKLIFT ACCESS
GATES
mezzanine floor plan
A8
A-300
623'-6"
D4
A-300
MAINT
SHOPS
FIRE
SHOPS
LIGHT
DUTY
MAINT
PARTS/
STORAGE
OFFICE
AREAS
HEAVY
MAINTENANCE
FIRE
MAINTENANCE
RADIO COMM
SHOPS
RADIO COMM
SHOPS
RADIO
COMM
OFFICE
AREAS
171'-2"
156'-6"
15'-2"
97'-6"
100'-0"
100'-0"
100'-6"
101'-0"
105'-0"
125'-
230'-10"
85'-4"
HEAVY DUTY VEHICLES
126'-2"
FIRE TRUCK REPAIRS
181'-2"
COMMUNICATIONS SHOP
ground floor plan

Precedent



- contemporary industrial
- civic building
- regional - prairie style FLW
- long horizontal overhangs - punched openings
- daylighting
- focus on entry - color

Phase 1A perspective looking at SW corner

Phase 1A perspective - NW corner

Phase 1A perspective - NE corner

Phase 1B perspective - NW corner

Phase 1B perspective - SW corner

Phase 1B perspective - NW corner

Phase 1B perspective - NE corner

south

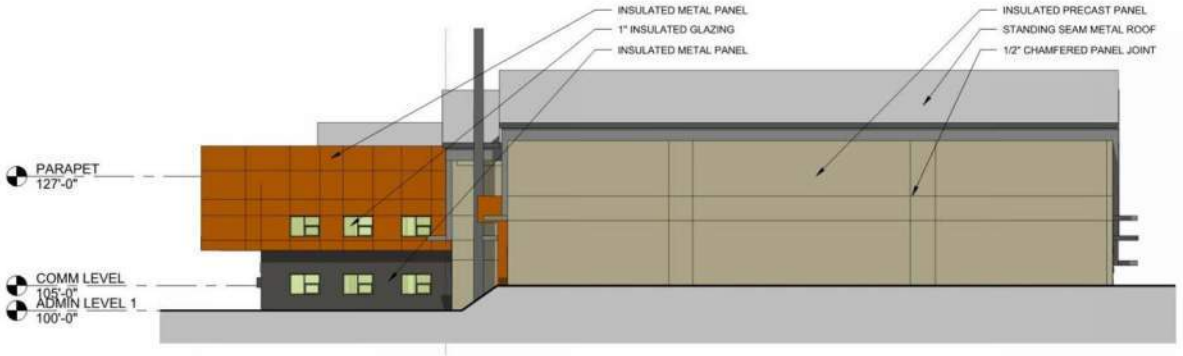
west

north

east

south

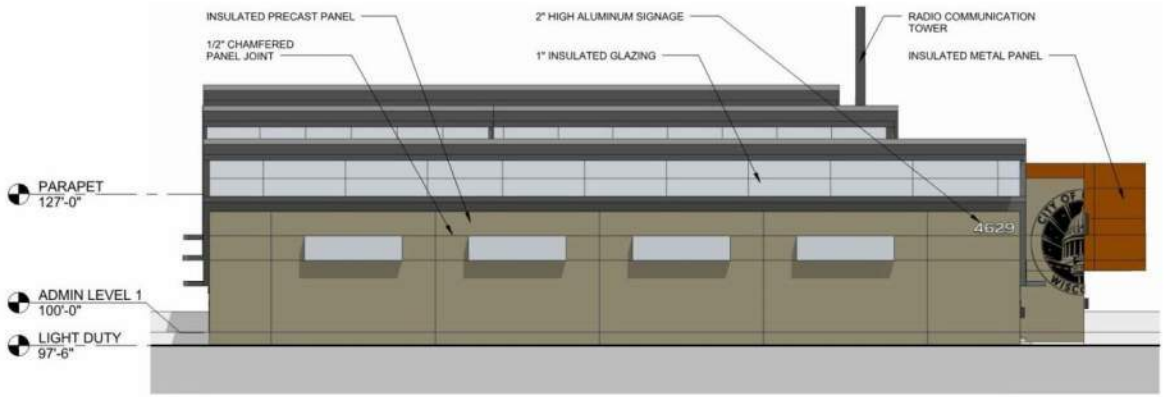
south cont.



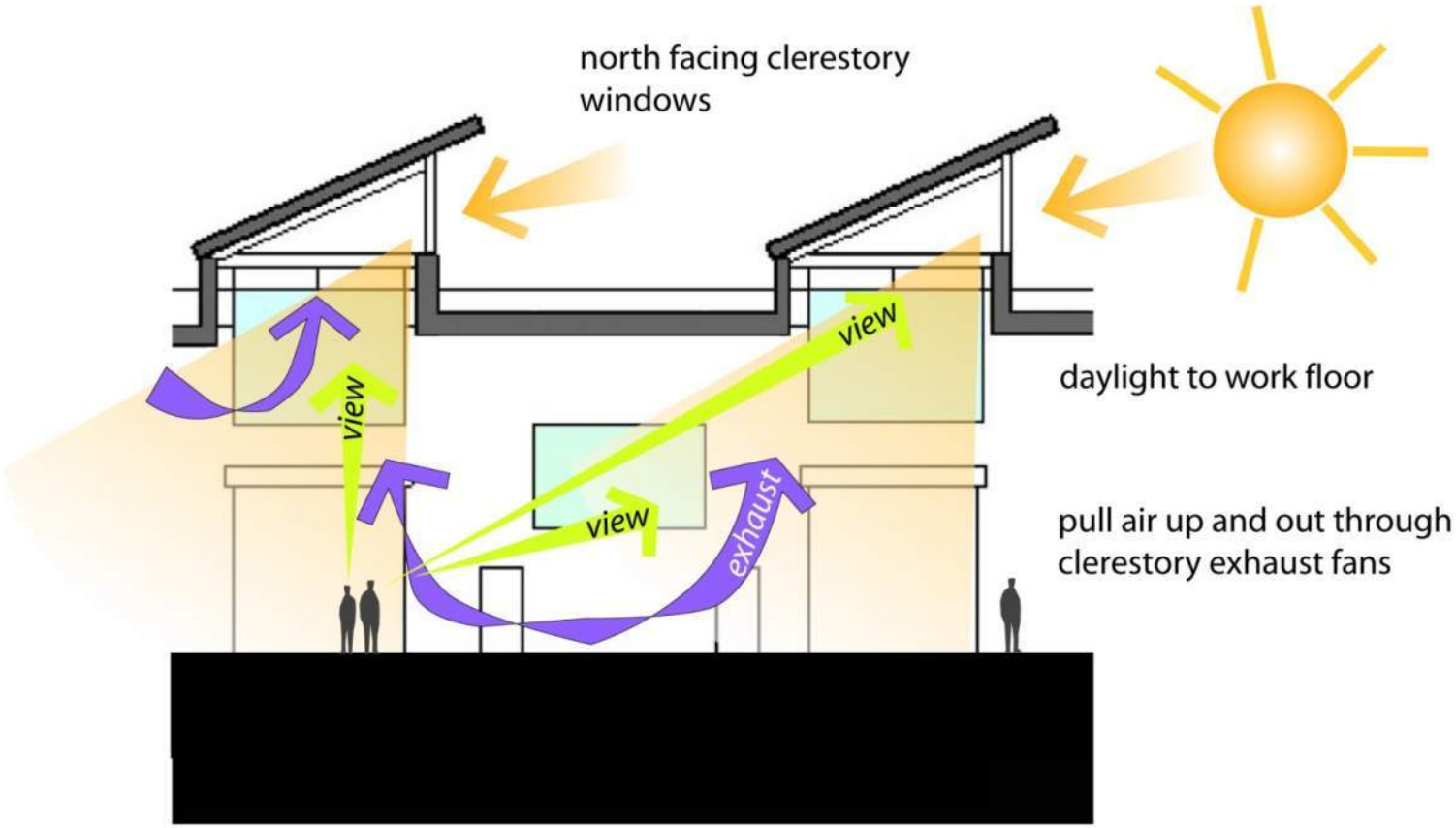
west

north

north cont.



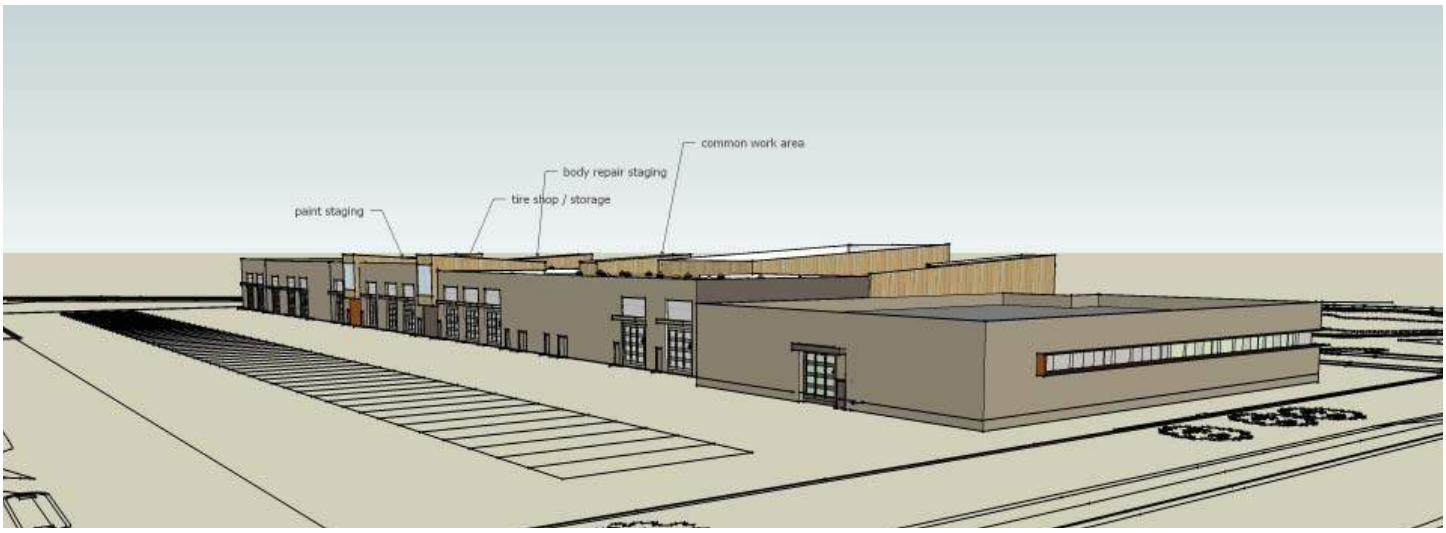
east



diagrammatic section concept

Questions

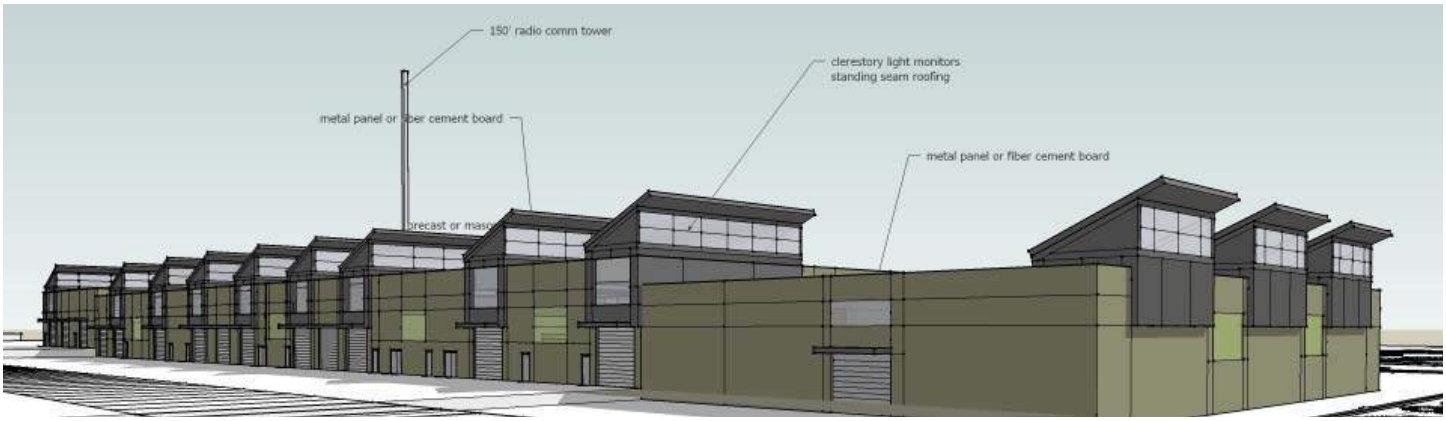
Appendix E – Progress Architectural Concepts



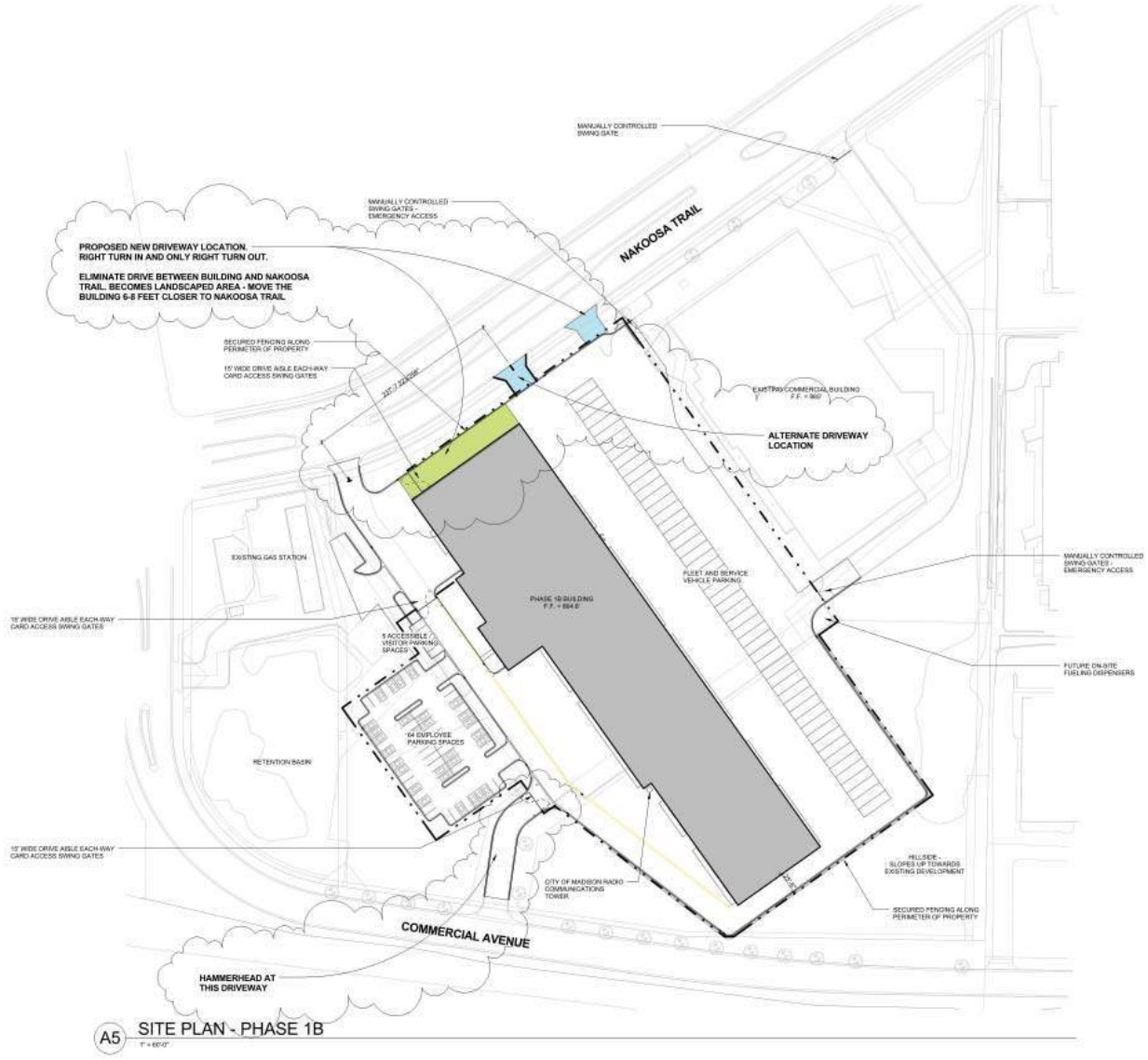
Early concept images - CONCEPT ‘A’

Early concept images - CONCEPT ‘B’

REVISED images of CONCEPT ‘B’



REVISED images of CONCEPT ‘B’



Alternate driveway location determined not feasible due to grading issues

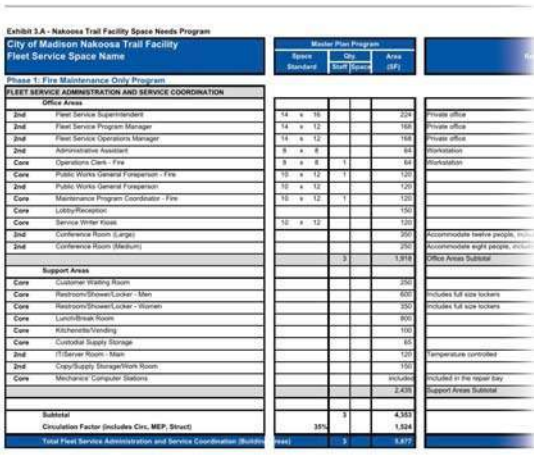


Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility

Fleet Service Space Name

Phase 1: Fire Maintenance Only Program

		Master Plan Program				
		Space Standard		Qty. Staff	Qty. Spaces	Area (SF)
FLEET SERVICE ADMINISTRATION AND SERVICE COORDINATION						
	Office Areas					
2nd	Fleet Service Superintendent	14	x 16			224
2nd	Fleet Service Program Manager	14	x 12			168
2nd	Fleet Service Operations Manager	14	x 12			168
2nd	Administrative Assistant	8	x 8			64
Core	Operations Clerk - Fire	8	x 8	1		64
Core	Public Works General Foreperson - Fire	10	x 12	1		120
2nd	Public Works General Foreperson	10	x 12			120
Core	Maintenance Program Coordinator - Fire	10	x 12	1		120
Core	Lobby/Reception					150
Core	Service Writer Kiosk	10	x 12			120
3rd	Conference Room (Large)					350
2nd	Conference Room (Medium)					250
				3		1,918
	Support Areas					
Core	Customer Waiting Room					250
Core	Restroom/Shower/Locker - Men					600
Core	Restroom/Shower/Locker - Women					350
Core	Lunch/Break Room					800
Core	Kitchenette/Vending					100
Core	Custodial Supply Storage					65
2nd	IT/Server Room - Main					120
2nd	Copy/Supply Storage/Work Room					150
Core	Mechanics' Computer Stations					included
						2,435
	Subtotal			3		4,353
	Circulation Factor (includes Circ, MEP, Struct)	35%				1,524
	Total Fleet Service Administration and Service Coordination (Building Area)			3		5,877

Appendix F – Fire Only Programming Document

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility
Fleet Service Space Name

Phase 1: Fire Maintenance Only Program

		Master Plan Program			
		Space Standard	Qty. Staff	Qty. Space	Area (SF)
FLEET SERVICE ADMINISTRATION AND SERVICE COORDINATION					
	Office Areas				
2nd	Fleet Service Superintendent	14 x 16			224
2nd	Fleet Service Program Manager	14 x 12			168
2nd	Fleet Service Operations Manager	14 x 12			168
2nd	Administrative Assistant	8 x 8			64
Core	Operations Clerk - Fire	8 x 8	1		64
Core	Public Works General Foreperson - Fire	10 x 12	1		120
2nd	Public Works General Foreperson	10 x 12			120
Core	Maintenance Program Coordinator - Fire	10 x 12	1		120
Core	Lobby/Reception				150
Core	Service Writer Kiosk	10 x 12			120
2nd	Conference Room (Large)				350
2nd	Conference Room (Medium)				250
			3		1,918
	Support Areas				
Core	Customer Waiting Room				250
Core	Restroom/Shower/Locker - Men				600
Core	Restroom/Shower/Locker - Women				350
Core	Lunch/Break Room				800
Core	Kitchenette/Vending				100
Core	Custodial Supply Storage				65
2nd	IT/Server Room - Main				120
2nd	Copy/Supply Storage/Work Room				150
Core	Mechanics' Computer Stations				included
					2,435
	Subtotal		**3**		**4,353**
	Circulation Factor (includes Circ, MEP, Struct)	**35%**			**1,524**
	Total Fleet Service Administration and Service Coordination (Buildin reas)		**3**		**5,877**

Remarks
Private office
Private office
Private office
Workstation
Workstation
Accommodate twelve people, include table and chairs
Accommodate eight people, include table and chairs
Office Areas Subtotal
Includes full size lockers
Includes full size lockers
Temperature controlled
Included in the repair bay
Support Areas Subtotal

REPAIR BAYS/SHOPS						
	Bay and Shop Areas					
Bay	Fire Apparatus Repair Bay	20 x 60	6	6	7,200	Use Heavy Bays in Phase 1
	Emergency Response/Ambulance Repair Bay	15 x 35		0	0	Use Heavy Bays in Phase 1
Core	Welding/Fabrication Bay	30 x 60		1	1,800	Adjacent to Weld/Fabrication Shop
Core	Welding/Fabrication Shop/Storage	15 x 60		1	900	Adjacent to the Weld/Fabrication Bay including Metal Storage
Core	Chassis Wash/Component Clean Bay	20 x 60		1	1,200	COULD BE SHELLED SPACE - BUILT IN PHASE 1B
Bay	Common Work Area(s)				450	
Bay	Tire Shop				200	
Core	Breathable Air System Shop (a.k.a. Mask Shop)				450	
Core	Mask and Breathable Air Bottle Storage Room				250	Secure Room Adjacent to Mask Shop & Compressor
			6		12,450	Bay and Shop Areas Subtotal
	Shop Storage Areas					
Core	Tool Crib/Room				100	Secure Storage of Specialty Tools
Bay	Portable Equipment Storage (PES)				450	Dedicated storage areas adjacent to bays and shops
Bay	Tire Storage - New	4		75	300	
Bay	Tire Storage - Used	4		25	100	Could be exterior covered
					950	Shop Storage Areas Subtotal
	Support Areas					
Core	Lube/Compressor Room				800	Bulk Storage Tanks and Drum Storage
Core	Breathable Air Compressor Room				150	Secure Sound Attenuated Room
Core	Electrical Room				250	
Core	Fire Riser Room				80	
Core	IT/Server Room - Remote				80	
Bay	Tool Box Storage	4 x 6		8	192	
					1,552	Support Areas Subtotal
	Subtotal				**14,952**	
	Circulation Factor (includes Circ, MEP, Struct)	**20%**			**2,990**	
	Total Fleet Service Repair/Shops (Building Areas)		**6**		**17,942**	

PARTS AND MATERIAL STORAGE							
	Office Areas						
Core	Parts Office	10	x 12	1		120	Private Office
Core	Issue Window/Counter			1		150	
				2		270	Office Areas Subtotal
	Storage Areas						
	Parts and Material Storage						
Core	Bench Stock Bins					150	
Core	Small Parts (Fast Movers)					750	
Core	Large/Bulk Parts (Slow Movers)					1,200	
Core	Battery Storage - Enclosed Room					150	
Core	Shipping and Receiving (Dock Area)					300	
						2,550	Storage Areas Subtotal
	Subtotal			**2**		**2,820**	
	Circulation Factor (includes Circ, MEP, Struct)		**10%**			**282**	
	Total Fleet Service Parts and Material Storage Areas			**2**		**3,102**	

FLEET SERVICE EXTERIOR AREAS							
	Exterior Storage Areas						
	Hazardous Material Storage Locker					100	
	Waste/Recycling Bin Enclosure					400	
						500	Exterior Storage Areas Subtotal
	Vehicle Parking/Storage						
	Down Line/Ready Line						
	Class 1: Refuse/Compactor/Fire Trucks	12	x 50		5	3,000	
	Class 2: Light Dump/Tower Truck Rescue Squad	12	x 30		5	1,800	
	Class 3: Heavy/Tower Truck Stake Body	12	x 40		5	2,400	
	Class 4: Cars, Pickups/Trucks/Trailers	9	x 24		5	1,080	
	Employee Parking	9	x 18		12	1,944	
	Visitor Parking	9	x 18		3	486	
	Accessible Parking	13	x 18		2	468	
	Subtotal					**11,678**	
	Circulation Factor (Includes Exterior Circ)		**100%**			**11,678**	
	Total Fleet Service Exterior Areas					**23,356**	

Summary- Fleet Services

	Master Plan		
Total Fleet Service Administration and Service Coordination (Building Areas)	**5,877**		
Total Fleet Service Repair/Shops (Building Areas)	**17,942**		
Total Fleet Service Parts and Material Storage Areas	**3,102**		
Subtotal	**26,921**	$	6,730,237.50
Total Fleet Service Exterior Areas	**23,356**		
Total All Areas	**50,277**		
Site Circulation Factor (includes setbacks, landscaping, etc.)	**25,138**		
Total Fleet Services Facility Areas	**75,415**		
	1.73		

Nakoosa Trail Facility Master Plan
Phase I Report: Programming and Master Planning

Section Three
Space Needs Program

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions		Master Plan Program			Remarks
	Qty.	Area (SF)	Space Standard	Qty.	Area (SF)	
	Staff / Space			Staff / Space		
FLEET SERVICE						
FLEET SERVICE ADMINISTRATION AND SERVICE COORDINATION						
Office Areas						
Fleet Service Superintendent	1	168	14 x 16	1	224	Private office
Fleet Service Program Manager	1	168	14 x 12	1	168	Private office
Fleet Service Operations Manager	1		14 x 12	1	168	Private office
Administrative Assistant	1	168	8 x 8	1	64	Workstation
Operations Clerk	1		8 x 8	1	64	Workstation
Public Works General Foreperson	2		10 x 12	2	240	
Maintenance Program Coordinator	1		10 x 12	1	120	
Lobby/Reception					150	
Service Writer Kiosk			10 x 12	1	120	
Conference Room (Large)					300	Accommodate twelve people. Include table and chairs.
Conference Room (Medium)					250	Accommodate eight people. Include table and chairs.
	6	336		9	1,910	Office Areas Subtotal
Support Areas						
Customer Waiting Room					250	
Restroom/Shower/Locker - Men	1	350			800	Includes full size lockers.
Restroom/Shower/Locker - Women	1	150			350	Includes full size lockers.
Lunch/Break Room	1	400			800	
Kitchenette/Vending		included			100	
Custodial Supply Storage					80	
IT/Server Room - Main	1				120	Temperature controlled
Copy/Supply Storage/Work Room					150	
Mechanics' Computer Stations	10				included	Included in the repair bay
		850			2,450	Support Areas Subtotal

Appendix G – Nakoosa Trail Space Needs Programming Document (full program)

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions			Master Plan Program				Remarks
	Qty.		Area	Space	Qty.		Area	
	Staff	Space	(SF)	Standard	Staff	Space	(SF)	
FLEET SERVICE								
FLEET SERVICE ADMINISTRATION AND SERVICE COORDINATION								
Office Areas								
Fleet Service Superintendent	1		168	14 x 16	1		224	Private office
Fleet Service Program Manager	1		168	14 x 12	1		168	Private office
Fleet Service Operations Manager	1		---	14 x 12	1		168	Private office
Administrative Assistant	1		196	8 x 8	1		64	Workstation
Operations Clerk	1		---	8 x 8	1		64	Workstation
Public Works General Foreperson	2		---	10 x 12	2		240	
Maintenance Program Coordinator	1		---	10 x 12	1		120	
Lobby/Reception							150	
Service Writer Kiosk				10 x 12	1		120	
Conference Room (Large)							350	Accommodate twelve people, include table and chairs
Conference Room (Medium)							250	Accommodate eight people, include table and chairs
	8		532		9		1,918	Office Areas Subtotal
Support Areas								
Customer Waiting Room			---				250	
Restroom/Shower/Locker - Men		1	300				600	Includes full size lockers
Restroom/Shower/Locker - Women		1	100				350	Includes full size lockers
Lunch/Break Room		1	400				800	
Kitchenette/Vending			included				100	
Custodial Supply Storage			---				65	
IT/Server Room - Main		1	---				120	Temperature controlled
Copy/Supply Storage/Work Room			---				150	
Mechanics' Computer Stations		1	---				included	Included in the repair bay
			800				2,435	Support Areas Subtotal

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions Qty. Staff	 Qty. Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Qty. Space	 Area (SF)	Remarks
FLEET SERVICE								
Training Areas								
Training Room			---	20 x 60		1	1,200	Accommodate training on a large truck
Training Aid Storage			---				100	
Table and Chair Storage			---				200	
			---				1,500	Training Areas Subtotal
Subtotal	**8**		**1,332**		**9**		**5,853**	
Total				**35%**			**2,049**	
	8		**1,332**		**9**		**7,902**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions Qty. Staff	 Qty. Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Qty. Space	 Area (SF)	Remarks
FLEET SERVICE								
FLEET SERVICE REPAIR/SHOPS								
Bay and Shop Areas								
Heavy Line	5				8			
Heavy Repair Bay			9,240	20 x 60		10	12,000	
Heavy PM/Inspection Bay (Lube Bay)	0.5		included	20 x 60	1	2	2,400	
Fire Apparatus Repair Bay				24 x 60		3	4,320	
Light Line	5				7			
Light/Medium Repair Bay			11,096	15 x 35		14	7,350	
Light Medium PM/Inspection Bay (Lube Bay)	0.5		included	15 x 35	1	2	1,050	
Emergency Response/Ambulance Repair Bay			---	15 x 35		3	1,575	
Specialty Bays						*34*		*26 Bays Phase I (11 Heavy + 15 Light)*
Body Repair Bay	1		4,832	20 x 60	1	3	3,600	Adjacent to Body Shop and Paint Booth
Body Shop/Storage			included	15 x 60		1	900	Separate Shop Area adjacent to Body Repair Bays
Welding/Fabrication Bay	1		1,222	30 x 60	1	1	1,800	Adjacent to Weld/Fabrication Shop
Welding/Fabrication Shop/Storage			included	15 x 60		1	900	Adjacent to the Weld/Fabrication Bay including Metal Storage
Paint Booth Bay			1,000	40 x 60		1	2,400	Includes Booth Exhaust System required area
Paint Storage/Kitchen			240				200	
Chassis Wash/Component Clean Bay			---	20 x 60		1	1,200	
Common Work Area(s)							600	Could be one for each line
Hydraulic Hose Shop/Storage			---				150	
Tire Shop			960				450	
Breathable Air System Shop (a.k.a. Mask Shop)			---				450	
Mask and Breathable Air Bottle Storage Room			---				250	Secure Room Adjacent to Mask Shop & Compressor
	13		28,590		19	*42*	41,345	Bay and Shop Areas Subtotal

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions Qty. Staff	 Qty. Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Qty. Space	 Area (SF)	Remarks
FLEET SERVICE								
Shop Storage Areas								
Tool Crib/Room			676				250	Secure Storage of Specialty Tools
Portable Equipment Storage (PES)			included				900	Dedicated storage areas adjacent to bays and shops
Tire Storage - New			1,288	4		250	1,000	
Tire Storage - Used			included	4		100	400	Could be exterior covered
Blade Storage			included				50	Arm Rack Storage adjacent to Bays
Hydraulic Piston Storage Rack			---				50	Arm Rack Storage adjacent to Bays
			1,964				2,650	Shop Storage Areas Subtotal
Support Areas								
Lube/Compressor Room			288				800	Bulk Storage Tanks and Drum Storage
Breathable Air Compressor Room			---				150	Secure Sound Attenuated Room
Electrical Room			---				250	
Fire Riser Room			---				80	
IT/Server Room - Remote			---				80	
Tool Box Storage			224	4 x 6		19	480	
			512				1,840	Support Areas Subtotal
Subtotal			**31,066**				**45,835**	
Circulation Factor (includes Circ, MEP, Struct)				**20%**			**9,167**	
Total	**13**		**31,066**		**19**		**55,002**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions Qty. Staff	 Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Space	 Area (SF)	Remarks
FLEET SERVICE								
FLEET SERVICE PARTS AND MATERIAL STORAGE								
Office Areas								
Parts Manager Office			---	10 x 12	1		120	Private Office
Parts Technician Workstations	5		---	6 x 6	5		180	Workstation
Fleet Parts Room Assistant			---	8 x 8	1		64	
Issue Window/Counter			---				150	
	5				7		514	Office Areas Subtotal
Storage Areas			---					
Parts and Material Storage			---					
Bench Stock Bins			---				150	
Small Parts (Fast Movers)			1,584				1,500	
Large/Bulk Parts (Slow Movers)			included				3,000	
Warranty Storage - Secure			---				450	
Battery Storage - Enclosed Room			included				250	
Long Term Storage			3,655					Located on the Mezzanine Level of Existing Facility
Shipping and Receiving (Dock Area)			---				300	
			5,239				5,650	Storage Areas Subtotal
Subtotal	**5**		**5,239**		**7**		**6,164**	
Circulation Factor (includes Circ, MEP, Struct)				**10%**			**616**	
Total	**5**		**5,239**		**7**		**6,780**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions Qty. Staff	Qty. Space	Area (SF)	Master Plan Program Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
FLEET SERVICE								
FLEET SERVICE COVERED AREAS								
Enclosed Heated Vehicle Parking/Storage			---					
Preserved State of Accident Vehicles			---	10 x 20		5	1,000	
Service Truck			---	10 x 20		1	200	
Tire Truck			---	10 x 20		1	200	
Service Jeep			---	10 x 20		1	200	
Bobcat			---	10 x 20		1	200	
Wide Deck Mower			---	12 x 30		1	360	
John Deere Tractor			---	12 x 30		1	360	
Fueling Facility								
Fueling Island				12 x 40		2	960	May be able to utilize Commercial Station of-site.
Subtotal							**3,480**	
Circulation Factor (includes Circ, MEP, Struct)				**10%**			**348**	
Total							**3,828**	
FLEET SERVICE EXTERIOR AREAS								
Exterior Storage Areas								
Miscellaneous Yard Storage			---				1,500	
Hazardous Material Storage Locker			---				100	
Waste/Recycling Bin Enclosure			---				400	
Fuel Tank Farm								
Unleaded Fuel Storage Tank				8 x 20		1	160	Unleaded 6,000 gallon AST
Diesel Fuel Storage Tank				8 x 35		1	280	Diesel 12,000 gallon AST
							2,000	Exterior Storage Areas Subtotal

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Fleet Service Space Name	Existing Conditions Qty. Staff	Existing Conditions Qty. Space	Existing Conditions Area (SF)	Master Plan Program Space Standard	Master Plan Program Qty. Staff	Master Plan Program Qty. Space	Master Plan Program Area (SF)	Remarks
FLEET SERVICE								
Vehicle Parking/Storage								
Impound /Auction Vehicles								
Heavy Duty Vehicles/Equipment			---	12 x 40		5	2,400	
Light/Medium Duty Vehicles			---	10 x 20		5	1,000	
Loaner Vehicles Storage								
Heavy Duty Vehicles/Equipment			---	12 x 40		5	2,400	
Light/Medium Duty Vehicles			---	10 x 20		5	1,000	
Down Line/Ready Line								
Class 1: Refuse/Compactor/Fire Trucks		10	---	12 x 50		20	12,000	
Class 2: Light Dump/Tower Truck Rescue Squad		10	---	12 x 30		20	7,200	
Class 3: Heavy/Tower Truck Stake Body		10	---	12 x 40		20	9,600	
Class 4: Cars, Pickups/Trucks/Trailers		60	---	9 x 24		80	17,280	
Employee Parking		30	---	9 x 18		35	5,670	
Visitor Parking		2	---	9 x 18		5	810	
Accessible Parking		0	---	13 x 18		2	468	
Subtotal							**61,828**	
Circulation Factor (Includes Exterior Circ)				**100%**			**61,828**	
Total Fleet Service Exterior Areas							**123,656**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

COMMUNICATIONS

City of Madison Nakoosa Trail Facility Communications Space Name	Existing Conditions Qty. Staff	Existing Conditions Qty. Space	Existing Conditions Area (SF)	Master Plan Program Space Standard	Master Plan Program Qty. Staff	Master Plan Program Qty. Space	Master Plan Program Area (SF)	Remarks
SHOPS/STORAGE/SUPPORT AREAS								
Shop/Workstations								
Supervisor	1		---	12 x 14	1		168	Private Office
Lead worker	1		---	8 x 12	1		96	Work Station
Communications Tech III	1		437	8 x 12	1		96	Work Station
Communications Tech II	4		575	8 x 12	4		384	Work Station
Communications Tech I	1		---	8 x 12	1		96	Work Station
Communications Worker	2		---	8 x 12	3		288	Work Station on Installation Floor
Administrative Clerk			---	8 x 8	1		64	
	10				*12*		*1,192*	Shops/Workstation Subtotal
Parts and Material Storage								
Small Parts Storage			348	30 x 30			600	Secure Small Parts Storage
Large Item/Palletized Storage			---	50 x 30			1,500	Secure Large Parts and Palletized Materials
Used/Reclaimed and Donor Parts Storage			---				300	
Receiving/Staging Area			---				200	
Parts Mezzanine Storage			768				1,200	Long Term Storage and Records
	10						*3,800*	Parts and Material Storage Subtotal

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Communications Space Name	Existing Conditions Qty. Staff	Existing Conditions Qty. Space	Existing Conditions Area (SF)	Master Plan Program Space Standard	Master Plan Program Qty. Staff	Master Plan Program Qty. Space	Master Plan Program Area (SF)	Remarks
COMMUNICATIONS								
Support Areas								
Conference Room			---				200	Six to Eight Persons
Break Room/Customer Waiting Room			---				400	Includes Lounge Area & Computer/Laptop Work Station
Copy/Supply Storage/Work Room			---				150	
Unisex Customer Restroom			---				64	
Men's Restroom/Shower/Lockers			---				450	
Women's Restroom/Shower/Lockers			---				250	
Custodial Supply Storage			---				65	
Electrical Room			---				200	
Mechanical Room			---				200	
Fire Suppression Riser Room			---				50	
IT/Network Systems Room			---				120	
			768				*2,149*	Support Areas Subtotal
Subtotal			**1,448**				**7,141**	
Circulation Factor (includes Circ, MEP, Struct)				**25%**			**1,785**	
Total			**1,448**				**8,926**	
COMMUNICATIONS - BAY AREAS								
Bay and Shop Areas								
Service Position - Standard				20 x 35		3	2,100	
Service Position - Large				20 x 50		2	2,000	
Installation Position - Standard				20 x 35		5	3,500	
Installation Position - Large				20 x 50		2	2,000	
Subtotal			**0**				**9,600**	
Circulation Factor (includes Interior Circ, MEP, Struct)				**100%**			**9,600**	Internal Circulation
Total			**0**		**0**		**19,200**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

COMMUNICATIONS

City of Madison Nakoosa Trail Facility Communications Space Name	Existing Conditions Qty. Staff	Existing Conditions Qty. Space	Existing Conditions Area (SF)	Master Plan Program Space Standard	Master Plan Program Qty. Staff	Master Plan Program Qty. Space	Master Plan Program Area (SF)	Remarks
COMMUNICATIONS COVERED AREAS								
Vehicle Parking								
Van (Comm. Shop)		3	---	10 x 20		4	800	Park Indoors at Night
Chevy Malibu (Comm. Shop)		1	---	10 x 20		2	400	Park Indoors at Night
Subtotal							**1,200**	
Circulation Factor (includes Circ, MEP, Struct)				**10%**			**120**	Internal Circulation
Total			**0**				**1,320**	
COMMUNICATIONS EXTERIOR AREAS								
Exterior Areas								
Vehicle Parking/Staging								
Down Line/Ready Line - Standard				10 x 20		15	3,000	
Down Line/Ready Line - Large			---	12 x 40		5	2,400	
Employee Parking		10	---	9 x 18		13	2,106	
Visitor Parking		3	---	9 x 18		3	486	
Disability Parking		0	---	13 x 18		1	234	
Other Exterior Areas								
Communications Tower				20 x 20		1	400	150 Foot Tall Tower (allowance for guy wire connections)
Trash/Recycling Bins (Dumpsters)				10 x 10		3	300	Area for 3 - 4 yard Dumpsters
Subtotal							**8,926**	
Circulation Factor (Includes Exterior Circ)				**100%**			**8,926**	Internal Circulation
Total			**0**		**0**		**17,852**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Metro Space Name	Existing Conditions			Master Plan Program				Remarks
	Qty.		Area	Space	Qty.		Area	
	Staff	Space	(SF)	Standard	Staff	Space	(SF)	
METRO TRANSIT SATELLITE FACILITY								
METRO TRANSIT ADMIN/OPERATIONS AREAS								
Office Areas								
On Site Manager			---	14 x 16	1		224	Private Office
Reception/ Office/ Workstation			---		1		200	Includes a 6 x 6 Workstation
Lost and Found Storage Room			---				50	
					2		224	Office Areas Subtotal
Operations Dispatch & Driver Support Areas								
Dispatch Center			---	8 x 8		3	192	3 workstations in the Dispatch Center
Transit (Operations) Supervisors			---	8 x 8	8		512	Workstation
Dispatch Storage			---				100	
Dispatch Vestibule			---	10 x 15		1	150	
Radio Equipment			---				100	
Drivers' Room			---				2,000	
Kitchenette/Vending			---				600	
Quite Room			---				300	
TV Viewing Alcove			---				600	
Drivers" Locker Alcove			---	3 x 1	200	200	600	1/2 Height Lockers
Men's' Restroom/Showers			---				650	
Women's' Restroom/Showers			---				450	
Fitness Room			---				500	
					208		6,754	Operations Dispatch & Driver Support Areas
Metro Operations Training Center								
Training Offices			---	12 x 14	2		336	Private Office
Training Room #1			---				1,200	
Table and Chair Storage			---				250	
Training Aid Storage			---				150	
Training Room #2			---				800	
Table and Chair Storage			---				250	
Training Aid Storage			---				150	
					2		*3,136*	Metro Operations Training Center

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Metro Space Name	Existing Conditions			Master Plan Program				Remarks
	Qty.		Area	Space	Qty.		Area	
	Staff	Space	(SF)	Standard	Staff	Space	(SF)	
METRO TRANSIT SATELLITE FACILITY								
Support Areas								
Copy/ Supply Storage/ Work Room			---				150	
General Storage Room			---				150	
Conference Room - Medium			---				200	
Coffee Bar/ Break Area			---				50	
Men's Restroom			---				160	Near/Adjacent to Training Rooms
Women's Restroom			---				160	Near/Adjacent to Training Rooms
IT/Network Systems Room			---				120	
Custodial Supply Storage			---				65	
							1,055	Support Areas Subtotal
Subtotal					**212**		**10,945**	
Circulation Factor (includes Circ, MEP, Struct)				**25%**			**2,736**	
Total					**212**		**13,681**	
METRO TRANSIT MAINTENANCE								
Office Areas								
Maintenance Manager			---	14 x 16	1		224	Private Office
Maintenance Supervisors			---	8 x 8	8		512	Workstation
Garage Dispatcher			---	8 x 8	1		64	Standalone Office on Bus Storage Floor
Manual Library			---				100	
					10		900	Office Areas Subtotal

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Metro Space Name	Existing Conditions			Master Plan Program				Remarks
	Qty.		Area	Space	Qty.		Area	
	Staff	Space	(SF)	Standard	Staff	Space	(SF)	
METRO TRANSIT SATELLITE FACILITY								
Support Areas			---					
Maintenance File Storage			---				200	
Conference Room - Medium			---				200	
Copy/ Supply Storage/ Work Room			---				150	
Uniform Lockers			---				50	
Men's Restroom/ Shower/ Lockers			---				450	Includes XX lockers
Women's Restroom/ Shower/ Lockers			---				250	Includes XX lockers
Maintenance Break Room			---				450	
Training Room			---				800	
							1,750	Support Areas Subtotal
Shop and Bay Areas								
Running Repair Bays			---	20 x 60		3	3,000	Ratio is 1 position for every 18 Buses
Artic Running Repair Bays			---	20 x 75		6	8,250	Ratio is 1 position for every 10 Buses
PM/ Inspection Bays			---	20 x 60		2	2,400	Ratio is 1 position for every 18 Buses
Artic P/M Inspection Bays			---	20 x 75		1	1,500	Ratio is 1 position for every 10 Buses
Major Repair Bay			---	20 x 60		1	1,200	Ratio is 1 position for every 50 Buses
Tire Shop/ Storage			---	4		100	400	4 sf per bus
Electronics Shop			---				200	
Common Work Area			---				500	
Chassis Wash Bay			---	20 x 75		1	1,500	Ratio is 1 position for every 125 Buses
High Pressure Washer Equipment Alcove			---				150	
							19,100	Shop and Bay Areas Subtotal
Support Areas								
Tool Vending Area			---				100	5 x 20
Battery Room			---				150	
Portable Equipment Storage			---				500	
Tool Box Storage			---	4 x 6		18	432	
Lube/ Compressor Room			---				600	
Tot Mechanical Room			---				300	
Electrical Room			---				200	
							2,282	Support Shops Subtotal

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Metro Space Name	Existing Conditions Qty. Staff	Existing Conditions Qty. Space	Existing Conditions Area (SF)	Master Plan Program Space Standard	Master Plan Program Qty. Staff	Master Plan Program Qty. Space	Master Plan Program Area (SF)	Remarks
METRO TRANSIT SATELLITE FACILITY								
Parts Room								
Parts Office			---	10 x 12	1		120	Private Office
Parts Clerk Workstations			---	6 x 6	3		108	Workstations
Parts Counter			---				100	
Parts Storage Areas			---	7.5		128	960	7.5 sf per Bus Equivalent
Large/Bulk Parts Storage			---	20.0		128	2,560	20 sf per Bus Equivalent
Warranty Storage			---				300	
Shipping/Receiving/Dock Area			---				300	
Storage Mezzanine			---					
					4		4,448	Support Shops Subtotal
Subtotal							**28,480**	
Circulation Factor (includes Circ, MEP, Struct)				**20%**			**5,696**	
Total					**14**		**34,176**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Metro Space Name	Existing Conditions			Master Plan Program				Remarks
	Qty.		Area	Space	Qty.		Area	
	Staff	Space	(SF)	Standard	Staff	Space	(SF)	
METRO TRANSIT SATELLITE FACILITY								
METRO TRANSIT SERVICE FACILITY								
Service Facility								
Service Positions								
Fueling/Fare/Interior Clean Positions				20 x 75	12	2	3,000	Ratio is 1 position for every 75 Buses - 2 lane minimum
Tot Service Separation Area/Detail Clean Area				20 x 75		2	3,000	
					12		6,000	Fueling Lanes Subtotal
Service Support Areas								
Money Counting Room							350	
Vacuum Equipment Area							300	
Service Storage Room							150	
Service Supervisor Office					1		100	
Service Facility Restroom							80	
Lube/Compressor Room							450	
Mechanical Room(s)							250	
Electrical Room(s)							200	
Telecommunication Room(s)							100	
Advertising Storage							400	
Trash Bins							incl	
					1	4	2,380	Fueling Lanes Subtotal
Bus Washer								
Tot Vehicle Washers				20 x 95		1	1,900	Ratio is 1 position for every 125 Buses - two lane minimum
Vehicle Wash & Reclamation Equipment				15 x 85		1	1,275	
Electrical Room				15 x 10		1	150	
							3,325	Bus Washer Subtotal
Subtotal							**11,705**	
Circulation Factor (includes Circ, MEP, Struct)				**10%**			**1,171**	
Total					**13**		**12,876**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

METRO TRANSIT SATELLITE FACILITY

City of Madison Nakoosa Trail Facility Metro Space Name	Existing Conditions Qty. Staff	 Qty. Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Qty. Space	 Area (SF)	Remarks
METRO TRANSIT ENCLOSED HEATED AREAS								
Bus Parking/Storage/Circulation								
Standard 40-foot Buses				12 x 42		45	22,680	
Articulated 60-foot Buses				12 x 62		55	40,920	
Non-Revenue Fleet				10 x 20		5	1,000	
Maintenance Support Vehicles				10 x 20		2	400	
Subtotal							**65,000**	
Circulation Factor (includes Circ, MEP, Struct)				**125%**			**81,250**	
Total							**146,250**	
METRO TRANSIT EXTERIOR AREAS								
Exterior Areas								
Employee Parking				9 x 18		191	30,974	Parking = all employees x 80%
Visitor Parking				9 x 18		5	810	
Accessible Parking				13 x 18		2	468	
Patio							400	
							32,652	Exterior Areas Subtotal
Fuel Tank Farm								
Fuel Tank Farm				8 x 35		2	560	Two - 12000 gallon AST's
							560	Fuel Tank Farm Subtotal
Subtotal							**33,212**	
Circulation Factor (Includes Exterior Circ)				**100%**			**33,212**	
Total							**66,425**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility Biodigester Space Name	Existing Conditions			Master Plan Program				Remarks
	Qty.		Area	Space	Qty.		Area	
	Staff	Space	(SF)	Standard	Staff	Space	(SF)	
BIODIGESTER								
BIODIGESTER BUILDING AREAS								
Office Areas								
Biodigester Manager			---	14 x 16	1		224	Private Office
Biodigester Supervisor			---	10 x 12	1		120	Private Office
Administrative Assistant/Scale Operator			---	8 x 8	1		64	Workstation
Future Office Area			---	10 x 12		1	120	
							528	Office Areas Subtotal
Support Areas								
Lobby/Reception			---				240	
Copy/Supply Storage/Work Room			---				150	
Conference Room/Break Room			---				240	
Men's Restroom/Showers			---				250	
Women's Restroom/Showers			---				250	
IT/Network/Communications Room			---				120	
Electrical Room			---				200	
Custodial Storage			---				50	
							1,500	Office Areas Subtotal
Subtotal							**2,028**	
Circulation Factor (includes Circ, MEP, Struct)				**35%**			**710**	
Total							**2,738**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

BIODIGESTER

City of Madison Nakoosa Trail Facility Biodigester Space Name	Existing Conditions Qty. Staff	 Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Space	 Area (SF)	Remarks
BIODIGESTER BUILDING AREAS								
General Shop								
Shop Area			---				500	Adjacent to Storage
							500	General Shop Subtotal
Storage Area								
Biodigester Storage Space			---				1,000	
							1,000	Storage Area Subtotal
Biodigester Dry Digestion Process								
Processing Room							1,600	
Tipping Floor (Mixing Hall)			---			1	8,225	80 x 100
Fermenters			---	130 x 24		12	37,440	12 Fermenting Rooms, Includes Circulation
Pressure Storage Tank (PST)			---				2,150	
Odor Control			---				1,500	
Biogas Cleaning			---				2,250	
Generation and Heat Recovery			---				2,300	
Solids Curing Area			---				8,300	
Compost Refining			---				---	Off Site
Composting Area			---				---	Off Site
							63,765	Biodigester Dry Digestion Process Subtotal
Subtotal							**65,265**	
				5%			**3,263**	
Total							**68,528**	
Total All Biodigester Building Areas							**71,266**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

BIODIGESTER

City of Madison Nakoosa Trail Facility Biodigester Space Name	Existing Conditions Qty. Staff	 Qty. Space	 Area (SF)	Master Plan Program Space Standard	 Qty. Staff	 Qty. Space	 Area (SF)	Remarks
BIODIGESTER EXTERIOR AREAS								
Vehicle and Equipment Parking								
Semi-Truck Parking			---	12 x 75		2	1,800	
Service Truck			---	10 x 20		1	200	
Employee Parking			---	9 x 18		6	972	Located in Shared Parking Lot
Visitor Parking			---	9 x 18		2	324	Located in Shared Parking Lot
Disability Parking			---	13 x 18		1	234	Located in Shared Parking Lot
							3,530	Vehicle and Equipment Parking Subtotal
Other Exterior Areas								
Vehicle Scale			---				1,080	
Hazordist Mat Storage Building			---				250	
Site Waste/ Recycling Dumpsters			---				800	
							2,130	Other Exterior Areas Subtotal
Subtotal							**5,660**	
Circulation Factor (Includes Exterior Circ)				**100%**	**0**		**5,660**	
Total Biodigester Exterior Areas							**11,320**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

STATE FLEET OPERATIONS

City of Madison Nakoosa Trail Facility State Fleet Space Name	Existing Conditions Qty. Staff	Qty. Space	Area (SF)	Master Plan Program Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
STATE FLEET OPERATIONS AREAS								
Office, Support, & Customer Areas								
Shared Open Office Area			---	15 x 16	1		240	Located directly proximate to the transaction counter
Private Office			---	10 x 12	1		120	
Customer Transaction Counter				5 x 10		1	50	
Waiting Area/ Reception Area			---				200	
Small Break Room			---				180	
Employee's Restroom			---				80	
Customer's Restroom			---				80	
							950	Support Areas Subtotal
Bay and Shop Space								
Service Bay Area			---	16 x 35		2	1,120	
Common Work Area							400	
Wash Bay			---	16 x 35		1	560	200 SF will is not big enough for Car Wash Bay
Wash Equipment			---				200	200 SF will is not big enough for Car Wash Bay
							2,280	Shop Space Subtotal
Storage Areas								
Portable Equipment Storage							200	
Tools and Parts Storage			---				400	Secure, Adjacent to Bays
Van/ Seat Tire Storage			---				0	
Lube/Compressor Room							200	Enclosed for Sound Attenuation, Secure
							800	Storage Areas Subtotal
Subtotal							4,030	
Circulation Factor (includes Circ, MEP, Struct)				**35%**			**1,411**	
Total							**5,441**	

Exhibit 3.A - Nakoosa Trail Facility Space Needs Program

City of Madison Nakoosa Trail Facility State Fleet Space Name	Existing Conditions Qty. Staff	Existing Conditions Qty. Space	Existing Conditions Area (SF)	Master Plan Program Space Standard	Master Plan Program Qty. Staff	Master Plan Program Qty. Space	Master Plan Program Area (SF)	Remarks
STATE FLEET OPERATIONS								
STATE FLEET OPERATIONS ENCLOSED HEATED AREAS								
Interior Parking								
State Fleet Enclosed Heated Vehicle Storage			---	9 x 18		0	0	
Total								
							0	
Circulation Factor (includes Circ, MEP, Struct)				**125%**			**0**	
Total							**0**	
STATE FLEET OPERATIONS COVERED AREAS								
Covered Parking								
State Fleet Covered Vehicle Storage			---	9 x 18		0	0	
Subtotal							**0**	
Circulation Factor (includes Circ, MEP, Struct)				**10%**			**0**	
Total							**0**	
STATE FLEET OPERATIONS EXTERIOR AREAS								
Exterior Parking								
Uncovered State Fleet Parking			---	9 x 18		200	32,400	
Client/ Private Parking			---	9 x 18		60	9,720	
Employee Parking		30	---	9 x 18		6	972	
Visitor Parking		4	---	9 x 18		2	324	
Disability Parking		0	---	13 x 18		1	234	
Subtotal							**43,650**	
Circulation Factor (Includes Exterior Circ)				**100%**			**43,650**	
Total							**87,300**	

Section 4 – Concept /Schematic Design Narratives

Introduction

The purpose of Section Four – Schematic Design Narratives is to describe the systems that make up a building project.

- Architectural
- Stormwater
- Site Grading
- Structural
- Water
- Mechanical
- Plumbing
- Fire Suppression
- Sanitary
- Electric and Natural Gas
- Traffic

Nakoosa Trail Fleet Services Concept / Schematic Design

Architectural Design

Friday, January 16, 2015

Narrative

The site of the former Cub Foods store is located near the intersection of Nakoosa Trail and Commercial Avenue. There are two entrances to the site off of Nakoosa Trail and one entrance off of Commercial Avenue. The site generally drains from southeast to northwest with an elevation difference in the existing paved parking lot of approximately 9 feet. There is another elevation difference from the paved parking lot out to Nakoosa Trail of approximately 4 feet. There is generally a 4 to 5 foot landscaping berm area immediately south of the sidewalk between the two entrances along Nakoosa Trail. It is anticipated that the City will desire to preserve this feature. An existing grass hillside is located between the existing paved parking area and Commercial Avenue to the south. This grass hillside extends up to 450 feet in length with an elevation difference of approximately 49 feet. Options H1, H2, and I2 all have portions of the hillside being built into. Currently soil borings are not available for the hillside area. It is recommended that soil borings be obtained within the hillside area. This will allow for a more clear understanding of the soil structure of the hillside and determine if bedrock will be encountered. This understanding will allow for more informed concept design decisions along with determining cost impacts associated with those decisions.

Design Process / Concept

The Nakoosa Trail project is a facility intended to service and maintain a fleet of vehicles to support the City of Madison Fire and Fleet Services in addition to the Radio Communication Department. The project is designed to accommodate the existing and future growth needs of these departments. It consists of a maintenance, washing, administration / operations services, and minor fueling.

The site is within an existing industrial business park and has been appropriately rezoned to Industrial Limited. The main front door of the facility faces Commercial Avenue and is set back from the main street frontage with a retention basin and employee parking in between the building and the street. The service vehicle parking is within the back (non-public) portion of the site, screened by the Maintenance Building. The service vehicles circulate in a counterclockwise maneuver motion around the site which facilitates reduced movement for maintenance staff as they service the vehicles at the end of each day.

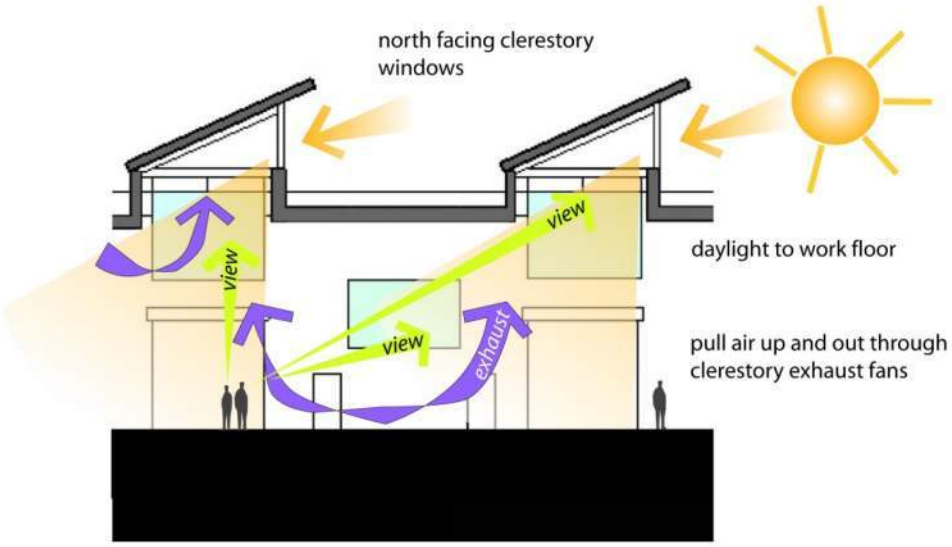
The overall design concept which informs the massing and character of the architecture stems from idealistic – prairie style architecture of the region. Simple and utilitarian in nature, this

imagery informs the massing and strategic use of color throughout the campus, by creatively arranging the architectural elements to form a composition that is specific to this project's function and site. This project is a contemporary version of an 'Industrial' manufacturing building with repetitive elements and high clerestory windows to capture daylight and views to the maintenance staff. Protective overhangs cantilever our from each maintenance bay door to protect the vehicles, staff and area preceding the door entries. The site and building layouts respond to the functional nature of the project while giving City of Madison Fleet Maintenance a new public image. Color is used strategically throughout the campus to emphasis specific functions and purposes such as entry.

The Administration / Operations portion of the building is two-story steel frame structure enclosed with insulated metal panels. The main front door of the building is the public entry which is directly across from the visitor, accessible and employee entrance parking lot. The main lobby is primarily insulated glass; this height projects out from the building to form a canopy covered entry way creating a second floor balcony. This was done to specifically emphasis the lobby as the main point of entry into the facility.

Fleet Services provides a necessary service to the community it serves, and strives to promote 'sustainability' not only as a byproduct of their service, but as a fundamental basis for this project, using the buildings as a Civic representation of their commitment to sustainability. All regularly occupied spaces will strive to receive natural light reducing the need for artificial light requirements through strategic placement of skylights or Solatubes. Each regularly occupied space will have operable windows and task lighting where appropriate. The office areas of each building will use natural ventilation techniques wherever possible to reduce electrical motor loads. The administration/operations and maintenance buildings together create an exterior, landscaped courtyard between them which is shared by all the users of the facility. The front landscaped area and connecting courtyard space stitch the two main buildings of the project together through the use of color, texture, and patterns in the hardscape.

The Maintenance building is a steel structure enclosed with insulated pre-cast panels. It is two service bays deep with openings on both ends giving the users the option of complete drive through capability. Operationally this building requires hard surfaces, easy to maintain and maneuver throughout; therefore floors will be sealed concrete with a light colored ad-mixture which will be light-reflective. Walls will be primarily masonry and ceilings primarily exposed. Ducts and conduits will be exposed and often surface mounted to walls or columns. Natural light is being brought into the maintenance bays through long linear clerestory lights above eveyother service bay and large picture windows on the east and west facades above the exterior overhead coiling doors and accented large colored glass at work areas.



The linear clerestories and Solatubes in combination will provide an even distribution of light throughout the bays, and not just at the back of the bays where work is being done, which should provide for an exceptional working environment and the reduction of operating costs. Natural light is being brought into the occupied mezzanine spaces by use of Solatubes.

Interior finishes will be appropriate for each specific function, durable and easy to maintain. The interior finishes relate to the exterior building materials, based on a neutral color palette and bold accent colors used at specific locations to add visual interest to the interior environment.

Some special consideration items are the use of passive ventilation techniques, and the use of photovoltaic panels. Covering the maintenance building and vehicular parking area to the east, photovoltaic panels may be considered to collect solar energy and offset our operational energy needs for the facility. This is also designed as an 'expression' of City of Madison's commitment to sustainability and to the surrounding community.

The cohesiveness of form and massing for the building lie in its use of durable materials, similar detailing, and a combination of massing which is appropriate to the environment while celebrating the richness of regional landscape forms and colors.

Phase IA

This is the initial phase of the project; fire maintenance staff will occupy the majority of the building. In addition to fire maintenance, parts storage and building support spaces will be built in the initial phase. Part of this determination regarding which departments would use the facility in the first phase is due to current needs of that department and a planned / phased expansion to allow for future growth in a manner that is least disruptive to the operations of the facility.

Phase IB

During Phase 1B, Fleet Services and Radio Communications departments will share the facility with Fire Maintenance. Fire Maintenance will shift into larger bays to the south and allow Fleet maintenance to use the Phase 1A bays. Light-Duty vehicle maintenance shop spaces will expand northward from parts storage. Radio Communications will expand to the south adjacent to the new maintenance bays which Fire maintenance will occupy.

The second floor of the Administration portion of the building will be expanded and built-out to accommodate staffing for the additional departments.

Building Materials and Technology

Fire and Life Safety

The Buildings will have appropriate systems such as automatic fire sprinklers and fire alarms throughout the facilities. They should be suited to the specific functional areas. All systems will comply with all Codes, Standards and Regulations within the design guidelines.

Backup generators will be considered in the next Phase. The final design and locations will be determined with the Owner.

Building Skin

The Exterior Cladding includes the Inside face of the wall to the Outside face of the wall.

A. Maintenance Areas
    - Insulated pre-cast panels, with Furring, Batt Insulation (Value R-13), Painted gyp. wall board

B. Administration / Operations Portion
    - Insulated metal panels on 6” metal studs with Batt Insulation (Value R-13) where required, Painted gyp. wall board
    - Low-E glazing or Translucent Polycarbonate windows at the linear clerestory windows and on the east/west facades where shown on the elevations.

Roof

Base building roof included in Conceptual Cost Estimate is Membrane roofing over rigid insulation (Value R-30).

A. Maintenance and Administration / Operations Building

- Membrane roofing over rigid insulation (Value R-30)
- Tubular Skylights

Fenestration

For all Buildings and options, tint and low e coating will reduce heat gain and glare for east, west and south exposures with a value of 0.25 shading coefficient.

HVAC Integration

HVAC equipment will be located on the interior of the building. HVAC delivery will be above the ceiling in the Administration/Operations Building. HVAC delivery will be exposed below the structure in the Maintenance Building.

Administration Interiors

The interior design will revolve the overall architectural design in materials, color and approach. The design will interpret operational needs of the client as established in programming, charettes and conceptual presentations. The materials will be sustainable where possible including but not limited to the following:

a. recycled content carpet and backing
b. low VOC paints, primers and adhesives
c. locally manufactured materials within 500 miles, when the industry allows
d. post-consumer recycled tile and counter tops
e. FSC certified wood products

The surfaces will optimize durability when possible. The office environments will be designed to enhance employee productivity with use of natural light, softer materials and multiple colors. All materials will be commercial or industrial grade and will be selected to reduce maintenance requirements where possible. The public spaces will have harder more durable surfaces.

Maintenance Interiors

Finishes in Maintenance Bays and adjacent functions are simpler due to nature of activities within these spaces. The floors in bays will be concrete with a white colored hardener to reflect natural light. The walls and ceilings in bays will be exposed primarily and natural light will be brought in through clerestories or skylights. The walls and ceilings will be light-colored for reflectivity and all floor coverings used must be durable and easily maintained.

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Phase 2 - Site Grading Memorandum Narrative

December 9, 2014

Phase 2 Scope

On October 17, 2014, Strand and RNL participated in a phone conference to discuss the shift in scope from that defined in the subconsultant agreement for Phase 2 services. Phase 1 ended with Strand providing a layout and narrative for a short-term site layout (Option H1) and a long-term site layout (Option H2). It was agreed that for Phase 2 services, Strand will update layouts and narrative for an immediate short-term Phase 1A layout for the Fire Maintenance Building (a portion of Option H1 referred to below as Phase 1A) and an intermediate short-term Phase 1B layout for the Fleet Services Building (full implementation of Option H1 referred to below as Phase 1B). No additional services will be completed for the long-term site layout (Option H2) .

In this regard, our Phase 1 layouts and narrative provided much of the site background and analysis to assist in the decision making process as the project moved into Phase 2. That information is updated or replaced with our Phase 2 deliverables, herein.

Narrative

The site of the former Cub Foods store is located near the intersection of Nakoosa Trail and Commercial Avenue. There are two entrances to the site off of Nakoosa Trail and one entrance off of Commercial Avenue. The site generally drains from southeast to northwest. The existing paved parking lot has an elevation difference of approximately 11 feet. There is another elevation difference from the paved parking lot out to Nakoosa Trail of approximately 4 feet. There is generally a 4 to 5 foot high landscaping berm area immediately south of the sidewalk between the two entrances along Nakoosa Trail. It is anticipated that the City will desire to maintain a berm in this location if possible. An existing grass hillside is located between the existing paved parking area and Commercial Avenue to the south. This grass hillside approximately 450 feet in length along Commercial Avenue with an elevation difference of approximately 49 feet from the existing parking lot up to Commercial Avenue. The Immediate Short-Term Phase 1A does not affect this hillside area. The Intermediate Short-Term Phase 1B builds into this area. Currently soil borings are not available for the grass hillside area. It is recommended that soil borings be obtained within the grass hillside area. This will allow for a more clear understanding of the soil structure of the hillside including to determine if bedrock will be encountered. This will allow for a better understanding of costs associated with the Phase 1B project. This information will be used in determining how the hillside will be excavated, which type of retaining wall will be best suited for the project, and what method of temporary shoring for the retaining wall should be used.

Immediate Short-Term Phase 1A

This option is limited to the new Fire Maintenance Building along with maintaining the old Cub Foods building. The new Fire Maintenance Building will be located on the western portion of the site. It will be located and designed to allow for the expansion of the Street Maintenance facility planned during Phase 1B. The conceptual site grading drawing for the Phase 1A layout is attached.

The Fire Maintenance Building will have two distinct areas requiring a different finish floor elevation. The finish floor elevation are based on the Phase 1B full build out for the Fleet Maintenance facility. It is anticipated that the majority of the utilities and grading will be completed in Phase 1A. Improvements will not be completed into the grass hillside to the south.

The future Fleet Maintenance building in Phase 1B is relatively close to the drive entrance off of Nakoosa Trail. The drive entrance elevation off of Nakoosa Trail immediately north of the Paint and Weld areas in the future Fleet Maintenance building is critical and is has a conceptual design grade of approximately 6 percent. If the finish floor elevation for this area is set to high, the grade will be too steep for vehicles to enter off of Nakoosa Trail. If the finish floor elevation is set to low, storm sewer piping and stormwater detention may be compromised. During final design this area will be optimized for the most advantageous elevations. This may require minor modifications to the facility or possible minor relocation of elements on the site.

The elevation of the Road Ranger gas station entrance is one of a number of critical components that determined the finish floor elevations of Fire Maintenance building. The existing entrance elevation into the Road Ranger gas station is generally fixed with some variation possible. Grading for the Phase 1A project will encroach into the Road Ranger gas station property. An agreement on access to this property for a construction easement will need to be negotiated with the property owner. During final design this area must be investigated in more detail to determine if the design can be optimized to reduce impacts to this adjacent property. The overall site grading for Phase 1A will conform generally to the site grading necessary for Phase 1B. The Phase 1A site grading limits will in general be contained to the existing paved areas. Grading to the south in the grass hillside will be very minimal.

It is anticipated that the stormwater detention basin and associated storm sewer piping in Phase 1A will be built to accommodate the full build out of the Street Maintenance facility in Phase 1B. Those portions of the storm sewer that would extend further to the south in Phase 1B will not be constructed.

The existing driveway off of Commercial Avenue must be rebuilt and will have a slope of approximately 7%. It is expected that curb and gutter will be utilized around the perimeter of the site and the main drive isle west of the Fire Maintenance Building. Gates will be located at the entrances to the site and will need to be coordinated with the site grades for functionality.

Intermediate Short-Term Phase 1B

This option is for the full build out of the Fleet Maintenance facility while maintaining the old Cub Foods building. Fleet Maintenance will be located on the western portion of the site and will extend south into the grass hillside. The conceptual site grading drawing for the Phase 1B layout is attached.

The Fleet Maintenance building is relatively close to the drive entrance off of Nakoosa Trail. The drive entrance elevation off of Nakoosa Trail immediately north of the Paint and Weld areas in the future Fleet Maintenance building is critical. If the finish floor elevation for this area is set to high, the grade will be too steep for vehicles to enter off of Nakoosa Trail. If the finish floor elevation is set to low, storm sewer piping and stormwater detention may be compromised. The elevation of the Road Ranger gas station entrance is one of a number of critical components that determined the finish floor elevations of Fire Maintenance building. The existing entrance elevation into the Road Ranger gas station is generally fixed with some variation possible. Grading will encroach into the Road Ranger gas station property. An agreement on access to this property for a construction easement will need to be negotiated with the property owner. During final design this area will be optimized for the most advantageous elevations. This may require minor modifications to the facility or possible minor relocation of elements on the site.

The Fleet Maintenance building is approximately 630 feet in length from north to south. There are a number of bay doors located consecutively along this length. Over this length the elevation difference in the site grade is approximately 14 feet. Because of this grade difference it will be necessary for the facility to have six distinct areas with various finish floor elevations. Because of the large elevation difference in the site from south to north, and the number of bay doors located over this length, site grading at these locations can be challenging. This may require minor modifications to the facility or possible relocation of minor elements on the site during the design process.

It is expected that a 1-2 percent slope will be provided for the paved area extending into the grass hillside to the south. At the southern limits of the site a retaining wall will extend for approximately 680 lineal feet around the site. The retaining wall will have a variable height with an anticipated maximum height of 29 feet. Permanent fencing will be required along almost the entire length of the retaining wall for fall protection. This fencing can be mounted on top of the wall, embedded in the wall, or embedded in the ground behind the wall. Many decorative fencing options are available. A drainage swale will be provided behind the retaining wall to properly drain stormwater runoff to a storm inlet. This storm inlet will connect into the storm sewer system below the retaining wall.

The southwesterly most portion of the Fleet Maintenance building is approximately 60 feet from Commercial Avenue with a 19 foot high retaining wall approximately 15 feet away from the back of curb on Commercial Avenue. During the design phase the appropriate distance between the retaining wall and Commercial Avenue must be investigated further to determine the most economical design. The amount of impact or disturbance to Commercial Avenue will be largely dependent on the final location of the Fleet Maintenance Building, the type of retaining wall selected and the distance of the retaining wall from Commercial Avenue.

Retaining wall options include a tied back modular block wall with geogrid, a gabion retaining wall, a large gravity block wall system and a cast-in-place wall with form liner (stained or unstained). During the design process, different retaining wall systems will be evaluated for constructability, economy, impact to Commercial Avenue, aesthetics, durability and other factors.

Temporary shoring will be needed to construct the retaining wall at the southwest and southeast corners of the project. The shoring at the southwest corner may require 40-50 feet deep cantilevered sheeting. The shoring at the southeast corner of the site will be required to protect the existing gravel parking area of the properties to the east. During the design process investigations should occur to determine if an agreement with the property owner to the east can be obtained to disturb this gravel parking area during construction. If the gravel parking area can be temporarily removed, shoring in this area would be limited.

Madison Gas and Electric has a 10 foot wide easement along the southerly 10 feet of the site. Existing gas, telephone, electric and overhead power utilities are located within this easement. The retaining wall and temporary shoring will encroach upon this easement. It is likely that all utilities in the southeast portion of the site will need to be temporarily relocated during the construction of the retaining wall. Existing trees in this area will also be affected. It should be planned that new trees will need to be planted. During conversations with the City of Madison, it was suggested that sidewalk should be considered along Commercial Avenue as part of this project.

Budgeting for Phase 1B site improvements must include costs for improvements related to the retaining wall that may include temporary utility relocations, temporary shoring, possible impacts to Commercial Avenue, and other items that may arise from information obtained from the future soil borings. Depending on the final design of the project and information from the soil borings, these costs could be significant.

Soil borings have not been obtained in the grass hillside to the south. This will be very important to obtain early in the design phase. Information obtained from the soil borings will be used in locating the building, type and height of the retaining wall to provide, type of temporary shoring required for the retaining wall, possible impacts on Commercial Avenue, and other items.

The existing driveway off of Commercial Avenue must be rebuilt and will have a slope of approximately 7%. It is expected that curb and gutter will be utilized around the perimeter of the site and the main drive isle west of the Fleet Maintenance facility. Fencing will be included around the site with gates located at the main entrances to the site. The gates will need to be coordinated with the site grades for functionality.

The City of Madison Fire Department must also be consulted so that fire lane access is maintained.

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Phase 2 - Electric and Natural Gas Service Memorandum Narrative

December 9, 2014

Phase 2 Scope

On October 17, 2014, Strand and RNL participated in a phone conference to discuss the shift in scope from that defined in the subconsultant agreement for Phase 2 services. Phase 1 ended with Strand providing a layout and narrative for a short-term site layout (Option H1) and a long-term site layout (Option H2). It was agreed that for Phase 2 services, Strand will update layouts and narrative for an immediate short-term Phase 1A layout for the Fire Maintenance Building (a portion of Option H1 referred to below as Phase 1A) and an intermediate short-term Phase 1B layout for the Fleet Services Building (full implementation of Option H1 referred to below as Phase 1B). No additional services will be completed for the long-term site layout (Option H2) .

In this regard, our Phase 1 layouts and narrative provided much of the site background and analysis to assist in the decision making process as the project moved into Phase 2. That information is updated or replaced with our Phase 2 deliverables, herein.

Narrative

A 60 PSI Natural gas service (Madison Gas and Electric, MG&E) is available to the proposed building from Nakoosa Trail. The proposed location for a new MG&E owned meter would be along the northeast wall of the Fire Maintenance building. MG&E will size and provide piping, a regulator, and a meter to this location from Nakoosa Trail. There would be a charge from MG&E for the new gas service. The meter and regulator should be protected from vehicle traffic by bollards, and the regulator vent should be routed to a point at least 3 feet above all nearby doors, air intakes, and operable windows. At the time of the future facility expansion, gas demand should be reevaluated based upon new loads and the meter and regulator changed if appropriate. There is typically no MG&E charge associated with changing of their meters and regulators.

Three-phase, 13.8kV overhead electrical service exists on the east and south sides of the site. Only single phase power is available along Nakoosa Trail. The existing electrical service to the Cub Foods building is fused at a power pole on the east side of the site. A radial feed is provided from the pole through an underground service to a 1000kVA transformer on the northeast side of the building. The underground service and transformer were replaced in the fall of 2013. The transformer provides 277/480V, three phase power to the building. 120/208V 3 phase electrical service to the Road Ranger site is provided through an underground service to a 75 kVA transformer located south of the building. A separate 25 kVA transformer at the southeast corner of Commercial Avenue and Nakoosa Trail provides power to an adjacent traffic controller.

The existing three-phase, 13.8 kV overhead electrical distribution along the east and south sides of the site will have sufficient capacity to supply both the immediate short-term Phase 1A and the intermediate short term Phase 1B. If accurate electrical information can be provided for the ultimate site build-out, the new electrical service for the immediate short-term Phase 1A-out can be sized to accommodate the ultimate site build-out. Designing the electrical service for the ultimate site build-out will eliminate the need to replace the service entrance switchboard when the facility is expanded which

will avoid a potential extended outage. The Utility Company will only size their transformer for the immediate short-term Phase 1A but the secondary conduits from the Utility Company transformer to the service entrance switchboard can be sized for the ultimate site build-out. This will eliminate cutting and patching of existing pavement and the potential for exposed conduits in the future. The Utility Company guidelines for the location of their transformer is that it be located within 50 feet of the building. Exceptions can be made to this guideline, however, the cost of the service from the Utility Company will increase based on the additional distance. Additional guidelines for transformer installations include keeping them 20 feet outwards and 10 feet either side of doorways; 10 feet outward and 10 feet either side of air intake openings or 25 feet diagonally from any air intake opening above the transformer; 10 feet outward and 3 feet either side of windows or other than air intake openings; and not less than 5 feet from any second story window or other than air intake opening.

The ideal location for the new service entrance switchboard would be adjacent to an exterior wall. Per the National Electrical Code (NEC) as amended by the Wisconsin State Electrical Code, the service entrance conductors must terminate at the service disconnect within 8 feet of entering the building. The service entrance conductors can be run below grade (not exposed) beneath the building slab if the service entrance switchboard is not adjacent to an exterior wall. However if a fault were to occur in any of these conduits thus rendering them un-useable, new conduits would need to be provided either below the existing floor slab or within the building space encased in concrete.

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Phase 2 - Sanitary Memorandum Narrative

December 9, 2014

Phase 2 Scope

On October 17, 2014, Strand and RNL participated in a phone conference to discuss the shift in scope from that defined in the subconsultant agreement for Phase 2 services. Phase 1 ended with Strand providing a layout and narrative for a short-term site layout (Option H1) and a long-term site layout (Option H2). It was agreed that for Phase 2 services, Strand will update layouts and narrative for an immediate short-term Phase 1A layout for the Fire Maintenance Building (a portion of Option H1 referred to below as Phase 1A) and an intermediate short-term Phase 1B layout for the Fleet Services Building (full implementation of Option H1 referred to below as Phase 1B). No additional services will be completed for the long-term site layout (Option H2) .

In this regard, our Phase 1 layouts and narrative provided much of the site background and analysis to assist in the decision making process as the project moved into Phase 2. That information is updated or replaced with our Phase 2 deliverables, herein.

Narrative

On August 4, 2014 Patrick Rank from Strand Associates, Inc. met with Mark Moder, an engineer in the sanitary sewer department of the City of Madison, and Jim Whitney along with Ken Anderson via teleconference. The meeting entailed review of sanitary sewer conditions for the Nakoosa Trail Fleet Services site located at the former Cub Foods store near the intersection of Nakoosa Trail and Commercial Avenue. Two general site concepts were preferred at that time. Each concept included a new facility for the City's Radio, Fleet, and Fire Department Maintenance staff and services. The site utility plan for Phase 1A and Phase 1B is attached.

Sanitary sewer service is only available from Nakoosa Trail. The City has a 48 inch reinforced concrete pipe sanitary sewer along Nakoosa Trail. There is an existing 10 foot wide sanitary sewer easement located immediately east and south of the former Cub Foods. Within this easement is an 8 inch sanitary sewer main constructed in 1986. There is also an existing 15 foot wide sanitary sewer easement with an 8 inch sanitary sewer main located along the easterly portion of the BP gas station extending southerly for approximately 200 feet.

After reviewing the different scenarios being considered for the site at that time, the group agreed that the existing 8 inch sanitary sewer would be sufficient to service this development. The existing 8 inch sanitary sewer varies in depth from approximately 9 to 12 feet deep. It may be necessary to lower the existing sanitary sewer main to avoid a possible conflict with the new storm sewer. During detailed design all utility crossings must be verified for conflicts. Mark indicated that there are currently no operational concerns with the City's sanitary sewer facility, nor any upgrades currently planned.

Mark Moder was provided with the conceptual design drawings of Phase 1A and Phase 1B for review on December 3, 2014. The existing 8 inch sanitary sewer along the easterly portion of the BP gas station will be reconstructed, likely at a 0.40 percent grade. This will allow for sufficient clearance from the new storm sewers that service the stormwater detention basin. The new 8 inch sanitary sewer will be sufficient to service the Fleet Services Building in both Phase 1A and Phase 1B.

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Phase 2 - Stormwater Technical Memorandum Narrative

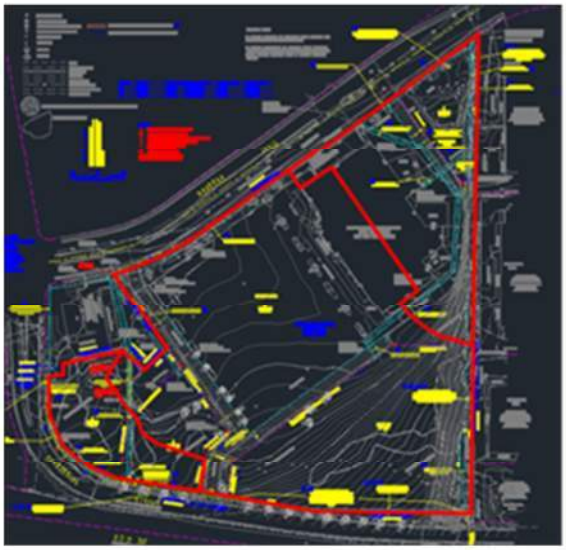
December 9, 2014

Phase 2 Scope

On October 17, 2014, Strand and RNL participated in a phone conference to discuss the shift in scope from that defined in the subconsultant agreement for Phase 2 services. Phase 1 ended with Strand providing a layout and narrative for a short-term site layout (Option H1) and a long-term site layout (Option H2). It was agreed that for Phase 2 services, Strand will update layouts and narrative for an immediate short-term Phase 1A layout for the Fire Maintenance Building (a portion of Option H1 referred to below as Phase 1A) and an intermediate short-term Phase 1B layout for the Fleet Services Building (full implementation of Option H1 referred to below as Phase 1B). No additional services will be completed for the long-term site layout (Option H2) .

In this regard, our Phase 1 layouts and narrative provide much of the site background and analysis to assist in the decision making process as the project moves into Phase 2. That information is updated or replaced with our Phase 2 deliverables, herein.

Existing Drainage Patterns



Existing Conditions Drainage Patterns

There are generally three drainage basins on the existing site. The area northwest of the Commercial Avenue site entrance drains northwesterly through the existing vegetated area. The area between the Commercial Avenue site entrance and the center of the existing Cub Foods building drains northwesterly toward Nakoosa Trail prior to being picked up by the on-site storm sewer system that connects to the public storm sewer in Nakoosa Trail. At the west Nakoosa Trail site entrance, a 27 inch diameter reinforced concrete pipe (RCP) storm sewer exits the site and connects to a storm sewer in the public right of way. The area northeast of the center of the existing Cub Foods building drains northeast through the existing parking lot prior to discharge onto Nakoosa Trail without entering an on-site storm sewer system. While there is a depressional area in the northeast corner of the site, it doesn't appear that this area is being used for detention. Rather, it is simply a forested low area. The trees in the low area appear to mostly be cottonwood trees. It does not appear that the low area is drained by storm sewer, nor does is appear that there is nearby storm sewer in Nakoosa Trail whereby a new storm sewer could be connected to the public storm sewer system.

It appears that the existing site is not served by any water quality or quantity features. It is our understanding through discussions with Greg Fries, that there is significant flooding on Commercial

Avenue northwest of the site at the railroad crossing. In that regard, detention provided on the site will have positive impacts in that area.

Proposed Conditions Drainage Patterns

Proposed Conditions Drainage Patterns for Phase 1A and Phase 1B are generally the same because the immediate short-term Phase 1A layout has to fit into the intermediate short-term Phase 1B layout. See the attached Phase 1A and the Phase 1B figures showing the schematic grading and storm sewer layouts. These two figures also show the assumed drainage basins used for storm sewer sizing. It is recommended that as this project moves out of the master plan phase and into the preliminary design phase, that these drainage basins be updated with Cub Foods roof drainage plans (previously requested but not received) and roof drainage plans for the proposed City of Madison facilities since this may affect the storm sewer sizing/layout.

The table below shows the breakout of impervious area, pervious area, and added impervious area that have a bearing on stormwater regulations that must be met.

Option	Impervious Area On Western Portion of Site (sf)	Pervious Area On Western Portion Of Site (sf)	Total Area On Western Portion of Site (sf)	Total Area On Western Portion of Site (acres)	Added Impervious Area (sf)
Existing Conditions: *Entire Site*	338,000	331,082	669,082	15.36	N/A
Existing Conditions: *Western Portion of Site*	220,974	277,479	498,453	11.44	N/A
Phase 1A	220,974	277,479	498,453	11.44	N/A
Phase 1B	327,160	171,293	498,453	11.44	106,186

Stormwater Requirements

As shown in the attached table, both DNR NR 151 and City of Madison Chapter 37-The Public Stormwater System Including Erosion Control are applicable to the Nakoosa Trail site. The City of Madison requirements are more restrictive and will therefore be used for purposes of planning for stormwater features for the site.

Strand has corresponded with the City on multiple occasions (November 23, 2013, July 3, 2014, July 28, 2014, July 28, 2014, August 14, 2014, and October 15, 2014) to confirm stormwater requirements for the site. The feedback that we received from the City has been incorporated into the attached table.

For purposes of preliminary sizing of stormwater features serving the two options, Strand performed HydroCAD and WinSLAMM modeling for Phase 1B to confirm preliminary compliance with the stormwater quantity and quality stormwater requirements. It should be noted that during preliminary design of this project, prorated stormwater requirements should be developed that account for the portions of the site defined as redevelopment and development. Preliminarily, it appears that the prorated stormwater quality requirement would be approximately a 75 percent TSS reduction (rather than 80 percent). These prorated stormwater requirements should be agreed upon with the City and may allow for the downsizing of the wet detention basin. For purposes of the Phase 1B Schematic design, we have sized the wet detention basin to meet the development stormwater requirements for stormwater quantity and quality. For infiltration, we have assumed that 2 percent of the added impervious area on the site be dedicated to infiltration. Detailed infiltration calculations should be completed during detailed design. The table below shows the results of modeling efforts.

	Stormwater Quantity			**Stormwater Quality**	**Infiltration**	**Oil and Grease Control**
Option	**Existing Conditions Flow Rate 1-yr/2-yr/10-yr (cfs)**	**Proposed Conditions Flow Rate to Pond 1-yr/2-yr/10-yr (cfs)**	**Meets Development Stormwater Quantity Standard**	**TSS Reduction From Pond**	**2% of Added Impervious Area Dedicated to Infiltration (sf)**	**Treat the first 0.5 inch of runoff**
Phase 1B	1.03/2.60/10.87	1.00/2.62/4.14	Yes	80.1%	Phase 1A: *None* Phase 1B: *2,124 sf*	Utilize inlet filters.

Storm Sewer Sizing

The attached figures for each of the two options show the storm sewer size necessary to convey the 10-year, 24-hour duration design storm using TP-40 rainfall depths and Type II rainfall distribution. Modeling was performed in StormCAD. Relay of the existing 27-IN RCP storm sewer (as a new 12-IN RCP storm sewer) and the existing 8-IN sanitary sewer serving the site are required to accomplish the grades shown on the figures. The modeled 2-year water surface elevation in the wet detention basin is used as a boundary condition/starting water surface elevation for the 10-year storm sewer design in StormCAD. These sizes do not account for water that would be diverted to an underground infiltration gallery to the east of the proposed City building. In doing so, the storm sewer sizes are conservative.

The Fleet Maintenance Building footprint from the Phase 1 concept has increased in size including extending further north and south on the site. Because of this, the storm sewer has had to be laid extremely flat (0.1%) to provide adequate cover over the pipe at critical locations along the north side of the proposed building. In addition, minor adjustments of headloss coefficients at storm structures had to be made in order to keep the hydraulic grade line (HGL) below the ground surface for the 10-year, 24-hour duration design storm at a critical location northeast of the northeast corner of the proposed City building. Headloss coefficients ranging from 0.5 to 0.8 were used. It should be noted that challenges in storm sewer sizing/layout have been precipitated by the desire to have the wet detention basin in the southwest corner of the site (rather than a stormwater feature along Nakoosa Trail). In doing so, the storm sewer has to “fight grade” to reach the proposed wet detention basin. We recommend that the storm sewer sizing be optimized during detailed design accounting for the following.

- *Cub Foods Roof Drainage*-It is recommended that the existing roof drainage plan be acquired to determine the portion of the roof draining to the existing storm sewer at the northwest corner of the existing building. At this time, about 42 percent of the existing Cub Foods roof is assumed to drain to the existing storm sewer at the northwest corner of the existing building. In turn, this area and flows are accounted for in our storm sewer calculations. These flows will reach the proposed wet detention basin prior to discharge to the existing storm sewer in Nakoosa Trail. In this way, this portion of the Cub Foods roof will also be served by proposed Phase 1A and 1B stormwater facilities for the long-term (Phase 2) build-out of the site.
- *Proposed Fleet Services Building Roof Drainage Plans*-It is recommended that the proposed roof drainage plan be completed and necessary revisions to the drainage basins be made. In doing so, all roof drainage not required for infiltration should be directed to the west side of the proposed building to reduce flows to the storm sewer that serves the northerly half of the proposed building.
- *Infiltration*-It is recommended that an agreement with the City be reached on whether or not the effect of infiltration needs to be accounted for in the storm sewer sizing.

Looking east at Southwest Detention Basin site.

Wet Detention Basin

Preliminary sizing of the *southwest wet detention basin* serving Phase 1B was completed. Only a portion of the wet detention basin technically needs to be constructed to serve Phase 1A construction. However, please see the discussion in the Construction Phasing of Stormwater Features section below for a discussion on our recommendation to construct the entire wet detention basin during Phase 1A. Details of this basin include the following:

- Permanent Water Surface Elevation =852.00
- Permanent Water Surface Area = 9,530 square feet
- 2-Year Water Surface Elevation =855.26
- 10-Year Water Surface Elevation = 856.69
- 100-Year Water Surface Elevation = 858.60
- Emergency Spillway Elevation = 860.00
- Top of Berm Elevation = 861.00
- Bottom of Basin Elevation = 847.00
- Bottom of Clay Liner Elevation = 845.00
- Side Slopes: 4H:1V on north side, 3H:1V other sides
- Safety Shelf: 10 foot width
- Side Slopes Below Permanent Water Surface: 2H:1V
- Outlet Structure:
    - 3.5” orifice at elev. 852.00
    - 2 ft width sharp crested weir at elev. 854.95
    - 12” RCP downstream to Nakoosa Trail

Looking southwest at Southwest Detention Basin site.

Due to the presence of granular soils in the vicinity of the basin, we have assumed that a 2-foot thick clay liner is necessary for the basin to hold water and perform its stormwater treatment function. The clay liner will also guard against migration of flows

toward areas of known contamination northeasterly from the basin. Excess excavated material from the basin construction will need to be hauled off-site. Given the contamination in the vicinity of this basin, specifications should be written regarding material handling and any special disposal requirements. It is recommended that geotechnical and environmental borings be obtained including a report with recommendations concerning the material on-site.

Infiltration Best Management Practice (BMP)

Example underground infiltration gallery (Contech-ChamberMaxx).

The Phase I deliverable identified a surface infiltration basin serving roof areas as a potential BMP to meet the infiltration requirements for the proposed development on the project site. A meeting with the City of Madison on October 5, 2014, confirmed that infiltration will be required on the site but that there is a preference to locate the infiltration BMP to the east of the proposed Fleet Services Building in underground infiltration galleries. The Phase 2 deliverable shows the potential size of this underground infiltration gallery to meet the infiltration requirement for Phase 1B assuming that 2 percent of the added impervious area (2,124 sf) is dedicated to infiltration. Preliminary calculations were completed to see how this compares to the requirement to have post-development infiltration volume at least 90 percent of pre-development infiltration volume. Preliminary calculations show that approximately 2.4 acres of rooftop would need to be drained to this size infiltration area with a native infiltration rate of 11 inches per hour to meet this requirement. Preliminary calculations also show that if the entire proposed roof top area of 1.8 acres was drained to an infiltration facility and all of the water was infiltrated, it would fall short of meeting the requirement (78.5%). In this regard, it appears that the 2 percent cap on project site area dedicated to infiltration will control. It appears that draining the entire roof area (1.8 acres) to the 2,124 underground infiltration area would infiltrate 69.4% of the pre-development infiltration volume using an 11 inches per hour infiltration rate. It will be important to obtain geotechnical data during detailed design to determine the in-situ infiltration rate of the soil underlying the proposed infiltration area to better model the infiltration area performance.

Environmental and Geotechnical Issues

Based on discussions within this narrative and below, the following geotechnical and environmental borings are recommended during detailed design. Following the table is a discussion relative to environmental issues on the project site.

Feature	Geotechnical Borings	Environmental Borings/Temporary Wells	Reasoning
Wet Detention Basin	6	4	Need for clay liner, excess material disposal requirements, dewatering requirements.
Infiltration Basin/Gallery	4 east of building and 2 southwest of employee parking,	2 southwest of employee parking	Infiltration rates at both potential locations of infiltration BMPs.

	including double ring infiltrometer test at elevation of proposed infiltration layer		Environmental borings near southwest infiltration BMP location.
Building Foundation and Site Grading	4	2	Soil Bearing Capacity, Groundwater Elevations and Rock Elevations. Environmental borings toward north 1/2 of building.
Retaining Wall	4	0	Design Parameters for Retaining Wall

July 23, 2013 Phase II Environmental Assessment, TRC Review-The TRC Site investigation report dated July 23, 2013 was reviewed. The following summary is based on the results of soil and groundwater sampling completed at borings GP-1/TW-1, G-2/TW-2, and GP-5/TW-5 near the proposed detention basin at southwest corner of the Nakoosa Trail site. We have the following observations and recommendations.

- *Groundwater Contamination*-The depth to groundwater at temporary wells TW-1 and TW-5, nearest to the proposed basin, was reported as ranging from approximately 11 to 13 feet. Petroleum-related groundwater contamination was detected at TW-1 and TW-5. This contamination appears to be related to the former Li'l Bear Gas Station. Petroleum contamination detected at these wells exceeded the NR 140 Enforcement Standards (ESs). Chlorinated solvent groundwater contamination was detected at TW-2, just east of the active gasoline station. The concentrations of solvents in the groundwater were low (below ESs) and the source of the contamination is unknown.

  The extent of the existing petroleum groundwater plume likely extends to the proposed location of the detention basin. Dewatering water that is generated during construction of the basin may be impacted, potentially requiring pumping to sanitary sewer or on-site treatment. Dewatering would also potentially influence the adjacent contaminant plume and would have some potential to draw the contaminant plume toward the dewatering operation. After construction of the basin, there would be some ongoing, long term potential for infiltration of contaminated groundwater into the basin. Inclusion of some type of groundwater barrier, such as a clay liner, should be part of the basin design.

  The solvent-related groundwater contamination does not appear to be a concern. The solvent concentrations in the groundwater were low and the detections were isolated to only TW-2. No potential source for the solvent contamination has been reported.

- *Soil Contamination*-No contamination was detected in the shallow, unsaturated soils that are above the water table. There is no indication that contaminated soil at depths above the water

table would be encountered during excavation of the basin. Soil excavated from below the water table, because it is likely in contact with contaminated groundwater, may have some level of petroleum contamination. Based on the results from soil samples collected below the water table at borings GP-1 and GP-5, the level of petroleum contamination is likely below NR 720 Industrial and Non-Industrial Residual Contaminant Levels (RCLs). If this is the case, no special handling or management of the excavated soil would be required.

- *Recommended Environmental Borings/Temporary Wells/Sampling*-Additional sampling at 4 additional soil borings/temporary wells is recommended at the wet detention basin site. On two borings, wells should be placed near the north end of the proposed wet detention basin to determine if soil or groundwater contamination from the existing gasoline station has impacted that area. One boring along the east side of the basin and one boring in the central area of the basin should be considered to confirm the soil and groundwater quality in those areas. The additional data will be useful for planning the appropriate management of contaminated soil and groundwater and will assist with the preparation of construction bidding documents.

Opinion of Probable Construction Cost

The attached table includes an opinion of probable construction cost (OPCC) for the stormwater features necessary for the site for Phase 1B. This cost can be adjusted for the stormwater features planned to be constructed for Phase 1A.

Construction Phasing of Stormwater Features

The attached Phase 1A Stormwater Features figure shows the stormwater features recommended for construction for the Phase 1A layout. The entire wet detention basin is recommended for construction during Phase 1A because of the economies of scale that will be realized by constructing it at one time. As well, the wet detention basin will need a clay liner that will be less susceptible to leaking/failure if it is constructed at one time. As can be seen on the Phase 1A Stormwater Features figure, storm sewer serving the Phase 1A layout and infiltration required to serve Phase 1B (construct in Phase 1A because it is in the constructed portion of Phase 1A) are recommended for construction. All remaining stormwater features would be constructed during Phase 1B.

LEED Opportunities

For this project, there appear to be the following credit opportunities in the various LEED 2009 categories directly related to stormwater management. As this project proceeds into detailed design, we recommend that the potential for attaining LEED credits though implementation of various strategies defined below enter into the decision-making process.

Category	Opportunities
Sustainable Sites • Credit 1: Site Selection • Credit 2: Development Density and Community Connectivity	• Project site appears to meet these requirements. • Project appears to meet the community connectivity requirements.

• Credit 3: Brownfield Redevelopment	• Requirement to development on a site documented to have existing contamination on site appears to be met.
• Credit 5.1: Site Development-Protect or Restore Habitat	• Opportunities include ***restoring a native prairie habitat*** around the proposed wet detention basin as part of restoration as well as ***native prairie habitat restoration*** along the undeveloped portions of the hillside on the southeast side of the project.
• Credit 5.2: Site Development-Maximize Open Space	• Calculations could be completed to determine if these requirements are met.
• Credit 6.1: Stormwater Design-Quantity Control	• Since the existing site has greater than 50 percent imperviousness, a 25 percent decrease in the volume of stormwater runoff from the 2-year, 24-hour design storm would need to be accomplished. During detailed design, this calculation could be completed to check the performance of the required infiltration on the site. If the required infiltration doesn't meet this requirement, the infiltration BMP could be upsized or additional infiltration BMPs could be constructed (ie: ***porous pavement*** for the employee parking area).
• Credit 6.2: Stormwater Design-Quality Control	• Because stormwater quality modeling indicates that the west wet detention basin achieves approximately an 80 percent TSS reduction, the design promotes infiltration, and reduction of impervious cover, it is likely that this requirement is achieved.
• Credit 7.1: Heat Island Effect-Nonroof	• While it appears that these requirements might not be able to be met in their entirety, there are several technologies/strategies that could be employed on a portion of the site (and could be part of the discussion during detailed design) including: ***shading*** of site hardscape, use ***hardscape materials*** with a solar reflectance index (SRI) of at least 29 (ie: concrete), ***porous pavement***.
• Credit 7.2: Heat Island Effect-Roof	• To meet this requirement, an architectural/structural decision would need to be made on the roofing material: ***roofing materials*** with appropriate SRI covering 75 percent of the roof area or ***vegetated roof*** covering 50 percent of the roof area, or combination thereof.
Water Efficiency	
• Credit 1: Water Efficient Landscaping	• This requirement involves reduction of potable water usage for landscape irrigation purposes in one of two options: (1) 50% Reduction or (2) Not Potable Water Use. Strategies to employ include use of ***native or other***

	adapted plants to reduce or eliminate irrigation need or ***cistern to capture rainwater for irrigation*** usage.
• Credit 2: Innovative Wastewater Technologies	• This requirement involves reducing wastewater generation and potable water demand. Strategies to employ from a site standpoint include a ***cistern*** to collect rainwater for building usage.
Materials and Resources • Credit 5: Regional Materials	• This requirement involves use of building materials that have been extracted, harvested or recovered, as well as manufactured within 500 miles of the project site for a portion of the required project materials. Strategies to employ include ***locally sourcing materials*** such as ***concrete, asphalt, pipe, stormwater system structure castings, porous pavement, and underground infiltration gallery units.***

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Stormwater Requirements Table

December 9, 2014

Agency	Development Type	Stormwater Quantity	Stormwater Quality	Infiltration	Oil and Grease Control	Storm Sewer
DNR NR 151	Redevelopment	Exempt per NR 151.12 (5) (b) 2. And NR 151.123 (2)	40% TSS Reduction (40 percent of load from parking areas and roads per NR 151.122	-Exempt per NR 151.12 (5) (c) 6. c. -Excluded per NR 151.12 (5) (c) Infiltration 5. Exclusions h. Areas where contaminants of concern, as defined in s. NR 720.03 (2), are present in the soil through which infiltration will occur	Yes, for fueling and maintenance areas	N/A
City of Madison Chapter 37	Redevelopment	Not Applicable	80 percent TSS Reduction compared to existing conditions prior to the proposed redevelopment BUT, no greater than 60 percent TSS reduction compared to no controls for new parking	Not Applicable	Treat the first 0.5 inch of runoff	N/A
City of Madison Chapter 37	Development (applicable to increase of impervious area over 20,000 sf)	**Maintain predevelopment peak runoff rates for the 1-year, 2-year, and 10-year, 24-hour storm event while safely passing the 100-year storm event**	80 percent TSS Reduction compared to no controls	**Requirement:** Infiltrate sufficient volume so that post-development infiltration volume is at least 90% of pre-development infiltration volume, based on average annual rainfall. If unable to achieve without dedicating more than 2% of site to infiltration, then may elect to achieve through Secondary Recharge Standard that requires no greater than 2% of site dedicated to infiltration. *Email requesting determination on need to meet infiltration requirements sent to Greg Fries at City on July 3, 2014. Concern is existing groundwater contamination in the southwestern third of the site. Per email from Greg on August 14, 2014, the City will require and allow infiltration on the site as long as it is outside of the general area of the contamination in the vicinity of soil borings GP-1/TW-1 and GP-5/TW-5. As further discussed with Greg and Bryn Bemis on October 15, 2014, the City will require infiltration on the site. Greg's preference is to have the infiltration occur in underground galleries to the east of the proposed City Fleet Services Building. The infiltration galleries would accept only "clean" roof water. Bryn said that, if need be, infiltration could occur to the south and southwest of the proposed employee parking area/location of known contamination because the contaminant levels aren't really that high.*	Treat the first 0.5 inch of runoff *Per Greg Fries email on 10/20/14, for this project, the City prefers use of inlet filters with oil booms. The City's preferred filter is: Flo-Gard or CatchAll.*	10-Year, 24-Hour Design Storm Capacity Per Greg Fries on October 15, 2014, if any storm sewer serving a short-term alternative needs to be removed as part of a long-term alternative, then the pipe installed in the short-term should be a pipe material less-expensive than reinforced concrete pipe (RCP).

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Stormwater Requirements and Narrative for Phase 1A and Phase 1B

December 9, 2014

Phase	Development Type	Stormwater Quantity	Stormwater Quality	Infiltration	Oil and Grease Control	Storm Sewer
Phase 1A *Regulatory Requirements*	**Redevelopment**	**Redevelopment:** Not Applicable	**Redevelopment:** 80 percent TSS Reduction compared to existing conditions prior to the proposed redevelopment BUT, no greater than 60 percent TSS reduction compared to no controls for new parking.	**Redevelopment:** Not Applicable	**Redevelopment and Development:** Treat the first 0.5 inch of runoff	**10-Year, 24-Hour Design Storm Capacity**
Phase 1A *Proposed Stormwater Improvements*	**Western Portion of the Site Drainage Area (11.44 acres):** *No increase in impervious area.*	**Stormwater Quantity Not Required for Phase 1A. However, wet pond is required to achieve TSS reduction per the Stormwater Quality requirements. It is recommended that the entire wet pond be built during Phase 1A to achieve economy of scale and because of leaking concerns of a clay liner built in two phases.**	**WinSLAMM modeling will show that the wet detention basin will achieve an 80.1% TSS reduction compared to no controls.** The WinSLAMM commercial standard landuse file was used and applied to the 11.44 acre drainage area.	**Infiltration Not Required for Phase 1A. However, the proposed infiltration for Phase 1B is located underneath pavement that will be constructed during Phase 1A. Therefore, it is recommended that all infiltration BMPs be constructed during Phase 1A.**	**Install Inlet Filters on all storm sewer inlets.**	**A 10-year, 24 hour storm system has been layed out to convey flows to the wet detention basin**
Phase 1B *Regulatory Requirements*	**Redevelopment** and **Development** *(applicable to increase of impervious area over 20,000 sf)*	**Redevelopment:** Not Applicable **Development:** Maintain predevelopment peak runoff rates for the 1-year, 2-year, and 10-year, 24-hour storm event while safely passing the 100-year storm event	**Redevelopment:** 80 percent TSS Reduction compared to existing conditions prior to the proposed redevelopment BUT, no greater than 60 percent TSS reduction compared to no controls for new parking. **Development:** 80 percent TSS Reduction compared to no controls	**Redevelopment:** Not Applicable **Development:** Per email from Greg on August 14, 2014, the City will require and allow infiltration on the site as long as it is outside of the general area of the contamination in the vicinity of soil borings GP-1/TW-1 and GP-5/TW-5. **Requirement:** Infiltrate sufficient volume so that post-development infiltration volume is at least 90% of pre-development infiltration volume, based on average annual rainfall. If unable to achieve without dedicating more than 2% of site to infiltration, then may elect to achieve through Secondary Recharge Standard that requires no greater than 2% of site dedicated to infiltration.	**Redevelopment and Development:** Treat the first 0.5 inch of runoff	**10-Year, 24-Hour Design Storm Capacity**
Phase 1B *Proposed Stormwater Improvements*	**Western Portion of the Site Drainage Area (11.44 acres):** *Impervious Area Increase of 106,186 sf.*	**Northeast Quadrant:** N/A **Southwast Quadrant:** HydroCAD modeling shows the wet detention basin reduces proposed 1-, 2-, and 10-year 24 hour flows to or less than predevelopment flow rates as shown in the project narrative.	**WinSLAMM modeling will show that the wet detention basin will achieve an 80.1% TSS reduction compared to no controls.** The WinSLAMM commercial standard landuse file was used and applied to the 11.44 acre drainage area.	**As requested by the City of Madison, the infiltration BMP has been identified as an underground infiltration gallery on the east side of the Fleet Services Building. We have assumed that 2% of the added impervious area be dedicated to infiltration. Added impervious area is 106,186 sf in Phase 1B, so 2% of this area is 2,124 sf. It is proposed to divert a portion of the Fleet Services Building roof drainage to the infiltration area which would bypass the proposed storm sewer system. Soil borings and double ring infiltrometer tests are required to confirm the appropriateness of the proposed location for infiltration.**	**Install Inlet Filters on all storm sewer inlets.**	**A 10-year, 24 hour storm system has been layed out to convey flows to the wet detention basin.**

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Phase 2 - Traffic Memorandum Narrative

December 9, 2014

Attendees:

Scott Langer – City of Madison Traffic Engineering

Jim Whitney – City of Madison

Ron Janowski – City of Madison Fleet Maintenance

Ken Anderson – RNL (via phone)

Jin Soo Park – RNL (via phone)

Jeff Held – Strand Associates

Narrative

In August, 2014 representatives from the City of Madison, RNL, and Strand Associates met to review traffic issues related to the Nakoosa Trail Fleet Services site located at the former Cub Foods store near the intersection of Commercial Avenue and Nakoosa Trail on Madison's east side. Two general site concepts are being advanced at this time. This includes the Immediate Short-Term Phase 1A which has the Fire Maintenance Building, and the Intermediate Short-Term Phase 1B which includes the Fleet Services Building.

The existing transportation infrastructure is robust. There is a full access traffic signal provided at US 51/Stoughton Road and Commercial Avenue and a four-lane Commercial Avenue typical section including medians at access points. All-way stop control was recently installed at the Commercial Avenue and Nakoosa Trail intersection. There is good intersection spacing and a well-developed street grid providing multiple routes for site ingress/egress. All of the streets near the site include on-street bike accommodations. There are some gaps in the sidewalk provided near the site.

The group agreed that it is unlikely that any of the scenarios being considered will result in higher traffic volumes or intensity than that generated by Cub foods when it was operational. Furthermore, City of Madison staff indicated that there really are no operational concerns in the area at this time. This suggests that significant modifications to the nearby transportation system are not needed. Sidewalk should be considered along Commercial Avenue as part of this project.

Traffic Impacts Summary

1. The City does not foresee an overall motor vehicle access or capacity issue due to Phase 1A, 1B, or subsequent future phases as currently envisioned.
2. During subsequent future phases if a Metro Transit facility is added, the study team should evaluate 'peak period' traffic patterns at the proposed southwest access to/from Commercial Avenue. There could be private employee vehicles and Metro bus vehicles accessing that driveway at the same time during shift changes.
3. The BP gas station in the southeast quadrant of the Commercial Avenue and Nakoosa Road intersection enjoys a perpetual, non-exclusive easement granting it cross access to Nakoosa Trail to the north and Commercial Avenue to the south via the existing westernmost parking lot drive

isle of the former Cub Foods parking lot. If modifications to this access easement are desired, the City will need to coordinate this with the BP gas station owner. City staff suggested that it may be prudent to maintain the ability to revert this area back to public use in the future if the City chooses to redevelop a portion of the southwest corner of the site, south of the gas station in the future. (It should be note that the current conceptual design drawings have plans for a stormwater detention basin and employee parking lot in that area.)

4. Access to the BP gas station off of Nakoosa Trail should remain public.
5. Complaints regarding additional vehicle traffic are not anticipated as a result of Phase 1A or Phase 1B.
6. Peak traffic through the existing traffic signal at US 51 (Stoughton Road) and Commercial Avenue is approximately 1,000 vehicles, or 10,000-12,000 vehicles daily. Additional traffic generated by Phase 1A or Phase 1B is not anticipated to significantly impact operations through this intersection or along Nakoosa Trail or Commercial Avenue.
7. The team should investigate adding a sidewalk along Commercial Ave. Currently sidewalks are missing, but there is/will be some pedestrian traffic.
8. During design Metro Transit should be contacted to determine if there are plans to add or relocate any bus stops on Nakoosa Trail or Commercial Avenue near the site.
9. The City anticipates allowing access of fleet vehicles to either Nakoosa Trail or Commercial Avenue. Using both streets reduces the additional traffic on both of them.

Nakoosa Trail Fleet Services Nakoosa Trail Fleet Services Conceptual/Schematic Design

Phase 2 - Water Memorandum Narrative

December 9, 2014

Phase 2 Scope

On October 17, 2014, Strand and RNL participated in a phone conference to discuss the shift in scope from that defined in the subconsultant agreement for Phase 2 services. Phase 1 ended with Strand providing a layout and narrative for a short-term site layout (Option H1) and a long-term site layout (Option H2). It was agreed that for Phase 2 services, Strand will update layouts and narrative for an immediate short-term Phase 1A layout for the Fire Maintenance Building (a portion of Option H1 referred to below as Phase 1A) and an intermediate short-term Phase 1B layout for the Fleet Services Building (full implementation of Option H1 referred to below as Phase 1B). No additional services will be completed for the long-term site layout (Option H2) .

In this regard, our Phase 1 layouts and narrative provided much of the site background and analysis to assist in the decision making process as the project moved into Phase 2. That information is updated or replaced with our Phase 2 deliverables, herein.

Narrative

On August 1, 2014 and also December 5, 2014, Patrick Rank from Strand Associates, Inc. spoke with Dennis Cawley, a design engineer with the Madison Water Utility. Dennis was sent the conceptual design drawings to review for both Phase 1A and Phase 1B on December 3, 2014. The site utility plan for Phase 1A and Phase 1B is attached. The following are the observations and findings from the review and interactions with the City Water Utility.

Currently a 10 inch water main installed in 1972 encircles the property along Nakoosa Trail and Commercial Avenue. There are 3-8 inch water services that extend into the property from Nakoosa Trail. At least one of the services was used by the old Cub Foods store. A sufficient number of fire hydrants within the right-of-way are placed along Nakoosa Trail and Commercial Avenue. Dennis indicated there are no operational concerns with the water main in the area.

We spoke about the details of the conceptual design for both phases. An 8 inch water service will be extended into the project to service the future buildings. Water main will also be provided with associated fire hydrants around the site for fire protection. The fire hydrants must be located as directed by the Fire Department. The current requirements indicate that fire hydrants must be placed so that all portions of the exterior walls of a newly constructed public building shall be within 500 feet of at least two fire hydrants. This water main service will be connected at the existing 8 inch water service located in Nakoosa Trail near the driveway entrance to the west.

After reviewing the different scenarios being considered for the site, Dennis agreed that the water utility had no concern with the future development in regards to the Water Utility's ability to provide capacity, pressure, or fire flow. If an additional water service is needed because of site conditions, the Water Utility would have no issue with that. During the design of the facility, appropriate water mains, valves, and fire hydrants will need to be located on the property. The Water Utility has no plans to upgrade the water facility in this area.

Nakoosa Trail Fleet Services Conceptual / Schematic Design

Fire Suppression Systems

Monday, December 22, 2014

Narrative

Building fire suppression system shall be designed to comply with the National Fire Protection Association (NFPA 13) standards.

A new wet pipe sprinkler system will serve the new maintenance facility. The entire building will be protected by a wet pipe sprinkler system. A double check detector back flow prevention device will be provided at the fire riser. A fire department connection (FDC) will extend to the front of the building where the fire department will have easy access to it. An electric alarm bell will be located in same area as the FDC.

The fire protection contractor shall be responsible for sprinkler system pipe sizing and design, head layout, and provide a confirmation flow test which will form the basis of the hydraulic design. The building will be a mix of light hazard and ordinary hazard occupancies.

Sprinkler Design:

Offices / Break Rooms / Toilet Rooms / Data Processing areas and similar areas.

Occupancy Classification: Light Hazard

Storage Areas/Mechanical Rooms/ Tool Rooms/ Automobile Parking Garages and similar areas.

Occupancy Classification: Ordinary Hazard/Group 1

Repair Garages/ Machine Shops/ Metal Working areas.

Occupancy Classification: Ordinary Hazard/Group 2

Combustible Hydraulic Fluids use areas.

Occupancy Classification: Extra Hazard/Group 1

Nakoosa Trail Fleet Services Conceptual / Schematic Design

Mechanical Systems

Monday, December 22, 2014

Narrative

Following is a conceptual narrative encompassing all mechanical systems and approaches assumed for the new facility. The narrative is based on the current design approach and previous experience from similar types of projects completed by both Mead & Hunt and by RNL.

A. HVAC System Overview

1. The mechanical systems for the Nakoosa Trail Public Works Facility will be designed to meet the US Green Building Council's LEED Silver rating. Mechanical systems will include high efficiency boilers, radiant floor heating, variable speed motors, make-up air units, destratification fans, and natural ventilation. Variable volume air handling units will provide zone control air conditioning for office areas. Make-up air units and louvered openings will provide supply ventilation for maintenance bays. General, purge, and source capture systems will provide exhaust ventilation for maintenance bays. Mechanical systems will be controlled and monitored through a DDC based Building Automation System.

B. Base Design Criteria

1. Applicable Codes

a. The Mechanical Systems will be designed in accordance with the following Codes:
   1) Wisconsin Administrative Code including the following:
      a) COMM 63 - Energy Conservation
      b) COMM 64 - Heating, Ventilating and Air Conditioning

2. Applicable Guidelines and Standards

a. The Mechanical Systems will be designed in accordance with appropriate portions of the following Guidelines and Standards:
   1) National Fire Protection Association (NFPA) guidelines and standards including the following:
      a) NFPA 54 - National Fuel Gas Code.
      b) NFPA 72 - National Fire Alarm Code.
      c) NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems, 2009 Edition.
   2) Occupational Safety and Health Administration (OSHA)
   3) ASHRAE Standard 62 Ventilation for Acceptable Indoor Air Quality, 2010 Edition. Project is pursuing LEED-NC Silver Certification.
   4) ASHRAE Standard 90.1 Energy Standard for Buildings except Low-Rise Residential Buildings, 2010 edition. Project is pursuing LEED-NC Silver Certification.
   5) ASHRAE Standard 55 Thermal Environmental Conditions for Human Occupancy 2010 Edition. Project is pursuing LEED-NC Silver Certification.

3. Outdoor Design Conditions

a. Summer

1) Dry-Bulb Temperature = 87°F per COMM 63.1023
2) Wet-Bulb Temperature = 75°F per COMM 63.1023

b. Winter
1) Dry-Bulb Temperature = -15°F per COMM 63.1023

4. Indoor Design Conditions

a. Offices, Break Rm. Training Rm.
1) Dry-Bulb Temperature
a) Summer = 75°F ± 3°F
b) Winter = 70°F ± 3°F
2) Relative Humidity
a) Summer = 50% maximum ± 5%
b) Winter = No control

b. Telecommunication Rooms
1) Dry-Bulb Temperature = 72°F ± 2°F (year round)
2) Relative Humidity = Mechanical humidification not planned

c. Mechanical Rooms
1) Dry-Bulb Temperature
a) Summer = No Cooling
b) Winter = 60°F Minimum
2) Relative Humidity = No requirement

d. Vehicle Storage and Repair Areas
1) Dry-Bulb Temperature = 65 - 85°F
2) Relative Humidity = Ambient

a. Occupancy
1) The occupancy heat rejection will be based on 2013 ASHRAE Handbook of Fundamentals, Chapter 18 for Walking/Standing:
a) Sensible = 250 Btuh/person
b) Latent (walking/standing) = 250 Btuh/person Meeting
c) Latent = 200 Btuh/person Office (moderately active office work)
2) The number of occupants in each space will be based on the actual occupant density listed in the facility program.
3) Occupancy Density
a) Diversity = 90% occupancy
b) Occupancy Schedule
i. The mechanical systems will be designed to operate 24 hrs/day, 7 days/week. Pending Owner's direction. The unoccupied/occupied setpoints will be based on occupancy sensors and a time delay.

b. Building Envelope
1) Performance criteria for building envelope construction materials will at a minimum be in accordance with ASHRAE 90.1.

5. Ventilation Rates

a. The minimum ventilation (outdoor air) rates will be as follows:

1) Offices, Conference and Administrative Support Area.

a) Based on ASHRAE 62 Standard *130% for LEED-v3.0 IEQp1 and IEQc2 achievement.

2) Vehicle Storage and Repair Areas.

a) Based on WI Comm 64 (IMC 2009): Required Outdoor Air Ventilation.

b) Based on IMC 502.16: Mechanical Ventilation for CNG Repair garages.

c) 100% exhaust.

6. Pressure Relationships

a. Pressure relationships will be maintained by offsets between supply and exhaust airflow rates. Relative pressures to adjacent spaces will be as follows:

Space Area	Relationship to Adjacent
Office	Positive
Break Room	Neutral
Toilets, Janitor Closets, Lockers	Negative
Vehicle Storage/Repair	Negative

C. Systems Descriptions

1. Heating Hot Water System

a. System Description

1) The heating system will be sized to serve the Phase 1 project and proposed future additions.
2) Heating hot water system will serve heating coils and terminal heating devices such as unit heaters, cabinet unit heaters, radiant floor manifolds, etc.
3) Radiant floor heating: First floor offices with exterior exposure and all vehicle repair and storage areas will be provided with an underfloor radiant heating system.
4) Heating hot water system will consist of two high efficiency condensing hot water boilers, boiler pumps, two heating distribution pumps, and distribution piping system.
5) Hot water will be distributed at supply temperature of 160 °F. OA temperature reset will allow supply temperature down to 100°F.
6) Heating hot water system will be variable volume system utilizing a modulating 2-way control valve at each terminal heating device. Distribution pumps will each be provided with VFD.
7) A differential pressure transmitter between the supply and return mains will be utilized to vary the speed of the pumps, via variable frequency drives, to maintain a constant pressure differential between the piping mains.
8) Boilers will be located on the mezzanine and will have direct intake and exhaust connections to outdoors.

b. Design Criteria

1) General
   a) Heating and reheat water piping will be sized as follows:
      i. Maximum pressure drop of 4 ft of water/100 ft of piping for piping 6" and smaller.
      ii. Coils will be sized for water temperature drop of approximately 20°F.

c. Distribution

1) Heating and reheat water will be distributed through Type L copper piping with soldered joints or steel piping with welded joints.
2) Unions will be provided at terminal heating devices in copper piping.
3) Piping will be insulated with rigid glass fiber insulation with insulation jacket.
4) Underfloor radiant tubing will be 5/8” PEX with an oxygen diffusion barrier.
5) Reserve Capacity and Redundancy
   a) Two boilers will each be sized to provide 65% of the final design heating

load.

b) Two pumps will each be sized for 100% of the final design load. Two pumps will operate in parallel.

d. Equipment and Material

1) Hot water boiler(s) will be high efficiency condensing type with natural gas burner(s).
2) Distribution pumps will be end suction centrifugal type with VFDs.
3) The heating hot water system will also include the following components:
   a) Chemical pot feeder
   b) Air separator
   c) Bladder type expansion tank
   d) Glycol fill tank and pump
   e) Piping specialties.

2. Air handling Units (Office Areas)

1) A packaged indoor air handling unit will serve the office spaces and be located on the mezzanine level.
2) System will be variable volume with demand control ventilation control based on CO2 levels.
3) An outdoor air condensing unit will be utilized with direct expansion cooling coils in the air handling unit to provide mechanical cooling for the building.
4) Heat Pump Alternative: As an alternative the AHU unit will have an integral refrigerant system with refrigerant coils, compressor and reversing valve to allow heat pump operation.
5) Ductwork will be constructed in accordance with SMACNA Standards for appropriate pressure class. Ductwork will be sealed to meet SMACNA Seal Class A as a minimum and to limit ductwork leakage not exceeding 1% of the design flow rate for high pressure ductwork and 2% for low pressure ductwork.

a. Design Criteria

1) Air Handling Unit Component Sizing
   a) Maximum allowable nominal face velocities or pressure drop are as follows:

Cooling Coils:	500 fpm
Heating Coils	600 fpm
Pre-filters and Final-filters:	500 fpm

2) Duct System Distribution Criteria
   a) Supply Ductwork Sizing (based on diversified CFM)
      i. From Air Handling Unit to Air terminal (AT) Device Maximum pressure drop of 0.10"/100 ft.
      ii. Duct size to AT device = AT inlet size up to 10 ft from AT.
      iii. Air Terminal Device to Supply Diffuser Maximum pressure drop of 0.08"/100 ft
   b) Exhaust Ductwork Sizing
      i. Maximum pressure drop of 0.1"/100 ft.
3) Reserve Capacity

a) Air handling system will be sized with 10% reserve capacity.

b. Equipment and Material
   1) The air handling unit will be of galvanized steel double wall construction. The units will consist of the following components:
      a) Outside Air Intake Damper
      b) (Merv 7) Efficient Prefilters (as rated on ASHRAE Standard 52.1)
      c) (Merv 13) Efficient Final Filters (as rated on ASHRAE Standard 52.1)
      d) Cooling Coils
      e) Heating Coils
      f) Supply Fan with VFD
      g) Smoke Detector at Return Air Ductwork
   2) Supply fans will be double width double inlet centrifugal type with airfoil blades. Fan speed and air volume will be modulated through variable frequency drives (VFDs) controlled by supply duct static pressure controller.
   3) Return/ Exhaust fan will be an inline centrifugal fan. Fan speed and air volume will be modulated through VFDs controlled by building static pressure controller.
   4) The supply air terminals (ATs) will have internal liner with closed cell insulation. ATs will be provided with system pressure independent DDC controllers with 24 volt electric actuators.

c. Distribution
   1) Medium pressure galvanized steel ductwork will distribute supply air from the air handling unit to the supply air terminal devices.
   2) Low pressure galvanized steel ductwork will be utilized downstream of supply terminal devices to distribute supply air to the spaces.
      a) Supply air ductwork will be externally insulated with fiberglass insulation.
      b) Ductwork lining will be provided upstream and downstream of the air handling unit and downstream of the supply air terminals for sound attenuation.

3. Geothermal Water System Alternative (Office AHU)

a. System Description
   1) Geothermal water system will serve the alternative AHU/ Heat Pump.
   2) Geothermal water system will consist of a vertical well field, distribution manifold, fill tank w/pump, air separator, expansion tank, distribution pumps, and distribution piping.
   3) A differential pressure transmitter between the supply and return mains will be utilized to control the speed of the pumps, via variable frequency drives, to maintain a constant pressure differential between the piping mains.

b. Design Criteria
   1) General
      a) Geothermal water piping will be sized as follows:
         i. Maximum pressure drop of 4 ft of water/100 ft of piping for piping 6" and smaller.

c. Distribution
   1) Geothermal water inside the building will be distributed through Type L copper

piping with soldered joints or steel piping with welded joints. Geothermal water outside the building will be distributed through HDPE piping with fused joints.

2) Unions will be provided at terminal heating devices in copper piping.
3) Interior piping will be insulated with rigid glass fiber insulation with insulation jacket.
4) Reserve Capacity and Redundancy
    a) Geothermal field will be sized to provide 125% of the design heating/cooling load.
    b) Two parallel pumps will each be sized for 100% of the design load.

d. Equipment and Material
1) Distribution pumps will be end suction centrifugal type with VFDs.
2) The geothermal water system will also include the following components:
    c) Chemical pot feeder
    d) Air separator
    e) Bladder type expansion tank
    f) Glycol fill tank and pump
    g) Piping specialties.

4. Make-up Air Units (Vehicle Repair and Storage areas)

1) Packaged indoor gas fired Make-up Air units will serve the vehicle repair and storage areas. The MAU's will be located on mezzanine levels.
2) System will be constant volume with ventilation control based on CONO2 levels and minimum daily run times.
3) Ductwork will be constructed in accordance with SMACNA Standards for appropriate pressure class. Ductwork will be sealed to meet SMACNA Seal Class A as a minimum and to limit ductwork leakage not exceeding 1% of the design flow rate for high pressure ductwork and 2% for low pressure ductwork.

d. Equipment and Material
1) The MUA unit will be of galvanized steel. The units will consist of the following components:
    h) Outside Air Intake Damper
    i) (Merv 7) Efficient Prefilters (as rated on ASHRAE Standard 52.1)
    j) Indirect gas fired heating assembly
    k) Supply Fan

5. Toilet Exhaust Systems

a. System Description
1) The system will service toilet rooms, janitor's closets, locker rooms, etc.
2) The exhaust fans will be interlocked with occupancy sensors with a time delay.

b. Design Criteria
1) Duct Distribution Criteria
    a) Exhaust ductwork sizing:
        i. Maximum pressure drop of 0.10"/100 ft of ductwork.
        ii. Maximum velocity of 1500 fpm.
2) Reserve Capacity and Redundant Systems

a) There will be no redundancy.
b) During power outages the toilet exhaust fan will be off.

c. Equipment and Materials
1) The exhaust system will consist of the following components:
a) In-line exhaust fans.
b) Motorized backdraft damper at fan inlet.
c) Ductwork will be galvanized steel.

6. Vehicle Storage and Repair Areas

a. System Description
1) General Exhaust Systems
a) The general exhaust fans will be interlocked with gas fired make-up air units.
b) The general exhaust fans will be controlled by CO and NO2 gas detectors.
2) General Exhaust Systems
a) The purge exhaust will be controlled by methane (CH4) sensors and by manual operation.

b. Design Criteria
3) Duct Distribution Criteria
c) Exhaust ductwork sizing:
i. Maximum pressure drop of 0.10"/100 ft of ductwork.
ii. Maximum velocity of 1500 fpm.
4) Reserve Capacity and Redundant Systems
a) A purge exhaust system will provide 100% redundant ventilation to help flush the building during periods of heavy use.
b) Source capture exhaust systems will used for welding and vehicle repair operations.

c. Equipment and Materials
    1) The exhaust systems will consist of the following components:
        a) Inline exhaust fans.
        b) Motorized backdraft damper at fan inlet.
        c) Ductwork will be galvanized steel
d. Destratification fans
    1) Variable speed industrial ceiling fans (20’ diameter) will be provided to maintain air movement and reduce stratification.

7. Building Automation System

a. System Description
    1) Mechanical systems will be controlled and monitored through a DDC based Building Automation System (BAS) with distributed processing at the local level.
b. Design Criteria
    1) DDC controllers will utilize distributed architecture and will not rely on "front-end" or higher level controller to perform required control sequence.
    2) Each DDC controller will have a minimum of 10% spare points of each type (DI, DO, AI and AO) at each panel. For universal joints, the spares will be divided evenly between the analog and digital types of points.
    3) All DDC system primary LAN controllers, PC's and communications equipment that monitors life safety and critical points (fire alarm, CNG alarms, etc.).
        a) System will monitor temperature, pressure, status, alarms, runtime, positions, occupancy, etc. as required to provide owner operators adequate feedback to diagnose system operation.

Nakoosa Trail Fleet Services Conceptual / Schematic Design

Plumbing Systems

Monday, December 22, 2014

Narrative

Following is a conceptual narrative encompassing all plumbing systems and approaches assumed for the new facility. The narrative is based on the current design approach and previous experience from similar types of projects completed by both Mead & Hunt and by RNL. This narrative includes domestic water, as well as storm and sanitary plumbing systems. In addition, the team has included initial design narratives for compressed air and maintenance fluids assumed to be required in the final design.

A. Plumbing Systems Overview

1. The plumbing systems considered for the Nakoosa Trail Public Works Facility building will include Sanitary, Storm, Vent, Domestic and Non-potable water systems. Maintenance Bays to include vehicle wash/recycle, compressed air for shop use and vehicle lubrication systems. Low flow plumbing fixtures will be used throughout the building and will meet ADA requirements.

B. Base Design Criteria

1. The following applicable Codes, Standards and Guidelines are intended to be used to determine acceptable design criteria, standard of performance, workmanship, etc. Based on industry best practice and Owner's experience, system design criteria that exceed the minimum standards will be applied as appropriate.
2. Applicable Codes
   a. The plumbing systems will be designed in compliance with the following Codes required by law (as adopted by the Authorities Having Jurisdiction) for minimum design criteria:
      1) Wisconsin State Plumbing Code
      2) City of Madison and Dane County Code of Ordinances
      3) Applicable National Fire Protection Association (NFPA) guidelines and standards including but not limited to the following:

C. System Descriptions

1. Sanitary Waste and Vent

a. System Description
   1) A sanitary waste and vent system will be provided for all plumbing fixtures and equipment that require drainage. Plumbing fixtures and devices will be drained by gravity through conventional soil waste stacks, building drains and building sewers that will connect to the municipal sewer.
   2) All fixtures will be trapped and vented to the atmosphere.

b. Design Criteria
   1) The sanitary drainage system will be pitched to maintain flow at a minimum velocity of 2 fps when flowing half full. Below floor piping will be pitched at ¼" per foot for piping 2" and smaller and 1/8" for piping 3" and larger. Above grade will be pitched at 1/8" per foot.

c. Equipment and Material
    1) Maintenance bays will be run through drench drains and catch basins to intercept sand, oil and debris before connecting to the sanitary sewer system.

d. Distribution
    1) Below ground sanitary waste and vent piping will be type PVC-DWV schedule 40 with solvent cement joints and or no-hub cast iron pipe.
    2) Above ground sanitary waste and vent piping will be hub-less cast-iron pipe with heavy duty stainless steel couplings, galvanized steel pipe with threaded cast-iron drainage fittings and threaded malleable iron vent fittings, or type PVC-DWV schedule 40 solid pipe with solvent cement fittings. Areas with plenum ceilings all piping will be cast-iron pipe with heavy duty stainless steel couplings, and or galvanized steel pipe with threaded cast-iron drainage fittings meeting IMC requirements.

2. Storm and Clearwater Waste

a. System Description
    1) A storm drainage system will be provided to convey rainwater from the roof of the building and discharge to the municipal storm system. A secondary drainage will discharge to grade through a down spout nozzle.

b. Design Criteria
    1) The storm drainage system will be sized based on a maximum rainfall rate as determined by the Wisconsin Plumbing Code.

c. Distribution
    1) Above and below ground storm piping will be type PVC-solid wall schedule 40 pipe with solvent cement joints or no hub cast iron.
    2) Areas with plenum ceilings all piping will be cast-iron pipe with heavy duty stainless steel couplings, and or galvanized steel pipe with threaded cast-iron drainage fittings meeting IMC requirements.
    3) Roof drain bodies and portions of above ground storm and Clearwater waste piping will be insulated.

3. Water Service

a. System Description
    1) Water will be supplied to the building via one water services from the municipal water system which will serve both the domestic water system and fire protection system.

b. Design Criteria
    1) The water service will be designed to provide water to the building’s fixtures and equipment at a minimum pressure of 45 psig. Maximum pressure will not exceed 80 psig and flow velocity will not exceed 8 fps.

c. Equipment and Material
    1) Water meters will be provided in accordance with City water utility company.

d. Distribution
    1) The water service main to the building will be ductile iron with mechanical joints.

4. Domestic Water

a. System Description
   1) Domestic water will be provided to all plumbing fixtures and any other devices and fixtures that require a domestic water supply. Hot water will be generated at 140°F to help prevent legionella disease and then tempered down to 120°F through a master mixing valve for distribution.

b. Design Criteria
   1) The piping will be sized to limit the velocity to a maximum of 8 fps for cold water and 6 fps for hot water.
   2) The water heater will be sized for 100% of the design hot water load.

c. Equipment and Material
   1) Domestic hot water will be produced by a gas fired high efficient condensing type water heater
   2) The hot water system temperature will be maintained by recirculating the hot water through a continuous loop with an in-line circulating pump.
   3) Water hammer arrestors will be provided at all solenoid valves and at other potential water hammer sources and will be located in accessible spaces.

d. Distribution
   1) The domestic hot and cold water systems will be Type L copper tube with wrought copper fittings and soldered joints. Solder will be lead-free, 95-5 type solder.
   2) The water system piping will be insulated with rigid fiberglass insulation with a vapor barrier.
   3) Isolation valves will be provided at all branch piping run-outs to fixture groups, and at fixtures requiring maintenance.

5. Non-Potable Water Systems

a. System Description
   1) A non-potable water system will be provided to the wash bay for vehicle under carriage washing and to hose bibs and other devices that require separation from the domestic water system.
   2) A wash bay water recycle system will be considered to recover wash water waste from vehicle wash down.

b. Design Criteria
   1) The piping will be sized to limit the velocity to a maximum of 8 fps. A reduced pressure backflow preventer will protect the domestic water supply and will be sized for 100% of the design load.

c. Equipment and Material
   1) Water hammer arrestors will be provided at all solenoid valves and at other potential water hammer sources and will be located in accessible spaces.

d. Distribution
   1) The non-potable water system will be Type L copper tube with wrought copper fittings and soldered joints. Solder will be lead-free, 95-5 type solder.
   2) The non-potable water system will be insulated the same as the domestic water system.
   3) Isolation valves will be provided at all run-outs to fixtures.

6. Compressed Air System

a. System Description

1) The compressed air system will provide compressed air to the vehicle maintenance bays and workshops. The compressed air will be for tire maintenance and tools in work shop areas.

b. Design Criteria

1) The compressed air will be distributed at 120psi adjustable and the distribution system will be designed to limit the pressure drop.

c. Equipment and Material

1) Compressed air will be produced by a duplex tank mounted compressor system. Each pump in the system will be sized for 100% of the load.

d. Distribution

1) Compressed air piping will be schedule 40 steel pipe with malleable iron fittings.

7. Lube Oil Systems

e. System Description

1) Oil and grease distribution systems will be provided for vehicle lubrication throughout the maintenance bays.

f. Equipment and Material

1) Oils will be distributed to hose reels by high pressure oil pumps connected to oil drums.

g. Distribution

1) Oil piping will be schedule 40 steel pipe with malleable iron fittings.

8. Fixtures & Equipment

Water Heater:	Gas fired, high efficiency, tank type (domestic use)
Floor drains:	Heavy duty cast iron in nonpublic area, and standard duty public areas.
Trench drains:	Formed in place with heavy duty cast iron grate H-20 load rating
Catch Basins:	Precast, heavy duty cast iron grates Hs-20 load rating
Wall Hydrants:	Freeze-proof, chrome wall plate
Water Closets:	Wall hung, 1.28 gpf, with Automatic battery powered flushometers.
Urinals:	Wall hung, 0.5 gpf, with Automatic battery powered flushometers.
Lavatories:	Wall hung or integral with counter, with manual single lever faucet
Sinks:	Stainless Steel break room sink with gooseneck ADA faucet.
Showers:	ADA compliant with low flow heads.
Water heater:	Under cartridge high pressure (Hotsy) water heater with 2 wash wands.
Hose reels:	compressed air, and oil.
Air Compressor:	120psi adjustable for shop use.
Hand sinks:	Stainless Steel ½ round Bradley or equal hand wash sinks for shop areas.
Emergency Shower / eyewash:	Bradley or equal emergence shower/eyewash will be installed throughout the shop and work bays as required by code and OSHA requirements.

Nakoosa Trail Fleet Services Conceptual / Schematic Design

Structural Systems

Monday, December 22, 2014

Narrative

Following is a conceptual narrative encompassing structural systems and approaches assumed for the new facility. The narrative is based on the current design approach and previous experience from similar types of projects completed by both Mead & Hunt and by RNL.

Applicable Building Codes and Design Criteria

1. Wisconsin Building Code – (currently IBC 2009 Building Code.) We anticipate state adoption of IBC 2012 in the year 2015.
2. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.
3. International Fire Code.
4. It is anticipated the building will have two different occupancy categories according to the IBC 2012; with one being Business Group B and the other being Moderate Hazard Storage, Group S-1.
5. According to 406.8.6, an automated sprinkler system is required for motor vehicle repair garages.
6. According to IBC 2012, Table 508.4, fire separation between these occupancies is not required. It is anticipated the type of construction will be Type II, Non-Combustible.
7. It is anticipated the building will be classified as ASCE Occupancy Category II.
8. Ground Snow Load for the City of Madison is 30 psf.
9. Seismic Site Class D, Sds=0.090g, Sd1=0.073g, SDC=B.
10. Basic Wind Speed =115 mph, (Three second gust at 33 ft above ground in Exposure C.
11. A geotechnical investigation will be required to determine the load bearing capacity of the underlying soils.

This building will be constructed in two phases, with phase 1A being six fire apparatus repair bays, maintenance shops, parts/storage, offices, and a mezzanine level. Phase 1B will add light duty maintenance bays, six more large truck bays, and radio comm. shops.

The building will be constructed of precast concrete walls with structural steel and steel joist roof framing. The high bay roof height will be approximately 30’-0” above grade. The roof will be generally flat with ¼” per ft. slope to interior roof drains. The building will feature several sawtooth, daylighting clerestories. The clerestories will be framed with structural steel or light gauge steel construction. Some interior columns and steel girders will likely be required depending on the layout of the building. If a bridge crane is desired, the crane runway will consist of structural steel girders supported by columns and bracing.

The office area will feature insulated metal panel siding and large area of glazing. The mezzanine level will consist of concrete slab on composite metal deck supported by structural steel framing.

The floor of the maintenance garage areas will consist of reinforced concrete slab-on-grade supported by a course of crushed limestone. The garage area floors will be sealed with an oil resistant, non-slip, coating. The ground floor of the office area will also be concrete slab-on-grade.

A geotechnical investigation with borings to a depth of at least 50 feet will be required to determine the bearing capacity of the underlying soils. If the upper soils have adequate strength, conventional concrete footings will be designed to support the building. If the upper soils do not have adequate strength, then soil improvements or deep foundations will be designed to support the building.

The maintenance garage areas will likely include the following features. The structural components of the building will be designed to incorporate these features as required.

1. Hydraulic vehicle lifts.
2. Overhead bridge cranes.
3. Miscellaneous equipment hoists.
4. Vehicle scales.
5. Overhead hose reels and lubricating equipment.
6. High lift overhead garage doors with clear openings of 12 ft wide x 14 ft high.
7. Some or all of the bays will be drive through with OH doors on each end.
8. Large equipment storage area.
9. Small equipment and parts storage areas. This space may be provided by a mezzanine.
10. Storage racks.
11. Trench drains and catch basins cast into the floor that will drain to an oil/water separator.
12. Automatic sprinkler system.
13. Clerestory daylighting.
14. Large ceiling fans.

Section 5 – Conceptual Equipment List

Equipment List

The purpose of the Maintenance Equipment List is to identify types and quantities of maintenance equipment recommended for facility operations and to provide the Design Team with relevant coordination data.

Recommendations are based on existing equipment and potential equipment acquisitions. Maintenance equipment described in this list represents the needs of each functional area of the facility based on discussions with stakeholders. The Equipment List does not include furniture and fixtures required.

The Equipment List is a working document to be updated as the design process for the new facility occurs.

Equipment List Definitions

The Equipment list is divided into the foloowing categories.

Category:	Description:
Discipline Coordination:	Identifies other design team disciplines requiring coordination to properly accommodate equipment items in the facility design. Refer to Datasheets for detailed coordination issues.
Revision Note:	Identifies an item that has been modified from the previous Equipment List. (N = New information, U = Updated information)
Equipment Identifier:	All identical equipment items are assigned the same number. The Equipment Identifier coordinates this list with equipment layout drawings, datasheets, cutsheets, functional models, design details, and specifications. New equipment items are indicated by a 4-digit Equipment Identifier and existing equipment items are indicated by a 5-digit Equipment Identifier number.
Item Description:	Description for equipment.
Unit Price:	The estimated price not including installation.
Quantity:	The number of equipment items located within the functional area is listed.
Extended Price:	The estimated price of equipment based on quantities required.
Dimensions:	Overall equipment length, width, and height respectively, listed in inches unless otherwise noted.
Specified By:	Identifies suggested responsibility for specification preparation. CM = City of Madison; FUEL = Fuel Consulatant; MDG = Maintenance Design Group
Furnish/Install:	Recommends responsibility to furnish and install equipment.

Category:	Description:
CF/CI	Contractor to furnish and install, usually by bid package specifications for General Contractor installation.
OF/CI	Owner to furnish and Contractor to install. This includes any items in the existing facility, which are to be moved by the Contractor to the new facility. The Contractor would be responsible for final utility connections and verification of satisfactory operation.
OF/OI	Owner to furnish and install, usually smaller office and shop equipment normally purchased by owner. This also includes any items in the existing facility, which are to be moved to the new facility.
Project Comments:	Includes special requirements and other relevant data to be considered during detailed design for the project.

PHASE 1A CONCEPTUAL EQUIPMENT LIST - FIRE SERVICES

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	MAINTENANCE BUILDING										
	Portable Equipment Storage (PES) (Room 33)										
	1200	Cart, parts	430	2	860	24	48	32-1/2	MDG	CF/CI	
	1455	Rack, bulk storage	1000	2	2000	72	24	96	MDG	CF/CI	
	2040	Charger, battery, portable	500	1	500	12	11	35	MDG	CF/CI	
	5412	Jack, service, floor, 5 ton	1300	2	2600	62-1/4	16-3/4	47-7/8	MDG	CF/CI	
	5414	Jack, stand, lift, portable	1100	8	8800	31	31	52	MDG	CF/CI	
	5420	Jack, transmission, 1 ton	2100	1	2100	38	38	48	MDG	CF/CI	
	7998	Receiver, used coolant, 25 gallon	630	2	1260	24	24	45	MDG	CF/CI	
	7999	Receiver, used oil, 25 gallon	570	2	1140	24	24	69	MDG	CF/CI	
		Subtotal			**$19,260**						
	Common Work Area (CWA) (Room 32)										
	1140	Cabinet, flammable materials, large	2000	2	4000	43	18	65	MDG	CF/CI	
	1185	Cabinet, storage, shop	760	2	1520	36	18	78	MDG	CF/CI	
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2075	Buffer/grinder, 6 inches, bench mounted	1000	1	1000	18	9	---	MDG	CF/CI	
	2220	Drill press, variable speed, 20 inches	4900	1	4900	22	36	69	MDG	CF/CI	
	2690	Saw, band, horizontal	4700	1	4700	65	28	42	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	1	760	17-1/4	9	9-1/4	MDG	CF/CI	
		Subtotal			**$19,680**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Repair Bays (Room 26, 27, 28)										
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	2	1520	17-1/4	9	9-1/4	MDG	CF/CI	
	3466	Reel, vehicle exhaust, motor operated, individual fan, 4 inch hose	8600	4	34400	42	25	30	MDG	CF/CI	
	5644	Lift, dual axle, three post, 90,000 pound, shallow design	236000	1	236000	---	---	---	MDG	CF/CI	
	5716	Lift, surface mounted, twin-posts, 18,000 pounds	26000	1	26000	124	155	197-1/4	MDG	CF/CI	
	5863	Lift, column, mobile (set of four), battery powered, wireless, 72,000 pounds	80000	1	80000	45-1/2	48-9/16	102	MDG	CF/CI	
	5861	Lift, column, mobile (set of 6), battery powered, wireless, 108,000 pounds	111000	1	111000	49	46	120	MDG	CF/CI	
	7190	Drops, air/electric, trapeze	1000	3	3000	24	2	72	MDG	CF/CI	
	7540	Pump, diaphragm, used fluid evacuation (UO)	3300	1	3300	14-3/4	10-3/4	16	MDG	CF/CI	
	7541	Pump, diaphragm, used fluid evacuation (UC)	3200	1	3200	14-3/4	10-3/4	16	MDG	CF/CI	
	7720	Reel bank (two commodity)	2680	2	5360	---	---	---	MDG	CF/CI	
	7740	Reel bank (four commodity)	5360	3	16080	---	---	---	MDG	CF/CI	
		Subtotal			**$522,660**						
	Heavy Repair Bays (Room 29, 30, 31)										
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	2	1520	17-1/4	9	9-1/4	MDG	CF/CI	
	3460	Reel, vehicle exhaust, motor operated, individual fan, 6 inch hose	9400	3	28200	46	32	33	MDG	CF/CI	
	3540	Tank, parts cleaning, 15 gallon	1000	1	1000	36	22	60	MDG	CF/CI	
	5050	Crane, bridge, top running, 5 ton	32400	1	32400	---	---	---	MDG	CF/CI	
	5644	Lift, dual axle, three post, 90,000 pound, shallow design	236000	1	236000	---	---	---	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Heavy Repair Bays (Room 29, 30, 31) (Continued)										
	5779	Lift, parallelogram, 100,000 pounds, 42 feet	200000	1	200000	504	112	---	MDG	CF/CI	
	5861	Lift, column, mobile (set of 6), battery powered, wireless, 108,000 pounds	110300	1	110300	48-1/2	45-1/2	102	MDG	CF/CI	
	7540	Pump, diaphragm, used fluid evacuation (UO)	3300	1	3300	14-3/4	10-3/4	16	MDG	CF/CI	
	7541	Pump, diaphragm, used fluid evacuation (UC)	3200	1	3200	14-3/4	10-3/4	16	MDG	CF/CI	
	7740	Reel bank (four commodity)	5360	2	10720	---	---	---	MDG	CF/CI	
		Subtotal			**$629,440**						
	Tire Shop/Tire Storage (Room 36)										
	1634	Rack, tire, heavy duty, folding ramps	750	2	1500	93-1/2	48	54-1/2	MDG	CF/CI	
	2110	Cage, inflation, tire	1040	1	1040	36	24	60	MDG	CF/CI	
	2450	Mounter/demounter, tire, truck	20000	1	20000	96	108	66	MDG	CF/CI	
	4920	Balancer, wheel, truck, heavy duty	25000	1	25000	62	72	84	MDG	CF/CI	
		Subtotal			**$47,540**						
	Lube/Compressor Room (Room 20)										
	1235	Dolly, handler, drum	4200	1	4200	34-1/2	36	48-1/4	MDG	CF/CI	
	2162	Compressor, air, receiver mounted, 15 HP duplex	25000	1	25000	89	55	73-1/2	MDG	CF/CI	
	2229	Dryer, air, refrigerated, 150 CFM	4900	1	4900	29	20	38	MDG	CF/CI	
	7510	Pump, air piston (CG), with hoist	6100	1	6100	24	30	56	MDG	CF/CI	
	7520	Pump, air piston, 10:1 ratio	3800	5	19000	6 dia.	---	12	MDG	CF/CI	
	7531	Pump, diaphragm, non-mixing	2000	2	4000	14-3/4	10-1/4	16	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Lube/Compressor Room (Room 20) (Continued)										
	7833	Tank, polyethylene, 300 gallon	490	1	490	36 dia.	---	79	MDG	CF/CI	
	7960	Tank, double, cube, 280 gallon	3900	4	15600	58	34	49	MDG	CF/CI	
	7970	Tank, double wall, cube, 500 gallon	5600	2	11200	61	46	61	MDG	CF/CI	
	7980	Tank, double wall, cube, 1,000 gallon	7500	2	15000	112	48	61	MDG	CF/CI	
		Subtotal			**$105,490**						
	Parts Room (Room 14)										
	1106	Cabinet, six drawer, 33 inches, underbench	2100	16	33600	30	27-3/4	33-1/2	MDG	CF/CI	
	1110	Cabinet, 10 drawer, 59 inches	3200	12	38400	30	27-3/4	59	MDG	CF/CI	
	1140	Cabinet, flammable materials, large	2000	2	4000	43	18	65	MDG	CF/CI	
	1185	Cabinet, storage, shop	810	3	2430	36	18	78	MDG	CF/CI	
	1455	Rack, bulk storage	1000	10	10000	72	24	96	MDG	CF/CI	
	1535	Rack, pallet, 8 feet, with deck	910	7	6370	102	42	96	MDG	CF/CI	
	1570	Rack, spool, wire	500	2	1000	36	8	84	MDG	CF/CI	
	1688	Shelving unit, 18 inch	700	40	28000	36	18	84	MDG	CF/CI	
	1698	Shelving unit, 18 inches, with six drawers	2700	20	54000	18	36	84	MDG	CF/CI	
	1870	Workbench, wood top, 6 feet	930	1	930	72	30	34	MDG	CF/CI	
		Subtotal			**$178,730**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Battery Storage (Room 21)										
	2030	Bench, battery	800	2	1600	60	24	20	MDG	CF/CI	
	2045	Charger, bus, battery, multiple, with bus bar	2700	1	2700	17	14	26	MDG	CF/CI	
		Subtotal			**$4,300**						
	Breathable Air Bottle Storage Room (Room 235)										
	1146	Cage, storage, gas cylinder, small	1200	3	3600	60	38	72	MDG	CF/CI	
	1535	Rack, pallet, 8 feet, with deck	910	5	4550	102	42	96	MDG	CF/CI	
		Subtotal			**$8,150**						
	Breathable System Shop (Room 234)										
	1106	Cabinet, six drawer, 33 inch, underbench	2100	2	4200	30	27-3/4	33-1/2	MDG	CF/CI	
	1455	Rack, bulk storage	990	4	3960	72	24	96	MDG	CF/CI	
	1745	Stool, electronic station, anti-static	1300	2	2600	18	18	19-27	MDG	CF/CI	
	1806	Workstation, electronics, ESD, five drawer	4000	2	8000	72	36	51-1/2	MDG	CF/CI	
		Subtotal			**$18,760**						
	Breathable Air Compressor (Room 236)										
	21871	Compressor, breathable air	xxx	1	0	32	24	77	CM	OF/CI	
		Subtotal			**$0**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Fire Storage (Room 219)										
	1688	Shelving unit, 18 inch	700	27	18900	36	18	84	MDG	CF/CI	
		Subtotal			**$18,900**						
	Small Engine Repair (Room 63)										
	1110	Cabinet, 10 drawer, 59 inches	3200	1	3200	30	27-3/4	59	MDG	CF/CI	
	1860	Workbench, severe use, 6 feet	1200	1	1200	72	32	34	MDG	CF/CI	
	2075	Buffer/grinder, 6 inches, bench mounted	1000	1	1000	18	9	---	MDG	CF/CI	
	2205	Drill press, variable speed, 15 inch	730	1	730	13	31	63	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	610	1	610	17-1/4	9	9-1/4	MDG	CF/CI	
	3540	Tank, parts cleaning, 15 gallon	1000	1	1000	36	22	60	MDG	CF/CI	
	5451	Lift, table, 2,000 pounds	22000	1	22000	72	36	17	MDG	CF/CI	
		Subtotal			**$29,740**						
	Tool Crib (Room 64)										
	1098	Board, peg, tool	460	2	920	72	1/2	36	MDG	CF/CI	
	1688	Shelving unit, 18 inch	700	5	3500	36	18	84	MDG	CF/CI	
		Subtotal			**$4,420**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
		CF/CI (Contractor Furnished/Contractor Installed)			**$1,607,070**						
		Estimated Equipment Installation Costs			**$241,061**						
		OF/OI (Owner Furnished/Owner Installed)			**$0**						
		TOTAL			**$1,848,131**						

PHASE 1B CONCEPTUAL EQUIPMENT LIST - FLEET SERVICES

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	MAINTENANCE BUILDING										
	Portable Equipment Storage (PES) (Room 97)										
	1200	Cart, parts	430	2	860	24	48	32-1/2	MDG	CF/CI	
	1455	Rack, bulk storage	1000	2	2000	72	24	96	MDG	CF/CI	
	2040	Charger, battery, portable	500	1	500	12	11	35	MDG	CF/CI	
	5412	Jack, service, floor, 5 ton	1300	2	2600	62-1/4	16-3/4	47-7/8	MDG	CF/CI	
	5414	Jack, stand, lift, portable	1100	8	8800	31	31	52	MDG	CF/CI	
	5420	Jack, transmission, 1 ton	2100	1	2100	38	38	48	MDG	CF/CI	
	7998	Receiver, used coolant, 25 gallon	630	6	3780	24	24	45	MDG	CF/CI	
	7999	Receiver, used oil, 25 gallon	570	6	3420	24	24	69	MDG	CF/CI	
		Subtotal			**$24,060**						
	Common Work Area (CWA) (Room 108)										
	1140	Cabinet, flammable materials, large	2000	2	4000	43	18	65	MDG	CF/CI	
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2075	Buffer/grinder, 6 inches, bench mounted	1000	1	1000	18	9	---	MDG	CF/CI	
	2191	Crimper, fittings/hose, electric/hydraulic	5900	1	5900	13	12	26-1/2	MDG	CF/CI	
	2220	Drill press, variable speed, 20 inches	4900	1	4900	22	36	69	MDG	CF/CI	
	2600	Press, electric/hydraulic, 100 ton	13500	1	13500	55-1/2	28	96	MDG	CF/CI	
	2690	Saw, band, horizontal	4700	1	4700	65	28	42	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	1	760	17-1/4	9	9-1/4	MDG	CF/CI	
		Subtotal			**$37,560**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Light Duty Repair Bays (Room 90, 91, 92, 93, 100, 101, 102, 103, 104)										
	1860	Workbench, severe use, 6 feet	1400	7	9800	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	7	5320	17-1/4	9	9-1/4	MDG	CF/CI	
	3466	Reel, vehicle exhaust, motor operated, individual fan, 4 inch hose	8600	9	77400	42	25	30	MDG	CF/CI	
	5716	Lift, surface mounted, two post, 18,000 pounds	24000	5	120000	244	108	---	MDG	CF/CI	
	5732	Lift, twin posts, drive through/over, 12,000 pounds	19000	2	38000	110	99	---	MDG	CF/CI	
	7190	Drops, air/electric, trapeze	1000	7	7000	24	2	72	MDG	CF/CI	
	7540	Pump, diaphragm, used fluid evacuation (UO)	3300	3	9900	14-3/4	10-3/4	16	MDG	CF/CI	
	7541	Pump, diaphragm, used fluid evacuation (UC)	3200	3	9600	14-3/4	10-3/4	16	MDG	CF/CI	
	7770	Reel bank (seven commodity)	9380	7	65660	---	---	---	MDG	CF/CI	
		Subtotal			**$342,680**						
	Medium Duty Repair Bays (Emergency Response/Ambulance) (Room 94, 95, 96, 105, 106, 107)										
	1860	Workbench, severe use, 6 feet	1400	5	7000	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	5	3800	17-1/4	9	9-1/4	MDG	CF/CI	
	3466	Reel, vehicle exhaust, motor operated, individual fan, 4 inch hose	8600	6	51600	42	25	30	MDG	CF/CI	
	5702	Lift, surface mounted, four post, 18,000 pounds	16700	1	16700	175	133	78	MDG	CF/CI	
	5734	Lift, parallelogram, 30,000 pounds, 26 feet	100000	1	100000	312	104	---	MDG	CF/CI	
	5840	Lift, column, mobile (set of four)	50000	1	50000	44	49-1/4	97	MDG	CF/CI	
	7190	Drops, air/electric, trapeze	1000	5	5000	24	2	72	MDG	CF/CI	
	7540	Pump, diaphragm, used fluid evacuation (UO)	3300	2	6600	14-3/4	10-3/4	16	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Medium Duty Repair Bays (Emergency Response/Ambulance) (Room 94, 95, 96, 105, 106, 107) (Continued)										
	7541	Pump, diaphragm, used fluid evacuation (UC)	3200	2	6400	14-3/4	10-3/4	16	MDG	CF/CI	
	7770	Reel bank (seven commodity)	9380	6	56280	---	---	---	MDG	CF/CI	
		Subtotal			**$303,380**						
	Heavy Repair Bays (Room 39, 44)										
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	2	1520	17-1/4	9	9-1/4	MDG	CF/CI	
	3460	Reel, vehicle exhaust, motor operated, individual fan, 6 inch hose	9400	2	18800	46	32	33	MDG	CF/CI	
	3540	Tank, parts cleaning, 15 gallon	1000	1	1000	36	22	60	MDG	CF/CI	
	5020	Crane, bridge, top running, 2 ton	30000	1	30000	498	---	---	MDG	CF/CI	
	5050	Crane, bridge, top running, 5 ton	32400	1	32400	---	---	---	MDG	CF/CI	
	5646	Lift, axle, three post, 90,000 pounds, shallow design	230000	1	230000	---	---	---	MDG	CF/CI	
	5863	Lift, column, mobile (set of four), battery powered, wireless, 72,000 pounds	80000	2	160000	45-1/2	48-9/16	102	MDG	CF/CI	
	7770	Reel bank (seven commodity)	9380	2	18760	---	---	---	MDG	CF/CI	
		Subtotal			**$495,280**						
	Heavy Inspection Bays (Fire Apparatus) (Room 38, 43)										
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	2	1520	17-1/4	9	9-1/4	MDG	CF/CI	
	3460	Reel, vehicle exhaust, motor operated, individual fan, 6 inch hose	9400	2	18800	46	32	33	MDG	CF/CI	
	3540	Tank, parts cleaning, 15 gallon	1000	1	1000	36	22	60	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Heavy Inspection Bays (Fire Apparatus) (Room 38, 43) (Continued)										
	5050	Crane, bridge, top running, 5 ton	32400	1	32400	---	---	---	MDG	CF/CI	
	5646	Lift, axle, three post, 90,000 pounds, shallow design	230000	1	230000	---	---	---	MDG	CF/CI	
	5779	Lift, parallelogram, 100,000 pounds, 42 feet	200000	1	200000	504	112	---	MDG	CF/CI	
	7190	Drops, air/electric, trapeze	1000	2	2000	24	2	72	MDG	CF/CI	
	7540	Pump, diaphragm, used fluid evacuation (UO)	3300	1	3300	14-3/4	10-3/4	16	MDG	CF/CI	
	7541	Pump, diaphragm, used fluid evacuation (UC)	3200	1	3200	14-3/4	10-3/4	16	MDG	CF/CI	
	7770	Reel bank (seven commodity)	9380	2	18760	---	---	---	MDG	CF/CI	
		Subtotal			**$513,780**						
	Heavy Inspection Bays (Room 37, 42)										
	1860	Workbench, severe use, 6 feet	1400	2	2800	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	2	1520	17-1/4	9	9-1/4	MDG	CF/CI	
	3460	Reel, vehicle exhaust, motor operated, individual fan, 6 inch hose	9400	2	18800	46	32	33	MDG	CF/CI	
	5734	Lift, parallelogram, 30,000 pounds, 26 feet	100000	1	100000	101	411	---	MDG	CF/CI	
	5791	Lift, platform, half scissors, vertical, 62,400 pounds, flush mounted	88000	1	88000	354-1/2	102-1/2	69	MDG	CF/CI	
		Subtotal			**$211,120**						
	Body Repair/Staging (Room 45, 46)										
	1140	Cabinet, flammable materials, large	2000	1	2000	43	18	65	MDG	CF/CI	
	1425	Rack, arm, single face, heavy duty	1500	1	1500	72	48	144	MDG	CF/CI	
	1455	Rack, bulk storage	1000	2	2000	72	24	96	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches)			Spec By	Furnish/ Install	Projects Comments
						Length	Width	Height			
	Body Repair/Staging (Room 45, 46) (Continued)										
	1622	Rack, sheet metal, one bay	600	1	600	40	84	31	MDG	CF/CI	
	1688	Shelving unit, 18 inch	700	3	2100	36	18	84	MDG	CF/CI	
	1860	Workbench, severe use, 6 feet	1400	1	1400	72	32	34	MDG	CF/CI	
	2080	Buffer/grinder, 8 inches, with dust collector	12000	1	12000	20	22	70	MDG	CF/CI	
	2085	Buffer/grinder, 8 inches, with pedestal	1800	1	1800	24	13	47	MDG	CF/CI	
	2195	Cutter, plasma	3000	1	3000	17-1/2	10-3/8	15-1/4	MDG	CF/CI	
	2220	Drill press, variable speed, 20 inches	4900	1	4900	22	36	69	MDG	CF/CI	
	2691	Saw, band, vertical, metal, 20 inches	7500	1	7500	42	30	79	MDG	CF/CI	
	2740	Screen, welding	430	1	430	144	1	72	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	760	1	760	17-1/4	9	9-1/4	MDG	CF/CI	
	2915	Welder, MIG, portable, with wire feed	4600	1	4600	19	39	32	MDG	CF/CI	
	2918	Welder, multiprocess, w/wire feeder, portable	4100	1	4100	28	23	---	MDG	CF/CI	
	2920	Welder, oxyacetylene, with cart	800	1	800	28	13	43-1/2	MDG	CF/CI	
	3280	Extractor, fume, welding, portable, 800 CFM	7000	1	7000	37-1/2	24	91-1/4	MDG	CF/CI	
	5020	Crane, bridge, top running, 2 ton	30000	1	30000	498	---	---	MDG	CF/CI	
		Subtotal			**$86,490**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches)			Spec By	Furnish/ Install	Projects Comments
						Length	Width	Height			
	Paint Booth Bay/Staging (Room 40, 41)										
	1140	Cabinet, flammable materials, large	2000	1	2000	43	18	65	MDG	CF/CI	
	1796	Table, hand workstation	670	1	670	60	24	---	MDG	CF/CI	
	6120	Booth, paint, side, downdraft with heated air makeup	55000	1	55000	843	264	231	MDG	CF/CI	
	6160	Paint, mixing/storage room, self contained	5700	1	5700	124	112	---	MDG	CF/CI	
		Subtotal			**$63,370**						
	Tire Storage/Shop (Room 99)										
	1860	Workbench, severe use, 6 feet	1400	1	1400	72	32	34	MDG	CF/CI	
	2450	Mounter/demounter, tire, truck	20000	1	20000	96	108	66	MDG	CF/CI	
	4920	Balancer, wheel, truck, heavy duty	25000	1	25000	62	72	84	MDG	CF/CI	
	2110	Cage, inflation, tire	1040	1	1040	36	24	60	MDG	CF/CI	
	1634	Rack, tire, heavy duty, folding ramps	750	8	6000	93-1/2	48	54-1/2	MDG	CF/CI	
	1641	Rack, tire, auto/light truck, three tier	300	6	1800	60	15	84	MDG	CF/CI	
		Subtotal			**$55,240**						
	Lube/Compressor Room (Room 20)										
	1235	Dolly, handler, drum	4200	1	4200	34-1/2	36	48-1/4	MDG	CF/CI	
	2162	Compressor, air, receiver mounted, 15 HP duplex	25000	1	25000	89	55	73-1/2	MDG	CF/CI	
	2229	Dryer, air, refrigerated, 150 CFM	4900	1	4900	29	20	38	MDG	CF/CI	
	7510	Pump, air piston (CG), with hoist	6100	1	6100	24	30	56	MDG	CF/CI	
	7520	Pump, air piston, 10:1 ratio	3800	4	15200	6 dia.	---	12	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches)			Spec By	Furnish/ Install	Projects Comments
						Length	Width	Height			
	Lube/Compressor Room (Room 20) (Continued)										
	7531	Pump, diaphragm, non-mixing	2000	1	2000	14.7	10.2	15.9	MDG	CF/CI	
	7833	Tank, polyethylene, 300 gallon	490	1	490	36 dia.	---	79	MDG	CF/CI	
	7820	Tank, polyethylene, 130 gallon	510	2	1020	29 dia.	---	51	MDG	CF/CI	
	7958	Tank, double wall, cube, 240 gallon	3900	4	15600	52	37	38	MDG	CF/CI	
	7970	Tank, double wall, cube, 500 gallon	5600	2	11200	61	46	61	MDG	CF/CI	
		Subtotal			**$85,710**						
	Parts Storage (Room 14)										
	1106	Cabinet, six drawer, 33 inches, underbench	2100	12	25200	30	27-3/4	33-1/2	MDG	CF/CI	
	1140	Cabinet, flammable materials, large	2000	2	4000	43	18	65	MDG	CF/CI	
	1185	Cabinet, storage, shop	810	2	1620	36	18	78	MDG	CF/CI	
	1451	Shelving unit, Rack, storage, 144 bin	650	2	1300	36	12	---	MDG	CF/CI	
	1455	Rack, bulk storage	1000	9	9000	72	24	96	MDG	CF/CI	
	1535	Rack, pallet, 8 feet, with deck	910	6	5460	102	42	96	MDG	CF/CI	
	1570	Rack, spool, wire	500	2	1000	36	8	84	MDG	CF/CI	
	1688	Shelving unit, 18 inch	700	16	11200	36	18	84	MDG	CF/CI	
	1698	Shelving unit, 18 inches, with six drawers	2700	16	43200	18	36	84	MDG	CF/CI	
	1870	Workbench, wood top, 6 feet	930	1	930	72	30	34	MDG	CF/CI	
		Subtotal			**$102,910**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches)			Spec By	Furnish/ Install	Projects Comments
						Length	Width	Height			
	Chassis Wash Bay (Room 17)										
	3720	Washer, high pressure, hot water, NG, 8 GPM	17000	1	17000	51	31	63-1/2	MDG	CF/CI	
	5779	Lift, parallelogram, 100,000 pounds, 42 feet	218000	1	218000	504	110	63	MDG	CF/CI	
		Subtotal			**$235,000**						
	Welding Fabrication Shop and Storage (Room 18)										
	1140	Cabinet, flammable materials, large	2000	2	4000	43	18	65	MDG	CF/CI	
	1185	Cabinet, storage, shop	760	1	760	36	18	78	MDG	CF/CI	
	1425	Rack, arm, single face, heavy duty	1500	1	1500	72	60	144	MDG	CF/CI	
	1860	Workbench, severe use, 6 feet	1200	1	1200	72	32	34	MDG	CF/CI	
	1793	Table, welding, layout, 8 feet	8400	1	8400	96	60	32	MDG	CF/CI	
	2020	Anvil, with stand	5100	1	5100	27	14	20	MDG	CF/CI	
	2191	Crimper, fittings/hose, electric/hydraulic	5900	1	5900	13	12	26-1/2	MDG	CF/CI	
	2195	Cutter, plasma	3000	1	3000	17-1/2	10-3/8	15-1/4	MDG	CF/CI	
	2691	Saw, band, vertical, metal, 20 inches	7500	1	7500	42	30	79	MDG	CF/CI	
	2740	Screen, welding	430	2	860	144	1	72	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	610	1	610	17-1/4	9	9-1/4	MDG	CF/CI	
	2915	Welder, MIG, portable, with wire feed	4600	1	4600	19	39	32	MDG	CF/CI	
	2940	Welder, TIG	2700	1	2700	18-1/2	43	31-1/2	MDG	CF/CI	
	3280	Extractor, fume, welding, portable, 800 CFM	8200	1	8200	37-1/2	24	91-1/4	MDG	CF/CI	
		Subtotal			**$54,330**						

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Welding Fabrication (Room 19)										
	1860	Workbench, severe use, 6 feet	1200	1	1200	72	32	34	MDG	CF/CI	
	2832	Vise, swivel base, 5 inches	610	1	610	17-1/4	9	9-1/4	MDG	CF/CI	
	3540	Tank, parts cleaning, 15 gallon	1000	1	1000	36	22	60	MDG	CF/CI	
	5208	Crane, jib, foundation insert mounted, 7.5 ton, 19 foot span, motorized mast	36000	1	36000	240	269	269	MDG	CF/CI	
	5392	Hoist, chain, electric, motorized trolley, 2 ton	7400	1	7400	23-3/8	11-5/8	8	MDG	CF/CI	
		Subtotal			**$46,210**						
	CF/CI (Contractor Furnished/Contractor Installed)				**$2,657,120**						
	Estimated Equipment Installation Costs				**$398,568**						
	OF/OI (Owner Furnished/Owner Installed)				**$0**						
	TOTAL				**$3,055,688**						

PHASE 1B CONCEPTUAL EQUIPMENT LIST - RADIO COMMUNICATIONS

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches)			Spec By	Furnish/ Install	Projects Comments
						Length	Width	Height			
	COMMUNICATION BUILDING										
	Installation Bays (Room 49, 50, 51, 52, 53)										
	1140	Cabinet, flammable materials, large	2000	1	2000	43	18	65	MDG	CF/CI	
	1185	Cabinet, storage, shop	810	2	1620	36	18	78	MDG	CF/CI	
	1200	Cart, parts	430	2	860	24	48	32-1/2	MDG	CF/CI	
	1451	Shelving unit, 144 bin	650	3	1950	36	12	---	MDG	CF/CI	
	1570	Rack, spool, wire	500	2	1000	36	8	84	MDG	CF/CI	
	1745	Stool, electronic station, anti-static	1300	3	3900	18	18	19-27	MDG	CF/CI	
	1805	Workbench, electronics, static dissipative	2300	3	6900	60	30	33-1/2	MDG	CF/CI	
	3280	Extractor, fume, portable, 800 CFM	7000	1	7000	---	---	---	MDG	CF/CI	
	3466	Reel, vehicle exhaust, motor operated, individual fan, 4 inch hose	8600	6	51600	42	25	30	MDG	CF/CI	
	5751	Lift, parallelogram, 50,000 pounds, 32 feet	200000	2	400000	384	105	11-3/4	MDG	CF/CI	
	6100	Booth, spray paint, with air makeup	16500	1	16500	88	116	86	MDG	CF/CI	
	7190	Drops, air/electric, trapeze	1000	4	4000	24	2	72	MDG	CF/CI	
		Subtotal			**$497,330**						
	Service Bays (Room 80, 81)										
	1141	Cabinet, flammable materials, small	600	1	600	43 x 18		44	MDG	CF/CI	
	1185	Cabinet, storage, shop	810	2	1620	36	18	78	MDG	CF/CI	
	1570	Rack, spool, wire	500	3	1500	36	8	84	MDG	CF/CI	
	2040	Charger, battery, portable	500	1	500	12	11	35	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches)			Spec By	Furnish/ Install	Projects Comments
						Length	Width	Height			
	Service Bays (Room 80, 81) (Continued)										
	2205	Drill press, variable speed, 15 inch	730	1	730	13	31	63	MDG	CF/CI	
	3466	Reel, vehicle exhaust, motor operated, individual fan, 4 inch hose	8600	3	25800	42	25	30	MDG	CF/CI	
		Subtotal			**$30,750**						
	Parts Storage (Room 58)										
	1140	Cabinet, flammable materials, large	2000	2	4000	43	18	65	MDG	CF/CI	
	1185	Cabinet, storage, shop	810	2	1620	36	18	78	MDG	CF/CI	
	1451	Shelving unit, Rack, storage, 144 bin	650	8	5200	36	12	---	MDG	CF/CI	
	1455	Rack, bulk storage	1000	12	12000	72	24	96	MDG	CF/CI	
	1535	Rack, pallet, 8 feet, with deck	910	6	5460	102	42	96	MDG	CF/CI	
	1570	Rack, spool, wire	500	4	2000	36	8	84	MDG	CF/CI	
	1688	Shelving unit, 18 inch	700	6	4200	36	18	84	MDG	CF/CI	
	1698	Shelving unit, 18 inches, with six drawers	2700	2	5400	18	36	84	MDG	CF/CI	
	1870	Workbench, wood top, 6 feet	930	1	930	72	30	34	MDG	CF/CI	
		Subtotal			**$40,810**						
	Electonics Court (Room 65, 66, 72, 73, 74, 75, 76, 77)										
	1106	Cabinet, six drawer, 33 inches, underbench	2100	8	16800	30	27-3/4	33-1/2	MDG	CF/CI	
	1185	Cabinet, storage, shop	810	4	3240	36	18	78	MDG	CF/CI	
	1215	Chair, shop, electronic, dissipative	580	8	4640	18	18	19	MDG	CF/CI	
	1451	Shelving unit, 144 bin	650	8	5200	36	12	---	MDG	CF/CI	

Revision Note	Eqpmnt ID#	Description	Unit Price	Qty	Extended Price	Dimensions (inches) Length	Width	Height	Spec By	Furnish/ Install	Projects Comments
	Electonics Court (Room 65, 66, 72, 73, 74, 75, 76, 77) (Continued)										
	1570	Rack, spool, wire	500	2	1000	36	8	84	MDG	CF/CI	
	1688	Shelving unit, 18 inch	700	4	2800	36	18	84	MDG	CF/CI	
	1806	Workstation, electronics, ESD five drawer	3900	8	31200	72	36	51-1/2	MDG	CF/CI	
	1870	Workbench, wood top, 6 feet	930	2	1860	72	30	34	MDG	CF/CI	
		Subtotal			**$66,740**						
	CF/CI (Contractor Furnished/Contractor Installed)				**$635,630**						
	Estimated Equipment Installation Costs				**$95,345**						
	OF/OI (Owner Furnished/Owner Installed)				**$0**						
	TOTAL				**$730,975**						

Section 6 – LEED

Introduction

A sustainability meeting was held on 07/10/2014. The sustainable goals of the project were discussed with the City of Madison and users of the facility. A number of goals have been established to help guide the project through the different design phases. The goals are used as a measurement tool by which the design team will be held accountable for. The following is a summary of the goals and strategies discussed.

Overarching Sustainability Goals

The City of Madison Fleet Maintenance Department is seeking to design, construct and operate a new Service and Maintenance Facility in a sustainable manner that reflects and enables the agency's missions and values.

The project's holistic sustainability approach will optimize the triple bottom line of environmental, economic and social imperatives as a means for "*wise investment of physical, economic, and human resources*." The project will also follow a systems approach to problem solving ensuring "*an integrated system of innovative, accessible and efficient public transportation services*."

The City of Madison has stated they this project aspires to achieve a LEED Silver rating.

The client has identified LEED-Silver as desirable but LEED goals should not interfere with functional needs. The team will pursue the highest rating level feasible within the functional and economic parameters of the project.

Energy and Carbon Goals

- Optimize energy performance at site system's scale
  - Consider district energy and fuel solutions and seek synergies and potential integration between energy systems for buildings and vehicles.
- Optimize carbon footprint
  - Measure carbon footprint at building facility and site scales

  - Track performance toward a carbon neutral solution for the building operational energy.
  - Estimate the value of embodied carbon for saving and remodeling the facility.
- Integrate the use of natural gas into the fuel mix for building energy.

Water Goals

- Reduce potable water use for building water, irrigation water and process water (including water used for vehicle wash and cooling) and create a water budget for the project.
- Develop, design and track water targets for the building facility and site with the goal of reducing potable water for building and irrigation by at least 50% better than the LEED-NC 2014 baseline.
- Consider rainwater harvest and water reuse such as gray water.
- Incorporate vehicle wash water recycling
- To the extent feasible manage quality and quantity of stormwater on-site using bioswales, on-site detention, and pervious pavement.

Material and Waste Goals

- Minimize use of virgin material by following a material selection hierarchy
  - Salvage and reuse materials from existing site (concrete, rock, steel, etc.)
  - Reduce new material quantities
  - Recycle materials from existing site demo and construction waste
  - Utilize materials with high recycled content
  - Design for materials to be reclaimed in the future
- Maintain durability and functionality for all material choices

Social Sustainability

- Improve IEQ through daylighting, lighting quality, increase air quality, natural ventilation (where appropriate), low VOC materials, and quality acoustics.

- Focus on occupant wellness
    - Address wellness needs of staff including drivers and mechanics.
    - Incorporate building program to address physical therapy, injury prevention, etc. related to physical labor and performance requirements of the jobs.

Resilience

- Long service life – 50 years.
- Consider vehicle and fuel technology of the future so that the facility can be flexible enough to adapt for future technology.
- Build in future flexibility by providing empty conduits, extra water and air lines, etc.

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist - DRAFT

Nakoosa Trail Fleet Maintenance Facility

16-Feb-15

Y	?	N			
1			Credi 1	Integrative Process	1

4	5	23	**Location and Transportation**		Possible Points:	16
		16	Credit 1	LEED for Neighborhood Development Location		16
1			Credit 2	Sensitive Land Protection		1
	2	2	Credit 3	High Priority Site		2
		5	Credit 4	Surrounding Density and Diverse Uses		5
	3		Credit 5	Access to Quality Transit		5
1			Credit 6	Bicycle Facilities		1
1			Credit 7	Reduced Parking Footprint		1
1			Credit 8	Green Vehicles		1

3	5	2	**Sustainable Sites**		Possible Points:	10
Y			Prereq 1	Construction Activity Pollution Prevention		Required
	1		Credit 1	Site Assessment		1
		2	Credit 2	Site Development--Protect or Restore Habitat		2
	1		Credit 3	Open Space		1
	3		Credit 4	Rainwater Management		3
2			Credit 5	Heat Island Reduction		2
1			Credit 6	Light Pollution Reduction		1

9	0	2	**Water Efficiency**		Possible Points:	11
Y			Prereq 1	Outdoor Water Use Reduction		Required
Y			Prereq 2	Indoor Water Use Reduction		Required
Y			Prereq 3	Building-Level Water Metering		Required
2			Credit 1	Outdoor Water Use Reduction		2
6			Credit 2	Indoor Water Use Reduction		6
		2	Credit 3	Cooling Tower Water Use		2
1			Credit 4	Water Metering		1

15	12	6	**Energy and Atmosphere**		Possible Points:	33
Y			Prereq 1	Fundamental Commissioning and Verification		Required
Y			Prereq 2	Minimum Energy Performance		Required
Y			Prereq 3	Building-Level Energy Metering		Required
Y			Prereq 4	Fundamental Refrigerant Management		Required
6			Credit 1	Enhanced Commissioning		6
6	6	6	Credit 2	Optimize Energy Performance		18
	1		Credit 3	Advanced Energy Metering		1
2			Credit 4	Demand Response		2
1	2		Credit 5	Renewable Energy Production		3
	1		Credit 6	Enhanced Refrigerant Management		1
	2		Credit 7	Green Power and Carbon Offsets		2

8	0	5	**Materials and Resources**	Possible Points:	13
Y			Prereq 1	Storage and Collection of Recyclables	Required
Y			Prereq 2	Construction and Demolition Waste Management Planning	Required
		5	Credit 1	Building Life-Cycle Impact Reduction	5
2			Credit 2	Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2			Credit 4	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit 5	Construction and Demolition Waste Management	2

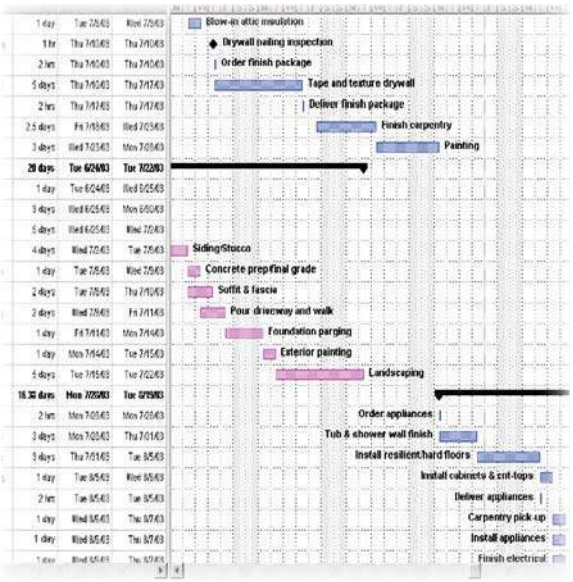
15	1	0	**Indoor Environmental Quality**	Possible Points:	16
Y			Prereq 1	Minimum Indoor Air Quality Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke Control	Required
2			Credit 1	Enhanced Indoor Air Quality Strategies	2
3			Credit 2	Low-Emitting Materials	3
1			Credit 3	Construction Indoor Air Quality Management Plan	1
2			Credit 4	Indoor Air Quality Assessment	2
1			Credit 5	Thermal Comfort	1
2			Credit 6	Interior Lighting	2
3			Credit 7	Daylight	3
	1		Credit 8	Quality Views	1
1			Credit 9	Acoustic Performance	1

3	3	0	**Innovation**	Possible Points:	6
2	3		Credit 1	Innovation	5
1			Credit 2	LEED Accredited Professional	1

0	5	0	**Regional Priority**	Possible Points:	4
	1		Credit 1	Regional Priority: Specific Credit	1
	2		Credit 2	Regional Priority: Specific Credit	1
	1		Credit 3	Regional Priority: Specific Credit	1
	1		Credit 4	Regional Priority: Specific Credit	1

48	31	36	**Total**	Possible Points:	110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



Section 7 – Schedule

Introduction

The purpose of Section Seven – Preliminary Schedule, is to outline an estimated duration timeframe for the final design and construction of Phase 1A – Fire Maintenance Facility, of the project. Phase 1B – Fleet Maintenance and Communication Shop, is anticipated to be completed at a later date under a different contract.

Through this Master Plan and Conceptual/Schematic Design Study, a significant amount of facility design has been accomplished. It includes the development of the required Program for all the project components, the development of multiple Site Plan options on the Nakoosa Trail site for both the Phase 1A and Phase 1B uses, and also options for State Fleet, Madison Metro or a Bio-Digester facility to co-locate on the site at a future time. Finally, the conceptual design of the Phase 1A and Phase 1B uses has been largely developed, including the architectural approach to the building massing and enclosure, the approach to addressing Nakoosa Trail, major building materials and major approaches to sustainable strategies. Additionally, site circulation, access and utilization have been developed.

The design has been reviewed with numerous City of Madison agencies, and has been initially submitted and presented to the Urban Design Commission with favorable response.

The attached schedule outlines anticipated remaining phases for design completion, permitting and construction for Phase 1A – Fire Maintenance Facility.

Design completion requires the typical Design Development and Construction Documentation phases and is a five (5) to six (6) month total duration, depending on City of Madison and agency review and approval times.

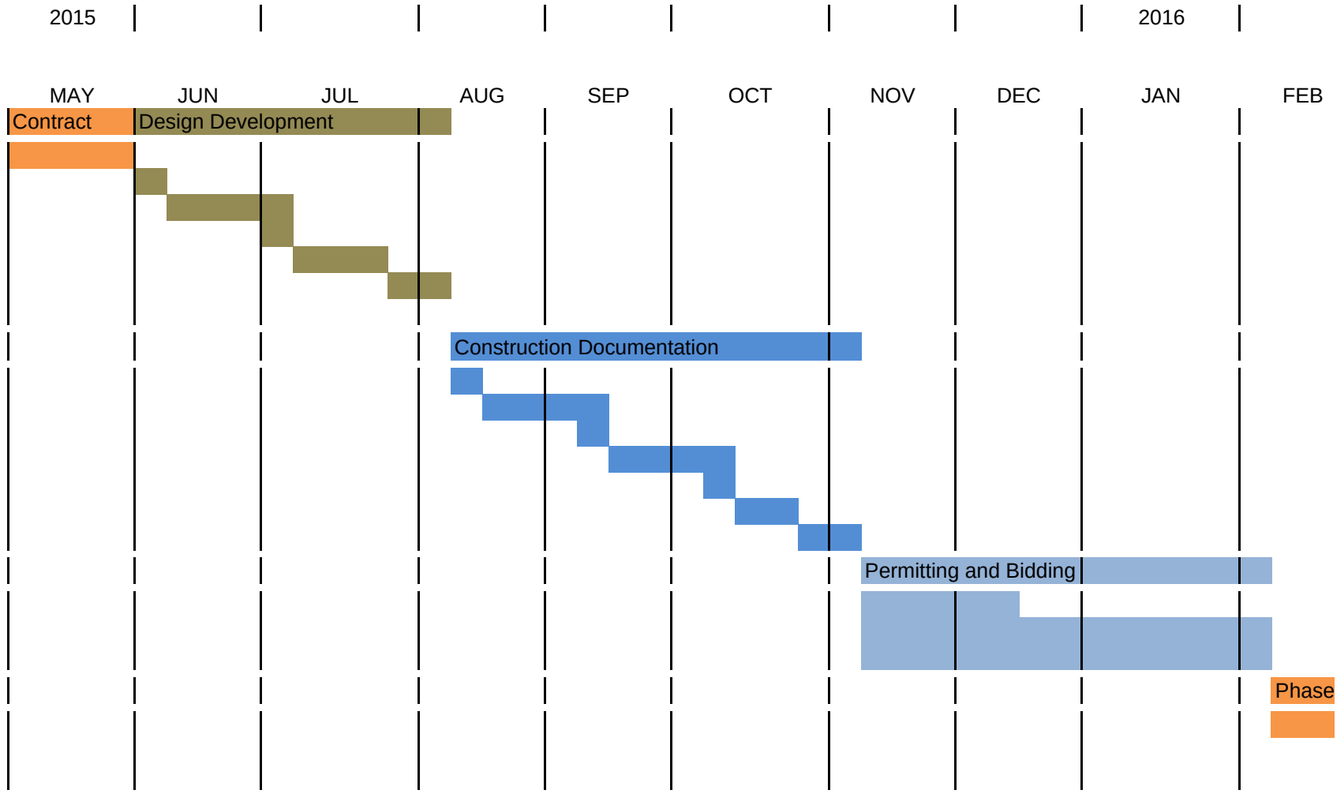
Permitting and Bidding encompasses both the time required to obtain City of Madison building and site permit approvals, and the time required to advertise, select and contract a construction firm for the construction phase. The City has a streamlined permitting process for City projects, so that process is fairly efficient. Additionally, the rezoning of the site was completed under this contract, so no additional work is anticipated to make the site compliant with this use. Bidding and contracting requires more time and is the bulk of this phase of the schedule.

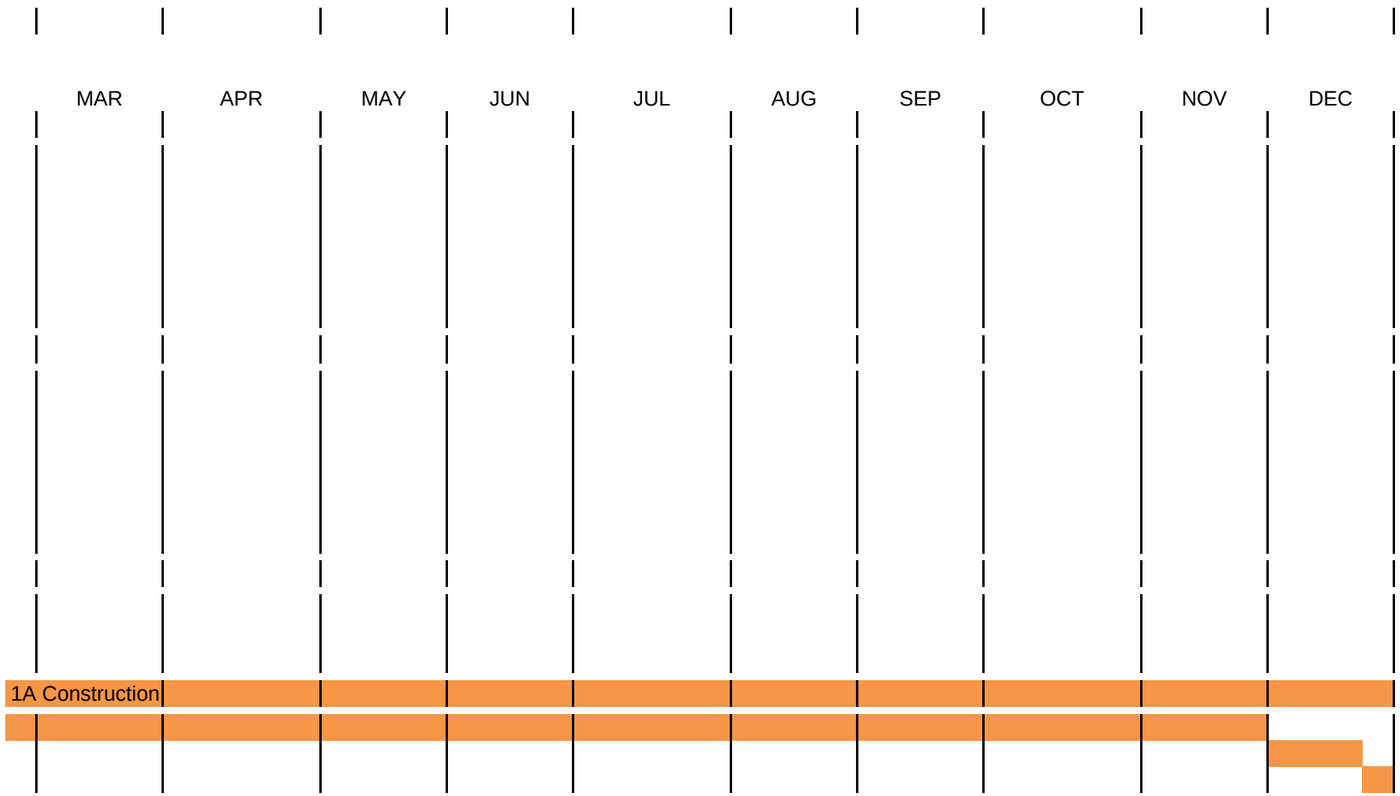
Although a good sized and in some ways complicated facility, construction of Phase 1A should be fairly straight-forward. The schedule anticipates start of construction in February, so frozen ground hindering site and foundation work is an initial consideration to be monitored. Phase 1A construction does not impact the hillside along the south and southeast of the site.

The following schedule is an educated estimate based on what the design team knows at the time of writing, and will be reviewed and updated in the following phase of the project.

Bar Schedule
Design Development
Final Design (Construction Documentation)
Permitting and Bidding
Construction

	Duration (working days)	Begin	End
Design Development	**50**	**06/01/15**	**08/07/15**
Contract Signature / NTP	30	05/04/15	05/29/15
Program and Concept/Schematic Review and Confirmation	5	06/01/15	06/05/15
Design Development	20	06/08/15	07/03/15
Mid-Phase COM/Agency Review	1	07/03/15	07/03/15
Design Development	15	07/06/15	07/24/15
Final Submittal and Acceptance	10	07/27/15	08/07/15
UDC Submittal	1	tbd	
Final Design (Construction Documentation)	**65**	**08/10/15**	**11/06/15**
Program and Concept/Schematic Review and Confirmation	5	08/10/15	08/14/15
Refine Design	20	08/17/15	09/11/15
60% COM/Agency Review	1	09/11/15	09/11/15
Final Design	20	09/14/15	10/09/15
90% COM/Agency Review	1	10/09/15	10/09/15
Final Design	10	10/12/15	10/23/15
Final Submittal and Acceptance	10	10/26/15	11/06/15
Permitting and Bidding	**70**	**11/09/15**	**02/05/16**
Submit for Permit Review, Re-submit, and Obtain Permit	25	11/09/15	12/12/15
Conduct Bidding Process	70	11/09/15	02/05/16
Construction Contract Process / NTP	70	11/09/15	02/05/16
Construction	**230**	**02/08/16**	**12/23/16**
Construction	215	02/08/16	12/02/16
Substantial Completion / Punch List	15	12/05/16	12/23/16
Final Occupancy	1	12/26/16	




MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
1A Construction

Section 8 – Financial

Slopping hillside requires heavy retaining wall

Introduction

As part of the Concept Design effort, the RNL team developed Phase 1A and Phase1B floor plans and site plans. Both options were given a cost estimate value. Specific financial models included in this report include the following:

- Schematic Design Cost Estimate-Final (Jan. 13, 2015)
  - Phase IA
  - Phase IB
  - Phase IA – Mezzanine Alternate
- Schematic Design Cost Estimate-Draft (Dec. 17, 2014)
  - Phase IA
  - Phase IB
  - Phase IA – Mezzanine Alternate
- Schematic Design Cost Estimate – Phase IB South Retaining Wall
- Schematic Design Cost Estimate – Phase IB South Retaining Wall with Earthwork

Tom Middleton at Middleton & Associates developed the preliminary cost estimates for each phase and for the site retaining wall for Phase IB. For this phase, Middleton also did the cost updated cost estimates, however these were performed by Peter Sparling of MCC, without knowledge of the original estimates. They represent an indepent view, but final costs are very similar and consistent to the Master Planning estimates. This points to added confidence for the City of Madison going forward into the next phase of the project with reliable estimates.

The estimates are still high-level at this stage of the project in some ways utilizing a combination of historical data, square footage pricing and Conceptual design plans and elevations developed within Phase II. However, they are an advancement to the Phase I estimates in that in many cases where specific material selections have been made, Middleton was able to utilize material take-offs to refine the price and remove some variables.

MIDDLETON CONSTRUCTION CONSULTING

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CITY OF MADISON

NAKOOSA TRAIL FLEET SERVICES BLDG

Madison, Wisconsin

Schematic Design
January 13, 2015

Prepared For:
RNL
1451 Dolley Madison Blvd
Suite 200
McLean, Virginia 22101

NOTES REGARDING PREPARATION OF ESTIMATE

This estimate was prepared based on the following documents provided by RNL Design:

1. Schematic Design Pricing Package provided by RNL Design.
   dated December 17, 2014.

2. Stormwater - Opinion of Probable Cost by Strand Associates
   dated November 26, 2014.

4. 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 generated from current material/labor rates, historical production data, and discussions with relevant subcontractors and material suppliers. 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 Madison, 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 bid date for Phase 1A of ??.
2. A construction period of 6-8 months.
3. A construction bid date for Phase 1B of ??.
4. A construction period of 8-10 months.
5. The contract will be competitively bid to multiple contractors.
6. All contractors will be required to pay prevailing wages.
7. There are no phasing requirements within each project.
8. The contractors will have full access to the site during normal working hours
9. Estimate includes pricing as of December 2014.

EXCLUSIONS
The following are excluded from the cost of this estimate:

1. Professional Design Fees
2. Testing Fees
3. Owner Contingencies/Scope Changes
4. Construction Contingency
5. Premium Time / Restrictions on Contractor Working Hours
6. **Cost Escalation**
7. Finance and Legal Charges
8. Environmental Abatement Costs
9. Temporary Facilities
10. Loose Furniture
11. Equipment (Owner Furnished/Installed)
12. Artwork
13. Non-fixed Audio/Visual Equipment
14. Telephone / Data Equipment
15. Intercom System
16. City of Madison Radio Communications Tower
17. Overhead cranes
18. Vehicle lift equipment

Grand Summary

COST SUMMARY	GSF	$/SF	BUILDING TOTAL
Phase 1A	38,956	$240.46	$9,367,447
Phase 1B	59,477	$245.16	$14,581,571
Phase 1A - Mezzanine Alternate	3,093	$38.35	$118,607
TOTAL ESTIMATED CONSTRUCTION COSTS	**101,526**	$237.06	**$24,067,625**

Summary - Phase 1A

	COST SUMMARY	38,956 GSF	$/SF	BUILDING TOTAL
01000	GENERAL REQUIREMENTS		$0.00	$0
02000	EXISTING CONDITIONS		$0.00	$0
03000	CONCRETE		$27.20	$1,059,469
04000	MASONRY		$6.83	$266,143
05000	METALS		$20.69	$805,988
06000	WOODS, PLASTICS & COMPOSITES		$1.07	$41,628
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$20.49	$798,253
08000	OPENINGS		$9.84	$383,472
09000	FINISHES		$2.98	$116,059
10000	SPECIALTIES		$0.43	$16,697
11000	EQUIPMENT		$0.00	$0
12000	FURNISHINGS		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$0.00	$0
21000	FIRE SUPPRESSION		$3.00	$116,872
22000	PLUMBING		$8.00	$311,648
23000	HEATING, VENTILATING & AIR CONDITIONING		$16.00	$623,296
26000	ELECTRICAL		$26.00	$1,012,704
27000	COMMUNICATIONS		$0.25	$9,743
28000	ELECTRONIC SAFETY AND SECURITY		$2.27	$88,282
31000	EARTHWORK		$19.93	$776,317
32000	EXTERIOR IMPROVEMENTS		$16.09	$626,949
33000	UTILITIES		$16.33	$636,092
	SUBTOTAL		**$197.39**	**$7,689,612**
	ESCALATION TO CONSTRUCTION BID DATE	0.0%	$0.00	$0
	GENERAL CONDITIONS/BOND/INSURANCE	7.0%	$13.82	$538,273
	CONTRACTOR'S FEES	3.5%	$7.39	$287,976
	DESIGN CONTINGENCY	10.0%	$21.86	$851,586
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$240.46**	**$9,367,447**

Summary - Phase 1B

	COST SUMMARY	59,477 GSF	$/SF	BUILDING TOTAL
01000	GENERAL REQUIREMENTS		$0.00	$0
02000	EXISTING CONDITIONS		$0.04	$2,387
03000	CONCRETE		$32.38	$1,925,602
04000	MASONRY		$2.17	$129,336
05000	METALS		$21.64	$1,287,301
06000	WOODS, PLASTICS & COMPOSITES		$1.54	$91,648
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$19.00	$1,130,269
08000	OPENINGS		$9.03	$537,028
09000	FINISHES		$5.33	$316,728
10000	SPECIALTIES		$0.98	$58,095
11000	EQUIPMENT		$0.00	$0
12000	FURNISHINGS		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$2.10	$125,000
21000	FIRE SUPPRESSION		$3.00	$178,437
22000	PLUMBING		$14.98	$891,085
23000	HEATING, VENTILATING & AIR CONDITIONING		$16.00	$951,632
26000	ELECTRICAL		$26.00	$1,546,170
27000	COMMUNICATIONS		$0.25	$14,875
28000	ELECTRONIC SAFETY AND SECURITY		$2.27	$134,787
31000	EARTHWORK		$26.02	$1,547,552
32000	EXTERIOR IMPROVEMENTS		$15.19	$903,509
33000	UTILITIES		$3.34	$198,376
	SUBTOTAL			**$11,969,817**
	ESCALATION TO CONSTRUCTION BID DATE	0.0%	$0.00	$0
	GENERAL CONDITIONS/BOND/INSURANCE	7.0%	$14.09	$837,887
	CONTRACTOR'S FEES	3.5%	$7.54	$448,270
	DESIGN CONTINGENCY	10.0%	$22.29	$1,325,597
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$245.16**	**$14,581,571**

Summary - Phase 1A Mezzanine Alternate

	COST SUMMARY	3,093 GSF	$/SF	BUILDING TOTAL
01000	GENERAL REQUIREMENTS		$0.00	$0
02000	EXISTING CONDITIONS		$0.00	$0
03000	CONCRETE		$3.91	$12,091
04000	MASONRY		$0.00	$0
05000	METALS		$20.42	$63,173
06000	WOODS, PLASTICS & COMPOSITES		$0.00	$0
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$0.00	$0
08000	OPENINGS		$0.00	$0
09000	FINISHES		$1.89	$5,861
10000	SPECIALTIES		$0.00	$0
11000	EQUIPMENT		$0.00	$0
12000	FURNISHINGS		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$0.00	$0
21000	FIRE SUPPRESSION		$0.00	$0
22000	PLUMBING		$0.00	$0
23000	HEATING, VENTILATING & AIR CONDITIONING		$0.00	$0
26000	ELECTRICAL		$5.25	$16,238
27000	COMMUNICATIONS		$0.00	$0
28000	ELECTRONIC SAFETY AND SECURITY		$0.00	$0
31000	EARTHWORK		$0.00	$0
32000	EXTERIOR IMPROVEMENTS		$0.00	$0
33000	UTILITIES		$0.00	$0
	SUBTOTAL			**$97,363**
	ESCALATION TO CONSTRUCTION BID DATE	0.0%	$0.00	$0
	GENERAL CONDITIONS/BOND/INSURANCE	7.0%	$2.20	$6,815
	CONTRACTOR'S FEES	3.5%	$1.18	$3,646
	DESIGN CONTINGENCY	10.0%	$3.49	$10,782
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$38.35**	**$118,607**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
PHASE 1A				
03000 CONCRETE				
03100 Concrete Formwork				
Formwork for strip footings	2,141	SQFT	5.98	12,813
Formwork for column footings	810	SQFT	6.76	5,477
Formwork for elevator pit mat slab	142	SQFT	11.33	1,609
Formwork for elevator pit walls	325	SQFT	7.00	2,275
Formwork for foundation walls	6,761	SQFT	8.04	54,381
SUBTOTAL: Concrete Formwork				**$76,556**
03200 Concrete Reinforcement				
Reinforcement in strip footings, avg 65 lbs/cy	4	TONS	2,250.02	9,000
Reinforcement in column footings, avg 80 lbs/cy	2	TONS	2,250.02	3,375
Reinforcement in elevator pit mat foundations, avg 175 lbs/cy	1	TONS	2,250.12	1,125
Reinforcement in elvator pit walls, avg 115 lbs/cy	1	TONS	2,250.13	1,125
Reinforcement in foundation walls, avg 115 lbs/cy	8	TONS	2,250.02	16,875
SUBTOTAL: Concrete Reinforcement				**$31,500**
03300 Cast in Place Concrete				
Concrete in strip footings, 4,000 psi	119	CUYD	155.20	18,469
Concrete in column footings, 4,000 psi	38	CUYD	161.70	6,145
Concrete in elevator pit mat foundations, 4,000 psi	5	CUYD	133.85	669
Concrete in elevator pit walls, 4,000 psi	6	CUYD	138.07	828
Concrete in foundation walls, 4,000 psi	126	CUYD	159.84	20,140
Concrete slab on grade, 5" thk, with W6x6-2.9x2.9	16,102	SQFT	4.56	73,427
Concrete ramps	241	SQFT	11.07	2,667
Concrete slab on grade, 8" thk, with W6x6-2.9x2.9	15,133	SQFT	5.36	81,139
Vapor barrier at slab	31,235	SQFT	0.91	28,468
Extra for stepped footings	20	LNFT	137.49	2,750
Exterior concrete stairs	33	LNFT	28.28	933
Shake hardener - reflective	15,133	SQFT	1.22	18,520
NLWT Concrete on metal deck, 4-1/2" thk, with W6x6-1.4x1.4	6,612	SQFT	3.91	25,846
NLWT Concrete on metal deck, 4-1/2" thk, with W6x6-1.4x1.4	3,093	SQFT	3.91	12,091
Slab @ stoops	1,596	SQFT	5.09	8,125
Concrete fill at metal pan stair landing	113	SQFT	15.03	1,698
Concrete fill at metal pan stair tread	96	LNFT	12.40	1,190
SUBTOTAL: Cast in Place Concrete				**$303,105**
03500 Precast Structural Concrete				
Insulated precast panel	15,814	SQFT	41.76	660,399
SUBTOTAL: Precast Structural Concrete				**$660,399**
TOTAL: CONCRETE				**$1,071,560**
04000 MASONRY				
04300 Interior Masonry				
8" CMU partition	20,950	SQFT	12.70	266,143
SUBTOTAL: Interior Masonry				**$266,143**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
TOTAL: MASONRY				**$266,143**
05000 METALS				
05100 Structural Steel				
Structural steel columns, beams & joist @ flooor areas, 10lbs/sf	33	TONS	3,728.92	123,055
Structural steel columns, beams & joist @ roof areas, 7lbs/sf	125	TONS	3,728.92	466,116
Structural steel columns, beams & joist @ flooor areas, 10lbs/sf	16	TONS	3,328.92	51,598
Composite metal floor deck, 2" thk, 18 ga	6,612	SQFT	3.59	23,744
Metal roof deck, galvanized, 1-1/2" thk, 18 ga	35,766	SQFT	2.39	85,373
SUBTOTAL: Structural Steel				**$749,886**
05300 Stairs				
Metal pan stairs	96	LNFT	75.16	7,215
Metal pan stair landing	113	SQFT	95.39	10,779
Steel railing system, painted - stairs	22	LNFT	113.06	2,487
Steel handrail, 1-1/2" dia, wall mounted, painted	40	LNFT	30.59	1,224
SUBTOTAL: Stairs				**$21,705**
05400 Metal Fabrications				
Miscellaneous angles, channels, lintels, etc.	38,956	SQFT	1.30	50,526
Guardrail gate 2 @ 3' each	2	EACH	530.18	1,060
Guardrail @ Mezzanine	93	LNFT	113.06	10,515
Canopies @ overhead door entrances	738	SQFT	48.06	35,470
SUBTOTAL: Metal Fabrications				**$97,571**
TOTAL: METALS				**$869,161**
06000 WOODS, PLASTICS & COMPOSITES				
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	38,956	SQFT	0.79	30,701
SUBTOTAL: Rough Carpentry				**$30,701**
06300 Millwork				
P-lam base cabinets and solid surface countertops	15	LNFT	415.04	6,226
P-lam wall hung cabinets	20	LNFT	235.05	4,701
SUBTOTAL: Millwork				**$10,926**
TOTAL: WOODS, PLASTICS & COMPOSITES				**$41,628**
07000 THERMAL & MOISTURE PROTECTION				
07100 Dampproofing & Waterproofing				
Dampproofing - foundation walls	3,016	SQFT	1.44	4,332
Elevator pit waterproofing	1	LSUM	1,642.81	1,643
SUBTOTAL: Dampproofing & Waterproofing				**$5,974**
07200 Thermal Insulation				
2" foundation insulation	6,288	SQFT	2.13	13,387
SUBTOTAL: Thermal Insulation				**$13,387**
07400 Roofing				
Membrane roofing, w/ insulation and all flashings	24,220	SQFT	8.86	214,514

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
SUBTOTAL: Roofing				**$214,514**
07500 Roofing Specialties				
Pavers @ Patio - adjustable ht	741	SQFT	20.00	14,820
SUBTOTAL: Roofing Specialties				**$14,820**
07600 Metal Panel Systems				
Standing seam roofing, w/ insulation & all flashing	11,546	SQFT	15.14	174,834
Metal Soffit	1,489	SQFT	17.28	25,736
Insulated metal siding, w/ stud back-up	12,849	SQFT	26.81	344,425
SUBTOTAL: Metal Panel Systems				**$544,995**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	38,956	SQFT	0.12	4,562
SUBTOTAL: Caulking & Sealants				**$4,562**
TOTAL: THERMAL & MOISTURE PROTECTION				**$798,253**
08000 OPENINGS				
08100 Windows				
Fixed windows	4,386	SQFT	41.19	180,668
Translucent wall panels	404	SQFT	63.63	25,705
SUBTOTAL: Windows				**$206,373**
08200 Curtainwall & Storefront				
Exterior storefront	988	SQFT	50.77	50,159
SUBTOTAL: Curtainwall & Storefront				**$50,159**
08300 Exterior Doors, Frames, & Hardware				
(2) 3'0"x7'0" HM door, frame & hardware	4	EACH	3,173.70	12,695
3'0"x7'0" HM door, frame & hardware	8	EACH	1,854.22	14,834
3'0" x 7'0" Aluminum glass door, frame & hardware	3	EACH	3,404.22	10,213
SUBTOTAL: Exterior Doors, Frames, & Hardware				**$37,741**
08400 Interior Doors, Frames, & Hardware				
(2) 3'0"x7'0" HM door, frame & hardware	1	EACH	2,923.70	2,924
3'0"x7'0" HM door, frame & hardware	6	EACH	1,854.22	11,125
3'0"x7'0" SC wood door, frame & hardware	13	EACH	1,604.22	20,855
SUBTOTAL: Interior Doors, Frames, & Hardware				**$34,904**
08500 Interior Glazing				
Borrowed lite	122	SQFT	31.00	3,782
Interior storefront	180	SQFT	42.53	7,655
SUBTOTAL: Interior Glazing				**$11,437**
08600 Special Doors, Frames, & Hardware				
Elect operated OH door - 14'x14'	8	EACH	4,485.71	35,886
Elect operated OH door - 10'x12'	2	EACH	3,485.71	6,971
SUBTOTAL: Special Doors, Frames, & Hardware				**$42,857**
TOTAL: OPENINGS				**$383,472**
09000 FINISHES				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
09100 Plaster & Gypsum Board				
2" mtl stud w/gypsum-1 side - @ Precast/CMU walls	4,146	SQFT	3.82	15,834
4" mtl stud w/gypsum-1 side - Chase	478	SQFT	3.96	1,892
3-5/8" 25 ga metal studs, 5/8" type x gypboard each side, 3" mineral fiber blanket insulation, full-height	2,159	SQFT	6.55	14,142
SUBTOTAL: Plaster & Gypsum Board				**$31,868**
09200 Floor Finishes				
Ceramic tile floor	227	SQFT	10.83	2,457
Ceramic tile base, 6" high	105	LNFT	15.28	1,604
VCT	3,748	SQFT	3.69	13,835
Rubber floor tile	113	SQFT	13.03	1,473
Vinyl base, 6" high	649	LNFT	1.92	1,247
Rubber stair tread, 12" wide	96	LNFT	20.66	1,983
SUBTOTAL: Floor Finishes				**$22,599**
09400 Ceiling Finishes				
Gyp ceiling	226	SQFT	7.60	1,717
Gypsum board soffit	20	SQFT	11.44	229
ACT system, 2'-0" x 2'-0"	4,015	SQFT	3.97	15,949
SUBTOTAL: Ceiling Finishes				**$17,894**
09600 Paints & Coatings				
Concrete sealer	9,258	SQFT	0.85	7,892
Concrete sealer	3,093	SQFT	0.85	2,637
Paint exposed structure	34,345	SQFT	1.04	35,805
Paint exposed structure	3,093	SQFT	1.04	3,224
SUBTOTAL: Paints & Coatings				**$49,558**
TOTAL: FINISHES				**$121,920**
10000 SPECIALTIES				
10200 Signage				
Sign and graphic allowance	1	LSUM	10,000.00	10,000
SUBTOTAL: Signage				**$10,000**
10400 Toilet Accessories				
Toilet paper dispenser, single roll	2	EACH	65.73	131
Paper towel dispenser, surface mounted	2	EACH	86.46	173
Napkin disposal, stainless steel, surface mounted	1	EACH	104.55	105
Soap dispenser	2	EACH	76.46	153
Coat hook	2	EACH	17.92	36
Grab bar set, three piece	2	EACH	239.38	479
Mirror	2	EACH	74.55	149
SUBTOTAL: Toilet Accessories				**$1,226**
10500 Fire Protection Specialties				
Fire extinguisher & cabinet, wall mounted	10	EACH	230.30	2,303
Fire extinguisher & cabinet, recessed	8	EACH	396.12	3,169
SUBTOTAL: Fire Protection Specialties				**$5,472**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
TOTAL: SPECIALTIES				**$16,697**
21000 FIRE SUPPRESSION				
21200 Fire Sprinkler Equipment & Specialties				
Wet sprinkler system - $/SF	38,956	SQFT	3.00	116,872
SUBTOTAL: Fire Sprinkler Equipment & Specialties				**$116,872**
TOTAL: FIRE SUPPRESSION				**$116,872**
22000 PLUMBING				
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				
Plumbing - complete	38,956	SQFT	8.00	311,648
SUBTOTAL: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$311,648**
TOTAL: PLUMBING				**$311,648**
23000 HEATING VENTILATION & AIR CONDITIONING				
23200 Ventilation & Exhaust				
HVAC - complete	38,956	SQFT	16.00	623,296
SUBTOTAL: Ventilation & Exhaust				**$623,296**
TOTAL: HEATING VENTILATION & AIR CONDITIONING				**$623,296**
26000 ELECTRICAL				
26200 Main Power Distribution				
Electrical - Complete	38,956	SQFT	26.00	1,012,704
SUBTOTAL: Main Power Distribution				**$1,012,704**
26500 Lighting				
Lighting System - Light fixtures including installation and hook up	3,093	SQFT	4.00	12,372
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	3,093	SQFT	1.25	3,866
SUBTOTAL: Lighting				**$16,238**
TOTAL: ELECTRICAL				**$1,028,942**
27000 COMMUNICATIONS				
27200 Tele/Data Systems				
Telecommunication/Data - rough-in only	38,956	SQFT	0.25	9,743
SUBTOTAL: Tele/Data Systems				**$9,743**
TOTAL: COMMUNICATIONS				**$9,743**
28000 ELECTRONIC SAFETY & SECURITY				
28200 Fire Alarm Systems				
Fire alarm System, complete	38,956	SQFT	1.83	71,165
SUBTOTAL: Fire Alarm Systems				**$71,165**
28300 Intrusion Detection & Access Control Systems				
Intrusion Detection System, complete	38,956	SQFT	0.44	17,117
SUBTOTAL: Intrusion Detection & Access Control Systems				**$17,117**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
TOTAL: ELECTRONIC SAFETY & SECURITY				**$88,282**
31000 EARTHWORK				
31100 Site Preparation & Excavation				
Detention Basin Grading & Restoration - See attached estimate by Strand Associates	1	LSUM	295,975.00	295,975
Cut site to new elevations	4,659	CUYD	5.09	23,723
Haul excavated material off site as CCDD (20% expansion)	5,590	CUYD	12.11	67,697
6" aggregate base @ 5" SOG	299	CUYD	28.97	8,662
8" aggregate base @ 8" SOG	376	CUYD	28.97	10,892
SUBTOTAL: Site Preparation & Excavation				**$406,949**
31200 Site Grading				
Rough grading, large area	5	ACRE	9,309.60	44,872
Fine grading, large area	4	ACRE	4,315.67	17,608
SUBTOTAL: Site Grading				**$62,480**
31300 Foundation Excavation & Fill				
Excavate for foundations	856	CUYD	10.24	8,766
Backfill with excavated material	731	CUYD	7.41	5,414
Haul off excavated material as CCDD (20% expansion)	150	CUYD	12.11	1,817
SUBTOTAL: Foundation Excavation & Fill				**$15,997**
31600 Erosion & Sedimentation Control				
Erosion Control - See attached estimate by Strand Associates	1	LSUM	25,000.00	25,000
SUBTOTAL: Erosion & Sedimentation Control				**$25,000**
31800 Site Demolition				
Sanitary sewer demo - See attached estimate by Strand Associates	1	LSUM	2,500.00	2,500
Storm sewer demo - See attached estimate by Strand Associates	1	LSUM	12,300.00	12,300
Remove asphalt paving	178,548	SQFT	0.60	107,361
Remove curb and gutter	2,806	LNFT	1.33	3,733
Saw cut asphalt	504	LNFT	3.91	1,971
Remove & haul off paving stone base	4,430	CUYD	31.16	138,027
SUBTOTAL: Site Demolition				**$265,892**
TOTAL: EARTHWORK				**$776,317**
32000 EXTERIOR IMPROVEMENTS				
32100 Pavement				
CA-6 base, 8" thk at asphalt paving	5,417	CUYD	27.30	147,867
Asphalt pavement, 2" surface course, on 2" binder course	148,636	SQFT	2.44	362,434
Parking lot striping	1	LSUM	2,500.00	2,500
Concrete curb & gutter, machine formed	1,870	LNFT	11.09	20,745
Concrete curb & gutter, depressed	341	LNFT	17.83	6,082
SUBTOTAL: Pavement				**$539,627**
32300 Fencing & Walls				
Manually operated steel arm gate	1	EACH	1,793.83	1,794
Card access gates	3	LSUM	8,000.00	24,000
SUBTOTAL: Fencing & Walls				**$25,794**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
32600 Landscaping				
Landscaping allowance	1	LSUM	25,000.00	25,000
Topsoil, 6" thk	5,289	SQFT	0.74	3,895
Seeding, fertilizer and fine grading, machine	5,289	SQFT	0.50	2,632
SUBTOTAL: Landscaping				**$31,528**
32900 Miscellaneous Exterior Improvements				
Signage, Monument Sign	1	LSUM	30,000.00	30,000
SUBTOTAL: Miscellaneous Exterior Improvements				**$30,000**
TOTAL: EXTERIOR IMPROVEMENTS				**$626,949**
33000 UTILITIES				
33200 Site Water Service				
Site water service - See attached estimate by Strand Associates	1	LSUM	63,455.00	63,455
SUBTOTAL: Site Water Service				**$63,455**
33300 Site Sanitary & Storm Sewer				
New storm sewer - See attached estimate by Strand Associates	1	LSUM	328,690.00	328,690
Underground Infiltration Gallery - See attached estimate by Strand Associates	1	LSUM	36,158.00	36,158
New sanitary sewer - See attached estimate by Strand Associates	1	LSUM	21,565.00	21,565
SUBTOTAL: Site Sanitary & Storm Sewer				**$386,413**
33800 Site Electrical				
Site Electrical - Exterior lighting	129,525	SQFT	0.47	61,123
Site Electrical Service	414	LNFT	302.18	125,101
SUBTOTAL: Site Electrical				**$186,224**
TOTAL: UTILITIES				**$636,092**
TOTAL: PHASE 1A				**$7,786,975**
PHASE 1B				
02000 EXISTING CONDITIONS				
02100 Selective Demolition				
Remove CMU for new door openings, add lintel	3	EACH	397.64	1,193
Remove drywall metal stud partition	820	SQFT	1.07	873
Remove drywall ceiling, suspended	151	SQFT	1.74	262
Remove door and frame, single	1	EACH	58.58	59
SUBTOTAL: Selective Demolition				**$2,387**
TOTAL: EXISTING CONDITIONS				**$2,387**
03000 CONCRETE				
03100 Concrete Formwork				
Formwork for strip footings	3,894	SQFT	5.98	23,304
Formwork for column footings	1,500	SQFT	6.76	10,142
Formwork for foundation walls	12,159	SQFT	8.04	97,800
SUBTOTAL: Concrete Formwork				**$131,247**
03200 Concrete Reinforcement				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Reinforcement in strip footings, avg 65 lbs/cy	7	TONS	2,250.02	15,750
Reinforcement in column footings, avg 80 lbs/cy	3	TONS	2,250.02	6,300
Reinforcement in foundation walls, avg 115 lbs/cy	13	TONS	2,250.02	29,250
SUBTOTAL: Concrete Reinforcement				**$51,300**
03300 Cast in Place Concrete				
Concrete in strip footings, 4,000 psi	216	CUYD	155.20	33,524
Concrete in column footings, 4,000 psi	69	CUYD	161.70	11,157
Concrete in foundation walls, 4,000 psi	225	CUYD	159.84	35,965
Concrete slab on grade, 5" thk, with W6x6-2.9x2.9	3,861	SQFT	4.56	17,607
Concrete ramps	560	SQFT	11.07	6,197
Concrete slab on grade, 8" thk, with W6x6-2.9x2.9	50,511	SQFT	5.36	270,825
Vapor barrier at slab	54,372	SQFT	0.91	49,555
Patch SOG @ toilet removal	1	EACH	154.81	155
Extra for stepped footings	60	LNFT	137.49	8,249
Exterior concrete stairs	15	LNFT	28.28	424
Shake hardener - reflective	50,511	SQFT	1.22	61,815
NLWT Concrete on metal deck, 4-1/2" thk, with W6x6-1.4x1.4	4,070	SQFT	3.91	15,910
Slab @ stoops	3,474	SQFT	5.09	17,686
Concrete fill at metal pan stair landing	130	SQFT	15.03	1,953
Concrete fill at metal pan stair tread	197	LNFT	12.40	2,443
SUBTOTAL: Cast in Place Concrete				**$533,465**
03500 Precast Structural Concrete				
Insulated precast panel	28,965	SQFT	41.76	1,209,590
SUBTOTAL: Precast Structural Concrete				**$1,209,590**
TOTAL: CONCRETE				**$1,925,602**
04000 MASONRY				
04300 Interior Masonry				
8" CMU partition	10,181	SQFT	12.70	129,336
SUBTOTAL: Interior Masonry				**$129,336**
TOTAL: MASONRY				**$129,336**
05000 METALS				
05100 Structural Steel				
Structural steel columns, beams & joist @ flooor areas, 10lbs/sf	18	TONS	3,728.92	67,121
Structural steel columns, beams & joist @ roof areas, 7lbs/sf	223	TONS	3,728.92	831,550
Composite metal floor deck, 2" thk, 18 ga	3,574	SQFT	3.59	12,834
Metal roof deck, galvanized, 1-1/2" thk, 22 ga	63,597	SQFT	2.39	151,806
SUBTOTAL: Structural Steel				**$1,063,311**
05300 Stairs				
Metal pan stairs	197	LNFT	75.16	14,806
Metal pan stair landing	130	SQFT	95.39	12,400
Steel railing system, painted - stairs	47	LNFT	113.06	5,314
Steel handrail, 1-1/2" dia, wall mounted, painted	108	LNFT	30.59	3,304
SUBTOTAL: Stairs				**$35,824**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
05400 Metal Fabrications				
Miscellaneous angles, channels, lintels, etc.	59,477	SQFT	1.30	77,142
Guardrail gate 2 @ 3' each	3	EACH	530.18	1,591
Guardrail @ Mezzanine, ramp	258	LNFT	113.06	29,170
Canopies @ overhead door entrances	1,670	SQFT	48.06	80,264
SUBTOTAL: Metal Fabrications				**$188,167**
TOTAL: METALS				**$1,287,301**
06000 WOODS, PLASTICS & COMPOSITES				
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	59,477	SQFT	0.79	46,874
SUBTOTAL: Rough Carpentry				**$46,874**
06300 Millwork				
P-lam base cabinets and solid surface countertops	53	LNFT	415.04	21,997
P-lam wall hung cabinets	53	LNFT	235.05	12,457
Solid surface vanity	44	LNFT	234.55	10,320
SUBTOTAL: Millwork				**$44,775**
TOTAL: WOODS, PLASTICS & COMPOSITES				**$91,648**
07000 THERMAL & MOISTURE PROTECTION				
07100 Dampproofing & Waterproofing				
Dampproofing - foundation walls	4,836	SQFT	1.44	6,945
SUBTOTAL: Dampproofing & Waterproofing				**$6,945**
07200 Thermal Insulation				
2" foundation insulation	10,304	SQFT	2.13	21,937
SUBTOTAL: Thermal Insulation				**$21,937**
07400 Roofing				
Membrane roofing, w/ insulation and all flashings	42,215	SQFT	8.86	373,894
SUBTOTAL: Roofing				**$373,894**
07600 Metal Panel Systems				
Standing seam roofing, w/ insulation & all flashing	21,382	SQFT	15.14	323,775
Metal soffit @ Loading Dock	313	SQFT	10.20	3,193
Insulated metal siding, w/ stud back-up	14,682	SQFT	26.81	393,560
SUBTOTAL: Metal Panel Systems				**$720,528**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	59,477	SQFT	0.12	6,965
SUBTOTAL: Caulking & Sealants				**$6,965**
TOTAL: THERMAL & MOISTURE PROTECTION				**$1,130,269**
08000 OPENINGS				
08100 Windows				
Fixed windows	7,875	SQFT	41.19	324,387
Translucent wall panels	369	SQFT	63.63	23,478
SUBTOTAL: Windows				**$347,865**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
08200 Curtainwall & Storefront				
Exterior storefront	437	SQFT	50.77	22,186
SUBTOTAL: Curtainwall & Storefront				**$22,186**
08300 Exterior Doors, Frames, & Hardware				
(2) 3'0"x7'0" HM door, frame & hardware	2	EACH	3,173.70	6,347
3'0"x7'0" HM door, frame & hardware	10	EACH	1,854.22	18,542
3'0" x 7'0" Aluminum glass door, frame & hardware	2	EACH	3,404.22	6,808
SUBTOTAL: Exterior Doors, Frames, & Hardware				**$31,698**
08400 Interior Doors, Frames, & Hardware				
3'0"x7'0" HM door, frame & hardware	8	EACH	1,854.22	14,834
3'0"x7'0" SC wood door, frame & hardware	14	EACH	1,604.22	22,459
SUBTOTAL: Interior Doors, Frames, & Hardware				**$37,293**
08500 Interior Glazing				
Interior storefront	300	SQFT	42.53	12,758
SUBTOTAL: Interior Glazing				**$12,758**
08600 Special Doors, Frames, & Hardware				
Elect operated OH door - 14'x14'	19	EACH	4,485.71	85,229
SUBTOTAL: Special Doors, Frames, & Hardware				**$85,229**
TOTAL: OPENINGS				**$537,028**
09000 FINISHES				
09100 Plaster & Gypsum Board				
2" mtl stud w/gypsum-1 side - @ Precast/CMU walls	6,456	SQFT	3.82	24,656
4" mtl stud w/gypsum-1 side - Chase	663	SQFT	3.96	2,625
Infill doors - gyp partition	1	EACH	290.53	291
3-5/8" 25 ga metal studs, 5/8" type x gypboard each side, 3" mineral fiber blanket insulation, full-height	10,434	SQFT	6.55	68,345
SUBTOTAL: Plaster & Gypsum Board				**$95,916**
09200 Floor Finishes				
Ceramic tile floor	1,870	SQFT	10.83	20,243
Ceramic tile base, 6" high	575	LNFT	15.28	8,784
VCT	4,721	SQFT	3.69	17,426
Rubber floor tile	528	SQFT	13.03	6,881
Vinyl base, 6" high	1,606	LNFT	1.92	3,087
Rubber stair tread, 12" wide	96	LNFT	20.66	1,983
Carpet tile	2,593	SQFT	4.82	12,510
SUBTOTAL: Floor Finishes				**$70,914**
09300 Wall Finishes				
Ceramic wall tile	4,188	SQFT	11.45	47,953
SUBTOTAL: Wall Finishes				**$47,953**
09400 Ceiling Finishes				
Gyp ceiling	1,749	SQFT	7.60	13,286
Gypsum board soffit	60	SQFT	11.44	687
ACT system, 2'-0" x 2'-0"	8,396	SQFT	3.97	33,351

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
SUBTOTAL: Ceiling Finishes				**$47,324**
09600 Paints & Coatings				
Concrete sealer	3,935	SQFT	0.85	3,355
Paint exposed structure	49,176	SQFT	1.04	51,266
SUBTOTAL: Paints & Coatings				**$54,621**
TOTAL: FINISHES				**$316,728**
10000 SPECIALTIES				
10300 Movable Partitions				
Folding partition	291	SQFT	44.96	13,085
SUBTOTAL: Movable Partitions				**$13,085**
10400 Toilet Accessories				
Toilet partition, accessible	6	EACH	1,038.20	6,229
Toilet partition, standard	13	EACH	810.56	10,537
Urinal screen	1	EACH	357.94	358
Toilet paper dispenser, single roll	18	EACH	65.73	1,183
Paper towel dispenser, surface mounted	7	EACH	86.46	605
Napkin disposal, stainless steel, surface mounted	11	EACH	104.55	1,150
Mirror	246	SQFT	16.35	4,022
Soap dispenser	15	EACH	76.46	1,147
Shower curtain rod	2	EACH	48.49	97
Folding shower seat	2	EACH	391.57	783
Coat hook	4	EACH	17.92	72
Grab bar set, three piece	7	EACH	239.38	1,676
Mirror	1	EACH	74.55	75
SUBTOTAL: Toilet Accessories				**$27,934**
10500 Fire Protection Specialties				
Fire extinguisher & cabinet, wall mounted	15	EACH	230.30	3,454
SUBTOTAL: Fire Protection Specialties				**$3,454**
10600 Lockers & Benches				
Locker bench	14	LNFT	33.39	467
Lockers	26	EACH	340.95	8,865
SUBTOTAL: Lockers & Benches				**$9,332**
10900 Miscellaneous Specialties				
Wire mesh partition	474	SQFT	7.01	3,323
Wire mesh partition - 3'x7' doors	2	EACH	483.97	968
SUBTOTAL: Miscellaneous Specialties				**$4,290**
TOTAL: SPECIALTIES				**$58,095**
14000 CONVEYING EQUIPMENT				
14300 Hydraulic Elevators				
Hydraulic freight elev 2 stop	1	EACH	125,000.00	125,000
SUBTOTAL: Hydraulic Elevators				**$125,000**
TOTAL: CONVEYING EQUIPMENT				**$125,000**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
21000 FIRE SUPPRESSION				
21200 Fire Sprinkler Equipment & Specialties				
Wet sprinkler system - $/SF	59,477	SQFT	3.00	178,437
SUBTOTAL: Fire Sprinkler Equipment & Specialties				**$178,437**
TOTAL: FIRE SUPPRESSION				**$178,437**
22000 PLUMBING				
22100 Selective Demolition				
Remove existing floor-mount water closets including carrier and piping	1	EACH	199.90	200
Remove existing sink including piping	1	EACH	399.80	400
SUBTOTAL: Selective Demolition				**$600**
22200 Plumbing Fixtures				
Domestic plumbing - fixtures & piping	59,477	SQFT	6.00	356,868
Water closet, wall hung, hardwired sensor-op flush valve - in Phase 1A Bldg	11	EACH	2,294.49	25,239
Lavatory, self rimming countertop, hardwired sensor-op faucet - in Phase 1A Bldg	14	EACH	1,856.29	25,988
Urinal, wall hung, hardwired automatic flush valve - in Phase 1A Bldg	3	EACH	2,191.19	6,574
SUBTOTAL: Plumbing Fixtures				**$414,669**
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				
Plumbing - complete	59,477	SQFT	8.00	475,816
SUBTOTAL: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$475,816**
TOTAL: PLUMBING				**$891,085**
23000 HEATING VENTILATION & AIR CONDITIONING				
23200 Ventilation & Exhaust				
HVAC - complete	59,477	SQFT	16.00	951,632
SUBTOTAL: Ventilation & Exhaust				**$951,632**
TOTAL: HEATING VENTILATION & AIR CONDITIONING				**$951,632**
26000 ELECTRICAL				
26200 Main Power Distribution				
Electrical - Complete	59,477	SQFT	26.00	1,546,170
SUBTOTAL: Main Power Distribution				**$1,546,170**
TOTAL: ELECTRICAL				**$1,546,170**
27000 COMMUNICATIONS				
27200 Tele/Data Systems				
Telecommunication/Data - rough-in only	59,477	SQFT	0.25	14,875
SUBTOTAL: Tele/Data Systems				**$14,875**
TOTAL: COMMUNICATIONS				**$14,875**
28000 ELECTRONIC SAFETY & SECURITY				
28200 Fire Alarm Systems				
Fire alarm System, complete	59,477	SQFT	1.83	108,653
SUBTOTAL: Fire Alarm Systems				**$108,653**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
28300 Intrusion Detection & Access Control Systems				
Intrusion Detection System, complete	59,477	SQFT	0.44	26,134
SUBTOTAL: Intrusion Detection & Access Control Systems				**$26,134**
TOTAL: ELECTRONIC SAFETY & SECURITY				**$134,787**
31000 EARTHWORK				
31100 Site Preparation & Excavation				
Excavate for retaining wall	8,303	CUYD	8.96	74,398
Rock removal - ALLOWANCE	3,000	CUYD	30.00	90,000
Backfill with excavated material	7,576	CUYD	7.41	56,111
Cut site to new elevations	49,638	CUYD	5.09	252,752
Haul off excavated material as CCDD (20% expansion)	60,438	CUYD	12.11	731,928
6" aggregate base @ 5" SOG	72	CUYD	28.97	2,086
8" aggregate base @ 8" SOG	1,254	CUYD	28.97	36,327
SUBTOTAL: Site Preparation & Excavation				**$1,243,602**
31200 Site Grading				
Rough grading, large area	4	ACRE	9,309.60	37,518
Fine grading, large area	4	ACRE	4,315.67	17,392
SUBTOTAL: Site Grading				**$54,910**
31300 Foundation Excavation & Fill				
Excavate for foundations	1,291	CUYD	10.24	13,220
Backfill with excavated material	1,079	CUYD	7.41	7,992
Haul off excavated material as CCDD (20% expansion)	255	CUYD	29.28	7,466
SUBTOTAL: Foundation Excavation & Fill				**$28,678**
31400 Soil Stabilizations				
Sheet pile (shoring for retention wall installation)	11,200	SQFT	14.76	165,361
SUBTOTAL: Soil Stabilizations				**$165,361**
31800 Site Demolition				
Remove asphalt paving	39,702	SQFT	0.60	23,873
Remove curb and gutter	329	LNFT	1.33	439
Remove & haul off paving stone base	985	CUYD	31.16	30,690
SUBTOTAL: Site Demolition				**$55,002**
TOTAL: EARTHWORK				**$1,547,552**
32000 EXTERIOR IMPROVEMENTS				
32100 Pavement				
Asphalt pavement, 2" surface course, on 2" binder course	69,625	SQFT	2.44	169,774
Asphalt pavement, 2" surface course, on 2" binder course - replace at additions	9,692	SQFT	2.49	24,103
Parking lot striping	1	LSUM	3,000.00	3,000
Concrete curb & gutter, machine formed	983	LNFT	11.09	10,905
Concrete curb & gutter, depressed	218	LNFT	17.83	3,888
SUBTOTAL: Pavement				**$211,670**
32300 Fencing & Walls				
Chain link fence	1,050	LNFT	46.85	49,188

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Chain link fence gates - (2) 6'ht x 14'	2	EACH	2,993.83	5,988
Chain link fence on retaining wall	713	LNFT	43.21	30,810
Formwork for retaining wall strip footing	2,908	SQFT	5.98	17,404
Formwork for retaining walls	22,718	SQFT	10.15	230,517
Reinforcement in retaining wall strip footing, avg 125 lbs/cy	41	TONS	2,059.03	83,391
Reinforcement in retaining walls, avg 200 lbs/cy	42	TONS	2,059.03	86,479
Concrete in retaining wall strip footing, 4,000 psi	646	CUYD	155.20	100,260
Concrete in retaining walls, 4,000 psi	421	CUYD	172.93	72,802
SUBTOTAL: Fencing & Walls				**$676,839**
32600 Landscaping				
Landscaping allowance	1	LSUM	15,000.00	15,000
SUBTOTAL: Landscaping				**$15,000**
TOTAL: EXTERIOR IMPROVEMENTS				**$903,509**
33000 UTILITIES				
33200 Site Water Service				
Site water service - See attached estimate by Strand Associates	1	LSUM	51,670.00	51,670
SUBTOTAL: Site Water Service				**$51,670**
33300 Site Sanitary & Storm Sewer				
New storm sewer - See attached estimate by Strand Associates	1	LSUM	113,850.00	113,850
SUBTOTAL: Site Sanitary & Storm Sewer				**$113,850**
33800 Site Electrical				
Site Electrical - Exterior lighting	69,625	SQFT	0.47	32,856
SUBTOTAL: Site Electrical				**$32,856**
TOTAL: UTILITIES				**$198,376**
TOTAL: PHASE 1B				**$11,969,819**

Draft Budget

OWNER	City of Madison
PROJECT TITLE	Nakoosa Trail Poject Options H&I
PROJECT NUMBER	13.182
DATE	August 27, 2014

MIDDLETON CONSTRUCTION CONSULTING

Description	Quantity	Unit	Cost / Unit	BaseTotal Cost Phase 1 only	Add for Alternate B - State Fleet	Add for Alternate C - Cub Foods Demo	Comments
Option H Phase 1 - Fire Maintenance Only							
0.0 SITE WORK							
Site Prep and Grading	1	LS		155,788	98,870	0	We are moving about 60% less earth with this option
Pavement	1	LS		349,130	371,627	-263,168	Option B Requires additional Parking Option C is Green Space
Landscaping	1	LS		100,000	50,000	0	I don't think we would need 200K anylonger
Site Improvements	1	LS		30,942	20,878	0	Retaining Walls/Etc.
Additional Green Space for Option C	1	LS				91,243	Option C requires Additional Green Space/Less Parking area
SITE WORK SUBTOTAL				635,860	541,375	-171,925	
0.1 NEW CONSTRUCTION							
Fleet Maintenance Building	26921	SF	$ 260.00	6,999,460			
Renovate Cub Foods for State Fleet	70000	SF	$ 44.89	0	3,142,300		
Demo Of Cub Foods	1	LS		0		591,766	
NEW BUILDING CONSTRUCTION SUBTOTAL				6,999,460	3,142,300	591,766	
OPTION H PHASE 1 CONSTRUCTION COSTS TOTAL				7,635,320	3,683,675	419,841	
Add Equipment Costs				1,750,000		0	Fleet Equipment
Add Equipment Costs for State Fleet Building					369,208		
Add Soft Costs- Design Fess, Geotechnical, Etc.	12.00%			1,126,238	442,041	50,381	
Total Costruction and Fees-Option H - Fire Maintenance Only				10,511,558	4,494,924	470,222	Add or Deduct from Base #; select Alt 'B' or Alt 'C'

MIDDLETON CONSTRUCTION CONSULTING

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CITY OF MADISON

NAKOOSA TRAIL FLEET SERVICES BLDG

Madison, Wisconsin

Schematic Design
December 17, 2014

DRAFT

Prepared For:
RNL
1451 Dolley Madison Blvd
Suite 200
McLean, Virginia 22101

NOTES REGARDING PREPARATION OF ESTIMATE

This estimate was prepared based on the following documents provided by RNL Design:

1. Schematic Design Pricing Package provided by RNL Design.
   dated December 17, 2014.

2. Stormwater - Opinion of Probable Cost by Strand Associates
   dated November 26, 2014.

4. 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 generated from current material/labor rates, historical production data, and discussions with relevant subcontractors and material suppliers. 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 Madison, 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 bid date for Phase 1A of ??.
2. A construction period of 6-8 months.
3. A construction bid date for Phase 1B of ??.
4. A construction period of 8-10 months.
5. The contract will be competitively bid to multiple contractors.
6. All contractors will be required to pay prevailing wages.
7. There are no phasing requirements within each project.
8. The contractors will have full access to the site during normal working hours
9. Estimate includes pricing as of December 2014.

EXCLUSIONS

The following are excluded from the cost of this estimate:

1. Professional Design Fees
2. Testing Fees
3. Owner Contingencies/Scope Changes
4. Construction Contingency
5. Premium Time / Restrictions on Contractor Working Hours
6. **Cost Escalation**
7. Finance and Legal Charges
8. Environmental Abatement Costs
9. Temporary Facilities
10. Loose Furniture
11. Equipment (Owner Furnished/Installed)
12. Artwork
13. Non-fixed Audio/Visual Equipment
14. Telephone / Data Equipment
15. Intercom System
16. City of Madison Radio Communications Tower
17. Overhead cranes
18. Vehicle lift equipment

Grand Summary

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COST SUMMARY	GSF	$/SF	BUILDING TOTAL
Phase 1A	38,956	$240.46	$9,367,447
Phase 1B	59,477	$243.32	$14,471,934
Phase 1A - Mezzanine Alternate	3,093	$38.35	$118,607
TOTAL ESTIMATED CONSTRUCTION COSTS	**101,526**	$235.98	**$23,957,988**

	COST SUMMARY	38,956 GSF	$/SF	BUILDING TOTAL
01000	GENERAL REQUIREMENTS		$0.00	$0
02000	EXISTING CONDITIONS		$0.00	$0
03000	CONCRETE		$27.20	$1,059,469
04000	MASONRY		$6.83	$266,143
05000	METALS		$20.69	$805,988
06000	WOODS, PLASTICS & COMPOSITES		$1.07	$41,628
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$20.49	$798,253
08000	OPENINGS		$9.84	$383,472
09000	FINISHES		$2.98	$116,059
10000	SPECIALTIES		$0.43	$16,697
11000	EQUIPMENT		$0.00	$0
12000	FURNISHINGS		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$0.00	$0
21000	FIRE SUPPRESSION		$3.00	$116,872
22000	PLUMBING		$8.00	$311,648
23000	HEATING, VENTILATING & AIR CONDITIONING		$16.00	$623,296
26000	ELECTRICAL		$26.00	$1,012,704
27000	COMMUNICATIONS		$0.25	$9,743
28000	ELECTRONIC SAFETY AND SECURITY		$2.27	$88,282
31000	EARTHWORK		$19.93	$776,317
32000	EXTERIOR IMPROVEMENTS		$16.09	$626,949
33000	UTILITIES		$16.33	$636,092
	SUBTOTAL		**$197.39**	**$7,689,612**
	ESCALATION TO CONSTRUCTION BID DATE	0.0%	$0.00	$0
	GENERAL CONDITIONS/BOND/INSURANCE	7.0%	$13.82	$538,273
	CONTRACTOR'S FEES	3.5%	$7.39	$287,976
	DESIGN CONTINGENCY	10.0%	$21.86	$851,586
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$240.46**	**$9,367,447**

	COST SUMMARY	59,477 GSF	$/SF	BUILDING TOTAL
01000	GENERAL REQUIREMENTS		$0.00	$0
02000	EXISTING CONDITIONS		$0.04	$2,387
03000	CONCRETE		$32.38	$1,925,602
04000	MASONRY		$2.17	$129,336
05000	METALS		$21.64	$1,287,301
06000	WOODS, PLASTICS & COMPOSITES		$1.54	$91,648
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$19.00	$1,130,269
08000	OPENINGS		$9.03	$537,028
09000	FINISHES		$5.33	$316,728
10000	SPECIALTIES		$0.98	$58,095
11000	EQUIPMENT		$0.00	$0
12000	FURNISHINGS		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$2.10	$125,000
21000	FIRE SUPPRESSION		$3.00	$178,437
22000	PLUMBING		$14.98	$891,085
23000	HEATING, VENTILATING & AIR CONDITIONING		$16.00	$951,632
26000	ELECTRICAL		$26.00	$1,546,170
27000	COMMUNICATIONS		$0.25	$14,875
28000	ELECTRONIC SAFETY AND SECURITY		$2.27	$134,787
31000	EARTHWORK		$24.51	$1,457,552
32000	EXTERIOR IMPROVEMENTS		$15.19	$903,509
33000	UTILITIES		$3.34	$198,376
	SUBTOTAL			**$11,879,817**
	ESCALATION TO CONSTRUCTION BID DATE	0.0%	$0.00	$0
	GENERAL CONDITIONS/BOND/INSURANCE	7.0%	$13.98	$831,587
	CONTRACTOR'S FEES	3.5%	$7.48	$444,899
	DESIGN CONTINGENCY	10.0%	$22.12	$1,315,630
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$243.32**	**$14,471,934**

Summary - Phase 1A Mezzanine Alternate **DRAFT**

	COST SUMMARY	3,093 GSF	$/SF	BUILDING TOTAL
01000	GENERAL REQUIREMENTS		$0.00	$0
02000	EXISTING CONDITIONS		$0.00	$0
03000	CONCRETE		$3.91	$12,091
04000	MASONRY		$0.00	$0
05000	METALS		$20.42	$63,173
06000	WOODS, PLASTICS & COMPOSITES		$0.00	$0
07000	THERMAL & MOISTURE PROTECTION SYSTEM		$0.00	$0
08000	OPENINGS		$0.00	$0
09000	FINISHES		$1.89	$5,861
10000	SPECIALTIES		$0.00	$0
11000	EQUIPMENT		$0.00	$0
12000	FURNISHINGS		$0.00	$0
13000	SPECIAL CONSTRUCTION		$0.00	$0
14000	CONVEYING EQUIPMENT		$0.00	$0
21000	FIRE SUPPRESSION		$0.00	$0
22000	PLUMBING		$0.00	$0
23000	HEATING, VENTILATING & AIR CONDITIONING		$0.00	$0
26000	ELECTRICAL		$5.25	$16,238
27000	COMMUNICATIONS		$0.00	$0
28000	ELECTRONIC SAFETY AND SECURITY		$0.00	$0
31000	EARTHWORK		$0.00	$0
32000	EXTERIOR IMPROVEMENTS		$0.00	$0
33000	UTILITIES		$0.00	$0
	SUBTOTAL			**$97,363**
	ESCALATION TO CONSTRUCTION BID DATE	0.0%	$0.00	$0
	GENERAL CONDITIONS/BOND/INSURANCE	7.0%	$2.20	$6,815
	CONTRACTOR'S FEES	3.5%	$1.18	$3,646
	DESIGN CONTINGENCY	10.0%	$3.49	$10,782
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$38.35**	**$118,607**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Base Bid				
01 PHASE 1A				
03000 CONCRETE				
031 031 - Missing Description				
Formwork for strip footings	2,141	SQFT	5.98	12,813
Formwork for column footings	810	SQFT	6.76	5,477
Formwork for elevator pit mat slab	142	SQFT	11.33	1,609
Formwork for elevator pit walls	325	SQFT	7.00	2,275
Formwork for foundation walls	6,761	SQFT	8.04	54,381
Subtotal: 031 - Missing Description				**$76,555.58**
032 032 - Missing Description				
Reinforcement in strip footings, avg 65 lbs/cy	4	TONS	2,250.02	9,000
Reinforcement in column footings, avg 80 lbs/cy	2	TONS	2,250.02	3,375
Reinforcement in elevator pit mat foundations, avg 175 lbs/cy	1	TONS	2,250.12	1,125
Reinforcement in elvator pit walls, avg 115 lbs/cy	1	TONS	2,250.13	1,125
Reinforcement in foundation walls, avg 115 lbs/cy	8	TONS	2,250.02	16,875
Subtotal: 032 - Missing Description				**$31,500.35**
033 033 - Missing Description				
Concrete in strip footings, 4,000 psi	119	CUYD	155.20	18,469
Concrete in column footings, 4,000 psi	38	CUYD	161.70	6,145
Concrete in elevator pit mat foundations, 4,000 psi	5	CUYD	133.85	669
Concrete in elevator pit walls, 4,000 psi	6	CUYD	138.07	828
Concrete in foundation walls, 4,000 psi	126	CUYD	159.84	20,140
Concrete slab on grade, 5" thk, with W6x6-2.9x2.9	16,102	SQFT	4.56	73,427
Concrete ramps	241	SQFT	11.07	2,667
Concrete slab on grade, 8" thk, with W6x6-2.9x2.9	15,133	SQFT	5.36	81,139
Vapor barrier at slab	31,235	SQFT	0.91	28,468
Extra for stepped footings	20	LNFT	137.49	2,750
Exterior concrete stairs	33	LNFT	28.28	933
Shake hardener - reflective	15,133	SQFT	1.22	18,520
NLWT Concrete on metal deck, 4-1/2" thk, with W6x6-1.4x1.4	6,612	SQFT	3.91	25,846
Slab @ stoops	1,596	SQFT	5.09	8,125
Concrete fill at metal pan stair landing	113	SQFT	15.03	1,698
Concrete fill at metal pan stair tread	96	LNFT	12.40	1,190
Subtotal: 033 - Missing Description				**$291,014.33**
035 035 - Missing Description				
Insulated precast panel	15,814	SQFT	41.76	660,399
Subtotal: 035 - Missing Description				**$660,398.97**
SUBTOTAL: CONCRETE				**$1,059,469**
04000 MASONRY				
043 043 - Missing Description				
8" CMU partition	20,950	SQFT	12.70	266,143
Subtotal: 043 - Missing Description				**$266,142.52**
SUBTOTAL: MASONRY				**$266,143**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
05000 METALS				
051 051 - Missing Description				
Structural steel columns, beams & joist @ flooor areas, 10lbs/sf	33	TONS	3,728.92	123,055
Structural steel columns, beams & joist @ roof areas, 7lbs/sf	125	TONS	3,728.92	466,116
Composite metal floor deck, 2" thk, 18 ga	6,612	SQFT	3.59	23,744
Metal roof deck, galvanized, 1-1/2" thk, 18 ga	35,766	SQFT	2.39	85,373
Subtotal: 051 - Missing Description				**$698,287.17**
053 053 - Missing Description				
Metal pan stairs	96	LNFT	75.16	7,215
Metal pan stair landing	113	SQFT	95.39	10,779
Steel railing system, painted - stairs	22	LNFT	113.06	2,487
Steel handrail, 1-1/2" dia, wall mounted, painted	40	LNFT	30.59	1,224
Subtotal: 053 - Missing Description				**$21,704.71**
054 054 - Missing Description				
Miscellaneous angles, channels, lintels, etc.	38,956	SQFT	1.30	50,526
Canopies @ overhead door entrances	738	SQFT	48.06	35,470
Subtotal: 054 - Missing Description				**$85,995.98**
SUBTOTAL: METALS				**$805,988**
06000 WOODS, PLASTICS & COMPOSITES				
062 062 - Missing Description				
Miscellaneous wood blocking & rough carpentry	38,956	SQFT	0.79	30,701
Subtotal: 062 - Missing Description				**$30,701.22**
063 063 - Missing Description				
P-lam base cabinets and solid surface countertops	15	LNFT	415.04	6,226
P-lam wall hung cabinets	20	LNFT	235.05	4,701
Subtotal: 063 - Missing Description				**$10,926.45**
SUBTOTAL: WOODS, PLASTICS & COMPOSITES				**$41,628**
07000 THERMAL & MOISTURE PROTECTION				
071 071 - Missing Description				
Dampproofing - foundation walls	3,016	SQFT	1.44	4,332
Elevator pit waterproofing	1	LSUM	1,642.81	1,643
Subtotal: 071 - Missing Description				**$5,974.38**
072 072 - Missing Description				
2" foundation insulation	6,288	SQFT	2.13	13,387
Subtotal: 072 - Missing Description				**$13,387.15**
074 074 - Missing Description				
Membrane roofing, w/ insulation and all flashings	24,220	SQFT	8.86	214,514
Subtotal: 074 - Missing Description				**$214,514.12**
075 075 - Missing Description				
Pavers @ Patio - adjustable ht	741	SQFT	20.00	14,820
Subtotal: 075 - Missing Description				**$14,820.00**
076 076 - Missing Description				
Standing seam roofing, w/ insulation & all flashing	11,546	SQFT	15.14	174,834
Metal Soffit	1,489	SQFT	17.28	25,736

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Insulated metal siding, w/ stud back-up	12,849	SQFT	26.81	344,425
Subtotal: 076 - Missing Description				**$544,995.18**
078 078 - Missing Description				
Miscellaneous caulking & sealants	38,956	SQFT	0.12	4,562
Subtotal: 078 - Missing Description				**$4,561.75**
SUBTOTAL: THERMAL & MOISTURE PROTECTION				**$798,253**
08000 OPENINGS				
081 081 - Missing Description				
Fixed windows	4,386	SQFT	41.19	180,668
Translucent wall panels	404	SQFT	63.63	25,705
Subtotal: 081 - Missing Description				**$206,373.38**
082 082 - Missing Description				
Exterior storefront	988	SQFT	50.77	50,159
Subtotal: 082 - Missing Description				**$50,159.48**
083 083 - Missing Description				
(2) 3'0"x7'0" HM door, frame & hardware	4	EACH	3,173.70	12,695
3'0"x7'0" HM door, frame & hardware	8	EACH	1,854.22	14,834
3'0" x 7'0" Aluminum glass door, frame & hardware	3	EACH	3,404.22	10,213
Subtotal: 083 - Missing Description				**$37,741.22**
084 084 - Missing Description				
(2) 3'0"x7'0" HM door, frame & hardware	1	EACH	2,923.70	2,924
3'0"x7'0" HM door, frame & hardware	6	EACH	1,854.22	11,125
3'0"x7'0" SC wood door, frame & hardware	13	EACH	1,604.22	20,855
Subtotal: 084 - Missing Description				**$34,903.88**
085 085 - Missing Description				
Borrowed lite	122	SQFT	31.00	3,782
Interior storefront	180	SQFT	42.53	7,655
Subtotal: 085 - Missing Description				**$11,436.70**
086 086 - Missing Description				
Elect operated OH door - 14'x14'	8	EACH	4,485.71	35,886
Elect operated OH door - 10'x12'	2	EACH	3,485.71	6,971
Subtotal: 086 - Missing Description				**$42,857.12**
SUBTOTAL: OPENINGS				**$383,472**
09000 FINISHES				
091 091 - Missing Description				
2" mtl stud w/gypsum-1 side - @ Precast/CMU walls	4,146	SQFT	3.82	15,834
4" mtl stud w/gypsum-1 side - Chase	478	SQFT	3.96	1,892
3-5/8" 25 ga metal studs, 5/8" type x gypboard each side, 3" mineral fiber blanket insulation, full-height	2,159	SQFT	6.55	14,142
Subtotal: 091 - Missing Description				**$31,868.37**
092 092 - Missing Description				
Ceramic tile floor	227	SQFT	10.83	2,457
Ceramic tile base, 6" high	105	LNFT	15.28	1,604
VCT	3,748	SQFT	3.69	13,835
Rubber floor tile	113	SQFT	13.03	1,473

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Vinyl base, 6" high	649	LNFT	1.92	1,247
Rubber stair tread, 12" wide	96	LNFT	20.66	1,983
Subtotal: 092 - Missing Description				**$22,599.24**
094 094 - Missing Description				
Gyp ceiling	226	SQFT	7.60	1,717
Gypsum board soffit	20	SQFT	11.44	229
ACT system, 2'-0" x 2'-0"	4,015	SQFT	3.97	15,949
Subtotal: 094 - Missing Description				**$17,894.47**
096 096 - Missing Description				
Concrete sealer	9,258	SQFT	0.85	7,892
Paint exposed structure	34,345	SQFT	1.04	35,805
Subtotal: 096 - Missing Description				**$43,697.11**
SUBTOTAL: FINISHES				**$116,059**
10000 SPECIALTIES				
102 102 - Missing Description				
Sign and graphic allowance	1	LSUM	10,000.00	10,000
Subtotal: 102 - Missing Description				**$10,000.00**
104 104 - Missing Description				
Toilet paper dispenser, single roll	2	EACH	65.73	131
Paper towel dispenser, surface mounted	2	EACH	86.46	173
Napkin disposal, stainless steel, surface mounted	1	EACH	104.55	105
Soap dispenser	2	EACH	76.46	153
Coat hook	2	EACH	17.92	36
Grab bar set, three piece	2	EACH	239.38	479
Mirror	2	EACH	74.55	149
Subtotal: 104 - Missing Description				**$1,225.56**
105 105 - Missing Description				
Fire extinguisher & cabinet, wall mounted	10	EACH	230.30	2,303
Fire extinguisher & cabinet, recessed	8	EACH	396.12	3,169
Subtotal: 105 - Missing Description				**$5,471.91**
SUBTOTAL: SPECIALTIES				**$16,697**
21000 FIRE SUPPRESSION				
212 212 - Missing Description				
Wet sprinkler system - $/SF	38,956	SQFT	3.00	116,872
Subtotal: 212 - Missing Description				**$116,871.90**
SUBTOTAL: FIRE SUPPRESSION				**$116,872**
22000 PLUMBING				
224 224 - Missing Description				
Plumbing - complete	38,956	SQFT	8.00	311,648
Subtotal: 224 - Missing Description				**$311,648.00**
SUBTOTAL: PLUMBING				**$311,648**
23000 HEATING VENTILATION & AIR CONDITIONING				
232 232 - Missing Description				
HVAC - complete	38,956	SQFT	16.00	623,296

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: 232 - Missing Description				**$623,296.00**
SUBTOTAL: HEATING VENTILATION & AIR CONDITIONING				**$623,296**
26000 ELECTRICAL				
262 262 - Missing Description				
Electrical - Complete	38,956	SQFT	26.00	1,012,704
Subtotal: 262 - Missing Description				**$1,012,704.07**
SUBTOTAL: ELECTRICAL				**$1,012,704**
27000 COMMUNICATIONS				
272 272 - Missing Description				
Telecommunication/Data - rough-in only	38,956	SQFT	0.25	9,743
Subtotal: 272 - Missing Description				**$9,742.90**
SUBTOTAL: COMMUNICATIONS				**$9,743**
28000 ELECTRONIC SAFETY & SECURITY				
282 282 - Missing Description				
Fire alarm System, complete	38,956	SQFT	1.83	71,165
Subtotal: 282 - Missing Description				**$71,164.82**
283 283 - Missing Description				
Intrusion Detection System, complete	38,956	SQFT	0.44	17,117
Subtotal: 283 - Missing Description				**$17,117.27**
SUBTOTAL: ELECTRONIC SAFETY & SECURITY				**$88,282**
31000 EARTHWORK				
311 311 - Missing Description				
Detention Basin Grading & Restoration - See attached estimate by Strand Associates	1	LSUM	295,975.00	295,975
Cut site to new elevations	4,659	CUYD	5.09	23,723
Haul excavated material off site as CCDD (20% expansion)	5,590	CUYD	12.11	67,697
6" aggregate base @ 5" SOG	299	CUYD	28.97	8,662
8" aggregate base @ 8" SOG	376	CUYD	28.97	10,892
Subtotal: 311 - Missing Description				**$406,948.54**
312 312 - Missing Description				
Rough grading, large area	5	ACRE	9,309.60	44,872
Fine grading, large area	4	ACRE	4,315.67	17,608
Subtotal: 312 - Missing Description				**$62,480.21**
313 313 - Missing Description				
Excavate for foundations	856	CUYD	10.24	8,766
Backfill with excavated material	731	CUYD	7.41	5,414
Haul off excavated material as CCDD (20% expansion)	150	CUYD	12.11	1,817
Subtotal: 313 - Missing Description				**$15,996.51**
316 316 - Missing Description				
Erosion Control - See attached estimate by Strand Associates	1	LSUM	25,000.00	25,000
Subtotal: 316 - Missing Description				**$25,000.00**
318 318 - Missing Description				
Sanitary sewer demo - See attached estimate by Strand Associates	1	LSUM	2,500.00	2,500
Storm sewer demo - See attached estimate by Strand Associates	1	LSUM	12,300.00	12,300

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Remove asphalt paving	178,548	SQFT	0.60	107,361
Remove curb and gutter	2,806	LNFT	1.33	3,733
Saw cut asphalt	504	LNFT	3.91	1,971
Remove & haul off paving stone base	4,430	CUYD	31.16	138,027
Subtotal: 318 - Missing Description				**$265,892.04**
SUBTOTAL: EARTHWORK				**$776,317**
32000 EXTERIOR IMPROVEMENTS				
321 321 - Missing Description				
CA-6 base, 8" thk at asphalt paving	5,417	CUYD	27.30	147,867
Asphalt pavement, 2" surface course, on 2" binder course	148,636	SQFT	2.44	362,434
Parking lot striping	1	LSUM	2,500.00	2,500
Concrete curb & gutter, machine formed	1,870	LNFT	11.09	20,745
Concrete curb & gutter, depressed	341	LNFT	17.83	6,082
Subtotal: 321 - Missing Description				**$539,627.45**
323 323 - Missing Description				
Manually operated steel arm gate	1	EACH	1,793.83	1,794
Card access gates	3	LSUM	8,000.00	24,000
Subtotal: 323 - Missing Description				**$25,793.83**
326 326 - Missing Description				
Landscaping allowance	1	LSUM	25,000.00	25,000
Topsoil, 6" thk	5,289	SQFT	0.74	3,895
Seeding, fertilizer and fine grading, machine	5,289	SQFT	0.50	2,632
Subtotal: 326 - Missing Description				**$31,527.68**
329 329 - Missing Description				
Signage, Monument Sign	1	LSUM	30,000.00	30,000
Subtotal: 329 - Missing Description				**$30,000.00**
SUBTOTAL: EXTERIOR IMPROVEMENTS				**$626,949**
33000 UTILITIES				
332 332 - Missing Description				
Site water service - See attached estimate by Strand Associates	1	LSUM	63,455.00	63,455
Subtotal: 332 - Missing Description				**$63,455.00**
333 333 - Missing Description				
New sanitary sewer - See attached estimate by Strand Associates	1	LSUM	21,565.00	21,565
New storm sewer - See attached estimate by Strand Associates	1	LSUM	328,690.00	328,690
Underground Infiltration Gallery - See attached estimate by Strand Associates	1	LSUM	36,158.00	36,158
Subtotal: 333 - Missing Description				**$386,413.00**
338 338 - Missing Description				
Site Electrical - Exterior lighting	129,525	SQFT	0.47	61,123
Site Electrical Service	414	LNFT	302.18	125,101
Subtotal: 338 - Missing Description				**$186,224.29**
SUBTOTAL: UTILITIES				**$636,092**
TOTAL: PHASE 1A				**$7,689,612**

02 PHASE 1B

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
02000 EXISTING CONDITIONS				
021 021 - Missing Description				
Remove CMU for new door openings, add lintel	3	EACH	397.64	1,193
Remove drywall metal stud partition	820	SQFT	1.07	873
Remove drywall ceiling, suspended	151	SQFT	1.74	262
Remove door and frame, single	1	EACH	58.58	59
Subtotal: 021 - Missing Description				**$2,387.35**
SUBTOTAL: EXISTING CONDITIONS				**$2,387**
03000 CONCRETE				
031 031 - Missing Description				
Formwork for strip footings	3,894	SQFT	5.98	23,304
Formwork for column footings	1,500	SQFT	6.76	10,142
Formwork for foundation walls	12,159	SQFT	8.04	97,800
Subtotal: 031 - Missing Description				**$131,246.52**
032 032 - Missing Description				
Reinforcement in strip footings, avg 65 lbs/cy	7	TONS	2,250.02	15,750
Reinforcement in column footings, avg 80 lbs/cy	3	TONS	2,250.02	6,300
Reinforcement in foundation walls, avg 115 lbs/cy	13	TONS	2,250.02	29,250
Subtotal: 032 - Missing Description				**$51,300.39**
033 033 - Missing Description				
Concrete in strip footings, 4,000 psi	216	CUYD	155.20	33,524
Concrete in column footings, 4,000 psi	69	CUYD	161.70	11,157
Concrete in foundation walls, 4,000 psi	225	CUYD	159.84	35,965
Concrete slab on grade, 5" thk, with W6x6-2.9x2.9	3,861	SQFT	4.56	17,607
Concrete ramps	560	SQFT	11.07	6,197
Concrete slab on grade, 8" thk, with W6x6-2.9x2.9	50,511	SQFT	5.36	270,825
Vapor barrier at slab	54,372	SQFT	0.91	49,555
Patch SOG @ toilet removal	1	EACH	154.81	155
Extra for stepped footings	60	LNFT	137.49	8,249
Exterior concrete stairs	15	LNFT	28.28	424
Shake hardener - reflective	50,511	SQFT	1.22	61,815
NLWT Concrete on metal deck, 4-1/2" thk, with W6x6-1.4x1.4	4,070	SQFT	3.91	15,910
Slab @ stoops	3,474	SQFT	5.09	17,686
Concrete fill at metal pan stair landing	130	SQFT	15.03	1,953
Concrete fill at metal pan stair tread	197	LNFT	12.40	2,443
Subtotal: 033 - Missing Description				**$533,465.12**
035 035 - Missing Description				
Insulated precast panel	28,965	SQFT	41.76	1,209,590
Subtotal: 035 - Missing Description				**$1,209,589.99**
SUBTOTAL: CONCRETE				**$1,925,602**
04000 MASONRY				
043 043 - Missing Description				
8" CMU partition	10,181	SQFT	12.70	129,336
Subtotal: 043 - Missing Description				**$129,336.37**
SUBTOTAL: MASONRY				**$129,336**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
05000 METALS				
051 051 - Missing Description				
Structural steel columns, beams & joist @ flooor areas, 10lbs/sf	18	TONS	3,728.92	67,121
Structural steel columns, beams & joist @ roof areas, 7lbs/sf	223	TONS	3,728.92	831,550
Composite metal floor deck, 2" thk, 18 ga	3,574	SQFT	3.59	12,834
Metal roof deck, galvanized, 1-1/2" thk, 22 ga	63,597	SQFT	2.39	151,806
Subtotal: 051 - Missing Description				**$1,063,311.03**
053 053 - Missing Description				
Metal pan stairs	197	LNFT	75.16	14,806
Metal pan stair landing	130	SQFT	95.39	12,400
Steel railing system, painted - stairs	47	LNFT	113.06	5,314
Steel handrail, 1-1/2" dia, wall mounted, painted	108	LNFT	30.59	3,304
Subtotal: 053 - Missing Description				**$35,823.91**
054 054 - Missing Description				
Miscellaneous angles, channels, lintels, etc.	59,477	SQFT	1.30	77,142
Guardrail gate 2 @ 3' each	3	EACH	530.18	1,591
Guardrail @ Mezzanine, ramp	258	LNFT	113.06	29,170
Canopies @ overhead door entrances	1,670	SQFT	48.06	80,264
Subtotal: 054 - Missing Description				**$188,166.50**
SUBTOTAL: METALS				**$1,287,301**
06000 WOODS, PLASTICS & COMPOSITES				
062 062 - Missing Description				
Miscellaneous wood blocking & rough carpentry	59,477	SQFT	0.79	46,874
Subtotal: 062 - Missing Description				**$46,873.82**
063 063 - Missing Description				
P-lam base cabinets and solid surface countertops	53	LNFT	415.04	21,997
P-lam wall hung cabinets	53	LNFT	235.05	12,457
Solid surface vanity	44	LNFT	234.55	10,320
Subtotal: 063 - Missing Description				**$44,774.51**
SUBTOTAL: WOODS, PLASTICS & COMPOSITES				**$91,648**
07000 THERMAL & MOISTURE PROTECTION				
071 071 - Missing Description				
Dampproofing - foundation walls	4,836	SQFT	1.44	6,945
Subtotal: 071 - Missing Description				**$6,945.46**
072 072 - Missing Description				
2" foundation insulation	10,304	SQFT	2.13	21,937
Subtotal: 072 - Missing Description				**$21,937.22**
074 074 - Missing Description				
Membrane roofing, w/ insulation and all flashings	42,215	SQFT	8.86	373,894
Subtotal: 074 - Missing Description				**$373,894.03**
076 076 - Missing Description				
Standing seam roofing, w/ insulation & all flashing	21,382	SQFT	15.14	323,775
Metal soffit @ Loading Dock	313	SQFT	10.20	3,193
Insulated metal siding, w/ stud back-up	14,682	SQFT	26.81	393,560

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: 076 - Missing Description				**$720,527.78**
078 078 - Missing Description				
Miscellaneous caulking & sealants	59,477	SQFT	0.12	6,965
Subtotal: 078 - Missing Description				**$6,964.76**
SUBTOTAL: THERMAL & MOISTURE PROTECTION				**$1,130,269**
08000 OPENINGS				
081 081 - Missing Description				
Fixed windows	7,875	SQFT	41.19	324,387
Translucent wall panels	369	SQFT	63.63	23,478
Subtotal: 081 - Missing Description				**$347,865.33**
082 082 - Missing Description				
Exterior storefront	437	SQFT	50.77	22,186
Subtotal: 082 - Missing Description				**$22,185.92**
083 083 - Missing Description				
(2) 3'0"x7'0" HM door, frame & hardware	2	EACH	3,173.70	6,347
3'0"x7'0" HM door, frame & hardware	10	EACH	1,854.22	18,542
3'0" x 7'0" Aluminum glass door, frame & hardware	2	EACH	3,404.22	6,808
Subtotal: 083 - Missing Description				**$31,698.04**
084 084 - Missing Description				
3'0"x7'0" HM door, frame & hardware	8	EACH	1,854.22	14,834
3'0"x7'0" SC wood door, frame & hardware	14	EACH	1,604.22	22,459
Subtotal: 084 - Missing Description				**$37,292.84**
085 085 - Missing Description				
Interior storefront	300	SQFT	42.53	12,758
Subtotal: 085 - Missing Description				**$12,757.83**
086 086 - Missing Description				
Elect operated OH door - 14'x14'	19	EACH	4,485.71	85,229
Subtotal: 086 - Missing Description				**$85,228.53**
SUBTOTAL: OPENINGS				**$537,028**
09000 FINISHES				
091 091 - Missing Description				
2" mtl stud w/gypsum-1 side - @ Precast/CMU walls	6,456	SQFT	3.82	24,656
4" mtl stud w/gypsum-1 side - Chase	663	SQFT	3.96	2,625
Infill doors - gyp partition	1	EACH	290.53	291
3-5/8" 25 ga metal studs, 5/8" type x gypboard each side, 3" mineral fiber blanket insulation, full-height	10,434	SQFT	6.55	68,345
Subtotal: 091 - Missing Description				**$95,916.37**
092 092 - Missing Description				
Ceramic tile floor	1,870	SQFT	10.83	20,243
Ceramic tile base, 6" high	575	LNFT	15.28	8,784
VCT	4,721	SQFT	3.69	17,426
Rubber floor tile	528	SQFT	13.03	6,881
Vinyl base, 6" high	1,606	LNFT	1.92	3,087
Rubber stair tread, 12" wide	96	LNFT	20.66	1,983
Carpet tile	2,593	SQFT	4.82	12,510

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: 092 - Missing Description				**$70,913.54**
093 093 - Missing Description				
Ceramic wall tile	4,188	SQFT	11.45	47,953
Subtotal: 093 - Missing Description				**$47,953.02**
094 094 - Missing Description				
Gyp ceiling	1,749	SQFT	7.60	13,286
Gypsum board soffit	60	SQFT	11.44	687
ACT system, 2'-0" x 2'-0"	8,396	SQFT	3.97	33,351
Subtotal: 094 - Missing Description				**$47,324.22**
096 096 - Missing Description				
Concrete sealer	3,935	SQFT	0.85	3,355
Paint exposed structure	49,176	SQFT	1.04	51,266
Subtotal: 096 - Missing Description				**$54,620.57**
SUBTOTAL: FINISHES				**$316,728**
10000 SPECIALTIES				
103 103 - Missing Description				
Folding partition	291	SQFT	44.96	13,085
Subtotal: 103 - Missing Description				**$13,084.79**
104 104 - Missing Description				
Toilet partition, accessible	6	EACH	1,038.20	6,229
Toilet partition, standard	13	EACH	810.56	10,537
Urinal screen	1	EACH	357.94	358
Toilet paper dispenser, single roll	18	EACH	65.73	1,183
Paper towel dispenser, surface mounted	7	EACH	86.46	605
Napkin disposal, stainless steel, surface mounted	11	EACH	104.55	1,150
Mirror	246	SQFT	16.35	4,022
Soap dispenser	15	EACH	76.46	1,147
Shower curtain rod	2	EACH	48.49	97
Folding shower seat	2	EACH	391.57	783
Coat hook	4	EACH	17.92	72
Grab bar set, three piece	7	EACH	239.38	1,676
Mirror	1	EACH	74.55	75
Subtotal: 104 - Missing Description				**$27,933.68**
105 105 - Missing Description				
Fire extinguisher & cabinet, wall mounted	15	EACH	230.30	3,454
Subtotal: 105 - Missing Description				**$3,454.43**
106 106 - Missing Description				
Locker bench	14	LNFT	33.39	467
Lockers	26	EACH	340.95	8,865
Subtotal: 106 - Missing Description				**$9,332.07**
109 109 - Missing Description				
Wire mesh partition	474	SQFT	7.01	3,323
Wire mesh partition - 3'x7' doors	2	EACH	483.97	968
Subtotal: 109 - Missing Description				**$4,290.49**
SUBTOTAL: SPECIALTIES				**$58,095**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
14000 CONVEYING EQUIPMENT				
143 143 - Missing Description				
Hydraulic freight elev 2 stop	1	EACH	125,000.00	125,000
Subtotal: 143 - Missing Description				**$125,000.00**
SUBTOTAL: CONVEYING EQUIPMENT				**$125,000**
21000 FIRE SUPPRESSION				
212 212 - Missing Description				
Wet sprinkler system - $/SF	59,477	SQFT	3.00	178,437
Subtotal: 212 - Missing Description				**$178,436.95**
SUBTOTAL: FIRE SUPPRESSION				**$178,437**
22000 PLUMBING				
221 221 - Missing Description				
Remove existing floor-mount water closets including carrier and piping	1	EACH	199.90	200
Remove existing sink including piping	1	EACH	399.80	400
Subtotal: 221 - Missing Description				**$599.70**
222 222 - Missing Description				
Domestic plumbing - fixtures & piping	59,477	SQFT	6.00	356,868
Water closet, wall hung, hardwired sensor-op flush valve - in Phase 1A Bldg	11	EACH	2,294.49	25,239
Lavatory, self rimming countertop, hardwired sensor-op faucet - in Phase 1A Bldg	14	EACH	1,856.29	25,988
Urinal, wall hung, hardwired automatic flush valve - in Phase 1A Bldg	3	EACH	2,191.19	6,574
Subtotal: 222 - Missing Description				**$414,668.99**
224 224 - Missing Description				
Plumbing - complete	59,477	SQFT	8.00	475,816
Subtotal: 224 - Missing Description				**$475,816.00**
SUBTOTAL: PLUMBING				**$891,085**
23000 HEATING VENTILATION & AIR CONDITIONING				
232 232 - Missing Description				
HVAC - complete	59,477	SQFT	16.00	951,632
Subtotal: 232 - Missing Description				**$951,632.00**
SUBTOTAL: HEATING VENTILATION & AIR CONDITIONING				**$951,632**
26000 ELECTRICAL				
262 262 - Missing Description				
Electrical - Complete	59,477	SQFT	26.00	1,546,170
Subtotal: 262 - Missing Description				**$1,546,170.04**
SUBTOTAL: ELECTRICAL				**$1,546,170**
27000 COMMUNICATIONS				
272 272 - Missing Description				
Telecommunication/Data - rough-in only	59,477	SQFT	0.25	14,875
Subtotal: 272 - Missing Description				**$14,875.20**
SUBTOTAL: COMMUNICATIONS				**$14,875**
28000 ELECTRONIC SAFETY & SECURITY				
282 282 - Missing Description				
Fire alarm System, complete	59,477	SQFT	1.83	108,653

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: 282 - Missing Description				**$108,652.58**
283 283 - Missing Description				
Intrusion Detection System, complete	59,477	SQFT	0.44	26,134
Subtotal: 283 - Missing Description				**$26,134.19**
SUBTOTAL: ELECTRONIC SAFETY & SECURITY				**$134,787**
31000 EARTHWORK				
311 311 - Missing Description				
Excavate for retaining wall	8,303	CUYD	8.96	74,398
Backfill with excavated material	7,576	CUYD	7.41	56,111
Cut site to new elevations	49,638	CUYD	5.09	252,752
Haul off excavated material as CCDD (20% expansion)	60,438	CUYD	12.11	731,928
6" aggregate base @ 5" SOG	72	CUYD	28.97	2,086
8" aggregate base @ 8" SOG	1,254	CUYD	28.97	36,327
Subtotal: 311 - Missing Description				**$1,153,601.54**
312 312 - Missing Description				
Rough grading, large area	4	ACRE	9,309.60	37,518
Fine grading, large area	4	ACRE	4,315.67	17,392
Subtotal: 312 - Missing Description				**$54,909.84**
313 313 - Missing Description				
Excavate for foundations	1,291	CUYD	10.24	13,220
Backfill with excavated material	1,079	CUYD	7.41	7,992
Haul off excavated material as CCDD (20% expansion)	255	CUYD	29.28	7,466
Subtotal: 313 - Missing Description				**$28,677.80**
314 314 - Missing Description				
Sheet pile (shoring for retention wall installation)	11,200	LNFT	14.76	165,361
Subtotal: 314 - Missing Description				**$165,361.28**
318 318 - Missing Description				
Remove asphalt paving	39,702	SQFT	0.60	23,873
Remove curb and gutter	329	LNFT	1.33	439
Remove & haul off paving stone base	985	CUYD	31.16	30,690
Subtotal: 318 - Missing Description				**$55,001.61**
SUBTOTAL: EARTHWORK				**$1,457,552**
32000 EXTERIOR IMPROVEMENTS				
321 321 - Missing Description				
Asphalt pavement, 2" surface course, on 2" binder course	69,625	SQFT	2.44	169,774
Asphalt pavement, 2" surface course, on 2" binder course - replace at additions	9,692	SQFT	2.49	24,103
Parking lot striping	1	LSUM	3,000.00	3,000
Concrete curb & gutter, machine formed	983	LNFT	11.09	10,905
Concrete curb & gutter, depressed	218	LNFT	17.83	3,888
Subtotal: 321 - Missing Description				**$211,669.61**
323 323 - Missing Description				
Chain link fence	1,050	LNFT	46.85	49,188
Chain link fence gates - (2) 6'ht x 14'	2	EACH	2,993.83	5,988
Chain link fence on retaining wall	713	LNFT	43.21	30,810
Formwork for retaining wall strip footing	2,908	SQFT	5.98	17,404

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Formwork for retaining walls	22,718	SQFT	10.15	230,517
Reinforcement in retaining wall strip footing, avg 125 lbs/cy	41	TONS	2,059.03	83,391
Reinforcement in retaining walls, avg 200 lbs/cy	42	TONS	2,059.03	86,479
Concrete in retaining wall strip footing, 4,000 psi	646	CUYD	155.20	100,260
Concrete in retaining walls, 4,000 psi	421	CUYD	172.93	72,802
Subtotal: 323 - Missing Description				**$676,839.16**
326 326 - Missing Description				
Landscaping allowance	1	LSUM	15,000.00	15,000
Subtotal: 326 - Missing Description				**$15,000.00**
SUBTOTAL: EXTERIOR IMPROVEMENTS				**$903,509**
33000 UTILITIES				
332 332 - Missing Description				
Site water service - See attached estimate by Strand Associates	1	LSUM	51,670.00	51,670
Subtotal: 332 - Missing Description				**$51,670.00**
333 333 - Missing Description				
New storm sewer - See attached estimate by Strand Associates	1	LSUM	113,850.00	113,850
Subtotal: 333 - Missing Description				**$113,850.00**
338 338 - Missing Description				
Site Electrical - Exterior lighting	69,625	SQFT	0.47	32,856
Subtotal: 338 - Missing Description				**$32,856.04**
SUBTOTAL: UTILITIES				**$198,376**
TOTAL: PHASE 1B				**$11,879,819**
TOTAL: Base Bid				**$19,569,431**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Alternate #1 - Mezzanine				
01 PHASE 1A				
03000 CONCRETE				
033 033 - Missing Description				
NLWT Concrete on metal deck, 4-1/2" thk, with W6x6-1.4x1.4	3,093	SQFT	3.91	12,091
Subtotal: 033 - Missing Description				$12,090.54
SUBTOTAL: CONCRETE				$12,091
05000 METALS				
051 051 - Missing Description				
Structural steel columns, beams & joist @ flooor areas, 10lbs/sf	16	TONS	3,328.92	51,598
Subtotal: 051 - Missing Description				$51,598.33
054 054 - Missing Description				
Guardrail gate 2 @ 3' each	2	EACH	530.18	1,060
Guardrail @ Mezzanine	93	LNFT	113.06	10,515
Subtotal: 054 - Missing Description				$11,575.15
SUBTOTAL: METALS				$63,173
09000 FINISHES				
096 096 - Missing Description				
Concrete sealer	3,093	SQFT	0.85	2,637
Paint exposed structure	3,093	SQFT	1.04	3,224
Subtotal: 096 - Missing Description				$5,861.24
SUBTOTAL: FINISHES				$5,861
26000 ELECTRICAL				
265 265 - Missing Description				
Lighting System - Light fixtures including installation and hook up	3,093	SQFT	4.00	12,372
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	3,093	SQFT	1.25	3,866
Subtotal: 265 - Missing Description				$16,238.25
SUBTOTAL: ELECTRICAL				$16,238
TOTAL: PHASE 1A				**$97,364**
TOTAL: Alternate #1 - Mezzanine				**$97,364**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
EARTHWORK				
31100 Site Preparation & Excavation				
Excavate for retaining wall	8,303	CUYD	8.96	74,398
Backfill with excavated material	7,236	CUYD	7.41	53,593
Haul off excavated material as CCDD (20% expansion)	1,280	CUYD	12.11	15,501
TOTAL: Site Preparation & Excavation				**$143,492**
31400 Soil Stabilizations				
Sheet pile (shoring for retention wall installation)	11,200	LNFT	14.76	165,361
TOTAL: Soil Stabilizations				**$165,361**
TOTAL: EARTHWORK				**$308,854**
EXTERIOR IMPROVEMENTS				
32300 Fencing & Walls				
Chain link fence on retaining wall	713	LNFT	43.21	30,810
Formwork for retaining wall strip footing	2,908	SQFT	5.98	17,404
Formwork for retaining walls	22,718	SQFT	10.15	230,517
Reinforcement in retaining wall strip footing, avg 125 lbs/cy	41	TONS	2,059.03	83,391
Reinforcement in retaining walls, avg 200 lbs/cy	42	TONS	2,059.03	86,479
Concrete in retaining wall strip footing, 4,000 psi	646	CUYD	155.20	100,260
Concrete in retaining walls, 4,000 psi	421	CUYD	172.93	72,802
TOTAL: Fencing & Walls				**$621,664**
TOTAL: EXTERIOR IMPROVEMENTS				**$621,664**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
31000 EARTHWORK				
31100 Site Preparation & Excavation				
Excavate for retaining wall	8,303	CUYD	8.96	74,398
Rock removal - ALLOWANCE	3,000	CUYD	30.00	90,000
Backfill with excavated material	7,236	CUYD	7.41	53,593
Cut site to new elevations (building & parking lot area)	48,911	CUYD	5.09	249,050
Haul off excavated material as CCDD (20% expansion)	58,693	CUYD	12.11	710,796
Haul off excavated material as CCDD - retaining wall (20% expansion)	1,280	CUYD	12.11	15,501
SUBTOTAL: Site Preparation & Excavation				**$1,193,338**
31400 Soil Stabilizations				
Sheet pile (shoring for retention wall installation)	11,200	SQFT	14.76	165,361
SUBTOTAL: Soil Stabilizations				**$165,361**
TOTAL: EARTHWORK				**$1,358,699**
32000 EXTERIOR IMPROVEMENTS				
32300 Fencing & Walls				
Chain link fence on retaining wall	713	LNFT	43.21	30,810
Formwork for retaining wall strip footing	2,908	SQFT	5.98	17,404
Formwork for retaining walls	22,718	SQFT	10.15	230,517
Reinforcement in retaining wall strip footing, avg 125 lbs/cy	41	TONS	2,059.03	83,391
Reinforcement in retaining walls, avg 200 lbs/cy	42	TONS	2,059.03	86,479
Concrete in retaining wall strip footing, 4,000 psi	646	CUYD	155.20	100,260
Concrete in retaining walls, 4,000 psi	421	CUYD	172.93	72,802
SUBTOTAL: Fencing & Walls				**$621,664**
TOTAL: EXTERIOR IMPROVEMENTS				**$621,664**