Sanford Underground Research Facility

LZ

006 SURF - LZ DAVIS CAMPUS

Sanford Underground Research Facility
630 E. Summit Street Lead, SD 57754

Project No. 023-10206-004
11-02-2017
100% CONSTRUCTION DOCUMENTS

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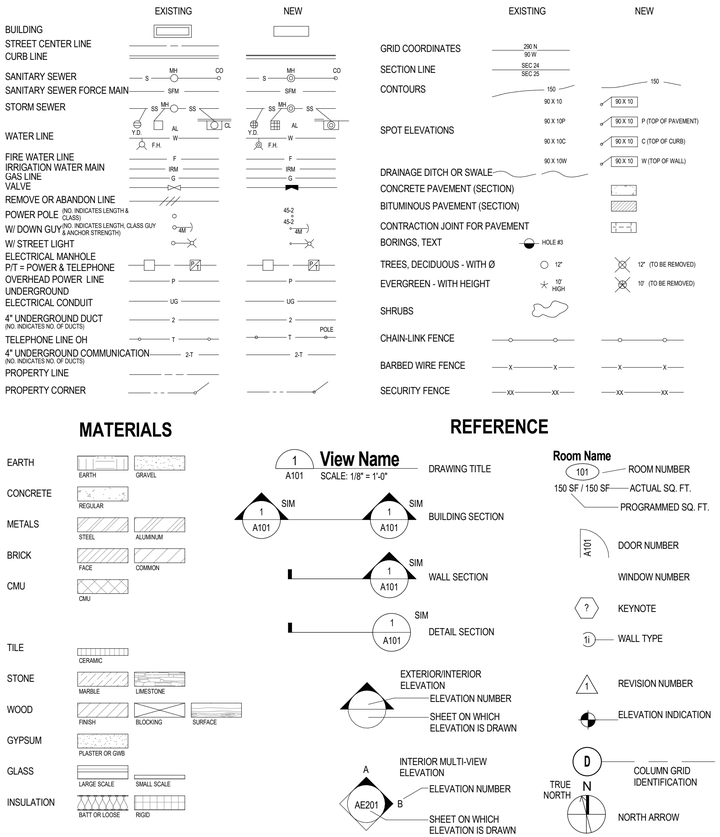
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GENERAL NOTES

SITE



MATERIALS

REFERENCE

ABBREVIATIONS

APX	APPROXIMATELY
BONIC	BY OWNER NOT IN CONTRACT
BOIBC	BY OWNER INSTALLED BY CONTRACTOR
FE	FIRE EXTINGUISHER
BOIBO	BY OWNER INSTALLED BY OWNER
PEMB	PRE ENGINEERED METAL BUILDING
RRS	RADON REDUCTION SYSTEM
SIM	SIMILAR

SHEET INDEX

SHEET NO.	SHEET NAME
000 - GENERAL	
GP-000-00	COVER SHEET
GP-000-01	SHEET INDEX
GP-000-02	DAVIS CAMPUS LIFE SAFETY ANALYSIS
GP-000-03	LZ DAVIS LAB LIFE SAFTEY ANALYSIS
000 - GENERAL DEMO	
GD-100-11	LOWER & MEZZ. LEVEL DEMOLITION PLANS
GD-100-12	4850 LEVEL DEMOLITION PLANS
GD-100-31	DAVIS LAB DEMOLITION SECTIONS
GD-400-10	MEZZANINE AND 4850 LEVEL MECHANICAL DEMOLITION PLAN
GD-400-11	XENON STORAGE ROOM MECHANICAL DEMOLITION PLAN
GD-400-12	DAVIS CAMPUS DRIFT MECHANICAL DEMOLITION PLAN
GD-700-11	LOWER - DAVIS CAVERN LIGHTING AND POWER DEMOLITION PLANS
GD-700-12	4850 LEVEL LIGHTING AND POWER DEMOLITION PLANS
GD-700-13	SYSTEMS DEMOLITION PLANS
GD-700-14	GENERATOR ROOM DEMOLITION PLANS
GD-700-15	RRS ROOM AND XENON STORAGE ROOM DEMOLITION PLANS
100 - ARCH	
GP-100-10	OVERALL DAVIS CAMPUS PLAN
GP-100-11	LOWER & MEZZANINE LEVEL FLOOR PLANS
GP-100-12	4850 LEVEL FLOOR PLANS
GP-100-13	GENERATOR AND CHILLER ROOM FLOOR PLANS
GP-100-31	DAVIS CAVERN SECTIONS
GP-100-32	CAVERN SECTIONS
GP-100-51	DETAILS AND SCHEDULES
GP-100-52	HANDRAIL AND LADDER DETAILS
300 - STRUCT	
GP-300-11	SERVICE LEVEL FRAMING PLAN
GP-300-12	4850 LEVEL PLAN
GP-300-51	NOTES AND DETAILS
GP-300-52	FRAMING PLANS AND DETAILS
400 - MECH	
GP-400-10	OVERALL DAVIS CAMPUS MECHANICAL PLAN
GP-400-11	MEZZANINE and 4850 LEVEL MECHANICAL PLAN
GP-400-12	LZ BACKUP GENERATOR AND FUEL TANK ROOM MECHANICAL PLANS
GP-400-13	RRS ROOM XENON STORAGE ROOM MECHANICAL PLANS AND MECHANICAL SECTIONS
GP-400-14	DAVIS CAMPUS DRIFT MECHANICAL PLAN
GP-400-51	MECHANICAL SCHEDULES, DETAILS, AND DIAGRAMS
700 - ELEC	
GP-700-00	ELECTRICAL SYMBOLS
GP-700-10	OVERALL DAVIS CAMPUS ELECTRICAL PLAN
GP-700-11	LOWER AND MEZZANINE LEVEL LIGHTING PLANS
GP-700-12	4850 LEVEL LIGHTING PLANS
GP-700-13	LZ GENERATOR ROOM LIGHTING PLAN
GP-700-14	LOWER AND MEZZANINE LEVEL POWER PLANS
GP-700-15	4850 LEVEL POWER PLANS
GP-700-16	LZ GENERATOR ROOM, SUBSTATION, AND ELECTRICAL ROOM POWER PLANS
GP-700-17	LOWER AND MEZZANINE LEVEL SYSTEMS PLANS
GP-700-18	4850 LEVEL SYSTEMS PLANS
GP-700-19	LZ GENERATOR ROOM SYSTEMS PLAN
GP-700-20	DETECTOR CABLE TRAY PLANS
GP-700-61	ELECTRICAL SCHEDULES
GP-700-62	ELECTRICAL SCHEDULES
GP-700-63	ELECTRICAL DETAILS AND SCHEDULES
GP-700-64	CABLE TRAY SECTIONS
GP-700-65	CABLE TRAY ISOMETRICS

SHEET NUMBERING KEY

005-GP-000-01-CO

First Digit	Second Digit	Third Digit	Fourth Digit	Fifth Digit
005 - Project Number	GD - General Demo GP - General Purpose	000 Series – General and Civil 100 Series – Architectural 300 Series – Structural 400 Series – Mechanical 700 Series – Electrical 800 Series – Vendor drawings	00 – GENERAL (SYMBOLS LEGEND, NOTES, ETC.) 10 – PLANS (HORIZONTAL VIEWS) 20 – ELEVATIONS (VERTICAL VIEWS) 30 – SECTIONS (SECTIONAL VIEWS, WALL SECTIONS) 40 – LARGE-SCALE VIEWS (PLANS, ELEVATIONS, STAIR SECTIONS) 50 – DETAILS 60 – SCHEDULES AND DIAGRAMS 70 – USER DEFINED (FOR TYPES THAT DO NOT FALL IN OTHER CATEGORIES) 80 – USER DEFINED (FOR TYPES THAT DO NOT FALL IN OTHER CATEGORIES) 90 – 3D REPRESENTATIONS (ISOMETRICS, PERSPECTIVES, PHOTOGRAPHS)	C0 – Revision Number

Sanford Underground Research Facility

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

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100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 000 - GENERAL
Level: 4850ft

Drawing Content:
SHEET INDEX

Drawing Number:
006- GP-000-01 -C1

Drawing Size: 22" x 34"
Drawing Count: Sheet 02 of 50

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DAVIS CAMPUS CODE SUMMARY

INTERNATIONAL BUILDING CODE REVIEW SUMMARY

PROJECT: 4850 Davis Campus - LZ Experiment Underground Facility
Sanford Laboratory @ Homestake
Lead, South Dakota

PROJECT NUMBER: 006

DATE: 11/02/2017

APPLICABLE CODES
INTERNATIONAL BUILDING CODE: 2015 EDITION
ACCESSIBILITY CODE: 2015 EDITION
INTERNATIONAL FIRE CODE: 2015 EDITION
NFPA 101

A. OCCUPANCY CLASSIFICATION

[SECTION 302.1, TABLE 302.3.3]

GROUP	DESCRIPTION OF AREA
B	Davis Lab
H-4/F-1/B	Majorana

ACCESSORY USE AREA (IF ANY):
Traditional Space [SECTION 302.2]

MIXED OCCUPANCY RESTRICTIONS (IF ANY):
See separate Lab Code Reviews [SECTION 302.3]

INCIDENTAL USE AREA (IF ANY):
None [SECTION 302.1.1]

B. TYPE OF CONSTRUCTION

[Section 405 - Underground Building; Table 601 Section 602]

Compartmentalization (Section 405.4.1)
Minimum of 2 compartments are required (>60' below level of discharge)
Approximately equal in size
Elevator lobby compartment required
Should extend from the highest level of discharge serving the underground portions

1-hour fire barrier wall
Gasketed fire doors with a drop sill & automatic closing by smoke detection
Where provided, separate air supply and exhaust system
Smoke Exhaust system

Number of Exits
Minimum of two exits

Smoke Control System (Section 405.5)
Required per section 909 - shall restrict to the general area of fire origin and maintain means of egress

Fire Alarm Systems (Section 405.6)
Required per section 907.2.19

Public Address System (Section 405.7)
Required per section 907.2.19.1

Means of Egress (Section 405.8)
Minimum of two means of egress required with smoke proof enclosures (section 1019.1.8)

Standby Power (Section 405.9)
Complying with Section 2702 and standby power loads specified in Section 405.9 (1. Smoke control System, 2. Ventilation and automatic fire detection equipment for smoke proof enclosures. 3. Fire Pumps.)
pick-up withnin 60 seconds of failure of normal power supply

C. EXTERIOR WALL AND OPENING PROGRAM

[TABLE 601, SECTIONS 704.12]
FIRE RESISTANCE REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE :

D. EXIT PASSAGEWAYS/ FIRE BARRIERS

[TABLE 1020 & 706]
CONSTRUCTION (SECTION 706)
Extend from top of floor/ ceiling assembly below to the underside of the floor or roof slab and shall be securely attached thereto.
Hollow vertical spaces with the fire barrier wall shall be firestopped at every level.
OPENINGS AND PENETRATIONS (Section 712, 715, 1020.4 & 1020.5)
Equipment, ductwork necessary for separate pressurization, sprinkler piping, standpipes electrical raceways for fire dept communication system & electrical raceways serving the exit enclosure and terminating in a steel box not exceeding 16 sq inches
FIRE DOORS (section 715.3 & 1020.5)
Exit doors allowed
Communicating openings between adjacent exit passageways is not allowed

E. ALLOWABLE HEIGHTS AND BUILDING AREA

[TABLE 503]

HEIGHT MODIFICATIONS : [SECTION 504] N/A

BUILDING AREA:

	ACTUAL AREA	ALLOWABLE AREA
DAVIS LAB		
4850 Level	1826 SF	
Lower Level	1388 SF	
Majorana Lab	4928 SF	
Transition	1360 SF	
Davis Campus TOTAL	9502 SF	Unlimited

F. FIRE RESISTIVE REQUIREMENTS BY TYPE OF CONSTRUCTION

[TABLE 601]

CONSTRUCTION TYPE: 1B

CONDITION	REQUIREMENT	NOTES
1. STRUCTURAL FRAME	2	Note a - considered to be columns and the girders, beams trusses &
2. BEARING WALLS-EXTERIOR	2	spandrels having direct connection to the columns and bracing members
3. BEARING WALLS-INTERIOR	2	designed to carry gravity loads
4. NONBEARING WALL-EXTERIOR	0	
5. NONBEARING WALLS-INTERIOR	0	
6. FLOOR CONSTRUCTION	2	
7. ROOF CONSTRUCTION	1	Note c - fire protection of structural members required for H and F-1

FIRE RESISTIVE SUBSTITUTION (IF APPLICABLE):

G. OCCUPANT LOAD

[TABLE 1003.2.2.2, SECTION 1003.2.2, 1003.2.3, TABLE 1004.2.1.]
(REFER TO PLAN FOR MORE INFORMATION.)

OCCUPANCY CATEGORY	OCC. LOAD FACTOR	SPACE DESCRIPTION	ACTUAL AREA	OCC. LOAD	REQ'D EXISTS	ACTUAL EXISTS
4850 Level - Transition Space						
MECHANICAL EQUIPMENT	300 SF	MECHANICAL	1037 SF	4	1	1
	300 SF	ELECTRICAL	186 SF	1	1	1
BUSINESS (ACCESSORY USE)	100 SF	COVERALL AND BOOT	112 SF	2	1	1
	100 SF	DIRTY LOCKERS	91 SF	1	1	1
	100 SF	SHOWERS/CLEAN LOCKERS	190 SF	2	1	1
	100 SF	TOILETS	108 SF	2	1	1
	100 SF	CLEAN COORIDOR	195 SF	2	1	1
	100 SF	JANITOR	54 SF	1	1	1
	100 SF	CLEAN CORRIDOR	197 SF	2	1	1
		TRANSITION SPACE SUBTOTALS	2170 SF	17		
4850 LEVEL - MAJORANA LAB						
BUSINESS	100 SF	ASSEMBLY AREA/COMPRESSOR RM	1360 SF	14	1	1
F-1	200 SF	MACHINE SHOP	1055 SF	6	1	1
H-4	200 SF	E-FORMING LAB	596 SF	3	1	1
		LEVEL 4850 SUBTOTALS	3011 SF	23	1	2
Davis Lab						
Lower Davis Cavern	100 SF	Business /Lab	854 SF	9		
	100 SF	Business /Lab	354 SF	4		
Upper Davis Cavern	100 SF	Business/ Lab	1868 SF	19	SEE SHEET	
Transition	300 SF	Mech/Elec	1223 SF	5	GP-000-003	
Transition (accessory)	100 SF	Lockers/Toilets/Showers	694 SF	0		
Guests				10		
		Davis Campus TOTAL	4993 SF	47		
BUILDING TOTALS			10,174 SF	87		

H. EXITING REQUIREMENTS

[SECTION 1005.1,]

OCCUPANCY H-4

AREA	OCC. LOAD	REQ'D EXIT WIDTH* (INCHES PER OCCUPANT= 0.2)	ACTUAL EXIT WIDTH	REQ'D STAIR WIDTH** (INCHES PER OCCUPANT= 0.3)	ACTUAL STAIR WIDTH
Davis Campus	64	13	32	20	N/A

* DOOR WIDTH SHALL BO LESS THAN 32 INCHES [SECTION 1008.1]
** STAIRWAY WIDTH SHALL NOT BE LESS THAN 44 INCHES [SECTION 1009.1]; exception 1 - 36 inches with an occupant load <50
*** EXIT CORRIDOR WIDTH MIN 44"; EXCEPTION - MIN WIDTH 36" (occupant<50) (Section 1016.2)
Ceiling height shall not be less than 7'-0" (Section 1003.2)

EXIT ACCESS TRAVEL DISTANCE [TABLE 1016.1]

OCCUPANCY	ALLOWABLE*	ACTUAL TRAVEL DISTANCE
F-1	250 FEET	Exceeding Allowable:
H-4	175 FEET	Increasing Travel Distance with EXIT PASSAGEWAYS

(ACTUAL TRAVEL DISTANCE TO EXTERIOR OF BUILDING: NOT TO PUBLIC WAY.)
* WITH SPRINKLER

I. PLUMBING SYSTEMS

[TABLE 2902.1]
MINIMUM NUMBER OF PLUMBING FACILITIES

OCCUPANCY TYPE	NO. OF OCCUPANTS PER CODE	WATER CLOSETS		LAVATORIES		DRINKING FOUNTAINS		OTHER (SERVICE SINK)	
		REQ'D	ACTUAL	REQ'D	ACTUAL	REQ'D	ACTUAL	REQ'D	ACTUAL
BUSINESS	64	1 & 1	2 UNISEX	1 & 1	2 UNISEX	1	1*	1	1

Note: The location does not allow for drinking fountains. Bottled water is provided.

CODE ANALYSIS LEGEND

FB — 1 HOUR FIRE BARRIER PER IBC SECTION 706. OPENINGS FIRE RATED FOR 90 MINUTES UNLESS SHAFT, EXIT ENCLOSURE, OR EXIT PASSAGEWAY WALLS WHICH REQUIRE 1 HOUR RATED OPENINGS.

FB — 2 HOUR FIRE BARRIER PER IBC SECTION 706. OPENINGS FIRE RATED FOR 90 MINUTES.

AREA NAME 150 SF / 00 00 OCC. — ROOM (NET) AND AREA (GROSS) TAGS INDICATING SQUARE FOOTAGE / OCCUPANCY LOAD FACTOR, AND RESULTING OCCUPANCY BELOW

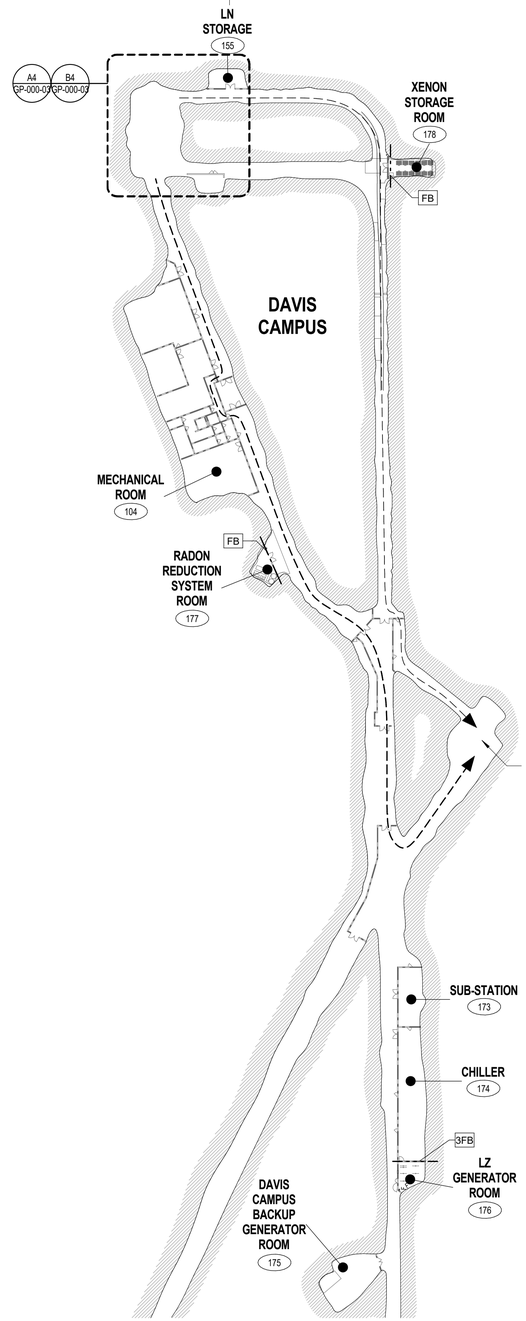
0 — INDICATES NUMBER OF OCCUPANTS EXITING ON EGRESS PATH

PATH A — EGRESS PATH WITH NAME, SEGMENT LENGTH, AND DIRECTION INDICATED

0 EXIT A — EXIT INDICATOR WITH NAME OF EXIT AND TOTAL OCCUPANTS EXITING INDICATED

B OCCUPANCY — IBC OCCUPANCY GROUP

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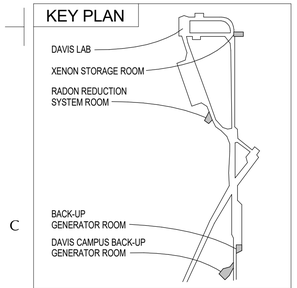
A4 **LIFE SAFETY PLAN**
GP-000-02 SCALE: 1" = 50'-0"

N

Sanford Underground Research Facility

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT REG. NO. 13412 MATTHEW CRAIG JOHNSON SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS
Project Name: LZ DAVIS CAMPUS
Issue Date: 11-02-2017
Discipline: 000 - GENERAL
Level: 4850ft
Drawing Content: DAVIS CAMPUS LIFE SAFETY ANALYSIS
Drawing Number: 006- GP-000-02 -C2
Drawing Size: 22" x 34"
Drawing Count: Sheet 03 of 50

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LZ DAVIS LAB CODE SUMMARY

INTERNATIONAL BUILDING CODE REVIEW SUMMARY

PROJECT: Davis - LZ Experiment Underground Facility
Sanford Laboratory @ Homestake
Lead, South Dakota

APPLICABLE CODES
INTERNATIONAL BUILDING CODE: 2015 EDITION
ACCESSIBILITY CODE: 2015 EDITION
INTERNATIONAL FIRE CODE: 2015 EDITION

PROJECT NUMBER: 006
DATE: 10/02/2017

A. OCCUPANCY CLASSIFICATION

[SECTION 302.1, TABLE 302.3.3]

GROUP: B — DESCRIPTION OF AREA: LAB

ACCESSORY USE AREA (IF ANY): [SECTION 302.2]
NA

MIXED OCCUPANCY RESTRICTIONS (IF ANY): [SECTION 302.3]
NA

INCIDENTAL USE AREA (IF ANY): [SECTION 302.1.1]
NA

CHEMICAL QUANTITIES (Closed System)
Liquid Nitrogen (LN2) - 800 kg (211 gallons)
Xenon (Xe) - 10000 Kilograms (2642 gallons)
Liquid Scintilator (UNLIMITED)

ALLOWABLE QUANTITIES (Table 307.7 w/ note "d")
Separate 1-hour enclosed LN room

CHEMICAL QUANTITIES (Chemical storage Cabinet)
Dow Corning 581 Silicone Transformer Oil < 5gal.
isopropyl alcohol = 5 liters (chemical cabinet)
JustRite = 1 dry quart (chemical cabinet)

B. TYPE OF CONSTRUCTION

[Section 405 - Underground Building; Table 601, Section 602]
TYPE I Construction (see overall code review - Sheet 006-GP-000-02)

C. EXTERIOR WALL AND OPENING PROGRAM

[TABLE 602, SECTIONS 704.12]
FIRE RESISTANCE REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE : N/A
(see overall code review - Sheet 006-GP-000-02)

D. ALLOWABLE HEIGHTS AND BUILDING AREA

[TABLE 503]
HEIGHT MODIFICATIONS : [SECTION 504]
(see overall code review - Sheet 006-GP-000-02)

			ACTUAL AREA	ALLOWABLE AREA
Accessory Storage areas	300 SF	LN Storage	322 SF	
BUILDING AREA:				
4850 LEVEL				
Business	100 SF	Lab area	904 SF	
	100 SF	Control Room	200 SF	
	100 SF	Clean Room	400 SF	
	300 SF	Xenon Storage room	280 SF	
		4850 LEVEL SUBTOTALS	2106 SF	Unlimited
LOWER LEVEL				
Accessory Storage areas	300 SF	Water Treatment	170 SF	
	300 SF	Lab area	854 SF	
	100 SF	Counting rooms	364 SF	
		LOWER LEVEL SUBTOTALS	1388 SF	Unlimited
		BUILDING TOTAL	3494 SF	Unlimited

E. FIRE RESISTIVE REQUIREMENTS BY TYPE OF CONSTRUCTION

[TABLE 601]
CONSTRUCTION TYPE: 1

CONDITION	REQUIREMENT	NOTES
1. STRUCTURAL FRAME	2	
2. BEARING WALLS-EXTERIOR	2	
3. BEARING WALLS-INTERIOR	2	
4. NONBEARING WALL-EXTERIOR	0	
5. NONBEARING WALLS-INTERIOR	0	
6. FLOOR CONSTRUCTION	2	
7. ROOF CONSTRUCTION	1	

Note c - fire protection of structural members required for H and F-1

FIRE RESISTIVE SUBSTITUTION (IF APPLICABLE): N/A

F. OCCUPANT LOAD AND EXITING REQUIREMENTS

[TABLE 1003.2.2.2, SECTION 1003.2.2, 1003.2.3, TABLE 1004.2.1]
(REFER TO PLAN FOR MORE INFORMATION.)

OCCUPANCY CATEGORY	OCC. LOAD FACTOR	SPACE DESCRIPTION	ACTUAL AREA	OCC. LOAD	REQ'D EXITS	ACTUAL EXITS
4850 LEVEL						
Accessory Storage areas	300 SF	LN Storage	322 SF	2	1	1
Business	100 SF	Lab area	904 SF	10	1	2
	100 SF	Control Room	200 SF	2	1	1
	100 SF	Clean Room	400 SF	4	1	1
	300 SF	Xenon Storage Room	280 SF	1	1	1
		4850 LEVEL SUBTOTALS	2106 SF	19	1	
LOWER DAVIS CAVERN						
Business	100 SF	Water Treatment	170 SF	2	1	1
	100 SF	Lab (excluding water tank)	854 SF	9	1	1
Business	100 SF	Compressor rooms	364 SF	4	1	1
		LOWER LEVEL SUBTOTALS	1388 SF	15	1	1
		OCCUPANT TOTAL	3494 SF	34	1	1

G. EXITING REQUIREMENTS

[Table 1003.2.3]

OCCUPANCY B AREA	OCC. LOAD	REQ'D EXIT WIDTH* (INCHES PER OCCUPANT= 0.3)	ACTUAL EXIT WIDTH	REQ'D STAIR WIDTH** (INCHES PER OCCUPANT= 0.2)	ACTUAL STAIR WIDTH
4850 LEVEL	19	3	32"	4	36"
LOWER LEVEL	7	2	32"	2	36"

* DOOR WIDTH SHALL NOT BE LESS THAN 32 INCHES [SECTION 1003.3.1]
** STAIRWAY WIDTH SHALL NOT BE LESS THAN 36 INCHES [SECTION 1003.3.3]

EXIT ACCESS TRAVEL DISTANCE [TABLE 1004.2.4]

OCCUPANCY	ALLOWABLE*	ACTUAL EXIT WIDTH
B	300 FEET	Exceeding MAX Increasing Travel Distance with Exit PASSAGEWAYS

(ACTUAL TRAVEL DISTANCE TO EXTERIOR OF BUILDING: NOT TO PUBLIC WAY.)
SEE OVERALL CODE REVIEW RELATIVE TO EXIST PASSAGEWAYS - SHEET 006-GP-000-02.
* WITH SPRINKLER

H. PLUMBING SYSTEMS

[Table 2902.1]
MINIMUM NUMBER OF PLUMBING FACILITIES
(see overall code review - Sheet 006-GP-000-03)

CODE ANALYSIS LEGEND

FB — 1 HOUR FIRE BARRIER PER IBC SECTION 706. OPENINGS FIRE RATED FOR 90 MINUTES UNLESS SHAFT, EXIT ENCLOSURE, OR EXIT PASSAGEWAY WALLS WHICH REQUIRE 1 HOUR RATED OPENINGS.

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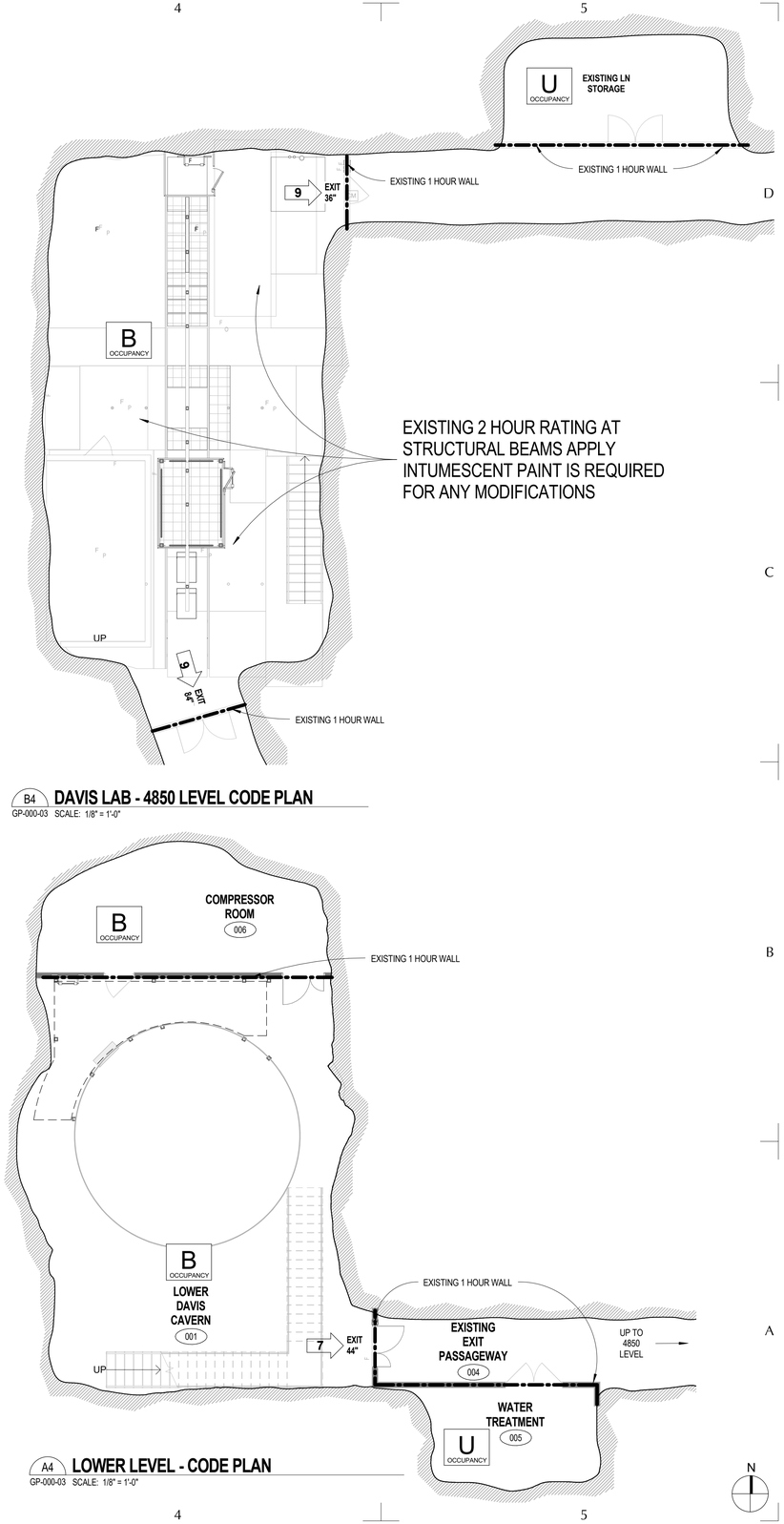
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B OCCUPANCY — IBC OCCUPANCY GROUP



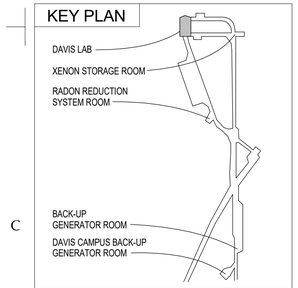
B4 **DAVIS LAB - 4850 LEVEL CODE PLAN**
GP-000-03 SCALE: 1/8" = 1'-0"

A4 **LOWER LEVEL - CODE PLAN**
GP-000-03 SCALE: 1/8" = 1'-0"

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Nov 2, 2017

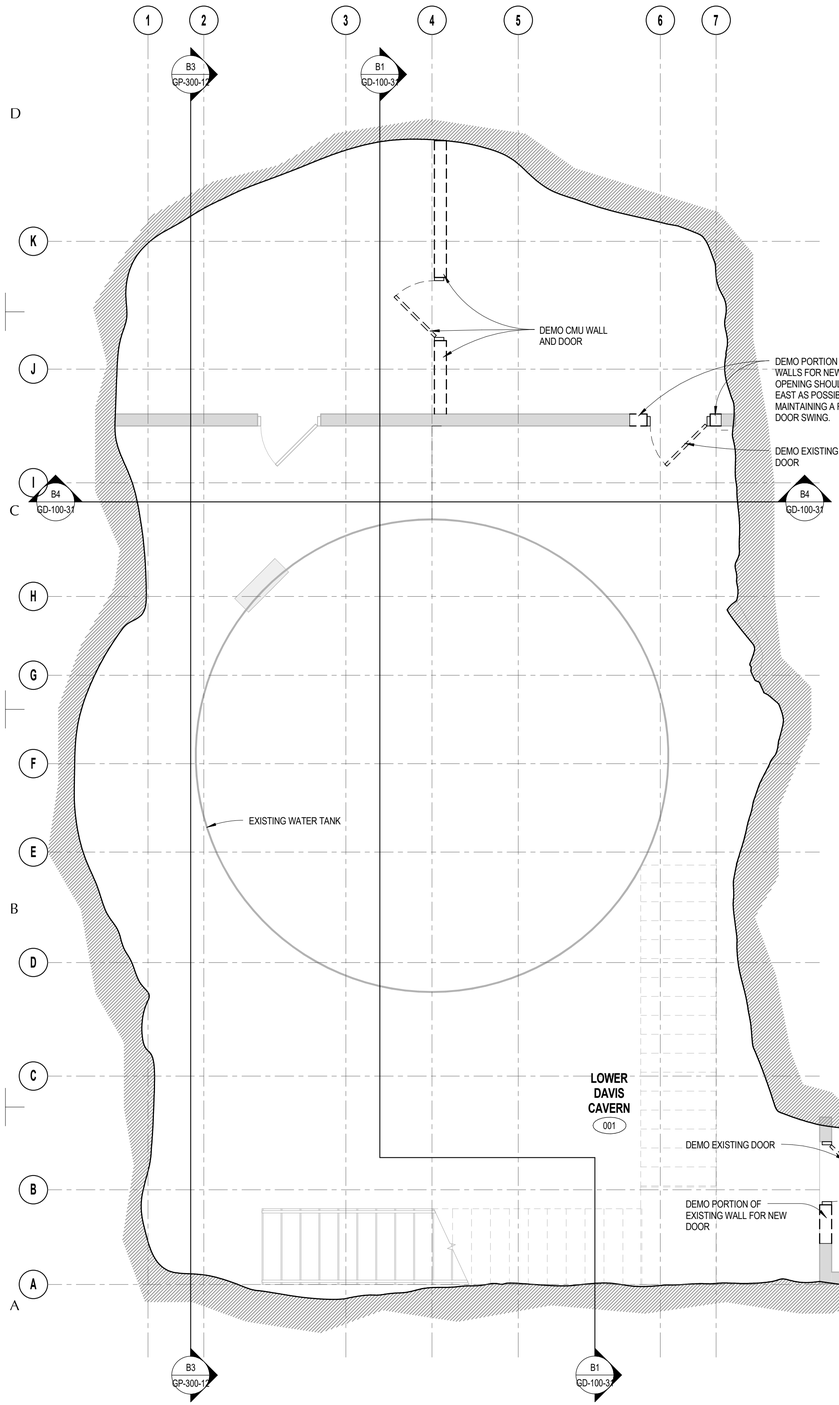
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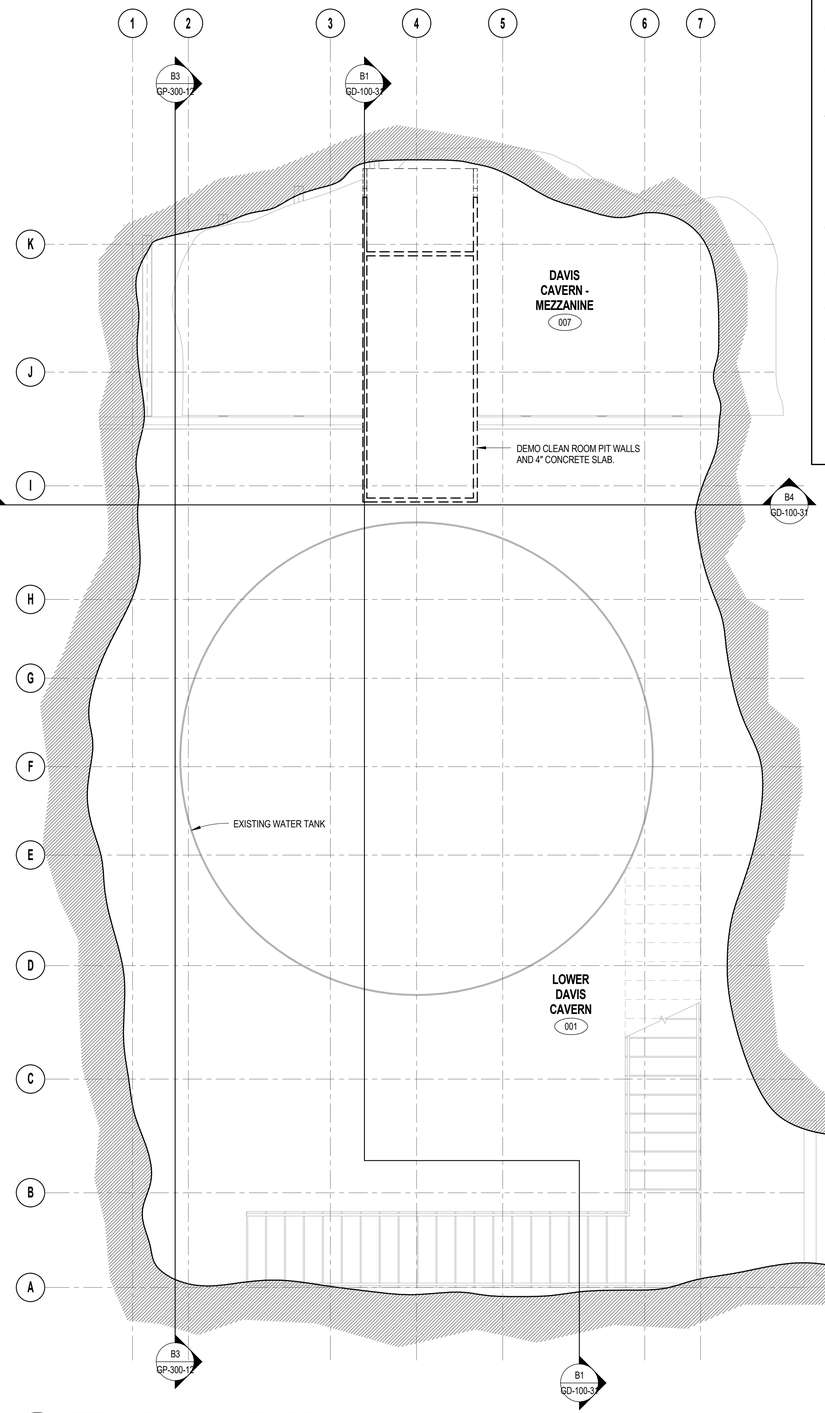
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A1 **LOWER - DAVIS CAVERN - DEMO**

GD-100-11 SCALE: 1/4" = 1'-0"



A3 **MEZZANINE - DAVIS CAVERN - DEMO**

GD-100-11 SCALE: 1/4" = 1'-0"

11/1/2017 2:41:00 PM

DEMOLITION GENERAL NOTES

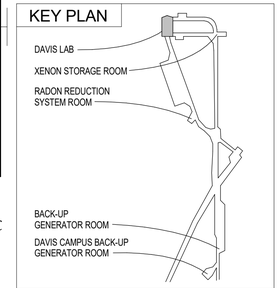
1. THE GENERAL CONTRACTOR SHALL ACCEPT THE PROJECT AS IT EXISTS. EXISTING CONDITIONS, WHETHER OR NOT SPECIFICALLY NOTED ON THE DRAWINGS, SHALL BE VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK.
2. DEMOLITION DRAWINGS INDICATE GENERAL SCOPE OF WORK ONLY. NOT ALL DEMOLITION WORK NECESSARY IS SPECIFICALLY INDICATED. THE EXTENT AND METHOD OF DEMOLITION SHALL BE AS NEEDED TO ACCOMMODATE THE NEW WORK AS DETAILED.
3. THE NOTATION "NO WORK" INDICATES THAT SUBSTANTIAL DEMOLITION ACTIVITIES ARE NOT ANTICIPATED IN THE DESIGNATED ROOM OR AREA. INCIDENTAL MODIFICATION OR DEMOLITION MAY BE REQUIRED TO ACCOMMODATE NEW WORK / SYSTEMS AS INDICATED ON OTHER DRAWINGS.
4. ACCESS ITEMS INDICATED FOR DEMOLITION IN A MANNER DESIGNED TO MINIMIZE IMPACT ON EXISTING WORK INDICATED TO REMAIN. WHENEVER POSSIBLE, PERFORM DEMOLITION ACTIVITIES FROM AREAS TO BE CONCEALED BY NEW WORK.
5. PATCH AND REPAIR EXISTING CONSTRUCTION WHICH IS DAMAGED OR DISTURBED TO MATCH EXISTING OR RESTORE TO ORIGINAL CONDITION. WHERE AREAS OR ITEMS THAT ARE INDICATED TO BE REMOVED ABUT OR ADJOIN EXISTING CONSTRUCTION INDICATED TO REMAIN, SAWCUT OR OTHERWISE REMOVE TO PROVIDE A CLEAN EDGE. IF EVIDENCE OF DEMOLITION WILL NOT BE CONCEALED BY NEW WORK, PATCH AND/OR REPAIR TRANSITION TO MATCH ADJACENT SURFACE AND FINISH.
6. ITEMS TO BE SALVAGED FOR THE OWNER HAVE BEEN INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS OR WILL BE REMOVED BY THE OWNER PRIOR TO THE START OF DEMOLITION. OTHER DEMOLISHED ITEM(S) SHALL BECOME THE CONTRACTOR'S PROPERTY AND SHALL BE REMOVED ENTIRELY FROM THE SITE.
7. CONSTRUCTION SCHEDULING AND SEQUENCING SHALL BE COORDINATED WITH THE OWNER PRIOR TO BEGINNING ANY WORK. COORDINATE DEMOLITION WORK TO ACCOMMODATE OWNER'S NORMAL OPERATIONS.
8. ERECT TEMPORARY PARTITIONS/BARRIERS AS REQUIRED TO PREVENT CONTAMINATION OF ADJACENT AREAS THAT ARE OR WILL BE USED BY THE OWNER FROM DUST, DEBRIS, AND EXCESSIVE NOISE CAUSED BY DEMOLITION ACTIVITIES.
9. SHORE AND/OR BRACE EXISTING WORK AS REQUIRED TO SAFELY REMOVE ITEM(S) OR EXISTING CONSTRUCTION WITHOUT DAMAGE TO EXISTING CONSTRUCTION INDICATED TO REMAIN.
10. DO NOT MODIFY EXISTING STRUCTURE UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED IN ADVANCE BY BOTH THE ARCHITECT AND STRUCTURAL ENGINEER.
11. REFER TO MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR SPECIFIC DEMOLITION OF RELATED ITEM(S).

Sanford Underground Research Facility

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP



100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

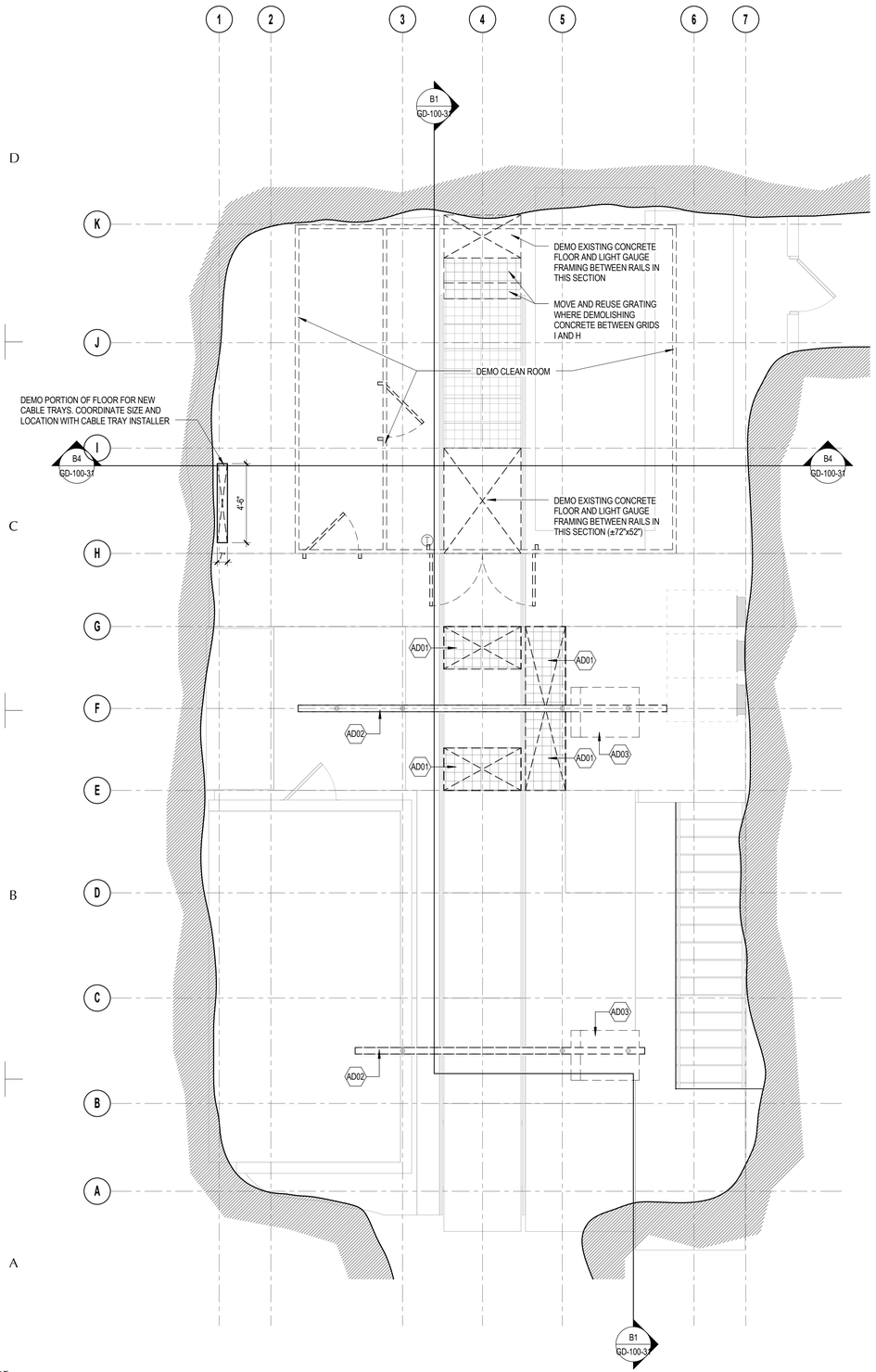
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Drawing Number: 006- GD-100-11 -C2

Drawing Size: 22" x 34"

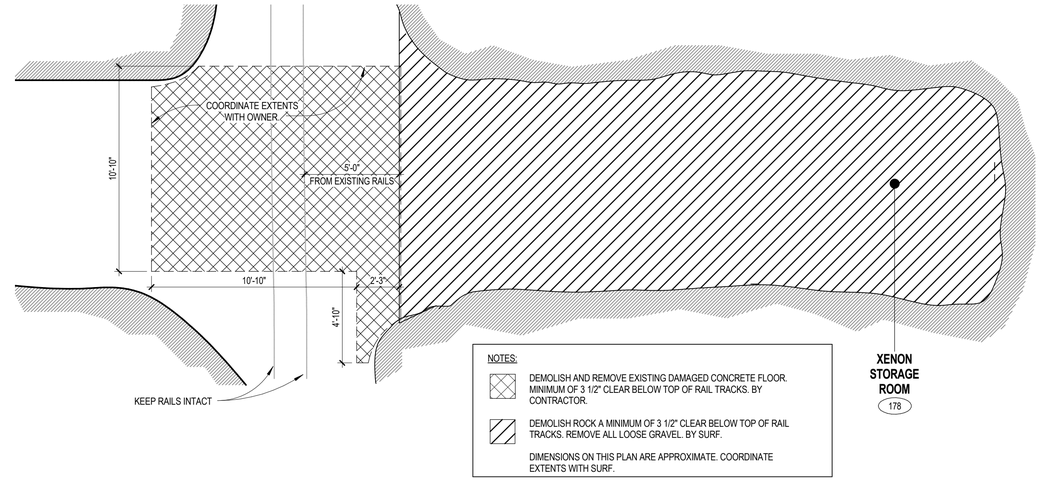
Drawing Count: Sheet 05 of 50

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A1 **UPPER - DAVIS CAVERN - DEMO**
GD-100-12 SCALE: 1/4" = 1'-0"

11/1/2017 2:41:00 PM



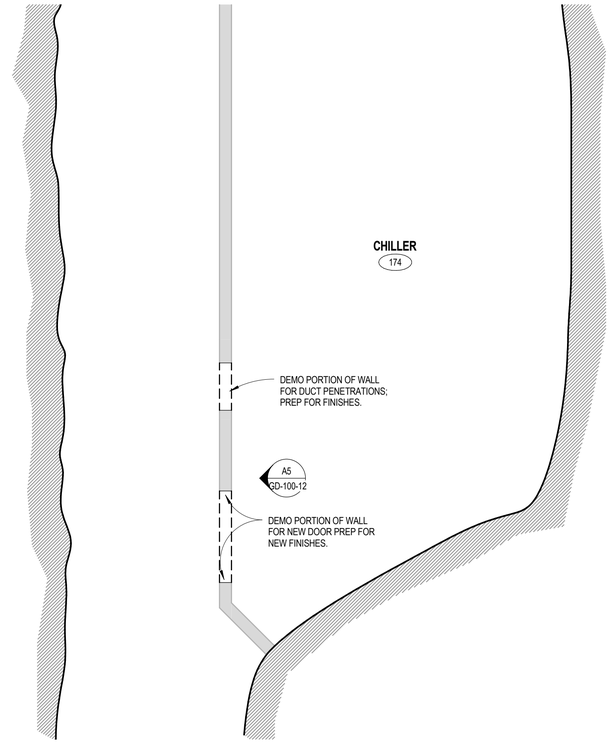
NOTES:

DEMOLISH AND REMOVE EXISTING DAMAGED CONCRETE FLOOR. MINIMUM OF 3 1/2" CLEAR BELOW TOP OF RAIL TRACKS. BY CONTRACTOR.

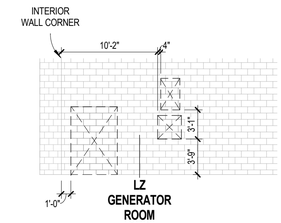
DEMOLISH ROCK A MINIMUM OF 3 1/2" CLEAR BELOW TOP OF RAIL TRACKS. REMOVE ALL LOOSE GRAVEL. BY SURF.

DIMENSIONS ON THIS PLAN ARE APPROXIMATE. COORDINATE EXTENTS WITH SURF.

3C **DEMO XENON STORAGE ROOM FLOOR PLAN**
GD-100-12 SCALE: 1/4" = 1'-0"



A3 **DEMO BACK-UP GENERATOR ROOM**
GD-100-12 SCALE: 1/4" = 1'-0"



NOTE:
- COORDINATE FINAL LOCATIONS/SIZES OF WALL DEMOLITION WITH EXISTING BLOCK COURSING AND THE MECHANICAL CONTRACTOR
- DIMENSIONS MAY VARY WITH EXISTING CONDITIONS

A5 **DEMO**
GD-100-12 SCALE: 1/8" = 1'-0"

N

*KEYNOTE LEGEND

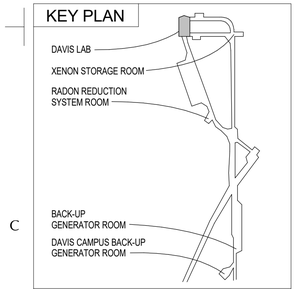
AD01	EXISTING GRATING WELDED DOWN. REMOVE WELDS, SALVAGE GRATING AND PLACE GRATING IN THE ORIGINAL LOCATIONS.
AD02	DISCONNECT MONORAIL FROM SUPPORTS AND RELOCATE. LEAVE EXISTING SUPPORTS(ANCHOR, FLANGE AND TUBE) IN PLACE FOR REUSE BY OWNER. SEE STRUCTURAL PLANS FOR MORE DETAIL.
AD03	REMOVE HOIST, DISCONNECT POWER AND RETURN TO OWNER.

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT
13412
MATTHEW CRAIG JOHNSON
SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

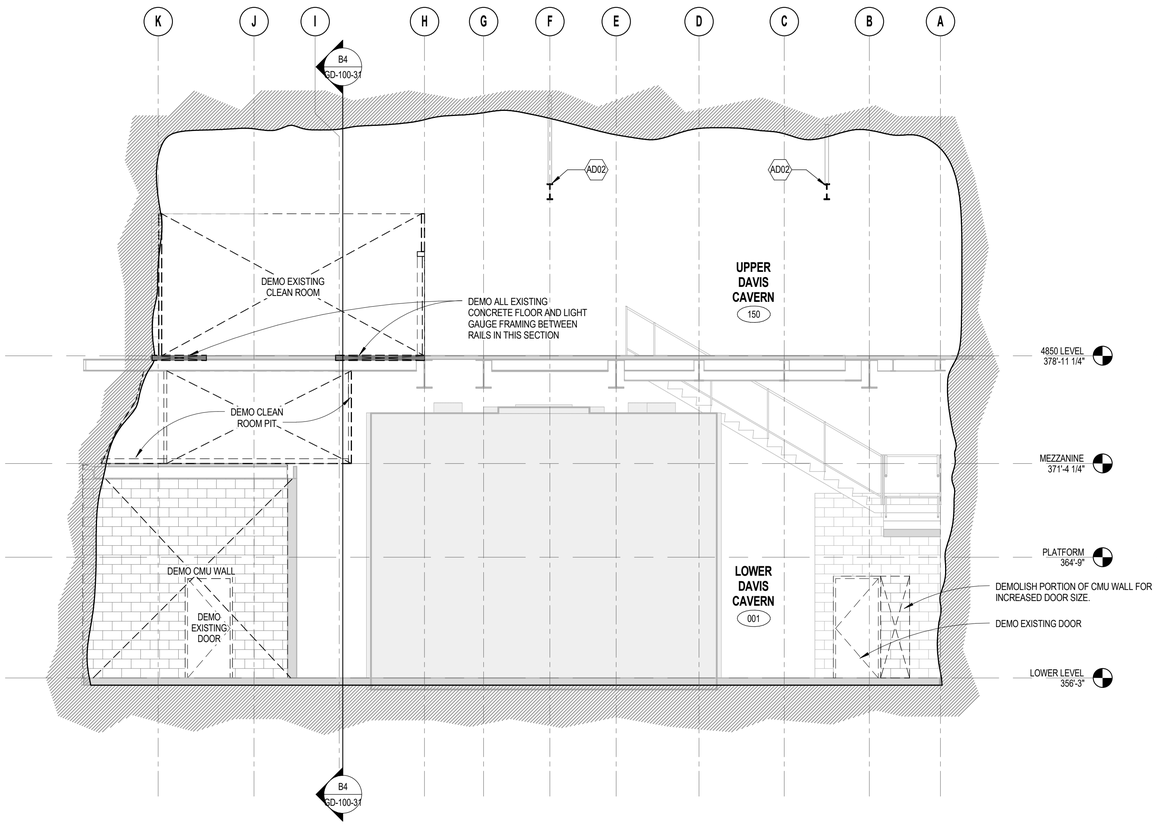
Discipline: 000 - GENERAL DEMO
Level: 4850ft

Drawing Content:
4850 LEVEL DEMOLITION PLANS

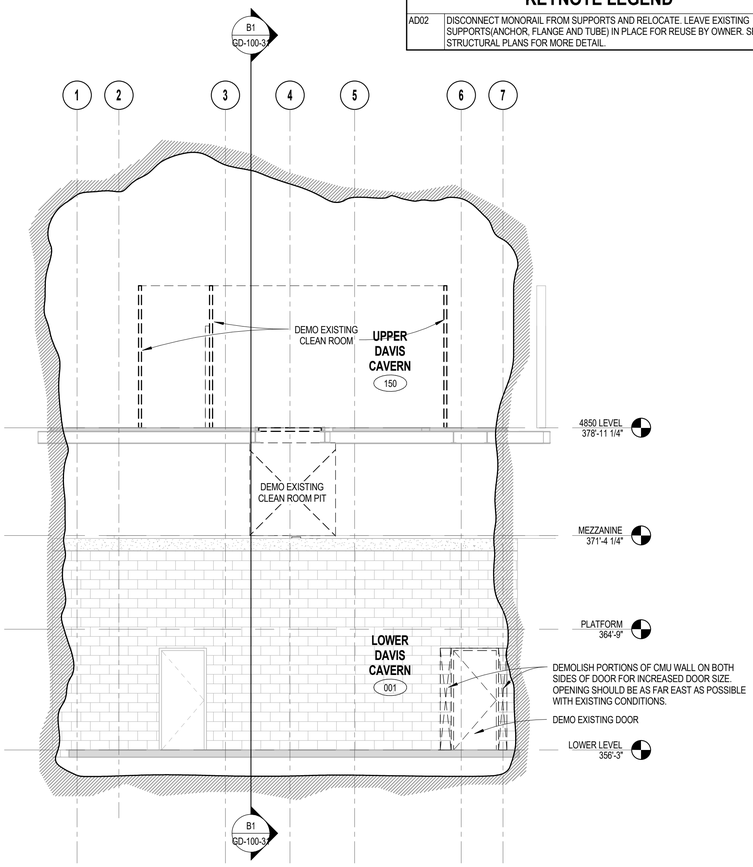
Drawing Number:
006- GD-100-12 -C2

Drawing Size: 22" x 34"
Drawing Count: Sheet 06 of 50

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B1 **DEMO DAVIS LAB SECTION**
GD-100-31 SCALE: 3/16" = 1'-0"



B4 **DEMO DAVIS LAB SECTION**
GD-100-31 SCALE: 3/16" = 1'-0"

*KEYNOTE LEGEND

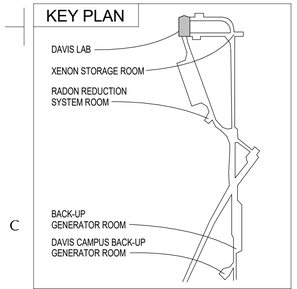
AD02	DISCONNECT MONORAIL FROM SUPPORTS AND RELOCATE. LEAVE EXISTING SUPPORTS(ANCHOR, FLANGE AND TUBE) IN PLACE FOR REUSE BY OWNER. SEE STRUCTURAL PLANS FOR MORE DETAIL.

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT
REG. NO. 13412
MATTHEW CRAIG JOHNSON
SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
000 - GENERAL DEMO

Level:
4850ft

Drawing Content:
DAVIS LAB DEMOLITION SECTIONS

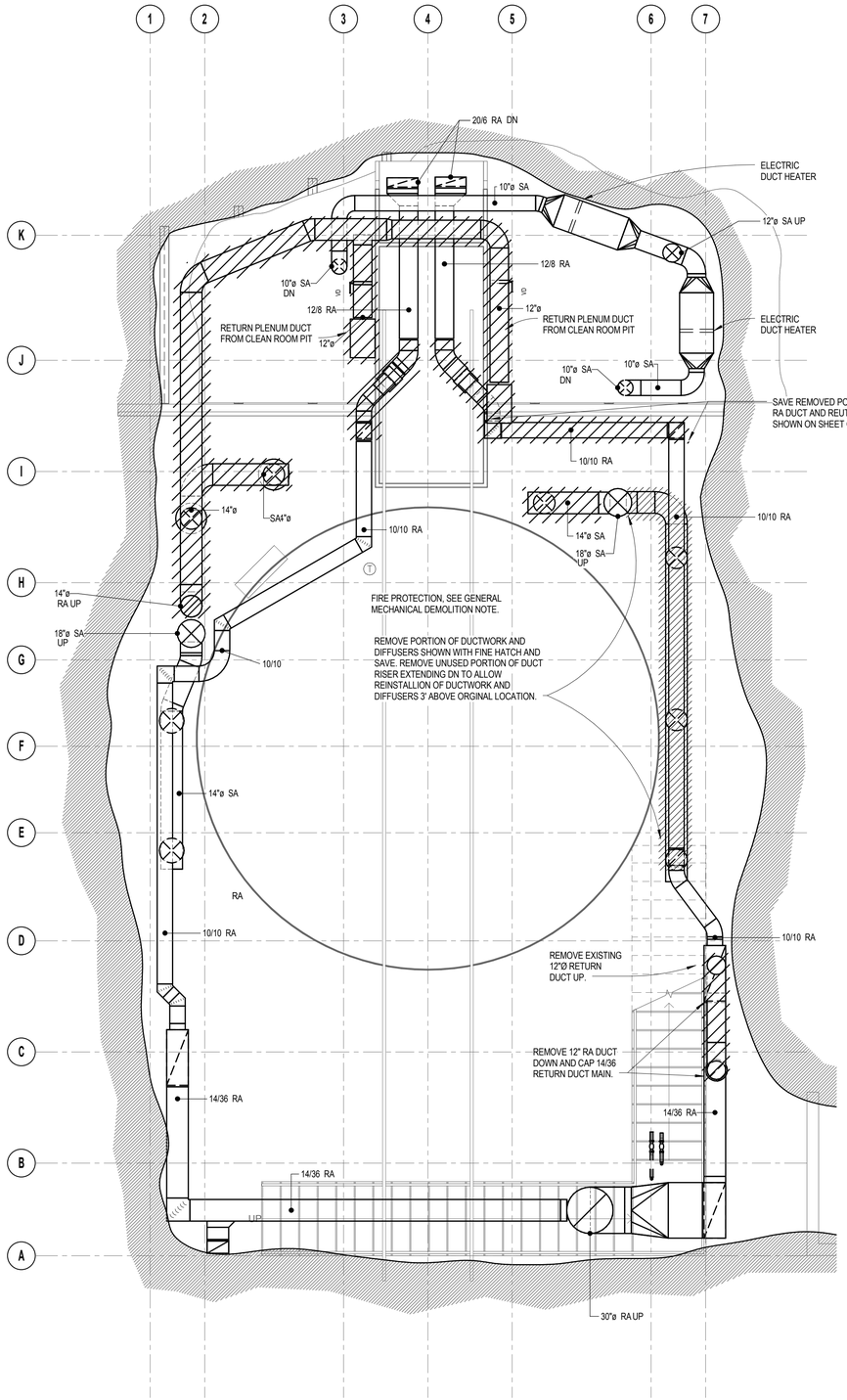
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006- GD-100-31 -C2

Drawing Size:
22" x 34"

Drawing Count:
Sheet 07 of 50

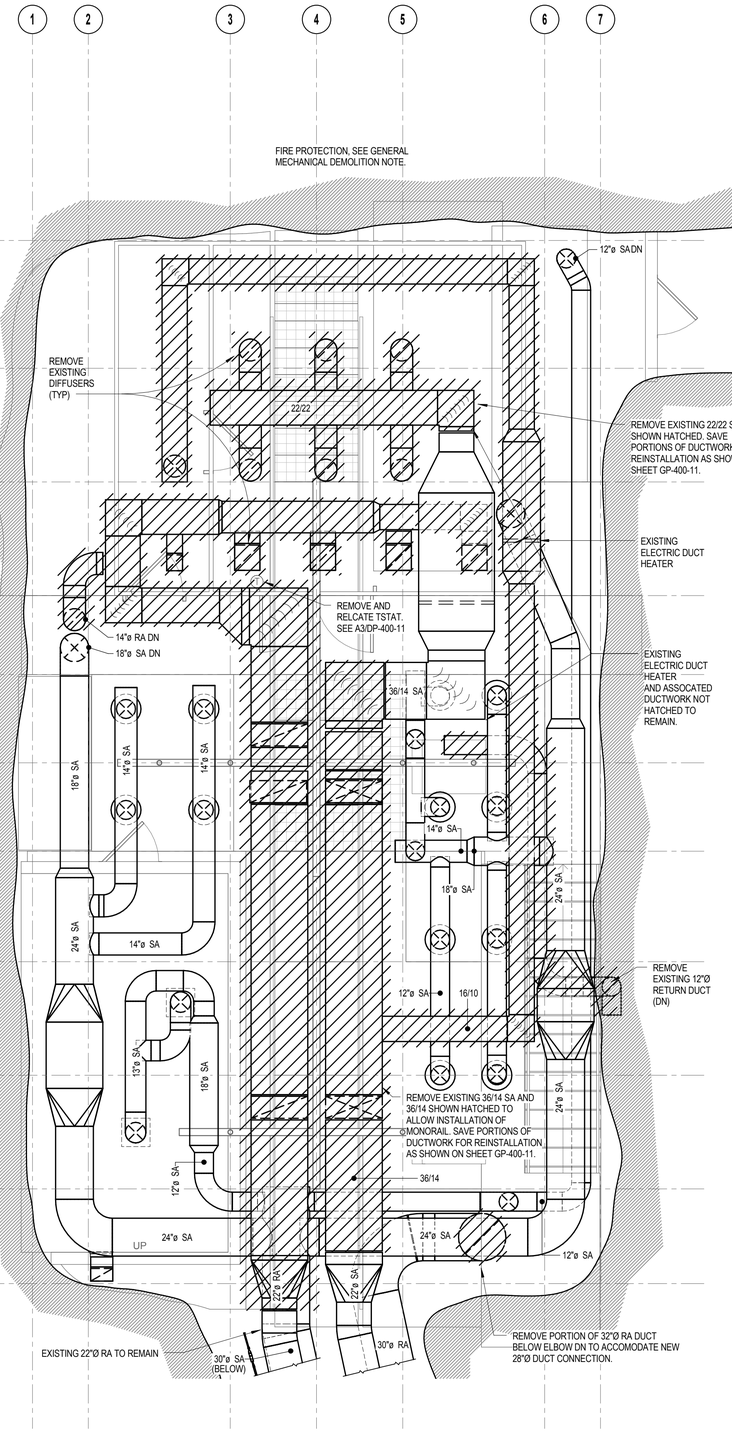
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11/1/2017 2:41:00 PM



A1 **MEZZANINE LEVEL MECHANICAL DEMO PLAN (BELOW DECK)**

GD-400-10 SCALE: 1/4" = 1'-0"



A3 **4850 LEVEL MECHANICAL DEMO PLAN (ABOVE DECK)**

GD-400-10 SCALE: 1/4" = 1'-0"

GENERAL MECHANICAL DEMOLITION NOTES

1. REMOVE ALL DUCTWORK AND MECHANICAL EQUIPMENT SHOWN HATCHED.
2. COORDINATE DEMOLITION OF ELECTRIC DUCT HEATER WITH ELECTRICAL CONTRACTOR.
3. DEMOLISH FIRE PROTECTION SYSTEM AS NEEDED TO ACCOMMODATE NEW FLOOR PLAN.
4. MEASURE AND RECORD ALL AIRFLOWS FROM DIFFUSERS/GRILLES IN THE DAVIS LAB. PRIOR TO DEMOLITION.

SCALE : 1/4" = 1'-0"

0 2' 4' 8'

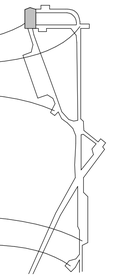
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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8891
DANIEL J. DELLOVECHIO
2 NOV 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

Drawing Content: MEZZANINE AND 4850 LEVEL MECHANICAL DEMOLITION PLAN

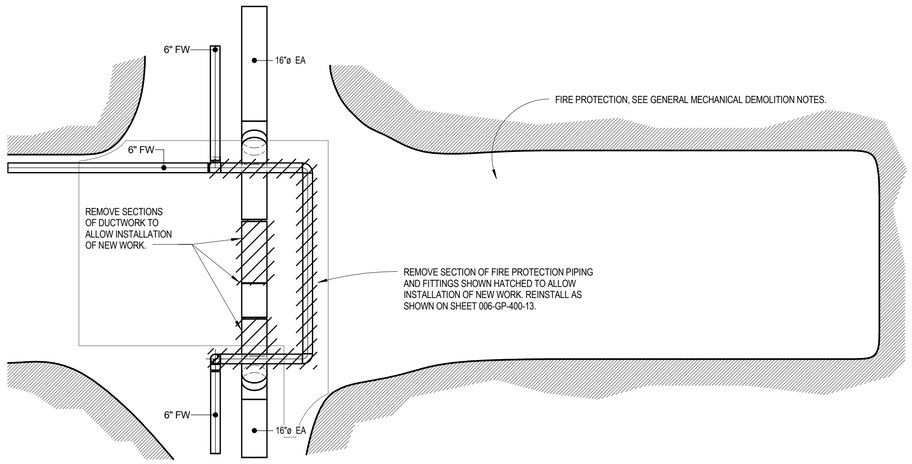
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Drawing Size: 22" x 34"

Drawing Count: Sheet 08 of 50

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11/1/2017 11:52:26 AM



C1 **XENON STORAGE ROOM MECHANICAL DEMO PLAN**

GD-400-11 SCALE: 1/4" = 1'-0"

GENERAL MECHANICAL DEMOLITION NOTES

1. REMOVE ALL DUCTWORK AND MECHANICAL EQUIPMENT SHOWN HATCHED.
2. DEMOLISH FIRE PROTECTION SYSTEM AS NEEDED TO FACILITATE XENON STORAGE ROOM.

0 2' 4' 8'

SCALE : 1/4" = 1'-0"

N

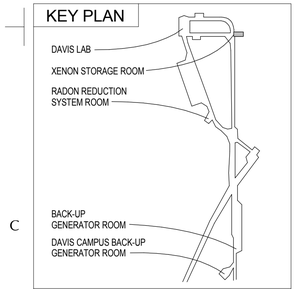
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LZ

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

STAMP



100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

Drawing Content:
XENON STORAGE ROOM MECHANICAL DEMOLITION PLAN

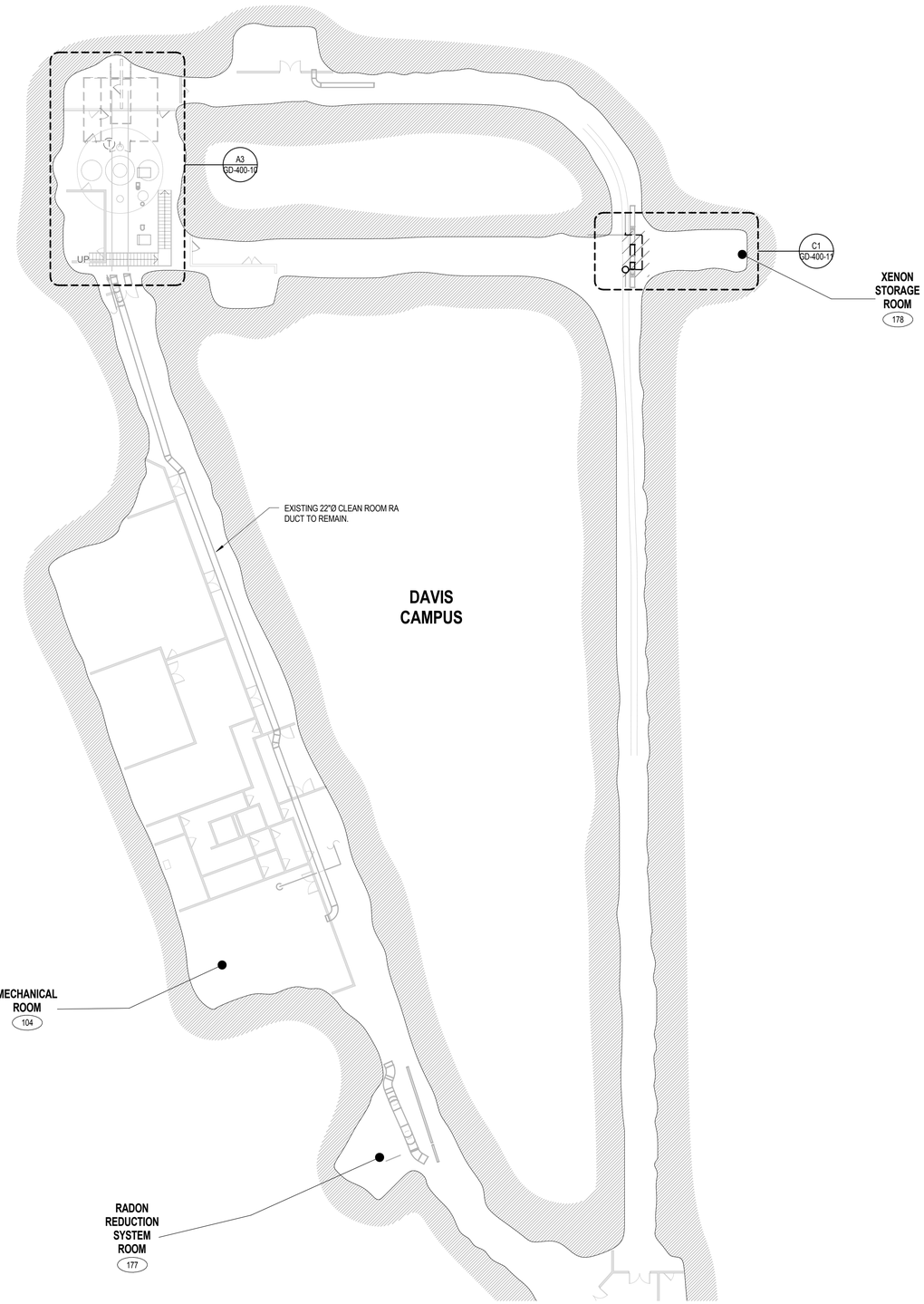
Drawing Number:

006- GD-400-11 -C1

Drawing Size: 22" x 34"

Drawing Count: Sheet 09 of 50

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1 **DAVIS CAMPUS DRIFT MECHANICAL DEMOLITION PLAN**

GD-400-12 SCALE: 1" = 20'-0"

GENERAL MECHANICAL DEMOLITION NOTES

1. REMOVE ALL DUCTWORK AND MECHANICAL EQUIPMENT SHOWN HATCHED.
2. DEMOLISH FIRE PROTECTION SYSTEM AS NEEDED TO ACCOMMODATE DUCTWORK REVISION.

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8891
DANIEL J.
DELLOVECHIO
SOUTH DAKOTA
2 NOV 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
000 - GENERAL DEMO

Level:
4850ft

Drawing Content:
DAVIS CAMPUS DRIFT
MECHANICAL DEMOLITION PLAN

Drawing Number:
006- GD-400-12 -C1

Drawing Size:
22" x 34"

Drawing Count:
Sheet 10 of 50

0 10' 20' 40'
SCALE : 1" = 20'-0"

N

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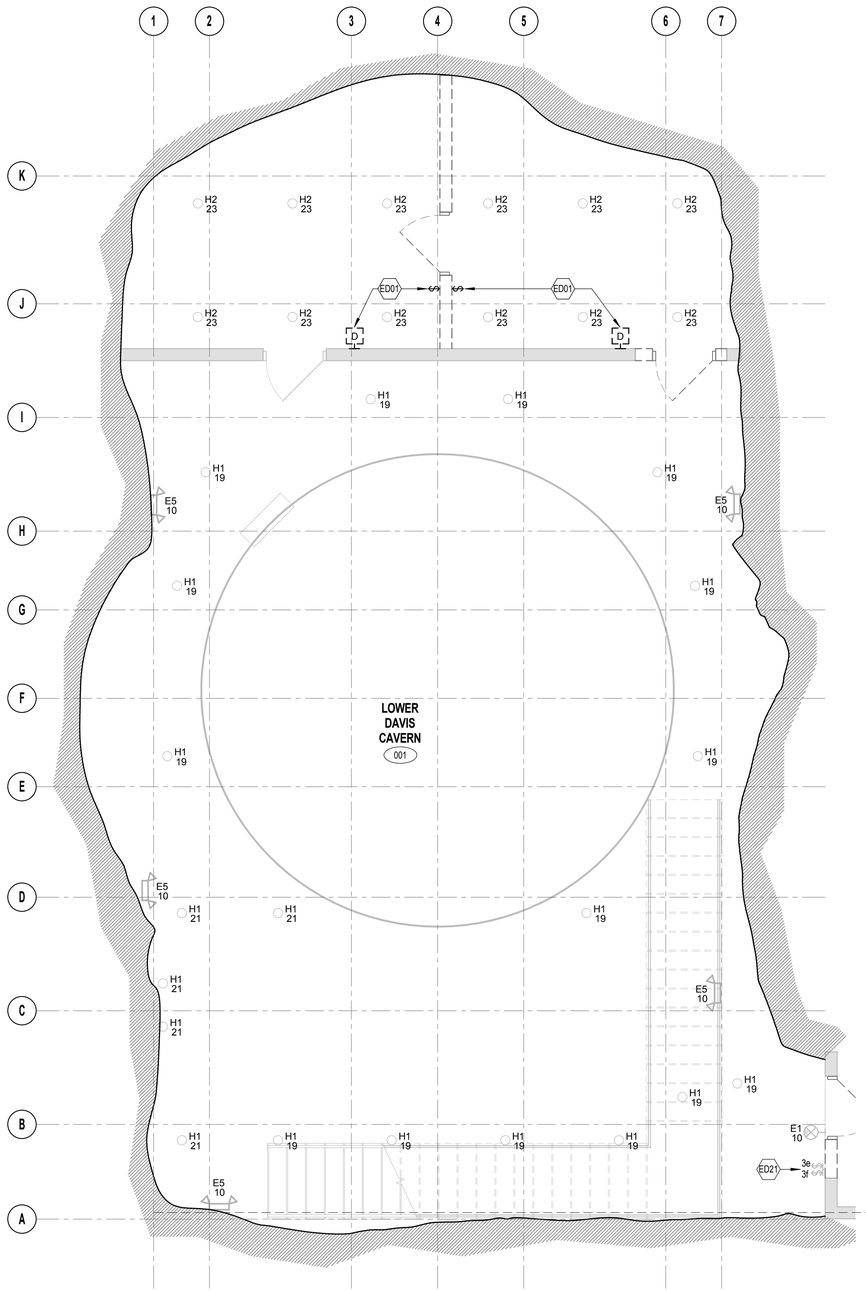
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GENERAL NOTES

1. EXISTING LIGHTING FIXTURES AND SWITCHES ARE TO REMAIN UNLESS OTHERWISE NOTED.
2. EXISTING RECEPTACLES ARE TO REMAIN UNLESS OTHERWISE NOTED.
3. REPLACE THE EXISTING INCANDESCENT LAMPS IN EXISTING FIXTURE TYPES H1 AND H2 WITH A GREEN CREATIVE #12A19G4DIM/840 LED LAMP. IF THE FIXTURE HAS A GLASS GLOBE, REMOVE THE GLASS GLOBE AND RETURN IT TO OWNER. REINSTALL THE WIRE GUARD OVER THE NEW LAMP. IF THE FIXTURE DOESN'T HAVE A WIRE GUARD, PROVIDE ONE.

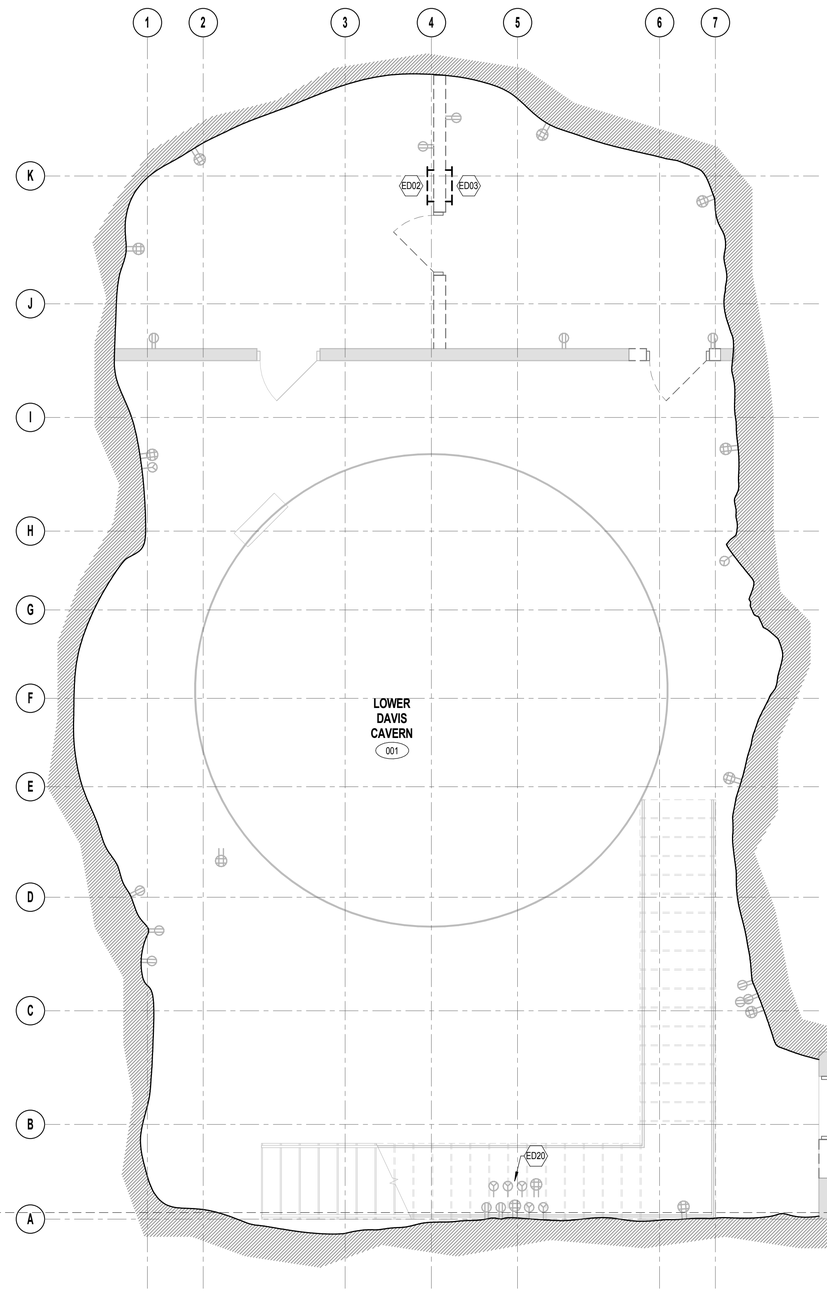
*KEYNOTE LEGEND

ED01	REMOVE EXISTING LIGHT SWITCHES AND DIMMERS.
ED02	EXISTING GROUND BAR TO BE RELOCATED. DISCONNECT AND REMOVE THE EXISTING GROUNDING CONDUCTOR UP TO THE SPLICE AT THE STRUCTURE. SEE A1/GP-700-14.
ED03	REMOVE EXISTING GROUND BAR AND TURN OVER TO OWNER. DISCONNECT AND REMOVE THE EXISTING GROUNDING CONDUCTOR UP TO THE SPLICE AT THE STRUCTURE.
ED20	REMOVE EXISTING RECEPTACLES AND OUTLET BOXES. REMOVE EXISTING CONDUITS AND WIRING BACK THEIR SOURCE.
ED21	REMOVE EXISTING LIGHT SWITCHES INCLUDING THE BOXES, CONDUIT AND WIRING AND RELOCATE TO THE OTHER SIDE OF THE DOOR. SEE DETAIL A1/GP-700-11.



A1 LOWER - DAVIS CAVERN - LIGHTING DEMOLITION PLAN

GD-700-11 SCALE: 1/4" = 1'-0"



A3 LOWER - DAVIS CAVERN - POWER DEMOLITION PLAN

GD-700-11 SCALE: 1/4" = 1'-0"

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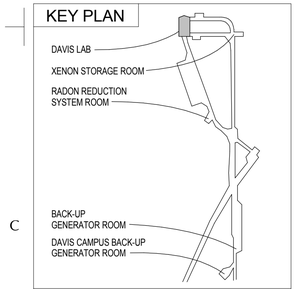
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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.01 15:32:17 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

Drawing Content: LOWER - DAVIS CAVERN LIGHTING AND POWER DEMOLITION PLANS

Drawing Number: 006- GD-700-11 -C1

Drawing Size: 22" x 34"

Drawing Count: Sheet 11 of 50

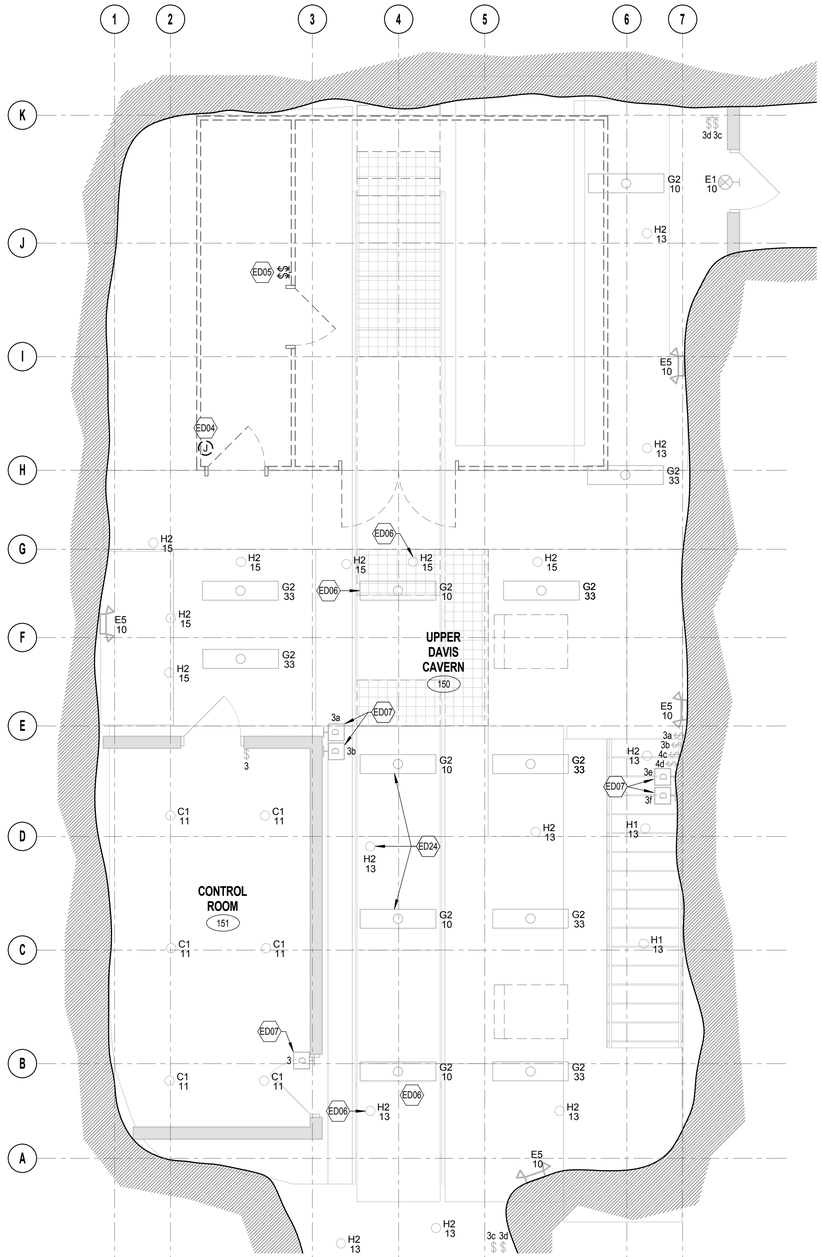
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GENERAL NOTES

1. EXISTING LIGHTING FIXTURES AND LIGHTING SWITCHES ARE TO REMAIN UNLESS OTHERWISE NOTED.
2. EXISTING RECEPTACLES ARE TO REMAIN UNLESS OTHERWISE NOTED.
3. REPLACE THE EXISTING INCANDESCENT LAMPS IN EXISTING FIXTURE TYPES H1 AND H2 WITH A GREEN CREATIVE #12A19G4DIM/840 LED LAMP. IF THE FIXTURE HAS A GLASS GLOBE, REMOVE THE GLASS GLOBE AND RETURN IT TO OWNER. REINSTALL THE WIRE GUARD OVER THE NEW LAMP. IF THE FIXTURE DOESN'T HAVE A WIRE GUARD, PROVIDE ONE.
4. REPLACE THE EXISTING INCANDESCENT LAMPS IN EXISTING FIXTURE TYPE C1 WITH A GREEN CREATIVE #12A19G4DIM/840 LED LAMP.

*KEYNOTE LEGEND

ED04	REMOVE EXISTING CIRCUIT TO CLEAN ROOM LIGHTING FIXTURES INCLUDING CONDUIT AND WIRE BACK TO PANELBOARD.
ED05	REMOVE EXISTING CLEAN ROOM LIGHT SWITCHES INCLUDING CONDUIT AND WIRE.
ED06	EXISTING LUMINAIRE TO BE RELOCATED. SEE A1/GP-700-12 FOR NEW LOCATIONS.
ED07	REMOVE EXISTING DIMMER.
ED08	REMOVE EXISTING RECEPTACLES INCLUDING CONDUIT AND WIRE BACK TO PANELBOARD.
ED09	JUNCTION BOX WITH CONNECTION TO HOIST TRAVELING CABLE. DISCONNECT TRAVELING CABLE AND REMOVE JUNCTION BOX, CONDUIT AND CONDUCTORS BACK TO THE HOIST DISCONNECT.
ED10	DISCONNECT EXISTING HEATING COIL IN DUCT.
ED24	REMOVE EXISTING LIGHTING FIXTURE AND RETURN TO OWNER. REVISE CIRCUITING TO ENSURE OTHER LIGHTING FIXTURES ON THE CIRCUIT REMAIN OPERATIONAL.
EP03	EXISTING HOIST DISCONNECT TO BE RELOCATED.
EP04	EXISTING PANELBOARDS TO REMAIN.



A1 **UPPER - DAVIS CAVERN - LIGHTING DEMOLITION PLAN**
GD-700-12 SCALE: 1/4" = 1'-0"



A3 **UPPER - DAVIS CAVERN - POWER DEMOLITION PLAN**
GD-700-12 SCALE: 1/4" = 1'-0"

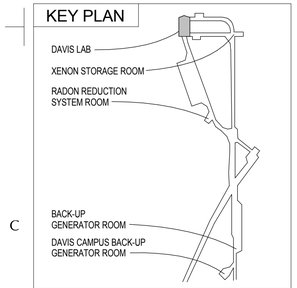
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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:32:27 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

Drawing Content: 4850 LEVEL LIGHTING AND POWER DEMOLITION PLANS

Drawing Number: 006- GD-700-12 -C1

Drawing Size: 22" x 34"

Drawing Count: Sheet 12 of 50

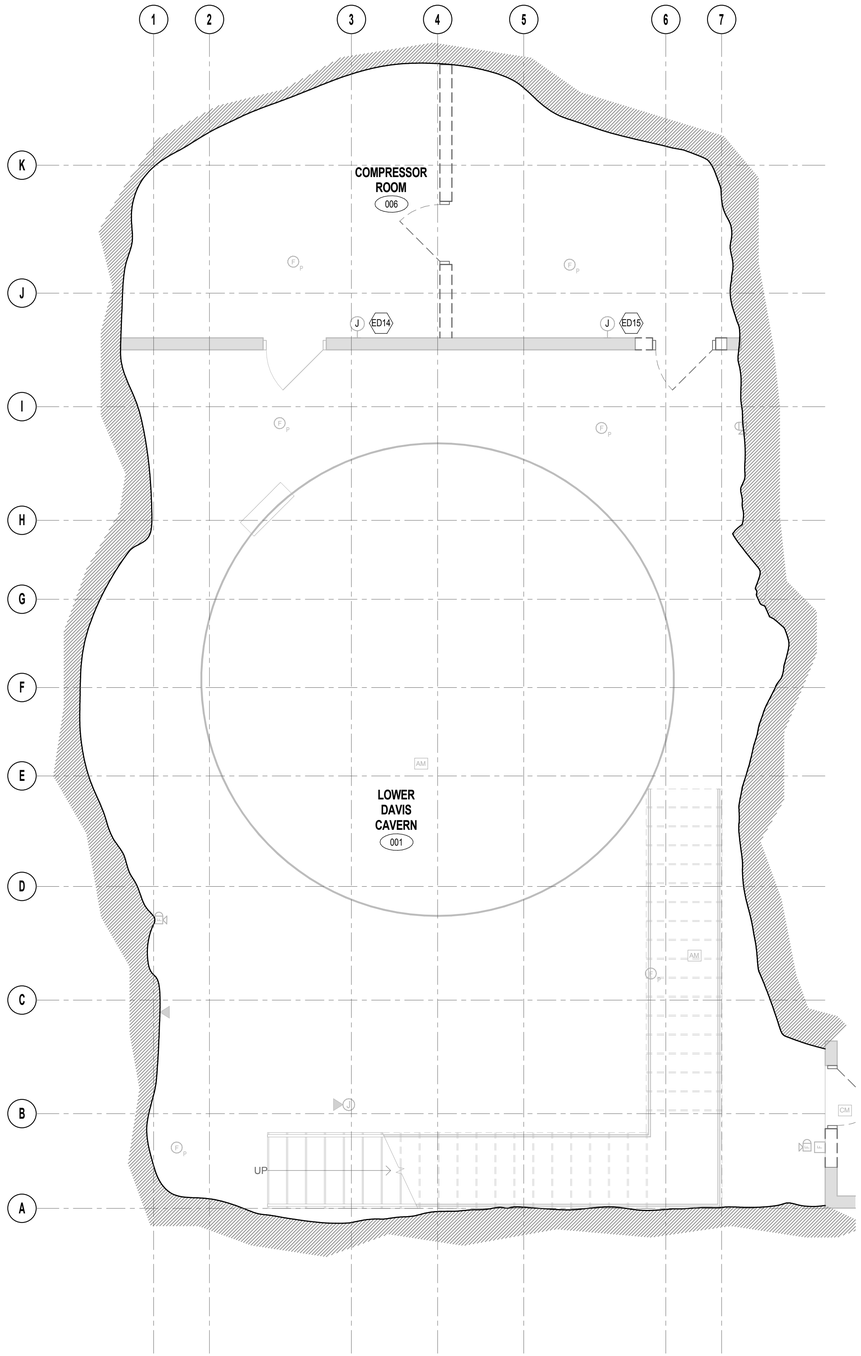
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GENERAL NOTES

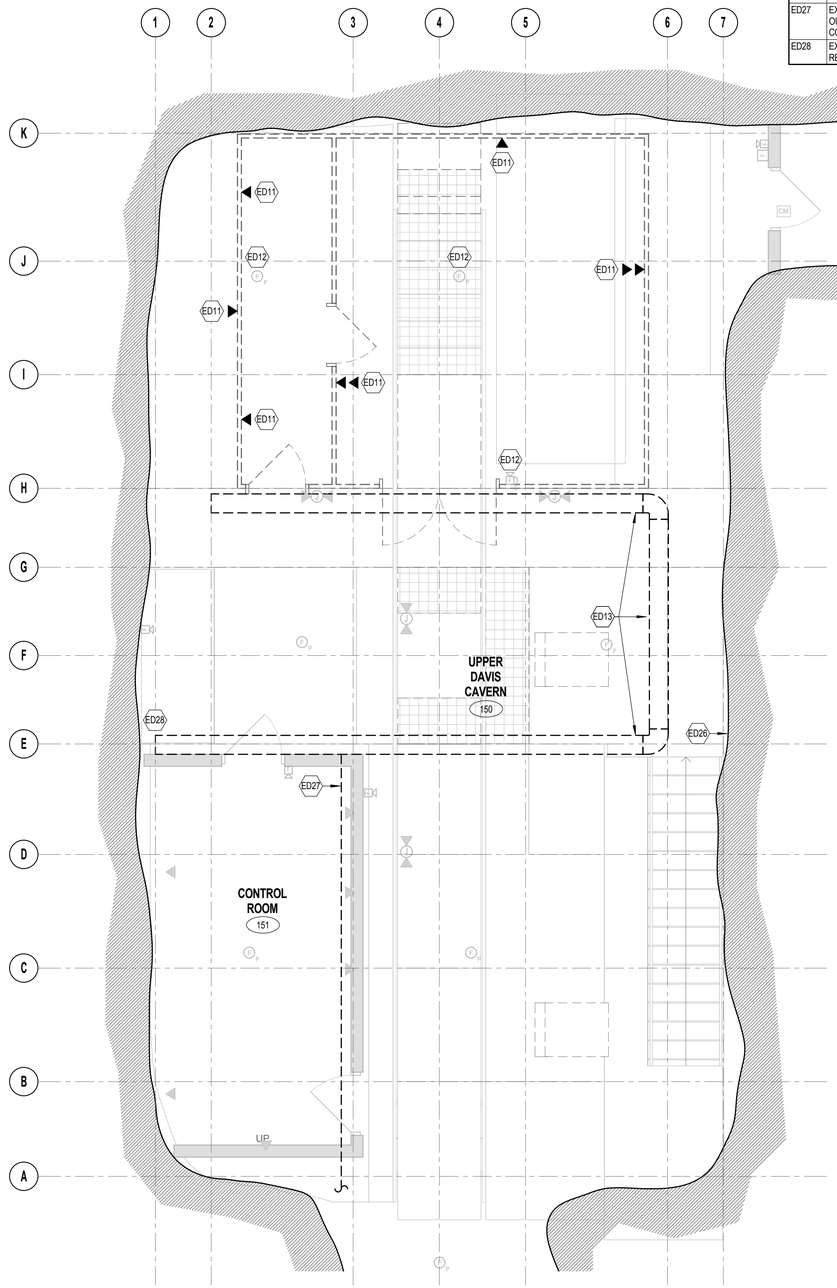
1. REMOVE ALL EXISTING VOICE AND DATA OUTLETS INCLUDING THE FACEPLATES AND JACKS. REMOVE THE EXISTING CATEGORY 6 DATA CABLES BACK TO THE EXISTING DATA RACK IN ROOM 112. REMOVE ALL EXISTING PATCH CABLES. ABANDON THE EXISTING OUTLET BOXES AND CONDUITS UNLESS OTHERWISE NOTED. RETAIN EXISTING FACEPLATES AND JACKS TO BE REUSED IN LOCATIONS WHERE NEW OUTLET BOXES ARE BEING ADDED OR IN LOCATIONS WHERE THE QUANTITY OF JACKS IN THE FACEPLATE CHANGES.
2. EXISTING FIRE ALARM DEVICES ARE TO REMAIN UNLESS OTHERWISE NOTED.
3. EXISTING CAMERAS ARE TO REMAIN UNLESS OTHERWISE NOTED.

*KEYNOTE LEGEND

ED11	EXISTING DATA JACK TO BE REMOVED INCLUDING THE OUTLET BOX AND CONDUIT.
ED12	RELOCATE EXISTING FIRE ALARM DEVICES.
ED13	REMOVE EXISTING CABLE TRAY SYSTEM.
ED14	EXISTING OXYGEN SENSOR TO BE RELOCATED. DISCONNECT AND REMOVE THE ADJACENT DATA OUTLET, PULL THE DATA WIRING BACK AND REMOVE THE OUTLET BOX AND CONDUIT. SEE SHEET GP-700-17 FOR NEW LOCATION.
ED15	EXISTING OXYGEN SENSOR TO BE RELOCATED. DISCONNECT AND REMOVE THE ADJACENT DATA OUTLET, PULL THE DATA WIRING BACK AND REMOVE THE OUTLET BOX AND CONDUIT. SEE DETAIL B3/GP-400-13 FOR NEW LOCATION.
ED26	EXISTING VERTICAL CABLE TRAY TO REMAIN.
ED27	EXISTING 4" CONDUIT FOR VOICE AND DATA CABLES ABOVE THE CONTROL ROOM TO OUT TO THE COMMON DRIFT TO REMAIN. REMOVE ALL DATA CABLES FROM CONDUIT. INSTALL PULL CORD IN CONDUIT WHEN CABLES ARE REMOVED.
ED28	EXISTING CONDUIT FOR VOICE AND DATA CABLES TO OUTLETS ON LOWER LEVEL TO REMAIN. INSTALL PULL CORD IN CONDUIT WHEN CABLES ARE REMOVED.



1 LOWER - DAVIS CAVERN - SYSTEMS DEMOLITION PLAN
GD-700-13 SCALE: 1/4" = 1'-0"



A3 UPPER - DAVIS CAVERN - SYSTEMS DEMOLITION PLAN
GD-700-13 SCALE: 1/4" = 1'-0"

11/1/2017 12:11:48 PM

Sanford Underground Research Facility

LEO A DALY
PLANNING ARCHITECTURE ENGINEERING INTERIORS

730 Second Avenue South, Suite 1100
Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA
Date: 2017.11.03 15:32:43 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

Drawing Content: SYSTEMS DEMOLITION PLANS

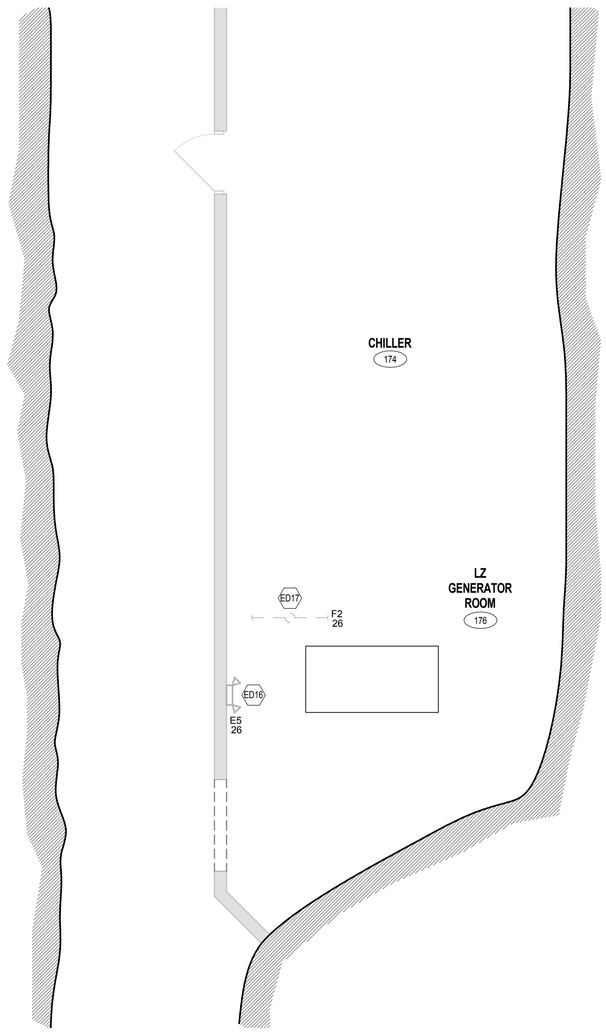
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Drawing Size: 22" x 34"

Drawing Count: Sheet 13 of 50

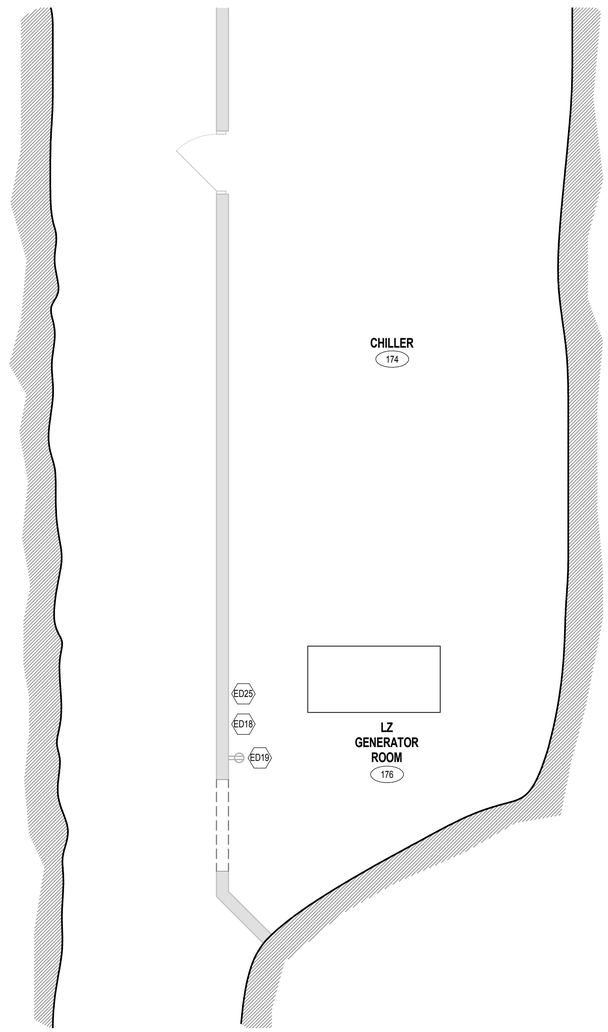
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*KEYNOTE LEGEND	
ED16	RELOCATE EXISTING EMERGENCY LIGHT. SEE A1/GP-700-13.
ED17	REMOVE EXISTING LUMINAIRE AND TURN OVER TO OWNER.
ED18	REMOVE EXISTING SURFACE MOUNTED PLUGMOLD.
ED19	RECEPTACLE TO BE RELOCATED. REMOVE RECEPTACLE, BOX AND CONDUIT TO AN ACCESSIBLE LOCATION.
ED25	DISCONNECT, COIL, AND PROTECT THE PHONE AND DATA CABLE FOR FUTURE EXTENSION TO A NEW OUTLET LOCATION.



A1 GD-700-14 SCALE: 1/4" = 1'-0"

GENERATOR ROOM LIGHTING DEMOLITION PLAN



A3 GD-700-14 SCALE: 1/4" = 1'-0"

GENERATOR ROOM POWER & SYSTEMS DEMOLITION PLAN

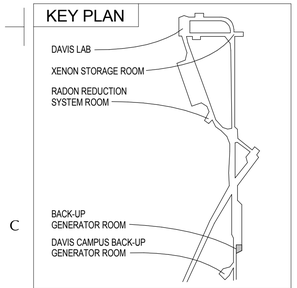
11/1/2017 12:11:48 PM

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LZ

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PLANNING ARCHITECTURE ENGINEERING INTERIORS
730 Second Avenue South, Suite 1100
Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.01 15:33:20 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 000 - GENERAL DEMO

Level: 4850ft

Drawing Content: GENERATOR ROOM DEMOLITION PLANS

Drawing Number: 006- GD-700-14 -C1

N

Drawing Size: 22" x 34"

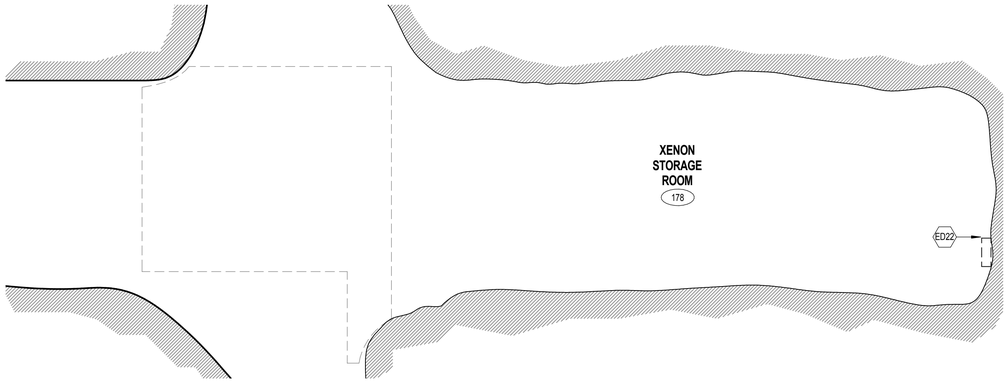
Drawing Count: Sheet 14 of 50

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A1 **RRS ROOM DEMOLITION PLAN**

GD-700-15 SCALE: 1/4" = 1'-0"



A3 **XENON STORAGE ROOM DEMOLITION PLAN**

GD-700-15 SCALE: 1/4" = 1'-0"

11/1/2017 12:11:49 PM

*KEYNOTE LEGEND	
ED22	DISCONNECT EXISTING OPTICAL FIBER CABLE FROM FIBER TERMINATION ENCLOSURE. COIL UP FIBER CABLE AND SECURE IT IN THE NEW CABLE TRAY. REMOVE AND SALVAGE THE PULL BOX AND RETURN TO OWNER. RELOCATE THE FIBER TERMINATION ENCLOSURE, SEE DETAIL A3/GP-700-18.
ED23	REMOVE EXISTING RECEPTACLES AND LIGHT SWITCH. SAVE LIGHT SWITCH FOR RELOCATION. REMOVE EXISTING CIRCUITING FROM RECEPTACLES TO LIGHTS. REMOVE EXISTING CIRCUITING BETWEEN RECEPTACLES AND BACK TO THE NEXT DEVICE ON THIS CIRCUIT. REPLACE EXISTING RECEPTACLE FACEPLATES WITH BLANK FACEPLATES AND ABANDON RACEWAY AND BOXES FOR RECEPTACLES.

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

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FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
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Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:33:31 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
000 - GENERAL DEMO

Level:
4850ft

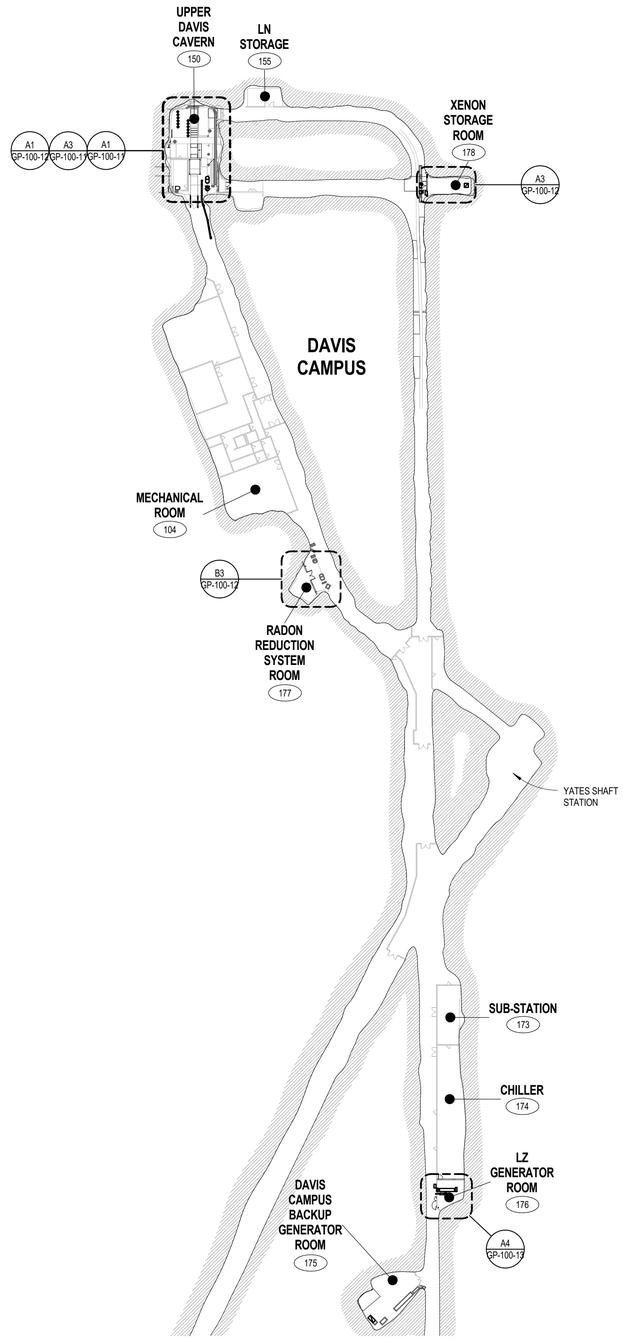
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RRS ROOM AND XENON STORAGE ROOM DEMOLITION PLANS

Drawing Number:
006- GD-700-15 -C1

Drawing Size:
22" x 34"

Drawing Count:
Sheet 15 of 50

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A4 GP-100-10 **OVERALL DAVIS CAMPUS PLAN**

SCALE: 1" = 50'-0"

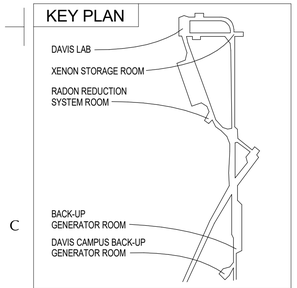
11/1/2017 2:41:02 PM

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Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP



100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
100 - ARCH

Level:
4850ft

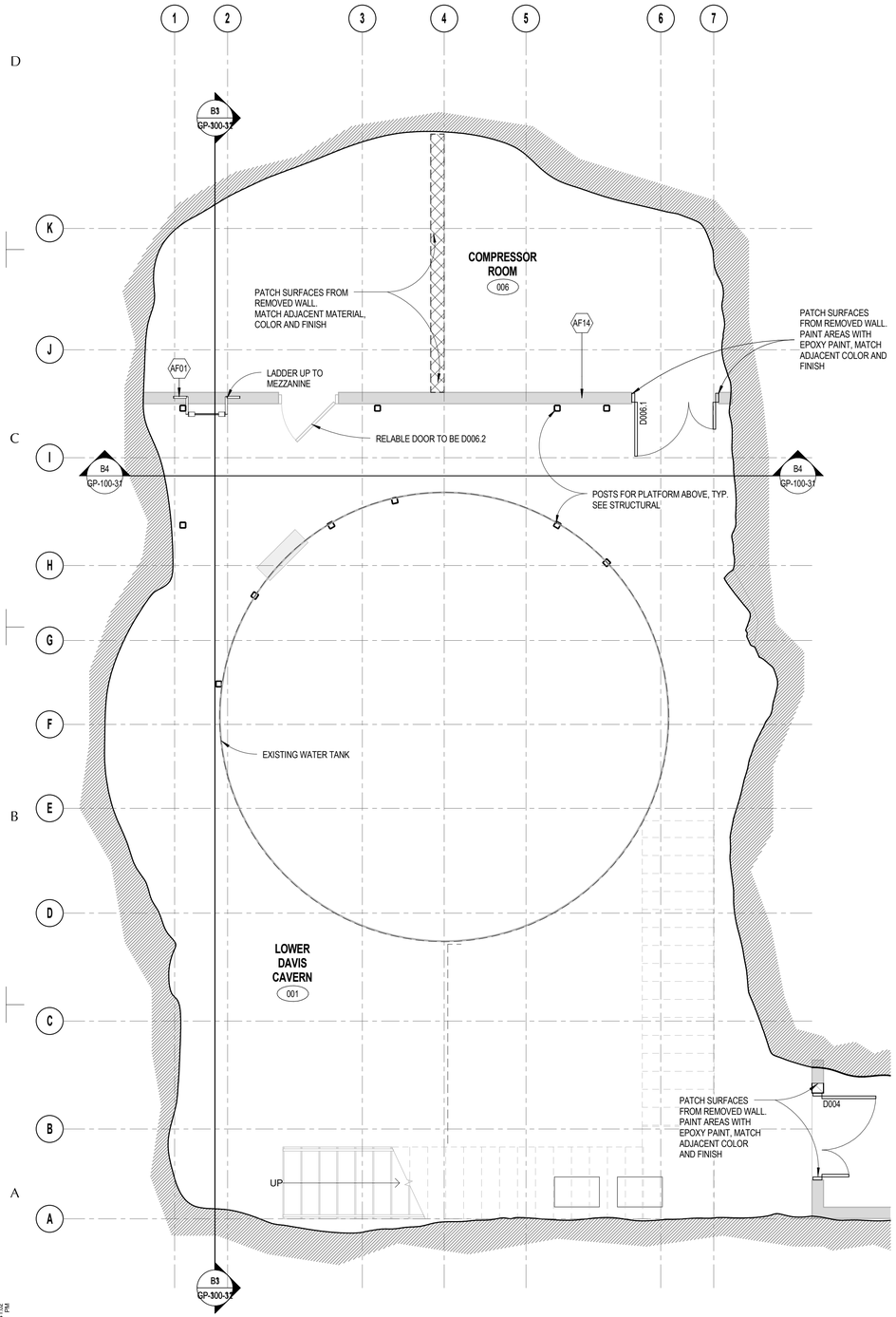
Drawing Content:
OVERALL DAVIS CAMPUS PLAN

Drawing Number:
006- GP-100-10 -C1

Drawing Size:
22" x 34"

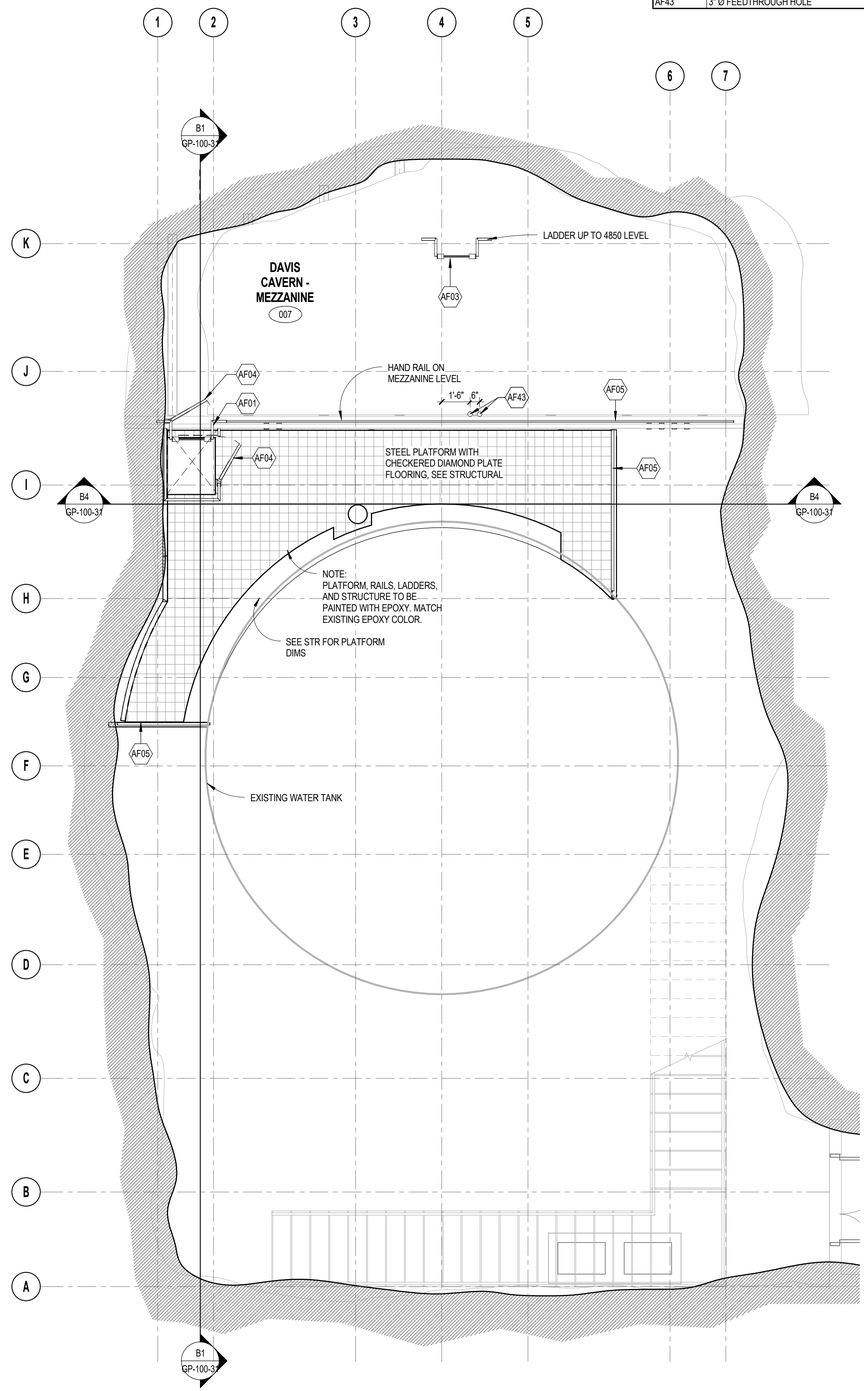
Drawing Count:
Sheet 16 of 50

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A1 **LOWER -DAVIS CAVERN**

GP-100-11 SCALE: 1/4" = 1'-0"



A3 **MEZZANINE - DAVIS CAVERN**

GP-100-11 SCALE: 1/4" = 1'-0"

11/1/2017 2:41:02 PM

*KEYNOTE LEGEND

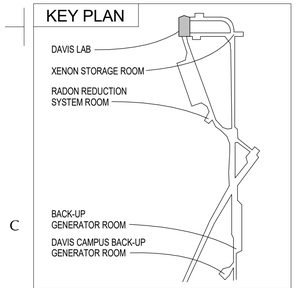
AF01	LOWER LEVEL TO MEZZANINE STEEL LADDER SEE A1/GP-100-52 FOR DETAILS
AF03	MEZZANINE TO 4850 STEEL LADDER SEE A4/GP-100-52 FOR DETAILS
AF04	SELF-CLOSING GATE. SEE C4/GP-100-52 FOR TYPICAL DETAIL
AF05	HANDRAIL. SEE C2/GP-100-52 FOR DETAIL
AF14	FILL CMU WALL SOLID WITH GROUT. FULL LENGTH AND HEIGHT.
AF43	3" Ø FEEDTHROUGH HOLE

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LZ

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Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP



100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 100 - ARCH

Level: 4850ft

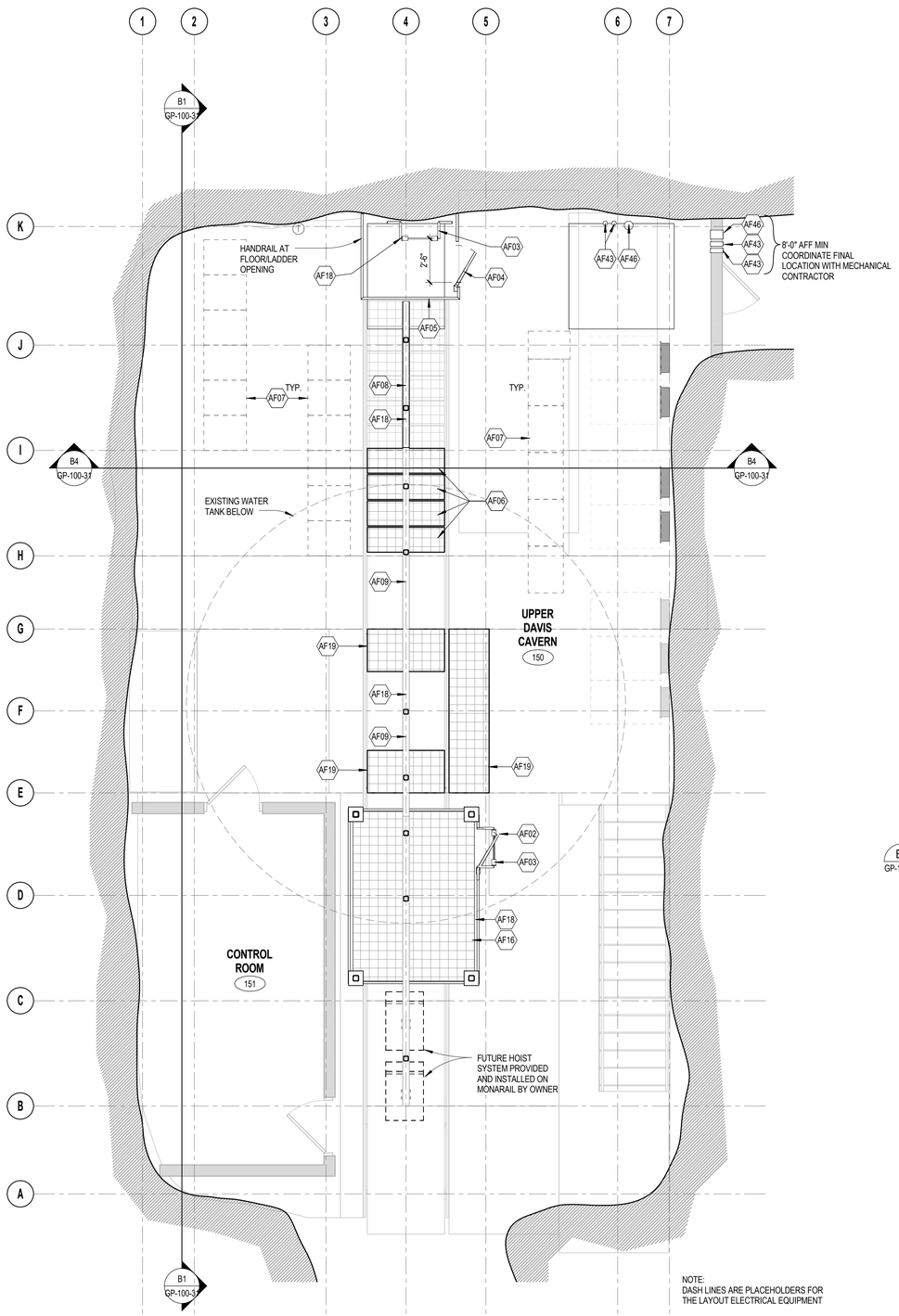
Drawing Content: LOWER & MEZZANINE LEVEL FLOOR PLANS

Drawing Number: 006- GP-100-11 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 17 of 50

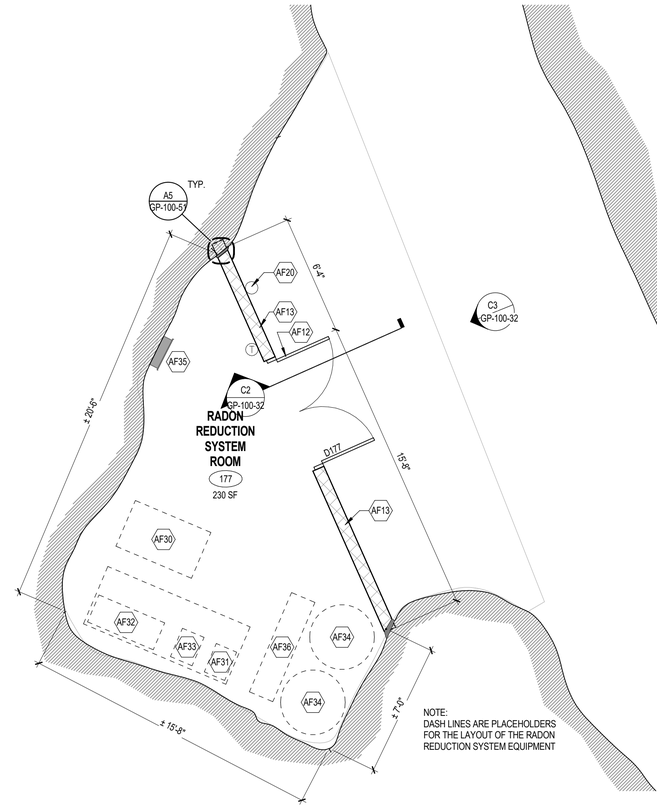
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A1 **UPPER - DAVIS CAVERN**

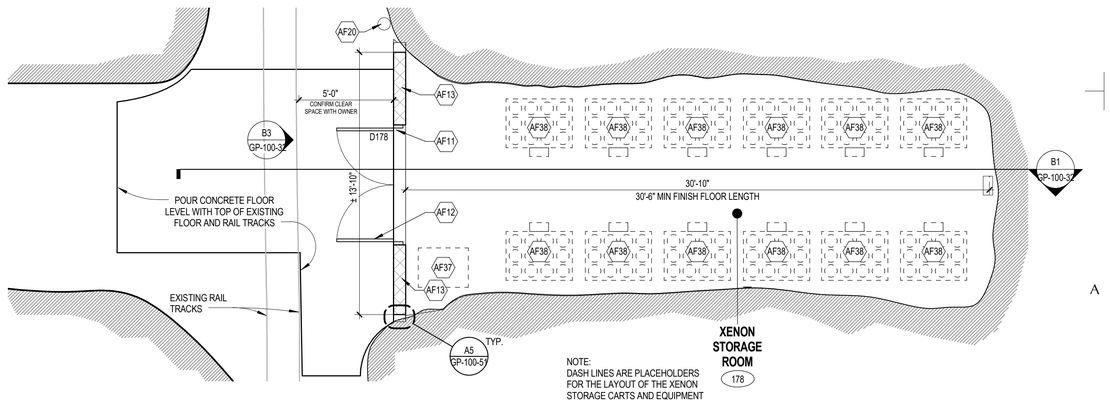
GP-100-12 SCALE: 1/4" = 1'-0"

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B3 **RRS ROOM FLOOR PLAN**

GP-100-12 SCALE: 1/4" = 1'-0"



A3 **XENON STORAGE ROOM FLOOR PLAN**

GP-100-12 SCALE: 1/4" = 1'-0"

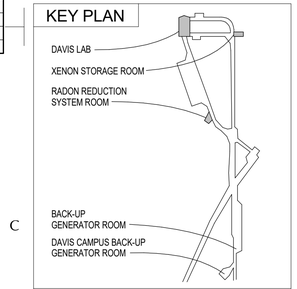
*KEYNOTE LEGEND	
AF02	4850 TO CRYOCOOLER PLATFORM STEEL LADDER SEE A2/GP-100-52 FOR DETAILS
AF03	MEZZANINE TO 4850 STEEL LADDER SEE A4/GP-100-52 FOR DETAILS
AF04	SELF-CLOSING GATE. SEE C4/GP-100-52 FOR TYPICAL DETAIL
AF05	HANDRAIL. SEE C2/GP-100-52 FOR DETAIL
AF06	INSTALL NEW GRATING WHERE NEEDED TO MATCH EXISTING. ±17"X 52" PANELS
AF07	ELECTRICAL EQUIPMENT, SEE ELECTRICAL.
AF08	NEW MONORAIL, SEE STRUCTURAL.
AF09	RELOCATED MONORAIL, SEE STRUCTURAL.
AF11	CENTER DOOR ON XENON STORAGE ROOM
AF12	45 MIN FRAME IN 8" CMU WALL
AF13	8" CMU WALL 1 HOUR RATED
AF16	CRYOCOOLER PLATFORM, SEE STRUCTURAL.
AF18	PAINT ALL STEEL W/EPOXY. MATCH EXISTING PAINT COLORS.
AF19	EXISTING GRATING PANELS RETURNED TO ORIGINAL LOCATIONS AFTER WELDS REMOVED.
AF20	FIRE EXTINGUISHER. BY OWNER.
AF30	PS: PUMP SKID WITH MONITOR, ROUGHING PUMP, BY LZ.
AF31	BL: BLOWER, BY LZ.
AF32	DH: DEHUMIDIFIER, BY LZ.
AF33	AC: AIR CHILLERS, BY LZ.
AF34	T1-4 : CARBON TANKS, BY LZ.
AF35	EB: ELECTRICAL PANEL, BY LZ.
AF36	VALVE RACK, BY LZ.
AF37	CONTROL RACK, BY LZ.
AF38	XENON PACK, BY LZ.
AF43	3" Ø FEEDTHROUGH HOLE
AF46	6" Ø FEEDTHROUGH HOLE

Sanford Underground Research Facility

LZ

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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT
REG. NO. 13412
MATTHEW CRAIG JOHNSON
SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 100 - ARCH

Level: 4850ft

Drawing Content: 4850 LEVEL FLOOR PLANS

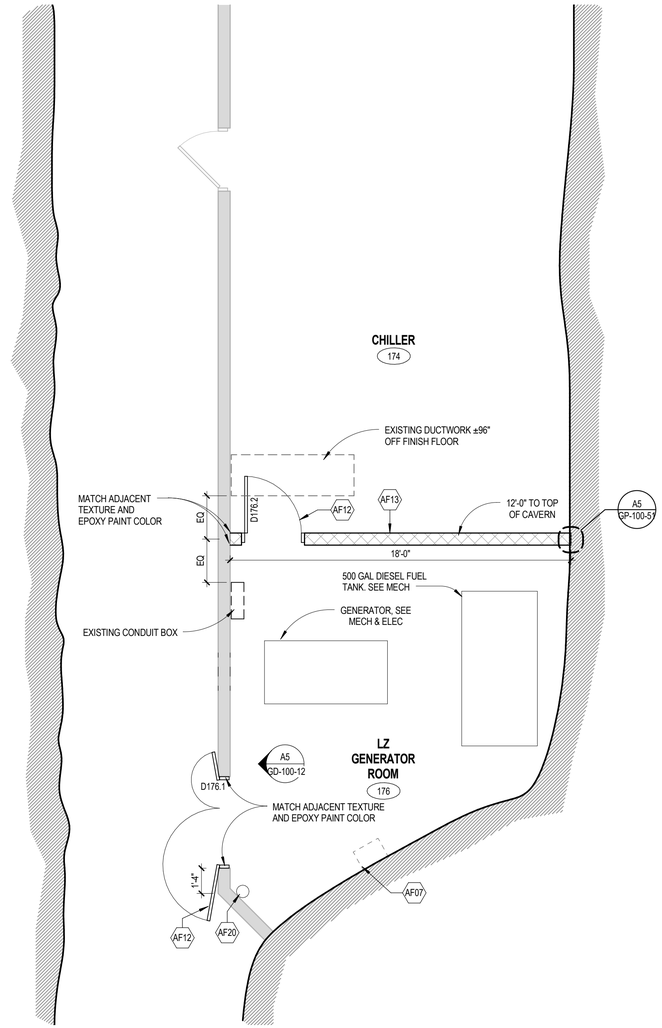
Drawing Number: 006- GP-100-12 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 18 of 50

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*KEYNOTE LEGEND	
AF07	ELECTRICAL EQUIPMENT, SEE ELECTRICAL.
AF12	45 MIN FRAME IN 8" CMU WALL
AF13	8" CMU WALL 1 HOUR RATED
AF20	FIRE EXTINGUISHER. BY OWNER.



A4 **BACK-UP GENERATOR ROOM**

GP-100-13 SCALE: 1/4" = 1'-0"

N

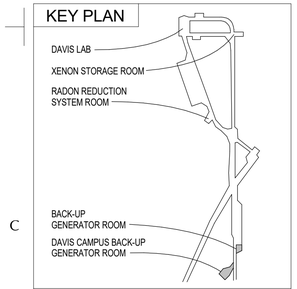
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LEO A DALY
PLANNING ARCHITECTURE ENGINEERING INTERIORS

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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT
REG. NO. 13412
MATTHEW CRAIG JOHNSON
SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 100 - ARCH

Level: 4850ft

Drawing Content:
GENERATOR AND CHILLER ROOM FLOOR PLANS

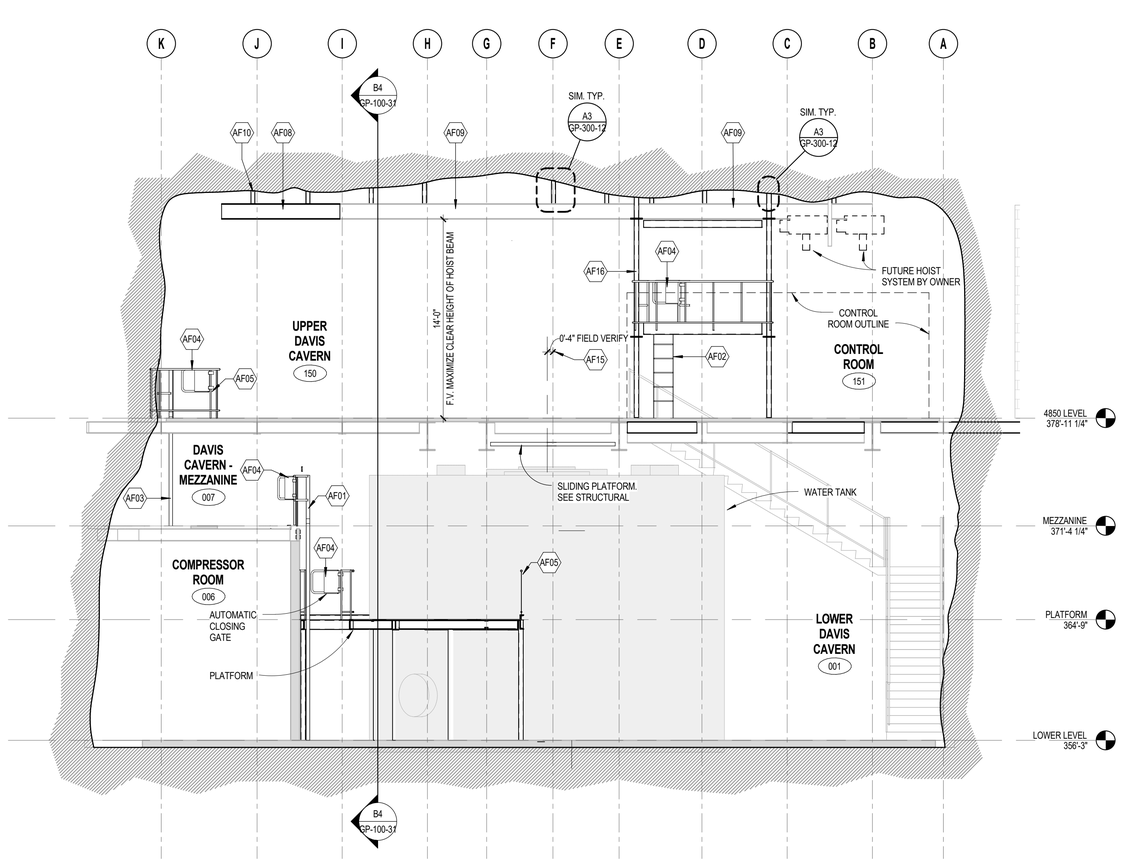
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Drawing Size: 22" x 34"

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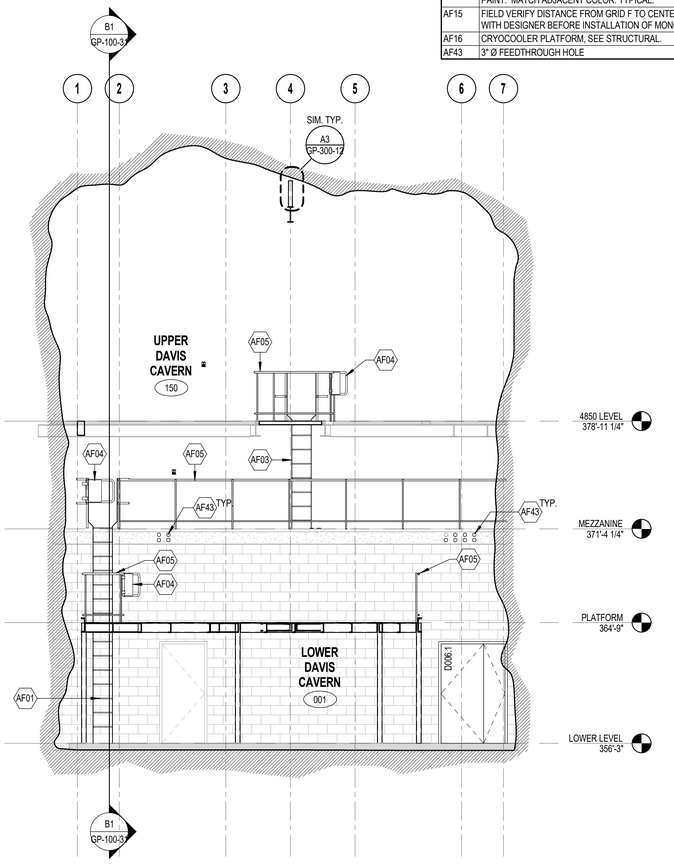
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11/7/2017 2:41:03 PM



B1 **DAVIS LAB SECTION**

GP-100-31 SCALE: 3/16" = 1'-0"



B4 **DAVIS LAB SECTION**

GP-100-31 SCALE: 3/16" = 1'-0"

*KEYNOTE LEGEND

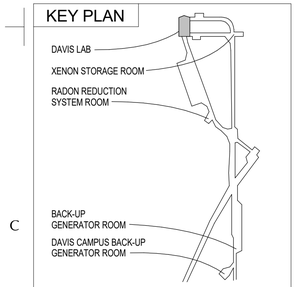
AF01	LOWER LEVEL TO MEZZANINE STEEL LADDER SEE A1/GP-100-52 FOR DETAILS
AF02	4850 TO CRYOCOOLER PLATFORM STEEL LADDER SEE A2/GP-100-52 FOR DETAILS
AF03	MEZZANINE TO 4850 STEEL LADDER SEE A4/GP-100-52 FOR DETAILS
AF04	SELF-CLOSING GATE. SEE C4/GP-100-52 FOR TYPICAL DETAIL
AF05	HANDRAIL. SEE C2/GP-100-52 FOR DETAIL
AF08	NEW MONORAIL, SEE STRUCTURAL.
AF09	RELOCATED MONORAIL, SEE STRUCTURAL.
AF10	NEW CAVERN ANCHOR IN CEILING. INSTALLED BY OWNER. PATCH CEILING SURFACES FROM PENETRATIONS WITH SIMILAR ADJACENT FINISH AND EPOXY PAINT. MATCH ADJACENT COLOR. TYPICAL.
AF15	FIELD VERIFY DISTANCE FROM GRID F TO CENTER OF WATER TANK AND VERIFY WITH DESIGNER BEFORE INSTALLATION OF MONORAIL
AF16	CRYOCOOLER PLATFORM, SEE STRUCTURAL.
AF43	3" Ø FEEDTHROUGH HOLE

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LZ

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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

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FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP



100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 100 - ARCH
Level: 4850ft

Drawing Content:
DAVIS CAVERN SECTIONS

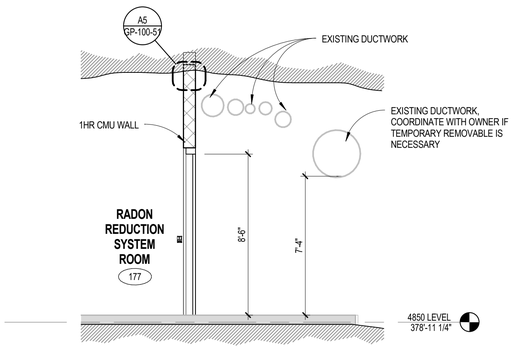
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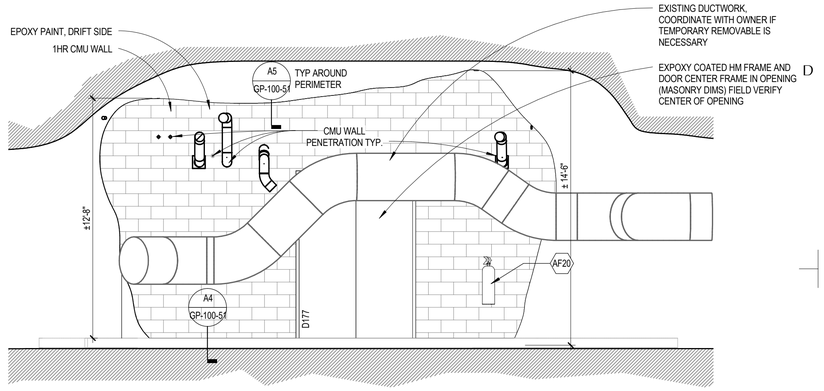
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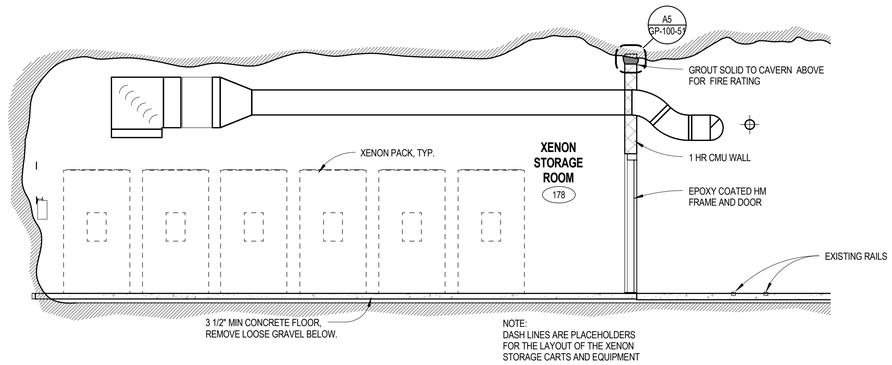
*KEYNOTE LEGEND	
AF20	FIRE EXTINGUISHER. BY OWNER.
AF43	3" Ø FEEDTHROUGH HOLE





C2 RRS ROOM SECTION

GP-100-32 SCALE: 1/4" = 1'-0"

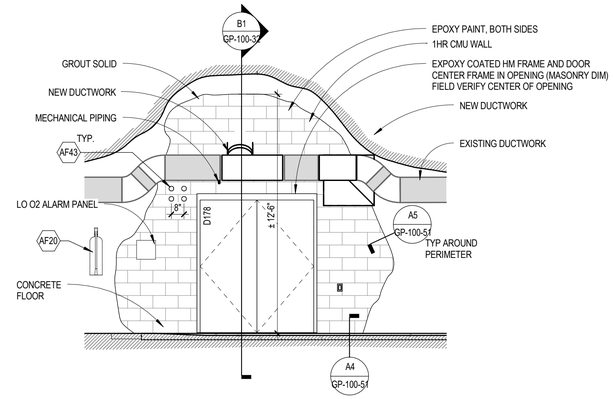


B1 XENON STORAGE ROOM SECTION

GP-100-32 SCALE: 1/4" = 1'-0"

C3 RRS ELEVATION

GP-100-32 SCALE: 1/4" = 1'-0"



B3 XENON STORAGE ROOM ELEVATION

GP-100-32 SCALE: 1/4" = 1'-0"

11/1/2017 2:41:04 PM

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT
REG. NO. 13412
MATTHEW CRAIG JOHNSON
SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 100 - ARCH

Level: 4850ft

Drawing Content: CAVERN SECTIONS

Drawing Number: 006- GP-100-32 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 21 of 50

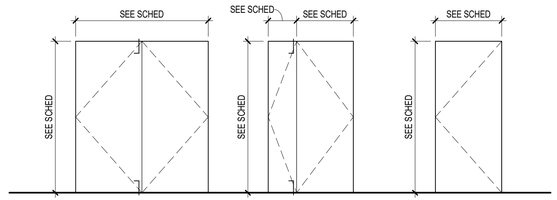
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DOOR SCHEDULE

DOOR SCHEDULE

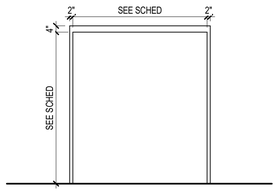
DOOR					DOOR			FRAME					
DOOR NO.		DOOR Width	HEIGHT	HDWE SET	TYPE	MAT'L	FIN.	TYPE	MAT'L	FIN.	HEAD & SILL DETAILS	LABEL HOUR	REMARKS
D004	PR	3'-0" & 1'-6"	7'-0"	03	B	HM	PT-1	A	HM	PT-1	B4 / GP-100-51	45 MINUTES	EPOXY PAINT, HOT DIP GALVANIZE FRAME AND DOOR
D006.1	PR	3'-0" & 1'-6"	7'-0"	03	B (SIM)	HM	PT-1	A	HM	PT-1	B4 / GP-100-51	45 MINUTES	EPOXY PAINT, HOT DIP GALVANIZE FRAME AND DOOR
D176.1	PR	3'-0" & 1'-6"	7'-0"	03	B	HM	PT-1	A	HM	PT-1	B4 / GP-100-51	45 MINUTES	EPOXY PAINT, HOT DIP GALVANIZE FRAME AND DOOR
D176.2	SINGLE	3'-0"	7'-0"	05	C	HM	PT-1	A	HM	PT-1	B4 / GP-100-51	45 MINUTES	EPOXY PAINT, HOT DIP GALVANIZE FRAME AND DOOR
D177	PR	3'-0" & 3'-0"	8'-6"	02	A	HM	PT-1	A	HM	PT-1	B4 / GP-100-51	45 MINUTES	EPOXY PAINT, HOT DIP GALVANIZE FRAME AND DOOR
D178	PR	3'-0" & 3'-0"	7'-0"	02	A	HM	PT-1	A	HM	PT-1	B4 / GP-100-51	45 MINUTES	EPOXY PAINT, HOT DIP GALVANIZE FRAME AND DOOR

NOTE:
PT-1 = EPOXY PAINT



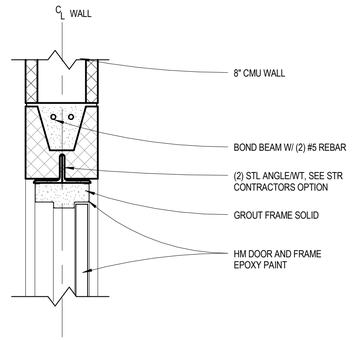
DOOR TYPE: A **DOOR TYPE: B** **DOOR TYPE: C**

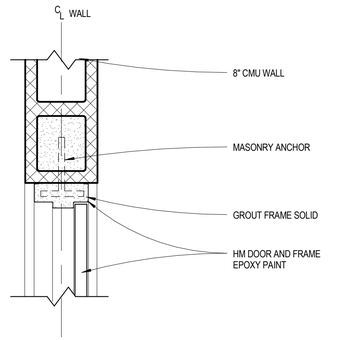
C3 **DOOR TYPES**
GP-100-51 SCALE: 1/4" = 1'-0"



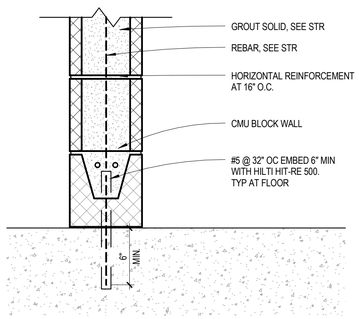
FRAME TYPE: A & B

C4 **FRAME TYPES**
GP-100-51 SCALE: 1/4" = 1'-0"

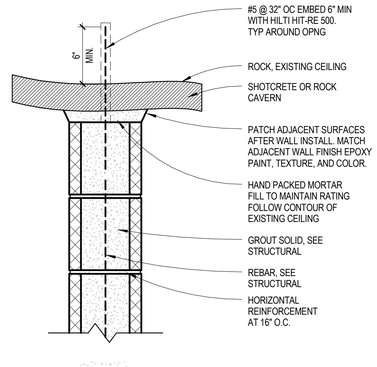




B4 **8" TYPICAL CMU DOOR DETAILS**
GP-100-51 SCALE: 1 1/2" = 1'-0"



A4 **TYPICAL CMU BASE DETAIL, JAMB SIM**
GP-100-51 SCALE: 1 1/2" = 1'-0"



A5 **TYPICAL CMU/ROCK CEILING DETAIL**
GP-100-51 SCALE: 1 1/2" = 1'-0"

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT
REG. NO. 13412
MATTHEW CRAIG JOHNSON
SOUTH DAKOTA
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
100 - ARCH

Level:
4850ft

Drawing Content:
DETAILS AND SCHEDULES

Drawing Number:
006- GP-100-51 -C1

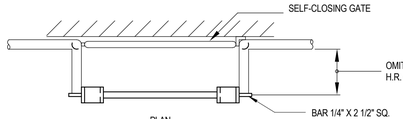
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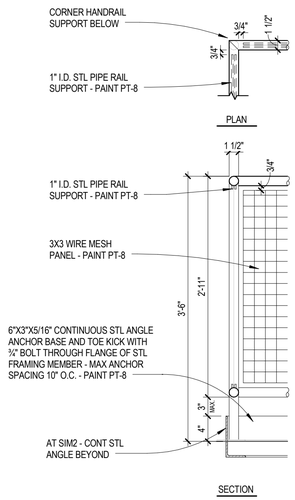
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Sheet 22 of 50

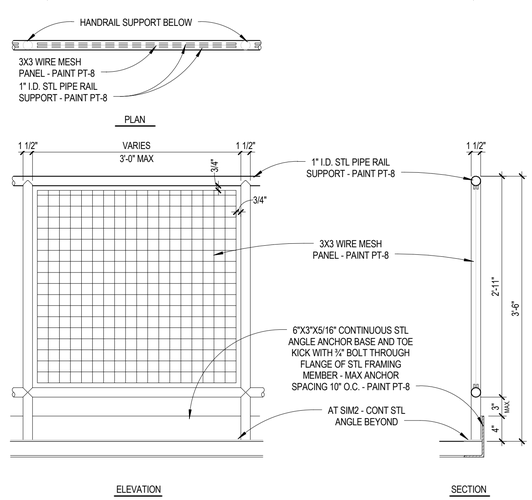
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GENERAL STEEL LADDER NOTES

1. PAINT ALL STEEL RAILINGS/ STAIRS/ PLATFORMS/ GRATING WITH EPOXY PAINT.
2. MATCH EXISTING PAINT COLORS.
3. USE RAIL BAR 2-1/2x3/8 FOR SUPPORT SPACING
4. PROFILES, DETAILS, AND MATERIAL DIMENSIONS AS SHOWN ARE INCLUDED AS THE ARCHITECTS INTENT AND ARE TO BE MAINTAINED IN FINAL CONSTRUCTION. FINAL SIZING OR OTHER MODIFICATIONS ARE REQUIRED TO MEET OSHA PART 1910 SECTION 27 FOR DESIGN CRITERIA.

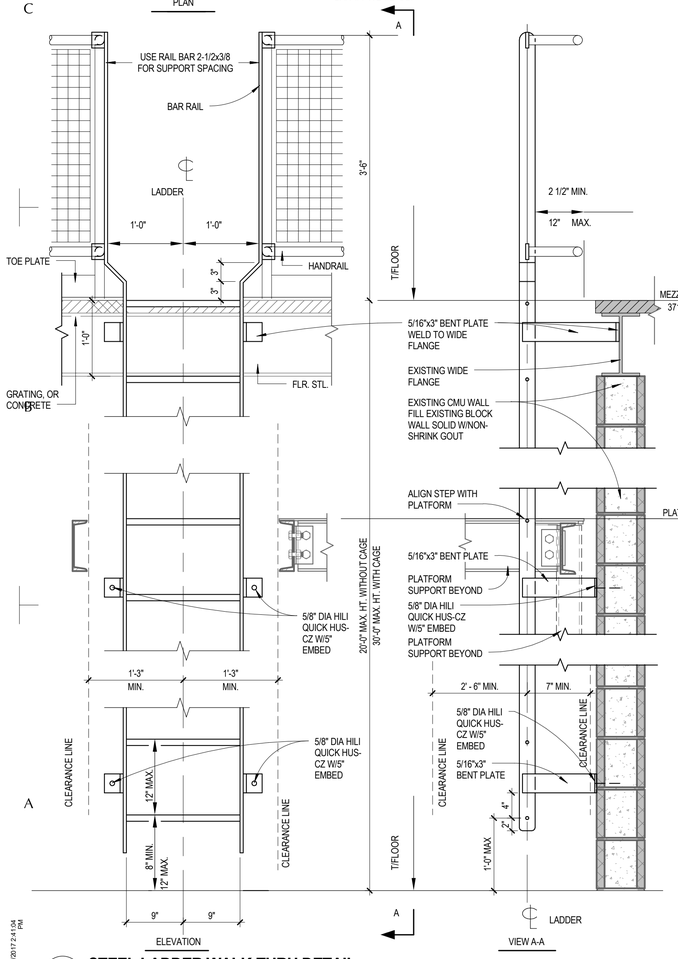






C2 TYPICAL METAL GRID RAILING

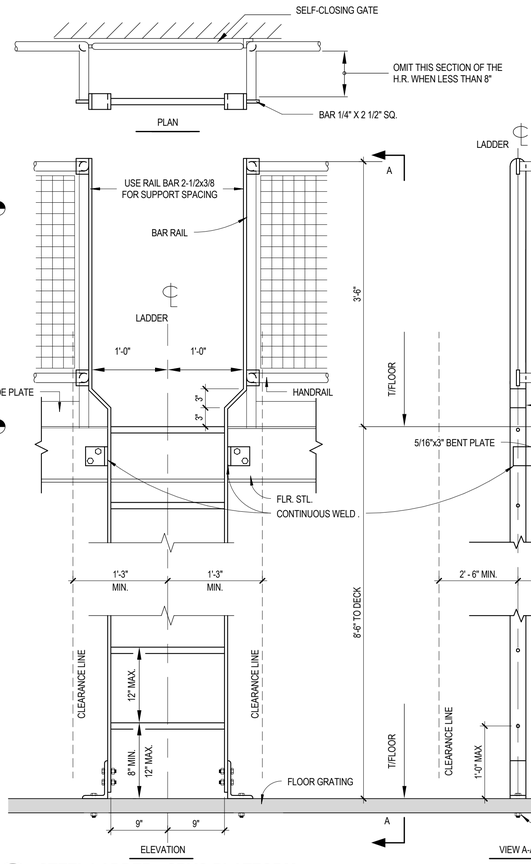
GP-100-52 SCALE: 1" = 1'-0"



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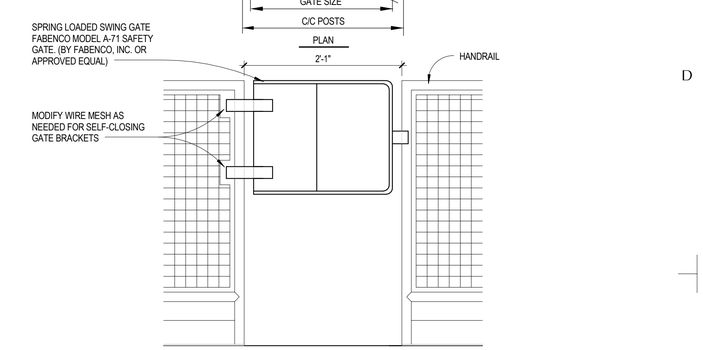
A1 STEEL LADDER WALK-THRU DETAIL

GP-100-52 SCALE: 1" = 1'-0"



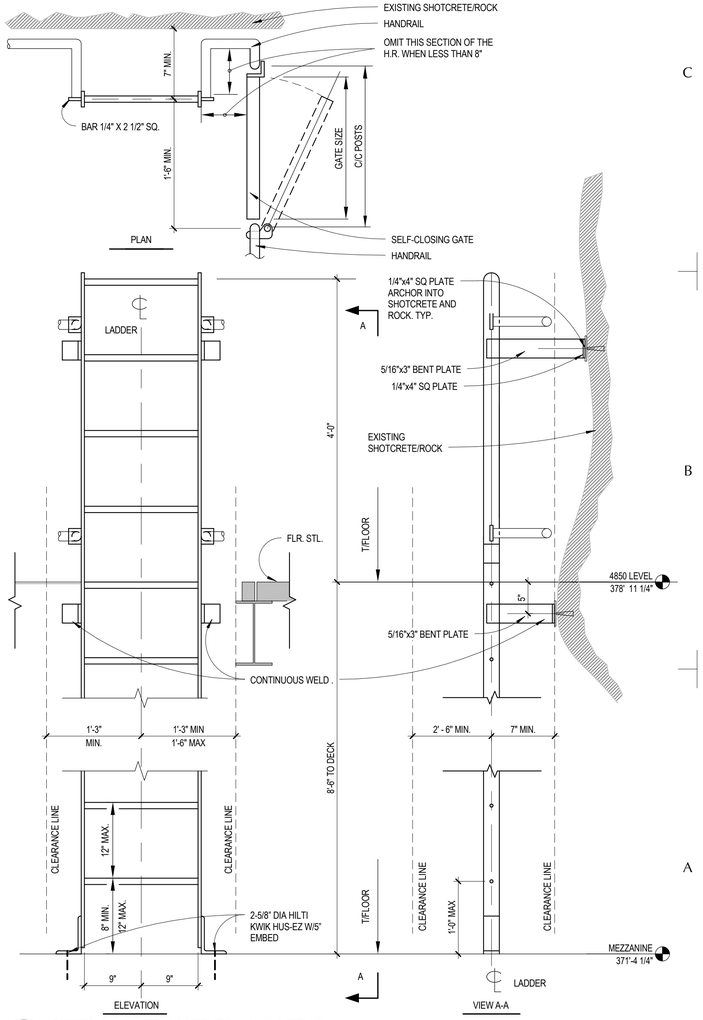
A2 STEEL LADDER - CRYO PLATFORM

GP-100-52 SCALE: 1" = 1'-0"



C4 TYPICAL SELF-CLOSING GATE DETAIL

GP-100-52 SCALE: 1" = 1'-0"



A4 STEEL LADDER MAZZ TO 4850 DETAIL

GP-100-52 SCALE: 1" = 1'-0"

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SPA
Draw	NRW
Check	MCJ

STAMP

REGISTERED PROFESSIONAL ARCHITECT 13412 MATTHEW CRAIG JOHNSON SOUTH DAKOTA U.S.A.
Nov 2, 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 100 - ARCH

Level: 4850ft

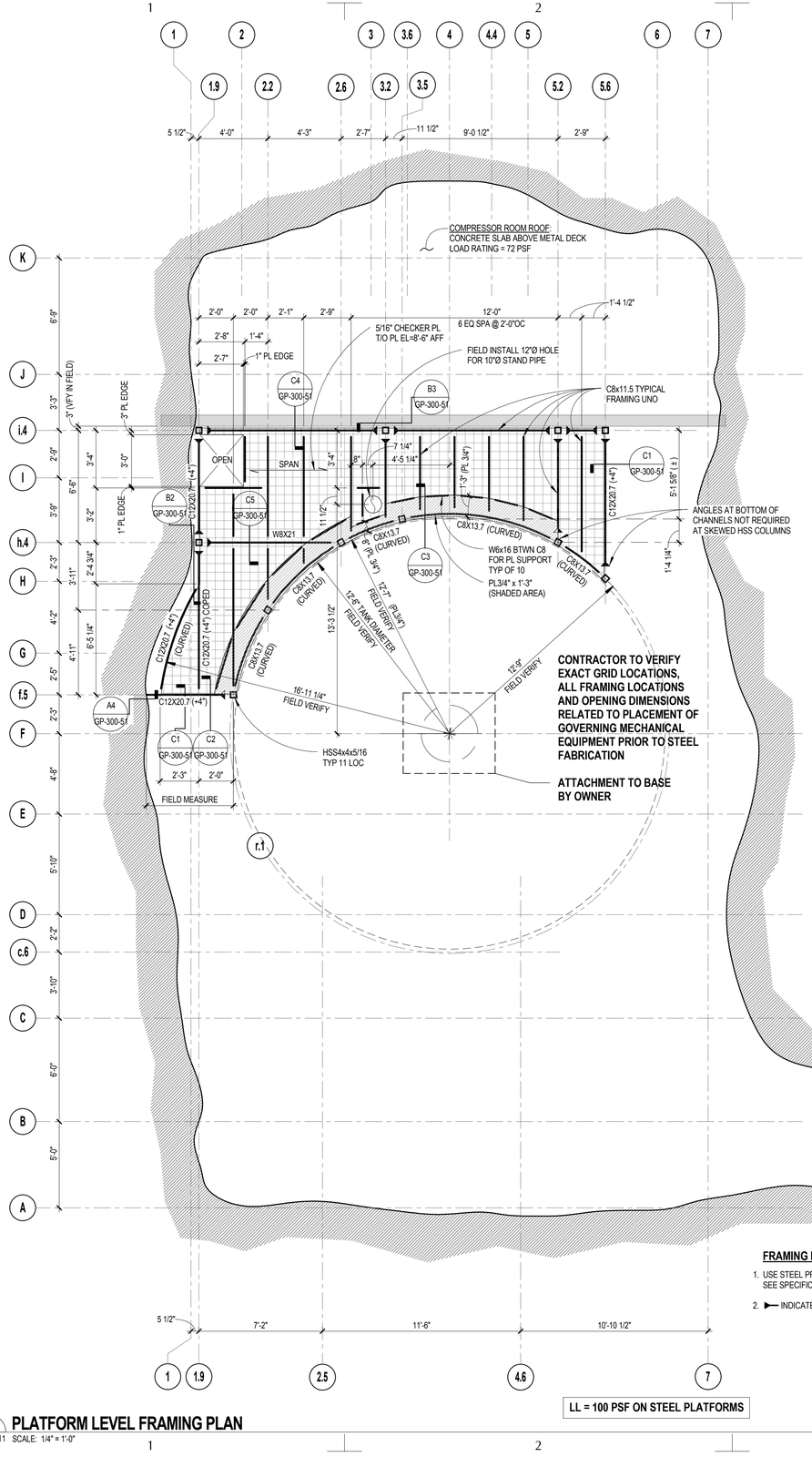
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Drawing Number: 006- GP-100-52 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 23 of 50

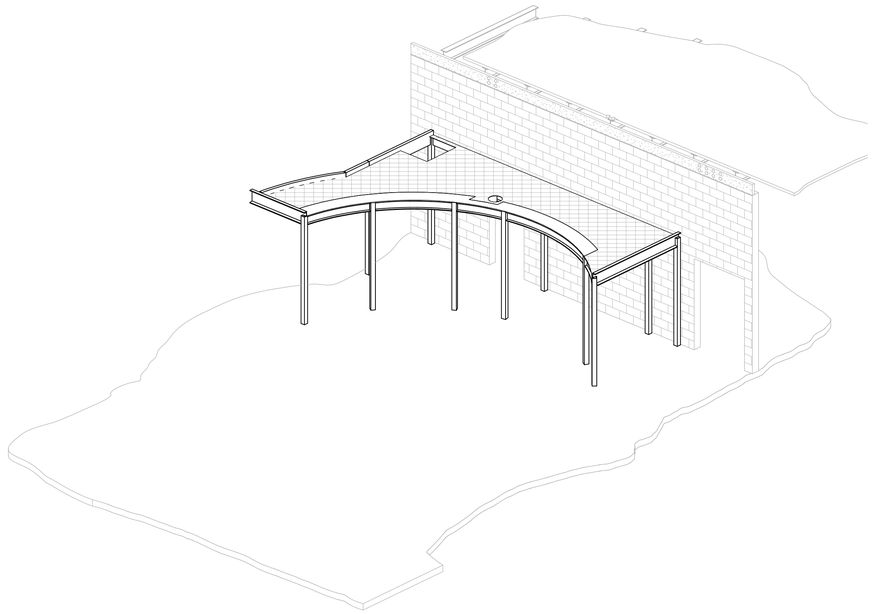
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A1 **PLATFORM LEVEL FRAMING PLAN**
GP-300-11 SCALE: 1/4" = 1'-0"

FRAMING PLAN NOTES:

1. USE STEEL PRIMER COMPATIBLE WITH STEEL EPOXY PAINT. SEE SPECIFICATION SECTION 09 91 00 - PAINTING.
2. ▶— INDICATES MOMENTS CONNECTION, SEE B3/006-GP-300-51.



C3 **PERSPECTIVE**
GP-300-11 SCALE:

EXISTING DRAWINGS AVAILABLE UPON REQUEST

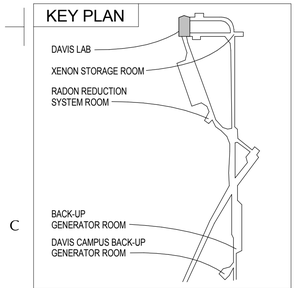
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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	WRE
Draw	SSS / DJF
Check	KDC

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13128
KEVIN D.
CLINTON
SOUTH DAKOTA
11/2/17

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 300 - STRUCT

Level: 4850ft

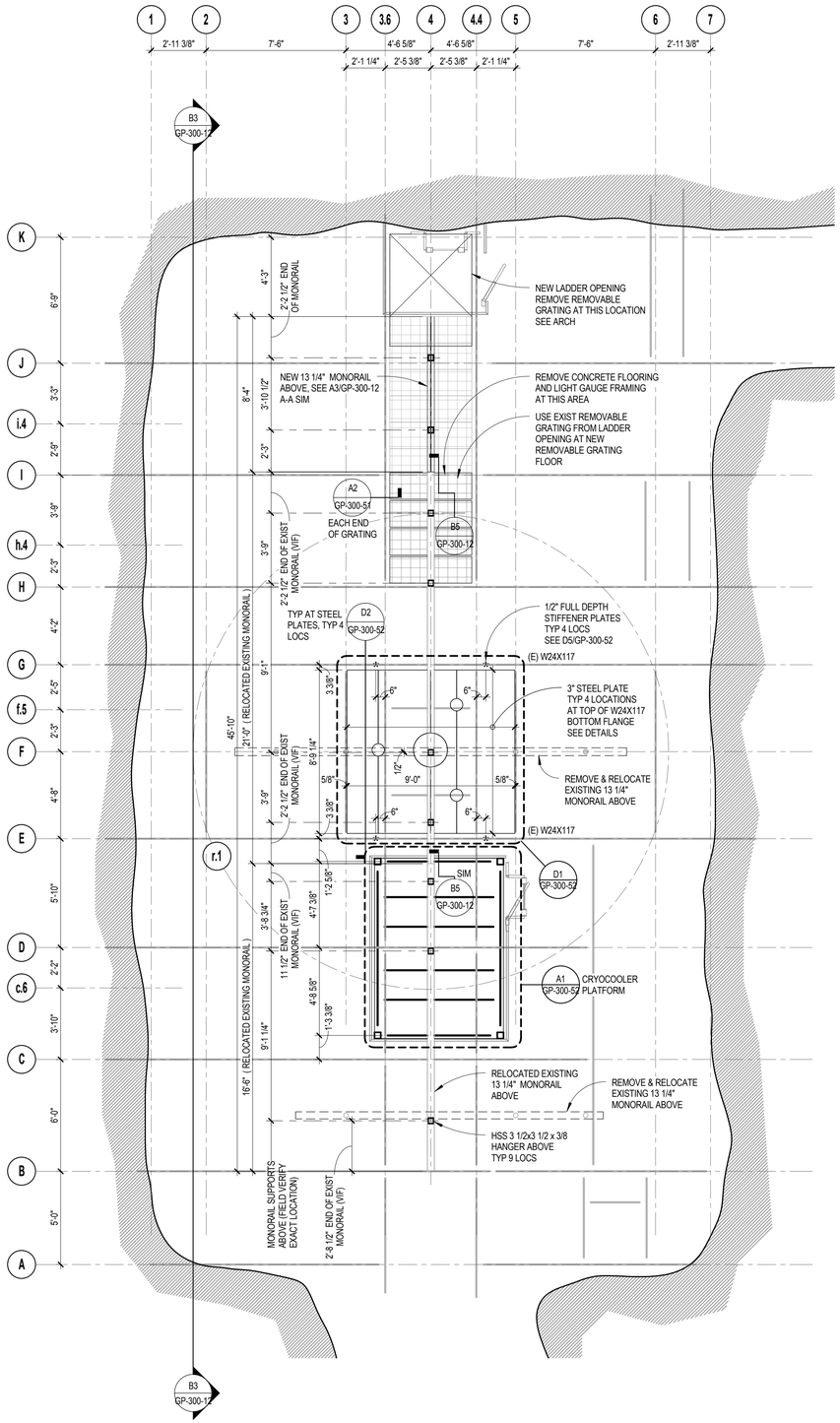
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Drawing Number: 006- GP-300-11 -C1

Drawing Size: 22" x 34"

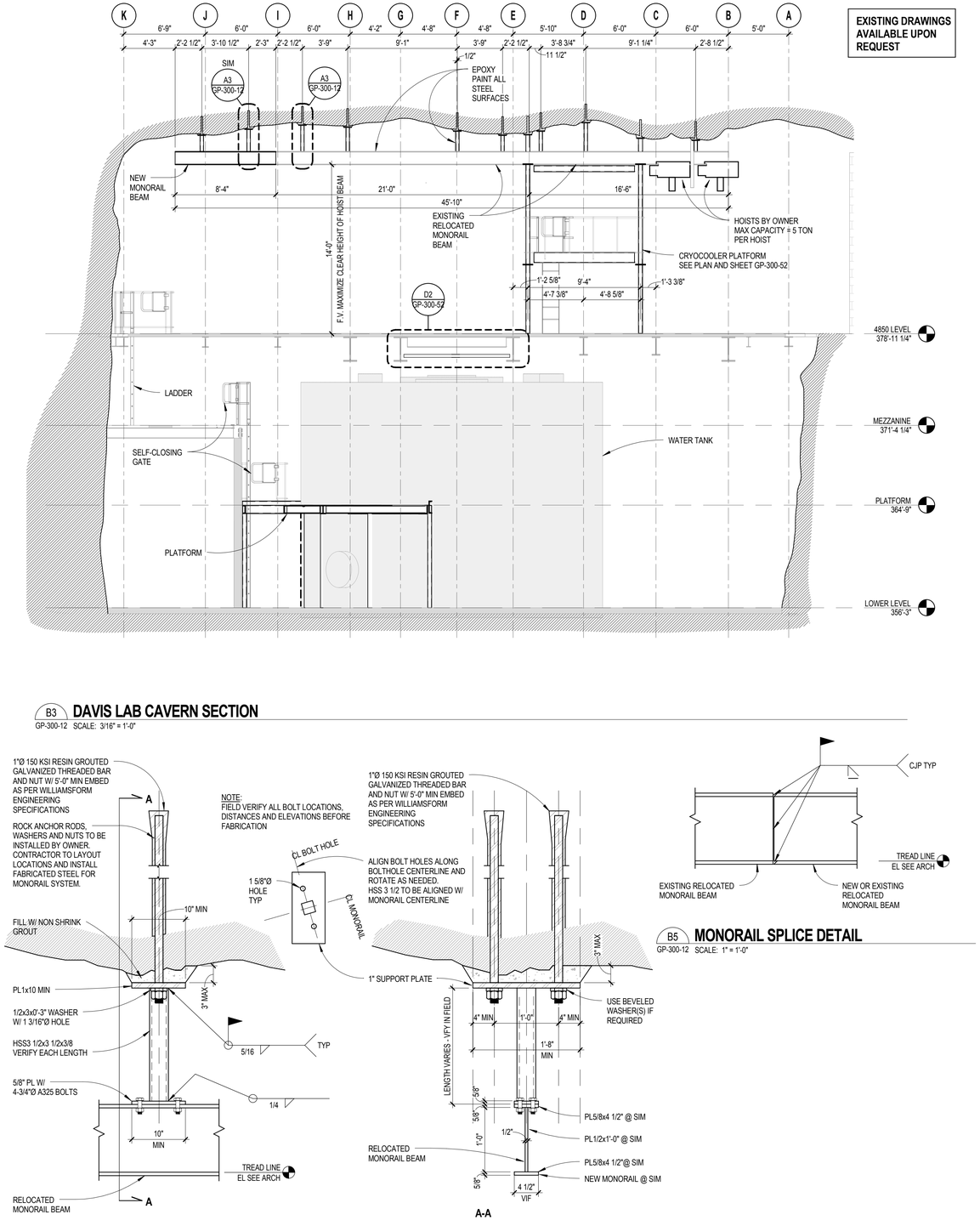
Drawing Count: Sheet 24 of 49

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A1 MONORAIL & FRAMING PLAN - 4850 LEVEL

GP-300-12 SCALE: 1/4" = 1'-0"



EXISTING DRAWINGS AVAILABLE UPON REQUEST

B3 DAVIS LAB CAVERN SECTION

GP-300-12 SCALE: 3/16" = 1'-0"

B5 MONORAIL SPLICE DETAIL

GP-300-12 SCALE: 1" = 1'-0"

A3 MONORAIL SUPPORT

GP-300-12 SCALE: 1" = 1'-0"

A5 NOT USED

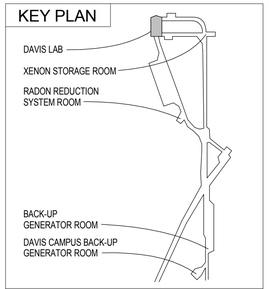
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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	WRE
Draw	SSS / DJF
Check	KDC

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13128
KEVIN D.
CLINTON
SOUTH DAKOTA
11/2/17

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 300 - STRUCT

Level: 4850ft

Drawing Content: 4850 LEVEL PLAN

Drawing Number: **006- GP-300-12 -C1**

Drawing Size: 22" x 34"

Drawing Count: Sheet 25 of 49

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GENERAL STRUCTURAL NOTES

A. DESIGN DATA

1. DESIGN CODES - (ALL LATEST EDITIONS UNLESS NOTED)
   - AMERICAN CONCRETE INSTITUTE (ACI)
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
   - AMERICAN WELDING SOCIETY (AWS)
   - INTERNATIONAL BUILDING CODE (2015 IBC)
   - ASCE7-10
2. DESIGN STRESSES
   - STRUCTURAL STEEL (ASTM A992)..... Fy 50,000 PSI
   - STRUCTURAL PLATES, CHANNELS AND ANGLES (ASTM A36)..... Fy 36,000 PSI
   - CAST-IN-PLACE CONCRETE:
   - FOOTINGS..... f'c = 3,000 PSI @ 28 DAYS
   - SLABS-ON-GRADE..... f'c = 4,000 PSI @ 28 DAYS
   - CMU COREFILL ..... f'c = 3,000 PSI @ 28 DAYS
   - TYPICAL BARS (ASTM A615, GRADE 60).....Fy = 60,000 PSI
   - ELECTRICAL EQUIPMENT PAD WELDABLE BARS (ASTM A706, GRADE 60).....Fy = 60,000 PSI
   - UHMW..... f'c = 3,000 PSI
3. DESIGN LIVE LOADS
   - FLOORS.....200 PSF & 100 PSF (SEE PLANS)
   - LOBBIES, CORRIDORS, AND STAIRS.....100 PSF
4. DESIGN SEISMIC LOADS — BASED ON ASCE 7 2010
   - OCCUPANCY CATEGORY = II — TABLE 1-1
   - Ss=0.160 — FIGURE 22-1
   - S1=0.044 — FIGURE 22-2
   - SITE CLASSIFICATION = C — TABLE 20.3-1
   - SEISMIC DESIGN CATEGORY = A — TABLE 11.6-1 & 2
5. DESIGN SOIL BEARING PRESSURES
   - SOIL BEARING PRESSURE..... 2000 PSF
   - FOUNDATION DESIGN IS BASED ON REQUIREMENTS OF GEOTECHICAL INVESTIGATION REPORT NO. 17-02381 DATED: OCTOBER 23, 2015 PREPARED BY: AMERICAN ENGINEERING TESTING, INC.

B. SPECIAL INSPECTIONS.....BASED ON IBC '15

1. PROVIDE SPECIAL INSPECTIONS FOR THE FOLLOWING ITEMS AS NOTED:
   a. FABRICATORS (REQUIRED), EXCEPT WHEN FABRICATOR MAINTAINS ONGOING INSPECTIONS BY AN APPROVED INDEPENDENT INSPECTION OR QUALITY CONTROL AGENCY (NOT REQUIRED) - SEE 1704.2
   b. STEEL CONSTRUCTION (REQUIRED AS DETAILED IN TABLE 1704.3)
   c. CONCRETE CONSTRUCTION (REQUIRED AS DETAILED IN TABLE 1704.4)

C. GENERAL INFORMATION

1. ALL COLUMNS SHALL BE CENTERED ON GRID LINES UNO.
2. ALL COLUMNS FOOTINGS SHALL BE CENTERED ON COLUMNS UNO.
3. ALL WALL FOOTINGS SHALL BE CENTERED ON WALLS UNO.

D. CAST-IN-PLACE CONCRETE

1. REINFORCING STEEL SHALL BE NEW AND ALL BARS SHALL BE DEFORMED.
2. CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT AT SURFACES NOT EXPOSED DIRECTLY TO THE GROUND OR WEATHER SHALL BE 3/4".
3. CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT AT SURFACES WHICH WILL BE EXPOSED TO THE WEATHER OR BE IN CONTACT WITH THE GROUND SHALL BE 2" FOR BARS LARGER THAN #5 AND 1 1/2" FOR #5 BARS OR SMALLER PROVIDE 3" COVER BELOW FOOTING BARS.
4. LOCATION AND SIZES OF OPENINGS, SLEEVES, ETC., REQUIRED FOR OTHER TRADES MUST BE VERIFIED BY THESE TRADES BEFORE PLACING CONCRETE.
5. FOR CONSTRUCTION, CONTROL AND EXPANSION JOINTS IN WALLS AND SLABS, SEE ARCHITECTURAL DRAWINGS.

E. STRUCTURAL STEEL

1. UNLESS DETAILED OTHERWISE, BEAM CONNECTIONS SHALL BE SELECTED TO SUPPORT THE END REACTION TABULATED USING THE "MAXIMUM TOTAL UNIFORM LOAD" IN PART 3 OF THE AISC STEEL CONSTRUCTION MANUAL, THIRTEENTH EDITION. FOR THE GIVEN BEAM SIZE, SPAN AND STEEL SPECIFICATION. UNLESS DETAILED OTHERWISE,CONNECTIONS SHALL CONFORM TO THOSE SHOWN IN PART 9 THRU PART 14 OF THE AISC STEEL CONSTRUCTION MANUAL, THIRTEENTH EDITION.
2. UNLESS DETAILED OTHERWISE, ALL FIELD CONNECTIONS SHALL BE MADE USING 3/4" DIAMETER ASTM A325 (N) HIGH STRENGTH BOLTS. TYPE "N" INDICATES BEARING TYPE WITH THREADS IN SHEAR PLANE.
3. STEEL BEAM CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR FOR AXIAL LOADING CONDITIONS SHOWN ON PLAN
4. STEEL ERECTOR SHALL PROVIDE THE NECESSARY BRACING FOR STRUCTURE STABILITY DURING ERECTION AND UNTIL ALL STEEL IS PLUMB AND SECURED.

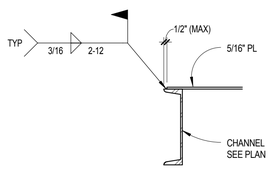
F. EXISTING CONSTRUCTION

1. BEFORE FABRICATION AND ERECTION OF ANY MATERIALS, FIELD VERIFY ALL EXISTING ELEVATIONS, DIMENSIONS AND CONDITIONS AS SHOWN ON THE DRAWINGS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT AT ONCE
2. CONTRACTOR IS SOLELY RESPONSIBLE FOR PROTECTION OF EXISTING BUILDING DURING ALL PHASES OF CONSTRUCTION
3. PROVIDE ALL SHORING, BRACING, ETC., AS REQUIRED TO TEMPORARILY SUPPORT THE EXISTING STRUCTURE DURING REMOVAL OF EXISTING STRUCTURAL ELEMENTS

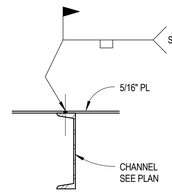
G. CONCRETE MASONRY - NORMAL WEIGHT BLOCK (FOR PARTITION WALLS - SEE ARCHITECTURAL DRAWINGS)

1. PROVIDE STANDARD HORIZONTAL JOINT REINFORCEMENT AT 16" OC FULL HEIGHT OF WALL.
2. PROVIDE VERTICAL REINFORCEMENT FULL HEIGHT OF WALL - DOWEL TO SLAB & ROCK SURFACE. REINF SIZE & SPA UNO:
   a. 8" BLK - #5 @ 32"OC
3. JAMB REINFORCING UNO: REINFORCE NUMBER OF CORES SHOWN BELOW WITH 2-#5 BARS (1 EACH FACE, FULL HEIGHT) EACH SIDE OF OPENING.
   a. OPENINGS < = 4'-0": 1 CORE
   b. 4'-0" < OPENINGS < = 8'-8": 2 CORES.
4. BOND BEAM REINFORCEMENT SHALL BE CONTINUOUS AT CONTROL JOINTS, CORNERS, AND STEPPED BOND BEAMS - LAP REINFORCEMENT 48 BAR DIAMETERS.
5. LAP ALL VERTICAL AND HORIZONTAL REINFORCEMENT 48 BAR DIAMETERS.
6. FOR ALL OPENINGS, THROUGH MASONRY WALLS INCLUDING MECHANICAL AND ELECTRICAL OPENINGS, PROVIDE ONE OF THE FOLLOWING UNLESS NOTED OTHERWISE.
   a. STEEL ANGLE LINTELS:
      1-3 1/2x3 1/2x1/4 ANGLE FOR EACH 4" THICKNESS OF WALL FOR SPANS UP TO 4'-0"
      1-5x3 1/2x5/16 ANGLE FOR EACH 4" THICKNESS OF WALL FOR SPANS UP TO 5'-0"
      1-6x3 1/2x5/16 ANGLE FOR EACH 4" THICKNESS OF WALL FOR SPANS UP TO 6'-0"
   b. BLOCK LINTELS: (8" HIGH UNLESS NOTED OTHERWISE)
      8" BLOCK
      2-#4 BOT NON-BEARING WALL UP TO 3'-4" SPAN
      2-#5 BOT NON-BEARING WALL 3'-5" TO 8'-8" SPAN
7. ALL LINTELS SHALL BEAR A MINIMUM OF 8" ON SOLID MASONRY. FILL BLOCK CORES UNDER ALL BEARINGS WITH CONCRETE CMU VERTICAL COREFILL A MINIMUM OF 3 COURSES DOWN FOR A 24" LENGTH OF WALL UNLESS NOTED OTHERWISE.
8. FILL ALL BLOCK LINTELS BOND BEAMS AND WALLS SOLID WITH CMU COREFILL
9. SEE ARCHITECTURAL FOR LOCATION OF CONTROL JOINTS, MASONRY OPENINGS AND EMBEDDED ANCHORS FOR DOORS, EXTEND CONTROL JOINTS FULL HEIGHT OF CMU WALL.

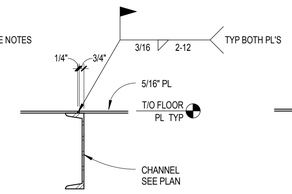
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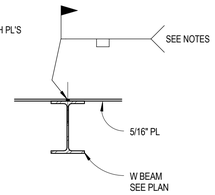
TYPICAL END



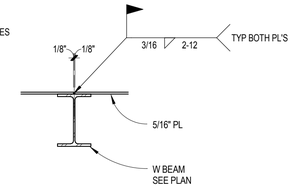
TYPICAL SUPPORT



SEAM AT CHANNEL



SUPPORT @ W BM



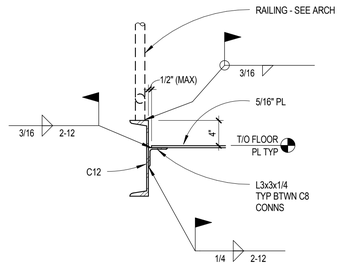
SEAM @ W BM

NOTES:

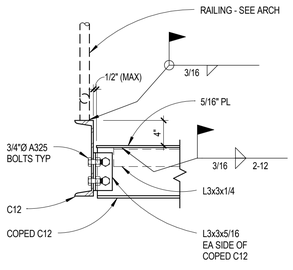
1. THE MAXIMUM CLEARANCE BETWEEN THE FLOOR PLATE AND ANY VESSEL, DUCT, PIPE (INCLUDING INSULATION) EQUIPMENT, STRUCTURAL STEEL OF ANY FLOOR OBSTACLE SHALL BE 1". WHERE THE CLEARANCE EXCEEDS 1", TOE PL SHALL BE REQUIRED.
2. WELD TOE PLATES TO THE PLATE FLOOR, AROUND RISER PIPES & CONDUIT OR DUCTS.
3. PROVIDE OPENINGS OVER 6" IN SHOP, ALL SMALLER OPENINGS TO BE PROVIDED IN FIELD. ALL OPENING EDGES GRIND SMOOTH.
4. THE HOLE DIAMETER FOR PLUG WELDS SHALL EQUAL THE THICKNESS PLUS 5/16" ROUNDED UP TO THE NEAREST ODD 16TH. HOLES SHALL BE SPACED AT 3'-0"OCD MAX.

D2 D2 - TYPICAL CHECKERED PLATE CONNECTION DETAILS

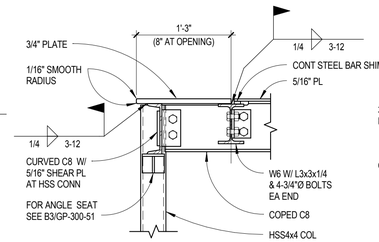
GP-300-51 SCALE: 1" = 1'-0"



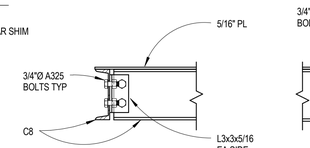
C1 SECTION
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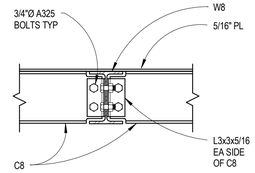
C2 SECTION
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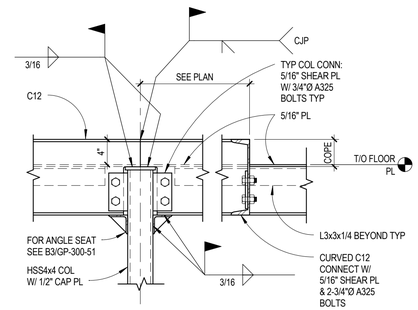
C3 SECTION
GP-300-51 SCALE: 1" = 1'-0"



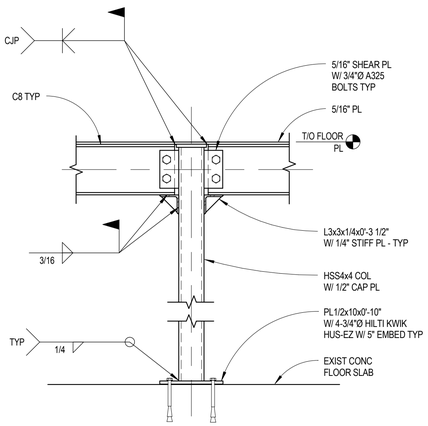
C4 SECTION
GP-300-51 SCALE: 1" = 1'-0"



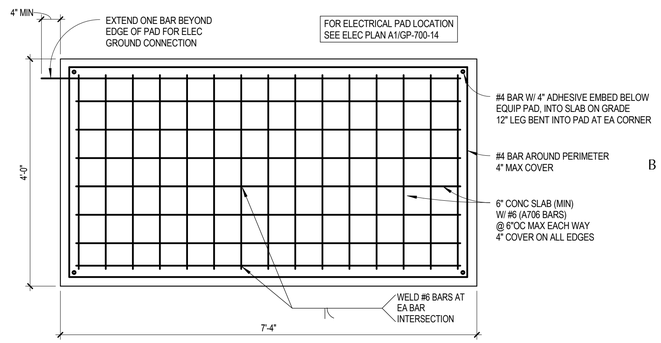
C5 SECTION
GP-300-51 SCALE: 1" = 1'-0"



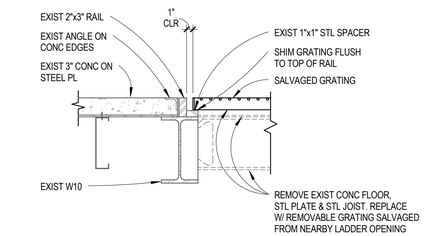
B2 SECTION
GP-300-51 SCALE: 1" = 1'-0"



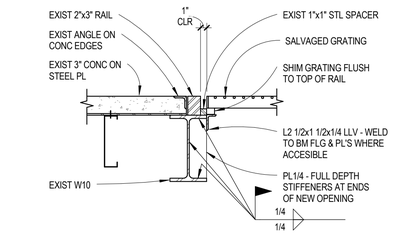
B3 SECTION
GP-300-51 SCALE: 1" = 1'-0"



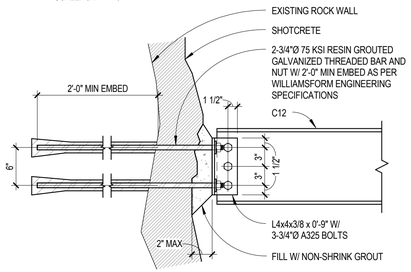
B4 ELECTRICAL EQUIPMENT PAD
GP-300-51 SCALE: 3/4" = 1'-0"



A2 REMOVABLE GRATING SECTION
GP-300-51 SCALE: 1" = 1'-0"



A3 REMOVABLE GRATING SECTION
GP-300-51 SCALE: 1" = 1'-0"



A4 BEAM TO WALL CONNECTION
GP-300-51 SCALE: 1" = 1'-0"

EXISTING DRAWINGS AVAILABLE UPON REQUEST

Sanford Underground Research Facility

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	WRE
Draw	SSS / DJF
Check	KDC

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13128
KEVIN D. CLINTON
SOUTH DAKOTA
11/2/17

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 300 - STRUCT

Level: 4850ft

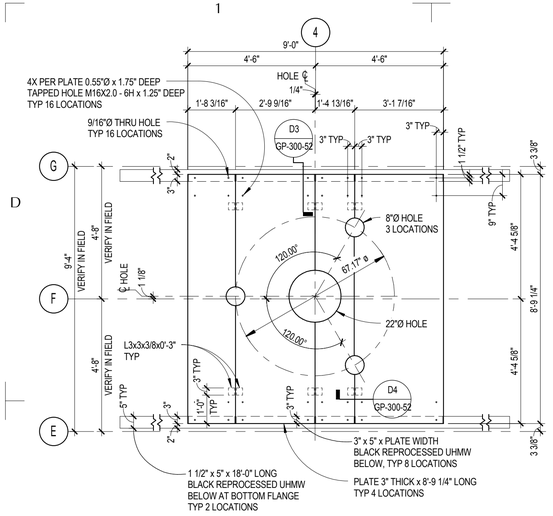
Drawing Content: NOTES AND DETAILS

Drawing Number: 006- GP-300-51 -C1

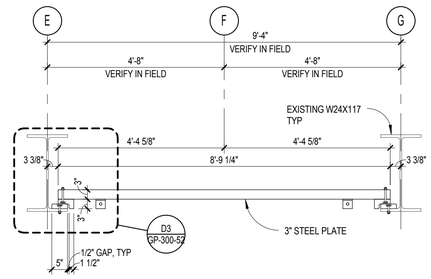
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Drawing Count: Sheet 26 of 49

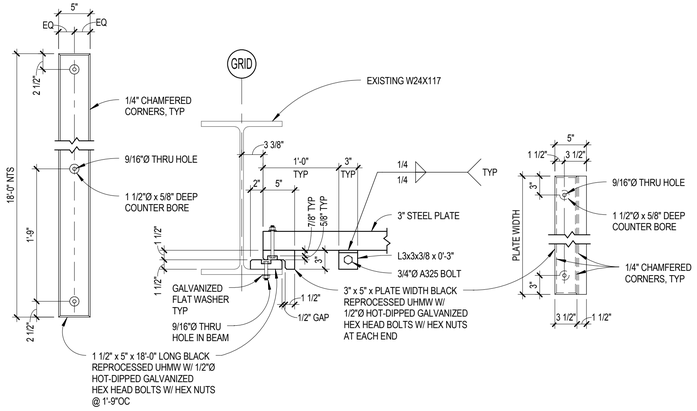
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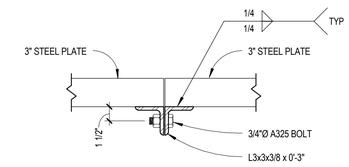
D1 **PLAN DETAIL**
GP-300-52 SCALE: 3/8" = 1'-0"



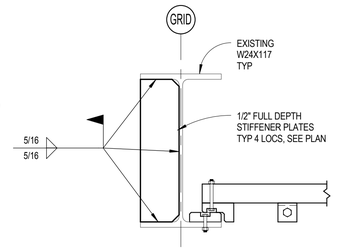
D2 **SECTION**
GP-300-52 SCALE: 1/2" = 1'-0"



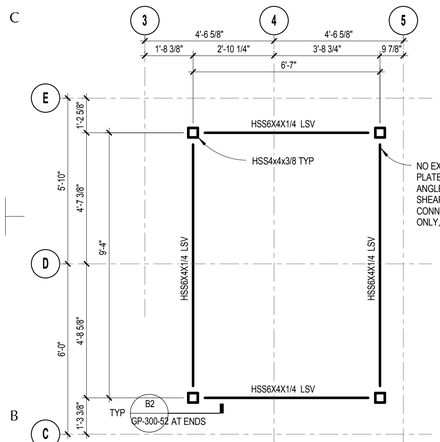
D3 **SECTION**
GP-300-52 SCALE: 1" = 1'-0"

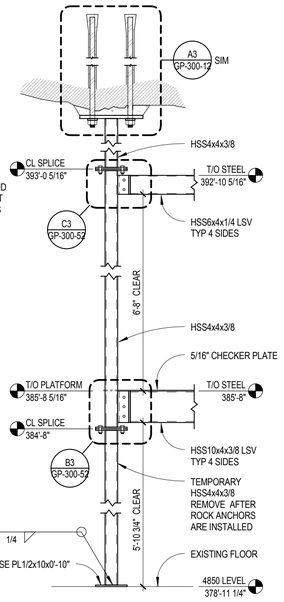


D4 **SECTION**
GP-300-52 SCALE: 1 1/2" = 1'-0"

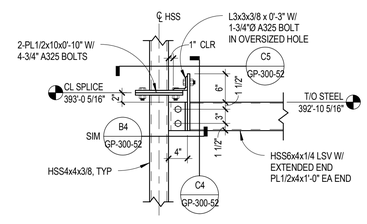


D5 **SECTION**
GP-300-52 SCALE: 1" = 1'-0"

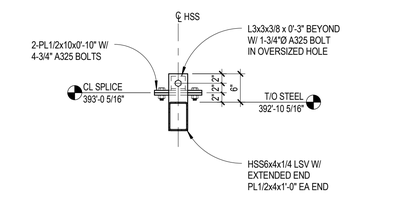




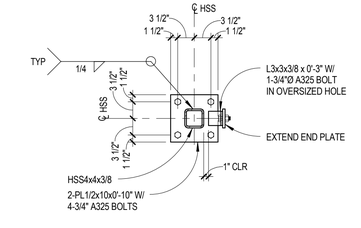
B2 **SECTION**
GP-300-52 SCALE: 1/2" = 1'-0"



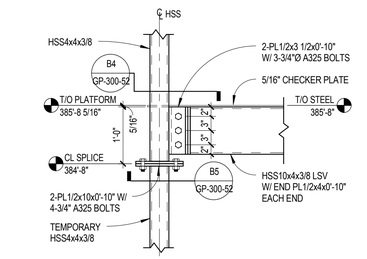
C3 **DETAIL**
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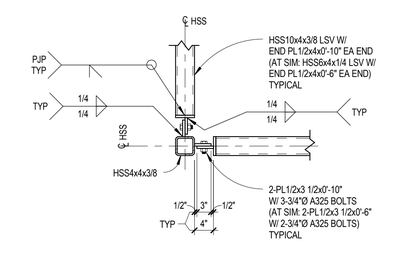
C4 **SECTION**
GP-300-52 SCALE: 3/4" = 1'-0"



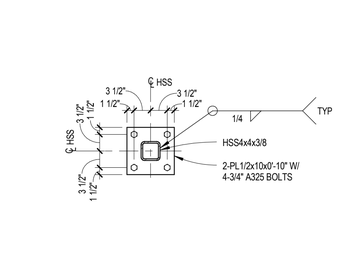
C5 **PLAN DETAIL**
GP-300-52 SCALE: 3/4" = 1'-0"



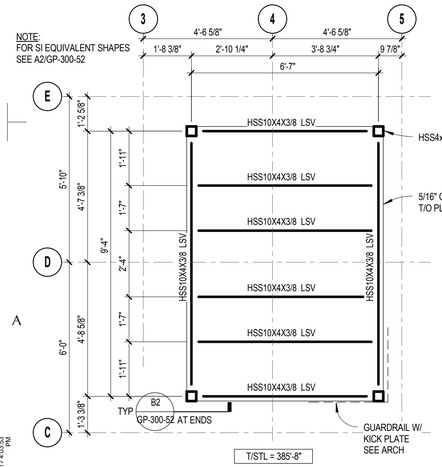
B3 **DETAIL**
GP-300-52 SCALE: 3/4" = 1'-0"



B4 **PLAN DETAIL**
GP-300-52 SCALE: 3/4" = 1'-0"



B5 **PLAN DETAIL**
GP-300-52 SCALE: 3/4" = 1'-0"



STANDARD U.S. SHAPES in x in x in	SI EQUIVALENT SHAPES mm x mm x mm	OTHER ACCEPTABLE SI SHAPES mm x mm x mm
HSS 4x4x3/8	HSS 101.6x101.6x9.5	HSS 100x100x10
HSS 6x4x1/4	HSS 152.4x101.6x6.4	HSS 150x100x6
HSS 10x4x3/8	HSS 254x101.6x9.5	HSS 250x100x10

NOTE:
HSS SECTIONS TO BE ASTM A500 GRADE B WITH Fy = 46,000 PSI (Fy = 345 MPA)

A1 **CRYOCOOLER PLATFORM FRAMING PLAN**
GP-300-52 SCALE: 3/8" = 1'-0"

A2 **SI EQUIVALENT SHAPES**
GP-300-52 SCALE: 12" = 1'-0"

10/31/2017 4:03:53 PM

Sanford Underground Research Facility

LZ

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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	WRE
Draw	SSS / DJF
Check	KDC

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13128
KEVIN D. CLINTON
SOUTH DAKOTA
11/2/17

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
300 - STRUCT

Level:
4850ft

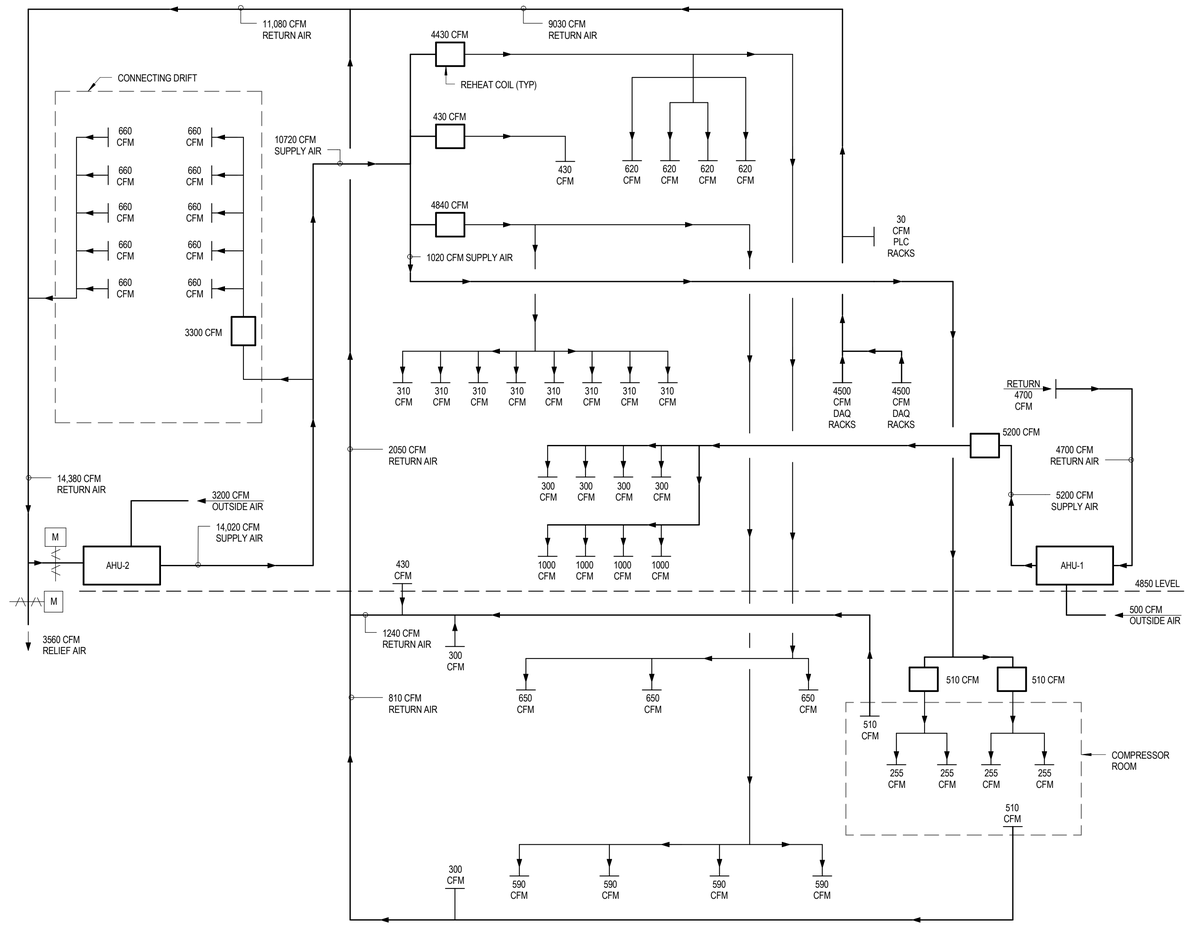
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FRAMING PLANS AND DETAILS

Drawing Number:
006- GP-300-52 -C0

Drawing Size:
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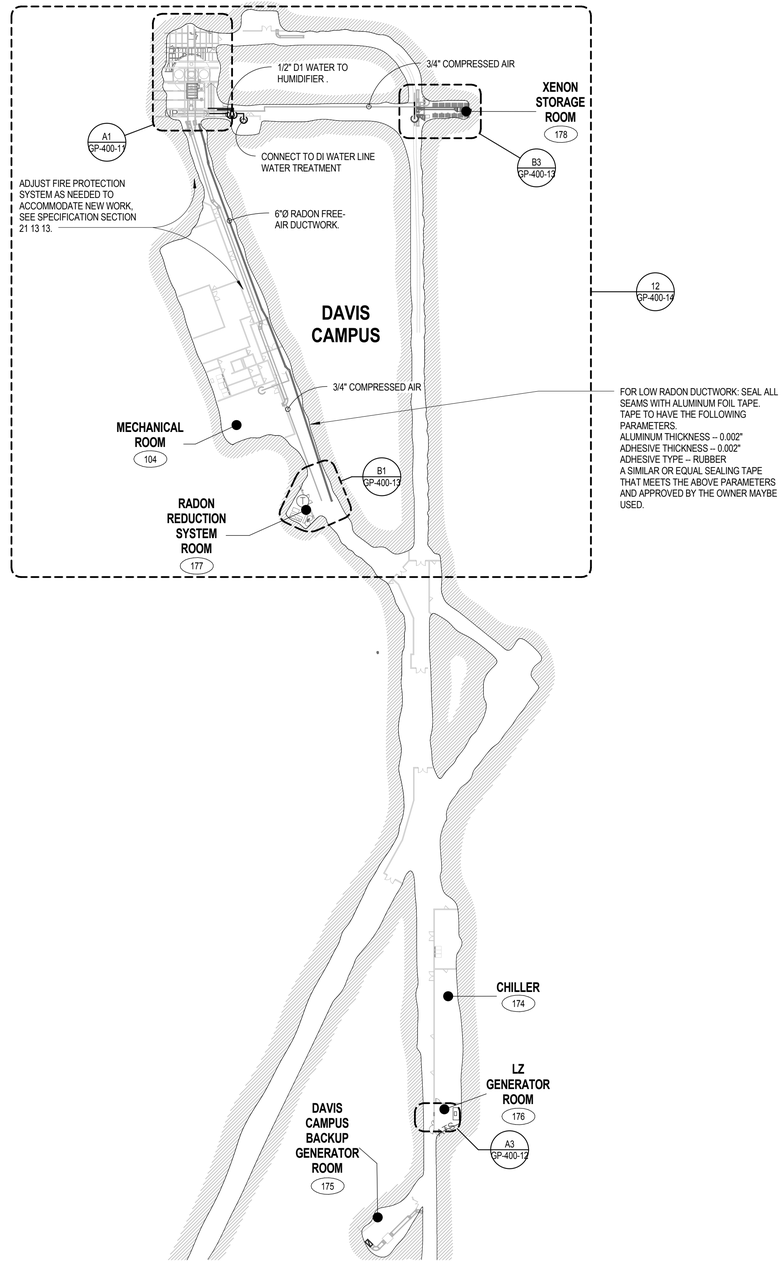
Drawing Count:
Sheet 27 of 49

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AIRFLOW SUMMARY				
AHU	**SA**	**RA**	**OA**	**Δ SA % RA**
AHU - 1	14,020	14,380	3200	-360
AHU - 2	5200	4700	500	+500
TOTAL	19,220	19,080		+140

A1 **DAVIS CAMPUS AIRFLOW BALANCE DIAGRAM**
GP-400-10 SCALE: NONE



A3 **OVERALL DAVIS CAMPUS MECHANICAL PLAN**
GP-400-10 SCALE: 1" = 50'-0"

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

N

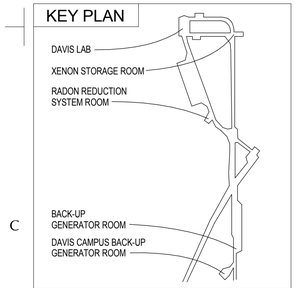
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Sanford Underground Research Facility

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Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8891
DANIEL J. DELLOVECHIO
2 NOV 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
400 - MECH

Level:
4850ft

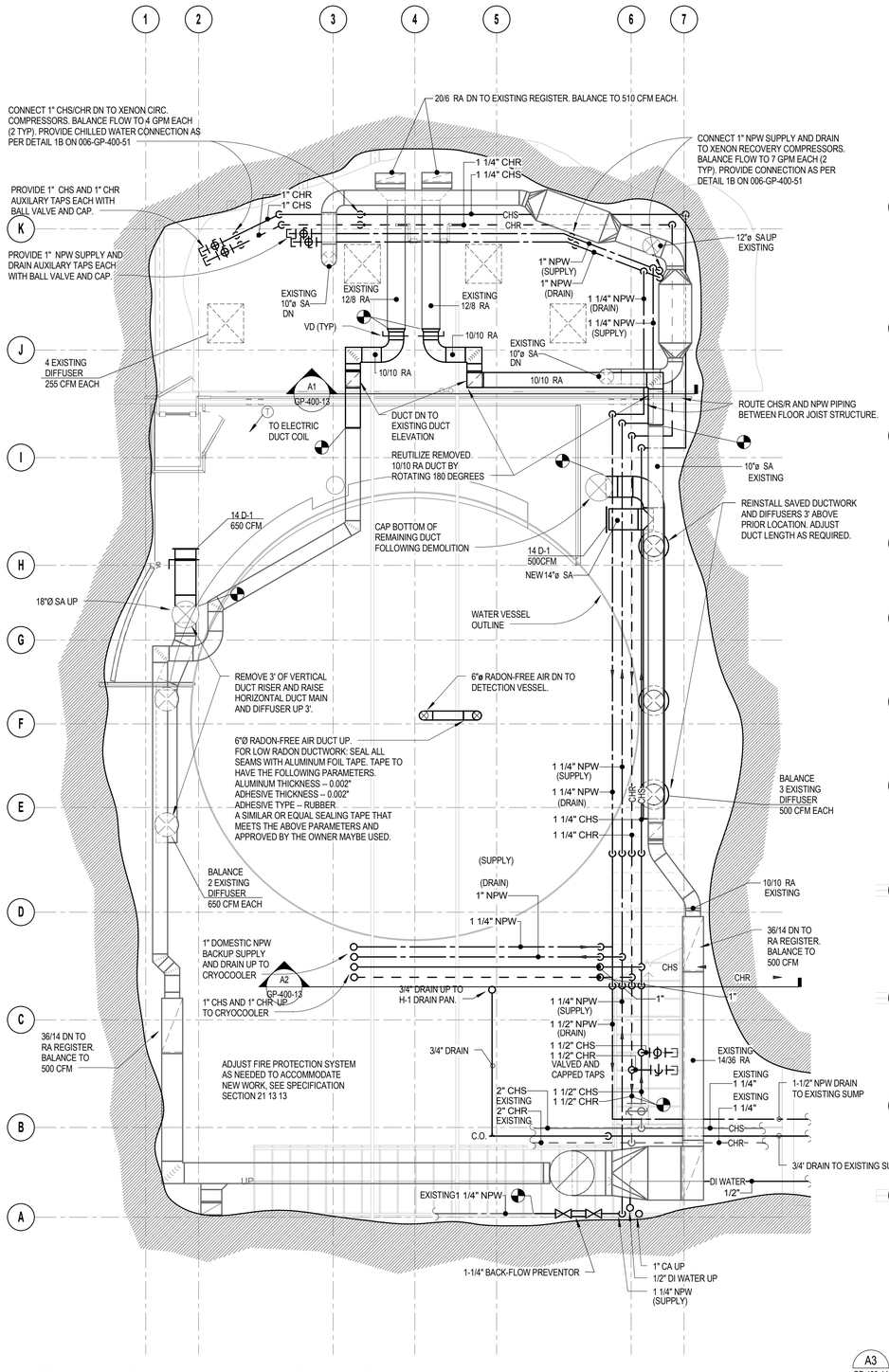
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OVERALL DAVIS CAMPUS MECHANICAL PLAN

Drawing Number:
006- GP-400-10 -C2

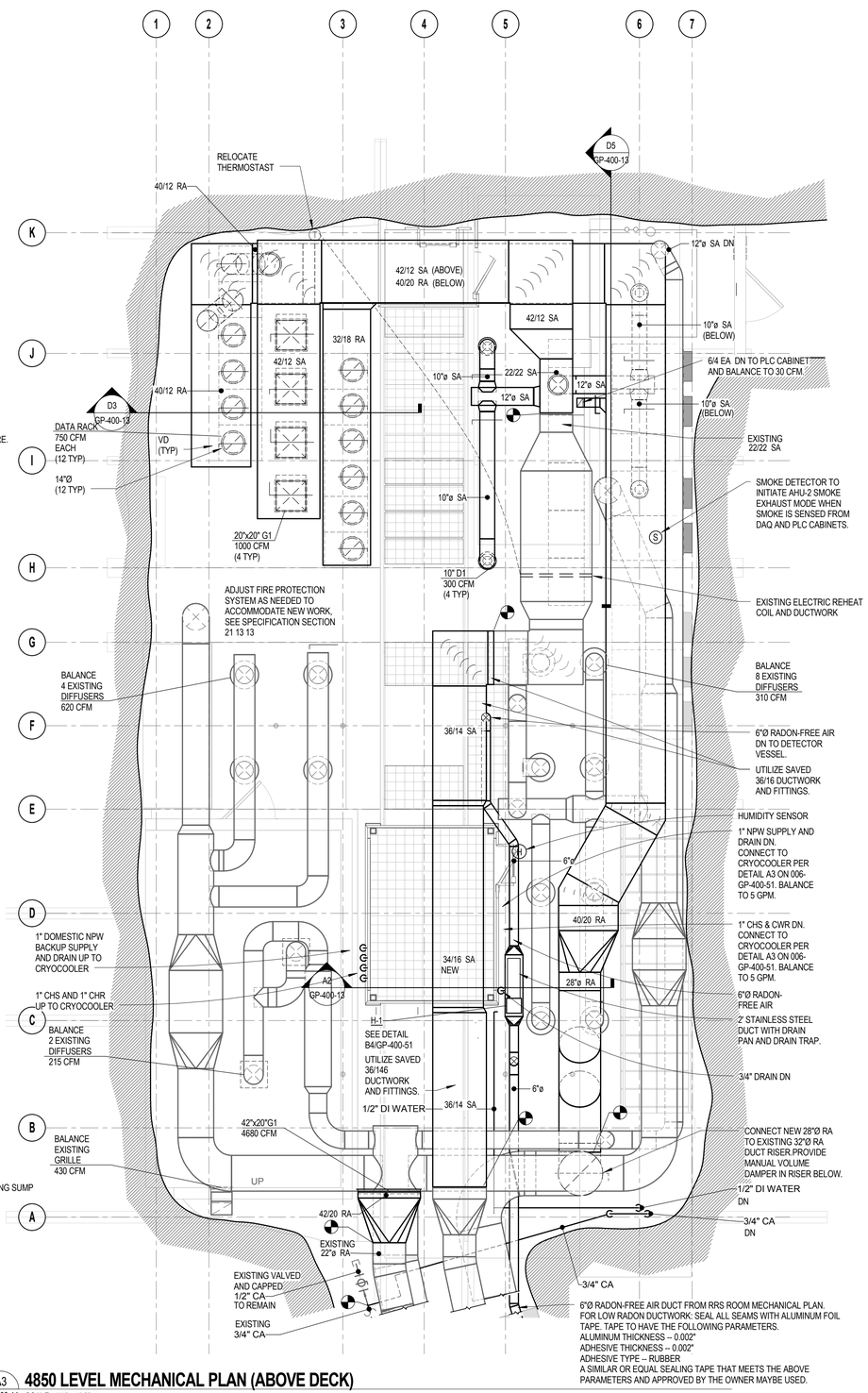
Drawing Size:
22" x 34"

Drawing Count:
Sheet 28 of 50

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A1 **MEZZANINE LEVEL MECHANICAL PLAN (BELOW DECK)**
GP-400-11 SCALE: 1/4" = 1'-0"



A3 **4850 LEVEL MECHANICAL PLAN (ABOVE DECK)**
GP-400-11 SCALE: 1/4" = 1'-0"

0 2' 4' 8'
SCALE : 1/4" = 1'-0"

N

11/1/2017 11:52:30 AM

Sanford Underground Research Facility
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Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

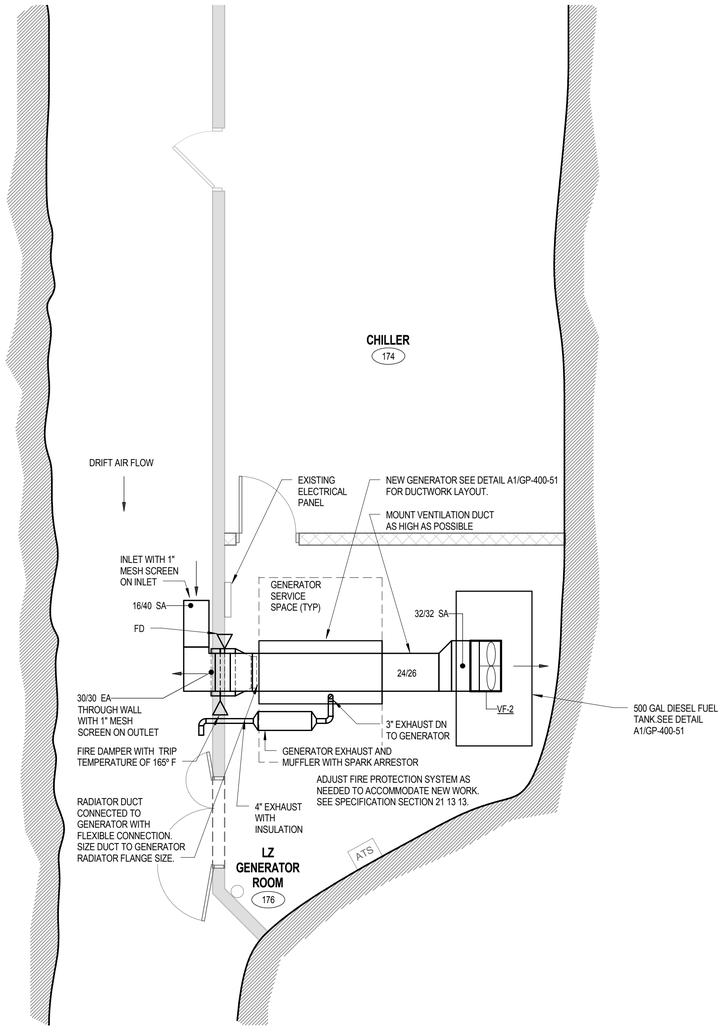
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REGISTERED PROFESSIONAL ENGINEER REG. NO. 8891 DANIEL J. DELLOVECCHIO SOUTH DAKOTA 2 NOV 2017

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS
Project Name: LZ DAVIS CAMPUS
Issue Date: 11-02-2017
Discipline: 400 - MECH
Level: 4850ft
Drawing Content: MEZZANINE and 4850 LEVEL MECHANICAL PLAN
Drawing Number: 006- GP-400-11 -C2
Drawing Size: 22" x 34"
Drawing Count: Sheet 29 of 50

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A3 **LZ BACKUP GENERATOR AND FUEL TANK ROOM MECHANICAL PLAN**

GP-400-12 SCALE: 1/4" = 1'-0"

0 2' 4' 8'

SCALE : 1/4" = 1'-0"

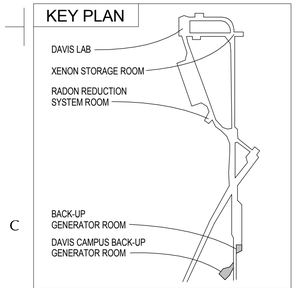
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Sanford Underground Research Facility

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Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8891
DANIEL J. DELLOVECHIO
SOUTH DAKOTA
2 NOV 2017

100% CONSTRUCTION DOCUMENTS

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Issue Date:
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Level:
4850ft

Drawing Content:
LZ BACKUP GENERATOR AND FUEL TANK ROOM MECHANICAL PLANS

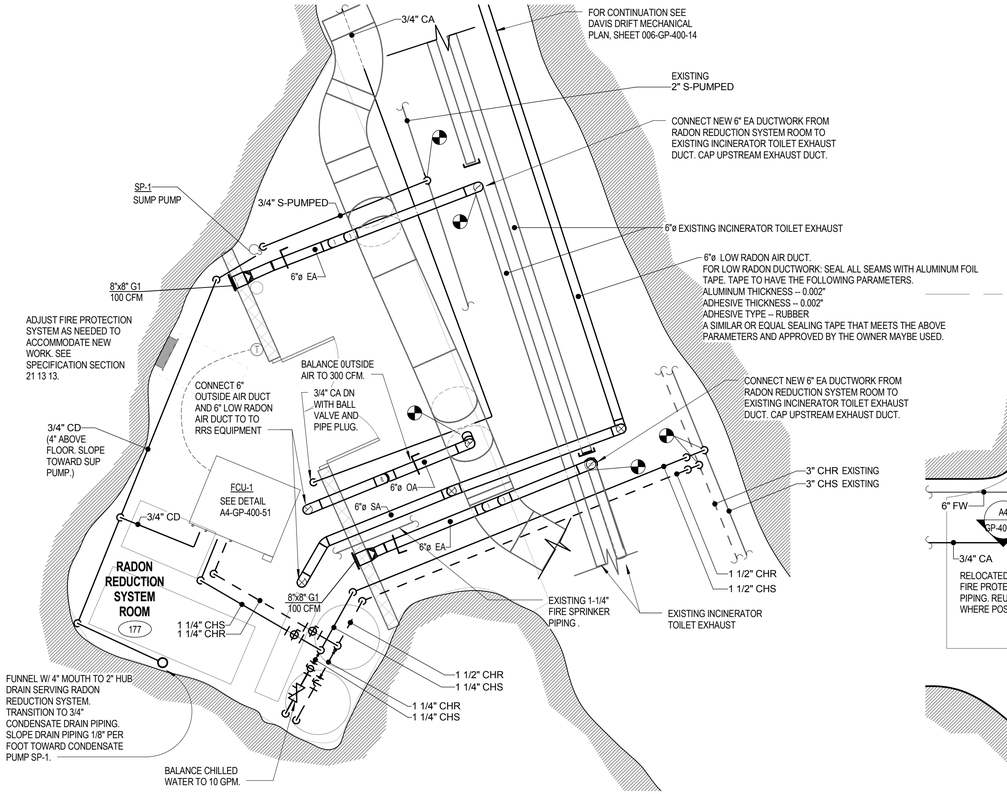
Drawing Number:
006- GP-400-12 -C2

Drawing Size:
22" x 34"

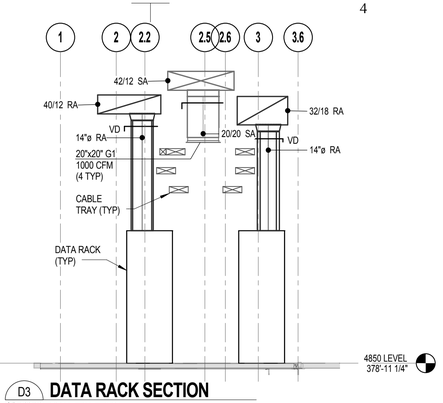
Drawing Count:
Sheet 30 of 50

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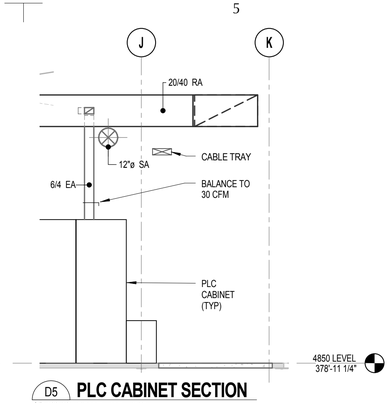
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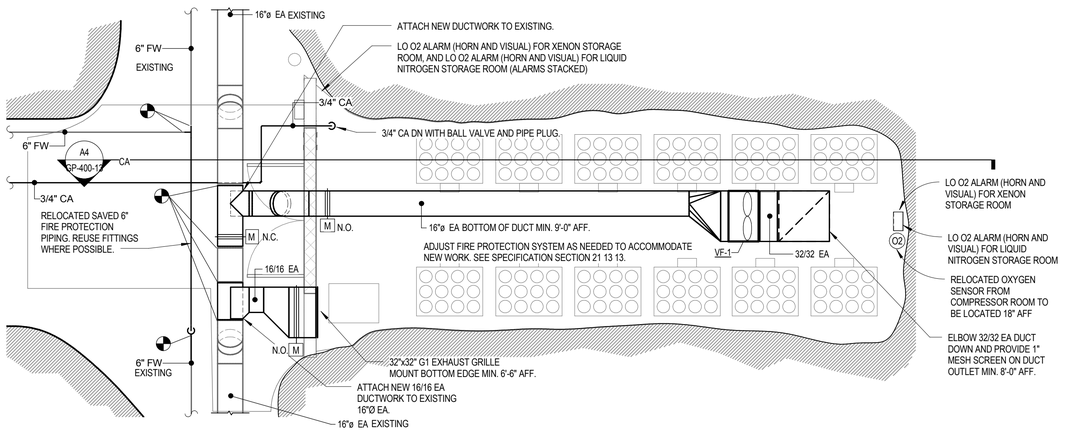
B1 **RRS ROOM MECHANICAL PLAN**
GP-400-13 SCALE: 1/4" = 1'-0"



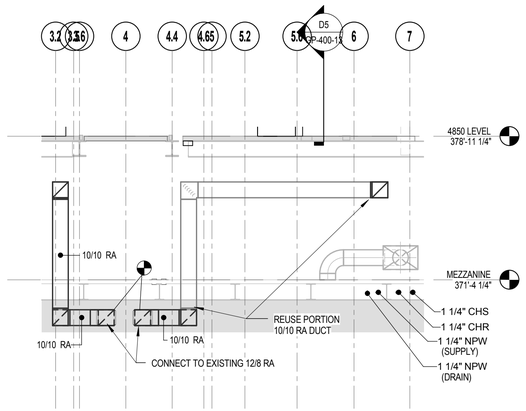
D3 **DATA RACK SECTION**
GP-400-13 SCALE: 1/4" = 1'-0"



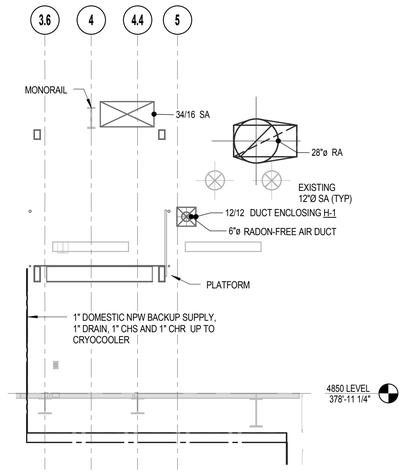
D5 **PLC CABINET SECTION**
GP-400-13 SCALE: 1/4" = 1'-0"



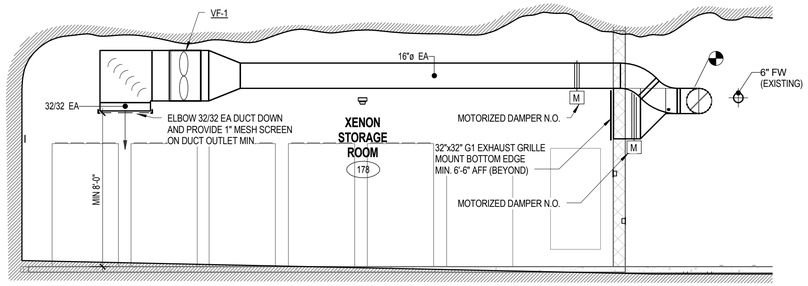
B3 **XENON STORAGE ROOM MECHANICAL PLAN**
GP-400-13 SCALE: 1/4" = 1'-0"



A1 **MECHANICAL MEZZANINE SECTION**
GP-400-13 SCALE: 1/4" = 1'-0"



A2 **PLATFORM SECTION**
GP-400-13 SCALE: 1/4" = 1'-0"



A4 **XENON STORAGE ROOM MECHANICAL SECTION**
GP-400-13 SCALE: 1/4" = 1'-0"

0 2' 4' 8'
SCALE : 1/4" = 1'-0"

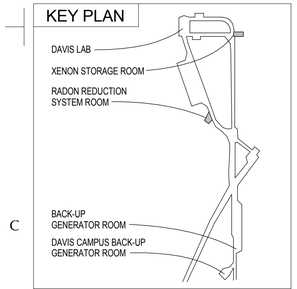
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KEY PLAN



REVISIONS

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FILE LOG

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Manager	MWL
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Check	DLA

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100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

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Level: 4850ft

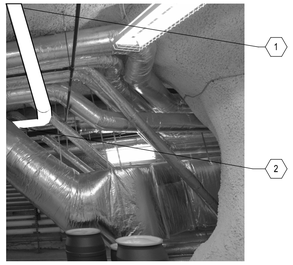
Drawing Content: RRS ROOM XENON STORAGE ROOM MECHANICAL PLANS AND MECHANICAL SECTIONS

Drawing Number: 006- GP-400-13 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 31 of 50

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1 LOW RADON DUCTWORK ROUTING 1
GP-400-14 SCALE: NONE



2 LOW RADON DUCTWORK ROUTING 2
GP-400-14 SCALE: NONE



3 LOW RADON DUCTWORK ROUTING 3
GP-400-14 SCALE: NONE



4 LOW RADON DUCTWORK ROUTING 4
GP-400-14 SCALE: NONE



5 LOW RADON DUCTWORK ROUTING 5
GP-400-14 SCALE: NONE



6 LOW RADON DUCTWORK ROUTING 6
GP-400-14 SCALE: NONE



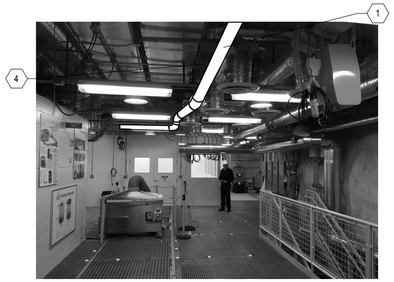
7 LOW RADON DUCTWORK ROUTING 7
GP-400-14 SCALE: NONE



8 LOW RADON DUCTWORK ROUTING 8
GP-400-14 SCALE: NONE



9 LOW RADON DUCTWORK ROUTING 9
GP-400-14 SCALE: NONE

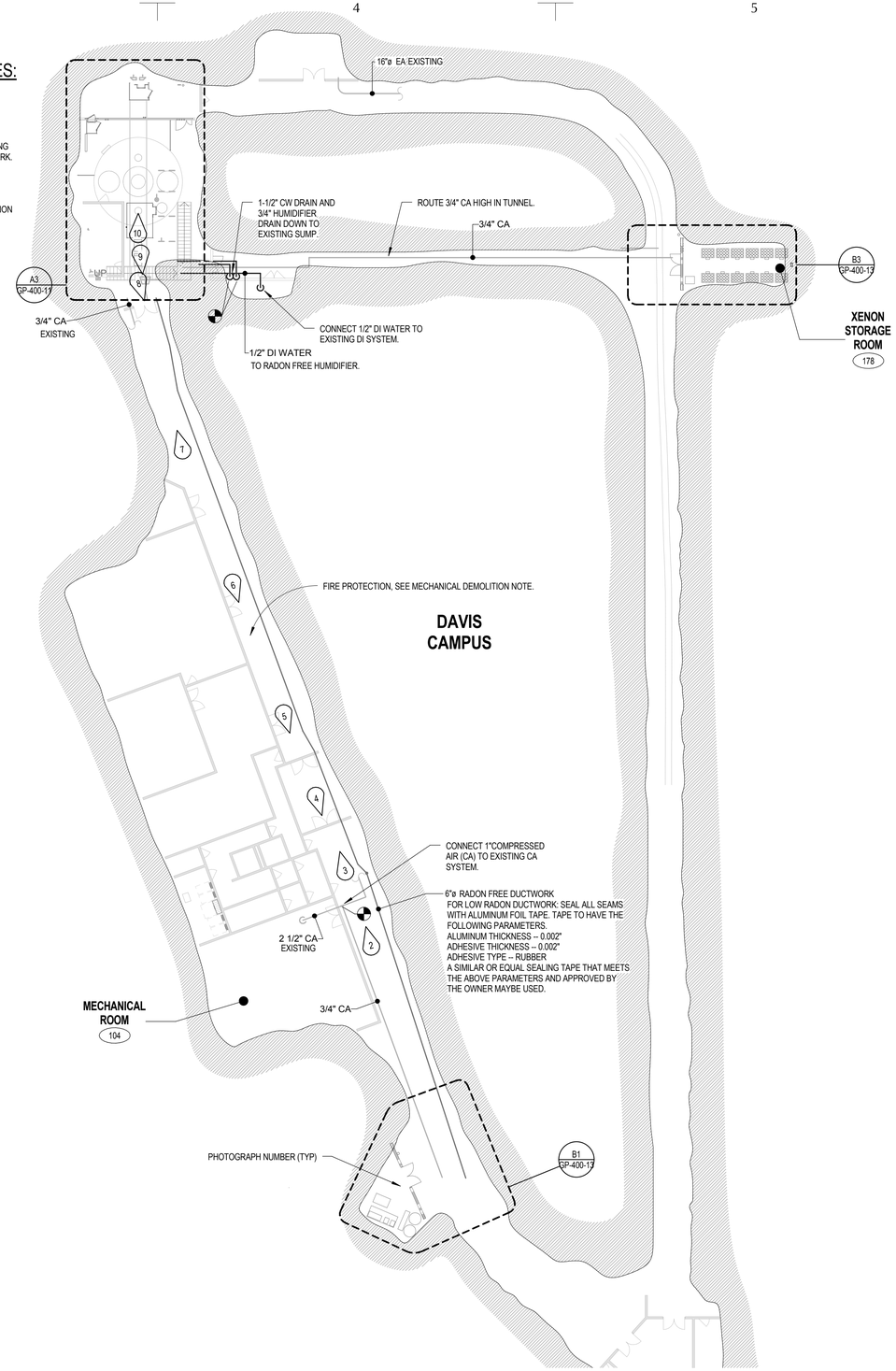


10 LOW RADON DUCTWORK ROUTING 6
GP-400-14 SCALE: NONE

1/17/2017 11:02:36 AM

KEYED PHOTOGRAPHY NOTES:

1. 6" LOW RADON DUCTWORK.
2. 6" ROUTE ABOVE EXISTING DUCTWORK.
3. RELOCATE 2 ELECTRICAL CONDUITS AND PVC PIPING TO ALLOW INSTALLATION OF LOW RADON DUCTWORK.
4. ROUTE LOW RADON DUCTWORK BELOW EXISTING DUCTWORK AND PIPING.
5. DRILL OPENING IN MASONRY WALL FOR INSTALLATION OF 6" DUCTWORK. SEAL AROUND DUCTWORK TO MATCH SURROUNDING WALL PENETRATIONS.



12 DAVIS CAMPUS DRIFT MECHANICAL PLAN
GP-400-14 SCALE: 1" = 20'-0"

0 10' 20' 40'
SCALE : 1" = 20'-0"

N

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Manager	MWL
Design	DJD
Draw	PEH
Check	DLA

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SOUTH DAKOTA
2 NOV 2017

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SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline:
400 - MECH

Level:
4850ft

Drawing Content:
DAVIS CAMPUS DRIFT MECHANICAL PLAN

Drawing Number:
006- GP-400-14 -C2

Drawing Size:
22" x 34"

Drawing Count:
Sheet 32 of 50

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14-FAN SCHEDULE

MARK	LOCATION	SERVES	TYPE	CFM	STAT PRESS IN WG	FAN RPM	MOTOR DATA					FAN WHEEL DIAMETER (IN.)	FAN WHEEL TYPE	DRIVE	MANUFACTURER	MODEL	NOTES
					TOTAL		HP	RPM	VOL	PH	HZ						
VF-1	XENON STORAGE ROOM	VENTILATION	DUCT MOUNTED	4000	0.50	1201	0.75	1750	460	3	60	24	PROPELLER	BELT	GREENHECK	SBE-3H24	
VF-2	LZ GENERATOR ROOM	VENTILATION	DUCT MOUNTED	5890	0.50	1439	1.50	1750	460	3	60	24	PROPELLER	BELT	GREENHECK	SBS-3H24	1

NOTE:
1. INTERLOCK FAN START/STOP WITH GENERATOR OPERATION

14-PUMP SCHEDULE

MARK	LOCATION	SERVES	TYPE	GPM	TOTAL HEAD FT WG	MOTOR DATA					MIN EFF %	MANUFACTURER	MODEL	NOTES
						HP	RPM	VOL	PH	HZ				
SP-1	RRS ROOM	DRAIN	CENTRIFUGAL	1	12	0.03	1800	120	1	60	0	LITTLE GIANT	VCMA-20ULS	

14-HUMIDIFIER SCHEDULE

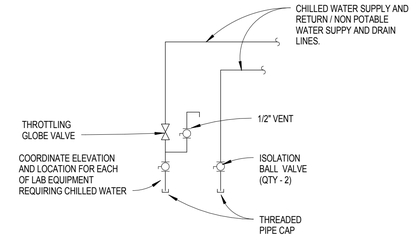
MARK	LOCATION	SERVES	TYPE	CFM	CAPACITY LBS/HR	ELECTRICAL DATA				MANUFACTURER	MODEL	NOTES
						KW	VOL	PH	HZ			
H-1	4850 LEVEL	RADONLESS AIR	ELEC ULTRASONIC	300	3.8	0.21	110	1	60	CAREL	HUMISONIC UU02	Equip

14-DIFFUSER, REGISTER AND GRILL SCHEDULE

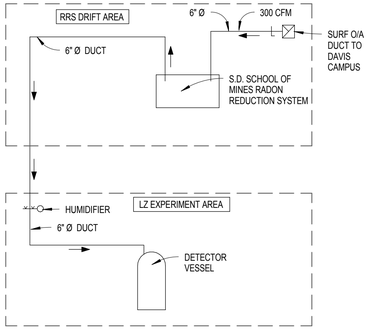
MARK	TYPE	FINISH	MAX PD INCH WG	MANUFACTURER	MODEL	NOTES
D1	ROUND SUPPLY DIFFUSER W/ ADJUSTABLE CONE	ALUMINUM	0.08	TITUS	TMR-AA	
D2	SQUARE BLADE DIFFUSER DOUBLE DEFLECTION	ALUMINUM	0.08	TITUS	300FL	
G1	RECTANGULAR EXHAUST LOUVER SINGLE DEFLECTION GRILLE	ALUMINUM	0.08	TITUS	350FL	

FAN COIL UNIT (COOLING ONLY) SCHEDULE

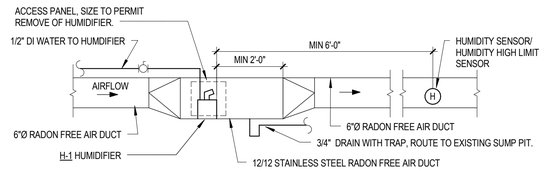
MARK	LOCATION	TYPE	CFM	EXT SP WC	COOLING DATA					MAX PD FT WG	ELECTRICAL DATA						MANUFACTURER	MODEL
					MIN CAP MBH		CHILLED WATER				FLA	HP	RPM	VOL	PH	HZ		
					SENS	TOTAL	GPM	EWT °F	LWT °F									
FCU-1	RRS ROOM	HORIZONTAL CABINET	1900	0.2	47.0	60.0	10	45	57	7.00	2.0	1.5	1410	460	3	60	DAIKIN	HCBB120



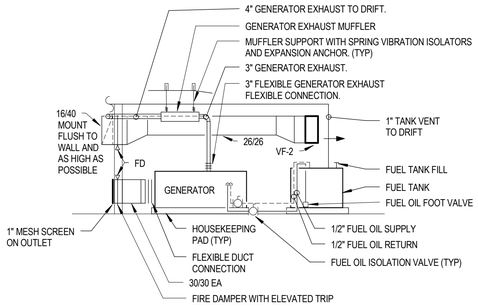
B1 CHILLED WATER TO EXPERIMENT EQUIPMENT CONNECTION DETAIL
GP-400-51 SCALE: NONE



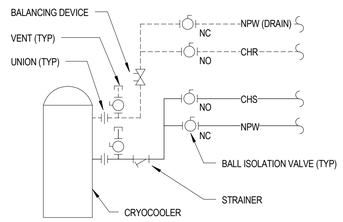
B3 DAVIS CAMPUS RADON REDUCED AIR AIRFLOW DIAGRAM
GP-400-51 SCALE: NONE



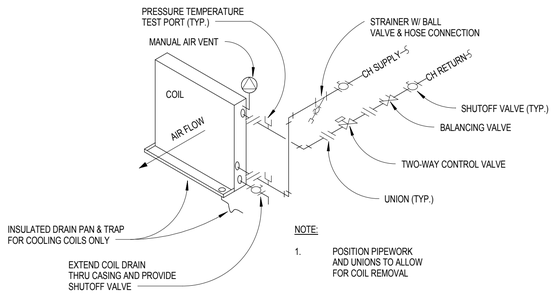
B4 RADON FREE HUMDIFIER DETAIL
GP-400-51 SCALE: NONE



A1 GENERATOR AND FUEL TANK DETAIL
GP-400-51 SCALE: NONE



A3 CRYOCOOLER PIPING DETAIL
GP-400-51 SCALE: NONE



A4 FAN COIL COOLING COIL (2 WAY)
GP-400-51 SCALE: NONE

MECHANICAL SYMBOLS

SYMBOL	DESCRIPTION
DOUBLE LINE / SINGLE LINE	DUCTWORK
	ROUND FACE SUPPLY DIFFUSER
	SQUARE FACE SUPPLY DIFFUSER
	RECTANGULAR REGISTER RETURN OR EXHAUST
	RECTANGULAR REGISTER OR DIFFUSER-SUPPLY
12X8	ROUND DUCT
	SUPPLY AIR DUCT
	RETURN OR EXHAUST DUCT
	FLEXIBLE CONNECTION
VD	VOLUME DAMPER
MD	MOTORIZED DAMPER
	FLEXIBLE DUCT
	FIRE DAMPER - FD
	CONNECT TO EXISTING
NPW	NON POTABLE WATER
CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
SA	SUPPLY AIR
RA	RETURN AIR
EA	EXHAUST AIR
DN	DOWN
RRS	RADON REDUCTION SYSTEM

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LZ

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Level: 4850ft

Drawing Content:
MECHANICAL SCHEDULES, DETAILS, AND DIAGRAMS

Drawing Number:
006- GP-400-51 -C2

Drawing Size: 22" x 34"
Drawing Count: Sheet 33 of 50

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ELECTRICAL SYMBOLS

(NOTE: NOT ALL SYMBOLS INDICATED ARE USED ON PLANS. COORDINATE SYMBOLS USED WITH SYMBOLS LEGEND ACCORDINGLY.)

SYMBOL	DESCRIPTION
	ONE-LINE
	GROUND CONNECTION
G	GENERATOR
	FUSE
	CIRCUIT BREAKER
M	METER
	CURRENT TRANSFORMER
	LIGHTNING ARRESTOR
	CAPACITOR
	DISCONNECT SWITCH
GFP	GROUND FAULT PROTECTOR
	DRAWOUT CIRCUIT BREAKER
	MAGNETIC MOTOR STARTER
	MOTOR
L-1	CIRCUIT BREAKER PANELBOARD (L-X = 208/120V)
NO C E L	TRANSFER SWITCH
	TRANSFORMER
	OVERLOAD RELAY
	N.O. CONTACT
	N.C. CONTACT
K	KIRK KEY
R	LAMP
SOLID-STATE MULTI-FUNCTION METER	3 CTS

SYMBOL	DESCRIPTION
	LIGHTING FIXTURES
a / A1 / 1	RECTANGULAR LUMINAIRE A1 = FIXTURE TYPE a = CONTROL SWITCH INDICATOR 1 = CIRCUIT NUMBER
	EGRESS LIGHTING: 1. FULLY SHADED SYMBOL - 24 HOUR EGRESS FIXTURE 2. HALF-SHADED SYMBOL - SWITCHED EGRESS FIXTURE
	BARE LAMP - INDUSTRIAL / STRIP
	ROUND LUMINAIRE
	WALL MOUNTED LUMINAIRE
	EXIT SIGN, CEILING OR WALL MOUNTED
	EMERGENCY LIGHTING UNIT
	POLE MOUNTED (HEADS AS INDICATED)
	SWITCHES & CONTROL OUTLETS
S^{a}_{3}	SWITCHES - 48" AFF GANG LIGHT SWITCHES INDICATED ADJACENT TO EACH OTHER IN A MULTI-GANG BOX AND MULTI-GANG FACEPLATE UNLESS OTHERWISE NOTED 2 = DOUBLE POLE, SINGLE THROW 3 = THREE WAY 4 = FOUR WAY K = KEY OPERATED C = MOMENTARY CONTACT, SPDT, CENTER OFF P = OFF PILOT LIGHT
D	DIMMER
PC	LIGHT SENSOR / PHOTO CONTROL
OC	OCCUPANCY SENSOR, CEILING MOUNTED
DS	DAYLIGHT SENSOR, CEILING MOUNTED
PB	PUSH BUTTON, 48" AFF UON
	CABLE TV & PUBLIC ADDRESS
TV	TELEVISION OUTLET 18" AFF UON
S	CEILING MOUNTED SPEAKER, UON
S	WALL MOUNTED SPEAKER, 7'-6" AFF, UON
AMP	SOUND CONTROL STATION
V	VOLUME CONTROL MOUNTED 48" AFF, UON
	POWER DISTRIBUTION
	PANELBOARD
	MOTOR CONTROL CENTER
	DISTRIBUTION POWER PANEL OR SWITCHBOARD
	ELECTRICAL CABINET - CONFIGURATION AS INDICATED
PB	PULL BOX, SIZED IN ACCORDANCE WITH NEC ARTICLE 314 REQUIREMENTS OR LARGER, UON
	DISCONNECT SWITCH
	MOTOR STARTER WITH NEMA SIZE AS INDICATED
	MOTOR OR EQUIPMENT CONNECTION
T	TRANSFORMER
	GROUNDING & LIGHTNING PROTECTION
	AIR TERMINAL - REFER TO DETAILS
	GROUND ROD
	EXOTHERMIC WELD TYPE GROUNDING CONNECTION
	WALL MOUNTED GROUNDING BUSBAR
	CONDUIT / WIRING
	CONDUIT UPWARD
	CONDUIT DOWNWARD
	CONDUIT CONCEALED
	CONDUIT EXPOSED

SYMBOL	DESCRIPTION
	POWER OUTLETS
	SINGLE RECEPTACLE, MOUNTED AT 18"AFF, UON
	DUPLEX RECEPTACLE, MOUNTED AT 18"AFF, UON
	DOUBLE DUPLEX RECEPTACLE, MOUNTED AT 18"AFF, UON
	SPECIAL RECEPTACLE - CONFIGURATION AS INDICATED MOUNTED 18"AFF, UON
	DUPLEX OR DOUBLE DUPLEX RECEPTACLE, FLUSH, CEILING MOUNTED, UON
	DUPLEX OR DOUBLE DUPLEX RECEPTACLE, FLUSH, FLOOR MOUNTED, UON
J	JUNCTION BOX, MOUNTED 18"AFF, UON
J	JUNCTION BOX, SURFACE MOUNTED ABOVE CEILING OR EXPOSED IN AREAS WITH EXPOSED CONDUIT, UON
J	JUNCTION OR PULL BOX, FLUSH, FLOOR MOUNTED, UON
	TELECOMMUNICATION OUTLETS
W	WALL TELEPHONE OUTLET, 54" AFF
	VOICE/DATA OUTLET, 18" AFF WITH 2 JACKS UON
	SUBSCRIPTS ON ELECTRICAL OUTLETS
+44" =	NUMBER INDICATES MOUNTING HEIGHT AFF TO CENTER LINE OF DEVICE.
AC =	ABOVE COUNTER - MOUNT DEVICE 6" ABOVE COUNTER OR 36" AFF AT WORKSTATIONS.
WP =	WEATHER PROOF - PROVIDE NEMA-3R RATED DEVICE OR ENCLOSURE SUITABLE FOR EXTERIOR USE.
TV =	TELEVISION DEDICATED - COORDINATE EXACT MOUNTING HEIGHT WITH EQUIPMENT INSTALLATION REQUIREMENTS.
EP =	EXPLOSION PROOF PER NEC 500 CLASS I, DIVISION 1.
EX =	EXISTING DEVICE OR EQUIPMENT.
EM =	CONNECTED TO AN EMERGENCY POWER SOURCE.
D =	DEDICATED - PROVIDE ENGRAVED COVER PLATE.
H =	HOSPITAL GRADE.
T =	TAMPER RESISTANT.
U =	CONNECTED TO UPS SYSTEM.
IG =	ISOLATED GROUND.
GFI =	OUTLET WITH GFCI PROTECTION.

SYMBOL	DESCRIPTION
	FIRE ALARM
F	MANUAL PULL STATION, 48"AFF UON
F_D	INITIATION DEVICE - CEILING MOUNT, DESIGNATIONS AS FOLLOWS: NO DESIGNATION - SMOKE DETECTOR D - DUCT DETECTOR CO - CARBON MONOXIDE DETECTOR SC - COMBINATION SMOKE AND CO H - HEAT DETECTOR
F_S	AUDIO AND VISUAL APPLIANCE, 84" AFF. DESIGNATIONS AS FOLLOWS: NO DESIGNATION - HORN S - SPEAKER
F	VISUAL APPLIANCE, 84" AFF. DESIGNATIONS AS FOLLOWS: NO DESIGNATION - FIRE ALARM
F_S	AUDIO APPLIANCE, 84" AFF. DESIGNATIONS AS FOLLOWS: NO DESIGNATION - HORN S - SPEAKER
TS	ALARM, VALVE SUPERVISORY TAMPER SWITCH
FS	ALARM, SPRINKLER SYSTEM, WATER FLOW SWITCH
R	REMOTE ADDRESSABLE RELAY (DPDT CONTACTS)
DH	FIRE ALARM DOOR HOLDER
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM REMOTE ANNUNCIATOR PANEL
LOC	LOCAL OPERATOR CONSOLE
AIM	ADDRESSABLE INPUT MODULE
	SECURITY
	VIDEO CAMERA, WALL MOUNTED 90" AFF UON
CR	CARD READER, 48" AFF UON
CK	COMBINATION CARD READER AND NUMERIC KEYPAD
K	KEYPAD
MD	MOTION DETECTOR
BMS	BALANCED MAGNETIC SWITCH
REX	REQUEST TO EXIT MOTION DETECTOR
ACP	ACCESS CONTROL PANEL
DC	DOOR CONTACT

PNL
1,3,5

WIRING METHOD AND IDENTIFICATION (NOTE: WITHOUT FURTHER IDENTIFICATION SYMBOL INDICATED 1/2" CONDUIT WITH 2#12 AWG CONDUCTORS. CROSS LINES INDICATE QUANTITY #12 AWG CONDUCTORS AND EXTENDED CROSS LINE W/O DOT INDICATES NEUTRAL CONDUCTOR, W/ DOT INDICATES HARD WIRE GROUND.

NOTE: INCREASE CONDUCTOR SIZES AS LISTED IN THE BRANCH CIRCUIT HOMERUN CONDUCTOR SIZING SCHEDULE. INCREASE CONDUIT SIZE TO ACCOMMODATE INCREASE IN CONDUCTOR SIZE AS PER THE NEC.

BRANCH CIRCUIT HOMERUN CONDUCTOR SIZING SCHEDULE

120V, 20A BRANCH CIRCUITS

HOMERUN LENGTH	MINIMUM CONDUCTOR SIZE
LESS THAN 100 FEET	#12 AWG COPPER
100 TO 150 FEET	#10 AWG COPPER
150 TO 250 FEET	#8 AWG COPPER
GREATER THAN 250 FEET	#6 AWG COPPER

NOTE: PROVIDE CONDUCTOR SIZES INDICATED ON ABOVE SCHEDULE UNLESS OTHERWISE NOTED ON LIGHTING, POWER AND SYSTEMS DRAWINGS. HOMERUN JUNCTION BOX TO BE WITHIN 10' OF LAST DEVICE CONNECTED TO CIRCUIT. HOMERUN LENGTH TO INCLUDE BOTH HORIZONTAL AND VERTICAL ROUTING DISTANCES. INCREASE CONDUIT SIZE TO MEET THE NEC FOR INCREASE CONDUCTOR SIZES

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:34:08 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: ELECTRICAL SYMBOLS

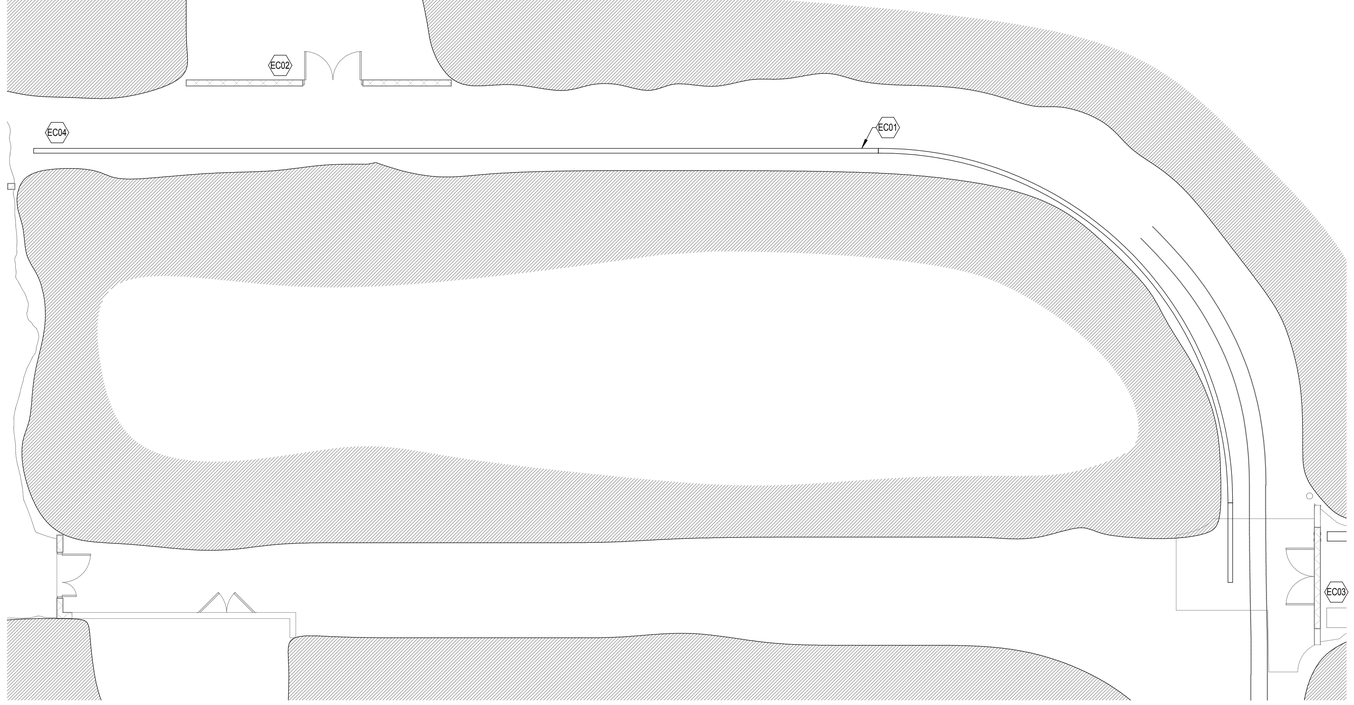
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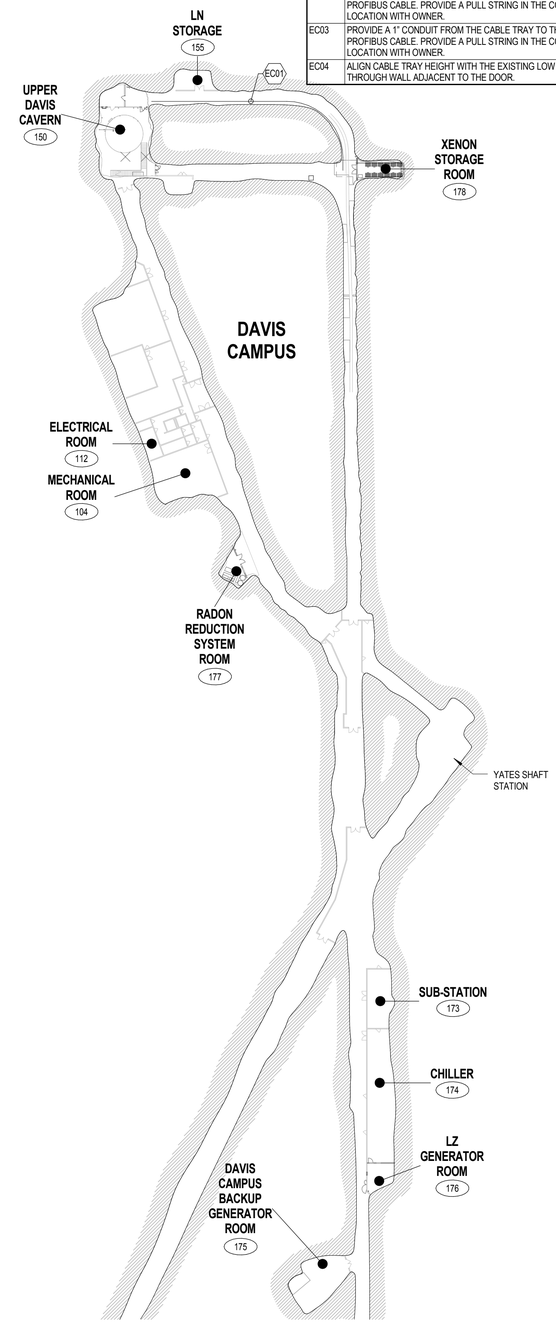
Drawing Count: Sheet 34 of 50

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11/7/2017 12:11:50 PM



1 **OVERALL DAVIS CAMPUS CABLE TRAY PLAN**
GP-700-10 SCALE: 1/8" = 1'-0"



A4 **OVERALL DAVIS CAMPUS ELECTRICAL PLAN**
GP-700-10 SCALE: 1" = 50'-0"

*KEYNOTE LEGEND

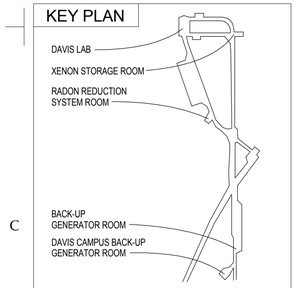
EC01	PROVIDE A 2" HIGH X 4" WIDE CABLE TRAY AND INSTALL IT FROM THE DOOR TO ROOM 150 TO THE XENON STORAGE ROOM 178. PROVIDE (4) 1/2 INCH CONDUITS FROM THE PLC RACKS IN ROOM 150. ROUTE (2) CONDUITS TO THE LN STORAGE ROOM PLC LOCATION AND ROUTE (2) CONDUITS TO THE XENON STORAGE ROOM PLC LOCATION. VERIFY PLC LOCATIONS WITH OWNER. PROVIDE PULL STRINGS IN ALL CONDUITS. PROVIDE 18" WIDE TRAPEZES SPACED ON 5 FOOT CENTERS. INSTALL THE ELECTRICAL CONDUITS AND CABLE TRAY ON THE TRAPEZES. LEAVE SPACE ON THE TRAPEZES FOR NITROGEN AND XENON PIPING. INSTALL THE TRAPEZES AS HIGH AS POSSIBLE, COORDINATE THE EXACT ROUTING AND INSTALLED HEIGHT WITH OWNER. COORDINATE THE ANCHORING OF THE THREADED ROD INTO THE BACK (CEILING) OF THE DRIFT WITH OWNER.
EC02	PROVIDE A 1" CONDUIT FROM THE CABLE TRAY TO THE PLC LOCATION FOR A PROFIBUS CABLE. PROVIDE A PULL STRING IN THE CONDUIT. VERIFY THE PLC LOCATION WITH OWNER.
EC03	PROVIDE A 1" CONDUIT FROM THE CABLE TRAY TO THE PLC LOCATION FOR A PROFIBUS CABLE. PROVIDE A PULL STRING IN THE CONDUIT. VERIFY THE PLC LOCATION WITH OWNER.
EC04	ALIGN CABLE TRAY HEIGHT WITH THE EXISTING LOW VOLTAGE CABLE SLEEVE THROUGH WALL ADJACENT TO THE DOOR.

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LZ

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KEY PLAN



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FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:34:35 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: OVERALL DAVIS CAMPUS ELECTRICAL PLAN

Drawing Number: 006- GP-700-10 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 35 of 50

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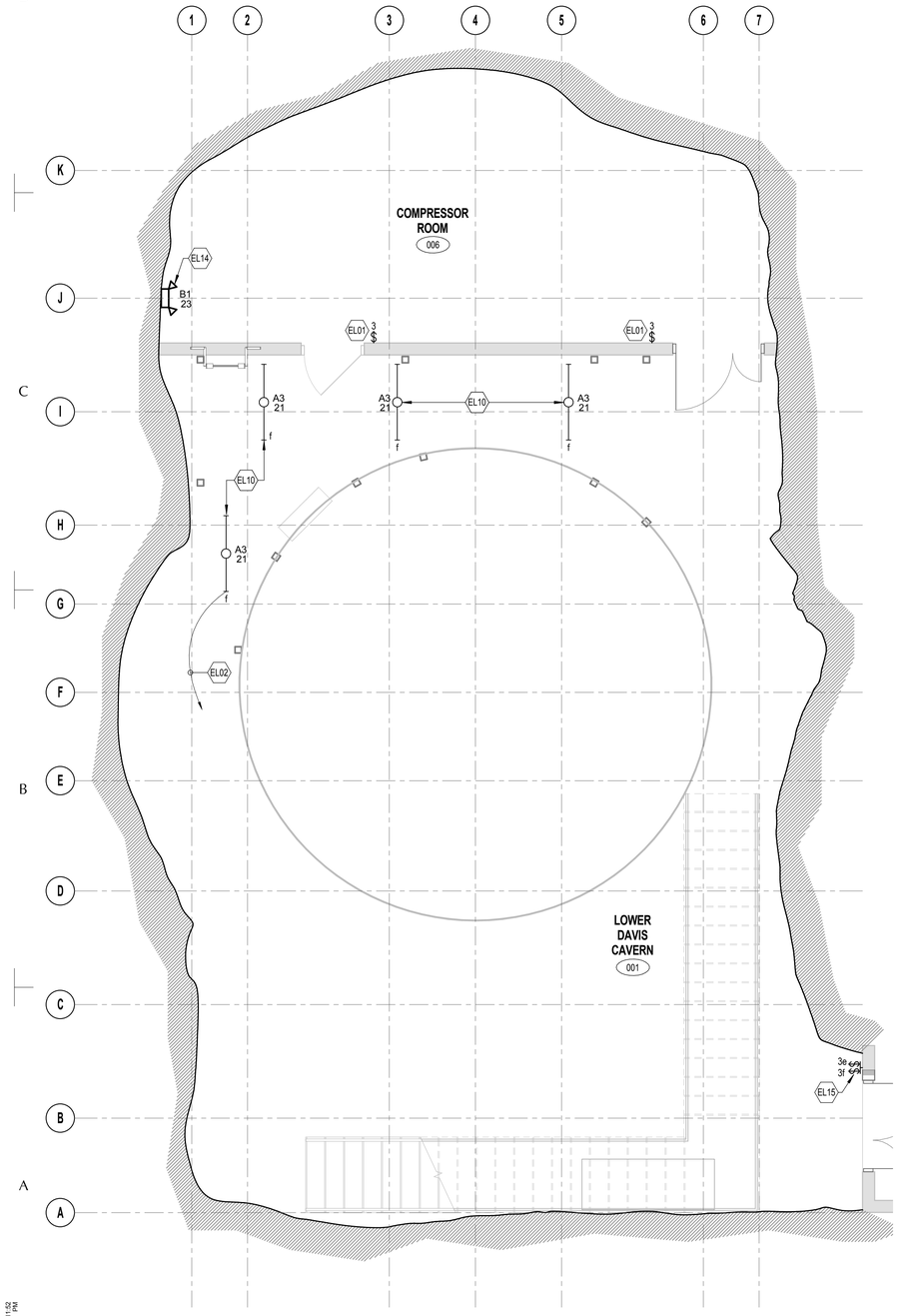
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GENERAL NOTES

1. PROVIDE DEDICATED NEUTRAL CONDUCTORS FOR EACH 20 AMP, 120 AND 277 VOLT BRANCH CIRCUIT.

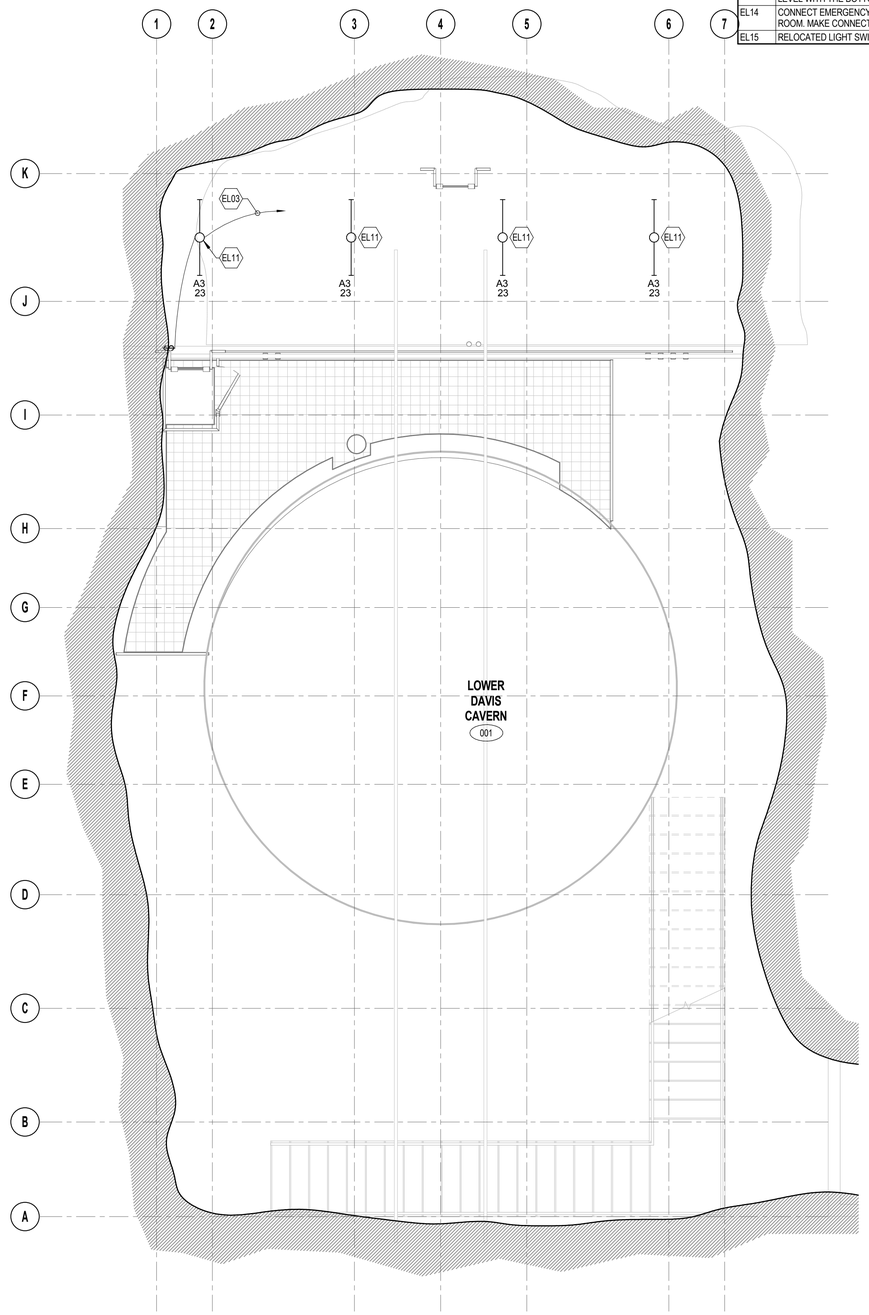
*KEYNOTE LEGEND

EL01	PROVIDE LIGHT SWITCH AND CONNECT TO THE EXISTING LIGHTING FIXTURES IN THE ROOM. MAKE CONNECTION BETWEEN THE TWO HALVES OF THE ROOM THAT WERE SEPARATED SO ALL THE ROOM LIGHTS ARE CONTROLLED FROM THESE SWITCHES.
EL02	CONNECT LIGHTS TO EXISTING CIRCUIT LH-1A/21. CONTROL LIGHTS USING EXISTING SWITCHING.
EL03	CONNECT LIGHTS TO EXISTING CIRCUIT LH-1A/23.
EL10	PENDANT THESE FIXTURES FROM THE UNDERSIDE OF THE MEZZANINE. COORDINATE HEIGHT AND LOCATION WITH CABLE TRAYS AND EXPERIMENT EQUIPMENT.
EL11	INSTALL THESE FIXTURES BETWEEN THE C CHANNEL STUDS SUPPORTING THE 4850 LEVEL WITH THE BOTTOM OF THE FIXTURE EVEN WITH THE BOTTOM OF THE STUDS.
EL14	CONNECT EMERGENCY LIGHT TO EXISTING CIRCUIT FEEDING THE LIGHTS IN THIS ROOM. MAKE CONNECTION BEFORE ANY SWITCHES.
EL15	RELOCATED LIGHT SWITCHES. SEE DETAIL A1/GD-700-11.



A1 **LOWER - DAVIS CAVERN - LIGHTING PLAN**

GP-700-11 SCALE: 1/4" = 1'-0"



A3 **MEZZANINE - DAVIS CAVERN - LIGHTING PLAN**

GP-700-11 SCALE: 1/4" = 1'-0"

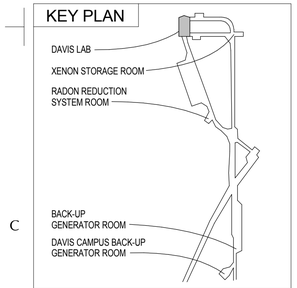
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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

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REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.01 15:35:01 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: LOWER AND MEZZANINE LEVEL LIGHTING PLANS

Drawing Number: 006- GP-700-11 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 36 of 50

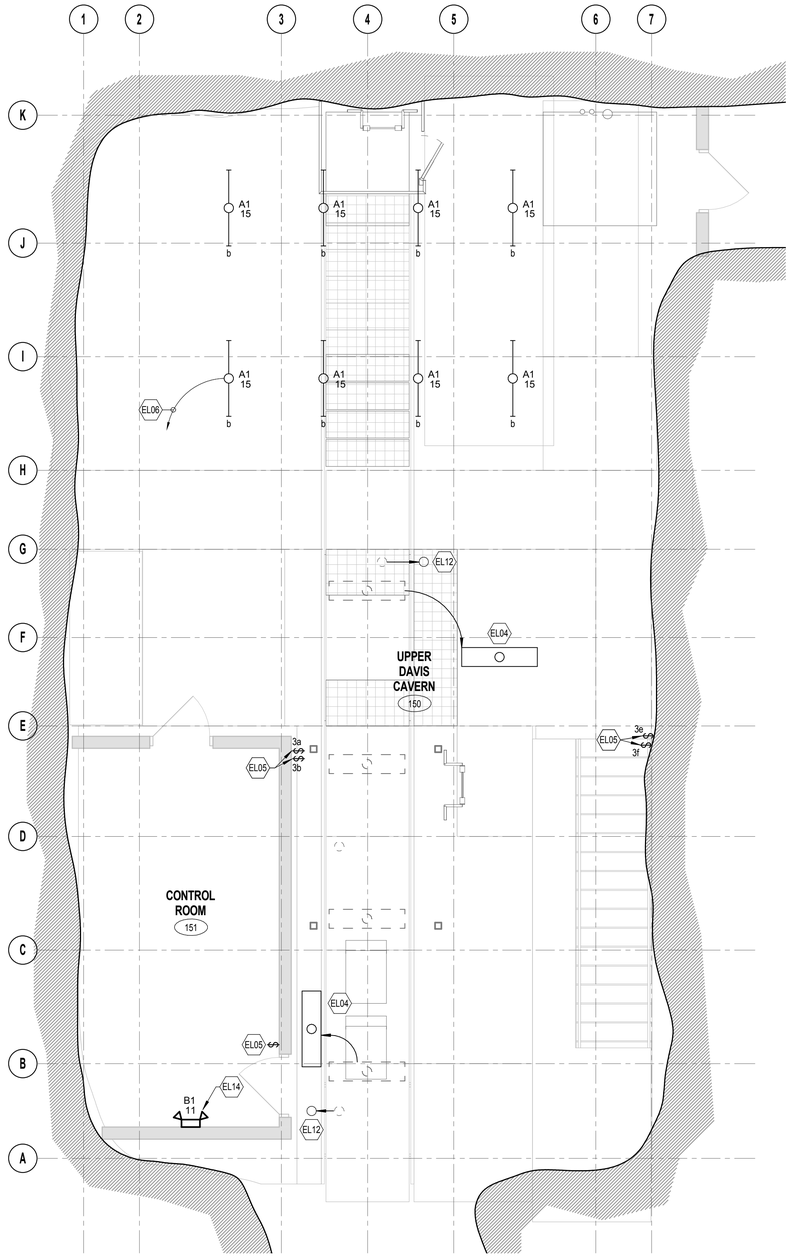
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GENERAL NOTES

1. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 20 AMP, 120 AND 277 VOLT BRANCH CIRCUITS.

*KEYNOTE LEGEND

EL04	RELOCATE EXISTING FLUORESCENT LIGHTING FIXTURE AS INDICATED. INSTALL RELOCATED LIGHT FIXTURES AS HIGH AS POSSIBLE.
EL05	REPLACE EXISTING DIMMER WITH THREE WAY SWITCH.
EL06	CONNECT LIGHTS TO EXISTING CIRCUIT LH-1A/15. CONTROL LIGHTS USING EXISTING SWITCHING.
EL07	EXISTING ROOM LIGHT FIXTURES TO REMAIN. CONNECT LIGHTS TO RECEPTACLE CIRCUIT L-RRS/15.
EL08	CONNECT TO ROOM LIGHTING CIRCUIT AHEAD OF LIGHTING SWITCH.
EL12	RELOCATE EXISTING INCANDESCENT LIGHTING FIXTURE AS INDICATED. INSTALL RELOCATED LIGHT FIXTURE AT SAME HEIGHT.
EL13	RELOCATED LIGHT SWITCH.
EL14	CONNECT EMERGENCY LIGHT TO EXISTING CIRCUIT FEEDING THE LIGHTS IN THIS ROOM. MAKE CONNECTION BEFORE ANY SWITCHES.



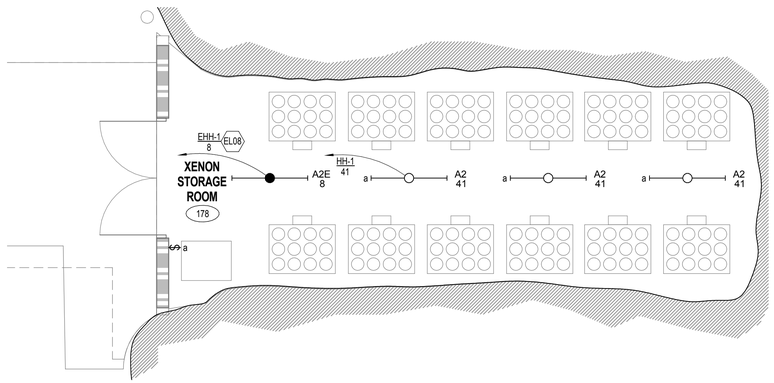
A1 **UPPER - DAVIS CAVERN - LIGHTING PLAN**

GP-700-12 SCALE: 1/4" = 1'-0"



B3 **RRS ROOM LIGHTING PLAN**

GP-700-12 SCALE: 1/4" = 1'-0"



A3 **XENON STORAGE ROOM LIGHTING PLAN**

GP-700-12 SCALE: 1/4" = 1'-0"

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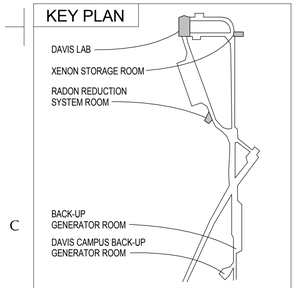
LZ

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Draw	AJL
Check	MSB

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REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:35:15 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: 4850 LEVEL LIGHTING PLANS

Drawing Number: 006- GP-700-12 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 37 of 50

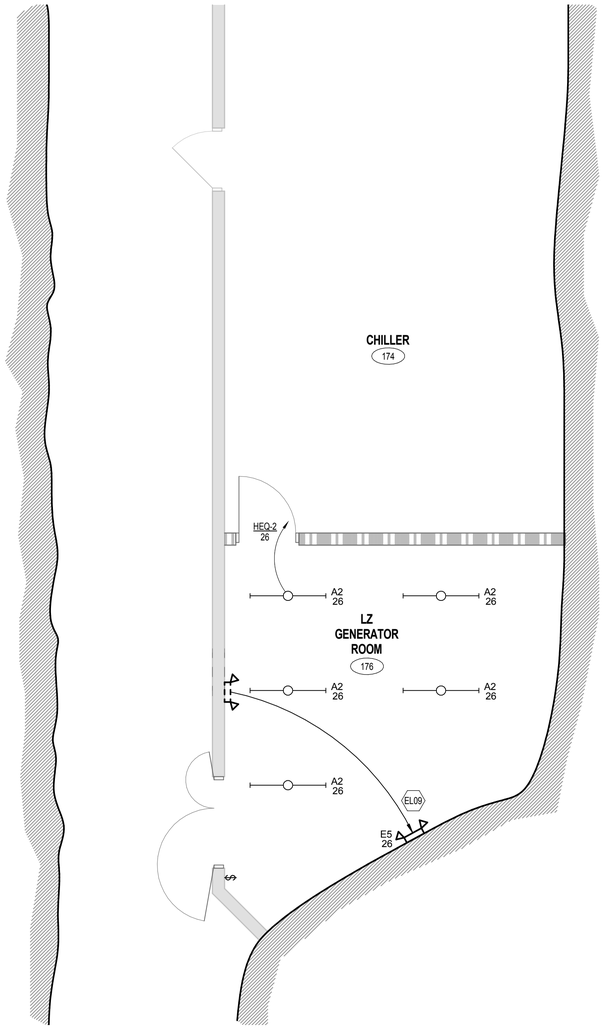
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GENERAL NOTES

1. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 20 AMP, 120 AND 277 VOLT BRANCH CIRCUITS.

*KEYNOTE LEGEND

EL09	RELOCATE EXISTING EMERGENCY LUMINAIRE. CONNECT TO LIGHTING CIRCUIT IN ROOM AHEAD OF LIGHT SWITCH.



A1 **LZ GENERATOR ROOM LIGHTING PLAN**

GP-700-13 SCALE: 1/4" = 1'-0"

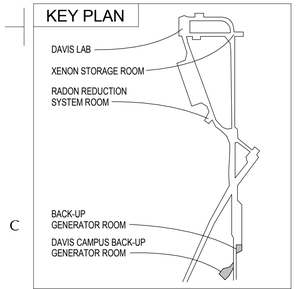
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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

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REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA

Date: 2017.11.01 15:35:29 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content:
LZ GENERATOR ROOM LIGHTING PLAN

Drawing Number:
006- GP-700-13 -C0

Drawing Size: 22" x 34"

Drawing Count: Sheet 38 of 50

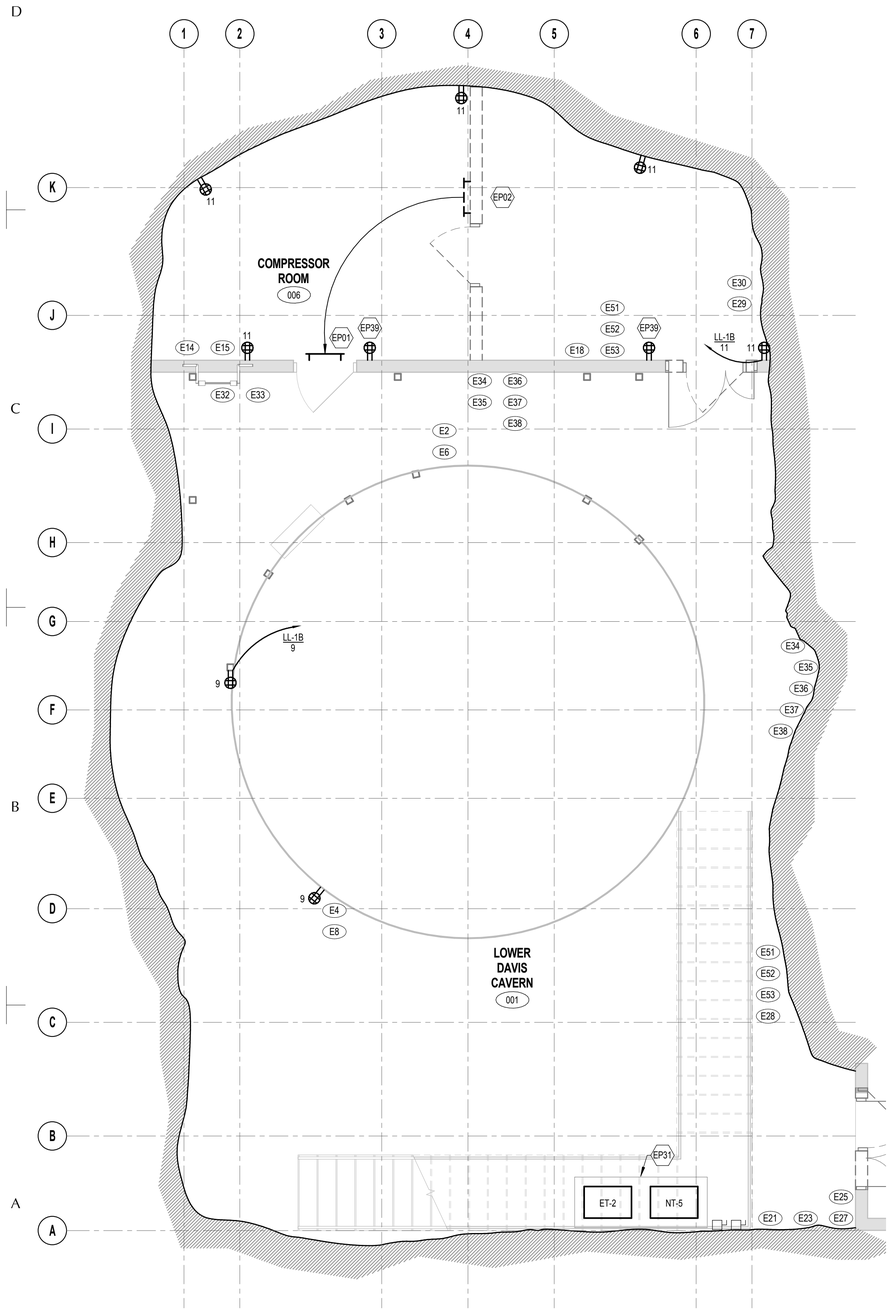
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GENERAL NOTES

1. PROVIDE DEDICATED NEUTRAL CONDUCTORS FOR EACH 20 AMP, 120 AND 277 VOLT BRANCH CIRCUIT.
2. PROVIDE GFCI CIRCUIT BREAKERS ON ALL BRANCH CIRCUITS FEEDING 20 AMP DUPLEX RECEPTACLES. PROVIDE GREY DUPLEX RECEPTACLES UNLESS OTHERWISE NOTED.
3. COORDINATE LOCATIONS FOR RECEPTACLES AND DISCONNECT SWITCHES FOR EXPERIMENT EQUIPMENT WITH LZ EQUIPMENT INSTALLERS.

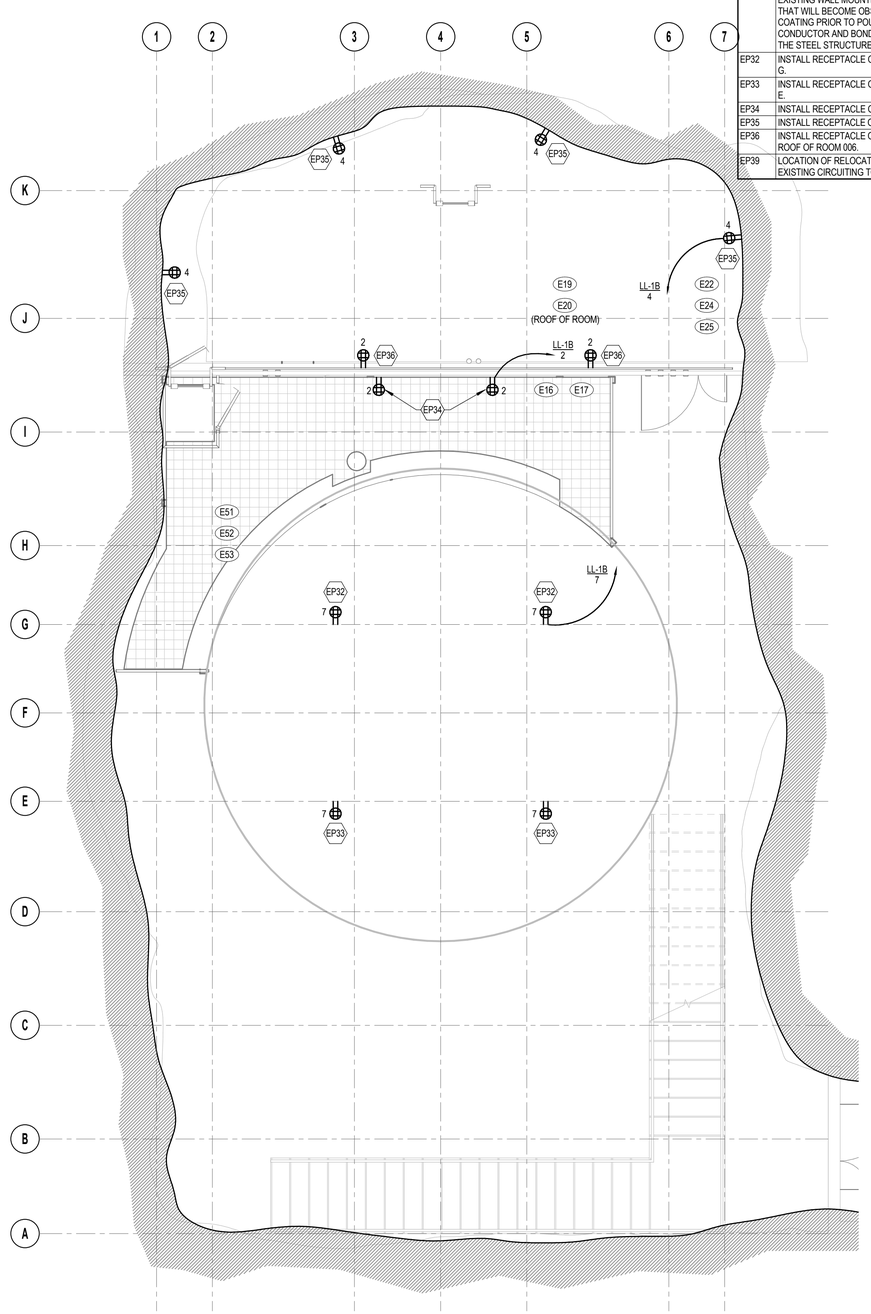
*KEYNOTE LEGEND

EP01	RELOCATE EXISTING GROUND BAR ABOVE DOOR AS INDICATED AND RE-INSTALL AT 10'-0" ABOVE FLOOR. PROVIDE A #3/0 AWG BARE COPPER GROUNDING CONDUCTOR AND ROUTE UP TO THE EXISTING SPLICE AT THE STRUCTURE. SPLICE THE #3/0 GROUNDING CONDUCTOR TO THE EXISTING BARE GROUNDING CONDUCTOR UNDER STRUCTURE GOING TO THE GROUND BAR ON THE 4850 LEVEL.
EP02	LOCATION OF EXISTING GROUNDING CONDUCTOR AT THE STRUCTURE THAT GOES TO THE GROUND BAR ON THE 4850 LEVEL. DISCONNECT THE TWO GROUNDING CONDUCTORS THAT ARE ATTACHED TO THE STRUCTURAL STEEL.
EP31	PROVIDE 6 INCH HIGH CONCRETE EQUIPMENT PAD FOR TRANSFORMERS. REMOVE EXISTING WALL MOUNTED ELECTRICAL RECEPTACLES AND OTHER EQUIPMENT THAT WILL BECOME OBSTRUCTED BY THE TRANSFORMERS. REMOVE FLOOR COATING PRIOR TO POURING PAD. PROVIDE A #3/0 AWG BARE COPPER GROUNDING CONDUCTOR AND BOND THE REINFORCING BAR EXTENDING OUT OF THE PAD TO THE STEEL STRUCTURE. SEE DETAIL B4/GP-300-51.
EP32	INSTALL RECEPTACLE ON THE NORTH SIDE OF THE WEB OF THE BEAM ALONG GRID G.
EP33	INSTALL RECEPTACLE ON THE SOUTH SIDE OF THE WEB OF THE BEAM ALONG GRID E.
EP34	INSTALL RECEPTACLE ON THE WALL 24" ABOVE THE MEZZANINE PLATFORM.
EP35	INSTALL RECEPTACLE ON WALL 24" ABOVE THE ROOF OF ROOM 006.
EP36	INSTALL RECEPTACLE ON VERTICAL SUPPORT FOR GUARD RAIL 24" ABOVE THE ROOF OF ROOM 006.
EP39	LOCATION OF RELOCATED RECEPTACLES. INSTALL AT 18" ABOVE FLOOR. EXTEND EXISTING CIRCUITING TO NEW LOCATIONS.



A1 **LOWER - DAVIS CAVERN - POWER PLAN**

GP-700-14 SCALE: 1/4" = 1'-0"



A3 **MEZZANINE - DAVIS CAVERN - POWER PLAN**

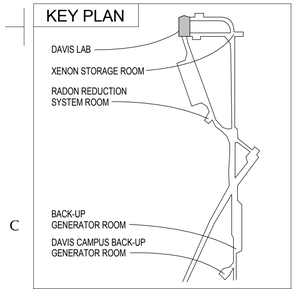
GP-700-14 SCALE: 1/4" = 1'-0"

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:35:45 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: LOWER AND MEZZANINE LEVEL POWER PLANS

Drawing Number: 006- GP-700-14 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 39 of 50

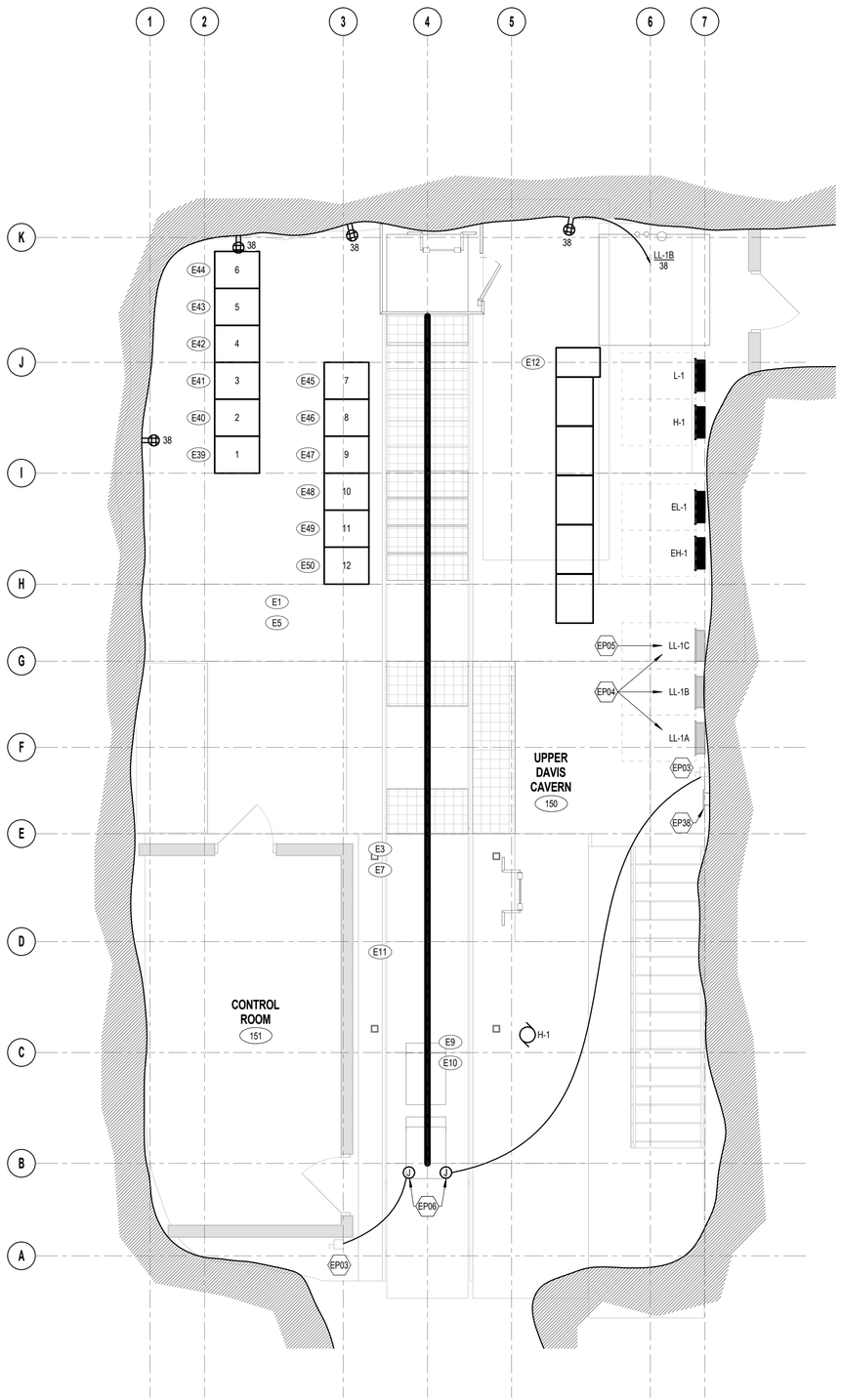
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GENERAL NOTES

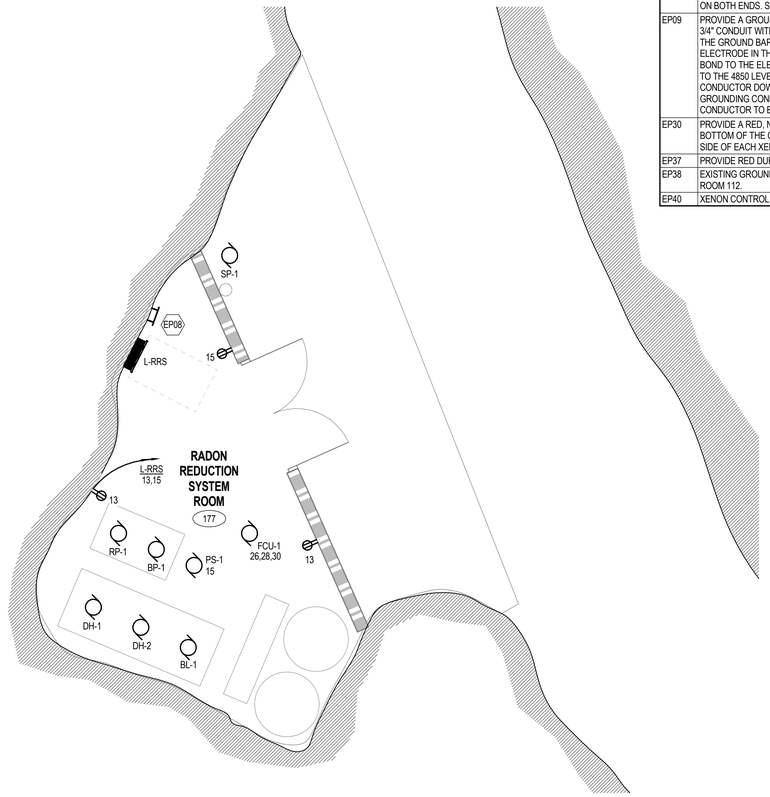
1. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 20 AMP, 120 AND 277 VOLT BRANCH CIRCUITS.
2. PROVIDE GFCI CIRCUIT BREAKERS ON ALL BRANCH CIRCUITS FEEDING 20 AMP DUPLEX RECEPTACLES. PROVIDE GREY DUPLEX RECEPTACLES UNLESS OTHERWISE NOTED.
3. COORDINATE LOCATIONS FOR RECEPTACLES AND DISCONNECT SWITCHES FOR EXPERIMENT EQUIPMENT WITH LZ EQUIPMENT INSTALLERS.

*KEYNOTE LEGEND

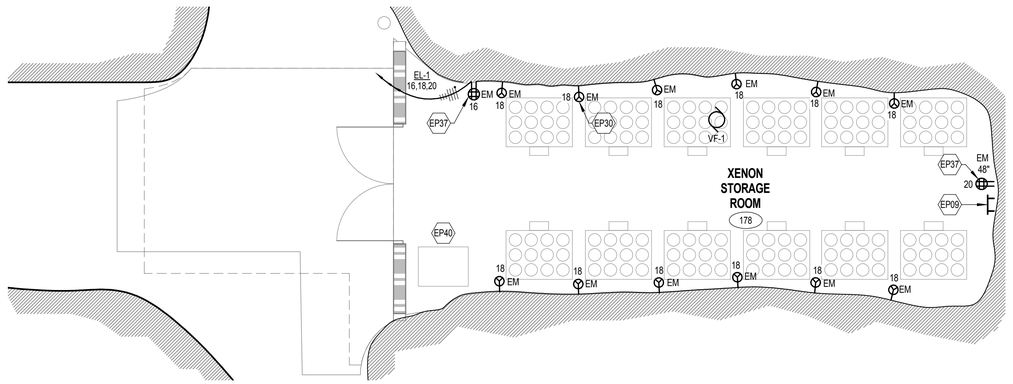
EP03	EXISTING HOIST DISCONNECT TO BE RELOCATED.
EP04	EXISTING PANELBOARDS TO REMAIN.
EP05	CHANGE THE NAME OF EXISTING PANELBOARD ULL-1 TO LL-1C.
EP06	PROVIDE A NEW BRANCH CIRCUIT FROM THE HOIST DISCONNECT TO J-BOX, SIZE TO MATCH EXISTING. CONNECT THE HOIST TRAVELING CABLE TO THE J-BOX.
EP08	PROVIDE A GROUND BAR AND INSTALL AT 18 INCHES ABOVE THE FLOOR. PROVIDE A 3/4" CONDUIT WITH A #3/0 BARE COPPER GROUNDING CONDUCTOR AND BOND TO THE GROUND BAR. ROUTE THE GROUNDING CONDUCTOR TO THE EXISTING GROUND BAR IN ROOM 112. BOND THE GROUNDING CONDUCTOR TO THE CONDUIT ON BOTH ENDS. SEE A4/GP-700-16 AND A4/GP-700-63.
EP09	PROVIDE A GROUND BAR AND INSTALL AT 18 INCHES ABOVE THE FLOOR. PROVIDE A 3/4" CONDUIT WITH A #3/0 BARE COPPER GROUNDING CONDUCTOR AND BOND TO THE GROUND BAR. ROUTE THE GROUNDING CONDUCTOR TO THE GROUNDING ELECTRODE IN THE TRANSFORMER PAD UNDER TRANSFORMERS ET-2 AND NT-5 AND BOND TO THE ELECTRODE. ROUTE THE GROUNDING CONDUCTOR ALONG THE DRIFT TO THE 4850 LEVEL OF THE EXPERIMENT CAVERN. ROUTE THE GROUNDING CONDUCTOR DOWN THROUGH THE FLOOR TO THE SECTION OF EXPOSED EXISTING GROUNDING CONDUCTOR AT THE STRUCTURE IN ROOM 006. BOND THE GROUNDING CONDUCTOR TO BOTH ENDS OF ALL CONDUITS. SEE A1/GP-700-14 AND A4/GP-700-63.
EP30	PROVIDE A RED, NEMA L5-20R TWIST LOCK RECEPTACLE AND INSTALL ON THE BOTTOM OF THE CABLE TRAY SUPPORT SYSTEM WITH ONE RECEPTACLE TO THE SIDE OF EACH XENON STORAGE PACK.
EP37	PROVIDE RED DUPLEX RECEPTACLES.
EP38	EXISTING GROUND BAR WITH GROUNDING CONDUCTOR TO THE GROUND BAR IN ROOM 112.
EP40	XENON CONTROL ELECTRONICS RACK.



A1 **UPPER - DAVIS CAVERN - POWER PLAN**
GP-700-15 SCALE: 1/4" = 1'-0"



B3 **RRS ROOM POWER PLAN**
GP-700-15 SCALE: 1/4" = 1'-0"



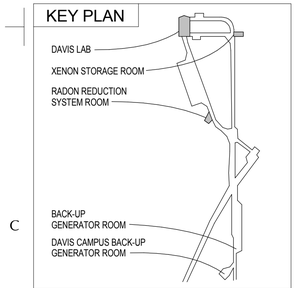
A3 **XENON STORAGE ROOM POWER PLAN**
GP-700-15 SCALE: 1/4" = 1'-0"

1/17/2017 12:11:55 PM

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:36:00 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: 4850 LEVEL POWER PLANS

Drawing Number: 006- GP-700-15 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 40 of 50

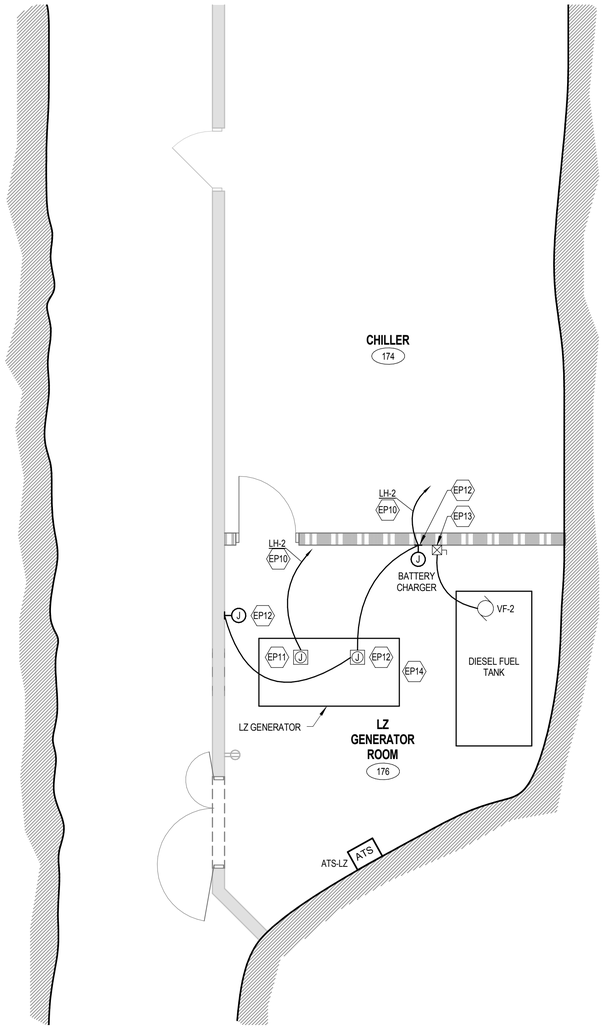
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GENERAL NOTES

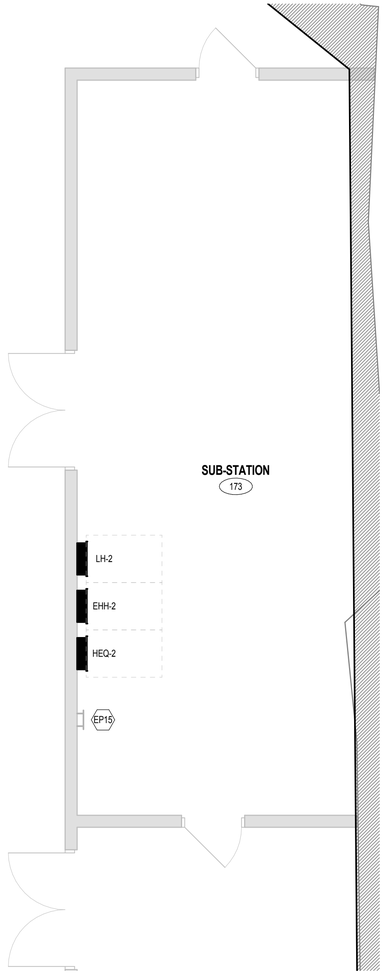
1. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 20 AMP, 120 AND 277 VOLT BRANCH CIRCUITS.

*KEYNOTE LEGEND

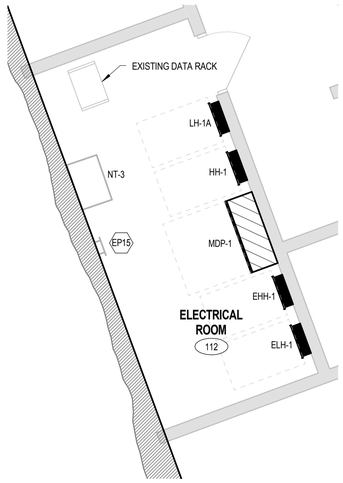
EP10	CONNECT TO AN EXISTING SPARE 20 AMP CIRCUIT BREAKER IN PANELBOARD.
EP11	MAKE 120 VOLT CONNECTION TO ENGINE WATER JACKET HEATER.
EP12	MAKE 120 VOLT CONNECTIONS TO DAMPER OPERATOR, BATTERY CHARGER, ALTERNATOR STRIP HEATER AND CONTROL PANEL STRIP HEATER.
EP13	COMBINATION STARTER FOR VENTILATION FAN VF-2. SEE A1/GP-700-63 FOR ADDITIONAL INFORMATION.
EP14	DISCONNECT THE NEUTRAL TO GROUND JUMPER IN THE GENERATOR. PROVIDE A 3/4" CONDUIT WITH A #3/0 AWG BARE COPPER GROUNDING CONDUCTOR AND BOND TO THE GENERATOR FRAME AND FUEL TANK. ROUTE THE GROUNDING CONDUCTOR IN CONDUIT AND BOND TO THE EXISTING ELECTRICAL GROUND BAR IN ROOM 173. BOND THE GROUNDING CONDUCTOR TO BOTH ENDS OF THE CONDUIT.
EP15	EXISTING ELECTRICAL GROUND BAR.



A1 **LZ GENERATOR ROOM POWER PLAN**
GP-700-16 SCALE: 1/4" = 1'-0"



A3 **SUBSTATION POWER PLAN**
GP-700-16 SCALE: 1/4" = 1'-0"



A4 **ELECTRICAL ROOM POWER PLAN**
GP-700-16 SCALE: 1/4" = 1'-0"

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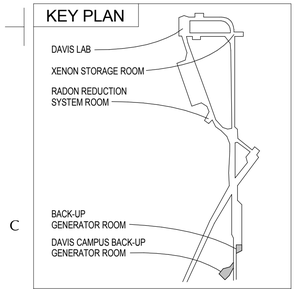
Sanford Underground Research Facility

LZ

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Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
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REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:36:13 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 700 - ELEC
Level: 4850ft

Drawing Content:
LZ GENERATOR ROOM, SUBSTATION, AND ELECTRICAL ROOM POWER PLANS

Drawing Number:
006- GP-700-16 -C1

N

Drawing Size: 22" x 34"
Drawing Count: Sheet 41 of 50

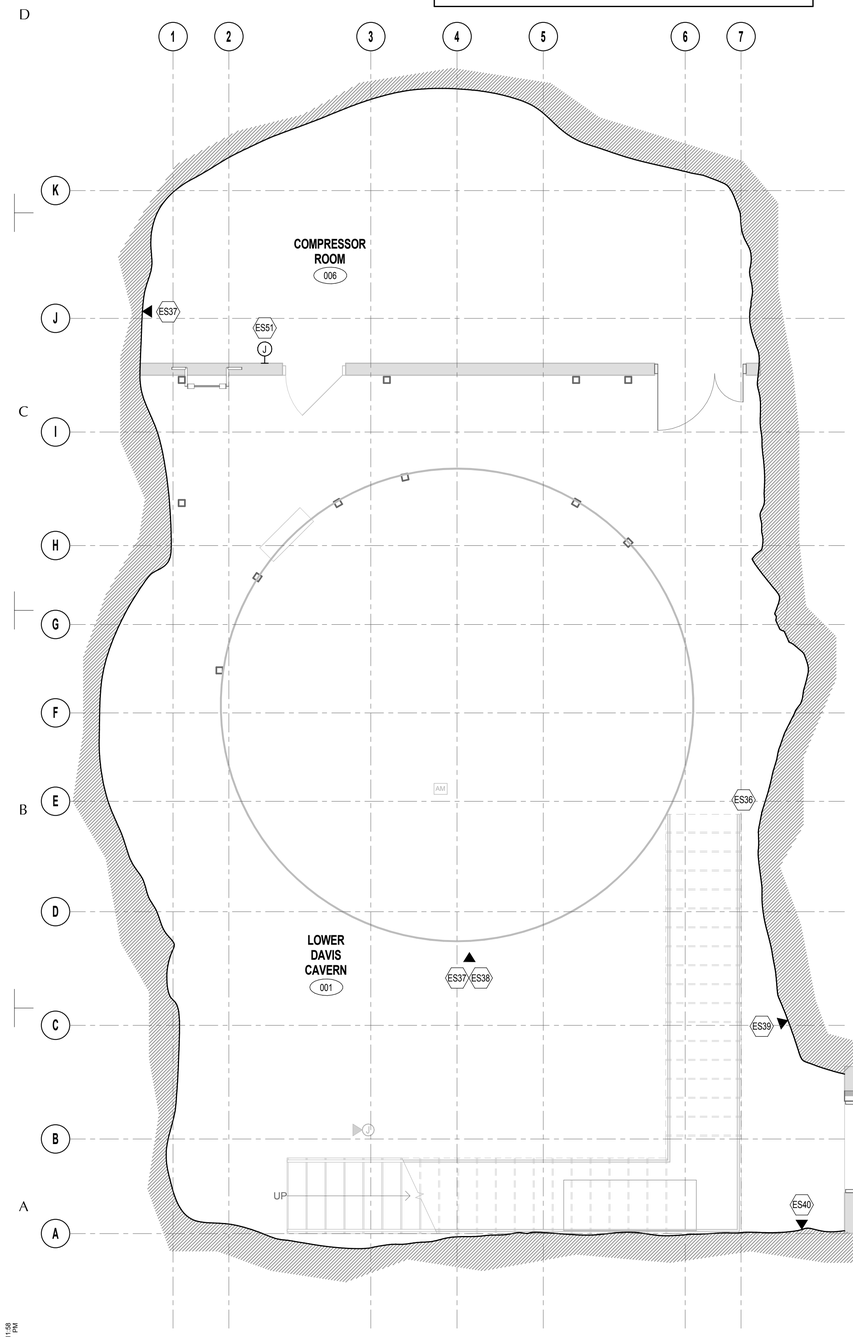
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GENERAL NOTES

1. REUSE EXISTING BOXES AND CONDUITS FOR VOICE AND DATA OUTLETS WHEN THEY ARE AVAILABLE.
2. PROVIDE ONE CATEGORY 6 CABLE TO EACH JACK.
3. ROUTE NEW CATEGORY 6 CABLES TO THE EXISTING DATA RACK IN ROOM 112 USING THE CONDUIT AND CABLE TRAY SYSTEMS. FOLLOW THE EXISTING PATH BACK TO ROOM 112. TERMINATE THESE CABLES ON EXISTING PATCH PANEL B STARTING AT PORT B01. UTILIZE THE EXISTING PATCH PANEL B PORTS MADE AVAILABLE BY THE DEMOLITION OF THE EXISTING CABLES. LABEL EACH NEW OUTLET JACK WITH THE CORRESPONDING PATCH PANEL PORT NUMBER.

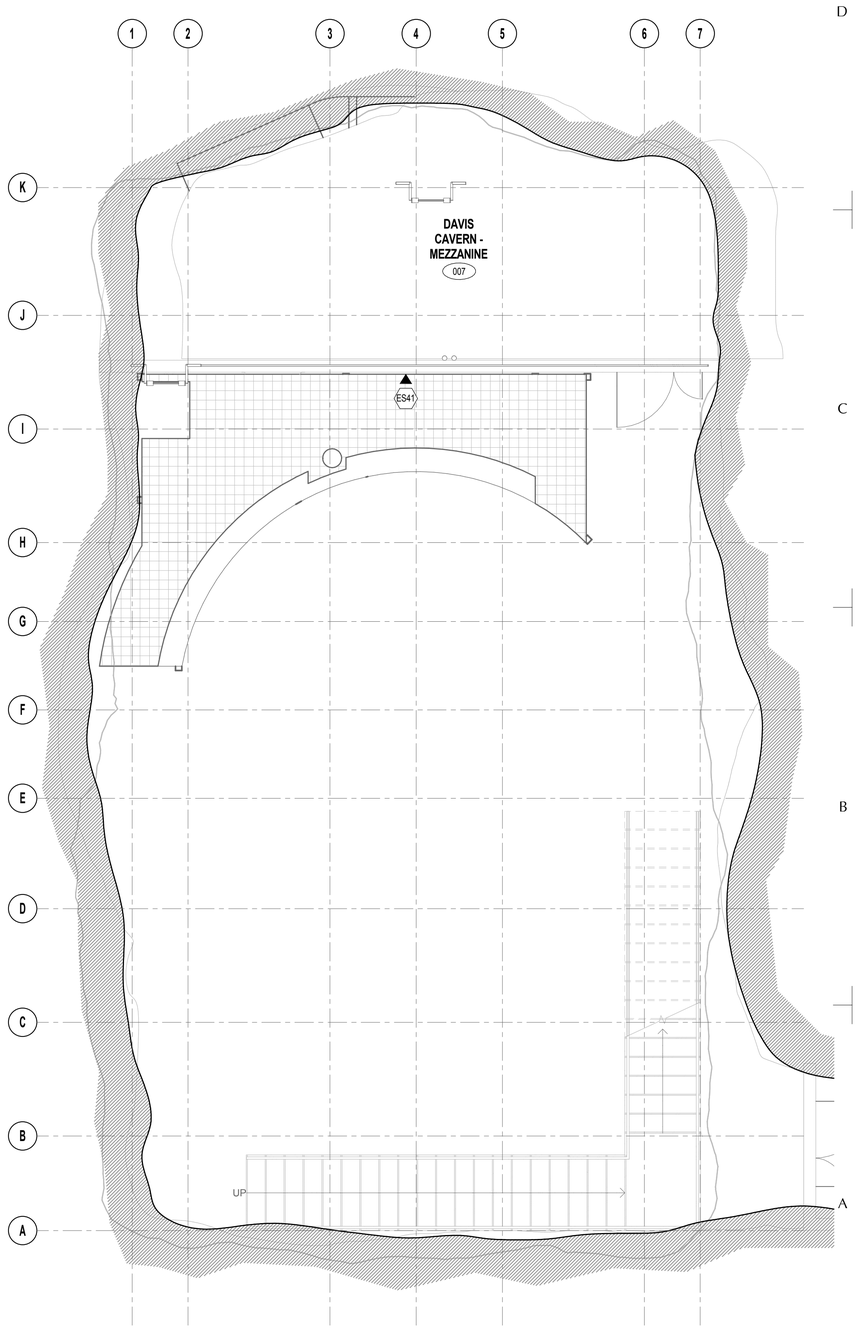
*KEYNOTE LEGEND

ES36	EXISTING CONDUITS FOR VOICE AND DATA CABLES UP TO THE VERTICAL CABLE TRAY ON THE 4850 LEVEL. REUSE AS APPLICABLE. PROVIDE PULL CORDS IN CONDUITS MADE EMPTY BY THE REMOVAL OF THE EXISTING CABLES. SEE DETAIL A3/GD-700-13.
ES37	REUSE EXISTING OUTLET BOX AND CONDUIT. PROVIDE OUTLET WITH FACEPLATE WITH TWO JACKS, ONE FOR A VOIP PHONE AND ONE FOR DATA.
ES38	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO NEAR GRIDS E X 7 AND CONNECT TO AN EXISTING CONDUIT ROUTING UP TO THE EXISTING VERTICAL CABLE TRAY ON THE 4850 LEVEL. INSTALL OUTLET BOX NEAR THE EXISTING VOIP PHONE.
ES39	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO NEAR GRIDS E X 7 AND CONNECT TO AN EXISTING CONDUIT ROUTING UP TO THE EXISTING VERTICAL CABLE TRAY ON THE 4850 LEVEL. PROVIDE ONE DATA JACK ON FACEPLATE.
ES40	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO NEAR GRIDS E X 7 AND CONNECT TO AN EXISTING CONDUIT ROUTING UP TO THE EXISTING VERTICAL CABLE TRAY ON THE 4850 LEVEL. PROVIDE ONE DATA JACK ON FACEPLATE FOR THE WATER LEAK ROUTER.
ES41	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO NEAR GRIDS E X 1 AND EXTEND CONDUIT UP THROUGH THE 4850 LEVEL TO THE HORIZONTAL CABLE TRAY. INSTALL BOX ON WALL ADJACENT TO THE EXISTING WIRELESS ACCESS POINT. PROVIDE ONE DATA JACK ON FACEPLATE. SEE DETAIL A3/GP-700-20.
ES47	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO NEAR GRIDS E X 7 AND CONNECT TO AN EXISTING CONDUIT ROUTING UP TO THE EXISTING VERTICAL CABLE TRAY ON THE 4850 LEVEL. PROVIDE OUTLET WITH FACEPLATE WITH TWO JACKS, ONE FOR A VOIP PHONE AND ONE FOR DATA.
ES51	RELOCATED OXYGEN SENSOR. RELOCATE DATA OUTLET CONDUIT AND BOX AND EXTEND DATA CABLE TO OUTLET. COORDINATE LOCATION WITH OWNER.



A1 LOWER - DAVIS CAVERN - SYSTEMS PLAN

GP-700-17 SCALE: 1/4" = 1'-0"



A3 MEZZANINE - DAVIS CAVERN - SYSTEMS PLAN

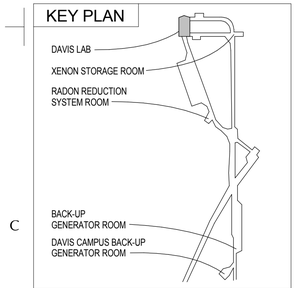
GP-700-17 SCALE: 1/4" = 1'-0"

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

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REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:36:27 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: LOWER AND MEZZANINE LEVEL SYSTEMS PLANS

Drawing Number: 006- GP-700-17 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 42 of 50

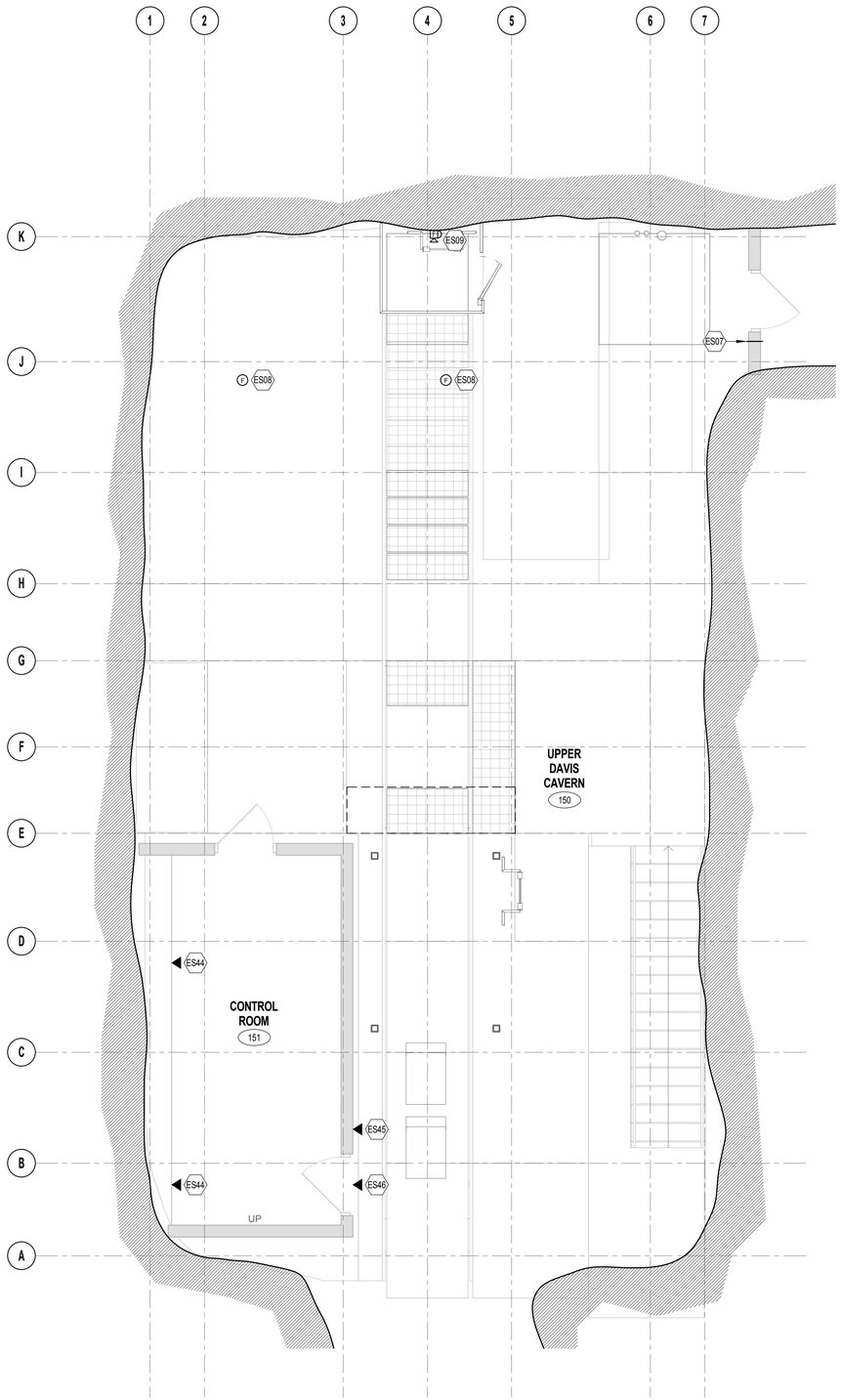
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GENERAL NOTES

1. PROVIDE FIRE ALARM DEVICES TO MATCH EXISTING FIRE ALARM SYSTEM.
2. ROUTE VOICE AND DATA CABLES IN CABLE TRAY SYSTEM. SEE SHEET GP-700-20.
3. PROVIDE ONE CATEGORY 6 CABLE TO EACH JACK.
4. ROUTE NEW CATEGORY 6 CABLES TO THE EXISTING DATA RACK IN ROOM 112 USING THE CONDUIT AND CABLE TRAY SYSTEMS UNLESS OTHERWISE NOTED. FOLLOW THE EXISTING PATH BACK TO ROOM 112. TERMINATE THESE CABLES ON EXISTING PATCH PANEL B STARTING AT PORT B01. UTILIZE THE EXISTING PATCH PANEL B PORTS MADE AVAILABLE BY THE DEMOLITION OF THE EXISTING CABLES. LABEL EACH NEW OUTLET JACK WITH THE CORRESPONDING PATCH PANEL PORT NUMBER.

*KEYNOTE LEGEND

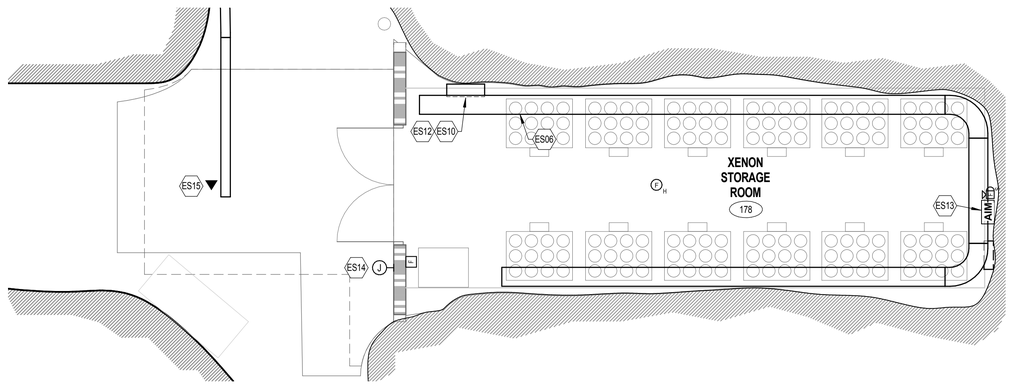
ES06	PROVIDE A 12 INCH WIDE BY 2 INCH HIGH CABLE TRAY. INSTALL THE TRAY 8'-0" ABOVE THE FLOOR AS CLOSE TO THE WALL AS POSSIBLE. SUPPORT THE TRAY WITH A TRAPEZE OF UNISTRUT AND TREADED RODS ANCHORED INTO THE ROCK. PLACE THE TRAPEZES ABOVE THE CENTER OF THE PACKS OF XENON GAS BOTTLES AS INDICATED. COORDINATE THE ROCK ANCHORS WITH THE OWNER.
ES07	EXISTING SLEEVE THROUGH WALL FOR VOICE, DATA AND LOW VOLTAGE CABLES.
ES08	RELOCATED EXISTING SMOKE DETECTOR.
ES09	RELOCATED EXISTING SPEAKER STROBE.
ES10	INSTALL THE SURF NETWORK ENCLOSURE, 20" X 24" X 8" HOFFMAN BOX FURNISHED BY SURF. INSTALL THE RELOCATED OPTICAL FIBER TERMINATION ENCLOSURE ABOVE THE HOFFMAN BOX. PROVIDE A 3/4" CONDUIT FROM THE FIBER ENCLOSURE TO THE CABLE TRAY FOR THE OPTICAL FIBER CABLE.
ES11	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO ELECTRICAL ROOM 112. PROVIDE OUTLET WITH FACEPLATE WITH TWO JACKS, ONE FOR A VOIP PHONE AND ONE FOR DATA. TERMINATE THE DATA CABLES ON EXISTING PATCH PANEL B IN THE EXISTING DATA RACK SIMILAR TO THE OTHER DATA OUTLETS. COORDINATE OUTLET LOCATION WITH RADON REDUCTION SYSTEM.
ES12	PROVIDE A SIX STRAND, SINGLE MODE OPTICAL FIBER CABLE AND TERMINATE IT ON THE RELOCATED WALL MOUNT FIBER TERMINATION ENCLOSURE. REPLACE THE EXISTING ADAPTER PANEL IN THE ENCLOSURE. USE THE EXISTING SPLICE PLATE TO SECURE THE FUSION SPLICED PIGTAILS. ROUTE THE OPTICAL FIBER CABLE THROUGH THE CONDUIT TO THE CABLE TRAY. FOLLOW THE CABLE TRAY AND CONDUIT SYSTEM BACK TO THE EXISTING DATA RACK IN ROOM 112. PROVIDE AN ADAPTER PANEL IN THE EXISTING RACK MOUNTED FIBER TERMINATION PANEL.
ES13	PROVIDE A FIRE ALARM ADDRESSABLE INPUT MODULE AND CONNECT IT TO THE LOW OXYGEN SENSOR.
ES14	PROVIDE A BOX FOR A LOW OXYGEN REMOTE DISPLAY. INSTALL AT 60 INCHES ABOVE THE FLOOR. PROVIDE A 3/4" CONDUIT THROUGH THE WALL TO THE OXYGEN SENSOR. PROVIDE CABLING PER THE SENSOR MANUFACTURER AND CONNECT THE REMOTE DISPLAY.
ES15	LOCATION OF WIRELESS ACCESS POINT PROVIDED BY SURF. PROVIDE A 1" CONDUIT TO THE HOFFMAN BOX IN THE XENON STORAGE ROOM FOR A PATCH CORD TO THE ACCESS POINT. PATCH CORD WILL BE PROVIDED BY SURF.
ES44	REUSE EXISTING OUTLET BOX AND CONDUIT. PROVIDE FACEPLATE WITH TWO JACKS, ONE FOR A VOIP PHONE AND ONE FOR DATA.
ES45	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO THE CABLE TRAY. INSTALL OUTLET BOX NEAR THE EXISTING VOIP PHONE. PROVIDE A FACEPLATE WITH TWO JACKS, ONE FOR THE VOIP PHONE AND ONE FOR DATA.
ES46	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO THE CABLE TRAY. INSTALL BOX ON WALL ADJACENT TO THE EXISTING WIRELESS ACCESS POINT. PROVIDE ONE DATA JACK ON FACEPLATE.



A1 UPPER - DAVIS CAVERN - SYSTEMS PLAN
GP-700-18 SCALE: 1/4" = 1'-0"



B3 RRS ROOM SYSTEMS PLAN
GP-700-18 SCALE: 1/4" = 1'-0"



A3 XENON STORAGE ROOM SYSTEMS PLAN
GP-700-18 SCALE: 1/4" = 1'-0"

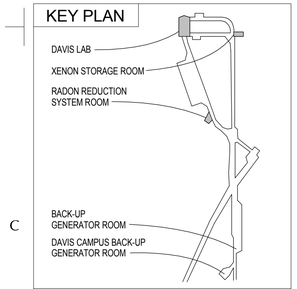
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LZ

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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S. NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:36:46 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 700 - ELEC
Level: 4850ft

Drawing Content:
4850 LEVEL SYSTEMS PLANS

Drawing Number:
006- GP-700-18 -C2

Drawing Size: 22" x 34"
Drawing Count: Sheet 43 of 50

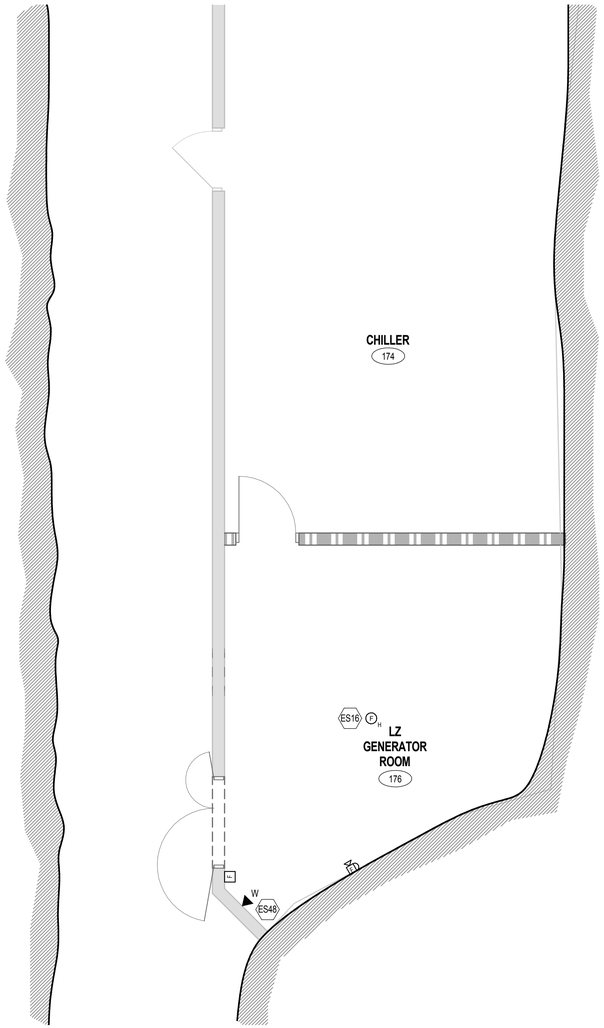
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GENERAL NOTES

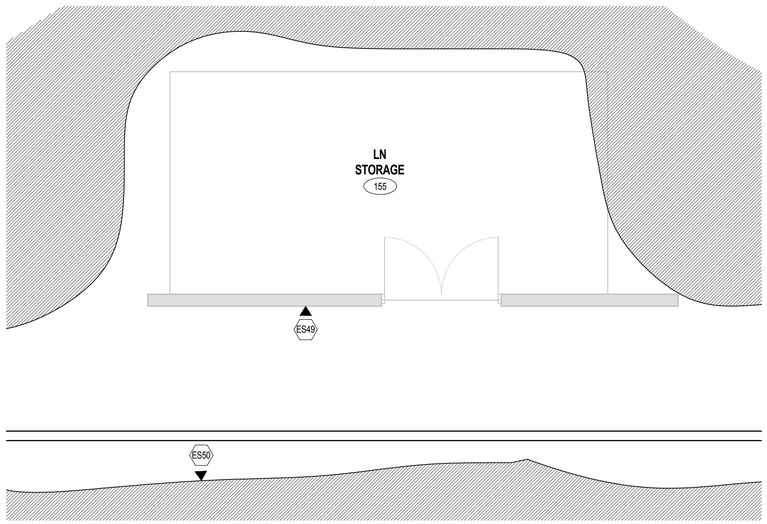
1. PROVIDE FIRE ALARM DEVICES TO MATCH EXISTING FIRE ALARM SYSTEM.
2. PROVIDE ONE CATEGORY 6 CABLE TO EACH JACK.
3. ROUTE NEW CATEGORY 6 CABLES TO THE EXISTING DATA RACK IN ROOM 112 USING THE CONDUIT AND CABLE TRAY SYSTEMS UNLESS OTHERWISE NOTED. FOLLOW THE EXISTING PATH BACK TO ROOM 112. TERMINATE THESE CABLES ON EXISTING PATCH PANEL B STARTING AT PORT B01. UTILIZE THE EXISTING PATCH PANEL B PORTS MADE AVAILABLE BY THE DEMOLITION OF THE EXISTING CABLES. LABEL EACH NEW OUTLET JACK WITH THE CORRESPONDING PATCH PANEL PORT NUMBER.

*KEYNOTE LEGEND

ES16	PROVIDE FIXED TEMPERATURE HEAT DETECTOR RATED TO ACTIVATE AT 194 DEGREES F.
ES48	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND A 3/4" CONDUIT TO THE CEILING. EXTEND TWO EXISTING CATEGORY 6 CABLES IN ROOM TO NEW OUTLET. PROVIDE OUTLET WITH FACEPLATE WITH TWO JACKS, ONE FOR A VOIP PHONE AND ONE FOR DATA.
ES49	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO THE CABLE TRAY. INSTALL OUTLET ADJACENT TO THE EXISTING VOIP PHONE. PROVIDE OUTLET WITH FACEPLATE WITH TWO JACKS, ONE FOR A VOIP PHONE AND ONE FOR DATA.
ES50	PROVIDE A 2 GANG BOX WITH A SINGLE GANG RING AND WITH A 3/4" CONDUIT TO THE CABLE TRAY. INSTALL OUTLET ADJACENT TO THE EXISTING CAMERA. PROVIDE OUTLET WITH FACEPLATE WITH ONE JACK FOR THE CAMERA.



A1 LZ GENERATOR ROOM SYSTEMS PLAN
GP-700-19 SCALE: 1/4" = 1'-0"



A3 LIQUID NITROGEN STORAGE SYSTEMS PLAN
GP-700-19 SCALE: 1/4" = 1'-0"

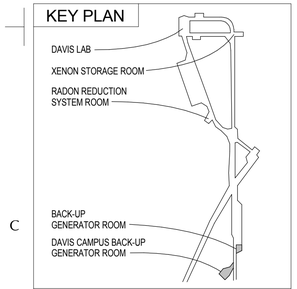
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LAD Project No. 023-10206-004

KEY PLAN



REVISIONS

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Manager	MWL
Design	SWN/WSN
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REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA

Date: 2017.11.01 15:37:02 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: LZ GENERATOR ROOM SYSTEMS PLAN

Drawing Number: 006- GP-700-19 -C1

Drawing Size: 22" x 34"

Drawing Count: Sheet 44 of 50

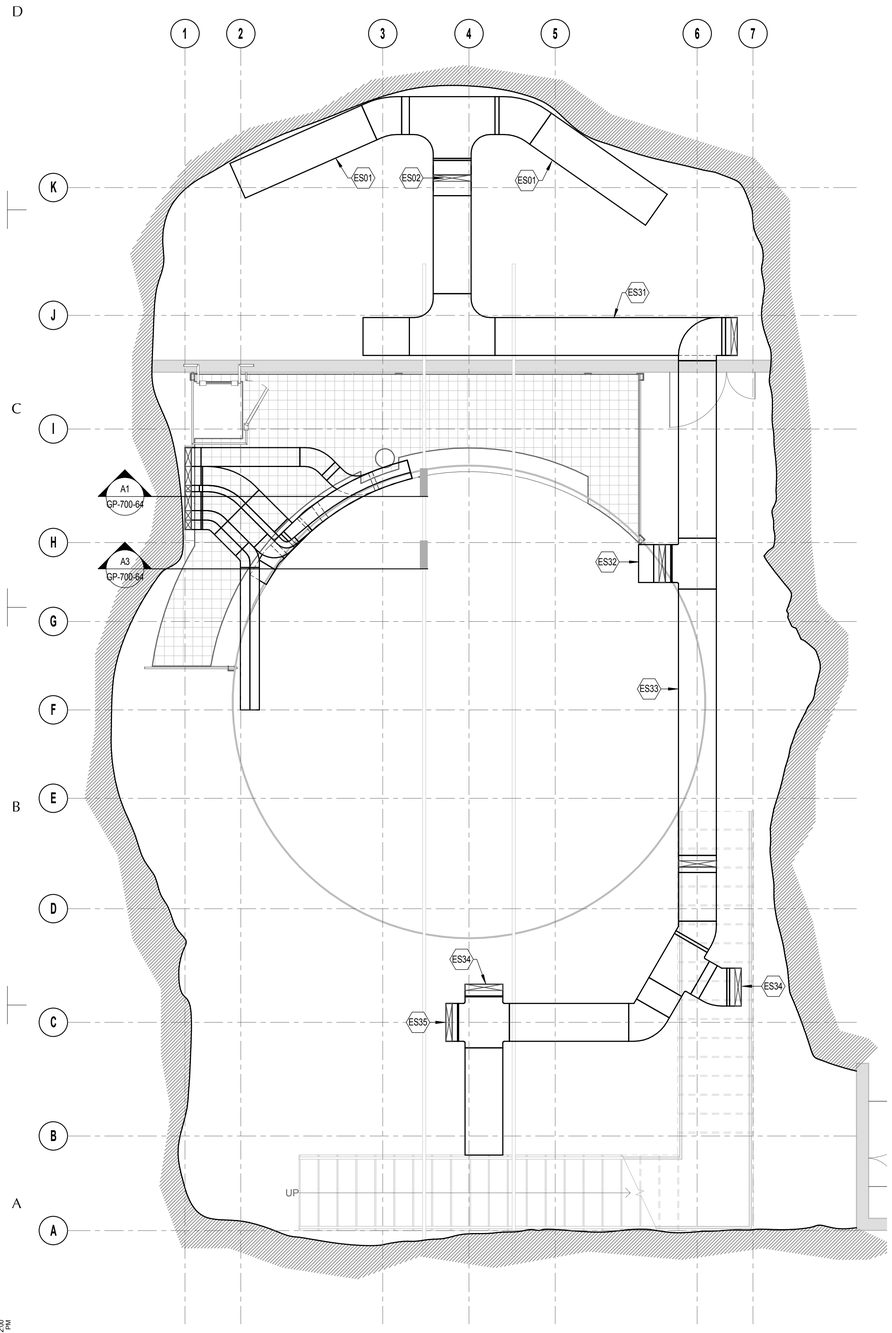
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*KEYNOTE LEGEND

ES01	PROVIDE A 24" WIDE BY 4" HIGH CABLE TRAY. INSTALL THE TRAY AT 7'-0" ABOVE THE FLOOR USING TRAPEZES 5'-0" ON CENTER. ANCHOR THE THREADED RODS TO STRUCTURE.
ES02	PROVIDE A 24" WIDE BY 4" HIGH CABLE TRAY. INSTALL THE TRAY AT 12'-0" ABOVE THE FLOOR USING TRAPEZES 5'-0" ON CENTER. ANCHOR THE THREADED RODS TO STRUCTURE.
ES18	SLOPE CABLE TRAY UP AND OVER THE MONORAIL THEN BACK DOWN TO THE PLC RACKS.
ES19	PROVIDE A 6" X 60" SLOT THROUGH CONCRETE FLOOR FOR CABLE TRAYS TO PASS THROUGH.
ES31	SLOPE CABLE TRAY UP TO AN OPENING ABOVE THE BLOCK WALL.

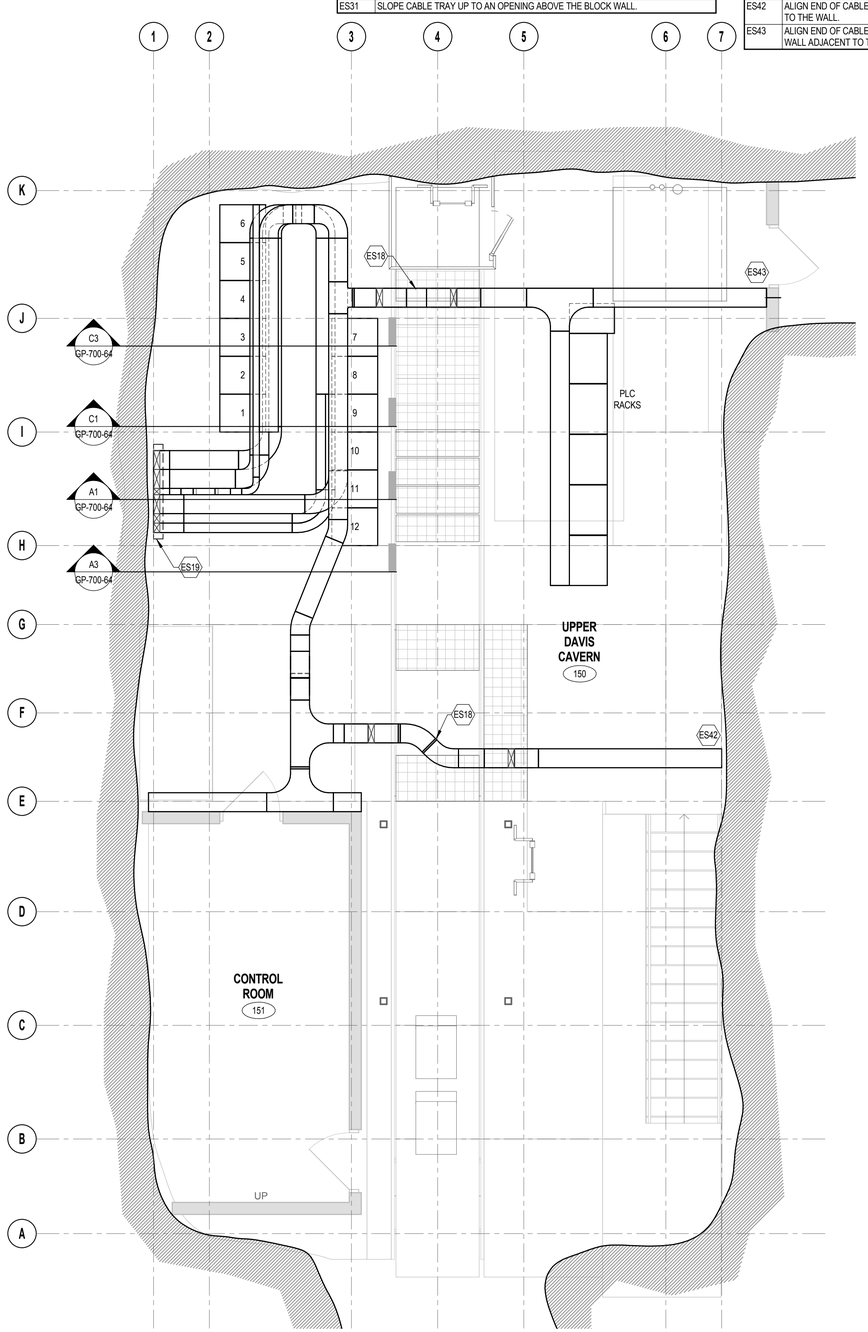
*KEYNOTE LEGEND

ES32	TURN THE CABLE TRAY UP AND ROUTE WEST SO IT'S DIRECTLY UNDER THE SOUTH MOST CABINET IN THE PLC RACK LINEUP. COORDINATE THE TRAY LOCATION WITH THE OPENING IN THE GRATING UNDER THE PLC CABINET.
ES33	PROVIDE A 24" WIDE BY 4" HIGH CABLE TRAY. INSTALL THE TRAY 11'-6" ABOVE THE FLOOR USING TRAPEZES 5'-0" ON CENTER. ANCHOR THE THREADED RODS TO STRUCTURE.
ES34	TURN CABLE TRAY DOWN TO 7'-0" ABOVE FINISHED FLOOR.
ES35	TURN CABLE TRAY UP AND ROUTE SOUTH TO AN OPENING IN THE GRATING UNDER THE CRYOCOOLER PLATFORM. COORDINATE THE TRAY LOCATION WITH THE OPENING.
ES42	ALIGN END OF CABLE TRAY WITH THE EXISTING VERTICAL CABLE TRAY MOUNTED TO THE WALL.
ES43	ALIGN END OF CABLE TRAY WITH THE EXISTING CABLE PENETRATION THROUGH THE WALL ADJACENT TO THE DOOR.



A1 **MEZZANINE - DAVIS CAVERN -DETECTOR CABLE TRAY PLAN**

GP-700-20 SCALE: 1/4" = 1'-0"



A3 **UPPER - DAVIS CAVERN - DETECTOR CABLE TRAY PLAN**

GP-700-20 SCALE: 1/4" = 1'-0"

11/1/2017 12:12:00 PM

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Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: DETECTOR CABLE TRAY PLANS

Drawing Number: 006- GP-700-20 -C2

N

Drawing Size: 22" x 34"

Drawing Count: Sheet 45 of 50

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DAVIS LAB LUMINAIRE SCHEDULE

FIXTURE TYPE	DESCRIPTION	MANUFACTURER	MODEL	LAMP	MOUNTING	NOTES
A1	4' 5000 LUMEN LED STRIPLIGHT WITH DROP LENS AND UPLIGHT (120V)	LITHONIA LIGHTING	ZL1D L48 5000LM 120 40K 80CRI	LED	PENDANT AT 12'-0" AFF	
A2	4' 5000 LUMEN LED STRIPLIGHT WITH DROP LENS AND UPLIGHT (277V)	LITHONIA LIGHTING	ZL1D L48 5000LM 277 40K 80CRI	LED	PENDANT AT 9'-0" AFF	
A2E	4' 5000 LUMEN LED STRIPLIGHT WITH DROP LENS AND UPLIGHT (277V)	LITHONIA LIGHTING	ZL1D L48 5000LM 277 40K 80CRI E7W	LED	PENDANT AT 9'-0" AFF	
A3	4' 5000 LUMEN LED STRIPLIGHT WITH DROP LENS AND UPLIGHT	LITHONIA LIGHTING	ZL1D L48 5000LM 40K 80CRI	LED	SURFACE	
B1	BATTERY EMERGENCY LIGHT	LITHONIA LIGHTING	ELT50-N2512	PAR36 INCANDESCENT	SURFACE	

1. PROVIDE FIXTURE WITH EMERGENCY BATTERY PACK.

GENERAL NOTES

1. PANELBOARDS LL-1A AND LL-1B ARE EXISTING. THE LOADS INDICATED ARE IN BREAKER POSITIONS THAT ARE CURRENTLY SPARE BREAKERS. REPLACE EXISTING BREAKERS AS REQUIRED. BREAKERS WITH NO LOAD INDICATED ARE EXISTING LOADS.

SCHEDULE FOR... H-1 **PROJECT** 006 SURF - LZ DAVIS CAMPUS **COMM. NO.** 023-10206-004
MAINS: MCB **AMP** 100 A/3P **VOLTS** 480/277 Wye **MOUNTING** Surface
FEED FROM HH-1 **LOCATION** UPPER DAVIS CAVERN 150 **A.I.C....** 14,000

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
E11 - 1 KW CRYOCOOLER	20	3	1	4.0	2.1					2	3	30	E14 - CIRCULATION COMP. 1
--	--	--	3			4.0	2.1			4	--	--	--
--	--	--	5					4.0	2.1	6	--	--	--
SPARE	20	1	7	0.0	2.1					8	3	30	E15 - CIRCULATION COMP. 2
SPARE	20	1	9			0.0	2.1			10	--	--	--
SPARE	20	1	11					0.0	2.1	12	--	--	--
SPARE	20	1	13	0.0	0.0					14	1	20	SPARE
SPARE	20	1	15			0.0	0.0			16	1	20	SPARE
SPARE	20	1	17					0.0	0.0	18	1	20	SPARE
SPARE	20	1	19	0.0	0.0					20	1	20	SPARE
SPACE	--	--	21			0.0	0.0			22	--	--	SPACE
SPACE	--	--	23					0.0	0.0	24	--	--	SPACE
SPACE	--	--	25	0.0	0.0					26	--	--	SPACE
SPACE	--	--	27			0.0	0.0			28	--	--	SPACE
SPACE	--	--	29					0.0	0.0	30	--	--	SPACE
				8200 VA		8200 VA		8200 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Power	24600 VA	100.00%	24600 VA		
				Total Conn. Load:	25 kVA
				Est. Demand:	25 kVA
				Total Conn. Current:	30 A
				Est. Demand Current:	30 A

Notes:

SCHEDULE FOR... EH-1 **PROJECT** 006 SURF - LZ DAVIS CAMPUS **COMM. NO.** 023-10206-004
MAINS: MCB **AMP** 225 A/3P **VOLTS** 480/277 Wye **MOUNTING** Surface
FEED FROM EHH-2 **LOCATION** UPPER DAVIS CAVERN 150 **A.I.C....** 14,000

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
E29 - XE RECOVERY COMP. 1	60	3	1	4.0	4.0					2	3	60	E30 - XE RECOVERY COMP. 2
--	--	--	3			4.0	4.0			4	--	--	--
--	--	--	5					4.0	4.0	6	--	--	--
ET-2	125	3	7	5.4	2.0					8	3	20	SUMP PUMPS SP-2A & SP-2B
--	--	--	9			3.2	2.0			10	--	--	--
--	--	--	11					7.3	2.0	12	--	--	--
SPARE	20	1	13	0.0	0.0					14	1	20	SPARE
SPARE	20	1	15			0.0	0.0			16	--	--	SPACE
SPARE	20	1	17					0.0	0.0	18	--	--	SPACE
SPARE	20	1	19	0.0	0.0					20	--	--	SPACE
SPACE	--	--	21			0.0	0.0			22	--	--	SPACE
SPACE	--	--	23					0.0	0.0	24	--	--	SPACE
SPACE	--	--	25	0.0	0.0					26	--	--	SPACE
SPACE	--	--	27			0.0	0.0			28	--	--	SPACE
SPACE	--	--	29					0.0	0.0	30	--	--	SPACE
				15440 VA		13190 VA		17270 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Receptacles	2880 VA	100.00%	2880 VA		
Power	43020 VA	100.00%	43020 VA		
				Total Conn. Load:	46 kVA
				Est. Demand:	46 kVA
				Total Conn. Current:	55 A
				Est. Demand Current:	55 A

Notes:

SCHEDULE FOR... LL-1A **PROJECT** 006 SURF - LZ DAVIS CAMPUS **COMM. NO.** 023-10206-004
MAINS: MCB **AMP** 225 A/3P **VOLTS** 208/120 Wye **MOUNTING** Surface
FEED FROM NT-3 **LOCATION** UPPER DAVIS CAVERN 150 **A.I.C....** 10,000

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
SPARE	20	1	1	0.0	0.0					2	1	20	EXISTING LOAD
EXISTING LOAD	20	1	3			0.0	0.0			4	1	20	EXISTING LOAD
EXISTING LOAD	20	1	5					0.0	0.0	6	1	20	EXISTING LOAD
E16 - GETTER 1	20	2	7	1.3	1.6					8	3	20	E19 - XE SAMPLING REFRIG.
--	--	--	9			1.3	1.6			10	--	--	--
E17 - GETTER 2	20	2	11					1.3	1.6	12	--	--	--
--	--	--	13	1.3	0.4					14	1	20	E18 - TURBO W/ SCR. PUMP
E20 - RN REM. REF. LOC. 1	20	1	15			1.0	0.5			16	1	20	E22 - RN RP & SM. GTR LOC. 1
E21 - RN REM. REF. LOC. 2	20	1	17					0.0	0.0	18	1	20	E23 - RN RP & SM. GTR LOC. 2
EXISTING LOAD	20	1	19	0.0	1.3					20	1	20	E24 - RN REM. I.R. LOC. 1 C1
EXISTING LOAD	20	1	21			0.0	1.3			22	1	20	E25 - RN REM. I.R. LOC. 1 C2
EXISTING LOAD	20	1	23					0.0	0.0	24	1	20	E26 - RN REM. I.R. LOC. 2 C1
EXISTING LOAD	20	1	25	0.0	0.0					26	1	20	E27 - RN REM. I.R. LOC. 2 C2
EXISTING LOAD	20	1	27			0.0	8.0			28	3	20	LL-1B
EXISTING LOAD	20	1	29					0.0	6.4	30	--	--	--
EXISTING LOAD	20	1	31	0.0	4.9					32	--	--	--
EXISTING LOAD	20	1	33			0.0				34			
EXISTING LOAD	20	1	35					0.0	0.0	36	1	20	EXISTING LOAD
EXISTING LOAD	20	1	37	0.0	0.0					38	1	20	EXISTING LOAD
			39				0.0			40	1	20	EXISTING LOAD
			41						0.0	42	1	20	EXISTING LOAD
				10640 VA		13660 VA		9250 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Motor	500 VA	100.00%	500 VA		
Receptacles	8280 VA	100.00%	8280 VA	Total Conn. Load:	34 kVA
Power	24770 VA	100.00%	24770 VA	Est. Demand:	34 kVA
				Total Conn. Current:	93 A
				Est. Demand Current:	93 A

Notes:
EXISTING PANELBOARD

SCHEDULE FOR... L-1 **PROJECT** 006 SURF - LZ DAVIS CAMPUS **COMM. NO.** 023-10206-004
MAINS: MLO **AMP** 225 A/3P **VOLTS** 208/120 Wye **MOUNTING** Surface
FEED FROM NT-5 **LOCATION** UPPER DAVIS CAVERN 150 **A.I.C....** 10,000

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
E39 - DAQ SYSTEM UPS 1	60	2	1	1.3	0.9					2	2	60	E45 - TPC CALIBRATIONS UPS
--	--	--	3			1.3	0.9			4	--	--	--
E40 - DAQ SYSTEM UPS 2	60	2	5					1.3	2.7	6	2	60	E46 - AMPLIFIER POWER UPS
--	--	--	7	1.3	2.7					8	--	--	--
E41 - DAQ SYSTEM UPS 3	60	2	9			1.3				10			
--	--	--	11					1.3		12			
E42 - DAQ SYSTEM UPS 4	60	2	13	1.3	1.0					14	2	60	E48 - PMT HIGH VOLT. UPS
--	--	--	15			1.3	1.0			16	--	--	--
E43 - DAQ SYSTEM UPS 5	60	2	17					1.3	1.4	18	2	60	E49 - OUTER DETECTOR UPS
--	--	--	19	1.3	1.4					20	--	--	--
E44 - DAQ SYSTEM UPS 6	60	2	21			1.3	0.6			22	2	60	E50 - OUTER DET. CAL. UPS
--	--	--	23					1.3	0.6	24	--	--	--
SPARE	20	1	25	0.0	0.0					26	1	20	SPARE
SPARE	20	1	27			0.0	0.0			28	1	20	SPARE
SPARE	20	1	29					0.0	0.0	30	--	--	SPACE
SPACE	--	--	31	0.0	0.0					32	--	--	SPACE
SPACE	--	--	33			0.0	0.0			34	--	--	SPACE
SPACE	--	--	35					0.0	0.0	36	--	--	SPACE
SPACE	--	--	37	0.0	0.0					38	--	--	SPACE
SPACE	--	--	39			0.0	0.0			40	--	--	SPACE
SPACE	--	--	41					0.0	0.0	42	--	--	SPACE
				10930 VA		7530 VA		9680 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Power	28140 VA	100.00%	28140 VA		
				Total Conn. Load:	28 kVA
				Est. Demand:	28 kVA
				Total Conn. Current:	78 A
				Est. Demand Current:	78 A

Notes:

SCHEDULE FOR... EL-1 **PROJECT** 006 SURF - LZ DAVIS CAMPUS **COMM. NO.** 023-10206-004
MAINS: MLO **AMP** 100 A/3P **VOLTS** 208/120 Wye **MOUNTING** Surface
FEED FROM ET-2 **LOCATION** UPPER DAVIS CAVERN 150 **A.I.C....** 10,000

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
E1 - TURBO PUMP 1	20	1	1	0.1	0.3					2	1	20	E5 - BACKING PUMP 1
E2 - TURBO PUMP 2	20	1	3			0.1	0.3			4	1	20	E6 - BACKING PUMP 2
E3 - TURBO PUMP 3	20	1	5					0.1	0.3	6	1	20	E7 - BACKING PUMP 3
E4 - TURBO PUMP 4	20	1	7	0.1	0.3					8	1	20	E8 - BACKING PUMP 4
E9 - THERMOSYPH & VAC S1	20	1	9			0.3	0.3			10	1	20	E10 - THERMOSYPH & VAC S2
E12 - FNAL SLOW CONT. UPS	60	2	11					1.1	2.5	12	1	20	E32 - XE RECOVERY HEATER
--	--	--	13	1.1	2.5					14	1	20	E33 - XE RECOVERY HEATER
E13 - SL. CONT. NON-UPS PNL	60	2	15			1.1	0.4			16	1	20	XENON STORAGE RECEPTS.
--	--	--	17					1.1	2.2	18	1	20	XENON STORAGE RECEPTS.
E47 - SLOW CONTROL UPS	60	2	19	0.8	0.4					20	1	20	XENON STORAGE RECEPTS.
--	--	--	21			0.8	0.0			22	1	20	SPARE
SPARE	20	1	23					0.0	0.0	24	1	20	SPARE
SPACE	--	--	25	0.0	0.0					26	1	20	SPARE
SPACE	--	--	27			0.0	0.0			28	1	20	SPARE
SPACE	--	--	29					0.0	0.0	30	1	20	SPARE
				5440 VA		3190 VA		7270 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Receptacles	2880 VA	100.00%	2880 VA		
Power	13020 VA	100.00%	13020 VA	Total Conn. Load:	16 kVA
				Est. Demand:	16 kVA
				Total Conn. Current:	44 A
				Est. Demand Current:	44 A

Notes:
NORMAL OPERATION DEMAND 14.3 KVA/40A

SCHEDULE FOR... LL-1B **PROJECT** 006 SURF - LZ DAVIS CAMPUS **COMM. NO.** 023-10206-004
MAINS: MLO **AMP** 225 A/3P **VOLTS** 208/120 Wye **MOUNTING** Surface
FEED FROM LL-1A **LOCATION** UPPER DAVIS CAVERN 150 **A.I.C....** 10,000

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
			1		1.4					2	1	20	RECEPTACLES
			3				1.4			4	1	20	RECEPTACLES
E28 - TURBO ON SRV W/ DIA.	20	1	5					0.4		6			
RECEPTACLES	20	1	7	1.4	1.0					8	3	20	E34 - NEUTRON GENERATOR
RECEPTACLES	20	1	9			0.7	1.0			10	--	--	--
RECEPTACLES	20	1	11					1.8	1.0	12	--	--	--
			13		1.0					14	2	20	E35 - CHILLER
HUMIDIFIER H-1	20	1	15			0.5	1.0			16	--	--	--
			17					1.4		18	1	20	E36 - CALIB. RACK CKT 1
			19		1.4					20	1	20	E37 - CALIB. RACK CKT 2
			21				1.4			22	1	20	E38 - CALIB. RACK CKT 3
			23					0.3		24	1	20	E51 - VACUUM CART CKT 1
			25		0.3					26	1	20	E52 - VACUUM CART CKT 2
LL-1C	20	3	27			0.0	0.3			28	1	20	E53 - VACUUM CART CKT 3
--	--	--	29					0.0		30			
--	--	--	31	0.0						32			
EXISTING LOAD	20	1	33			0.0				34			
EXISTING LOAD	20	1	35					0.0		36			
EXISTING LOAD	20	1	37	0.0	1.4					38	1	20	RECEPTACLES
EXISTING LOAD	20	1	39			0.0				40			
EXISTING LOAD	20	1	41					0.0		42			
				8020 VA		6360 VA		4850 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Motor	500 VA	100.00%	500 VA		
Receptacles	8280 VA	100.00%	8280 VA	Total Conn. Load:	19 kVA
Power	10450 VA	100.00%	10450 VA	Est. Demand:	19 kVA
				Total Conn. Current:	53 A
				Est. Demand Current:	53 A

Notes:
EXISTING PANELBOARD

LEO A DALY
PLANNING ARCHITECTURE ENGINEERING INTERIORS
730 Second Avenue South, Suite 1100
Minneapolis, MN 55402-2455 USA
Tel 612-338-8741 Fax 612-338-4840
LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA
Date: 2017.11.03 15:37:36-05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS
Project Name: LZ DAVIS CAMPUS
Issue Date: 11-02-2017
Discipline: 700 - ELEC
Level: 4850ft
Drawing Content: ELECTRICAL SCHEDULES
Drawing Number: 006- GP-700-61 -C2
Drawing Size: 22" x 34"
Drawing Count: Sheet 46 of 50

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11/1/2017 12:12:01 PM

LZ EQUIPMENT SCHEDULE

NEW																
ID	DESCRIPTION	LOAD INFORMATION			CONDUIT			WIRE				DISCONNECT				NOTES
TAG		KW	VOLTAGE	PANEL	SET(S)	SIZE	TYPE	P+N	PHASE	NEUT	GND	BY	TYPE	SIZE	LOC	
E1	TURBO PUMP 1	0.3	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E2	TURBO PUMP 2	0.3	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E3	TURBO PUMP 3	0.3	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E4	TURBO PUMP 4	0.3	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E5	BACKING PUMP 1	0.6	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E6	BACKING PUMP 2	0.6	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E7	BACKING PUMP 3	0.6	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E8	BACKING PUMP 4	0.6	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E9	THERMOSYPHON AND VACUUM SYSTEM 1	1.5	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E10	THERMOSYPHON AND VACUUM SYSTEM 2	1.5	120/1	EL-1	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2, 5
E11	1 KW CRYOCOOLER	11	480/3	H-1	1	1/2"	EMT	3	12 AWG		12 AWG	ELEC	NFS	30A/3P	AT UNIT	
E12	FNAL SLOW CONTROL UPS	8	208/1	EL-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	FS	60A/2P	AT UNIT	4
E13	SLOW CONTROL NON-UPS PANELBOARD	4.5	208/1	EL-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	FS	60A/2P	AT UNIT	4
E14	CIRCULATION COMPRESSOR 1	8.3	480/3	H-1	1	1/2"	EMT	3	10 AWG		10 AWG	ELEC	NFS	30A/3P	AT UNIT	
E15	CIRCULATION COMPRESSOR 2	8.3	480/3	H-1	1	1/2"	EMT	3	10 AWG		10 AWG	ELEC	NFS	30A/3P	AT UNIT	
E16	GETTER 1	2.5	208/2	LL-1A	1	1/2"	EMT	2	12 AWG		12 AWG	ELEC	RECEPT	L6-20R	AT UNIT	1
E17	GETTER 2	2.5	208/2	LL-1A	1	1/2"	EMT	2	12 AWG		12 AWG	ELEC	RECEPT	L6-20R	AT UNIT	
E18	TURBO WITH SCROLL PUMP	0.9	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E19	XENON SAMPLING REFRIGERATOR	4.9	208/3	LL-1A	1	1/2"	EMT	3	10 AWG		10 AWG	ELEC	RECEPT	L15-20R	AT UNIT	
E20	RADON REMOVAL REFRIGERATOR LOCATION 1	1	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E21	RADON REMOVAL REFRIGERATOR LOCATION 2	1	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E22	RN REMOVAL GAS PUMP & SMALL GETTER LOCATION 1	0.5	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E23	RN REMOVAL GAS PUMP & SMALL GETTER LOCATION 2	0.5	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E24	RN REMOVAL INST RACK LOCATION 1 CIRCUIT 1	1.3	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E25	RN REMOVAL INST RACK LOCATION 1 CIRCUIT 2	1.3	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E26	RN REMOVAL INST RACK LOCATION 2 CIRCUIT 1	1.3	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E27	RN REMOVAL INST RACK LOCATION 2 CIRCUIT 2	1.3	120/1	LL-1A	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E28	TURBO ON SRV WITH DIAPHRAGM	0.9	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E29	XENON RECOVERY COMPRESSOR 1	17	480/3	EH-1	1	3/4"	EMT	3	6 AWG		10 AWG	ELEC	NFS	60A/3P	AT UNIT	
E30	XENON RECOVERY COMPRESSOR 2	17	480/3	EH-1	1	3/4"	EMT	3	6 AWG		10 AWG	ELEC	NFS	60A/3P	AT UNIT	
E31	DAVIS SUMP PUMP 2A AND 2B	3	480/3	EH-1	1	1/2"	EMT	3	10 AWG		10 AWG	ELEC				3
E32	XENON RECOVERY HEATER 1	3	120/1	EL-1	1	1/2"	EMT	2	8 AWG	8 AWG	10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E33	XENON RECOVERY HEATER 2	3	120/1	EL-1	1	1/2"	EMT	2	8 AWG	8 AWG	10 AWG	ELEC	NFS	60A/2P	AT UNIT	

LZ EQUIPMENT SCHEDULE

NEW																
ID	DESCRIPTION	LOAD INFORMATION			CONDUIT			WIRE				DISCONNECT				NOTES
TAG		KW	VOLTAGE	PANEL	SET(S)	SIZE	TYPE	P+N	PHASE	NEUT	GND	BY	TYPE	SIZE	LOC	
E34	NEUTRON GENERATOR	10.8	208/3	LL-1B	1	1/2"	EMT	3	10 AWG		10 AWG	ELEC	RECEPT	L15-30R	AT UNIT	
E35	CHILLER	4.2	208/1	LL-1B	1	1/2"	EMT	2	10 AWG		10 AWG	ELEC	RECEPT	L6-30R	AT UNIT	
E36	CALIBRATION RACK CIRCUIT 1	1.4	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E37	CALIBRATION RACK CIRCUIT 2	1.4	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E38	CALIBRATION RACK CIRCUIT 3	1.4	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E39	DAQ SYSTEM UPS 1	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E40	DAQ SYSTEM UPS 2	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E41	DAQ SYSTEM UPS 3	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E42	DAQ SYSTEM UPS 4	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E43	DAQ SYSTEM UPS 5	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E44	DAQ SYSTEM UPS 6	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E45	TPC CALIBRATIONS UPS	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E46	AMPLIFIER POWER UPS	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E47	SLOW CONTROL UPS	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E48	PMT HIGH VOLTAGE UPS	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E49	OUTER DETECTOR UPS	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E50	OUTER DETECTOR CALIBRATIONS UPS	8	208/1	L-1	1	3/4"	EMT	2	6 AWG		10 AWG	ELEC	NFS	60A/2P	AT UNIT	
E51	VACUUM CART CIRCUIT 1	0.8	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E52	VACUUM CART CIRCUIT 2	0.8	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2
E53	VACUUM CART CIRCUIT 3	0.8	120/1	LL-1B	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	ELEC	RECEPT	5-20R DBL. DUPLEX	AT UNIT	2

GENERAL NOTES:

A. OBTAIN SHOP DRAWINGS OF EQUIPMENT AND COMPARE CONNECTION, LOAD, AND VOLTAGE INFORMATION TO CONTRACT DOCUMENTS BEFORE INSTALLING FEEDER CONDUITS. NOTIFY ARCHITECT OF ANY DISCREPANCIES.

BEFORE MAKING EQUIPMENT POWER CONNECTIONS, COMPARE EQUIPMENT NAMEPLATE DATA TO SHOP DRAWINGS AND CONTRACT DOCUMENTS. NOTIFY ARCHITECT OF ANY DISCREPANCIES.

B. PROVIDE GREY DUPLEX RECEPTACLES UNLESS OTHERWISE NOTED.

NOTES:

1. PROVIDE A 30mA GFI CIRCUIT BREAKER IN PANEL FOR THIS CIRCUIT.
2. PROVIDE GFCI CIRCUIT BREAKER
3. DISCONNECT SUMP PUMPS FROM PANELBOARD HEQ-1A/B AND CONNECT TO PANELBOARD EL-1 AS INDICATED. REUSE EXISTING DISCONNECT SWITCH.
4. PROVIDE 50 AMP RK5 FUSES IN DISCONNECT.
5. PROVIDE RED DUPLEX RECEPTACLE

DAVIS LAB MOTOR AND EQUIPMENT SCHEDULE

ID	DESCRIPTION	LOAD INFORMATION						CONDUIT			WIRE				CONTROLLER				DISCONNECT				NOTES
TAG		HP	FLA	MCA	KW	VOLTAGE	PANEL	SET(S)	SIZE	TYPE	P+N	PHASE	NEUT	GND	BY	TYPE	SIZE	LOC	BY	TYPE	SIZE	LOC	
VF-1	EXHAUST FAN	0.75				480/3	H-1	1	1/2"	EMT	3	12 AWG		12 AWG	MFR				ELEC	NF	30 AMP	AT UNIT	
VF-2	LZ GENERATOR ROOM VENTILATION FAN	1.5				480/3	GENSET	1	1/2"	EMT	3	12 AWG		12 AWG	ELEC	FVNR	0	RM 175	ELEC	NF	30 AMP	AT UNIT	1
SP-1	SUMP PUMP	.03				120/1	L-RRS	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	MFR				MFR				
H-1	HUMIDIFIER				0.21	120/1	LL-1B	1	1/2"	EMT	3	12 AWG		12 AWG	MFR				ELEC	NFS	30 AMP	AT UNIT	
RP-1	RRS ROUGHING PUMP		27.8			208/3	L-RRS	1	3/4"	EMT	3	8 AWG		10 AWG	MFR				MFR				
BP-1	BOOSTER PUMP	10				208/3	L-RRS	1	3/4"	EMT	3	8 AWG		10 AWG	MFR				MFR				
DH-1	RRS DEHUMIDIFIER		23.8			208/1	L-RRS	1	1/2"	EMT	2	10 AWG		10 AWG	MFR				ELEC	NFS	30 AMP	AT UNIT	2
DH-2	RRS DEHUMIDIFIER		23.8			208/1	L-RRS	1	1/2"	EMT	2	10 AWG		10 AWG	MFR				ELEC	NFS	30 AMP	AT UNIT	2
BL-1	RRS BLOWER		10.6			208/3	L-RRS	1	1/2"	EMT	3	12 AWG		10 AWG	MFR				ELEC	NFS	30 AMP	AT UNIT	2
PS-1	PUMP SKID					120/1	L-RRS	1	1/2"	EMT	2	12 AWG	12 AWG	12 AWG	MFR				ELEC	5-20R	20 AMP	AT UNIT	3
FCU-1	FAN COIL UNIT	1.5	2	2.4		480/3	HH-1	1	1/2"	emt	3	12 AWG		12 AWG	ELEC	FVNR	0	177	ELEC	NF	30 AMP	177	4

GENERAL NOTES:
A. OBTAIN SHOP DRAWINGS OF EQUIPMENT AND COMPARE CONNECTION, LOAD, AND VOLTAGE INFORMATION TO CONTRACT DOCUMENTS BEFORE INSTALLING FEEDER CONDUITS. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
BEFORE MAKING EQUIPMENT POWER CONNECTIONS, COMPARE EQUIPMENT NAMEPLATE DATA TO SHOP DRAWINGS AND CONTRACT DOCUMENTS. NOTIFY ARCHITECT OF ANY DISCREPANCIES.

1. SEE A1/006-GP-700-63 FOR ADDITIONAL CONTROLLER AND CIRCUITING INFORMATION.
2. VERIFY LOCATION OF DISCONNECT WITH RADON REDUCTION SYSTEM INSTALLER.
3. VERIFY LOCATION OF RECEPTACLE WITH RADON REDUCTION SYSTEM INSTALLER.
4. PROVIDE COMBINATION DISCONNECT/SIZE 0 MAGNETIC STARTER. COORDINATE LOCATION IN ROOM WITH EQUIPMENT

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12979
WILLOW S. NICHOLS
SOUTH DAKOTA
Date: 2017.11.03 15:37:55 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: ELECTRICAL SCHEDULES

Drawing Number: 006- GP-700-62 -C2

Drawing Size: 22" x 34"

Drawing Count: Sheet 47 of 50

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SCHEDULE FOR...	L-RRS	**PROJECT**	006 SURF - LZ DAVIS CAMPUS						**COMM. NO.**	023-10206-004					
MAINS:	MCB	**AMP**	125 A/3P		**VOLTS**	208/120 Wye			**MOUNTING**	Surface					
FEED FROM	LH-1A	**LOCATION**	RADON REDUCTION SYSTEM ROOM 177						**A.I.C....**	10,000					

Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
RP-1	50	3	1	3.3	2.5					2	2	20	DH-2
--	--	--	3			3.3	2.5			4	--	--	--
--	--	--	5					3.3	1.3	6	3	30	BL-1
DH-1	20	2	7	2.5	1.3					8	--	--	--
--	--	--	9			2.5	1.3			10	--	--	--
SP-1	20	1	11					0.1	3.7	12	3	50	BP-1
RECEPTACLES	20	1	13	0.4	3.7					14	--	--	--
RECEPTACLES	20	1	15			0.7	3.7			16	--	--	--
SPARE	20	1	17					0.0	0.0	18	1	20	SPARE
SPACE	--	--	19	0.0	0.0					20	--	--	SPACE
SPACE	--	--	21			0.0	0.0			22	--	--	SPACE
SPACE	--	--	23					0.0	0.0	24	--	--	SPACE
SPACE	--	--	25	0.0	0.0					26	--	--	SPACE
SPACE	--	--	27			0.0	0.0			28	--	--	SPACE
SPACE	--	--	29					0.0	0.0	30	--	--	SPACE
				13660 VA		13980 VA		8400 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
HVAC	24400 VA	100.00%	24400 VA		
Motor	11100 VA	100.00%	11100 VA	**Total Conn. Load:**	36 kVA
Receptacles	540 VA	100.00%	540 VA	**Est. Demand:**	36 kVA
				Total Conn. Current:	100 A
				Est. Demand Current:	100 A

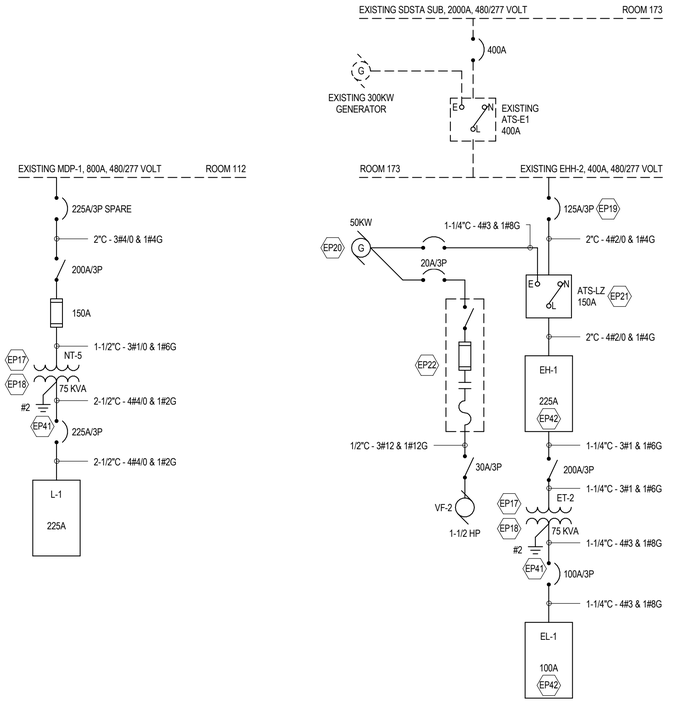
Notes:

SCHEDULE FOR...	HH-1	**PROJECT**	006 SURF - LZ DAVIS CAMPUS						**COMM. NO.**	023-10206-004					
MAINS:	MCB	**AMP**	225 A/3P		**VOLTS**	480/277 Wye			**MOUNTING**	Surface					
FEED FROM	MDP-1	**LOCATION**	ELECTRICAL ROOM 112						**A.I.C....**						

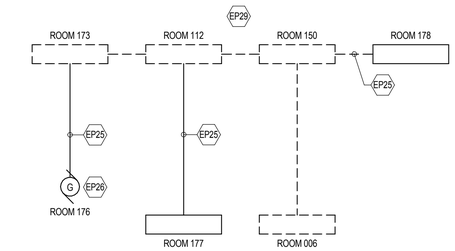
Load Name	A	P	CC...	A		B		C		CC...	P	A	Load Name
DAVIS HOIST (2)	20	3	1	0.0	0.0					2	3	20	FC-2 (2)
--	--	--	3			0.0	0.0			4	--	--	--
--	--	--	5					0.0	0.0	6	--	--	--
3 PHASE 480V OUTLETS (2)	30	3	7	0.0	0.0					8	3	20	FC-1 (2)
--	--	--	9			0.0	0.0			10	--	--	--
--	--	--	11					0.0	0.0	12	--	--	--
SPARE	20	1	13	0.0	0.0					14	3	35	ME-7 OVEN (2)
SPARE	20	1	15			0.0	0.0			16	--	--	--
SPARE	20	1	17					0.0	0.0	18	--	--	--
WATER SYSTEM (2)	30	3	19	0.0	8.2					20	3	100	PANEL H-1 (3)
--	--	--	21			0.0	8.2			22	--	--	--
--	--	--	23					0.0	8.2	24	--	--	--
SPARE	20	1	25	0.0	0.6					26	3	15	FCU-1
SPARE	20	1	27			0.0	0.6			28	--	--	--
SPARE	20	1	29					0.0	0.6	30	--	--	--
SPARE	20	1	31	0.0	0.0					32	1	20	SPARE
LIGHTS UPPER DAVIS (1)	20	1	33			0.0	0.0			34	1	20	SPARE
LIGHTS TRANSITION (1)	20	1	35					0.0	0.0	36	1	20	SPARE
LIGHTS TRANSITION (1)	20	1	37	0.0	0.0					38	1	20	SPARE
LIGHTS TRANSITION (1)	20	1	39			0.0	0.0			40	1	20	SPARE
LIGHTS DRIFT (1)	20	1	41					0.0	0.0	42	1	20	SPARE
				8754 VA		8754 VA		8754 VA					

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Lighting	377 VA	125.00%	471 VA		
Motor	1663 VA	100.00%	1663 VA	**Total Conn. Load:**	27 kVA
Power	24600 VA	100.00%	24600 VA	**Est. Demand:**	27 kVA
				Total Conn. Current:	32 A
				Est. Demand Current:	32 A

Notes:
(1) EXISTING PANELBOARD
(2) EXISTING LOAD
(3) REPLACE THREE EXISTING 20 AMP, 1 POLE BREAKERS WITH ONE 100 AMP, 3 POLE BREAKER



A1 **ONE-LINE DIAGRAMS**
GP-700-63 SCALE: 12" = 1'-0"



A4 **GROUNDING DIAGRAM**
GP-700-63 SCALE: 12" = 1'-0"

*KEYNOTE LEGEND

EP17	PROVIDE A FEDERAL PACIFIC 75 KVA, DRY TYPE, SHIELDED ISOLATION TRANSFORMER WITH A 480 VOLT, 3 PHASE PRIMARY AND A 208/120 VOLT, 3 PHASE, 4 WIRE SECONDARY. WINDINGS SHALL BE COPPER WITH A 150 DEGREE C TEMPERATURE RISE. TRANSFORMER SHALL BE K13 RATED AND SHALL HAVE DOUBLE ELECTROSTATIC SHIELDS WITH SEPARATE GROUNDING PROVISIONS FOR THE PRIMARY SHIELD, THE SECONDARY SHIELD AND THE ENCLOSURE GROUND. REFER TO FEDERAL PACIFIC DRAWING D48084251-020317M2.
EP18	CONNECT THE TRANSFORMER PRIMARY AND CASE GROUNDS TO THE GROUNDING ELECTRODE IN THE CONCRETE EQUIPMENT PAD THE TRANSFORMERS SIT ON. VERIFY WITH OWNER WHETHER THE SATURABLE INDUCTOR IS REQUIRED TO BE INSTALLED BETWEEN THE PRIMARY AND SECONDARY GROUNDS.
EP19	REMOVE THREE 20 AMP, SINGLE POLE SPARE CIRCUIT BREAKERS FROM PANELBOARD AND PROVIDE A 125 AMP, THREE POLE CIRCUIT BREAKER FOR THE FEEDER TO TRANSFER SWITCH ATS-LZ.
EP20	PROVIDE GENERATOR WITH AN AUXILIARY RELAY CONTACT THAT CLOSES WHEN THE GENERATOR RUNS. CONNECT THIS CONTACT TO THE STARTER FOR VENTILATION FAN VF-2 SO THE FAN STARTS WHEN THE GENERATOR STARTS. PROVIDE GENERATOR WITH AN AUXILIARY RELAY CONTACT THAT CLOSES WHEN THE GENERATOR RUNS. CONNECT THIS CONTACT TO THE LZ EXPERIMENT CONTROL SYSTEM TO NOTIFY THE SYSTEM THE GENERATOR IS RUNNING. VERIFY THE CONNECTION LOCATIONS WITH SURF.
EP21	PROVIDE AUTOMATIC TRANSFER SWITCH WITH AUXILIARY RELAY CONTACTS, ONE CLOSED WHEN THE SWITCH IS IN THE NORMAL POSITION AND ONE CLOSED WHEN THE SWITCH IS IN THE EMERGENCY POSITION. CONNECT BOTH CONTACTS TO THE LZ EXPERIMENT CONTROL SYSTEM. PROVIDE PRE-TRANSFER RELAY CONTACTS WHICH CLOSE BEFORE THE SWITCH CHANGES POSITIONS FOR BOTH NORMAL TO EMERGENCY AND EMERGENCY TO NORMAL. CONNECT THE PRE-TRANSFER CONTACTS TO THE LZ EXPERIMENT CONTROL SYSTEM TO NOTIFY THE SYSTEM THAT THE TRANSFER SWITCH IS GOING TO TRANSFER. VERIFY THE CONNECTION LOCATIONS WITH SURF.
EP22	PROVIDE A NEMA SIZE 0 COMBINATION STARTER FOR VENTILATION FAN VF-2. PROVIDE 4 1/2 AMP FUSES IN STARTER.
EP23	REMOVE THREE 20 AMP, SINGLE POLE SPARE CIRCUIT BREAKERS FROM PANELBOARD AND PROVIDE A 125 AMP, THREE POLE CIRCUIT BREAKER FOR THE FEEDER TO PANELBOARD L-RRS.
EP25	3/4" CONDUIT WITH A #3/0 BARE COPPER GROUNDING CONDUCTOR. BOND THE GROUNDING CONDUCTOR TO THE CONDUIT ON BOTH ENDS.
EP26	BOND THE GROUNDING CONDUCTOR TO THE GENERATOR FRAME AND FUEL TANK. SEE A1/GP-700-16.
EP29	GROUND BARS AND GROUNDING CONDUCTORS SHOWN DASHED ARE EXISTING.
EP41	INSTALL CIRCUIT BREAKER WITHIN 10 FEET OF CONDUCTOR LENGTH FROM TRANSFORMER SECONDARY CONNECTION.
EP42	DO NOT ADD ELECTRICAL LOAD TO THIS PANELBOARD WITHOUT CONSULTING THE ELECTRICAL ENGINEER OF RECORD.

Sanford Underground Research Facility

LZ

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LAD Project No. 023-10206-004

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
Check	MSB

STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12979
WILLOW S. NICHOLS
SOUTH DAKOTA
Date: 2017.11.01 15:30:36 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location: SURF DAVIS CAMPUS

Project Name: LZ DAVIS CAMPUS

Issue Date: 11-02-2017

Discipline: 700 - ELEC

Level: 4850ft

Drawing Content: ELECTRICAL DETAILS AND SCHEDULES

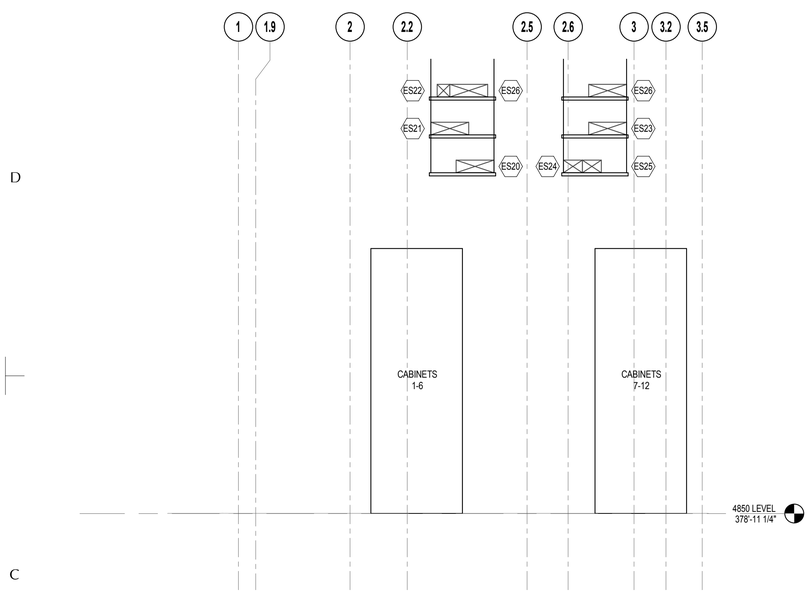
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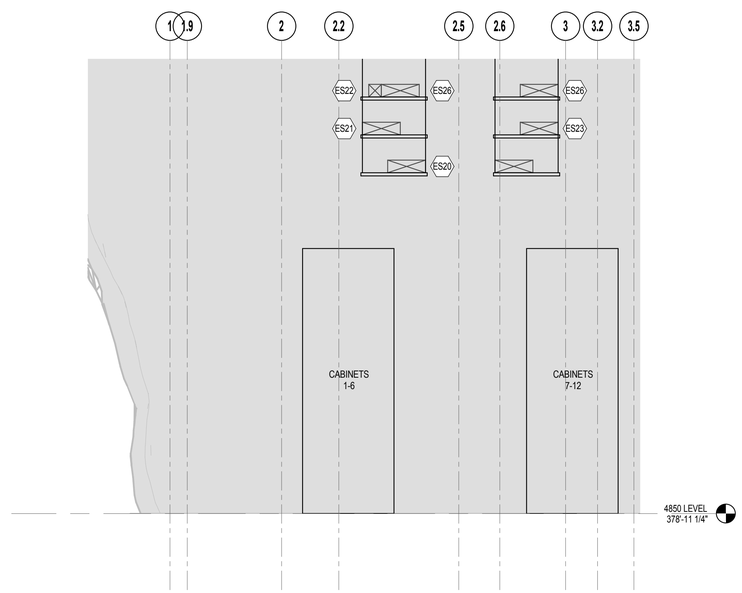
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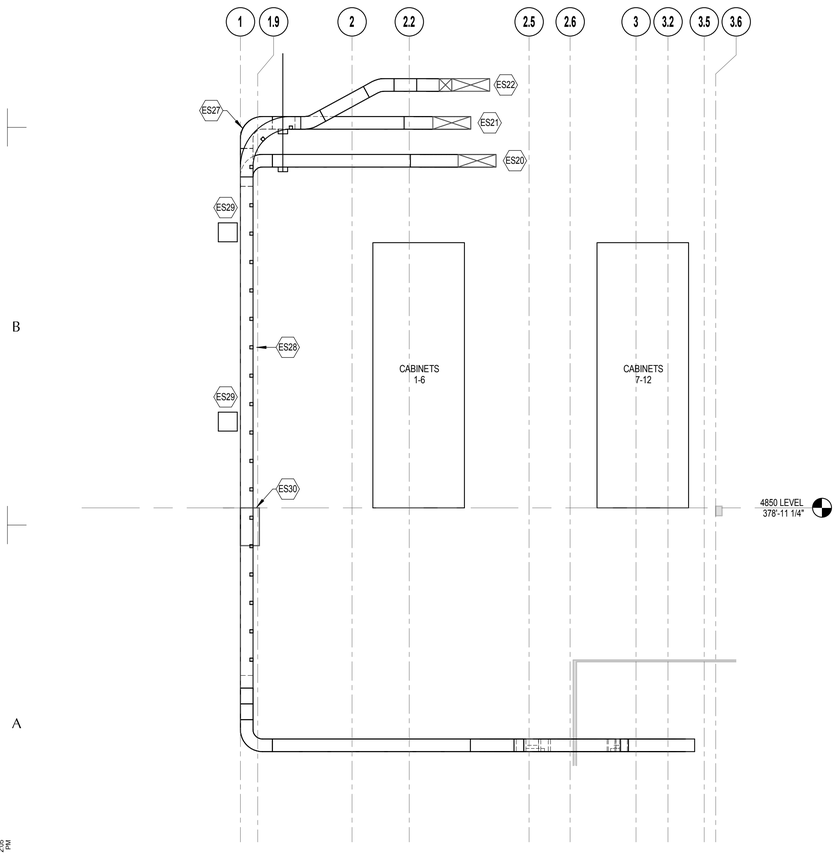
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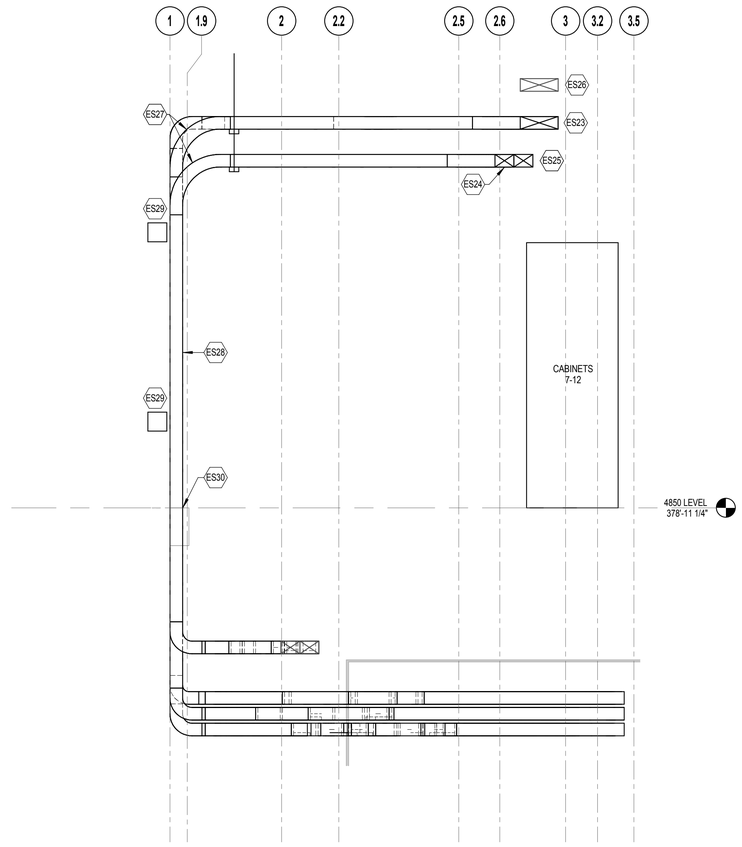
C1 **CABLE TRAY SECTION**
GP-700-64 SCALE: 1/2" = 1'-0"



C3 **CABLE TRAY SECTION**
GP-700-64 SCALE: 1/2" = 1'-0"



A1 **CABLE TRAY SECTION**
GP-700-64 SCALE: 1/2" = 1'-0"



A3 **CABLE TRAY SECTION**
GP-700-64 SCALE: 1/2" = 1'-0"

GENERAL NOTES

1. PROVIDE TRAPEZE SUPPORTS FOR CABLE TRAYS. PROVIDE SUPPORTS AT MAXIMUM 6 FOOT SPACING. ANCHOR THE THREADED RODS TO STRUCTURE OR CEILING. COORDINATE CEILING SUPPORTS WITH OWNER.
2. PROVIDE MINIMUM 6" RADIUS BENDS IN CABLE TRAYS.
3. PROVIDE A GREEN #6 GROUND WIRE ALONG ALL CABLE TRAY SECTIONS AND BOND TO EACH SECTION.
4. PROVIDE WIRE BASKET TYPE CABLE TRAYS UNLESS OTHERWISE NOTED.

*KEYNOTE LEGEND

ES20	4" X 12" CABLE TRAY FOR SIGNAL CABLES TO BREAKOUT FOR LOWER PMT ARRAY.
ES21	4" X 12" CABLE TRAY FOR SIGNAL CABLES TO BREAKOUT FOR UPPER PMT ARRAY.
ES22	4" X 4" CABLE TRAY FOR NETWORK CABLES TO BOTH BREAKOUTS.
ES23	4" X 12" CABLE TRAY FOR HIGH VOLTAGE AMPLIFIER POWER CABLES TO BOTH BREAKOUTS.
ES24	4" X 6" CABLE TRAY FOR THE OUTER DETECTOR HIGH VOLTAGE CABLES TO THE TOP OF THE TANK.
ES25	4" X 6" CABLE TRAY FOR OUTER DETECTOR SIGNAL CABLES, OPTICAL FIBER CABLES AND SOURCE DELIVERY NETWORK CABLES TO THE TOP OF THE TANK.
ES26	4" X 12" CABLE TRAY FOR NETWORK CABLES TO THE PLC RACKS, CONTROL ROOM AND DATA RACK IN ROOM 112.
ES27	PROVIDE FIELD FABRICATED VERTICAL ELBOWS OR CABLE DROP OUT FITTINGS FOR EACH WIRE BASKET TYPE CABLE TRAY. PROVIDE FACTORY ELBOWS FOR TROUGH TYPE CABLE TRAYS.
ES28	VERTICAL CABLE TRAY IS OPEN TO THE ROOM.
ES29	PROVIDE WALL SUPPORTS FOR CABLE TRAY.
ES30	CABLE TRAYS PASS THROUGH SLOT CUT THROUGH CONCRETE FLOOR. SEE A3/GP-700-20.

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LAD Project No. 023-10206-004

KEY PLAN

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ACTIVITY	BY
Manager	MWL
Design	SWN/WSN
Draw	AJL
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STAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12979
WILLOW S.
NICHOLS
SOUTH DAKOTA

Date: 2017.11.03 15:38:57 -05'00'

100% CONSTRUCTION DOCUMENTS

Project Description/Location:
SURF DAVIS CAMPUS

Project Name:
LZ DAVIS CAMPUS

Issue Date:
11-02-2017

Discipline: 700 - ELEC
Level: 4850ft

Drawing Content:
CABLE TRAY SECTIONS

Drawing Number:
006- GP-700-64 -C2

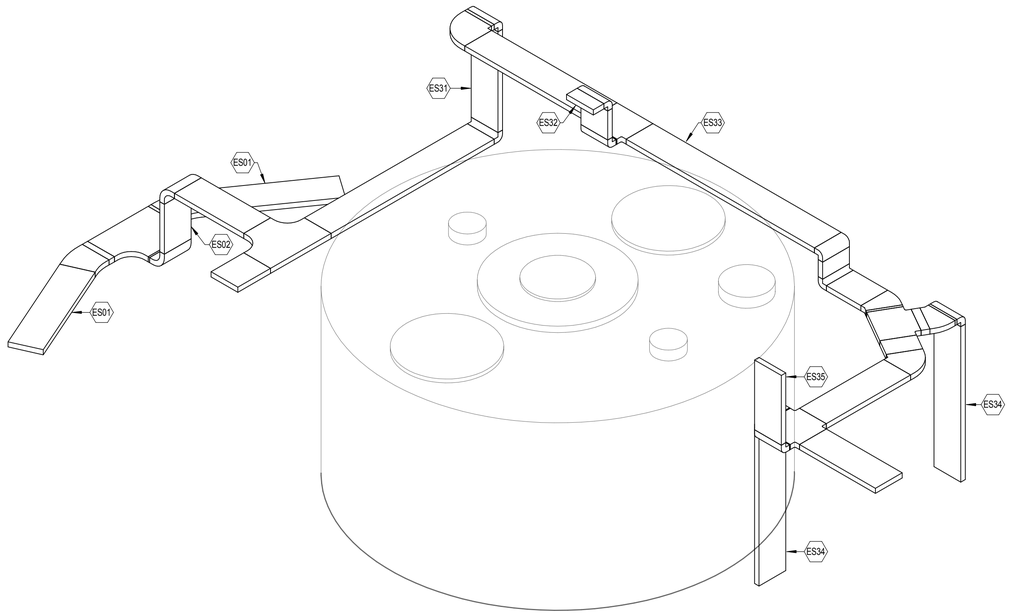
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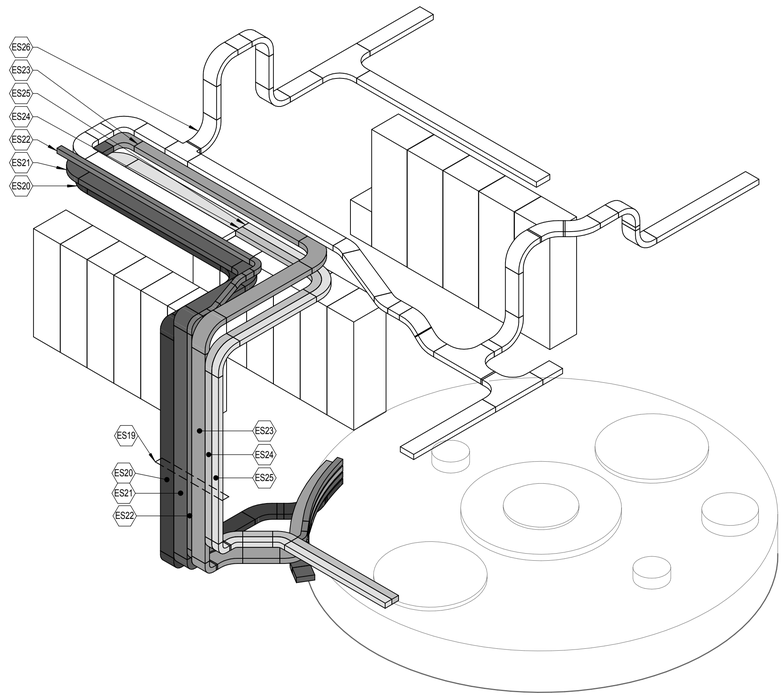
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*KEYNOTE LEGEND

ES01	PROVIDE A 24" WIDE BY 4" HIGH CABLE TRAY. INSTALL THE TRAY AT 7'-0" ABOVE THE FLOOR USING TRAPEZES 5'-0" ON CENTER. ANCHOR THE THREADED RODS TO STRUCTURE.
ES02	PROVIDE A 24" WIDE BY 4" HIGH CABLE TRAY. INSTALL THE TRAY AT 12'-0" ABOVE THE FLOOR USING TRAPEZES 5'-0" ON CENTER. ANCHOR THE THREADED RODS TO STRUCTURE.
ES19	PROVIDE A 6" X 60" SLOT THROUGH CONCRETE FLOOR FOR CABLE TRAYS TO PASS THROUGH.
ES20	4" X 12" CABLE TRAY FOR SIGNAL CABLES TO BREAKOUT FOR LOWER PMT ARRAY.
ES21	4" X 12" CABLE TRAY FOR SIGNAL CABLES TO BREAKOUT FOR UPPER PMT ARRAY.
ES22	4" X 4" CABLE TRAY FOR NETWORK CABLES TO BOTH BREAKOUTS.
ES23	4" X 12" CABLE TRAY FOR HIGH VOLTAGE AMPLIFIER POWER CABLES TO BOTH BREAKOUTS.
ES24	4" X 6" CABLE TRAY FOR THE OUTER DETECTOR HIGH VOLTAGE CABLES TO THE TOP OF THE TANK.
ES25	4" X 6" CABLE TRAY FOR OUTER DETECTOR SIGNAL CABLES, OPTICAL FIBER CABLES AND SOURCE DELIVERY NETWORK CABLES TO THE TOP OF THE TANK.
ES26	4" X 12" CABLE TRAY FOR NETWORK CABLES TO THE PLC RACKS, CONTROL ROOM AND DATA RACK IN ROOM 112.
ES31	SLOPE CABLE TRAY UP TO AN OPENING ABOVE THE BLOCK WALL.
ES32	TURN THE CABLE TRAY UP AND ROUTE WEST SO IT'S DIRECTLY UNDER THE SOUTH MOST CABINET IN THE PLC RACK LINEUP. COORDINATE THE TRAY LOCATION WITH THE OPENING IN THE GRATING UNDER THE PLC CABINET.
ES33	PROVIDE A 24" WIDE BY 4" HIGH CABLE TRAY. INSTALL THE TRAY 11'-6" ABOVE THE FLOOR USING TRAPEZES 5'-0" ON CENTER. ANCHOR THE THREADED RODS TO STRUCTURE.
ES34	TURN CABLE TRAY DOWN TO 7'-0" ABOVE FINISHED FLOOR.
ES35	TURN CABLE TRAY UP AND ROUTE SOUTH TO AN OPENING IN THE GRATING UNDER THE CRYOCOOLER PLATFORM. COORDINATE THE TRAY LOCATION WITH THE OPENING.



A1 **LABORATORY CABLE TRAY ISOMETRIC**
GP-700-65 SCALE:



A3 **DETECTOR CABLE TRAY ISOMETRIC**
GP-700-65 SCALE:

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Sanford Underground Research Facility

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KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE