



State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

Department of Administrative Services

KIMBERLY K. HOOD
Executive Director

Division of Facilities Construction and Management

DAVID G. BUXTON
Director

ADDENDUM NO. 2

Date: December 3, 2008

To: Contractors

From: Jim Russell, Project Manager, DFCM

Reference: Library/Classroom Building
Snow College
DFCM Project No. 07258700

Subject: **Addendum No. 2**

| | | |
|-------|------------------------------|----------------|
| Pages | Addendum Cover Sheet | 1 page |
| | Architect's Addendum | 4 pages |
| | Revised Plans | 13 pages |
| | Revised Specifications | 17 pages |
| | Commissioning Specifications | 19 pages |
| | Request for Product Approval | 2 pages |
| | <u>Details</u> | <u>3 pages</u> |
| | Total | 59 pages |

Note: *This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to Disqualification.*

While we contend that SB220 should only be potentially applicable to a contract issued after the effective date of said bill, this is to clarify that for purposes of this contract, regardless of the execution or effective dates of this contract, the status of Utah Law and remedies available to the State of Utah and DFCM, as it relates to any matter referred to or affected by said SB220, shall be the Utah law in effect at the time of the issuance of this Addendum.

2.1 **SCHEDULE CHANGES:** None

2.2 **GENERAL ITEMS:** See attached Architect's Addendum.



Addendum #002

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PROJECT NAME: SNOW COLLEGE LIBRARY / CLASSROOM BUILDING **DATE:** DEC 2, 2008

DFCM Proj. No: DFCM # 07258700

FROM: Cooper Roberts Simonsen Associates (435) 673-7362
55 S. Bluff St. Suite B Fax 435) 673-7392
St. George, UT 84770

TO: All Bidders

This Addendum forms a part of the Contract Documents and modifies the original Bid Documents dated Sept. 15, 2008 as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of (4) 8 1/2"x11" pages, (38) 8 1/2"x11" specification pages, (3) 8 1/2"x11" drawing pages, and (13) 30"x42" drawing pages.

I. CHANGES TO PRIOR ADDENDA:

I-1 NONE

II. CHANGES TO BIDDING REQUIREMENTS:

II-1 Insert EQUAL PRODUCT REQUEST FORM

III. CHANGES TO AGREEMENT & OTHER CONTRACT FORMS:

III-1 NONE

IV. CHANGES TO CONDITIONS OF THE CONTRACT:

IV-1 NONE

V. CHANGES TO SPECIFICATIONS:

V-1 Spec section 012300 ALTERNATES
Part 3.1 Schedule of Alternates
1. Alternate No 3. is to include all items in drawings and documents noted as alternates 3, 4, and 5.
2. Alternate numbers 6, 8, & 9 have been deleted from the bidding process.

V-2 Insert MECHANICAL SYSTEMS COMMISSIONING in appendage to section 230594 – General Testing, Adjusting, Balancing, and Commissioning.

V-3 Insert ELECTRICAL SYSTEMS COMMISSIONING to Division 26 – Electrical



Addendum #002

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- V-4 Section 034500 – PRECAST ARCHITECTURAL CONCRETE
Part 2 – Products
2.1 Manufacturers (approved for Bidding)
3. Unlimited Designs
4. MarcStone
- V-5 Section 076100 – SHEET METAL ROOFING
Part 2.5 Snow Guards
B. Seam Mounted, Stop-Type Snow Guards:
1. Products (approved for bidding)
d. Sno-Gem, Inc.
- C. Provide and install required number of snow guards adequate to prevent snow sliding from roof as determined by roofing and snow guard manufacturer. Snow guards shall be clamp on, continuous bar or fence type constructed of metal with no plastic components.
- V-6 Section 085200 – ALUMINUM CLAD WINDOWS
Part 2.4 Hardware
ADD:
E. Sash Lock
Provide sash lock with keyway for securing of windows at owners option.
- V-7 Section 096813
Part 2 – Products
2.1 & 2.2 Carpet Tile
Delete:
A.1 – Bentley Prince Street
A.2 – Interface Flor
- V-8 Section 087100 – DOOR HARDWARE
Delete existing Door Hardware section and insert the attached section DOOR HARDWARE and the revised HARDWARE SCHEDULE.
- V-9 Section 283111 – DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM
Contact Person:
David Croff
2702 S. 1030 W. #60
S.L.C., UT 84119
(801) 262-4242
dcroff@simplexgrinnell.com

VI. CHANGES TO DRAWINGS:

- VI-1 Remove Sheet AE105 and insert attached revised SHEET AE105
VI-2 Remove Sheet AE106 and insert attached revised SHEET AE106
VI-3 Remove Sheet AE107 and insert attached revised SHEET AE107
VI-4 Remove Sheet AE108 and insert attached revised SHEET AE108
VI-5 Remove Sheet AE113 and insert attached revised SHEET AE113
VI-6 Remove Sheet AE114 and insert attached revised SHEET AE114
VI-7 Remove Sheet AE115 and insert attached revised SHEET AE115

- VI-8 Remove Sheet AE116 and insert attached revised SHEET AE116
- VI-9 Remove Sheet AE301 and insert attached revised SHEET AE301
- VI-10 Remove Sheet AE503 and insert attached revised SHEET AE503
- VI-11 Remove Sheet AE601 and insert attached revised SHEET AE601
 Clarification: Doors noted on DOOR SCHEDULE as DRT-1, 2, or 3, have been re-noted to match plans and are now DS-1, 2, & 3. These doors are part of the Modular Wall Partition system – section 102217.
 Clarification: Doors noted as Specialty doors are to be RiteDoor system or similar as approved. See attached hardware Schedule.
- VI-12 Remove Sheet AE602 and insert attached revised SHEET AE602
- VI-13 Remove Sheet AE603 and insert attached revised SHEET AE603
- VI-14 SHEET AE601
 1. All windows note as “FIXED” are to be sash set, similar to a fixed casement window.
 2. Window TYPE ‘D’ is to be (2) windows mullied together.
- VI-15 Sheet SF102, grid 3, between A-B, Detail A1/SF102 applies to all 1 ½” elevation changes.
- VI-16 Column splices are allowed. See attached detail ADD#1-SD-01 for splice detail.
- VI-17 Sheet SF102, near grid C/2, detail A1/SF501 is a typical detail and applies to sheet SF103 as well.
- VI-18 Sheet SF103, Grid 2.4, between C-D, Use detail C2/SF503 for the typical detail where a steel beam connects to a concrete wall running in the same direction as the beam. For the W16x26, connecting perpendicular to this wall, use detail B1/SF504.
- VI-19 Sheet SF105 notes a beam on grid 2:B-C. The beam size is a W18x35.
- VI-20 Sheet SE001
 General Notes
 III.F.G – shall read:
 NO ALUMINUM CONDUIT OR PRODUCT CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO CONCRETE SHALL BE EMBEDDED IN CONCRETE. REFER TO DETAIL D4/SF502 FOR GENERAL REQUIREMENTS OF PLACING CONDUIT IN SUSPENDED SLABS ON DECK.
- VI-21 Sheets SF102, SF103, and SF104
 Add the following note to each floor framing plan:
 REFER TO DETAIL D4/SF502 FOR CONDUIT IN SUSPENDED SLAB’S ON METAL DECK REQUIREMENTS.
- VI-22 See Attached Sheet EL-101-R2-1 for revised lighting.
 1. Chair and Table Storage 025: Deleted (2) fixture type (W-3). Added (2) fixture type (GS-3).
 2. Stair 001B: Deleted (1) fixture type (W-3).



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3. Janitor 203: Moved (1) W-3 fixture.

VI-23 See Attached Sheet EL-104-R2-1 for revised lighting.

1. Reading 300: Deleted (38) fixture type (S-3). Added (2) fixture type (DF-37).
2. Mech. 316: Rotated (1) SA-1 fixture to be horizontal at entry door.

VI-24 Sheet EL601 – LIGHTING FIXTURE SCHEDULE

1. Lighting fixture types (DF-98), (DF-99), (DL-11) and (DL-99) must be dual voltage 120/277.
2. Added fixture type (GS-3)
2X4, 2 LAMP, 0.6 BALLAST FACTOR \ 2-F32T8, RE835 \ 65W \ 277/120V
LITHONIA #2 SP8G 232 A12125 MVOLT TUBRHP
METALUX #2GP-232A125-UNV-EB81-PROGRAM START
DAYBRITE #2DPG232-FS21-UNV-1/2EB-SPEC
LSI #LA125 232 SD SSO10PS UE
LIGHTOLIER #XT2GVI232-UNV-SOP
COLUMBIA #ST824-232G-FSA12.125-EB8LHPRUNV

End of Addendum

FLOOR PLAN KEYED NOTES

1. ROLL DOWN FIRE GATE
2. SECTIONAL PARTITION. SEE DETAIL B5, B6/AE604
3. SEMI-PERMANENT PARTITIONS
4. 7" TALL GYP. BOARD WALL
5. GLASS GUARD RAIL
6. HIGH DENSITY COLLECTIONS
7. FUTURE HIGH DENSITY COLLECTION LOCATION
8. SLIDING DOOR.
9. BOOK RETURN SEE DETAIL E1/AE506.
10. TEMPORARY GYP. BOARD WALL
11. AIR HANDLER. SEE MECHANICAL
12. BENCH SEE DETAIL D1/AE408
13. WINDOW WELL
14. WALK OFF MATS, FLUSH
15. ART WALL SEE DETAILS A4, A6, B4, B5, B6, C5/AE507
16. ALTERNATING TREAD, 6' X 3' SEE DETAIL B4/AE506
17. THEFT DETERRENT DEVICES
18. FIRE EXTINGUISHER CABINET. SEE DETAIL B4, B5/ AE502
19. EXTERIOR BOOK DROP LOCATION. (BY OTHERS.)
20. DISCHARGE IDENTIFICATION BARRIER. (MAG. HOLD OPEN)
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andrea@maddcinc.com

STAMP:

PROJECT NAME:
Snow College Library
150 College Avenue
Ephraim, Utah 84627

REVISIONS:

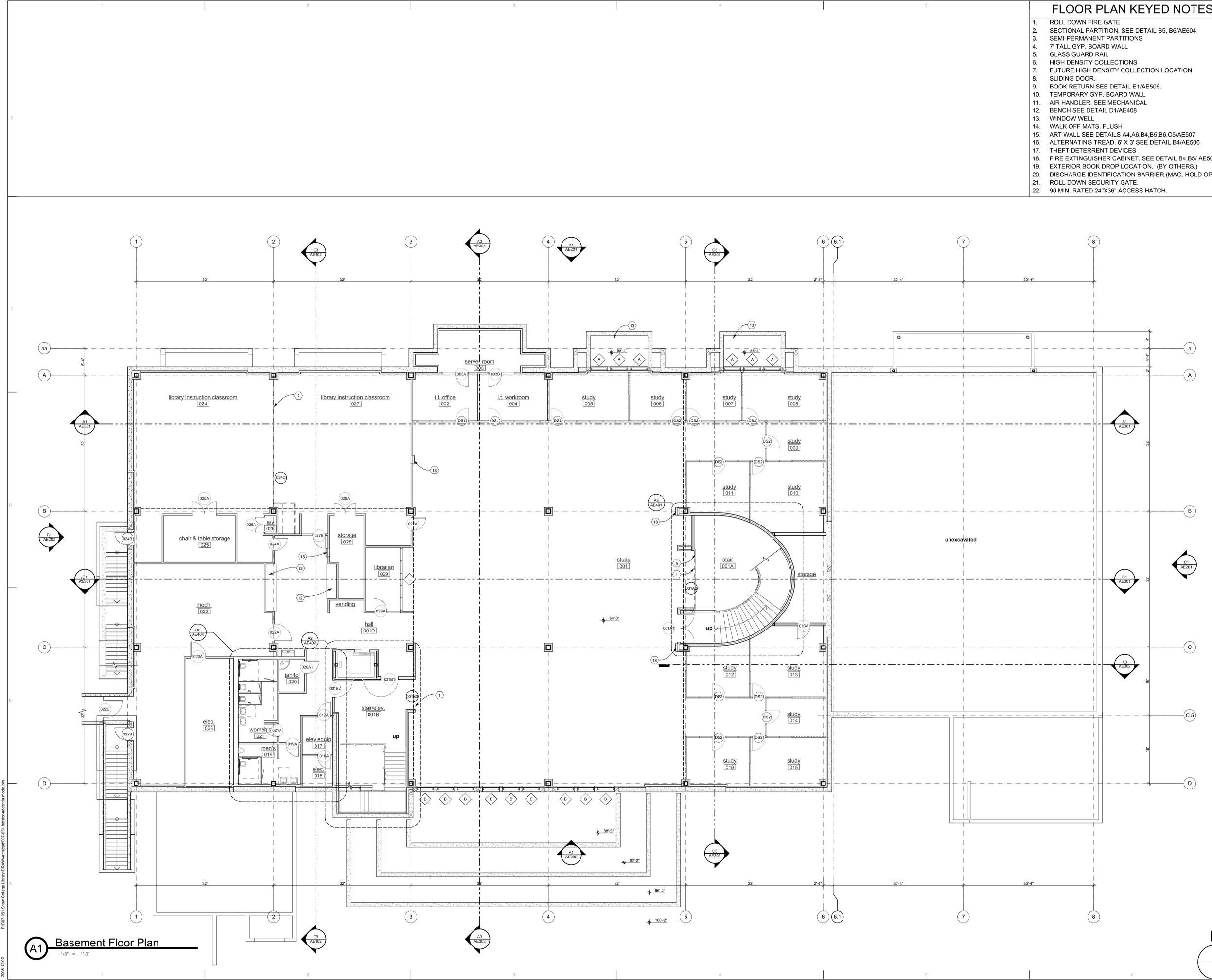
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DECEMBER 2ND, 2008
 NOVEMBER 25TH, 2008
 100% CD, September 15, 2008
 100% CD Review, August 4, 2008
 ISSUE DATE:
 SEPTEMBER 15 2008, 100% CD

ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:

Basement Level, Floor Plan
SHEET NUMBER:

AE105



A1 Basement Floor Plan
1/8" = 1'-0"

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2008-12-02

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21. ROLL DOWN SECURITY GATE.
22. 90 MIN. RATED 24"X36" ACCESS HATCH.

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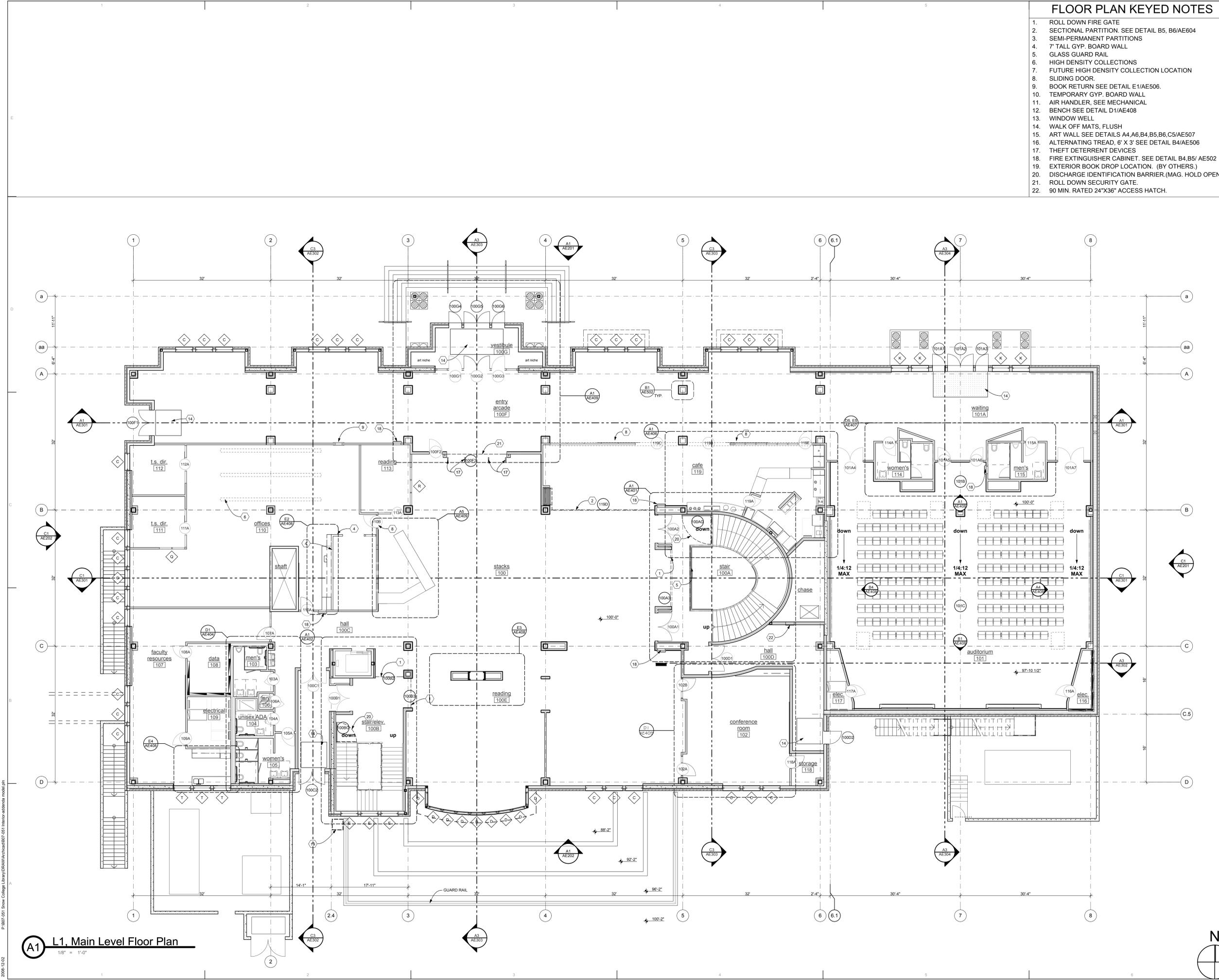
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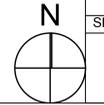
ISSUE DATE:
SEPTEMBER 15 2008, 100% CD
ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:

Level 1, Main Level, Floor Plan

SHEET NUMBER:
AE106



A1 L1, Main Level Floor Plan
1/8" = 1'-0"



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2008-12-02

FLOOR PLAN KEYED NOTES

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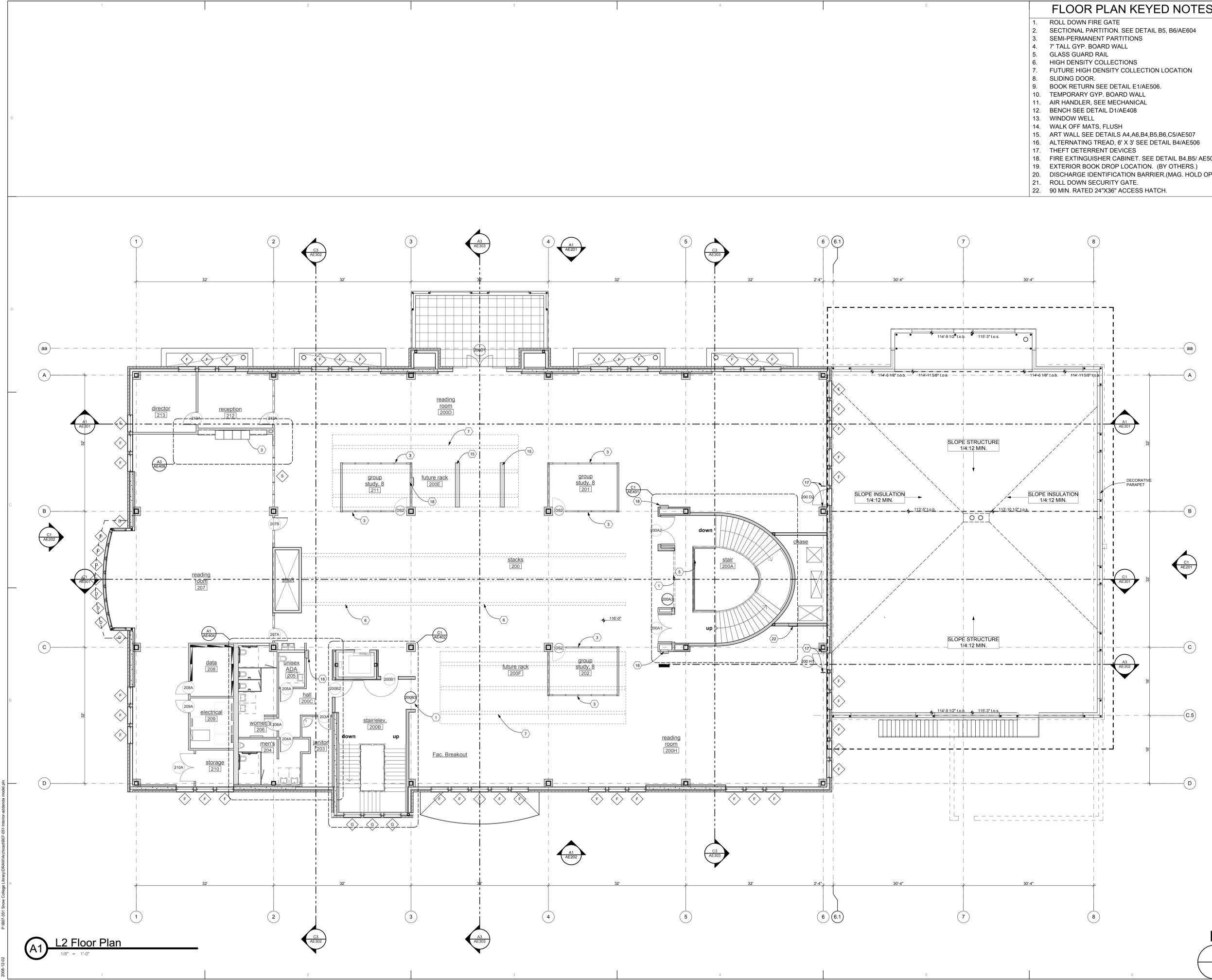
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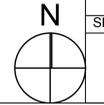
ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700

SHEET TITLE:
Level 2, Floor Plan

SHEET NUMBER:
AE107



A1 L2 Floor Plan
1/8" = 1'-0"



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2008-12-02

FLOOR PLAN KEYED NOTES

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2. SECTIONAL PARTITION. SEE DETAIL B5, B6/AE604
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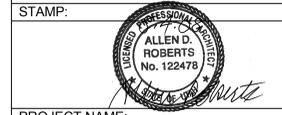
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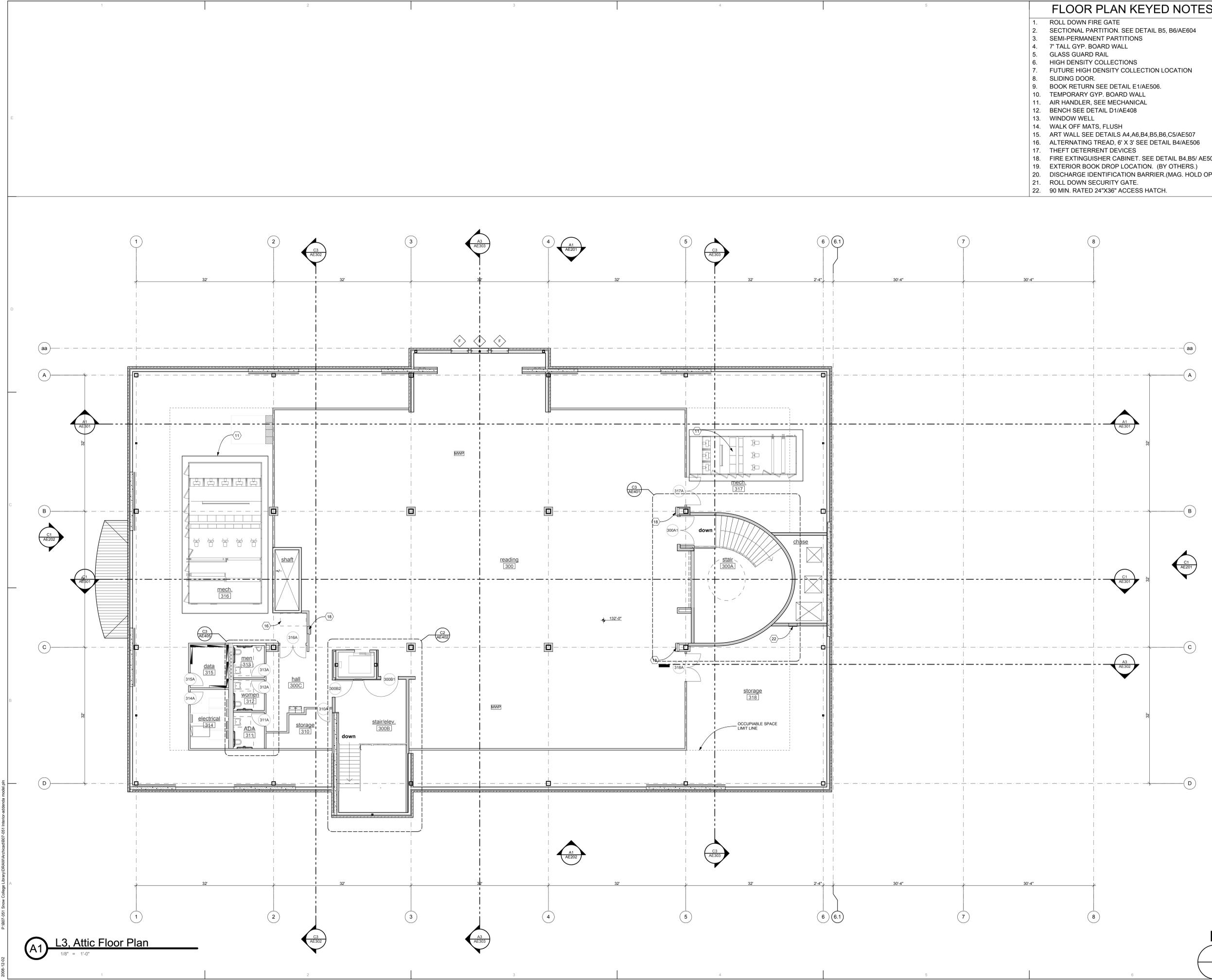
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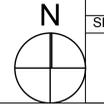
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ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:
Level 3, Attic, Floor Plan

SHEET NUMBER:
AE108



A1 L3, Attic Floor Plan
1/8" = 1'-0"



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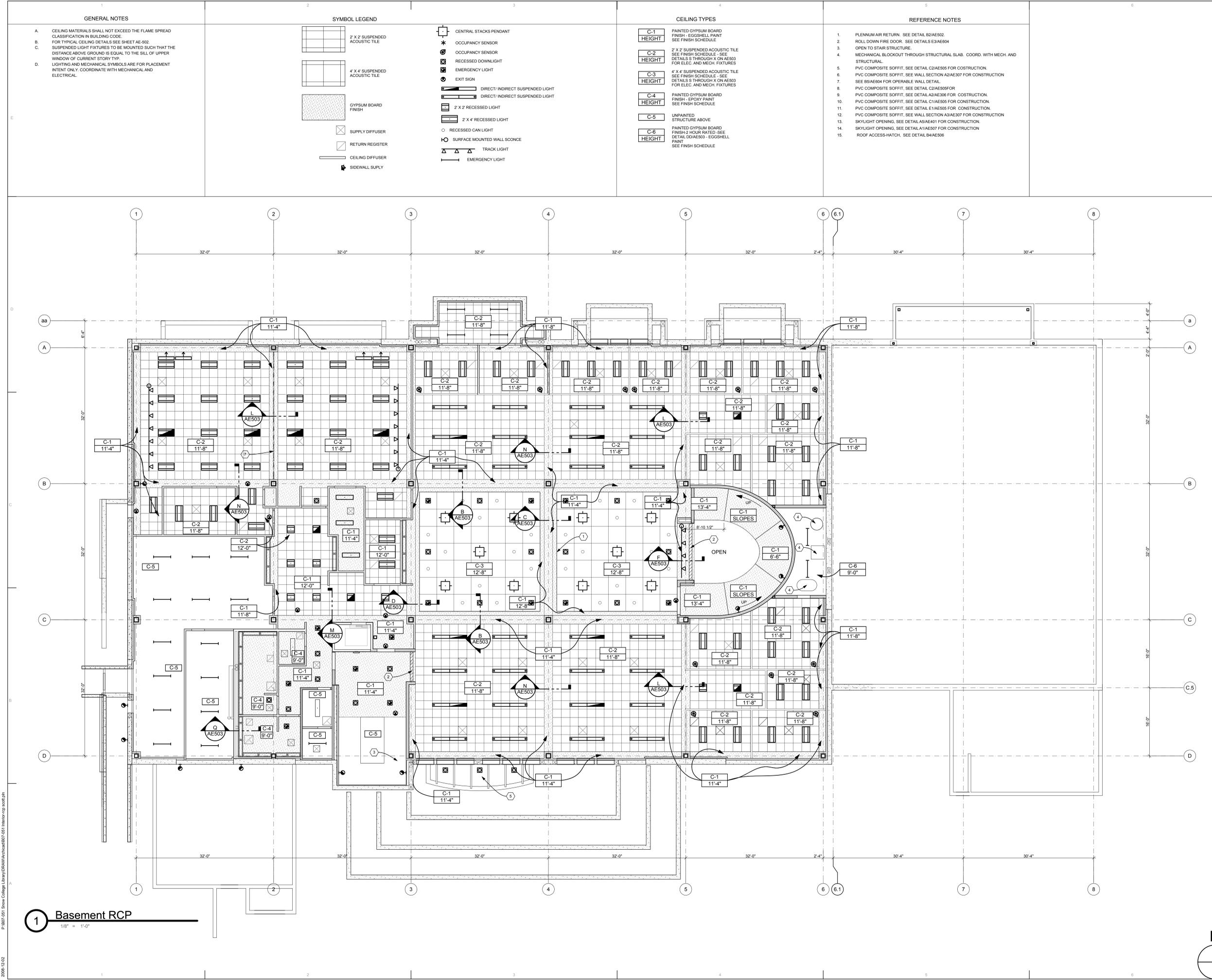
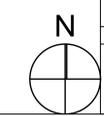
PROJECT NAME:
Snow College Library
150 College Avenue
Ephraim, Utah 84627

REVISIONS:
DECEMBER 2ND, 2008
NOVEMBER 25TH, 2008

100% CD, September 15, 2008
100% CD Review, August 4, 2008
ISSUE DATE:
SEPTEMBER 15, 2008, 100% CD

ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:
Basement Level R C P

SHEET NUMBER:
AE113



1 Basement RCP
1/8" = 1'-0"



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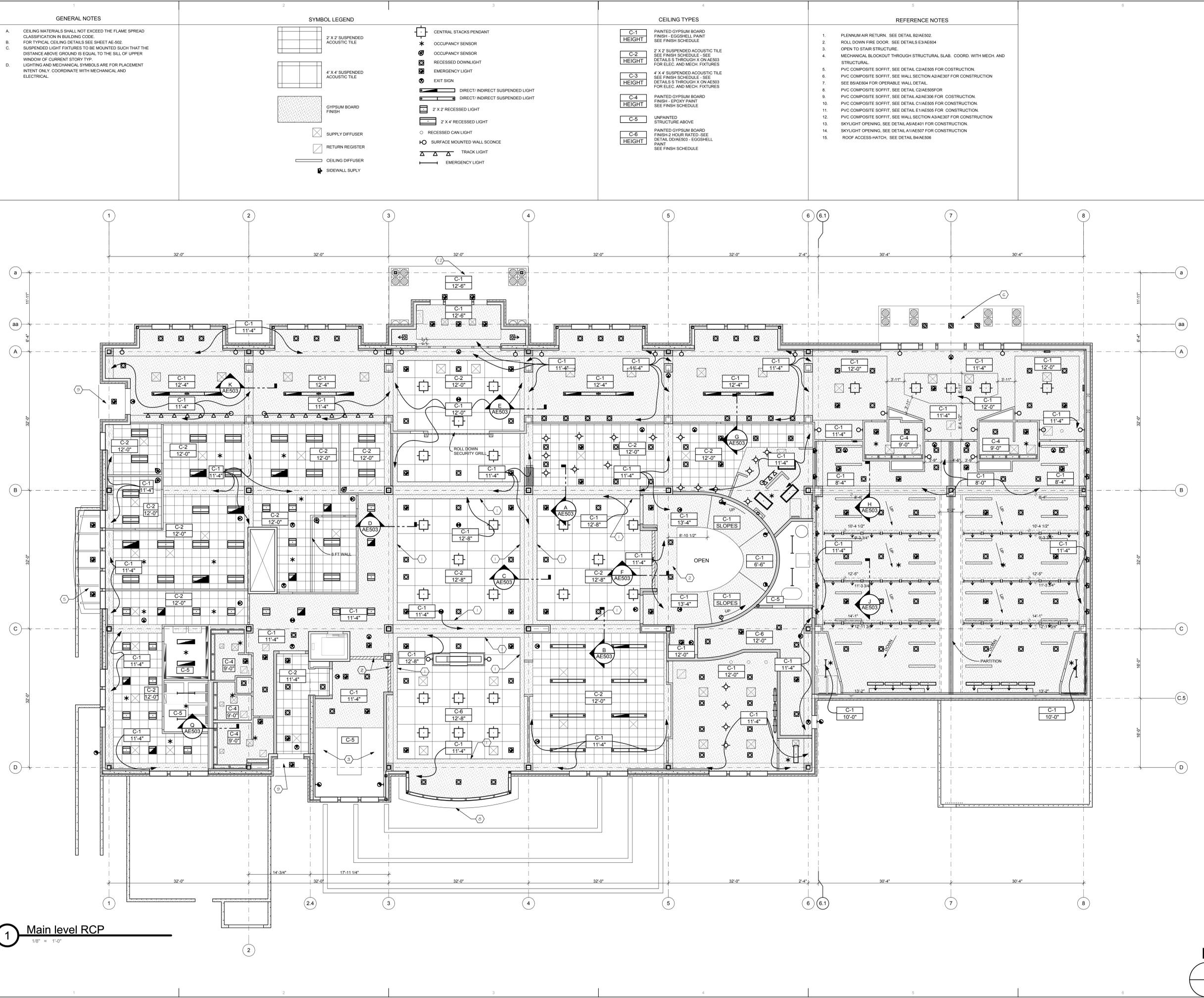
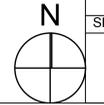
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ISSUE DATE:
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ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:

Level 1, Main Level, R C P
SHEET NUMBER:

AE114



1 Main level RCP
1/8" = 1'-0"



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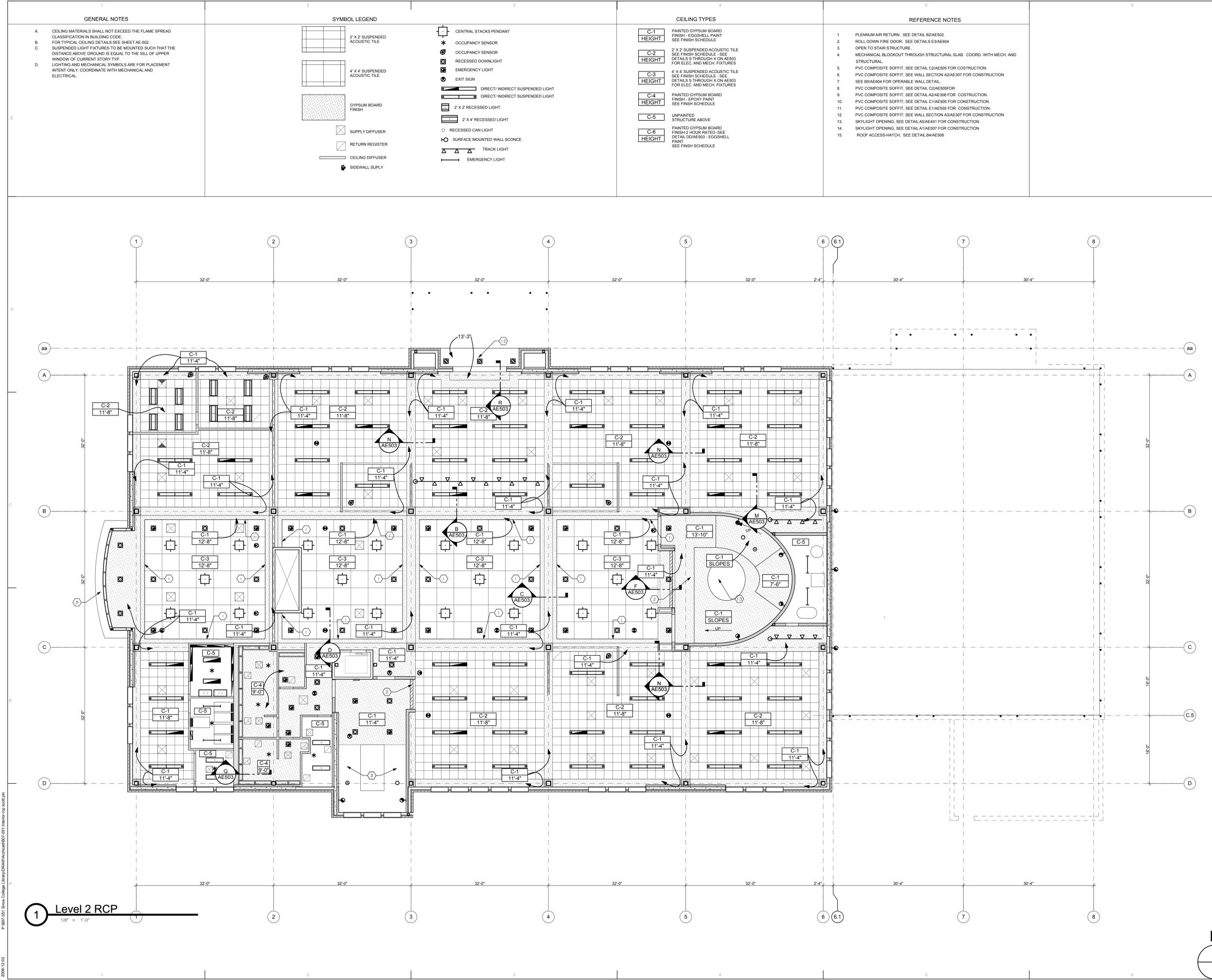
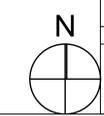
PROJECT NAME:
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REVISIONS:
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NOVEMBER 25TH, 2008

100% CD, September 15, 2008
100% CD Review, August 4, 2008
ISSUE DATE:
SEPTEMBER 15, 2008, 100% CD

ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:
Level 2, R C P

SHEET NUMBER:
AE115



1 Level 2 RCP
1/8" = 1'-0"



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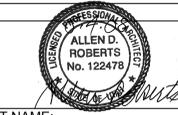
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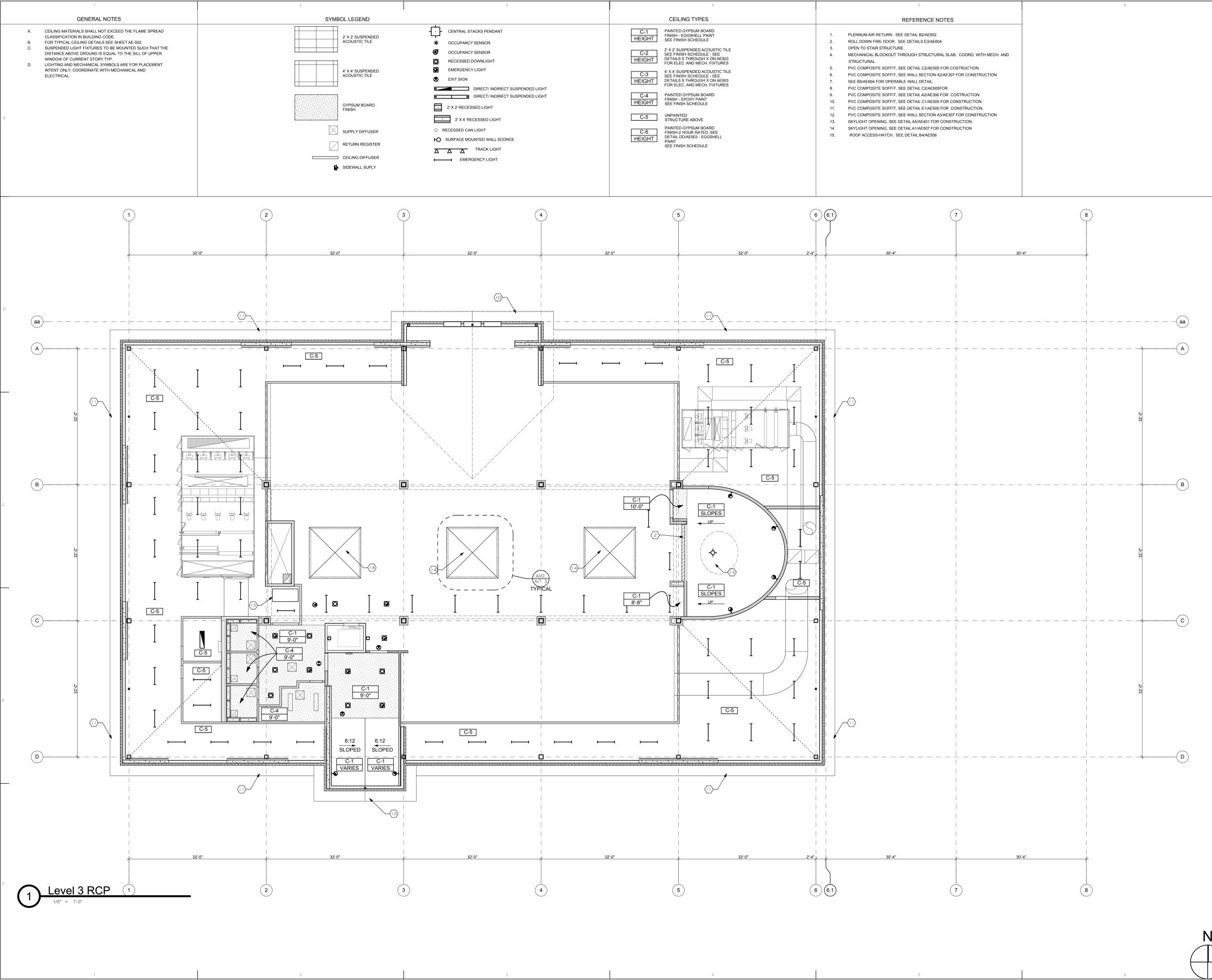
REVISIONS:

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|---|--------------------------------|
| ▲ | DECEMBER 2ND, 2008 |
| ▲ | NOVEMBER 25TH, 2008 |
| | 100% CD, September 15, 2008 |
| | 100% CD Review, August 4, 2008 |

ISSUE DATE:
SEPTEMBER 15, 2008, 100% CD
ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:

Level 3, Attic, R C P
SHEET NUMBER:

AE116



1 Level 3 RCP
1/8" = 1'-0"



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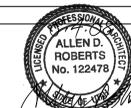
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PROJECT NAME:

Snow College Library

**150 College Avenue
Ephraim, Utah 84627**

REVISIONS:

▲ DECEMBER 2ND, 2008

▲ NOVEMBER 25TH, 2008

100% CD, September 15, 2008

100% CD Review, August 4, 2008

ISSUE DATE:

SEPTEMBER 15, 2008, 100% CD

ARCHITECT'S PROJECT NUMBER:

B07-051

DFCM PROJECT NUMBER:

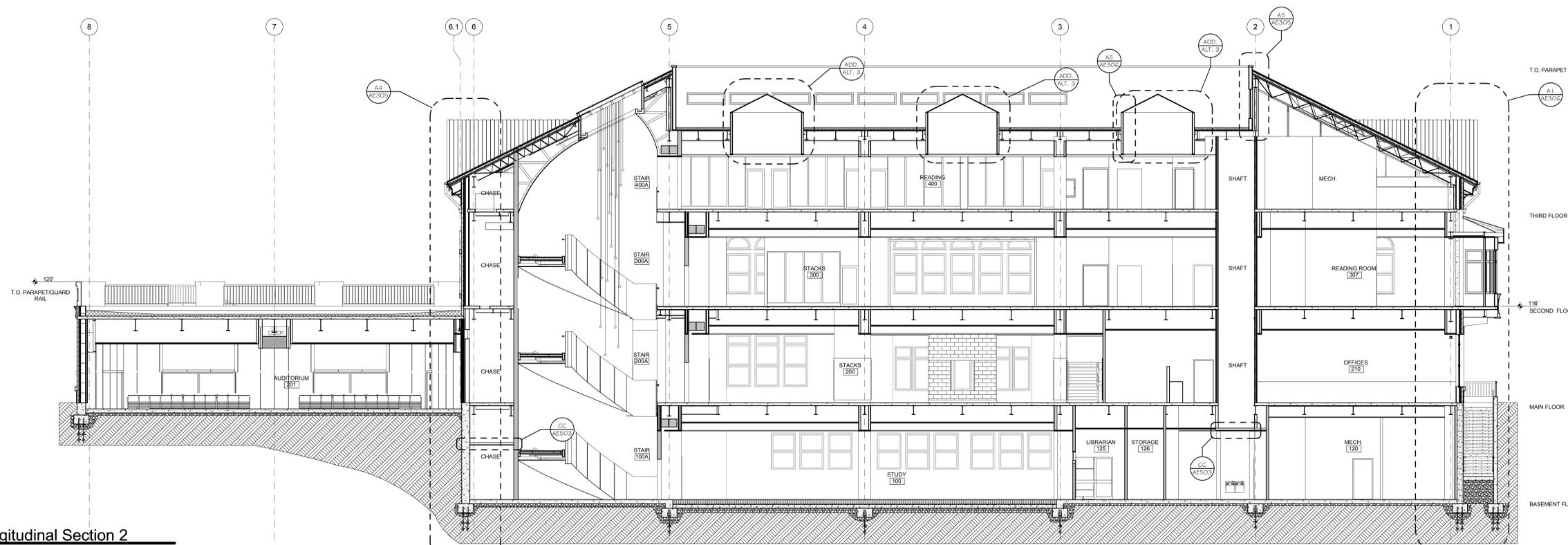
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SHEET TITLE:

Building Sections

SHEET NUMBER:

AE301



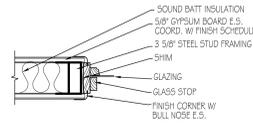
C1 Longitudinal Section 2

1/8" = 1'-0"

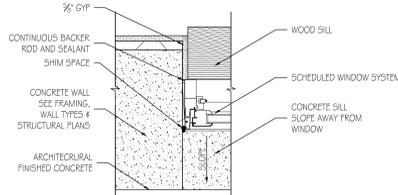


A1 Longitudinal Section 1

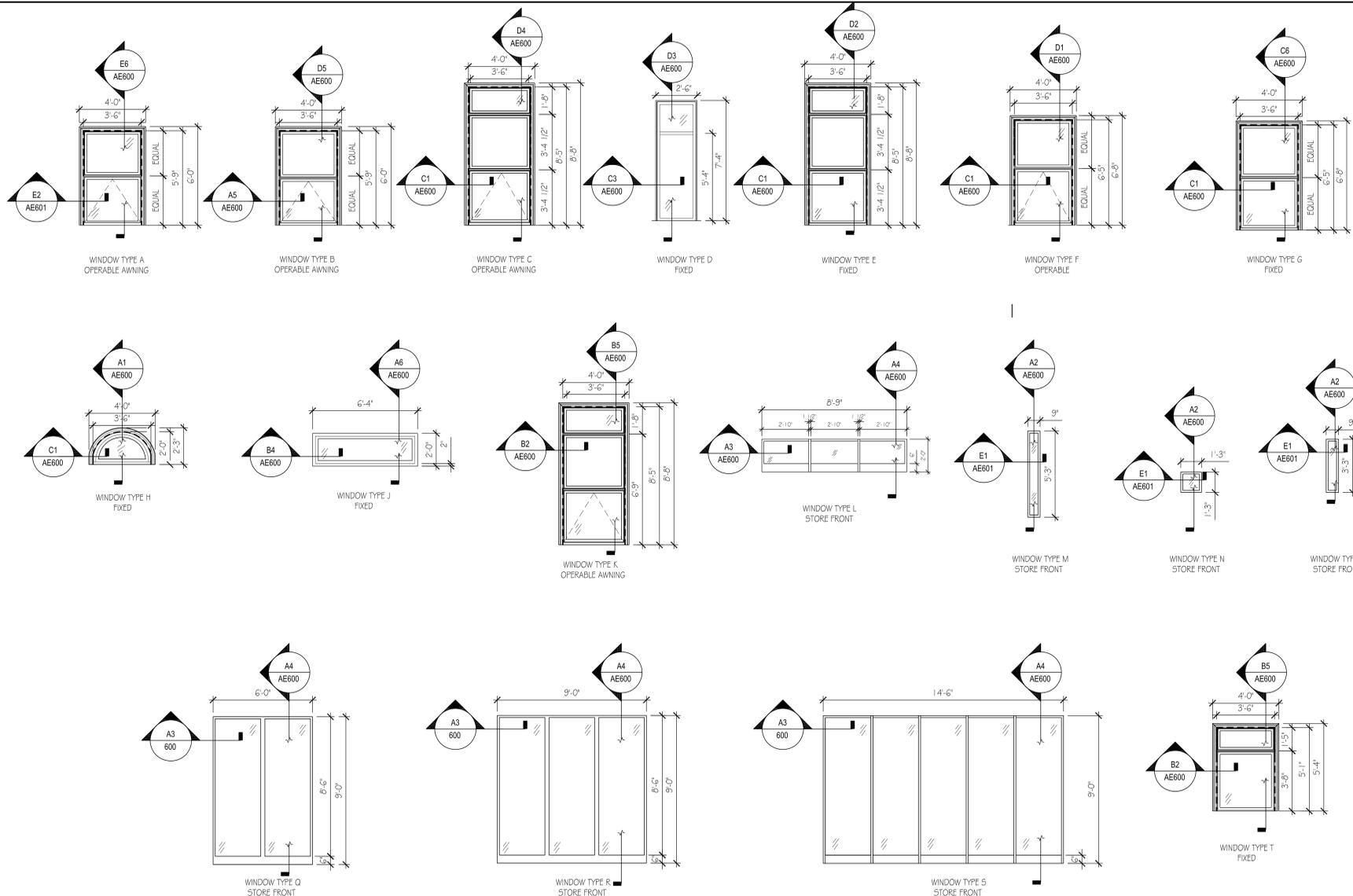
1/8" = 1'-0"



E1 JAMB TYP. TO M-N-P
SCALE: 1 1/2" = 1'-0"



E2 JAMB TYPE A
SCALE: 1 1/2" = 1'-0"



a WINDOW TYPES
SCALE: 1 3/16" = 1'-0"

WINDOW SCHEDULE

BASEMENT

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEET AE600 | |
|-------------------|------|----------------|--------|-------|--------|---------|----------|---------------------|------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 6 | A | NORTH EXTERIOR | A | 3'-6" | 5'-9" | 16 | | D6 | A5 |
| 9 | B | SOUTH EXTERIOR | B | 3'-6" | 5'-9" | 16 | | D5 | A5 |

BASEMENT INTERIOR WINDOWS

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEET AE600 | |
|-------------------|------|--------------------|--------|-------|--------|---------|----------|---------------------|------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 1 | L | LIBRARIAN RM # 125 | L | 8'-9" | 2'-0" | C | | A4 | A3 |

LEVEL ONE - MAIN LEVEL

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEET AE600 | |
|-------------------|------|----------------|--------|-------|--------|---------|----------|---------------------|------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 12 | C | NORTH EXTERIOR | C | 3'-6" | 8'-5" | 16 | | D4 | C1 |
| 4 | K | NORTH EXTERIOR | K | 3'-6" | 8'-5" | 16 | | B5 | B2 |
| 6 | C | WEST EXTERIOR | C | 3'-6" | 8'-5" | 16 | | D4 | C1 |
| 6 | C | SOUTH EXTERIOR | C | 3'-6" | 8'-5" | 16 | | D4 | C1 |
| 3 | F | SOUTH EXTERIOR | F | 3'-6" | 8'-5" | 16 | | D2 | C1 |
| 10 | D | SOUTH EXTERIOR | D | 2'-6" | 7'-4" | 16 | | D3 | C3 |
| 9 | T | SOUTH EXTERIOR | T | 3'-6" | 9'-1" | 16 | | B5 | B2 |

LEVEL ONE - INTERIOR WINDOWS

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEETS AE600 & AE01 | |
|-------------------|------|------------------|--------|-------|--------|---------|----------|-----------------------------|------------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 1 | D | ROOM 111 | D | 6'-0" | 9'-0" | C | | A4 / AE600 | A3 / AE600 |
| 1 | R | ROOM 113 | R | 9'-0" | 9'-0" | C | | A4 / AE600 | A3 / AE600 |
| 1 | M | CIRCULATION DESK | M | 0'-9" | 5'-3" | S | | A2 / AE600 | E1 / AE01 |
| 3 | N | CIRCULATION DESK | N | 1'-3" | 1'-0" | S | | A2 / AE600 | E1 / AE01 |
| 1 | P | CIRCULATION DESK | P | 0'-9" | 3'-3" | S | | A2 / AE600 | E1 / AE01 |

LEVEL TWO

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEETS AE600 | |
|-------------------|------|----------------|--------|-------|--------|---------|----------|----------------------|------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 12 | F | NORTH EXTERIOR | F | 3'-6" | 6'-5" | G1 | | D1 | C1 |
| 12 | H | NORTH EXTERIOR | H | 3'-6" | 2'-0" | G1 | | A1 | C1 |
| 6 | F | WEST EXTERIOR | F | 3'-6" | 6'-5" | G1 | | D1 | C1 |
| 6 | H | WEST EXTERIOR | H | 3'-6" | 2'-0" | G1 | | A1 | C1 |
| 9 | D | WEST EXTERIOR | D | 3'-0" | 7'-4" | G1 | | D3 | C3 |
| 14 | F | SOUTH EXTERIOR | F | 3'-6" | 6'-5" | G1 | | D1 | C1 |
| 17 | H | WEST EXTERIOR | H | 3'-6" | 2'-0" | G1 | | A1 | C1 |
| 3 | G | SOUTH EXTERIOR | G | 3'-6" | 6'-5" | G1 | | C6 | C1 |
| 10 | F | EAST EXTERIOR | F | 3'-6" | 6'-5" | G1 | | D1 | C1 |
| 12 | H | EAST EXTERIOR | H | 3'-6" | 2'-0" | G1 | | A1 | C1 |

LEVEL TWO - INTERIOR WINDOWS

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEETS AE600 | |
|-------------------|------|-------------|--------|--------|--------|---------|----------|----------------------|------------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 1 | S | READING 207 | S | 14'-6" | 9'-0" | C | | A4 / AE600 | A3 / AE600 |

ATTIC

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEETS AE600 | |
|-------------------|------|-----------------|--------|-------|--------|---------|----------|----------------------|------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 3 | F | NORTH ELEVATION | F | 3'-6" | 6'-5" | G1 | | D1 | C1 |

ROOF - CLERE STORY

| QUANTITY (VERIFY) | MARK | LOCATION | WINDOW | | | GLAZING | TEMPERED | DETAILS SHEETS AE600 | |
|-------------------|------|----------|--------|-------|--------|---------|----------|----------------------|------|
| | | | TYPE | WIDTH | HEIGHT | | | HEAD & SILL | JAMB |
| 22 | J | ROOF | J | 6'-4" | 2'-0" | G1 | | A6 | B4 |

SCHEDULE NOTES:

- WHERE WINDOW IS ADJACENT TO AUTOMATIC DOOR COORDINATE WITH AUTOMATIC DOOR MANUFACTURER.
- SOME MULLIONS AT THIS WINDOW ARE NOT TRUE DIVIDED (SEE WINDOW TYPES)

GLASS TYPES:

IG 1" INSULATED GLAZING
TIG TEMPERED INSULATED GLAZING

C CLEAR, TEMPERED, INSULATED
S 1/2" THICK SINGLE PANE

GENERAL NOTES

- DUE TO MULTIPLE USE, SOME OF THE DETAILS, FRAME TYPES ETC. REFERENCED TO ON THE WINDOW SCHEDULE ARE REVISED AND/OR ROTATED FROM THE DIRECTION SHOWN ON THE FLOOR PLAN. THE CONTRACTOR SHALL COORDINATE WITH WALL TYPES (SHEET XXXX FOR WALL FINISHES.) THE GENERAL INTENT OF DETAILS SHALL. IN ALL CASES, BE FOLLOWED AND THE ARCHITECT CONSULTED SHOULD QUESTIONS ARISE.
- CONTRACTOR TO VERIFY ALL DIMENSIONS AND WINDOW SIZES TO FIT TOUGH OPENINGS AS INDICATED IN WINDOW SCHEDULE
- DIMENSIONS SHOWN ARE WINDOW UNIT SIZES. SEE MANUFACTURER FOR R.O. DIMENSIONS
- ALL WINDOW MULLIONS ARE TRUE DIVIDED LIGHT UNLESS OTHERWISE NOTED.
- PLUMB AND SHIM ALL WINDOW UNITS.
- PROVIDE & FILL ALL ROUGH OPENING VOIDS WITH INSULATION TO ASSIST IN WINDOW PERFORMANCE ON EXTERIOR WALL LOCATIONS.
- PROVIDE BATT INSULATION IN ALL VOIDS BETWEEN ROUGH FRAMING AND WOOD FRAME.

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COLLEGE



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STAMP:
Professional Engineer Seal for Utah, State of Utah Department of Administrative Services, 1896.

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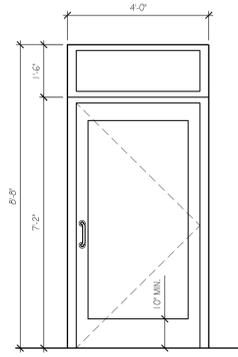
REVISIONS:

12 DECEMBER 2, 2008
11 NOVEMBER 25, 2008
100% CD, SEPTEMBER 15, 2008
100% CD, AUGUST 4, 2008
ISSUE DATE:

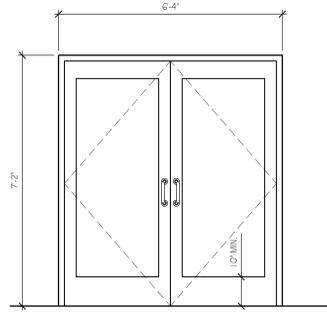
SEPTEMBER 15, 2008, 100% CD
ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:

WINDOW SCHEDULE
&
TYPES

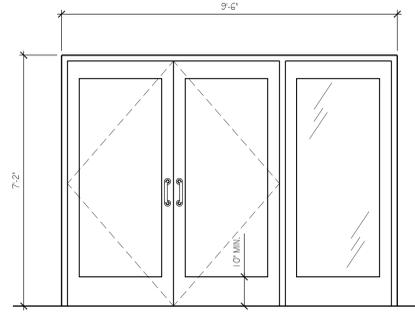
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AE601



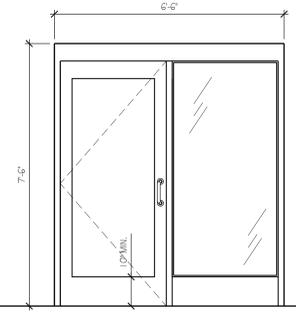
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ALUMINUM STOREFRONT
TERRACE ENTRY



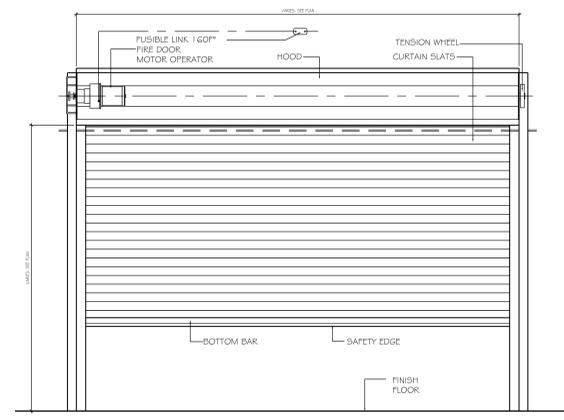
DOOR TYPE M
ALUMINUM STOREFRONT
BACK ENTRY



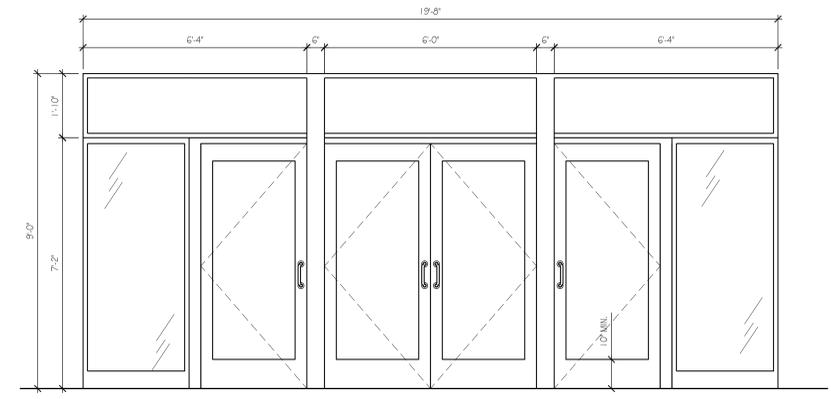
DOOR TYPE N
ALUMINUM STOREFRONT
MAIN ENTRY VESTIBULE



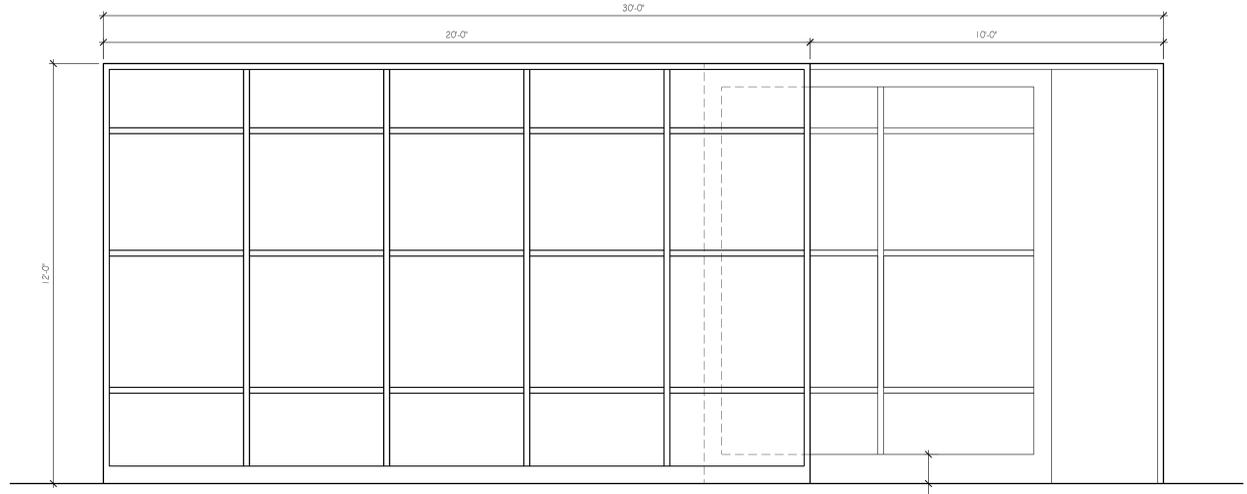
DOOR TYPE O
HOLLOW METAL
STOREFRONT
INTERIOR OFFICE ENTRY



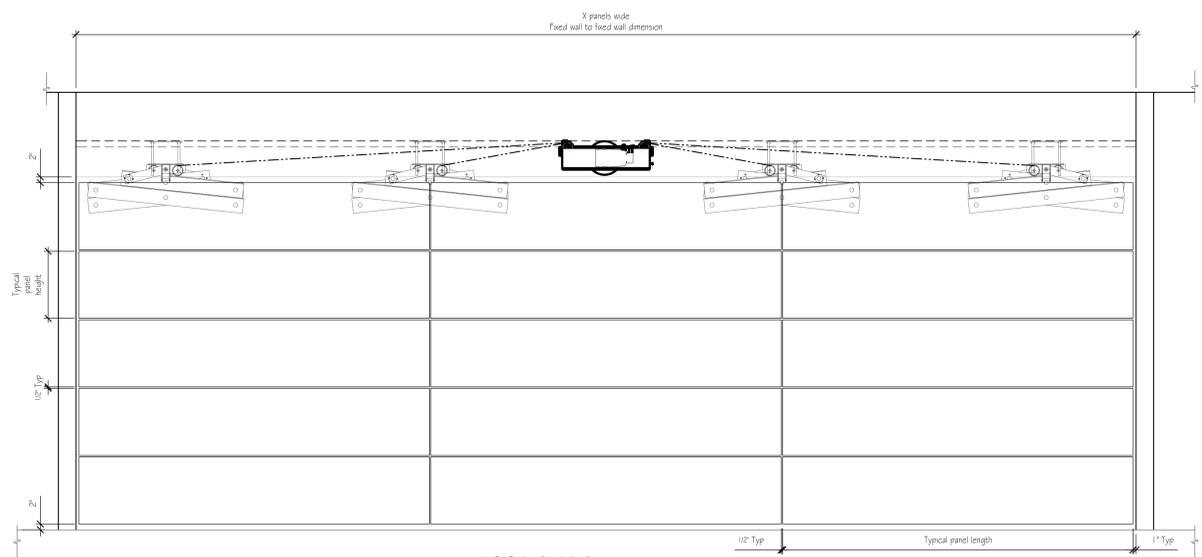
DOOR TYPE P
ALUMINUM STOREFRONT
MAIN ENTRY VESTIBULE



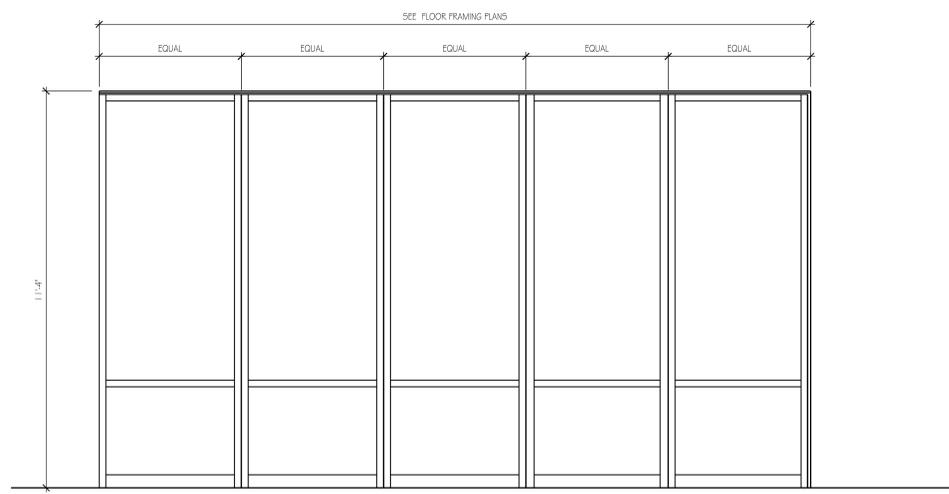
DOOR TYPE Q
ALUMINUM STOREFRONT
SLIDER DOOR
CAFE ENTRANCE



DOOR TYPE R
ALUMINUM STOREFRONT
SLIDER DOOR
CAFE ENTRANCE



DOOR TYPE T
GLASS PANEL DIVIDER
CAFE



DOOR TYPE S
GLASS PANEL DIVIDER
CAFE

COOPER
ROBERTS
SIMONSEN
ASSOCIATES

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REVISIONS:
DECEMBER 2, 2008
NOVEMBER 25, 2008
100% CD, SEPTEMBER 15, 2008
100% CD, AUGUST 4, 2008
ISSUE DATE:

AUGUST 4, 2008, 100% CD
ARCHITECT'S PROJECT NUMBER:
B07-051
DFCM PROJECT NUMBER:
07258700
SHEET TITLE:

DOOR TYPES
SHEET NUMBER:
AE603

SECTION 08 71 00 – DOOR HARDWARE

PART I – GENERAL

1.01 SUMMARY

A. SECTION INCLUDES

1. The work in this section includes furnishing all items of finish hardware as hereinafter specified or obviously necessary for all swinging, sliding, folding and other doors. Except items, which are specifically excluded from this section of the specification or of unique hardware, specified in the same sections as the doors and frames on which they are installed.

B. RELATED DOCUMENTS

1. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section.

C. RELATED SECTIONS

1. 06 20 00 – Finish Carpentry
2. 06 48 16 – Interior Wood Door Frames
3. 08 01 00 – Operations and Maintenance
4. 08 06 71 – Door Hardware Schedule
5. 08 11 13 – Metal Doors and Frames
6. 08 14 13 – Flush Wood Doors
7. 08 14 23 – Clad Wood Doors
8. 08 41 00 – Entrances and Storefronts
9. 08 71 13 – Automatic Door Operators
10. 08 74 00 – Access Control Hardware
11. 28 13 00 – Access Control

1.02 REFERENCES

A. STANDARDS

1. AIA A201 1997 – General Conditions of the Contract
2. ANSI-A250.4 – Steel Doors and Frames Physical Endurance
3. ANSI A156.1 – Butts and Hinges
4. ANSI A156.2 – Bored Locks and Latches
5. ANSI A156.3 – Exit Devices
6. ANSI A156.4 – Door Controls – Door Closers
7. ANSI A156.5 – Auxiliary Locks and Associated Products
8. ANSI A156.6 – Architectural Door Trim
9. ANSI A156.7 – Template Hinge Dimensions
10. ANSI A156.8 – Door Controls – Overhead Holders
11. ANSI A156.13 – Mortise Locks and Latches
12. ANSI A156.15 – Closer Holder Release Devices
13. ANSI A156.16 – Auxiliary Hardware
14. ANSI A156.18 – Material and Finishes
15. ANSI A156.26 – Continuous Hinges
16. UL10C – Positive Pressure Fire Tests of Door Assemblies

B. CODES

1. NFPA 101 – Life Safety Code
2. IBC 2003 – International Building Code
3. ANSI A117.1 – Accessible and Usable Buildings and Facilities
4. ADA – Americans with Disabilities Act

1.03 SUBMITTALS

A. GENERAL REQUIREMENTS

1. Submit copies of finish hardware schedule in accordance with Division 1, General Requirements.

B. SCHEDULES AND PRODUCT DATA

1. Schedules to be in vertical format, listing each door opening, and organized into "hardware sets" indicating complete designations of every item required for each door opening to function as intended. Hardware schedule shall be submitted within two (2) weeks from date the purchase order is received by the finish hardware supplier. Furnish four (4) copies of revised schedules after approval for field and file use. Note any special mounting instructions or requirements with the hardware schedule. Schedules to include the following information:
 - a. Location of each hardware set cross-referenced to indications on drawings, both on floor plans and in door and frame schedule.
 - b. Handing and degree of swing of each door.
 - c. Door and frame sizes and materials.
 - d. Keying information.
 - e. Type, style, function, size, and finish of each hardware item.
 - f. Elevation drawings and operational descriptions for all electronic openings.
 - g. Name and manufacturer of each hardware item.
 - h. Fastenings and other pertinent information.
 - i. Explanation of all abbreviations, symbols and codes contained in schedule
 - j. Mounting locations for hardware when varies from standard.
2. Submit catalog cuts and/or product data sheets for all scheduled finish hardware.
3. Submit separate detailed keying schedule for approval indicating clearly how the owner's final instructions on keying of locks has been fulfilled.

C. SAMPLES

1. Upon request, samples of each type of hardware in finish indicated shall be submitted. Samples are to remain undamaged and in working condition through submittal and review process. Items will be returned to the supplier or incorporated into the work within limitations of keying coordination requirements.

D. TEMPLATES

1. Furnish a complete list and suitable templates, together with finish hardware schedule to contractor, for distribution to necessary trades supplying materials to be prepped for finish hardware.

E. ELECTRONIC HARDWARE SYSTEMS

1. Provide complete wiring diagrams prepared by an authorized factory employee for each opening requiring electronic hardware, except openings where only magnetic hold-open devices are specified. Provide a copy with each hardware schedule submitted after approval.
2. Provide complete operational descriptions of electronic components listed by opening in the hardware submittals. Operational descriptions to detail how each electrical component functions within the opening incorporating all conditions of ingress and egress. Provide a copy with each hardware schedule submitted for approval.
3. Provide elevation drawings of electronic hardware and systems identifying locations of the system components with respect to their placement in the door opening. Provide a copy with each hardware schedule submitted for approval.
4. Prior to installation of electronic hardware, arrange conference between supplier, installers and related trades to review materials, procedures and coordinating related work.

5. The electrical products contained within this specification represent a complete engineered system. If alternate electrical products are submitted, it is the responsibility of the distributor to bear the cost of providing a complete and working system including re-engineering of electrical diagrams and system layout, as well as power supplies, power transfers and all required electrical components. Coordinate with electrical engineer and electrician to ensure that line voltage and low voltage wiring is coordinated to provide a complete and working system.
6. For each item of electrified hardware specified, provide standardized molex plug connectors to accommodate up to twelve (12) wires. Molex plug connectors shall plug directly into through-door wiring harnesses, frame wiring harnesses, electric locking devices and power supplies.

F. OPERATIONS AND MAINTENANCE MANUALS

1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
 - a. Approved hardware schedule, catalog cuts and keying schedule.
 - b. Hardware installation and adjustment instructions.
 - c. Manufacturer's written warranty information.
 - d. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

1.04 QUALITY ASSURANCE

A. SUBSTITUTIONS

1. All substitution requests must be submitted before bidding and within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his hardware consultant.

B. SUPPLIER QUALIFICATIONS

1. A recognized architectural door hardware supplier who has maintained an office and has been furnishing hardware in the project's vicinity for a period of at least two (2) years.
2. Hardware supplier shall have office and warehouse facilities to accommodate this project.
3. Hardware supplier shall have in his employment at least one (1) Architectural Hardware Consultant (AHC) who is available at reasonable times during business hours for consultation about the project's hardware and requirements to the owner, architect and contractor.
4. Hardware supplier must be an authorized factory distributor of all products specified herein.

1.05 FIRE-RATED OPENINGS

1. Provide door hardware for fire-rated openings that comply with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed by Underwriter's Laboratories (UL) or Warnock Hersey (WH) for use on types and sizes of doors indicated.
2. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.
 - a. Hardware required for fire doors shall be listed with Underwriters Laboratories for ratings specified.
 - b. Certification(s) of compliance shall be made available upon request by the Authority Having Jurisdiction.

1.06 DELIVERY, STORAGE AND HANDLING

A. MARKING AND PACKAGING

1. Properly package and mark items according to the approved hardware schedule, complete with necessary screws and accessories, instructions and installation templates for spotting mortising tools. Contractor shall check deliveries against accepted list and provide receipt for them, after which he is responsible for storage and care. Any shortage or damaged good shall be made without cost to the owner.
2. Packaging of door hardware is the responsibility of the supplier. As hardware supplier receives material from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set and door numbers to match the approved hardware schedule. Two or more identical sets may be packed in same container.

B. DELIVERY

1. The supplier shall deliver all hardware to the project site; direct factory shipments are not allowed unless agreed upon beforehand. Hardware supplier shall coordinate delivery times and schedules with the contractor. Inventory door hardware jointly with representatives of hardware supplier and hardware installer/contractor until each is satisfied that count is correct.
2. No keys, other than construction master keys and/or temporary keys are to be packed in boxes with the locks.
3. At time of hardware delivery, door openings supplier in conjunction with the contractor shall check in all hardware and set up a hardware storage room.

C. STORAGE

1. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of work will not be delayed by hardware losses both before and after installation.

1.07 WARRANTY

- A. All items, except as noted below, shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a minimum period of one (1) year commencing on the date of final completion and acceptance. In the event of product failure, promptly repair or replace item with no additional cost to the owner.
1. Mortise locksets: Seven (7) years
 2. Exit Devices: Five (5) years
 3. Door closers: Ten (10) years
 4. Securitron (and approved equals) electrified hardware: Unlimited Lifetime

PART II – PRODUCTS

2.01 MANUFACTURERS

- A. Only manufacturers as listed below shall be accepted. Obtain each type of finish hardware (hinges, latch and locksets, exit devices, door closers, etc.) from a single manufacturer.

2.02 MATERIALS

A. SCREWS AND FASTENERS

1. All required screws shall be supplied as necessary for securing finish hardware in the appropriate manner. Thru-bolts shall be supplied for exit devices and door closers where required by code and the appropriate blocking or reinforcing is not present in the door to preclude their use.

B. HANGING DEVICES

1. HINGES

- a. Hinges shall conform to ANSI A156.1 and have the number of knuckles as specified, oil-impregnated bearings as specified with NRP (non-removable pin) feature, at all exterior reverse bevel doors. Unless otherwise scheduled, supply one (1) hinge for every 30" of door height. Hinges shall be a minimum of 4 1/2" high and 4" wide; heavy weight hinges (.180) shall be supplied at all doors where specified.

- 1) Specified Manufacturer: McKinney
- 2) Approved Substitutes: Hager, Stanley

2. ELECTRIC HINGES

- a. Electric hinges shall be provided with molex standardized plug connectors to accommodate up to twelve (12) wires. Plug connectors shall plug directly into molex through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a mortar guard for each electric hinge specified.

- 1) Specified Manufacturer: McKinney QC Series
- 2) Approved Substitutes: NONE

3. MONITORING SWITCH HINGES

- a. Monitoring switch hinges to be magnetic reed, concealed, adjustable switch type with extra heavy magnet.

- 1) Specified Manufacturer: McKinney MM Series
- 2) Approved Substitutes: Hager EMN Series, Stanley CS Series

4. CONTINUOUS GEARED HINGES

- a. All hinges to be non-handed and completely reversible. Hinge line to be available in concealed flush mount with or without inset, full surface and half surface types as specified in the hardware sets. All hinges to be made of extruded 6060 T6 aluminum alloy with polyacetal thrust bearings, anodized after cutouts are made for bearings. All concealed hinges to be fire-rated for 20, 45 and 90 minutes when incorporated into proper door and frame labeled installations, without necessitating the use of fusible-link pins. All concealed hinges to be available in standard, heavy, and extra heavy duty weights; all full surface and half surface hinges in standard and heavy duty weights as specified in the hardware sets. All hinges to be factory cut for door size.

- 1) Specified Manufacturers: McKinney
- 2) Approved Manufacturers: Pemko, Select

5. CONTINUOUS STAINLESS STEEL HINGES

- a. All hinges to be non-handed and of slim barrel design. Hinges to be made of type 304 stainless steel and shall have a concealed teflon-coated stainless steel pin with twin self-lubricated nylon bearings at each knuckle. Hinges shall be UL list up to and including 3 hours and shall be available with power transfer cutouts when necessary.

- 1) Specified Manufacturers: McKinney MCK-FM300
- 2) Approved Manufacturers: Markar

C. FLUSH BOLTS AND ACCESSORIES

1. All manual and automatic flush bolts to be furnished as specified.

- a. Specified Manufacturer: McKinney
- b. Approved Substitutes: Quality, Rockwood, Trimco

D. CYLINDERS AND KEYING

1. CYLINDERS

2. KEYING

- a. All cylinders shall be by the owner.
- b. Master keys and all high-security or restricted keyway blanks shall be sealed in tamper-proof packaged boxes when shipped from the factory. The boxes shall be shrink wrapped and imprinted to ensure the integrity of the packaging.

3. KEY CABINET

- a. Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall expansion capacity of 150% of the number of locks required for the project.
 - 1) Specified Manufacturer: Telkee
 - 2) Approved Substitutes: Lund

E. LOCKING DEVICES

1. MORTISE LOCKSETS

- a. All locksets shall be ANSI 156.13 Series 1000, Grade 1 Certified. All functions shall be manufactured in a single sized case formed from 12 gauge steel minimum. The lockset shall have a field-adjustable, beveled armored front, with a .125" minimum thickness and shall be reversible without opening the lock body. The lockset shall be 2 3/4" backset with a one-piece 3/4" anti-friction stainless steel latchbolt. The deadbolt shall be a full 1" throw made of stainless steel and have 2 hardened steel roller inserts. All strikes shall be non-handed with a curved lip. To insure proper alignment, all trim, shall be thru-bolted and fully interchangeable between rose and escutcheon designs and shall be the product of one manufacturer.
 - 1) Specified Manufacturer: Sargent 8200 Series

F. EXIT DEVICES

1. CONVENTIONAL DEVICES – PUSH RAIL

- a. All exit devices shall be ANSI A156.3, Grade 1 Certified and shall be listed by Underwriters Laboratories and bear the UL label for life safety in full compliance with NFPA 80 and NFPA 101. Mounting rails shall be formed from a solid single piece of stainless steel, brass or bronze no less than 0.072" thick. Push rails shall be constructed of 0.062" thick material. Painted or anodized aluminum shall not be considered heavy duty and is not acceptable. Lever trim shall be available in finishes and designs to match that of the specified locksets.
 - 1) Specified Manufacturer: Sargent 80 Series
 - 2) Approved Substitutes: Corbin Russwin ED4000/ED5000 Series, Von Duprin 98 Series, Yale 7100/7200 Series

2. ELECTRIFIED DEVICES

- a. Electrified exit devices shall conform to all traditional exit device standards as specified above. All power requirements for exit devices used must utilize a continuous circuit electric hinge for clean design and no visible means of interrupting power to device.
- b. Options for delayed egress exit devices to be specified in the hardware sets. Devices to conform to NFPA 101 - Special Locking Arrangements for delayed egress. Nuisance delay to be available as standard for either zero (0) or two (2) seconds. Internal latchbolt monitoring, and a standard 10-second delay for "Authorized Entry" to be standard features on every device. Delayed egress feature to be available throughout all styles and sizes of exit devices including: Panic and Fire rated Rim, Wide and Narrow Stile, Mortise, Surface Vertical Rod, and Concealed Vertical Rod.

- c. All exit devices, both fire labeled and non-labeled devices, requiring electric dogging shall be held in the "dogged" or retracted position. All exit devices with electric latch retraction shall provide for a remote means of unlocking for momentary or maintained periods of time.
- d. Exit devices with electrified trim shall be fail-secure unless otherwise specified.
- e. Where specified exit devices shall be provided with a switch to monitor push rail or signal remote location and latchbolt monitoring.
- f. Provide an in-line power controller with all electrified exit devices.
 - 1) Specified Manufacturers: Sargent
 - 2) Approved Manufacturers: Corbin Russwin, Von Duprin, Yale

1. SURFACE MOUNTED CLOSERS – HEAVY DUTY

- a. All door closers shall be ANSI 156.4, Grade 1 Certified. All closers shall have aluminum alloy bodies, forged steel arms, and separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arms mounting on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 - 1) Specified Manufacturer: Norton 7500 Series
 - 2) Approved Substitutes: Corbin Russwin DC6000, Sargent 351 Series, Yale 4400 Series

2. AUTOMATIC DOOR OPERATORS – HEAVY DUTY

- a. All door closers shall be ANSI 156.19, Grade 1 Certified. Units shall have adjustments for door closing force and backcheck, motor assist from 0 to 30 seconds, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay up to 30 seconds. Operator units shall provide conventional door closer opening and closing forces unless the power operator motor is activated by an initiating device with door closer assembly having adjustable spring size, backcheck valve, sweep valve, latch valve, speed control valve, and pressure adjustment valve to control door closing. Operators shall have push and go function to activate power operator or power assist functions. Units shall have a presence detector input to prevent a closed door from opening or a door that is fully opened from closing and shall have a hold open toggle input to allow remote activation for indefinite hold open; door shall close the second time the input is activated. Operators shall have a SPDT relay for interfacing with latching or locking devices. All controlling operator switches shall be of radio-frequency design and not hard-wired.
 - 1) Specified Manufacturer: Norton 6900 Series
 - 2) Approved Substitutes: Besam Power Swing, Sargent MPower 4000 Series

G. DOOR TRIM AND PROTECTIVE PLATES

- 1. Kick plates shall be .050 gauges and two (2) inches less full width of door, or as specified. Push plates, pull plates, door pulls and miscellaneous door trim shall be as shown in the hardware schedule.
 - a. Specified Manufacturer: McKinney
 - b. Approved Substitutes: Quality, Rockwood, Trimco

H. DOOR STOPS AND HOLDERS

1. WALL MOUNTED DOOR STOPS

- a. Where a door is indicated on the plans to strike flush against a wall, wall bumpers shall be provided. Provide convex or concave design as indicated.

- 1) Specified Manufacturers: McKinney
- 2) Approved Substitutes: Quality, Rockwood, Trimco

2. MAGNETIC HOLD-OPENS

- a. Magnetic door holders shall meet or exceed ANSI A156.15 and be UL listed 228 for Door Closer and Holders, with or without integral smoke detectors. Holding force shall be 25 to 40 pounds and shall be fail-safe. Pushpin release that eliminates residual magnetism shall be standard. Provide magnetic hold-opens with triple-voltage coil that can receive 12 VDC, 24 VAC/DC, or 120VAC; or coordinate required voltage with electrical.

- 1) Specified Manufacturers: Rixson
- 2) Approved Substitutes: HES, Sargent

I. GASKETING AND THRESHOLDS

1. Provide continuous weatherseal on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide intumescent seals as required to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies. Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

2. Provide threshold units not less than 4" wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames. All threshold units shall comply with the Americans with Disabilities Act (ADA).

- a. Specified Manufacturers: McKinney
- b. Approved Substitutes: Pemko, Reese, Zero

J. SILENCERS

1. Furnish rubber door silencers all hollow metal frames; two (2) per pair and three (3) per single door frame.

K. ELECTRONIC PRODUCTS AND ACCESSORIES

1. INTEGRATED KEYPAD OPERATED PRODUCTS

- a. Provide access control products integrated with locks or exit devices as specified in the hardware groups with nonvolatile memory. Provide keypad operated products with a minimum of 100 user codes and a master code to assign emergency, supervisory and user codes. Provide the ability to print the last fifteen entries via infrared printer. Locking and unlocking of the lever handle shall be done by a motor-driven battery powered unit (solenoids not acceptable) contained completely within the body of the cylindrical lock. The inside lever is always free for egress. Provide LED's on unit to indicate status; unlocked and programming mode.

- 1) Specified Manufacturers: Sargent KP Series
- 2) Approved Manufacturers: Alarm Lock Trilogy Series

2. KEYPADS

- a. Keypads shall be 24VDC and operate a 5-amp DPDT relay to switch any type of fail-safe or fail-secure electric lock or strike and be weather proof, vandal resistant and suitable for mounting on a narrow mullion. The keypad system circuit board shall be a remote unit to allow for increased security. Release time shall be programmable from 1 to 99 seconds. Keypads shall support 2 to 7 digit codes for a minimum of 59 users and shall be locked out for 30 seconds when 16 wrong digits are entered. System shall have user/installer programmable options such as anti-tailgate, anti-door prop, and duress code alarm.

- 1) Specified Manufacturer: Securitron DK26 Series
- 2) Approved Substitutes: Folger Adams

3. KEYSWITCHES

- a. Keyswitches shall be furnished on a stainless steel single gang face plate with a 12/24VDC bi-color LED and an integral backing bracket that shall permit integration with any 1.25" or 1.125" mortise cylinder. Keyswitches shall be available for momentary or maintained action and in narrow stile designs.

- 1) Specified Manufacturers: Securitron MK Series
- 2) Approved Manufacturers: Folger Adams

4. IN-LINE POWER CONTROLLER

- a. Where specified, electrified products shall be supplied with an in-line power controller that enables the hardware to operate from 12 to 32 volts. On board safety features shall include an in-line fuse to protect the hardware and host system from any possible reverse current surges. The controller shall regulate current to provide continuous duty operation without the typical head build up.

- 1) Specified Manufacturers: HES 2005 Smart-Pac II
- 2) Approved Manufacturers: NONE

5. POWER SUPPLIES

- a. Power supplies shall furnish regulated 24VDC and shall be UL class 2 listed. LED's shall monitor zone status (voltage/no voltage) and slide switches shall be provided to connect or disconnect the load from power; 1, 4 or 8 separate output circuit breakers shall be provided to divide the load. Power supplies shall have the internal capability of charging optional 24VDC sealed lead acid batteries in addition to operating the DC load. Power supplies shall be supplied complete requiring only 120VAC to the fused input and shall be supplied in an enclosure. Power supplies shall be provided with emergency release terminals that allow the release of all devices upon activation of the fire alarm system.

- 1) Specified Manufacturer: Securitron BPS
- 2) Approved Substitutes: Folger Adams

2.03 FINISHES

- A. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S. finishes shown by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Where specified hardware shall have an antimicrobial coating which permanently suppresses the growth of bacteria, algae, fungus, mold and mildew applied. The finish shall control the spread and growth of bacteria, mold and mildew and shall be FDA listed for use in medical and food preparation equipment.

PART III – EXECUTION

3.01 EXAMINATION

- A. Contractor shall ensure that the building is secured and free from weather elements prior to installing interior door hardware. Examine hardware before installation to ensure it is free of defects.

3.02 INSTALLATION

- A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with the governing regulations.
 - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute (DHI.)
 - 2. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. All hardware shall be applied and installed in accordance with best trade practice by an experienced hardware installer. Care shall be exercised not to mar or damage adjacent work.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- D. Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.03 FIELD QUALITY CONTROL

- A. Prior to the installation of hardware, manufacturer's representatives for locksets, closers, and exit devices shall arrange and hold a jobsite meeting to instruct the installing contractor's personnel on the proper installation of their respective products. A letter of compliance, indicating when this meeting is held and who is in attendance, shall be sent to the Architect and Owner.
- B. The hardware supplier shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.
- C. The manufacturer's representative shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.

3.04 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
- B. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore to proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes and usage of any electronic devices.

3.05 PROTECTION

- A. Contractor shall protect all hardware, as it is stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

3.06 HARDWARE SCHEDULE

A. The following schedule is furnished for whatever assistance it may afford the Contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware heading, provide door or item with hardware same as required for similar purposes. Hardware supplier is responsible for handing and sizing all products as listed in the hardware heading. Quantities listed are for each pair of doors, or for each single door.

B. Manufacturer's Abbreviations:

1. AR – Adams Rite
2. MC – McKinney
3. RD - RiteDoor
4. RO – Rockwood
5. RX – Rixson
6. SA – Sargent
7. SN – Securitron

Heading AL-01

Doors: 100C2

| | | | | |
|---|---------------------|----------------------|-------|----|
| 2 | Continuous Hinge | MCK-12HD MM QC | CLEAR | MC |
| 1 | Removable Mullion | 650A | 28 | SA |
| 1 | Alarmed Exit Device | AL 8504 862 LC | 32D | SA |
| 2 | Alarmed Exit Device | AL 8510 862 | 32D | SA |
| 2 | Cylinder | BY OWNER | | |
| 2 | Closer | 351 CPS | EN | SA |
| 2 | Spacer Kit | 581-2 | EN | SA |
| 2 | Drop Plate | 351-D | EN | SA |
| 1 | Weatherstripping | BY DOOR MANUFACTURER | | |
| 1 | Remote Alarm | BY OTHERS | | |
| 1 | Threshold | 271 A | | PE |
| 1 | Mortise Keyswitch | MKA | | SN |

Emergency exit.

Doors are always closed and locked.

Alarm will sound at the door and close to security center when door is opened from the inside.

Free egress at all times.

Mortise keyswitch used to arm and disarm remote alarm.

Heading AL-02

Doors: 100F1, 100G5, 101A2

| | | | | |
|---|-------------------------|----------------------|-------|----|
| 2 | Continuous Hinge | MCK-12HD MM QC | CLEAR | MC |
| 1 | Removable Mullion | 650A | 28 | SA |
| 2 | Electrified Exit Device | 55 8510 862 | 32D | SA |
| 2 | Closer | 351 CPS | EN | SA |
| 2 | Drop Plate | 351-D | EN | SA |
| 2 | Spacer Kit | 581-2 | EN | SA |
| 1 | Weatherstripping | BY DOOR MANUFACTURER | | |
| 1 | Threshold | 271 A | | PE |

Heading AL-03

Doors: 100G6, 101A3

| | | | | |
|---|---------------------|----------------------|-------|----|
| 1 | Continuous Hinge | MCK-12HD MM QC | CLEAR | MC |
| 1 | Exit Device | 55 56 8504 862 LC | 32D | SA |
| 1 | Cylinder | BY OWNER | | |
| 1 | PowerMatic Operator | 6920 | 689 | NO |
| 1 | Actuator | 662 | | NO |
| 1 | Actuator | 580 | | NO |
| 1 | Mortise Keyswitch | MKA | US32D | SN |
| 1 | Switch Post | 578 | | NO |
| 1 | Power Supply | BPS-24-2 | | SN |
| 1 | Weatherstripping | BY DOOR MANUFACTURER | | |
| 1 | Threshold | 271 A | | PE |
| 1 | Card Reader | BY OTHERS | | |

Doors are always closed and locked. Presenting an authorized card at the card reader will retract the latch of the exit device allowing the door to be pulled open. Door will relock.

Free egress at all times.

Mortise keyswitch used to arm and disarm assembly.

Heading AL-04

Doors: 100G4, 101A1

| | | | | |
|---|------------------|----------------------|-------|----|
| 1 | Continuous Hinge | MCK-12HD MM | CLEAR | MC |
| 1 | Exit Device | 55 8510 862 | 32D | SA |
| 1 | Closer | 351 CPS | EN | SA |
| 1 | Drop Plate | 351-D | EN | SA |
| 1 | Spacer Kit | 581-2 | EN | SA |
| 1 | Weatherstripping | BY DOOR MANUFACTURER | | |
| 1 | Threshold | 271 A | | PE |

Heading AL-05

Doors: 100G2

| | | | | |
|---|------------------|----------------------|-------|----|
| 2 | Continuous Hinge | MCK-12HD MM | CLEAR | MC |
| 2 | Push pull | OP810 | 32D | MC |
| 2 | Closer | 351 CPS | EN | SA |
| 2 | Drop Plate | 351-D | EN | SA |
| 2 | Spacer Kit | 581-2 | EN | SA |
| 1 | Weatherstripping | BY DOOR MANUFACTURER | | |
| 1 | Threshold | 271 A | | PE |

Heading AL-06

Doors: 100G1, 100G3

| | | | | |
|---|------------------|----------------------|-------|----|
| 1 | Continuous Hinge | MCK-12HD MM | CLEAR | MC |
| 1 | Push pull | OP810 | 32D | MC |
| 1 | Closer | 351 CPS | EN | SA |
| 1 | Drop Plate | 351-D | EN | SA |
| 1 | Spacer Kit | 581-2 | EN | SA |
| 1 | Weatherstripping | BY DOOR MANUFACTURER | | |
| 1 | Threshold | 271 A | | PE |

Heading AL-07

Doors: 200D1

| | | | | |
|---|--------------------------|----------------------|-----|----|
| 2 | Continuous Hinges | MCK-12HD MM | CLE | MC |
| 1 | Double Cylinder Deadlock | MS1850S | 628 | AD |
| 2 | Mortise Cylinder | BY OWNER | | |
| 1 | Bolt Set | 4015 X 4016 X 4089 | 628 | AD |
| 2 | Closers | 351 CPS | EN | SA |
| 2 | Drop Plates | 351-D | EN | SA |
| 2 | Bracket | 851-2 | EN | SA |
| 1 | Threshold | 271 A | | PE |
| 1 | Weatherstrip | BY DOOR MANUFACTURER | | |

Heading AL-08

Doors: 119E, 200D2, 200H1

| | | | | |
|---|--------------------------|----------------------|-----|----|
| 1 | Continuous Hinges | MCK-12HD MM | CLE | MC |
| 1 | Double Cylinder Deadlock | MS1850S | 628 | AD |
| 2 | Mortise Cylinder | BY OWNER | | |
| 1 | Closers | 351 CPS | EN | SA |
| 1 | Drop Plates | 351-D | EN | SA |
| 1 | Bracket | 851-2 | EN | SA |
| 1 | Threshold | 271 A | | PE |
| 1 | Weatherstrip | BY DOOR MANUFACTURER | | |

Heading 01.0

Doors: 022B, 024B

| | | | | |
|---|------------------|---------------------------|-------|----|
| 3 | Hinges | T4A3386 4 1/2 X 4 1/2 NRP | 32D | MC |
| 1 | Exit Device | 8810 | 32D | SA |
| 1 | Closer | 351 CPS | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Smoke Seal | S88 D | | PE |
| 1 | Door Bottom | 315 CN | | PE |
| 1 | Threshold | 272 A | | PE |

Heading 02.0

Doors: 025A, 026A, 028A, 210A, 316A, 317A, 318A

| | | | | |
|---|-------------------|----------------------|-------|----|
| 6 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | SA |
| 2 | Flush Bolts | 555 | US26D | RO |
| 1 | Storeroom Lockset | LC 8204 OMD | 32D | SA |
| 1 | Cylinder | BY OWNER | | |
| 2 | Hold Open Closer | 351 PH10 | EN | SA |
| 2 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 2 | Wall Bumper | 406 | US32D | RO |
| 1 | Dust Proof Strike | 570 | US26D | RO |
| 1 | Astragal | 355 CV | | PE |

Heading 03.0

Doors: 002A, 004A, 029A, 213A

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | SA |
| 1 | Entrance Lockset | LC 8205 OMD | 32D | SA |
| 1 | Cylinder | BY OWNER | | |
| 1 | Wall Bumper | 406 | US32D | RO |
| 3 | Door Silencers | 608 | GREY | RO |

Heading 03.0 A

Doors: 020A, 106A, 203A

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | SA |
| 1 | Entrance Lockset | LC 8205 OMD | 32D | SA |
| 1 | Cylinder | BY OWNER | | |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 3 | Door Silencers | 608 | GREY | RO |

Heading 04.0

Doors: 005A, 006A, 007A, 008A, 009A, 010A, 011A, 012A, 013A, 014A, 015A, 016A, 201A, 202A, 211A, (ALT BID OPENUNGS 301A, 303A, 304A, 305A, 306A, 309A)

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | SA |
| 1 | Passage Latchset | 8215 OMD | 32D | SA |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Sound Seal | S88 | | RO |

Heading 05.0

Doors: 100C1, 100D1, 101A4, 101A7

| | | | | |
|---|-------------------|----------------------|-------|----|
| 6 | Hinges | TA2714 4 1/2 X 4 1/2 | 32D | MC |
| 1 | Removable Mullion | 12-980 | PC | SA |
| 1 | Exit Device | 12-8813 ETL LC | 32D | SA |
| 1 | Exit Device | 12-8810 | 32D | SA |
| 1 | Cylinder | BY OWNER | | |
| 2 | Closer | 351 P10 | EN | SA |
| 2 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 2 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | PK 55 | GREY | RO |

Heading 06.0

Doors: 003A, 003B, 013AA, 017A, 018A, 022A, 023A, 108A, 109A, 116A, 117A, 118A, 208A, 209A, 310A, 314A, 315A

| | | | | |
|---|-------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | MC |
| 1 | Storeroom Lockset | LC 8204 OMD | 32D | SA |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | PK-55 | GREY | RO |

Heading 07.0

Doors: 019A, 021A, 103A, 105A, 204A, 206A

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | MC |
| 1 | Door Pull | 126 X 70C | US32D | RO |
| 1 | Push Plate | 70C 4 X 16 | US32D | RO |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | S88 D | | PE |

Heading 08.0

Doors: 102A, 102B, (ALT BID OPENINGS 302A, 302B, 307A, 307B, 308A, 308B)

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | MC |
| 1 | Door Pull | 126 X 70C | US32D | RO |
| 1 | Push Plate | 70C 4 X 16 | US32D | RO |
| 1 | Hold Open Closer | 351 PH10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | S88 D | | PE |

Heading 09.0

Doors: 205A, 311A, 312A, 313A

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | MC |
| 1 | Privacy Set | 8265 OMD | 32D | SA |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | S88 D | | PE |

Heading 10.0

Doors: 100D2

| | | | | |
|---|-------------------|------------------------------|-------|----|
| 3 | Hinges | T4A3386 4 1/2 X 4 1/2 NRP | 32D | MC |
| 1 | Hinges | T4A3386 4 1/2 X 4 1/2 NRP MM | 32D | MC |
| 1 | Exit Device | AL 8804 ETL LC | 32D | SA |
| 2 | Cylinders | BY OWNER | | |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Remote Alarm | BY OTHERS | | |
| 1 | Smoke Seal | S88 D 17' | | PE |
| 1 | Mortise Keyswitch | MKA | | SN |

Emergency exit.

Door is always closed and locked.

Alarm will sound at the door and close to security center when door is opened from the inside.

Free egress at all times.

Mortise keyswitch used to arm and disarm remote alarm.

Heading 11.0

Doors: 001B1, 001B2, 200B1, 200B2, 300B1, 300B2

| | | | | |
|---|-----------------|--------------------------------------|--|----|
| 1 | Single RiteDoor | D3681 X D8907 AF PKT 90 FM-300 X 998 | | RD |
|---|-----------------|--------------------------------------|--|----|

Note: Rite Door assembly is to include the following numbers: D3681, D8907 AF PKT 90 With FM-300 Hinges, Exit Device x Pull trim. Assembly is to be complete. Contact factory for pricing.

Heading 12.0

Doors: 001A1, 100A1, 100A2, 100B1, 200A1, 200A2, 300A1

| | | | | |
|---|---------------|--------------------------------------|--|----|
| 2 | Pair RiteDoor | D3681 X D8907 AF PKT 90 FM-300 X 998 | | RD |
|---|---------------|--------------------------------------|--|----|

Note: Rite Door assembly is to include the following numbers: D3681, D8907 AF PKT 90 With FM-300 Hinges, Exit Device x Pull trim. Assembly is to be complete. Contact factory for pricing.

Heading 13.0

Doors: 107A, 110A, 110B, 207A, 207B, 212A

| | | | | |
|---|-------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | SA |
| 1 | Classroom Lockset | LC 8237 OMD | 32D | SA |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | S88 D | | PE |

Heading 14.0

Doors: 119A

| | | | | |
|---|---------------------|----------------------|-----|----|
| 2 | Spring Hinges | 1001 6 | 26D | MC |
| 1 | Balance of Hardware | BY DOOR MANUFACTURER | | |

Heading 15.0

Doors: 022C, 024A, 027A, 027B, 100F2, 101A5, 101A6

| | | | | |
|---|-------------------|----------------------|-------|----|
| 6 | Hinges | TA2714 4 1/2 X 4 1/2 | 32D | MC |
| 1 | Removable Mullion | 12-980 | PC | SA |
| 1 | Exit Device | 12-8813 ETL LC | 32D | SA |
| 1 | Exit Device | 12-8810 | 32D | SA |
| 1 | Cylinder | BY OWNER | | |
| 2 | Closer | 351 P10 | EN | SA |
| 2 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 2 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | PK 55 | GREY | RO |

Heading 16.0

Doors: 104A

| | | | | |
|---|---------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | SA |
| 1 | Mortise Deadbolt | LC 8221 | 26D | SA |
| 1 | Cylinder | BY OWNER | | |
| 1 | Door Pull | 126 X 70C | US32D | RO |
| 1 | Push Plate | 70C 4 X 16 | US32D | RO |
| 1 | PowerMatic Operator | 6920 | 689 | NO |
| 1 | Protection Plate | K1050 10" x 34" | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Door Switch | 662 | | NO |
| 1 | Smoke Seal | S88 D 17' | | PE |

Heading 17.0

Doors: 114A, 115A

| | | | | |
|---|------------------|----------------------|-------|----|
| 3 | Hinges | TA2714 4 1/2 x 4 1/2 | 26D | MC |
| 1 | Passage Set | 8215 OMD | 32D | SA |
| 1 | Closer | 351 P10 | EN | SA |
| 1 | Protection Plate | K1050 10" x 2" LDW | US32D | RO |
| 1 | Wall Bumper | 406 | US32D | RO |
| 1 | Smoke Seal | S88 D | | PE |

Heading 18.0

Doors: 001A2, 001B3, 027C, 100B2, 100B3, 100F3, 111A, 112A, 113A, 119B, 119C, 119D, 200A3, 200B3, 300A2

| | | | | |
|---|----------|------------------------|--|--|
| 1 | Hardware | ALL HARDWARE BY OTHERS | | |
|---|----------|------------------------|--|--|

Heading 19.0

Doors: 100AG, 100BG, 200AG, 200BG, 300AG, 300BG

| | | | | |
|---|---------------------|----------------------|-----|----|
| 2 | Spring Hinges | 1001 6 | 26D | MC |
| 1 | Magnetic Hold Open | 998 | 628 | RI |
| 1 | Balance of Hardware | BY DOOR MANUFACTURER | | |

END OF SECTION 08 71 00

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MECHANICAL SYSTEMS COMMISSIONING SPECIFICATIONS

PART 1-GENERAL

1.1 DESCRIPTION

- A. The purpose of the commissioning process is to provide the Owner/operator of the facility with a high level of assurance that the mechanical and associated electrical Systems have been installed in the prescribed manner, and operate within the performance guidelines set in the design intent. The Commissioning Authority shall provide the Owner with an unbiased, objective view of the systems installation, operation, and performance. This process is not to take away or reduce the responsibility of the design professionals or installing contractors to provide a finished product. Commissioning is intended to enhance the quality of system start-up and aid in the orderly transfer of systems to beneficial use by the owner. The Commissioning Authority will be a member of the construction team, cooperating and coordinating all commissioning activities with the design professionals, construction manager, contractors, subcontractors, manufacturers and equipment suppliers.

1.2 SCOPE

- A. The HVAC systems commissioning shall include a demonstration by the Contractor of each equipment control sequence. The commissioning process shall demonstrate that each control sequence (including alarms and lead/lag equipment operations) and the associated test and balance data all correspond with the contract documents and with the final test and balance report. The finalized temperature control software with graphic displays shall be installed and operational (at all required locations) and the final test and balance report shall be provided for review and acceptance by the Owner and the Engineer a minimum of 10 days prior to requesting date(s) for the HVAC systems commissioning. Additionally, the temperature control contractor and the test and balance contractor (along with any other necessary parties) shall complete a 'dry-run commissioning' and shall certify in writing that all equipment is operating in accordance with the finalized written control sequences prior to requesting date(s) for the actual official on-site HVAC systems commissioning session(s).
- B. The HVAC systems commissioning shall demonstrate that the quantities read and displayed by the control system are in agreement with actual' tested quantities (e.g.. variable air volume box cfm readings. minimum outside air cfm readings. air temperatures. water temperatures. duct static pressures, building static pressures, etc.). The HVAC systems commissioning shall also demonstrate that all quantities listed in the final test and balance report (cfm readings. gpm readings. temperature differences, pressure drops. etc.) are/were correctly reported.
- C. The Contractor shall schedule a pre-commissioning pre-balancing meeting with the Owner's representatives at least two weeks prior to beginning the testing and balancing. This meeting will be utilized to review and discuss the finalized control sequences and to verify specific testing and balancing requirements. The final approved temperature control sequences will be distributed and reviewed during this meeting. The final control sequences will include additional detail and/or modifications to the original sequences contained in the contract documents (since such details are commonly omitted from the Mechanical Engineer's original written control sequences and are developed after the equipment submittals and the temperature control system submittals are received).

The work associated with those additions and/or modifications shall be provided by the temperature control contractor and the test and balance contractor at no additional cost to the Owner.

- D. The Contractor shall furnish a set of two-way radios which will be utilized to expedite the commissioning process (typically a minimum of 3 fully charged radios will be necessary and required for the duration of the commissioning process).
- E. The demonstration of each control sequence shall be performed under conditions which simulate as close to an actual condition as possible. The Contractor shall provide all necessary materials and temporary system modifications as required to 'false-load' the system(s) as required to demonstrate the desired sequences (including appropriate gas required to simulate a refrigerant leak in the chiller room when applicable). The temperature control system software shall be capable of temporarily overriding analog inputs in order to facilitate demonstration of the temperature control sequences. In cases where the project does not include an on-site computer in the building being commissioned the temperature control contractor shall provide a laptop computer equipped with the complete graphic interface software package (the software on the laptop computer shall be identical with the software provided to the Owner).
- F. HVAC systems commissioning shall be conducted with representatives from the following entities (the required participants shall be confirmed with the commissioning agent prior to scheduling the commissioning).
 - 1. General Contractor (with a complete set of plans and specifications).
 - 2. Mechanical Contractor (with a complete set of mechanical equipment operating and maintenance manuals).
 - 3. Temperature Control Contractor (with a laptop computer loaded with the finalized programming and graphic interface software).
Test and Balance Contractor (with a complete set of testing apparatus as utilized during testing and balancing and a complete copy of the final test & balance report).
 - 5. Factory-authorized technicians for all major equipment (chillers, boilers, cooling towers, variable frequency drives, etc.). Technicians shall be available to verify equipment start-up has been properly completed and to make any necessary or desired adjustments to control settings.
 - 6. Water Treatment Contractor (with copies of final water treatment reports).
 - 7. Mechanical Engineer and or his designated representative.
 - 8. Owner's designated representative.
- G. The aforementioned representatives shall be present during all portions of the testing (and re-testing as required) and shall be equipped to promptly remedy any deficiencies discovered during the commissioning process.
- H. The temperature control contractor and the test and balance contractor (along with any other necessary parties) shall conduct a 'dry-run commissioning' to verify that all of the previously listed commissioning requirements are complete prior to requesting a date for the actual official on-site commissioning session(s).
- I. Should any of the aforementioned requirements not be met on the date that the commissioning process commences and/or if deficiencies are observed during the commissioning process the commissioning will be considered a failure and the deficiencies will be required to be remedied and then addressed in writing prior to requesting a date for re-commissioning. There will be no additional costs allowed to the Contractor for re-commissioning sessions as may be required to address issues that are found to be in non-compliance with the requirements of this specification.

- J. The Contractor shall include adequate time periods for both the 'dry-run commissioning' and the actual official on-site commissioning in the project schedule. The necessary time periods shall be carefully reviewed with all of the appropriate subcontractors to ensure that the subcontractors are in agreement with the time allotted for each scheduled task.
- K. Completion and acceptance of the HVAC systems commissioning shall be a condition of Substantial Completion. The building shall be considered 'not ready to utilize for its intended use' until such time that the HVAC systems commissioning is successfully completed.
- L. The responsibilities of the Contractor shall also include:
1. Coordinate and manage the Contractors commissioning activities.
 2. Coordinate directly with each subcontractor and vendor with respect to their responsibilities and contractual obligations for commissioning.
 3. Attend periodic on-site commissioning meetings
 4. Integrate commissioning schedule into the master construction activity schedule. Update schedule at specified intervals.
 5. Conduct installation verification inspections.
 6. Review controls documentation and interface with other systems.
 7. Obtain then review operation & maintenance information and as-built drawings provided by the various subcontractors and vendors.
 8. Note any inconsistencies or deficiencies in system operations. Enforce system compliance or recommend to the owners Representative modifications to system design that will correct or enhance system performance.
 9. Coordinate Commissioning Authority test witnessing, after verifying that pretests have been satisfactorily conducted and final tests are ready to be performed.
 10. Be present during training sessions to direct video recording., present training and direct the presentations of others.
 11. Be present during start-up activities to direct and witness execution of start-up.
 12. Monitor performance of testing, adjusting and balancing activities to ensure acceptable results, and use of approved methods and instrumentation.
 13. Ensure that necessary test instrumentation is available during verification and functional performance testing, and that instruments meet quality and calibration requirements and are in good working order.
 14. Be present during verification and functional performance testing and retesting to direct and witness execution of tests.
 15. In the event that a commissioning test fails, determine the cause of failure, direct timely correction of deficiency and then retest. Reimburse the Owner for billed costs for the extraordinary participation of the Owners Representative, Architect, Commissioning Authority and owners staff.
 16. Track commissioning deficiencies until correction and retesting is successfully completed.
- M. The functions and responsibility of the Commissioning Authority shall include:
1. Responsibility: The primary point of responsibility is to inform the Contractor and the Owner on the status, integration, and performance of systems within the facility.
 2. Information: The Commissioning Authority shall function as a catalyst and initiator to disseminate information and assist the design and construction teams in the completion of the construction process. This shall include system completeness, performance, and adequacy to meet the intended performance standards of each system. Services include construction observation, spot testing, verification and functional performance testing, and providing performance and operating information to the responsible parties, e.g., contractors, design professionals, and the Owner.

3. Quality Assurance: Assist the responsible parties to maintain a high quality level of installation and system performance.
4. Observation of tests: Commissioning Authority shall observe and coordinate testing as required to ensure system performance meets the design intent.
5. Documentation of tests: Commissioning Authority shall document the results of the performance testing directly and/or ensure that all testing is documented by the appropriate technicians. The Commissioning Authority shall provide standard forms to be used by all parties for consistency of approach and type of information to be recorded.
6. Resolution of disputes: The Commissioning Authority is to remain an independent party present on the project with specific knowledge of the subject. Should disputes arise, the Commissioning Authority shall perform research to determine the scope and extent of the problem and educate the involved parties as to the nature and extent of the problem. This shall include technical and financial aspects of the dispute, including assistance to help identify who the responsible parties are to implement corrective action. The Owner/Architect shall preside over resolution of the problem.
7. Deficiencies: Provision of technical expertise to oversee and verify the correction of deficiencies found during the commissioning process.
8. Provision of technical expertise to review and edit operating and maintenance descriptions by system.

1.3 SYSTEMS TO BE INCLUDED IN COMMISSIONING PROCESS

- A. The following pieces of equipment and systems shall go through commissioning:
 1. Mechanical systems including electrical that connects to mechanical.
 2. Variable frequency drives (if applicable).
 3. ATC control systems, hardware, software, and documentation.

1.4 COORDINATION

- A. The Commissioning authority shall receive a copy of all construction documents, addenda, change orders, and appropriate approved submittals and shop drawings directly from the Architect and Contractor.
- B. The Commissioning Authority shall disseminate written information and documents to all responsible parties relative to the nature and extent of the communication.
- C. The Commissioning Authority is primarily responsible to the Owner, and as such, shall regularly appraise the Architect, the Contractor, and the Owner of progress, pending problems and/or disputes, and shall provide regular status reports on progress with each system. Any potential change in the contractual and/or financial obligations of the owner (credits, change orders, schedule changes, etc.) shall be identified and quantified as soon as possible.
- D. The Commissioning Authority shall coordinate the schedule of commissioning activities with the construction schedule. It is possible that some procedures will be completed before the entire Mechanical system is completed.

1.5 SCHEDULE

- A. Commissioning of systems shall proceed per the criteria established, in the specific sections that follow, with activities to be performed on a timely basis. The Commissioning Authority shall be available to respond promptly to avoid construction delays.
- B. Start-up and testing of systems may proceed prior to final completion of systems to expedite progress. However, the Commissioning Authority shall not perform testing and checkout services that are the primary responsibility of the contractor/vendor in advance of their testing and checkout.
- C. Problems observed shall be addressed immediately, responsible parties notified, and actions to correct deficiencies coordinated in a timely manner.
- D. Contractor schedules and scheduling is the responsibility of the Contractor. The Commissioning Authority shall provide commissioning scheduling information to the Contractor for review and planning activities.
- E. The following list is a general set of tasks and criteria along with an approximate duration for each task. This list is intended to be utilized as a guideline for creating an appropriate schedule for all of the work related to HVAC systems commissioning. The actual time required for each task will vary depending on the size and complexity of the mechanical systems on the particular project. Determination of the actual time required for each task is the responsibility of the Contractor and shall be developed utilizing thorough review and discussion with all of the involved subcontractors prior to preparing and submitting the proposed schedule. A typical project requires between 4 and 8 weeks from start of test and balance to scheduling the dates for the formal on-site commissioning session(s).
 - 1. Pre-commissioning/pre-balancing meeting (2 weeks prior to start of testing and balancing).
 - 2. Begin testing and balancing (typically a 1 to two week process).
 - 3. Print and distribute final test and balance reports (typically a 1 to 2 week process).
 - 4. Temperature control contractor (with participation from test and balance contractor and mechanical contractor as necessary) conducts 'dry-run commissioning' (utilizing the UNVC 'HVAC Systems Commissioning Checklist' as a guide) and tunes all control loops (typically 1 to 2 week process). Note that this task occurs after testing and balancing is complete.
 - 6. Schedule formal on-site HVAC systems commissioning dates (typically a 1 to 3 day process).

1.6 RELATED WORK SPECIFIED ELSEWHERE

- A. Commissioning requires support from the contractors The commissioning process does not relieve any contractors from their obligations to complete all portions of work in a satisfactory manner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 COMMISSIONING PLAN AND SCHEDULE

- A. The Commissioning Authority shall develop and submit a schedule for the commissioning process which is integrated with the construction schedule. Included shall be the required work by all team members (Commissioning Authority, design team, contractors, and the Owner). Overlay with the construction schedule, and include time for test and balance, verification, and functional performance testing.

3.2 CONSTRUCTION OBSERVATION

- A. This is an additional and separate activity from that provided by the design team. Construction observation is required as part of the commissioning and coordination process provided by the C/A.

3.3 TEST AND BALANCE

- A. Air & water balance shall be accomplished by the test and balance firm. The Commissioning Authority shall spot check this work to verify accuracy of results.

3.4 VERIFICATION AND FUNCTIONAL PERFORMANCE TEST PROCEDURES

- A. Commissioning Authority shall develop and document the commissioning procedure to be used. Include a performance checklist and performance test data sheets for each system based on actual system configuration. These procedures shall be reviewed by the appropriate design engineers for technical depth, clarity of documentation and completeness. Emphasis shall be placed on testing procedures that shall determine actual system performance and compliance with the design intent.
- B. The majority of mechanical equipment requires safety devices to stop and/or prevent operation unless minimum safety standards or conditions are met. These may include adequate oil pressure, proof-of-flow, non freezing conditions, maximum static pressure, maximum head pressure, etc. The Commissioning Authority shall observe the actual performance of safety shutoffs in a real or closely simulated condition of failure.
- C. Systems may include safety devices and components that control a variety of equipment operating as a system. Interlocks may be hard-wired or operate from software. Operation of these interlocks shall be verified by the Commissioning Authority.
- D. The Commissioning Authority shall determine the acceptance procedures for each system within Division 15. The acceptance procedures shall incorporate the commissioning standards and successful testing results as referred to throughout Division 15 and 16 specifications.
 - 1. In particular, the temperature control system shall have all 1/0 points individually verified for proper function, calibration, and operation. The Commissioning Authority shall review proposed testing procedures and report formats, and observe sufficient field testing to confirm that all 1/0 points have been properly tested.
 - 2. All control sequence of operation strategies, alarm generation and reporting shall also be reviewed and proper operation verified by the Commissioning Authority.
 - 3. The central work station graphics, point assignments, alarm messages, and logging functions shall be verified.
- E. The appropriate contractor and vendor(s) shall be informed of what tests are to be performed and the expected results. Whereas some test results and interpretations may not become evident until the

actual tests are performed, all parties shall have a reasonable understanding of the requirements. The Commissioning Plan shall address those requirements and be distributed to all parties involved with that particular system.

- F. Acceptance procedures shall confirm the performance of systems to the extent of ' the design intent. When a system is accepted, the Owner shall be assured that the system is complete, works as intended, is correctly documented, and operator training has been performed.

3.5 HVAC SYSTEMS COMMISSIONING CHECKLIST

Review location of outside air temperature sensor.

Verify: calibrate outside air sensor (dry bulb & relative humidity). Verify wet bulb temperature calculation.

Verify outside air economizer control sequence and operation.

Verify all valves and dampers have been programmed to operate without hunting.

Verify programming of vfd's (minimum speed, auto restart, input/output speed calibration, alarm on failure, upward and downward ramp time settings).

Verify vav box maximum, minimum, and reheat cfm air flows (random verification).

Verify vav box discharge air temperature (in both heating and cooling modes).

Verify diffuser air flows at vav box maximum cfm (random verification).

Verify set-up of all required alarms (review automatic dial or automatic e-mail set-up).

Verify calibration of air filter alarms.

Verify set-up of occupancy schedules.

Verify set-up of holiday schedules.

Verify unoccupied mode operation (damper and valve positions).

Verify night set-back (heating) control sequence.

Verify night set-back (cooling) control sequence.

Verify morning warm-up control sequence.

Verify room sensor programming, displays, and calibration.

Verify room sensor unoccupied mode override feature.

Verify pump lead/lag programming and alarm display.

Verify boiler lead/lag programming and alarm display.

Verify chiller lead/lag programming and alarm display.

Verify pump head and gpm (compare test/ balance report to design).

Verify that pump strainers are clean.

Verify flow at heating and cooling coils (random verification).

Verify location installation of air vents in each closed loop piping system.

Verify chiller room emergency shut-down switch locations and operation.

Verify that mechanical system roof penetrations are properly installed (per roofing details).

Verify global, remote, and local room setpoint functions.

Verify adjustment range for local room temperature setpoints.

Verify equipment room temperature setpoints and deadbands.

Verify that all required spare parts (filters, belts, etc.) have been provided.

Verify acceptable air and noise levels throughout the building.

Verify duration of water flow at self-closing lavatory faucets.

Verify time delay before domestic hot water is available at lavatory faucets.

3.6 FUNCTIONAL PERFORMANCE TESTING - OBSERVATION

- A. The functional performance testing shall be done by the Contractor. The Commissioning Authority shall direct and witness all of these tests. -
- B. Tests shall be completed comprehensively and to the extent necessary to enable the Commissioning Authority to assure the Owner and design professional that the systems do perform per the design intent.

3.7 RE-TESTING

- A. Contractor shall, at no additional cost to the Owner, repeat the complete verification test procedure for each test for which acceptable results are not achieved. Repeat tests until acceptable results are achieved.
- B. Contractor shall compensate the Owner for costs incurred as the result of tests repeated. This includes the costs for the Commissioning Authority, Design Architect, Design Engineers, and Owner--s personnel.

3.8 CORRECTION OF DEFICIENCIES

- A. Correct functional performance test deficiencies promptly and schedule retest.
- B. Corrections during verification or functional performance test are generally prohibited to avoid consuming the time of personnel waiting for the test~ but not involved in making the correction. Exceptions will be allowed if the cause of the failure is obvious and corrective action can be

completed in less than five minutes. If corrections are made under this exception, the failure shall be noted on the test data form. A new test data form, marked retest, shall be initiated after the correction has been made. The entire test procedure shall be repeated.

3.9 SOFTWARE DOCUMENT

- A. Review detailed software documentation for all DDC control systems. This includes review of vendor documentation, their programming approach and the specific software routines applied to this project. Discrepancies in programming approaches and/or sequences shall be reported and coordinated in order to provide the Owner with the most appropriate, simple, and straightforward approach to software routines.

3.10 OPERATING AND MAINTENANCE (O&M) MANUALS

- A. The Commissioning Authority shall review the draft form of the O&M manuals provided by the Division 15 contractor and the Division 16 contractor. The review process shall verify that O&M instructions meet specifications and are included for all equipment furnished by the contractor, and that the instructions and wiring diagrams are specific (edited where necessary) to the actual equipment provided for this project.
- B. Published literature shall be specifically oriented to the provided equipment indicating required operation and maintenance procedures, parts lists, assembly/disassembly diagrams, and related information.
- C. The contractor shall incorporate the standard technical literature into system specific formats for this facility as designed and as actually installed. The resulting O&M information shall be system specific, concise, to the point, and tailored specifically to this facility. The Commissioning Authority shall review and edit these documents as necessary for final corrections by the contractor.
- D. The O&M manual review, and coordination efforts shall be completed prior to Owner training sessions, as these documents are to be utilized in the training sessions.

3.11 TRAINING

- A. Schedule and coordinate training sessions for the Owner's staff for each system. Training shall be in a classroom setting with the appropriate schematics, handouts, and visual/audio training aids on-site with equipment.
- B. The Commissioning Authority organizes, schedules, and directs the training sessions.
- C. The appropriate installing contractors shall provide training on all the major systems per specifications, including peculiarities specific to this project.
- D. The equipment vendors shall provide training on the specifics of each major equipment item including philosophy, troubleshooting, and repair techniques.
- E. The automatic control vendor shall provide training on the control system per their specification section.

3.12 RECORD DRAWINGS

- A. The Commissioning Authority shall review the as-built contract documents to verify incorporation of both design changes and as-built construction details. Discrepancies noted shall be corrected by the appropriate party.

3.13 EXCLUSIONS

- A. Responsibility for construction means and methods: The Commissioning Authority is not responsible for construction means, methods, job safety, or any, construction management functions on the job site.
- B. Hands-on work by the Commissioning Authority: The contractors shall provide all services requiring tools or the use of tools to start-up, test, adjust, or otherwise bring equipment and systems into a fully operational state. The Commissioning Authority shall coordinate and observe these procedures (and may make minor adjustments), but shall not perform construction or technician services other than verification of testing, adjusting, balancing, and control function.

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Utah New Vision Construction LLC

DFCM BUILDING COMMISSIONING AGENT

11350 E. 18625 S. #118 Mt Pleasant Utah, 84647 (801) 557-3211 Fax: (435)-462-3983

ELECTRICAL SYSTEMS COMMISSIONING SPECIFICATIONS

PART 1-GENERAL

1.1 DESCRIPTION

- A. The purpose of the commissioning process is to provide the Owner/operator of the facility with a high level of assurance that the Electrical Systems have been installed in the prescribed manner, and operate within the performance guidelines set in the design intent. The Commissioning Authority shall provide the Owner with an unbiased, objective view of the systems installation, operation, and performance. This process is not to take away or reduce the responsibility of the design professionals or installing contractors to provide a finished product. Commissioning is intended to enhance the quality of system start-up and aid in the orderly transfer of systems to beneficial use by the owner. The Commissioning Authority will be a member of the construction team, cooperating and coordinating all commissioning activities with the design professionals, construction manager, contractors, subcontractors, manufacturers and equipment suppliers.

1.2 SCOPE

- A. The responsibilities of the Contractor shall include:
1. Coordinate and manage the Contractors commissioning activities.
 2. Coordinate directly with each subcontractor and vendor with respect to their responsibilities and contractual obligations for commissioning.
 3. Attend periodic on-site commissioning meetings
 4. Integrate commissioning schedule into the master construction activities schedule. Update the schedule at specified intervals.
 5. Conduct installation verification inspections.
 6. Review controls documentation and interface with other systems.
 7. Obtain, review and assemble operation and maintenance information and as-built drawings provided by the various subcontractors and vendors.
 8. Note any inconsistencies or deficiencies in system operations. Enforce system compliance or recommend to the owners Representative modifications to system design that will correct or enhance system performance.
 9. Coordinate Commissioning Authority test witnessing, after verifying that pretests have been satisfactorily conducted and final tests are ready to be performed.
 10. Be present during training sessions to direct video recording., present training and direct the presentations of others.
 11. Be present during start-up activities to direct and witness execution of start-up.
 12. Monitor performance of testing, adjusting and other activities to ensure acceptable results, and use of approved methods and instrumentation.
 13. Ensure that necessary test instrumentation is available during verification and functional performance testing, and that instruments meet quality and calibration requirements and are in good working order.
 14. Be present during verification and functional performance testing and retesting to direct and witness execution of tests.
 15. In the event that a commissioning test fails, determine the cause of failure, direct timely correction of the deficiency and then retest. Reimburse the Owner for billed costs for the extraordinary participation of the Owners Representative, Architect, Commissioning Authority and owners staff.
 16. Track commissioning deficiencies until correction and retesting is successfully completed.

B. The functions and responsibility of the Commissioning Authority shall include:

1. Responsibility: The primary point of responsibility is to inform the Contractor and the owner on the status, integration, and performance of systems within the facility.
 2. Information: The Commissioning Authority shall function as a catalyst and initiator to disseminate information and assist the design and construction teams in the completion of the construction process. This shall include system completeness, performance, and adequacy to meet the intended performance standards of each system. Services include construction observation, spot testing, verification and functional performance testing, and providing performance and operating information to the responsible parties, e.g., contractors, design professionals, and the Owner.
 3. Quality Assurance: Assist the responsible parties to maintain a high quality level of installation and system performance.
 4. Observation of tests: Commissioning Authority shall observe and coordinate testing as required to ensure system performance meets the design intent.
 5. Documentation of tests: Commissioning Authority shall document the results of the performance testing directly and/or ensure that all testing is documented by the appropriate technicians. The Commissioning Authority shall provide standard forms to be used by all parties for consistency of approach and type of information to be recorded.
 6. Resolution of disputes: The Commissioning Authority is to remain an independent party present on the project with specific knowledge of the subject. Should disputes arise, the Commissioning Authority shall perform research to determine the scope and extent of the problem and educate the involved parties as to the nature and extent of the problem. This shall include technical and financial aspects of the dispute, including assistance to help identify who the responsible parties are and to help implement corrective action. The Owner/Architect shall preside over resolution of the problem.
 7. Deficiencies: Provision of technical expertise to oversee and verify the correction of deficiencies found during the commissioning process.
 8. Provision of technical expertise to review and edit operating and maintenance descriptions by system.
- C. The Commissioning Agent is an independent contractor and shall work under a separate contract directly for the Owner and / or Contractor.
- D. The Commissioning Agent shall not be financially associated with any entity, except the one employing him on this project, to avoid potential conflicts of interest.

1.3 SYSTEMS & REQUIREMENTS INCLUDED IN COMMISSIONING PROCESS

- A. The following tests and verifications are to be performed by the Contractor in accordance with Section 3.4 and a written report provided to the Owner and the Commissioning Agent, and notice shall be given to the Commissioning Agent as to when the tests are to be conducted so they may be in attendance.
1. Cable trays: Visually inspect grounding connections, joints, hangers and mountings. Check for damage that may eventually result in rust or corrosion
 2. Verify that all equipment is properly anchored to meet the seismic requirements detailed by the design engineer. Pay particular attention to the anchoring of floor mounted switchgear and other floor mounted devices.

3. Verify that all ground connections are tight and solid. Perform an impedance test on the grounding system.
4. Medium and High Voltage cables, capacitors, switches and switchgear, transformers, etc. are to be tested with DC or AC HI POT testers as recommended by the manufacturer and the results permanently recorded for future reference. Ground impedance for lower voltage cable and equipment is to be checked with an appropriate instrument.
5. Bus connections, cable connections, switches, transformers, etc., are to be checked with a remote reading thermometer where feasible after the equipment is in operation.
6. Verify that all motors are properly protected with properly sized disconnects (local if necessary), and that they are properly identified.
7. Verify that all communication and data cables are properly installed and tested.
8. Verify that all UPS systems are properly installed, labeled and tested under load.
9. Verify that all panel boards are properly installed, labeled and tested.
10. Verify that all receptacles, switches and other wiring devices are properly installed and tested.
11. Verify that all motor control cabinets, VFDs, etc. are properly installed and tested, and labeled.
12. Verify that all lighting systems including controls and dimmers are properly installed and tested.
13. Verify that all clocks are tested and working. Verify automatic adjustment if applicable.
14. Verify that the Fire Alarm System, the EXIT lights and the Emergency Lighting Systems are tested and approved by the proper governing authority. (i.e. Fire Marshal)
15. Verify that security systems are properly installed, labeled and tested if applicable.

1.4 COORDINATION

- A. The Commissioning authority shall receive a copy of all construction documents, addenda, change orders, and appropriate approved submittals and shop drawings directly from the Architect and Contractor.
- B. The Commissioning Authority shall disseminate written information and documents to all responsible parties relative to the nature and extent of the communication.
- C. The Commissioning Authority is primarily responsible to his employer, and as such, shall regularly appraise the Architect, the Contractor, and the Owner of progress, pending problems and/or disputes, and shall provide regular status reports on progress with each system. Any potential change in the contractual and/or financial obligations of the owner (credits, change orders, schedule changes, etc.) shall be identified and quantified as soon as possible.
- D. The Commissioning Authority shall coordinate the schedule of commissioning activities with the construction schedule. It is possible that some procedures will be completed before the Electrical system is completed.

1.5 SCHEDULE

- A. Commissioning of systems shall proceed per the criteria established, in the specific sections that follow, with activities to be performed on a timely basis. The Commissioning Authority shall be available to respond promptly to avoid construction delays.

- B. Start-up and testing of systems may proceed prior to final completion of systems to expedite progress. However, the Commissioning Authority shall not perform testing and checkout services that are the primary responsibility of the contractor/vendor in advance of their testing and checkout.
- C. Problems observed shall be addressed immediately, responsible parties notified, and actions to correct deficiencies coordinated in a timely manner.
- D. Contractor schedules and scheduling is the responsibility of the Contractor. The Commissioning Authority shall provide commissioning scheduling information to the Contractor for review and planning activities.

1.6 RELATED WORK SPECIFIED ELSEWHERE

Commissioning requires support from- the contractors The commissioning process does not relieve any contractors from their obligations to complete all portions of work in a satisfactory manner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 COMMISSIONING PLAN AND SCHEDULE

- A. The Commissioning Authority shall develop and submit a schedule for the commissioning process which is integrated with the construction schedule. Included shall be the required work by all team members (Commissioning Authority, design team, contractors, and the Owner). Overlay with the construction schedule, and include time for testing, verification, and functional performance testing.

3.2 CONSTRUCTION OBSERVATION

- A. This is an additional and separate activity from that provided by the design team. Construction observation is required as part of the commissioning and coordination process to be provided by the Commissioning Authority.

3.3 TESTING AND VERIFICATION

- A. Testing and Verification shall be accomplished by the Contractor or Their Designee. The Commissioning Authority shall spot check this work to verify accuracy of results.

3.4 VERIFICATION AND FUNCTIONAL PERFORMANCE TEST PROCEDURES

- A. The Commissioning Authority shall develop and document the commissioning procedure to be used. Include a performance checklist and performance test data sheets for each system based on actual system configuration. These procedures shall be reviewed by the appropriate design engineers for technical depth, clarity of documentation and completeness. Special emphasis shall be placed on testing procedures that shall conclusively determine actual system performance and compliance with the design intent.
- B. The majority of electrical equipment requires safety devices to stop and/or prevent operation unless minimum safety standards or conditions are met. The Commissioning Authority shall observe the actual performance of safety devices in a real or closely simulated condition of failure.

- C. Systems may include safety devices and components that control a variety of equipment operating as a system. Interlocks may be hard-wired or operate from software. Operation of these interlocks shall be verified by the Commissioning Authority.
- D. The Commissioning Authority shall determine the acceptance procedures for each system. The acceptance procedures shall incorporate the commissioning standards and successful testing results.
- E. The appropriate contractor and vendor(s) shall be informed of what tests are to be performed and the expected results. Whereas some test results and interpretations may not become evident until the actual tests are performed, all parties shall have a reasonable understanding of the requirements. The Commissioning Plan shall address those requirements and be distributed to all parties involved with that particular system.
- F. Acceptance procedures shall confirm the performance of systems to the extent of the design intent. When a system is accepted, the Owner shall be assured that the system is complete, works as intended, is correctly documented, and operator training has been performed.

3.5 FUNCTIONAL PERFORMANCE TESTING - OBSERVATION

- A. The functional performance testing shall be done by the Contractor. The Commissioning Authority shall direct and witness all of these tests.
- B. Tests shall be completed comprehensively and to the extent necessary to enable the Commissioning Authority to assure the Owner and design professional that the systems do perform per the design intent.

3.6 RE-TESTING

- A. The Contractor shall, at no additional cost to the Owner, repeat the entire verification test procedure for each test for which acceptable results are not achieved. Tests shall be repeated until acceptable results are achieved.
- B. The Contractor shall compensate the Owner for costs incurred as the result of tests repeated. This includes the costs for the Commissioning Authority, Design Architect, Design Engineers, and Owners personnel.

3.7 CORRECTION OF DEFICIENCIES

- A. The Contractor shall correct functional performance test deficiencies and promptly schedule a retest.
- B. Corrections during verification or functional performance test are generally prohibited to avoid consuming the time of personnel waiting for the test- but not involved in making the correction. Exceptions will be allowed if the cause of the failure is obvious and corrective action can be completed in less than five minutes. If corrections are made under this exception, the failure shall be noted on the test data form. A new test data form marked retest shall be initiated after the correction has been made. The entire test procedure shall be repeated.

3.8 SOFTWARE DOCUMENTATION

- A. Review detailed software documentation for all control systems. This includes review of vendor documentation, their programming approach and the specific software routines applied to this project. Discrepancies in programming approaches and/or sequences shall be reported and coordinated in order to provide the Owner with the most appropriate, simple, and straightforward approach to software routines.

3.9 OPERATING AND MAINTENANCE (O&M) MANUALS

- A. The Commissioning Authority shall review the draft form of the O&M manuals provided by the contractor. The review process shall verify that O&M instructions meet specifications and are included for all equipment furnished by the contractor, and that the instructions and wiring diagrams are specific (edited where necessary) to the actual equipment provide for this project.
- B. Published literature shall be specifically oriented to the provided equipment indicating required operation and maintenance procedures, parts lists, assembly/disassembly diagrams, and related information.
- C. The contractor shall incorporate the standard technical literature into system specific formats for this facility as designed and as actually installed. The resulting O&M information shall be system specific, concise, to the point, and tailored specifically to this facility. The Commissioning Authority shall review and edit these documents as necessary for final corrections by the contractor.
- D. The Commissioning Agent shall:
 - 1. Verify an alphabetical list of all systems components including the name, address and 24 hour phone number of the company responsible for servicing each item during the first years operations is included.
 - 2. Verify the manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed is included in equipment schedules. Physical verification will be used for accuracy.
 - 3. Verify complete operating instructions for entire electrical system.
 - 4. Verify all instructions for emergency procedures, fire or failure of major equipment and procedures for normal starting, operating, shutdown, seasonal and long term shut down are included.
 - 5. Verify maintenance instructions, proper lubricants and lubricating instructions for each piece of equipment and necessary cleaning/replacing/adjusting schedules are provided.
 - 6. Verify each piece of manufactures data is provided, including:
 - a. Installation instructions.
 - b. Drawings and specifications (final shop drawings).
 - c. Parts lists of each piece of equipment with graphic diagram.
 - d. Lubrication and other preventative maintenance data.

7. Verify equipment has been identified as specified on the drawings. Check copy of equipment list in operations and maintenance and compare to equipment identification.
8. Randomly verify all starters disconnect switches and manually operated controls, have been labeled with legible markers corresponding to the operating instructions in the maintenance manual.
9. Verify all extended warranties have been supplied in the maintenance manual in addition to the standard one year warranty. Verify all original copies of warranties for specific equipment where manufactures warranty exceeds the standard one year warranty.
10. Verify the signed Certificate for proof of performance is provided. The signed certificate from the electrical contractor stating they have personally checked the operation of equipment and everything under their said contract is operating as specified.
11. Verify all testing documents for fire system controls or other building electrical tests are supplied and installed in operations and maintenance manual.

3.10 ELECTRICAL IDENTIFICATION

1. Randomly verify all panel boards, starters, disconnect switches, circuit breakers, terminal boards, junction boxes and other special equipment items furnished/or installed by the electrical contractor is identified with permanently attached, engraved plastic name plates.
 2. Randomly verify all junction boxes and outlet boxes above ceiling and in unfinished areas and all others shall be permanently and legibly marked as to voltage, phase characteristics and the panel form which it is served.
 3. Verify each branch circuit in all panel boards have type written identification with complete description of loads served.
 4. Randomly verify all empty conduit systems are identified as to the use and junction and outlet boxes and pull wires are identified with point of termination clearly described.
 5. Randomly verify each and every wiring system is clearly identified as to the voltage and service, this includes signal and control conduits.
 6. Verify operating instructions include a brochure containing one copy of all approved engineering submitted data, approved diagrams and drawings including all shop drawings required for layout and installation and any/all other data or drawings required during construction are also delivered to owner.
 7. Verify single line diagram is supplied in main switch gear room, mounted under glass or laminated on the wall. The electrical contractor will supply this at his expense regardless if it is required in the electrical specifications or not.
- E. The O&M manual review, and coordination efforts shall be completed prior to Owner training sessions, as these documents are to be utilized in the training sessions.

3.11 TRAINING

- A. Schedule and coordinate training sessions for the Owner's staff for each system. Training shall be in a classroom setting with the appropriate schematics, handouts, and visual/audio training aids on-site with the vendor's equipment.
- B. The Commissioning Authority organizes, schedules, and directs the training sessions.
- C. The appropriate installing contractors shall provide training on all the major systems per specifications, including peculiarities specific to this project.
- D. The equipment vendors shall provide training on the specifics of each major equipment item including design philosophy, troubleshooting, and repair techniques.

3.12 RECORD DRAWINGS

- A. The Commissioning Authority shall review the as-built contract documents to verify incorporation of both design changes and as-built construction details. Discrepancies noted shall be corrected by the appropriate party. The Commissioning Agent shall:
 - 1. Verify horizontal and vertical location of underground utilities dimensioned off column lines.
 - 2. Verify dimension location of internal utilities in concealed construction.
 - 3. Verify changes by order of field order have been recorded to drawings.
 - 4. Verify all details not on original contract drawings have been converted and recorded on as built drawings.

3.13 EXCLUSIONS

- A. Responsibility for construction means and methods: The Commissioning Authority is not responsible for construction means, methods, job safety, or any, construction management functions on the job site.
- B. Hands-on work by the Commissioning Authority: The contractors shall provide all services requiring tools or the use of tools to start-up, test, adjust, or otherwise bring equipment and systems into a fully operational state. The Commissioning Authority shall coordinate and observe these procedures (and may make minor adjustments), but shall not perform construction or technician services other than verification of testing, adjusting, balancing, and control function.

EQUAL PRODUCT APPROVAL REQUEST FORM

Project Designation: Snow College Library B07-051

Request Number: _____

To: _____

From: _____

Bid Date: _____

A proposed product is not legally approved and cannot legally be included in a bid or used in the Work until it appears in an Addendum or other Contract Modification as defined in the General Conditions. See Instructions to Bidders Procurement Process. General Conditions Sections 7 and 12, and Section 016000.

PROPOSED EQUAL PRODUCT:

Specification Section: _____

Specified Products: _____

Proposed Product: _____

The Undersigned certifies:

1. Proposed equal product has been fully investigated and determined to be equal or superior in all respects to specified products.
2. Same warranty will be furnished for proposed equal product as for specified products.
3. Same maintenance service and source of replacement parts, as applicable, is available.
4. Proposed equal product will have no adverse effect on other trades and will not affect or delay progress schedule.
5. Proposed equal product does not affect dimensions and functional clearances.

ATTACHMENTS:

Include the following attachments:

1. Copy of the Project Manual Section where the proposed equal product would be specified, rewritten or red-lined to include any changes necessary to correctly specify the proposed equal product. Identify completely changes necessary to the original Project Manual Section.
2. Copies of details, elevations, cross-sections, and other elements of the Project Drawings redone as necessary to show changes necessary to accommodate proposed equal product. Identify completely the changes from the original Drawings.
3. Complete product literature and technical data, installation and maintenance instructions, test results, and other information required to show complete conformance with requirements of the Contract Documents.

SIGNED: _____

Company _____

Address _____

City, State, Zip _____

Telephone _____ FAX _____

REVIEW COMMENTS:

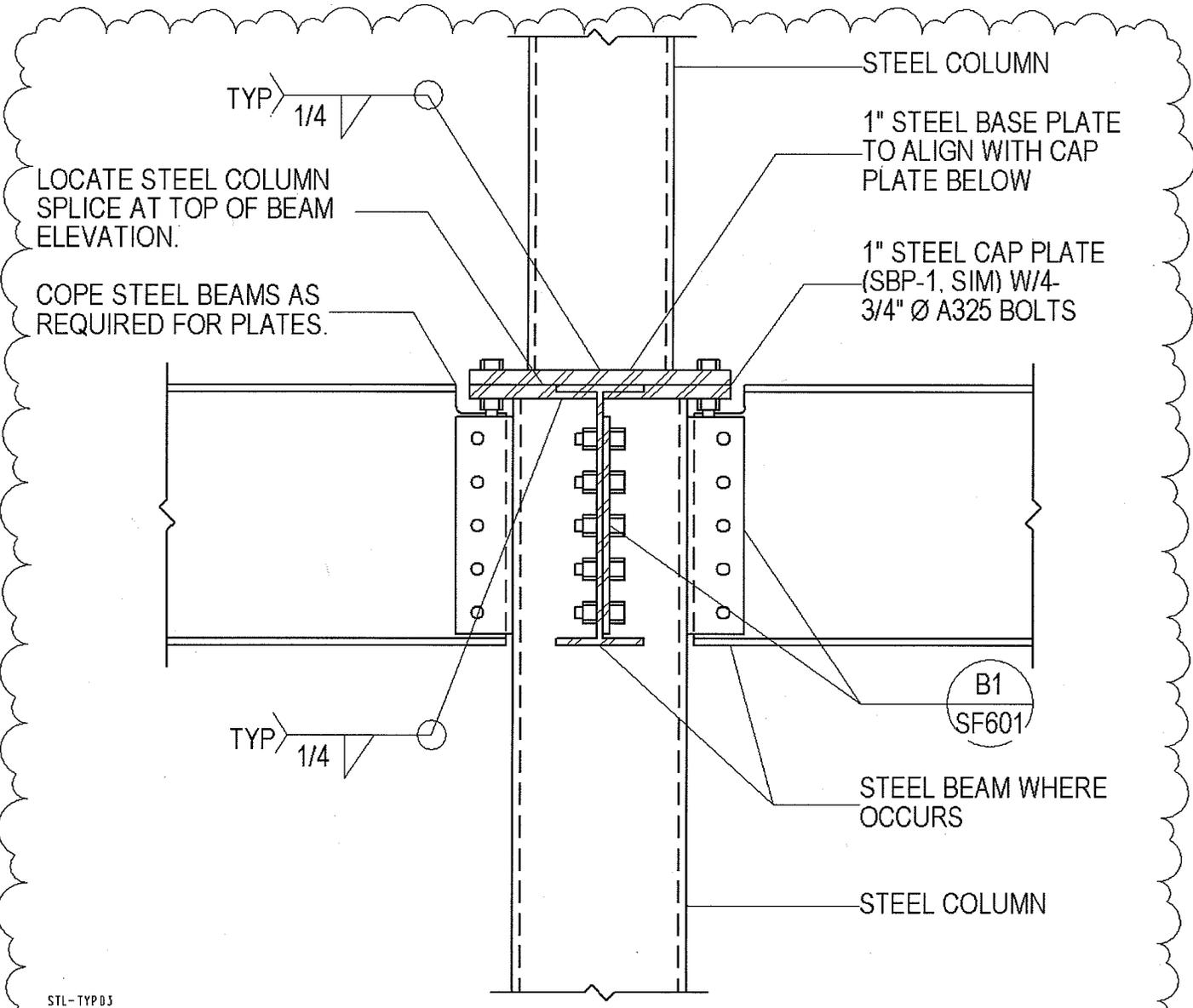
_____ Accepted. See Addenda Number _____.

_____ Submission Not in Compliance with instructions. Respond to attached comments and resubmit.

_____ Proposed Equal Product Not Acceptable. Use specified products.

_____ Not Reviewed. Submission received too late. Use specified products.

ADDITIONAL COMMENTS:



D2

TYPICAL STEEL TUBE COLUMN SPLICE DETAIL

SF503

NO SCALE

1



REAVELEY
ENGINEERS + ASSOCIATES
Consulting Structural Engineers

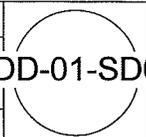
675 E. 500 S. Suite 400
Salt Lake City, Utah
P: 801.486.3883
F: 801.485.0911
www.reaveley.com

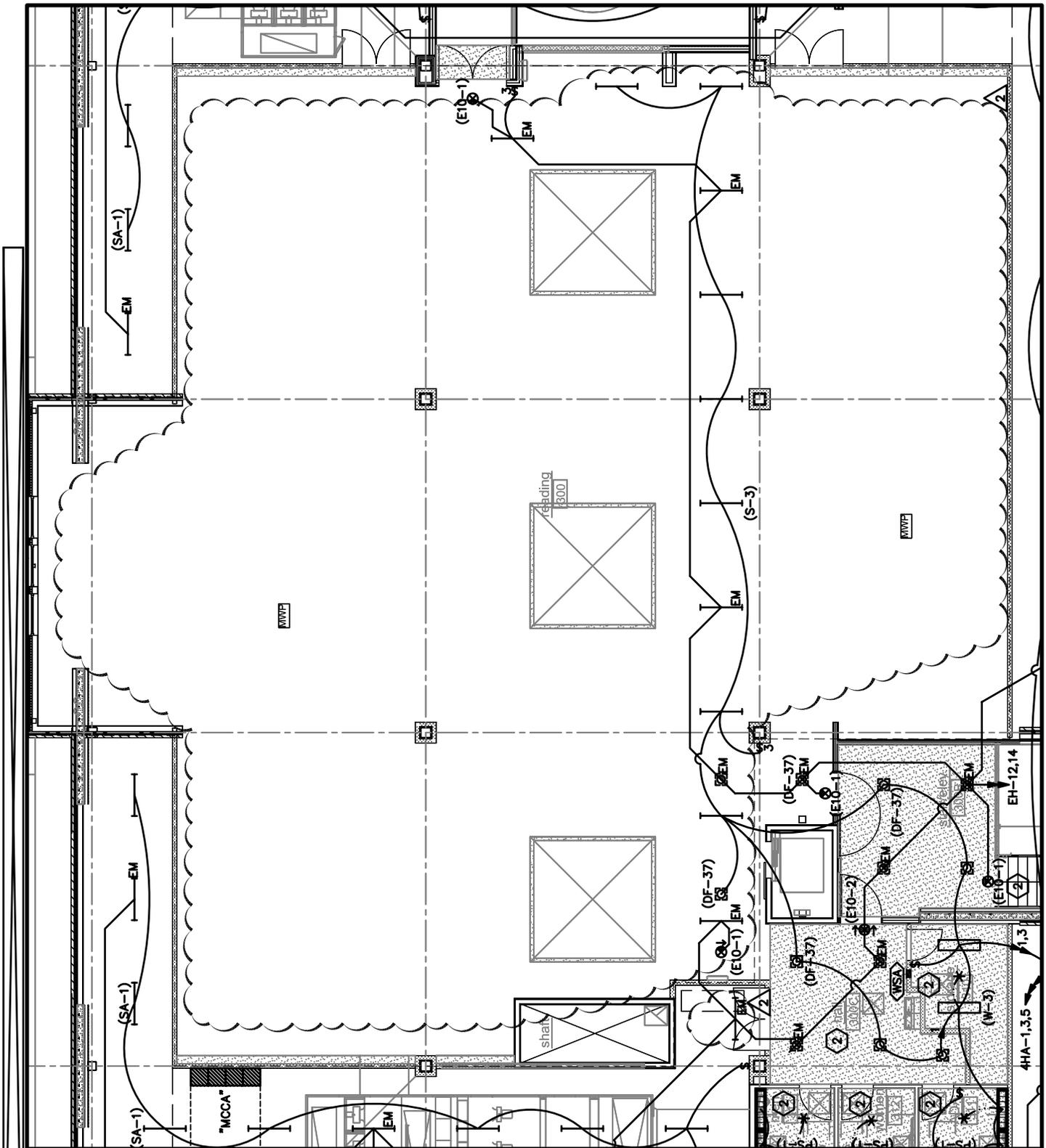
NEW DETAIL

11/21/08

Snow College Library

ADD-01-SD01





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|-------------|------------|
| REFERENCE: | EL-104 |
| ISSUE: | ADD2 |
| DATE: | 2008-12-02 |
| PROJ NO: | 20070473 |
| DRAWN BY: | WDA |
| CHECKED BY: | JMG |

PROJECT
 SNOW COLLEGE LIBRARY

SHEET TITLE
 LEVEL 3, ATTIC LIGHTING PLAN

SCALE
 NTS

EL-104-R2-1