# *SCHEMATIC DESIGN APPROVAL*

| | |
|---|---|
| **Name of Project:** | **UAF Critical Electrical Distribution Renewal Phase 1C** |
| **Location of Project:** | **University of Alaska Fairbanks** |
| **Project Number:** | **2011117 UTERC** |
| **Date of Request:** | **April 26, 2011** |

| | |
|---|---|
| **Total Project Cost:** | **$13,500,000** |
| **Approval Required:** | **Full Board of Regents** |
| **Prior Approvals/Actions:** | **Formal Project Approval: April 8, 2011** |

**SUPPORTING DOCUMENTS**

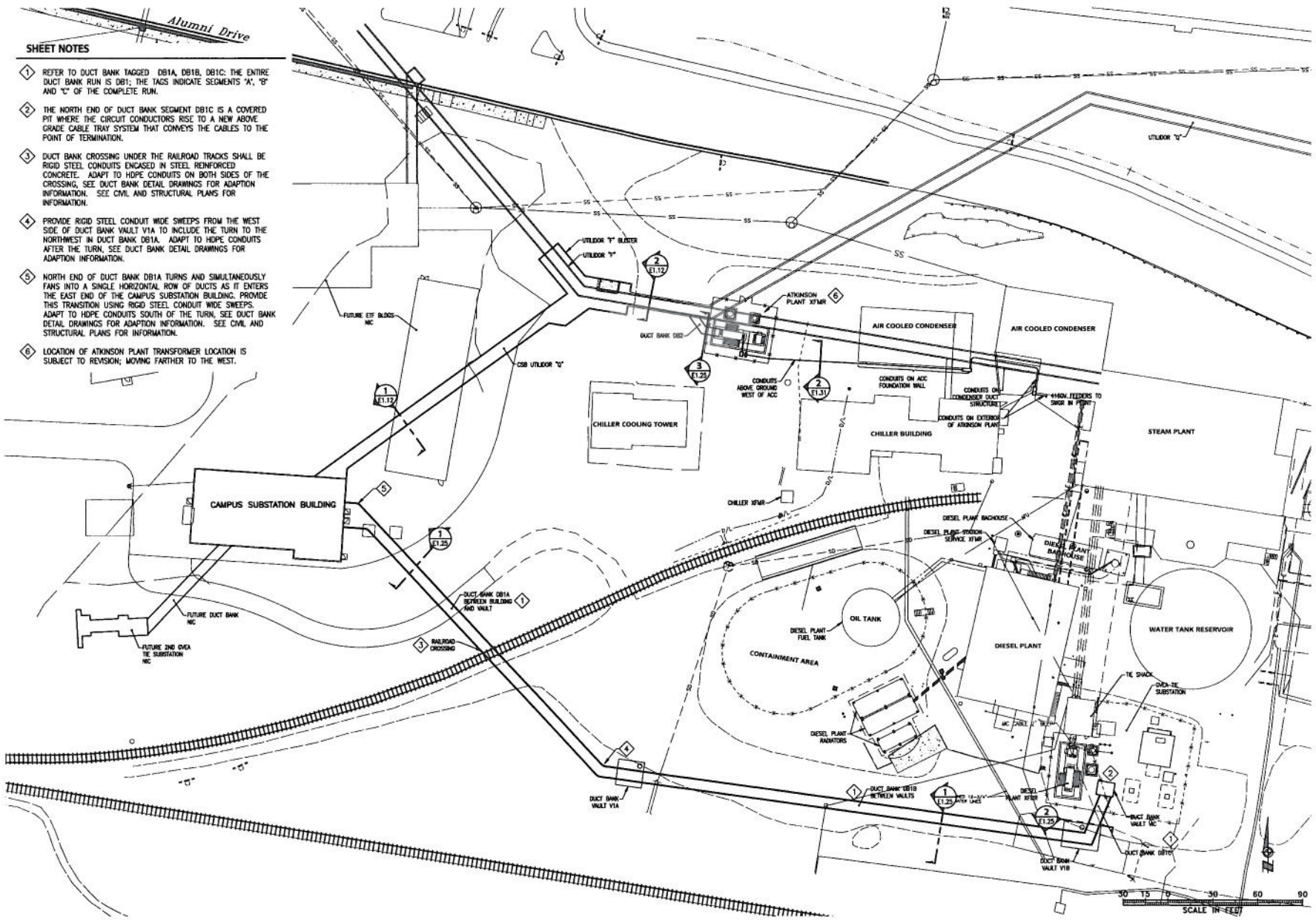
- One Page Budget
- Site Plan
- Design Drawings

| UNIVERSITY OF ALASKA | | | |
|---|---|---|---|
| Project Name: | Critical Electrical Distribution Renewal Phase 1C | | |
| MAU: | UAF | | |
| Building: | 0 | Date: | April 26, 2011 |
| Campus: | Fairbanks | Prepared By: | M. Ruckhaus |
| Project #: | 2011117 UTERC | Account No.: | 0 |
| Total GSF Affected by Project: | n/a | | |

| PROJECT BUDGET | | FPA |
|---|---|---|
| **A. Professional Services** | | |
| Advance Planning, Program Development | | $0 |
| Consultant: Design Services | | $1,000,000 |
| Consultant: Construction Phase Services | | $300,000 |
| Consul: Extra Services (List:_____) | | $0 |
| Site Survey | | $0 |
| Soils Testing & Engineering | | $0 |
| Special Inspections | | $0 |
| Plan Review Fees / Permits | | $0 |
| Other | | $0 |
| *Professional Services Subtotal* | | **$1,300,000** |
| **B. Construction** | | |
| General Construction Contract (s) | | $7,500,000 |
| Other Contractors (List:_____) | | $2,450,000 |
| Construction Contingency | | $870,625 |
| *Construction Subtotal* | | **$10,820,625** |
| *Construction Cost per GSF* | | ***N/A*** |
| **C. Building Completion Activity** | | |
| Equipment | | $0 |
| Fixtures | | $0 |
| Furnishings | | $0 |
| Signage not in construction contract | | $0 |
| Move-Out Cost/Temp. Reloc. Costs | | $0 |
| Move-In Costs | | $0 |
| Art | | $0 |
| Other (List:_____) | | $0 |
| OIT Support | | $0 |
| Maintenance/Operation Support | | $0 |
| *Building Completion Activity Subtotal* | | **$0** |
| **D. Owner Activities & Administrative Cost** | | |
| Project Planning and Staff Support | | $545,428 |
| Project Management | | $727,238 |
| Misc Expenses: Advertising, Printing, Supplies | | $0 |
| *Owner Activities & Administrative Cost Subtotal* | | **$1,272,666** |
| **E. Total Project Cost** | | **$13,393,291** |
| *Total Project Cost per GSF* | | ***N/A*** |
| **F. Total Appropriation(s)** | | **$13,500,000** |

## SHEET NOTES

1. REFER TO DUCT BANK TAGGED DB1A, DB1B, DB1C: THE ENTIRE DUCT BANK RUN IS DB1; THE TAGS INDICATE SEGMENTS "A", "B" AND "C" OF THE COMPLETE RUN.
2. THE NORTH END OF DUCT BANK SEGMENT DB1C IS A COVERED PIT WHERE THE CIRCUIT CONDUCTORS RISE TO A NEW ABOVE GRADE CABLE TRAY SYSTEM THAT CONVEYS THE CABLES TO THE POINT OF TERMINATION.
3. DUCT BANK CROSSING UNDER THE RAILROAD TRACKS SHALL BE RIGID STEEL CONDUITS ENCASED IN STEEL REINFORCED CONCRETE. ADAPT TO HDPE CONDUITS ON BOTH SIDES OF THE CROSSING, SEE DUCT BANK DETAIL DRAWINGS FOR ADAPTION INFORMATION. SEE CIVIL AND STRUCTURAL PLANS FOR INFORMATION.
4. PROVIDE RIGID STEEL CONDUIT WIDE SWEEPS FROM THE WEST SIDE OF DUCT BANK VAULT V1A TO INCLUDE THE TURN TO THE NORTHWEST IN DUCT BANK DB1A. ADAPT TO HDPE CONDUITS AFTER THE TURN, SEE DUCT BANK DETAIL DRAWINGS FOR ADAPTION INFORMATION.
5. NORTH END OF DUCT BANK DB1A TURNS AND SIMULTANEOUSLY FANS INTO A SINGLE HORIZONTAL ROW OF DUCTS AS IT ENTERS THE EAST END OF THE CAMPUS SUBSTATION BUILDING. PROVIDE THIS TRANSITION USING RIGID STEEL CONDUIT WIDE SWEEPS. ADAPT TO HDPE CONDUITS SOUTH OF THE TURN, SEE DUCT BANK DETAIL DRAWINGS FOR ADAPTION INFORMATION. SEE CIVIL AND STRUCTURAL PLANS FOR INFORMATION.
6. LOCATION OF ATKINSON PLANT TRANSFORMER LOCATION IS SUBJECT TO REVISION; MOVING FARTHER TO THE WEST.




CONSULTANT :

STATE OF ALASKA 49TH
Michael S. Dunbeling
May 24, 2010
EE-8705
REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5329

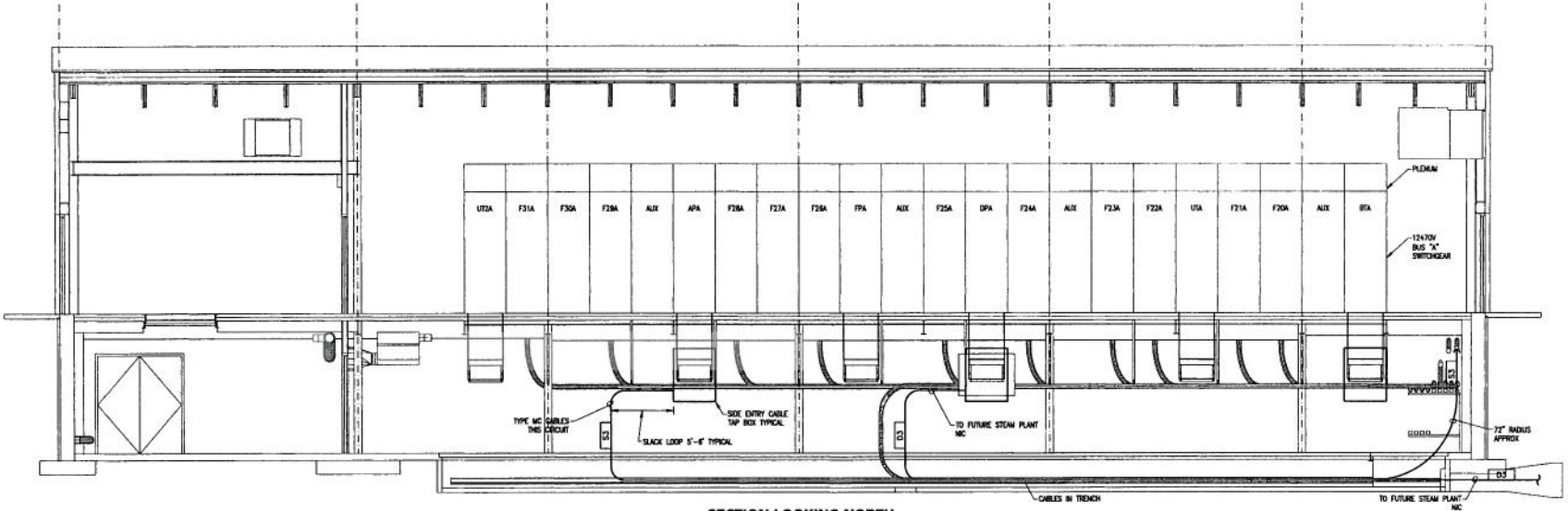
PROJECT :
UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE :
OVERALL SITE PLAN

| | |
|---|---|
| DESIGN | A.R |
| DRAWN | J.C |
| CHECKED | MW |
| DATE | MAY 25, 200 |

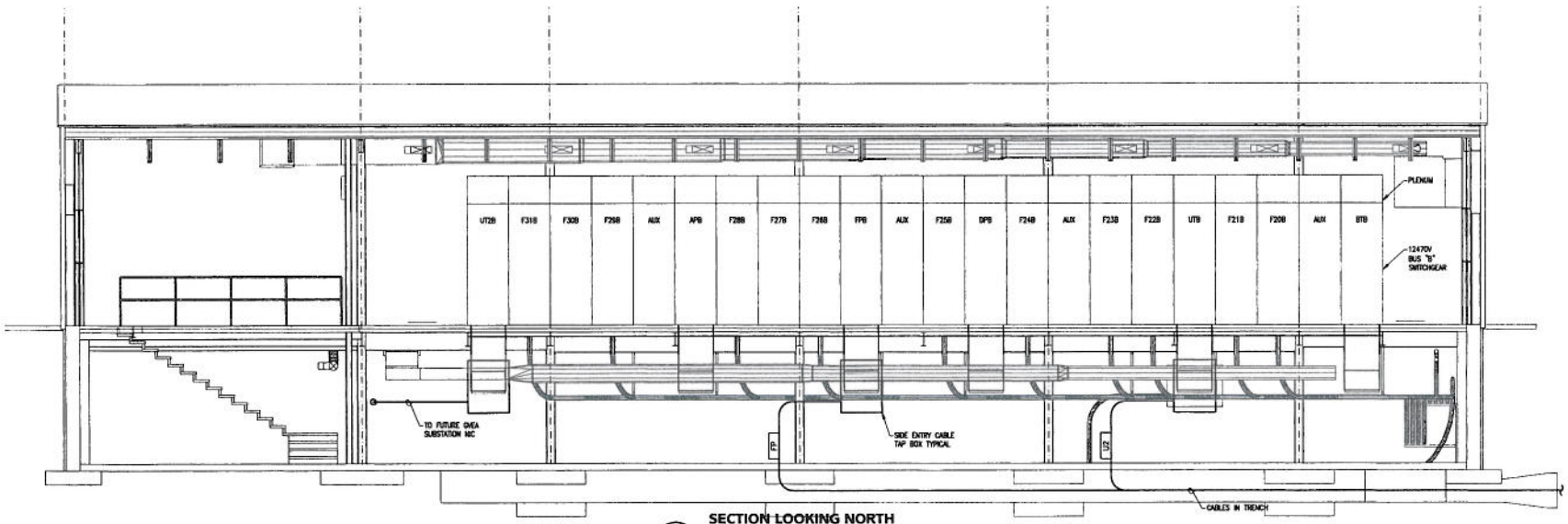
PROJECT No. F08085.01

SHEET NUMBER E1.01 OF 136 SHEETS




1 E2.63 **SECTION LOOKING NORTH CAMPUS SUBSTATION BUILDING**

4 2 0 4 8 12 FEET




2 E2.63 **SECTION LOOKING NORTH CAMPUS SUBSTATION BUILDING**

4 2 0 4 8 12 FEET

CONSULTANT :

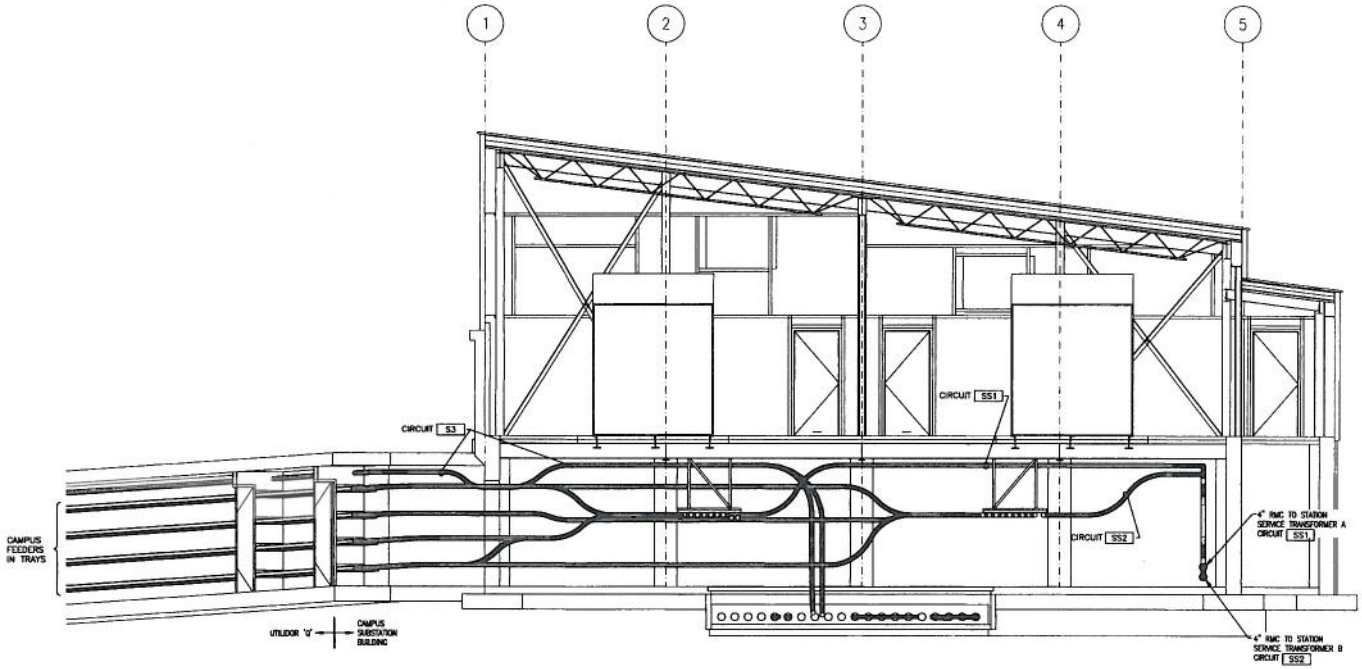
STATE OF ALASKA 49TH
Michael S. Grubbs
May 25, 2010
EE-8705
REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5329

PROJECT :
UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE :
CSB EQUIPMENT DETAILS

| | |
|---|---|
| DESIGN | AJS |
| DRAWN | JLC |
| CHECKED | MSG |
| DATE | MAY 25, 2010 |
| PROJECT No. | F08085.01 |
| SHEET NUMBER | E2.63 |
| OF 136 | SHEETS |




1 E2.62 **SECTION LOOKING EAST**
**CAMPUS SUBSTATION BUILDING**

4 2 0 4 8 12 FEET

CONSULTANT :

STATE OF ALASKA 49TH
Walter S. Gaskins
May 24, 2010
EE-8705
REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5329

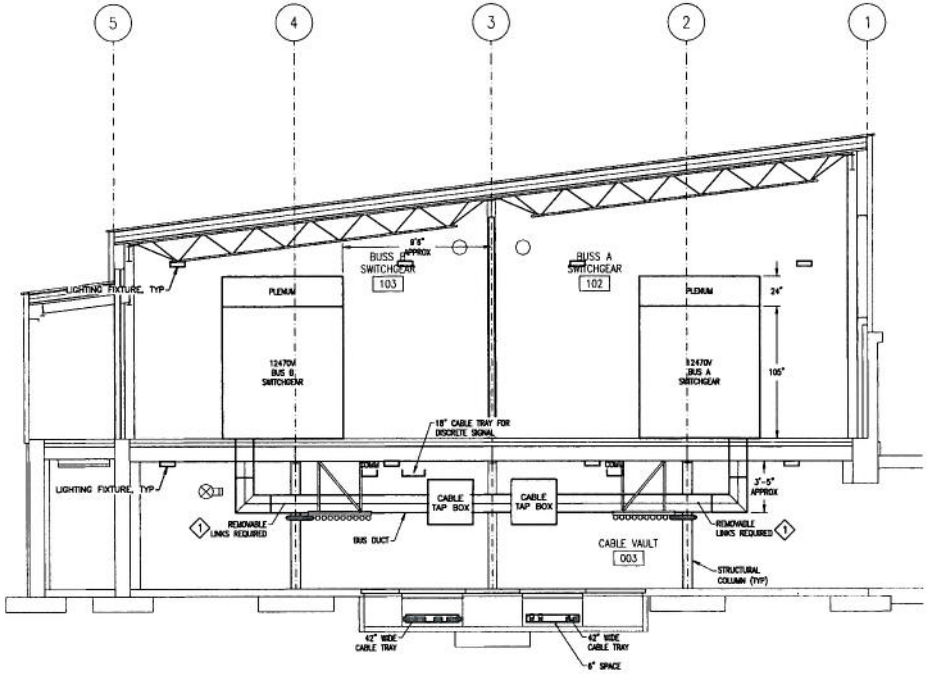
PROJECT :
UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE :
CSB EQUIPMENT
DETAILS

| | |
|---|---|
| DESIGN | AJS |
| DRAWN | JJC |
| CHECKED | WSG |
| DATE | MAY 25, 2010 |

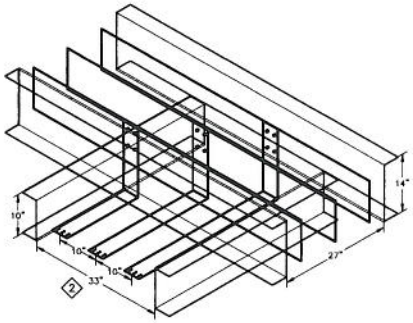
PROJECT No.
F08085.01

SHEET NUMBER
E2.62
OF 136 SHEETS

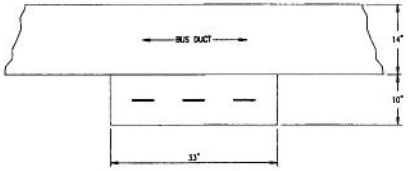



1 E2.61 **SECTION LOOKING WEST**
**CAMPUS SUBSTATION BUILDING**

4 2 0 4 8 12 FEET




2 E2.61 **SIDE ENTRY**
**BUS DUCT CABLE TAP BOX**
NTS




3 E2.61 **VIEW INTO BUS DUCT**
**CABLE TAP BOX CABLE ENTRY**
NTS

## SHEET NOTES

1. REMOVABLE LINKS REQUIRED TO ALLOW ISOLATION OF ONE SWITCHGEAR FROM THE BUS DUCT WHEN THE BUS DUCT IS ENERGIZED. THE REMOVABLE LINKS WILL BE REMOVED WITH THE BUS DUCT DEAD, AND BE ACCESSED BY REMOVING INDENTIFIED BUS DUCT COVERS. THE CONSTRUCTION OF THE BUS DUCT BUSSING, REMOVABLE LINKS, AND SUPPORTING INSULATING STRUCTURE SHALL BE SUCH THAT IT IS SAFE TO ENERGIZE THE BUS DUCT WITH THE LINKS REMOVED WITHOUT COMPROMISING THE FULL VOLTAGE, BIL, AND MOMENTARY CURRENT RATINGS OF THE BUS DUCT.

2. BUS DUCT CABLE TAP BOXES SHALL INCLUDE A TERMINATION ENCLOSURE THAT IS NOT SHOWN ON THE DETAILS OR PLANS. THE ENCLOSURES SHALL BE MATCHED TO THE CABLE TAP BOXES AND HOUSE THE 15KV CABLE TERMINATIONS WITHIN TO PRESENT A SAFE, DEAD-FRONT SURFACE TO PERSONNEL WHO CONTACT THE ENCLOSURE. THE ENCLOSURE SHALL BE SUITABLE FOR JACKETED TYPE MC CABLES OR MV-105 CABLES; QUANTITY AND SIZES AS INDICATED ON THE PLANS.

CONSULTANT :

STATE OF ALASKA 49TH Michael S. Stoddard May 24, 2010 EE-9705 REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5329

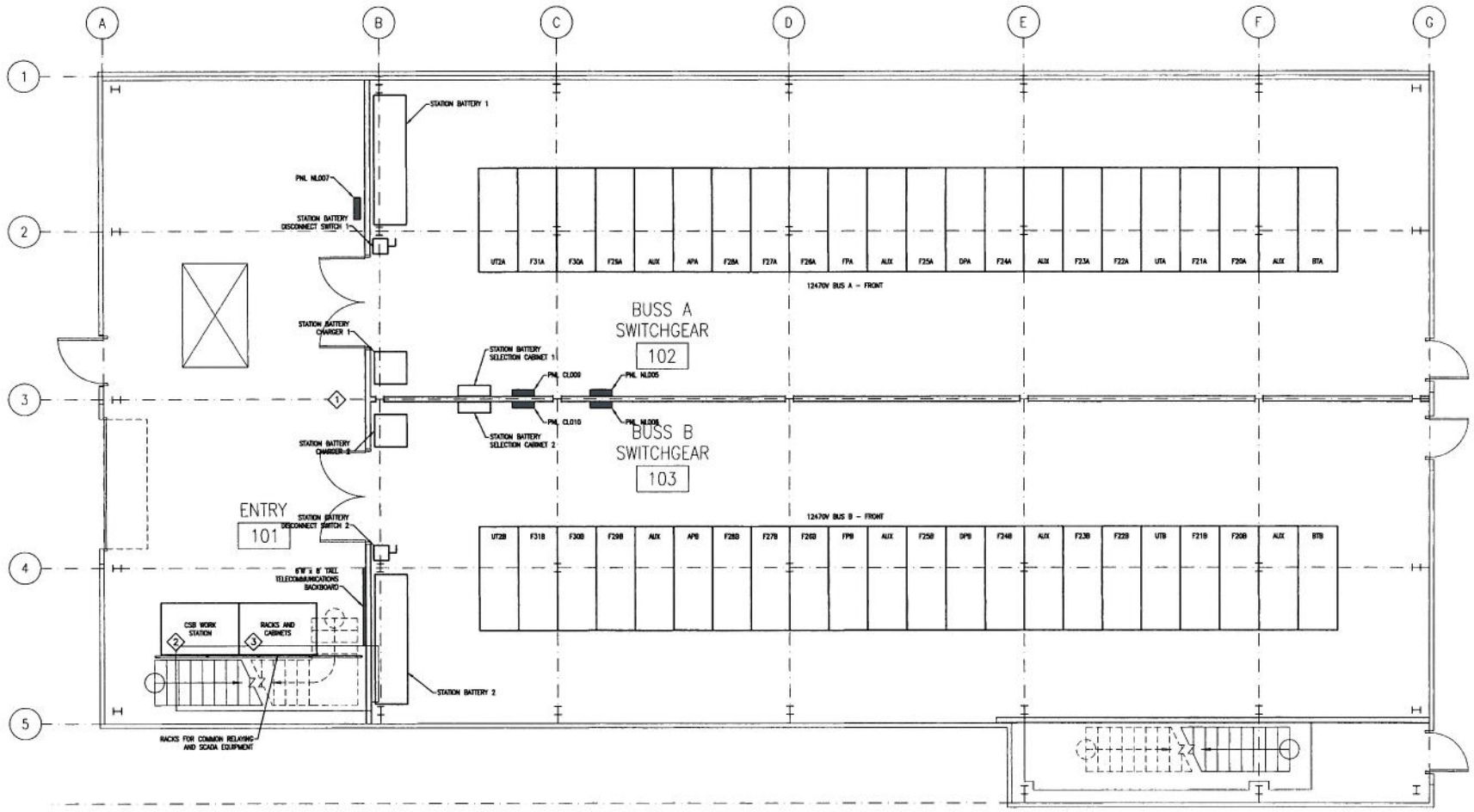
PROJECT : UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE : CSB EQUIPMENT DETAILS

| | |
|---|---|
| DESIGN | AJS |
| DRAWN | JLC |
| CHECKED | MSS |
| DATE | MAY 25, 2010 |

PROJECT No. F08085.01

SHEET NUMBER E2.61 OF 136 SHEETS




1 / E2.52 **CSB EQUIPMENT PLAN - GROUND LEVEL**

4 2 0 4 8 12 FEET

## SHEET NOTES

1. MOUNT NOTHING ON WEST SIDE OF WALLS BETWEEN DOUBLE DOORS AND GRID 3. THIS PORTION OF THE WALL MAY NEED TO BE REMOVED IF SWITCHGEAR REPLACEMENT BECOMES NECESSARY.

2. AREA DESIGNATED "CSB WORK STATION" REPRESENTS A DESK, CHAIR, COMPUTER TERMINAL, AND RELATED EQUIPMENT TO SERVE AS A LOCAL TERMINAL FOR THE SCADA SYSTEM.

3. AREA DESIGNATED "RACKS AND CABINETS" REPRESENTS EQUIPMENT RACKS, AND RELATED EQUIPMENT COMPOSED OF COMMON ELEMENTS FOR ELECTRICAL SYSTEM RELATED RELAY SIGNAL PROCESSING AND SCADA (UAF AND GVEA). THESE ELEMENTS ARE PHYSICALLY ISOLATED FROM THE CAMPUS DISTRIBUTION SWITCHGEARS SO THEY REMAIN FUNCTIONAL SHOULD DAMAGE OCCUR TO ONE OF THE SWITCHGEARS.

CONSULTANT :

STATE OF ALASKA 49TH Michael S. Gouding May 24, 2010 EE-8796 REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5520

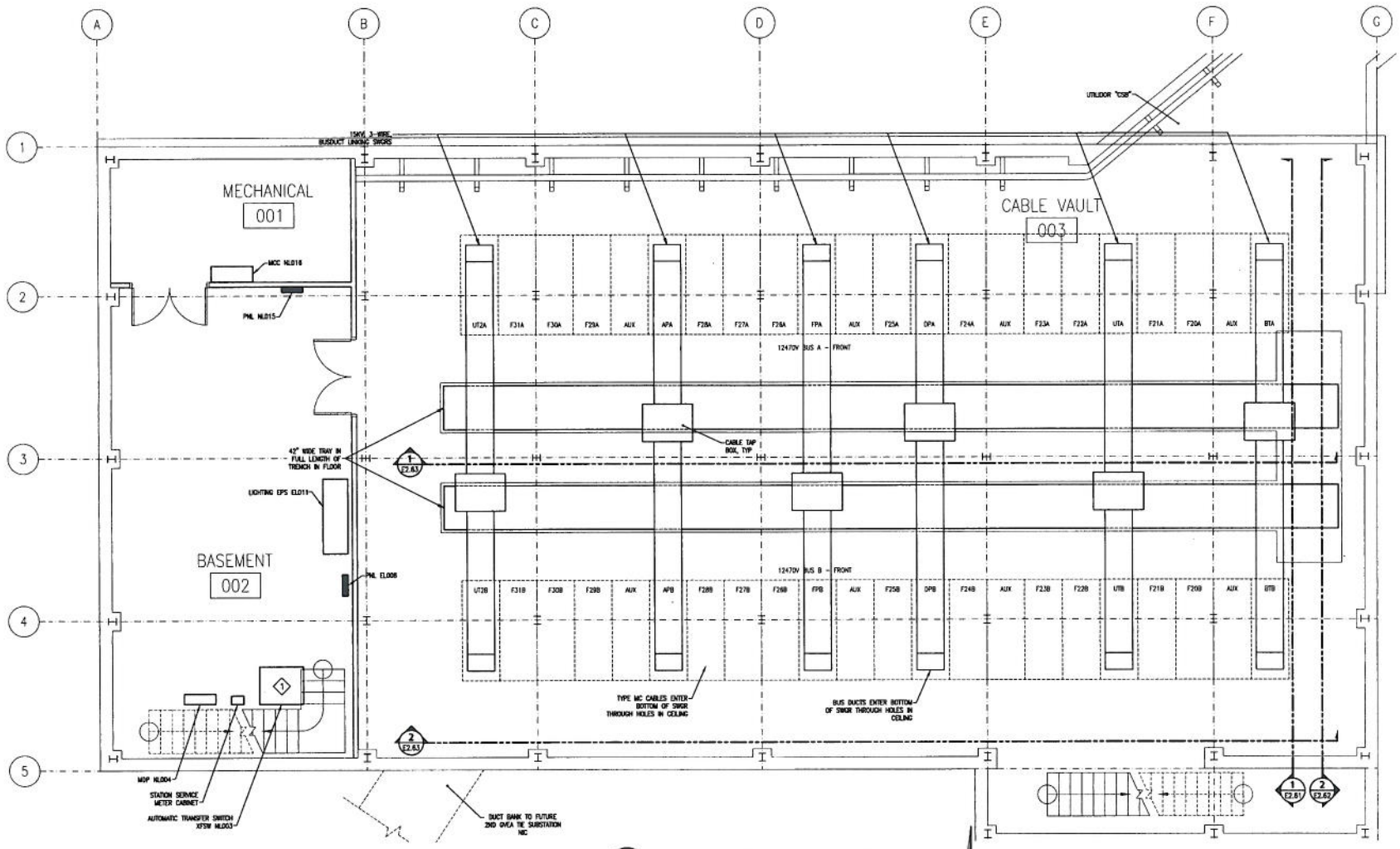
PROJECT :
UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE :
CSB EQUIPMENT PLAN
GROUND LEVEL

| | |
|---|---|
| DESIGN | AJS |
| DRAWN | JJC |
| CHECKED | MSG |
| DATE | MAY 25, 2010 |

PROJECT No. F08085.01

SHEET NUMBER E2.52 OF 130 SHEETS




1 E2.51 **CSB EQUIPMENT PLAN - BASEMENT**

4 2 0 4 8 12 FEET

N

## SHEET NOTES

1. BELOW-SLAB SERVICE ENTRANCE CONDUITS ENTER BOTTOM OF AUTOMATIC TRANSFER SWITCH.
2. SEE SHEET E2.53 FOR CABLE ROUTING PLAN IN BASEMENT.

CONSULTANT :

STATE OF ALASKA 49TH Michael S. Goulding May 24, 2010 EE-8706 REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5329

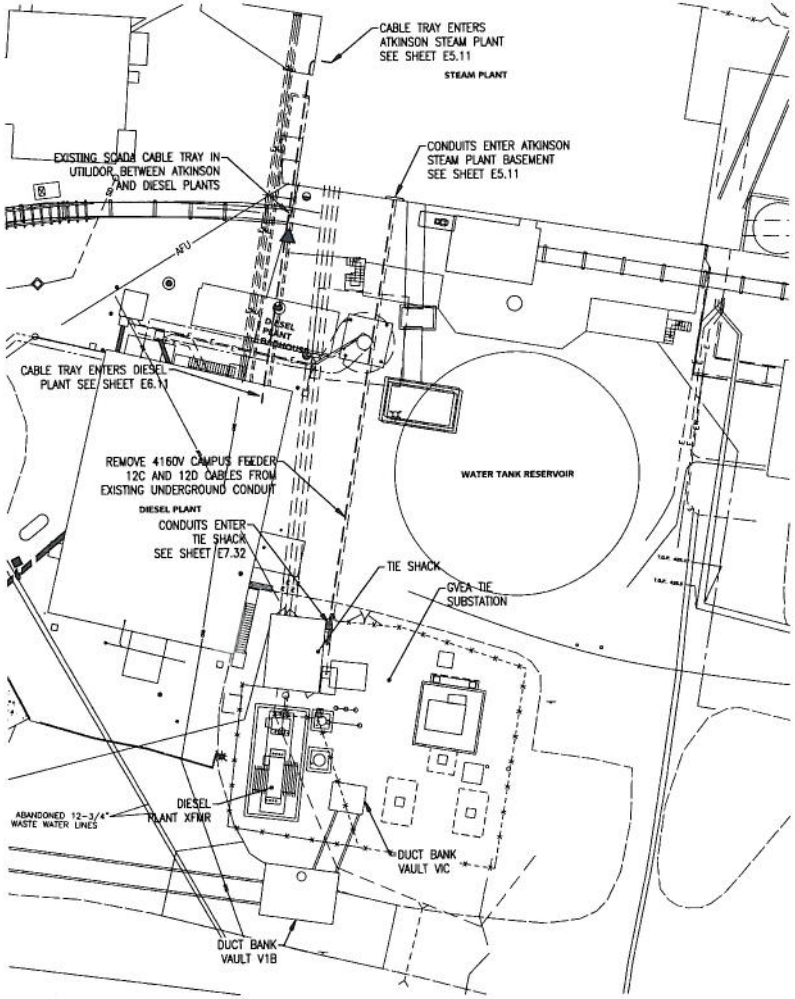
PROJECT :
UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE :
CSB EQUIPMENT PLAN
BASEMENT

| | |
|---|---|
| DESIGN | AJS |
| DRAWN | JLC |
| CHECKED | MM |
| DATE | MAY 25, 2010 |

PROJECT No. F08085.01

SHEET NUMBER E2.51 OF 136 SHEETS




1 E7.11 **POWER PLANTS OVERALL SITE PLAN**

20 10 0 20 40 60 FEET

CONSULTANT :

STATE OF ALASKA 49TH Michael S. Dowling May 25, 2010 CE 8318 REGISTERED PROFESSIONAL ENGINEER

PDC INC. ENGINEERS
1028 Aurora Drive, Fairbanks, Alaska 99709-5329

PROJECT :
UNIVERSITY OF ALASKA FAIRBANKS
CRITICAL ELECTRICAL DISTRIBUTION
RENEWAL, PHASE 1B
UAF PROJECT NO. 2010098 UTERB
FAIRBANKS, ALASKA

SHEET TITLE :
POWER PLANTS
OVERALL SITE PLAN

| | |
|---|---|
| DESIGN | A.B. |
| DRAWN | J.C. |
| CHECKED | MSD |
| DATE | MAY 25, 2010 |

PROJECT No.
F08085.01

SHEET NUMBER
E7.11
OF 136 SHEETS