



SCHEMATIC DESIGN APPROVAL

Name of Project: Antenna Installation Alaska Satellite Facility AS311
Project Type: New Construction
Location of Project: UAF, Fairbanks Campus
Project Number: 2013029 AIASF
Date of Request: May 13, 2013

Total Project Cost:	\$ 6,000,000	(Phase II amount \$ 5,000,000)
Approval Required:	Full BOR	
Prior Approvals:	Preliminary Administrative Approval	August 15, 2012
	Formal Project Approval Ph I	August 20, 2012
	Schematic Design Approval Ph I	August 20, 2012
	Formal Project Approval (Full Project)	December 7, 2012

A Schematic Design Approval (SDA) is required for all Capital Projects with a Total Project Cost in excess of \$250,000.

SDA represents approval of the location of the facility, its relationship to other facilities, the functional relationship of interior areas, and the basic design including construction materials, mechanical, electrical, technology infrastructure and telecommunications systems, and any other changes to the project since formal project approval. Unless otherwise designated by the approval authority or a material change in the project is subsequently identified, SDA also represents approval of the proposed cost of the next phases of the project and authorization to complete the design development process, to bid and award a contract within the approved budget, and to proceed to completion of project construction. Provided however, if a material change in the project is subsequently identified, such change will be subject to the approval process.

Action Requested

“The Facilities and Land Management Committee recommends that the Board of Regents approve the Schematic Design Approval request for the University of Alaska Fairbanks Antenna Installation Alaska Satellite Facility AS311 as presented in compliance with the campus master plan, and authorizes the university administration to complete construction bid documents to bid and award a contract within the approved budget, and to proceed to completion of project construction not to exceed a Total Project Cost of \$6,000,000. This motion is effective June 6, 2013.”

Project Abstract

The project, to be completed in two phases, will install a new and improved satellite dish west of the IARC Building on the West Ridge Campus. As part of this project, NASA will improve the ski trails adjacent to the two satellite dishes.

RATIONALE AND RECOMMENDATION

Background

Alaska Satellite Facility (ASF) is part of the Geophysical Institute at UAF and employs approximately 50 individuals responsible for a variety of technical functions. For nearly 20 years, ASF has operated two satellite tracking antenna systems on behalf of NASA. The two antenna systems operated by ASF include a 10-meter antenna (designated AS2) on the roof of the Elvey building and an 11-meter antenna (designated AS1) in the forest on North Campus.

One of the existing antennas, AS2 on top of Elvey, has surpassed its operational period and NASA intends to replace it with a system similar in size and function to the AS1 system that is located west of the IARC Building. Preliminary site and structural analysis and NASA's logistical study determined that direct replacement of the antenna on Elvey was not cost effective. It would require structural upgrades to the building due to the fact that the new 11-meter antenna is larger than the 10-meter antenna and rotates faster with more torsion forces when it stops.

A number of sites were reviewed for the possible location of the replacement antenna and were determined not to be suitable. The reasons for unsuitability, included but are not limited to, lack of power and communication infrastructure, obstructions to Elvey Building, wetlands, poor soil conditions and ice lenses, cutting down numerous trees, and potential radio frequency interference (RFI) from existing cellular communication towers. The other sites that were reviewed were the Large Animal Research Station (LARS), Range Road, Animal Paddock, North Taku, Agricultural Fields, and the West Ridge site west of the existing AS1 antenna. ASF, in concurrence with the North Campus Committee and UAF Master Planning Committee, determined the West Ridge site east of the existing AS1 antenna as the most suitable site.

Programmatic Need

The ASF satellite tracking program that includes the AS1, AS2 and AS3 antennas employs approximately 50 people at UAF doing a variety of technical functions. This program supports the down-linking science data from NASA and partner spacecraft to support spacecraft operations. In this capacity, ASF has grown to be one of the premier university-operated ground stations in the world. NASA funds ASF in excess of \$7M per year to support the NASA SAR Data Center. This project supports the university's research and academic partnering goals.

Project Scope

- Phase I: Phase One was completed in the summer of 2012. It involved site work on an area of approximately 150 feet by 150 feet, foundation and construction of a 20-foot high concrete base. The site preparation included clearing brush and trees, excavation and trenching, grading and improvements to the existing service road. It also included realigning the adjacent existing ski trail and expanding the training/ski head area for beginners.
- Phase II: Phase Two work will complete the concrete base and the required attachment system to install the pre-assembled 40 foot high L-3 Datron 11 meter antenna dish, tie-ins of the communications and electrical system. The L-3 Datron antenna will be shipped in pre-assembled sections that will be fully assembled on site for installation.

Project Impacts

The construction of this new satellite dish will temporarily limit access to the immediate area of the proposed dish. During the summer, this area is used for running, walking and/or hiking. While the area is closed, other trails will remain available to use. The site is located a sufficient distance away from the

main campus thoroughfare such that there will be limited construction noise for the building occupants of West Ridge, unless they are hiking or walking in the woods nearby.

Variances

None

Total Project Cost and Funding Sources

<u>Funding Title</u>	<u>Fund Account</u>	<u>Amount</u>
Phase 1 Funding		
FY13	100% NASA Funded	\$1,000,000
Phase 1 Project Cost		\$1,000,000
Phase 2 Funding		
FY14	100% NASA Funded	\$5,000,000
Phase 2 Project Cost		\$5,000,000
Total Project Cost		\$6,000,000

Total funding for this project estimated at \$6,000,000 is fully funded through NASA and its contracting partner ITT Exelis.

Annual Program and Facility Cost Projections

There are no anticipated costs for which the university will be responsible. O&M costs for this project are fully funded through NASA. NASA funds ASF approximately \$1.75M per year to operate and maintain the antennas.

Project Schedule

Design/Build Pre-Design & Design	June 2012 – August 2012
Construction	
Phase I (site clearing and foundation)	August 2012 – October 2012
Phase II (concrete base and assembly)	June 2013 – September 2013
Commissioning and Testing	September 2013 – November 2013
Mission Readiness	December 2013 – January 2014

Project Delivery Method

Method of project delivery will be Design-Bid-Build.

Supporting Documents

One-Page Budget

Drawings:

- Reflector Assembly Area Foundation (Figure 2.1)
- Vicinity Map (Plan C1.1)
- Civil Site Plan (Plan C1.2)
- Cross Section (C1.3)
- Structural General (S1.1)
- Structural and Section Details (S2.0)

Affirmation

This project complies with Regents' Policy and the campus master plan.

Approvals

The level of approval required for SDA shall be based upon the estimated TPC as follows:

- **TPC > \$4.0 million will require approval by the Board based on the recommendations of the Facilities and Land Management Committee (FLMC).**
- TPC > \$2.0 million but not more than \$4.0 million will require approval by the FLMC.
- TPC > \$1.0 million but not more than \$2.0 million will require approval by the Chair of the FLMC.
- $\text{TPC} \leq \$1.0$ million will require approval by the AVP of Facilities and Land Management.

UNIVERSITY OF ALASKA		
Project Name: Antenna Installation Alaska Satellite Facility AS311		
MAU: UAF		
Building: 0	Date: May 13, 2013	
Campus: UAF	Prepared By: Jonathan Shambare	
Project #: 2013029	Account No.: 0	
Total GSF Affected by Project: 1,600		
PROJECT BUDGET	FPA Budget	SDA Budget
A. Professional Services		
Advance Planning, Program Development	\$0	\$0
Consultant: Design Services	\$180,000	\$180,000
Consultant: Construction Phase Services	\$0	\$0
Consul: Extra Services (List: _____)	\$0	\$0
Site Survey	\$0	\$0
Soils Testing & Engineering	\$0	\$0
Special Inspections	\$0	\$0
Plan Review Fees / Permits	\$0	\$0
Other	\$0	\$0
<i>Professional Services Subtotal</i>	\$180,000	\$180,000
B. Construction		
General Construction Contract (s)	\$700,000	\$700,000
Other Contractors (List: _____)	\$0	\$0
Construction Contingency	\$63,000	\$63,000
<i>Construction Subtotal</i>	\$763,000	\$763,000
<i>Construction Cost per GSF</i>	\$476.88	\$476.88
C. Building Completion Activity		
Equipment	\$5,014,000	\$5,014,000
Fixtures	\$0	\$0
Furnishings	\$0	\$0
Signage not in construction contract	\$0	\$0
Move-Out Cost/Temp. Reloc. Costs	\$0	\$0
Move-In Costs	\$0	\$0
Art	\$0	\$0
Other (List: _____)	\$0	\$0
OIT Support	\$0	\$0
Maintenance/Operation Support	\$0	\$0
<i>Building Completion Activity Subtotal</i>	\$5,014,000	\$5,014,000
D. Owner Activities & Administrative Cost		
Project Planning and Staff Support	\$15,000	\$15,000
Project Management	\$23,000	\$23,000
Misc Expenses: Advertising, Printing, Supplies	\$5,000	\$5,000
<i>Owner Activities & Administrative Cost Subtotal</i>	\$43,000	\$43,000
E. Total Project Cost	\$6,000,000	\$6,000,000
<i>Total Project Cost per GSF</i>	\$3,750.00	\$3,750.00
F. Total Appropriation(s)	\$6,000,000	\$6,000,000

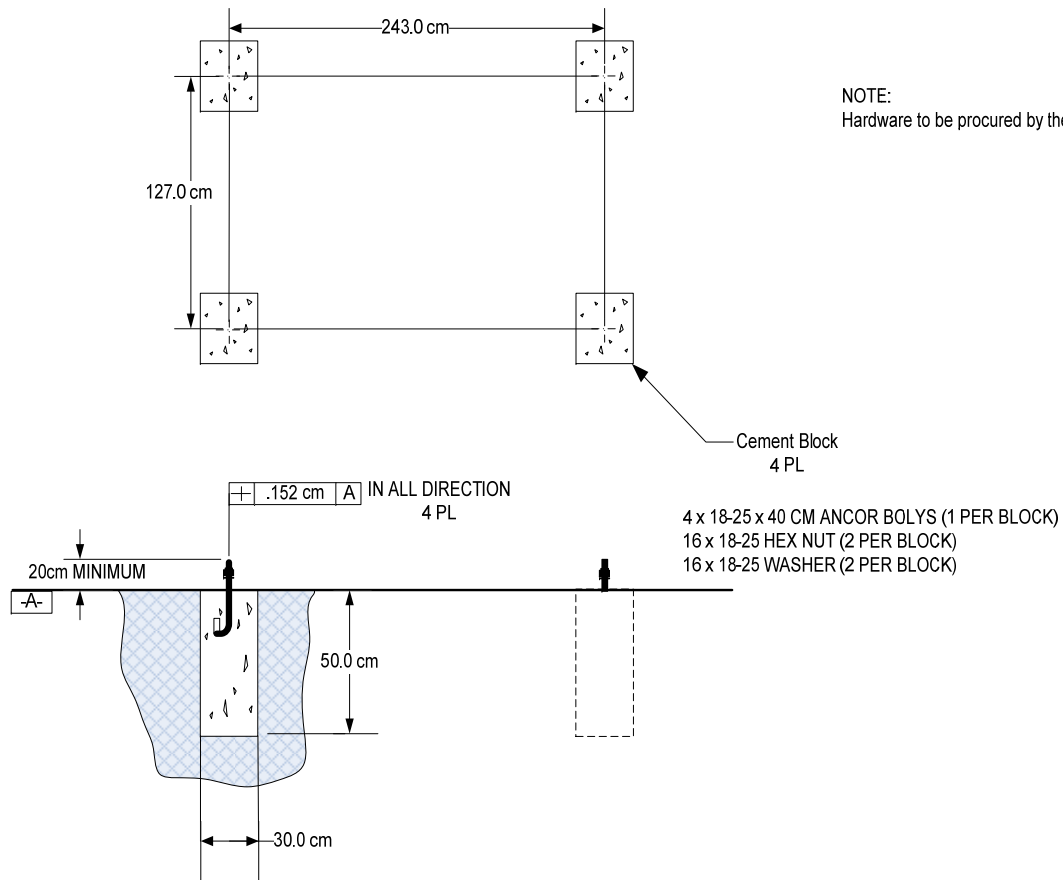
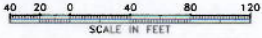


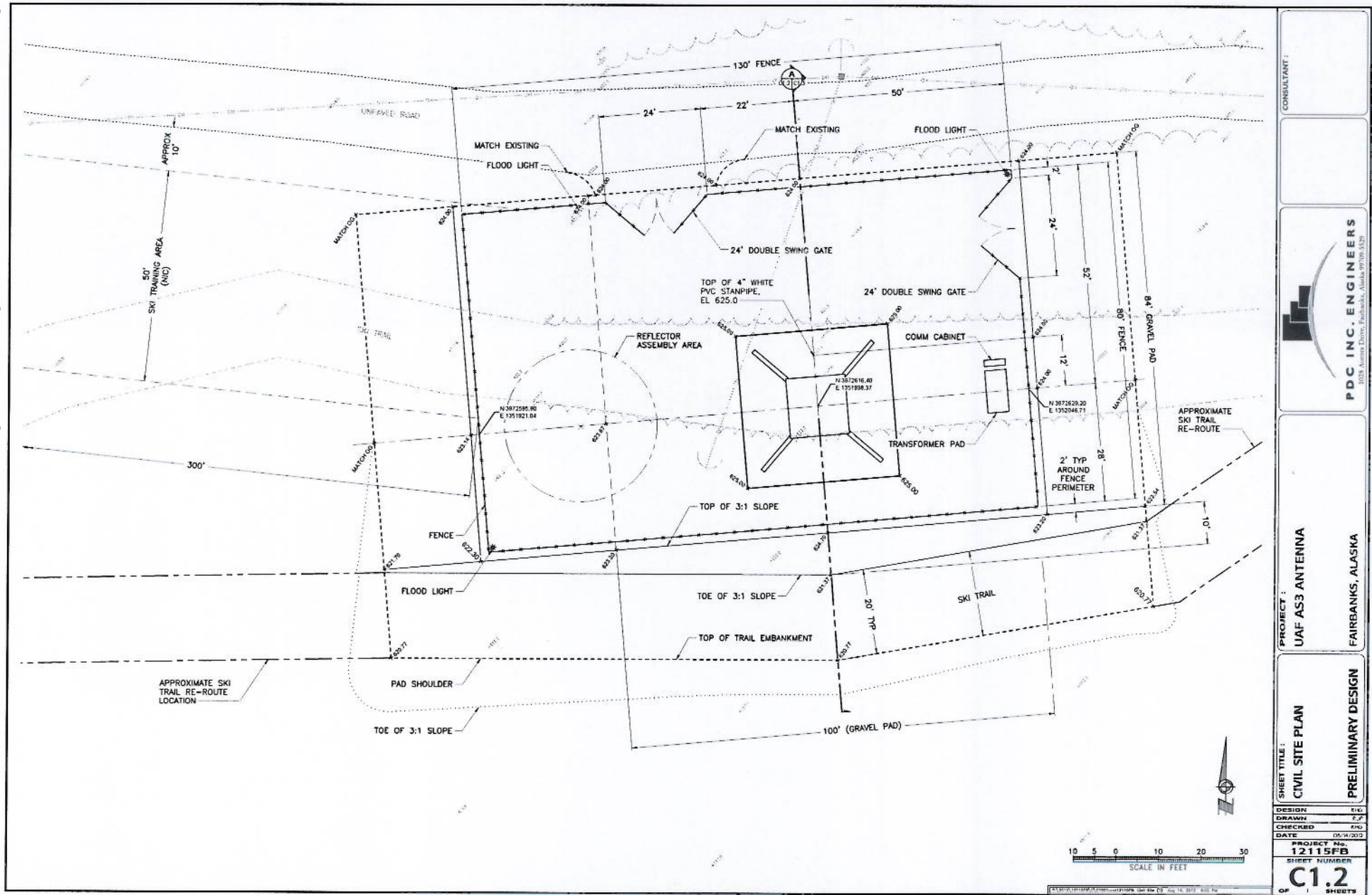
Figure 2.1 Reflector Assembly Area Foundation

PROJECT
ITTJOB NO.
AS3SITE NAMES
UAF FAIRBANKS, AK

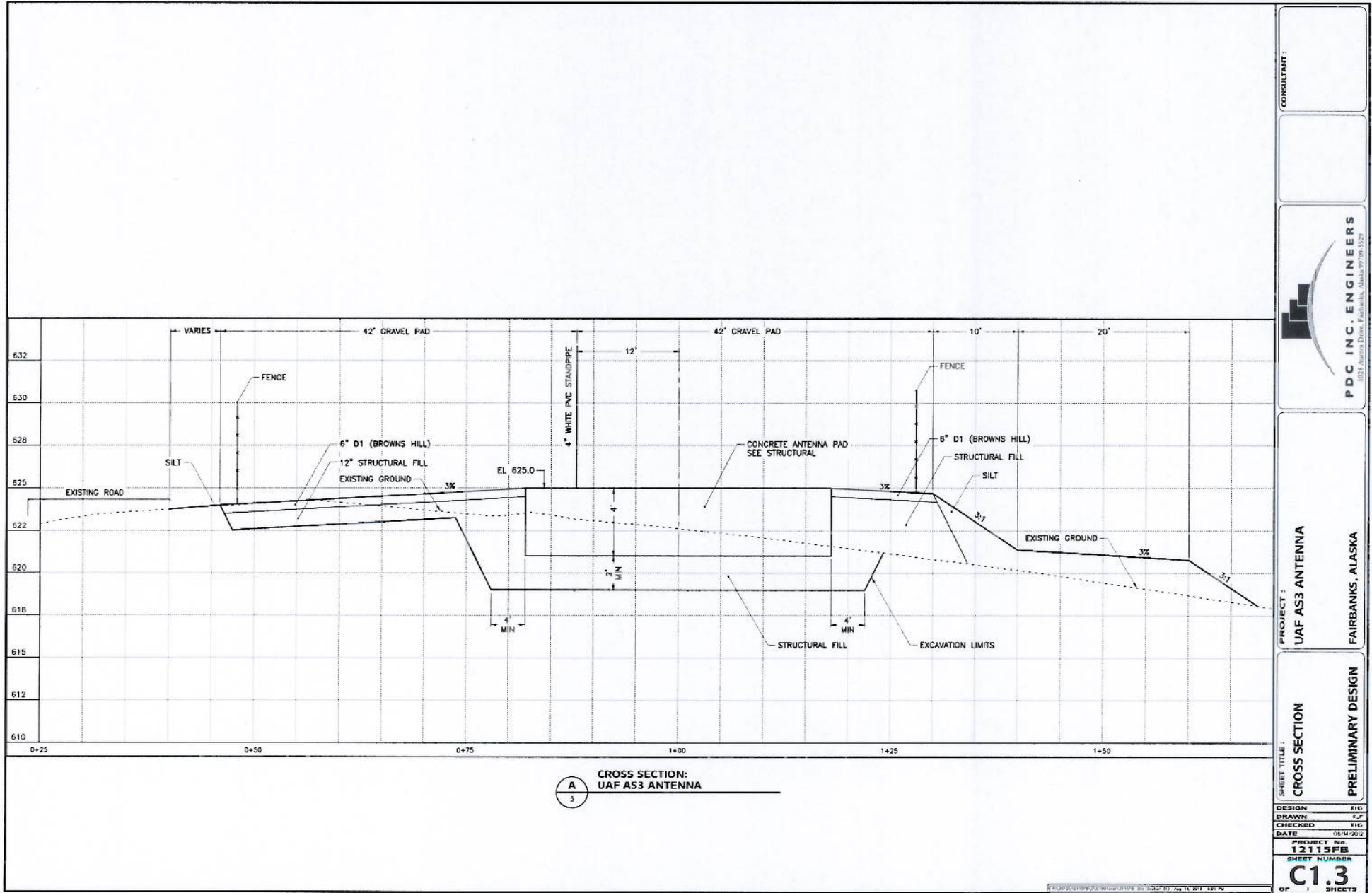
SDA - Phase II, Antenna Installation Alaska Satellite Facility AS311



CONSULTANT:	
 PDC INC. ENGINEERS 1004 Yuma Drive, Fairbanks, Alaska 99709-6529	
PROJECT:	UAF AS3 ANTENNA
FAIRBANKS, ALASKA	
SHEET TITLE:	VICINITY MAP
PRELIMINARY DESIGN	
DESIGN	END
DRAWN	END
CHECKED	END
DATE	08/14/2012
PROJECT No. 12115FES	
SHEET NUMBER C1.1	
OF 1 SHEETS	



SDA - Phase II, Antenna Installation Alaska Satellite Facility AS311



UNLESS REFERRED TO AS EXISTING OR BY OTHERS, ALL WORK ON THESE DRAWINGS SHALL BE CONSIDERED NEW AND SHALL BE PROVIDED UNDER THIS CONTRACT. ANTENNA INSTALLATION IS NOT PART OF THIS CONTRACT.

STRUCTURAL DESIGN DATA

LIVE LOADS:

SNOW LOAD	50 PSF	
OVER TURNING MOMENT	452 K-FT	APPLIED AT TOP OF CONC VAULT
SHEAR FORCE	10 K	APPLIED AT TOP OF CONC VAULT
MAX DOWN FORCE	69 K	APPLIED AT TOP OF CONC VAULT

SEISMIC LOADS:

IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (IBC) 2006 EDITION.

- SITE CLASS = D
- $I = 1.0$
- $S_s = 1.12g$
- $S_1 = 0.31g$
- SEISMIC USE GROUP = 2
- SEISMIC DESIGN CATEGORY = D

SERVICEABILITY LOADS:

- FOUNDATION STIFFNESS = 2.7 E-10 RAD/IN-IN-LBS/MIN

FOUNDATION NOTES

- MAT SHALL BE FOUNDED UPON COMPACTED STRUCTURAL FILL, WITH AN ALLOWABLE BEARING CAPACITY OF 2,000 PSF.
- ALL ORGANIC AND OR OTHER UNSUITABLE MATERIALS SHALL BE REMOVED FROM SUBGRADE AND BACKFILL AREAS.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY FROST OR ICE FROM PENETRATING ANY FOOTING OR SLAB SUBGRADE BEFORE AND AFTER PLACING OF CONCRETE UNTIL SUCH SUBGRADES ARE FULLY PROTECTED BY THE PERMANENT BUILDING STRUCTURE.

STRUCTURAL CONCRETE NOTES

- ALL CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING BARS SHALL BE NEW BILLET STEEL CONFORMING TO THE STANDARDS OF ASTM A615, GRADE 60, EXCEPT AS NOTED.
- ALL CONCRETE REINFORCEMENT SHALL BE DETAIL, FABRICATED, LABELED, SUPPORTED AND SPACED IN FORMS AND SECURED IN PLACE IN ACCORDANCE WITH THE PROCEDURES AND REQUIREMENTS OUTLINED IN THE LATEST EDITION OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" - ACI 318 AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" - ACI 315.
- DOWELS SHALL MATCH SIZE AND NUMBER OF MAIN REINFORCING.
- MINIMUM CONCRETE COVER SHALL BE:
 - 3" FOR CONCRETE CAST AGAINST THE EARTH.
 - 2" FOR BARS EXPOSED TO EARTH OR WEATHER AND IN WALLS.
- CHAMFER ALL EXPOSED CORNERS 1".
- ALL CONCRETE SHALL CONTAIN AN APPROVED AIR ENTRAINING ADMIXTURE.
- UNLESS NOTED OTHERWISE, THE FOLLOWING BAR LAPS SHALL BE PROVIDED:

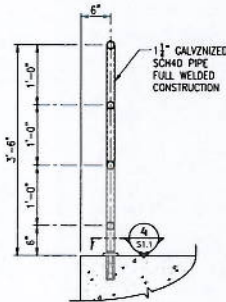
CONCRETE REBAR DEVELOPMENT LAP SPICE LENGTHS

BAR SIZE	MAT AND SLAB		WALLS
	L_d (INCHES)	L_d (INCHES)	CONCRETE COVER (C) $C > d$
#4	25	19	12
#5	31	24	20
#6	38	29	28
#7	55	42	38
#8	66	51	49

A. L_d = DEVELOPMENT BARS IN TENSION WITH LESS THAN 12" OF CONCRETE CAST BELOW

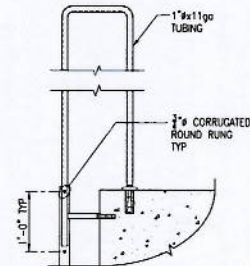
B. L_d = DEVELOPMENT OF BARS IN TENSION WITH MORE THAN 12" OF CONCRETE CAST BELOW

C. SPICE LENGTH EQUALS 1.3x DEVELOPMENT LENGTH.



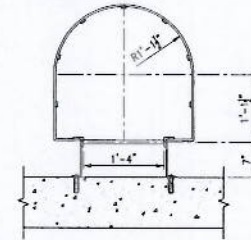
1 HANDRAIL DETAIL

S1.1 1'-0" S1.1 1211518.dwg



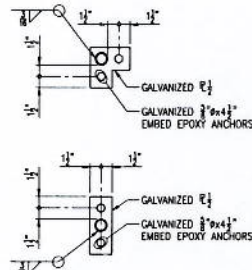
2 LADDER DETAIL

S1.1 1'-0" S1.1 1211518.dwg



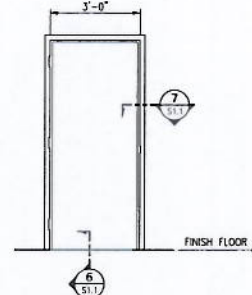
3 CAGE AND LADDER DETAIL

S1.1 1'-0" S1.1 1211518.dwg



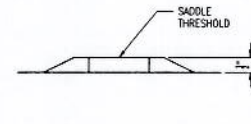
4 HANDRAIL BASE PLATE DETAILS

S1.1 1/2'-0" S1.1 1211518.dwg



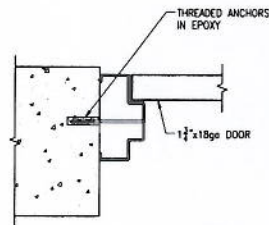
5 DOOR FRAME

S1.1 1/2'-0" S1.1 1211518.dwg



6 SILL DETAIL

S1.1 3'-0" S1.1 1211518.dwg



7 JAMB AND HEAD DETAIL

S1.1 3'-0" S1.1 1211518.dwg

CONSULTANT:

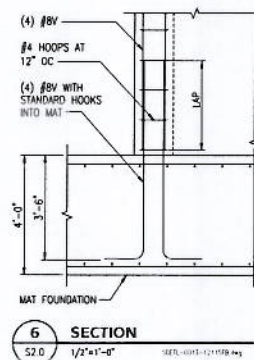
PDC INC. ENGINEERS
1008 Aurora Drive, Fairbanks, Alaska 99709-6502

PROJECT:
UAF AS3 ANTENNA

FAIRBANKS, ALASKA

SHEET TITLE:
STRUCTURAL GENERAL
NOTES AND TYPICAL
DETAILS

PRELIMINARY DESIGN



						DESIGN	JL.WTH
						DRAWN	D.M
						CHECKED	JL
						DATE	08/04/2013
						PROJECT NO.	12115FB
						SHEET NUMBER	
						S2.0	
						OF 1 SHEETS	

REVISIONS

No.	Date	Item
00	07/27/2013	S20 - MAT FOUNDATION DESIGN

AJW/ELI/MY/MS/KSW/06/09/11/09/12/13
 04 Aug 14 2013 5:43 AM